

1 **Malibu Creek Ecosystem Restoration Study**  
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3 **Los Angeles and Ventura Counties, California**  
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6 **Appendix L**  
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8 **Air Quality**  
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14 **U.S. Army Corps of Engineers**  
15 **Los Angeles District**  
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**January 2017**

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**Emissions Comparison by Alternative**

**Unmitigated Annual Emissions Comparison**

	Maximum Annual Emissions (tons per year)						Metric Tons CO2e/yr
	VOC	NOx	CO	SO2	PM10	PM2.5	
Alt 2a	0.8	11.9	5.8	0.02	1.1	0.5	244
Alt 2b	0.9	12.3	6.1	0.02	1.1	0.5	252
Alt 3a	0.4	4.7	3.2	0.01	0.8	0.3	269
Alt 3b	0.4	4.7	3.2	0.01	0.8	0.3	278
Alt 4a	0.8	11.7	5.8	0.02	1.1	0.5	248
Alt 4b	0.9	12.1	6.2	0.02	1.1	0.5	256
<b>Maximum</b>	<b>0.9</b>	<b>12.3</b>	<b>6.2</b>	<b>0.02</b>	<b>1.1</b>	<b>0.5</b>	<b>n/a</b>
<b>NEPA Significance Threshold</b>	<b>10</b>	<b>10</b>	<b>100</b>	<b>100</b>	<b>70</b>	<b>100</b>	<b>n/a</b>
<b>CEQA Significance Threshold</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>10,000</b>

Note:

CO2e emissions amortized over the lifetime of the project (assumed to be 30 years).

**Mitigated Annual Emissions Comparison**

	Maximum Annual Emissions (tons per year)						Metric Tons CO2e/yr
	VOC	NOx	CO	SO2	PM10	PM2.5	
Alt 2a	0.5	6.8	5.1	0.0	0.9	0.2	244
Alt 2b	0.5	7.1	5.5	0.0	0.9	0.2	252
Alt 3a	0.2	2.3	2.9	0.0	0.7	0.1	269.7
Alt 3b	0.2	2.3	2.9	0.0	0.7	0.1	278.0
Alt 4a	0.5	6.6	5.1	0.0	0.9	0.2	248
Alt 4b	0.5	7.0	5.5	0.0	0.9	0.2	256
<b>Maximum</b>	<b>0.5</b>	<b>7.1</b>	<b>5.5</b>	<b>0.02</b>	<b>0.9</b>	<b>0.2</b>	<b>n/a</b>
<b>NEPA Significance Threshold</b>	<b>10</b>	<b>10</b>	<b>100</b>	<b>100</b>	<b>70</b>	<b>100</b>	<b>n/a</b>
<b>CEQA Significance Threshold</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>n/a</b>	<b>10,000</b>

Note:

CO2e emissions amortized over the lifetime of the project (assumed to be 30 years).

**Unmitigated Daily Emissions Comparison**

	Maximum Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5
Alt 2a	20	224	109	0	17	8
Alt 2b	22	269	165	1	20	10
Alt 3a	25	120	170	1	14	6
Alt 3b	25	155	170	1	14	7
Alt 4a	75	1,096	510	2	49	38
Alt 4b	82	1,141	566	2	52	40
<b>Maximum</b>	<b>82</b>	<b>1,141</b>	<b>566</b>	<b>2</b>	<b>52</b>	<b>40</b>
<b>CEQA Significance Threshold</b>	<b>75</b>	<b>100</b>	<b>550</b>	<b>150</b>	<b>150</b>	<b>55</b>

**Mitigated Daily Emissions Comparison**

	Maximum Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5
Alt 2a	19	126	96	0	13	4
Alt 2b	19	172	152	1	14	5
Alt 3a	21	59	179	1	10	3
Alt 3b	21.0	103.7	179.3	0.7	11.6	4.5
Alt 4a	53	486	412	2	17	7
Alt 4b	53	532	468	2	18	8
<b>Maximum</b>	<b>53</b>	<b>532</b>	<b>468</b>	<b>2</b>	<b>18</b>	<b>8</b>
<b>CEQA Significance Threshold</b>	<b>75</b>	<b>100</b>	<b>550</b>	<b>150</b>	<b>150</b>	<b>55</b>

**Emissions Summary**  
**Alternative 2a - Dam Removal with Mechanical Transport**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)						
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
2016	0.02	0.53	0.18	0.00	0.06	0.02	0.02	0.41	0.16	0.00	0.05	0.01	
2017	0.42	5.45	3.01	0.01	0.81	0.28	0.18	2.29	2.39	0.01	0.65	0.13	
2018	0.82	11.91	5.78	0.02	1.08	0.47	0.49	6.77	5.08	0.02	0.79	0.20	
2019	0.56	7.61	4.47	0.02	0.90	0.33	0.35	4.45	4.10	0.02	0.72	0.17	
2020	0.45	5.72	3.72	0.01	0.84	0.27	0.32	3.68	3.57	0.01	0.72	0.16	
2021	0.55	5.62	4.29	0.02	0.97	0.30	0.47	4.05	4.27	0.02	0.86	0.20	
<b>Maximum</b>	<b>0.82</b>	<b>11.91</b>	<b>5.78</b>	<b>0.02</b>	<b>1.08</b>	<b>0.47</b>	<b>0.49</b>	<b>6.77</b>	<b>5.08</b>	<b>0.02</b>	<b>0.86</b>	<b>0.20</b>	
	<b>Percent Change</b>						<b>-40%</b>	<b>-43%</b>	<b>-12%</b>	<b>-2%</b>	<b>-21%</b>	<b>-58%</b>	

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2016</b>															
Offroad Construction Equipment	0.02	0.25	0.12	0.00	0.01	0.01	40	0.01	0.13	0.09	0.00	0.00	0.00	0.00	40
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	59	0.01	0.28	0.06	0.00	0.02	0.01	59	
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--	
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.53</b>	<b>0.18</b>	<b>0.00</b>	<b>0.06</b>	<b>0.02</b>	<b>99</b>	<b>0.02</b>	<b>0.41</b>	<b>0.16</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>100</b>	
<b>2017</b>															
Offroad Construction Equipment	0.41	5.40	2.81	0.01	0.23	0.21	752	0.17	2.24	2.19	0.01	0.07	0.06	733	
Onroad Vehicles	0.01	0.05	0.21	0.00	0.05	0.02	58	0.01	0.05	0.21	0.00	0.05	0.02	58	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2017 Total Emissions</b>	<b>0.42</b>	<b>5.45</b>	<b>3.01</b>	<b>0.01</b>	<b>0.81</b>	<b>0.28</b>	<b>809</b>	<b>0.18</b>	<b>2.29</b>	<b>2.39</b>	<b>0.01</b>	<b>0.65</b>	<b>0.13</b>	<b>791</b>	
<b>2018</b>															
Offroad Construction Equipment	0.77	10.04	5.43	0.02	0.39	0.36	1,713	0.45	4.90	4.73	0.02	0.10	0.08	1,679	
Onroad Vehicles	0.04	1.87	0.35	0.01	0.17	0.06	439	0.04	1.87	0.35	0.01	0.17	0.06	439	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2018 Total Emissions</b>	<b>0.82</b>	<b>11.91</b>	<b>5.78</b>	<b>0.02</b>	<b>1.08</b>	<b>0.47</b>	<b>2,152</b>	<b>0.49</b>	<b>6.77</b>	<b>5.08</b>	<b>0.02</b>	<b>0.79</b>	<b>0.20</b>	<b>2,118</b>	
<b>2019</b>															
Offroad Construction Equipment	0.53	6.65	4.23	0.01	0.27	0.24	1,226	0.33	3.49	3.86	0.01	0.08	0.07	1,257	
Onroad Vehicles	0.02	0.96	0.24	0.00	0.11	0.04	257	0.02	0.96	0.24	0.00	0.11	0.04	257	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2019 Total Emissions</b>	<b>0.56</b>	<b>7.61</b>	<b>4.47</b>	<b>0.02</b>	<b>0.90</b>	<b>0.33</b>	<b>1,483</b>	<b>0.35</b>	<b>4.45</b>	<b>4.10</b>	<b>0.02</b>	<b>0.72</b>	<b>0.17</b>	<b>1,514</b>	
<b>2020</b>															
Offroad Construction Equipment	0.42	4.97	3.49	0.01	0.20	0.18	996	0.30	2.93	3.34	0.01	0.08	0.07	999	
Onroad Vehicles	0.03	0.75	0.23	0.00	0.11	0.04	256	0.03	0.75	0.23	0.00	0.11	0.04	256	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2020 Total Emissions</b>	<b>0.45</b>	<b>5.72</b>	<b>3.72</b>	<b>0.01</b>	<b>0.84</b>	<b>0.27</b>	<b>1,252</b>	<b>0.32</b>	<b>3.68</b>	<b>3.57</b>	<b>0.01</b>	<b>0.72</b>	<b>0.16</b>	<b>1,256</b>	
<b>2021</b>															
Offroad Construction Equipment	0.47	5.12	4.02	0.01	0.21	0.19	1,245	0.39	3.55	4.00	0.01	0.09	0.08	1,241	
Onroad Vehicles	0.03	0.50	0.27	0.00	0.12	0.04	284	0.03	0.50	0.27	0.00	0.12	0.04	284	
Fugitive Dust Emissions	--	--	--	--	0.64	0.07	--	--	--	--	--	0.64	0.07	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2021 Total Emissions</b>	<b>0.55</b>	<b>5.62</b>	<b>4.29</b>	<b>0.02</b>	<b>0.97</b>	<b>0.30</b>	<b>1,528</b>	<b>0.47</b>	<b>4.05</b>	<b>4.27</b>	<b>0.02</b>	<b>0.86</b>	<b>0.20</b>	<b>1,525</b>	
<b>Maximum Emissions</b>	<b>0.82</b>	<b>11.91</b>	<b>5.78</b>	<b>0.02</b>	<b>1.08</b>	<b>0.47</b>	<b>n/a</b>	<b>0.49</b>	<b>6.77</b>	<b>5.08</b>	<b>0.02</b>	<b>0.86</b>	<b>0.20</b>	<b>n/a</b>	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	Yes	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							7,325	Total GHG Emissions (metric tons CO2e per project)							7,325
Amortized Emissions (metric tons CO2e per year)							244	Amortized Emissions (metric tons CO2e per year)							244
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Emissions Summary**  
**Alternative 2b - Dam Removal with Mechanical Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)						
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
2016	0.02	0.53	0.18	0.00	0.06	0.02	0.02	0.41	0.16	0.00	0.05	0.01	
2017	0.42	5.45	3.01	0.01	0.81	0.28	0.18	2.29	2.39	0.01	0.65	0.13	
2018	0.86	12.27	6.15	0.02	1.11	0.49	0.54	7.13	5.46	0.02	0.82	0.22	
2019	0.59	8.02	4.76	0.02	0.93	0.35	0.39	4.85	4.38	0.02	0.75	0.19	
2020	0.48	6.13	3.99	0.01	0.87	0.29	0.35	4.09	3.84	0.01	0.75	0.18	
2021	0.55	5.62	4.29	0.02	0.97	0.30	0.47	4.05	4.27	0.02	0.86	0.20	
<b>Maximum</b>	<b>0.86</b>	<b>12.27</b>	<b>6.15</b>	<b>0.02</b>	<b>1.11</b>	<b>0.49</b>	<b>0.54</b>	<b>7.13</b>	<b>5.46</b>	<b>0.02</b>	<b>0.86</b>	<b>0.22</b>	
	<b>Percent Change</b>						<b>-38%</b>	<b>-42%</b>	<b>-11%</b>	<b>-2%</b>	<b>-23%</b>	<b>-56%</b>	

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2016</b>															
Offroad Construction Equipment	0.02	0.25	0.12	0.00	0.01	0.01	40	0.01	0.13	0.09	0.00	0.00	0.00	0.01	40
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	59	0.01	0.28	0.06	0.00	0.02	0.01	59	
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--	
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.53</b>	<b>0.18</b>	<b>0.00</b>	<b>0.06</b>	<b>0.02</b>	<b>99</b>	<b>0.02</b>	<b>0.41</b>	<b>0.16</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>100</b>	
<b>2017</b>															
Offroad Construction Equipment	0.41	5.40	2.81	0.01	0.23	0.21	752	0.17	2.24	2.19	0.01	0.07	0.06	733	
Onroad Vehicles	0.01	0.05	0.21	0.00	0.05	0.02	58	0.01	0.05	0.21	0.00	0.05	0.02	58	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2017 Total Emissions</b>	<b>0.42</b>	<b>5.45</b>	<b>3.01</b>	<b>0.01</b>	<b>0.81</b>	<b>0.28</b>	<b>809</b>	<b>0.18</b>	<b>2.29</b>	<b>2.39</b>	<b>0.01</b>	<b>0.65</b>	<b>0.13</b>	<b>791</b>	
<b>2018</b>															
Offroad Construction Equipment	0.82	10.41	5.75	0.02	0.41	0.37	1,771	0.50	5.27	5.06	0.02	0.11	0.10	1,737	
Onroad Vehicles	0.04	1.86	0.40	0.01	0.18	0.06	449	0.04	1.86	0.40	0.01	0.18	0.06	449	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2018 Total Emissions</b>	<b>0.86</b>	<b>12.27</b>	<b>6.15</b>	<b>0.02</b>	<b>1.11</b>	<b>0.49</b>	<b>2,220</b>	<b>0.54</b>	<b>7.13</b>	<b>5.46</b>	<b>0.02</b>	<b>0.82</b>	<b>0.22</b>	<b>2,186</b>	
<b>2019</b>															
Offroad Construction Equipment	0.57	7.05	4.48	0.01	0.28	0.26	1,299	0.36	3.88	4.11	0.01	0.10	0.09	1,329	
Onroad Vehicles	0.03	0.97	0.28	0.00	0.12	0.04	270	0.03	0.97	0.28	0.00	0.12	0.04	270	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2019 Total Emissions</b>	<b>0.59</b>	<b>8.02</b>	<b>4.76</b>	<b>0.02</b>	<b>0.93</b>	<b>0.35</b>	<b>1,569</b>	<b>0.39</b>	<b>4.85</b>	<b>4.38</b>	<b>0.02</b>	<b>0.75</b>	<b>0.19</b>	<b>1,599</b>	
<b>2020</b>															
Offroad Construction Equipment	0.46	5.37	3.72	0.01	0.22	0.20	1,076	0.33	3.33	3.57	0.01	0.10	0.08	1,079	
Onroad Vehicles	0.03	0.76	0.27	0.00	0.12	0.04	269	0.03	0.76	0.27	0.00	0.12	0.04	269	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2020 Total Emissions</b>	<b>0.48</b>	<b>6.13</b>	<b>3.99</b>	<b>0.01</b>	<b>0.87</b>	<b>0.29</b>	<b>1,345</b>	<b>0.35</b>	<b>4.09</b>	<b>3.84</b>	<b>0.01</b>	<b>0.75</b>	<b>0.18</b>	<b>1,348</b>	
<b>2021</b>															
Offroad Construction Equipment	0.47	5.12	4.02	0.01	0.21	0.19	1,245	0.39	3.55	4.00	0.01	0.09	0.08	1,241	
Onroad Vehicles	0.03	0.50	0.27	0.00	0.12	0.04	284	0.03	0.50	0.27	0.00	0.12	0.04	284	
Fugitive Dust Emissions	--	--	--	--	0.64	0.07	--	--	--	--	--	0.64	0.07	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2021 Total Emissions</b>	<b>0.55</b>	<b>5.62</b>	<b>4.29</b>	<b>0.02</b>	<b>0.97</b>	<b>0.30</b>	<b>1,528</b>	<b>0.47</b>	<b>4.05</b>	<b>4.27</b>	<b>0.02</b>	<b>0.86</b>	<b>0.20</b>	<b>1,525</b>	
<b>Maximum Emissions</b>	<b>0.86</b>	<b>12.27</b>	<b>6.15</b>	<b>0.02</b>	<b>1.11</b>	<b>0.49</b>	<b>n/a</b>	<b>0.54</b>	<b>7.13</b>	<b>5.46</b>	<b>0.02</b>	<b>0.86</b>	<b>0.22</b>	<b>n/a</b>	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	Yes	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							7,571	Total GHG Emissions (metric tons CO2e per project)							7,571
Amortized Emissions (metric tons CO2e per year)							252	Amortized Emissions (metric tons CO2e per year)							252
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Emissions Summary**  
**Alternative 3a - Dam Removal with Natural Transport**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	0.02	0.52	0.15	0.00	0.05	0.02	0.01	0.40	0.13	0.00	0.05	0.01
2017	0.40	4.74	3.23	0.01	0.80	0.26	0.18	2.32	2.90	0.01	0.67	0.14
2019	0.17	1.72	1.35	0.00	0.63	0.14	0.10	1.23	1.29	0.00	0.61	0.12
2021	0.15	1.45	1.49	0.00	0.63	0.13	0.11	1.16	1.48	0.00	0.62	0.12
2023	0.13	1.13	1.46	0.00	0.61	0.11	0.11	1.11	1.51	0.00	0.62	0.12
2025	0.11	0.97	1.44	0.00	0.60	0.10	0.12	1.12	1.51	0.00	0.63	0.12
2027	0.10	0.85	1.42	0.00	0.59	0.09	0.06	0.49	1.32	0.00	0.57	0.07
2029	0.09	0.77	1.41	0.00	0.59	0.09	0.07	0.49	1.35	0.00	0.57	0.07
2031	0.09	0.73	1.40	0.00	0.58	0.08	0.07	0.50	1.39	0.00	0.57	0.07
2033	0.09	0.71	1.39	0.00	0.58	0.08	0.08	0.50	1.41	0.00	0.57	0.07
2035	0.09	0.69	1.39	0.00	0.58	0.08	0.08	0.50	1.45	0.00	0.57	0.07
2037	0.08	0.68	1.38	0.00	0.58	0.08	0.08	0.51	1.47	0.00	0.57	0.07
2039 - 2063	0.08	0.68	1.38	0.00	0.58	0.08	0.09	0.51	1.52	0.00	0.57	0.07
2066	0.21	1.27	2.13	0.01	0.64	0.11	0.20	0.83	2.30	0.01	0.62	0.10
<b>Maximum</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>0.20</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>
	<b>Percent Change</b>						<b>-50%</b>	<b>-51%</b>	<b>-10%</b>	<b>-1%</b>	<b>-16%</b>	<b>-46%</b>

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr		
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5			
<b>2016</b>																
Offroad Construction Equipment	0.02	0.25	0.10	0.00	0.01	0.01	33	0.01	0.12	0.07	0.00	0.00	0.00	0.00	33	
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	58	0.01	0.28	0.06	0.00	0.02	0.01	58		
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--		
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.52</b>	<b>0.15</b>	<b>0.00</b>	<b>0.05</b>	<b>0.02</b>	<b>91</b>	<b>0.01</b>	<b>0.40</b>	<b>0.13</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>91</b>		
<b>2017</b>																
Offroad Construction Equipment	0.39	4.64	2.98	0.01	0.21	0.19	671	0.18	2.22	2.66	0.01	0.07	0.07	663		
Onroad Vehicles	0.01	0.10	0.25	0.00	0.07	0.02	76	0.01	0.10	0.25	0.00	0.07	0.02	76		
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--		
<b>2017 Total Emissions</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>747</b>	<b>0.18</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>	<b>739</b>		
<b>2019</b>																
Offroad Construction Equipment	0.17	1.70	1.28	0.00	0.08	0.07	294	0.10	1.22	1.22	0.00	0.06	0.05	297		
Onroad Vehicles	0.00	0.01	0.07	0.00	0.02	0.01	22	0.00	0.01	0.07	0.00	0.02	0.01	22		
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--		
<b>2019 Total Emissions</b>	<b>0.17</b>	<b>1.72</b>	<b>1.35</b>	<b>0.00</b>	<b>0.63</b>	<b>0.14</b>	<b>316</b>	<b>0.10</b>	<b>1.23</b>	<b>1.29</b>	<b>0.00</b>	<b>0.61</b>	<b>0.12</b>	<b>319</b>		
<b>2021</b>																
Offroad Construction Equipment	0.15	1.44	1.40	0.00	0.07	0.06	310	0.11	1.15	1.39	0.00	0.06	0.06	308		
Onroad Vehicles	0.00	0.01	0.09	0.00	0.03	0.01	29	0.00	0.01	0.09	0.00	0.03	0.01	29		
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--		
<b>2021 Total Emissions</b>	<b>0.15</b>	<b>1.45</b>	<b>1.49</b>	<b>0.00</b>	<b>0.63</b>	<b>0.13</b>	<b>339</b>	<b>0.11</b>	<b>1.16</b>	<b>1.48</b>	<b>0.00</b>	<b>0.62</b>	<b>0.12</b>	<b>337</b>		
<b>2023</b>																
Offroad Construction Equipment	0.13	1.12	1.37	0.00	0.05	0.05	310	0.11	1.10	1.42	0.00	0.06	0.06	315		
Onroad Vehicles	0.00	0.01	0.08	0.00	0.03	0.01	28	0.00	0.01	0.08	0.00	0.03	0.01	28		
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--		
<b>2023 Total Emissions</b>	<b>0.13</b>	<b>1.13</b>	<b>1.46</b>	<b>0.00</b>	<b>0.61</b>	<b>0.11</b>	<b>338</b>	<b>0.11</b>	<b>1.11</b>	<b>1.51</b>	<b>0.00</b>	<b>0.62</b>	<b>0.12</b>	<b>343</b>		

Detailed Emissions Summary - Annual

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2025</b>															
Offroad Construction Equipment	0.11	0.97	1.36	0.00	0.04	0.04	310	0.12	1.11	1.44	0.00	0.07	0.06	309	
Onroad Vehicles	0.00	0.01	0.08	0.00	0.03	0.01	28	0.00	0.01	0.08	0.00	0.03	0.01	28	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2025 Total Emissions</b>	<b>0.11</b>	<b>0.97</b>	<b>1.44</b>	<b>0.00</b>	<b>0.60</b>	<b>0.10</b>	<b>337</b>	<b>0.12</b>	<b>1.12</b>	<b>1.51</b>	<b>0.00</b>	<b>0.63</b>	<b>0.12</b>	<b>337</b>	
<b>2027</b>															
Offroad Construction Equipment	0.10	0.84	1.35	0.00	0.03	0.03	310	0.06	0.48	1.25	0.00	0.01	0.01	312	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2027 Total Emissions</b>	<b>0.10</b>	<b>0.85</b>	<b>1.42</b>	<b>0.00</b>	<b>0.59</b>	<b>0.09</b>	<b>337</b>	<b>0.06</b>	<b>0.49</b>	<b>1.32</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>339</b>	
<b>2029</b>															
Offroad Construction Equipment	0.09	0.76	1.34	0.00	0.03	0.02	310	0.07	0.49	1.28	0.00	0.01	0.01	307	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2029 Total Emissions</b>	<b>0.09</b>	<b>0.77</b>	<b>1.41</b>	<b>0.00</b>	<b>0.59</b>	<b>0.09</b>	<b>336</b>	<b>0.07</b>	<b>0.49</b>	<b>1.35</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>334</b>	
<b>2031</b>															
Offroad Construction Equipment	0.09	0.72	1.33	0.00	0.02	0.02	310	0.07	0.49	1.33	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2031 Total Emissions</b>	<b>0.09</b>	<b>0.73</b>	<b>1.40</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.07</b>	<b>0.50</b>	<b>1.39</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>338</b>	
<b>2033</b>															
Offroad Construction Equipment	0.09	0.70	1.33	0.00	0.02	0.02	310	0.07	0.49	1.35	0.00	0.01	0.01	306	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	26	0.00	0.01	0.07	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2033 Total Emissions</b>	<b>0.09</b>	<b>0.71</b>	<b>1.39</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.50</b>	<b>1.41</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>333</b>	
<b>2035</b>															
Offroad Construction Equipment	0.08	0.69	1.32	0.00	0.02	0.02	310	0.08	0.50	1.39	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2035 Total Emissions</b>	<b>0.09</b>	<b>0.69</b>	<b>1.39</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.50</b>	<b>1.45</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>337</b>	
<b>2037</b>															
Offroad Construction Equipment	0.08	0.68	1.32	0.00	0.02	0.01	310	0.08	0.50	1.41	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2037 Total Emissions</b>	<b>0.08</b>	<b>0.68</b>	<b>1.38</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.51</b>	<b>1.47</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>337</b>	
<b>2039 - 2063</b>															
Offroad Construction Equipment	0.08	0.67	1.32	0.00	0.02	0.01	3,096	0.09	0.50	1.46	0.00	0.01	0.01	3,108	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2039 - 2063 Total Emissions</b>	<b>0.08</b>	<b>0.68</b>	<b>1.38</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>3,122</b>	<b>0.09</b>	<b>0.51</b>	<b>1.52</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>3,134</b>	
<b>2066</b>															
Offroad Construction Equipment	0.14	1.12	1.97	0.01	0.03	0.03	606	0.13	0.68	2.15	0.01	0.02	0.01	609	
Onroad Vehicles	0.02	0.15	0.15	0.00	0.08	0.03	164	0.02	0.15	0.15	0.00	0.08	0.03	164	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2066 Total Emissions</b>	<b>0.21</b>	<b>1.27</b>	<b>2.13</b>	<b>0.01</b>	<b>0.64</b>	<b>0.11</b>	<b>770</b>	<b>0.20</b>	<b>0.83</b>	<b>2.30</b>	<b>0.01</b>	<b>0.62</b>	<b>0.10</b>	<b>773</b>	
<b>Maximum Emissions</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>n/a</b>	<b>0.20</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>	<b>n/a</b>	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	No	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							8,078	Total GHG Emissions (metric tons CO2e per project)							8,092
Amortized Emissions (metric tons CO2e per year)							269	Amortized Emissions (metric tons CO2e per year)							270
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Alternative 3b - Dam Removal with Natural Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)						
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
2016	0.02	0.52	0.15	0.00	0.05	0.02	0.01	0.40	0.13	0.00	0.05	0.01	
2017	0.40	4.74	3.23	0.01	0.80	0.26	0.18	2.32	2.90	0.01	0.67	0.14	
2019	0.22	2.07	1.72	0.00	0.66	0.15	0.14	1.58	1.66	0.00	0.64	0.13	
2021	0.20	1.79	1.84	0.00	0.65	0.14	0.15	1.51	1.83	0.00	0.65	0.14	
2023	0.17	1.47	1.81	0.00	0.64	0.13	0.16	1.45	1.86	0.00	0.65	0.14	
2025	0.11	0.97	1.44	0.00	0.60	0.10	0.12	1.12	1.51	0.00	0.63	0.12	
2027	0.10	0.85	1.42	0.00	0.59	0.09	0.06	0.49	1.32	0.00	0.57	0.07	
2029	0.09	0.77	1.41	0.00	0.59	0.09	0.07	0.49	1.35	0.00	0.57	0.07	
2031	0.09	0.73	1.40	0.00	0.58	0.08	0.07	0.50	1.39	0.00	0.57	0.07	
2033	0.09	0.71	1.39	0.00	0.58	0.08	0.08	0.50	1.41	0.00	0.57	0.07	
2035	0.09	0.69	1.39	0.00	0.58	0.08	0.08	0.50	1.45	0.00	0.57	0.07	
2037	0.08	0.68	1.38	0.00	0.58	0.08	0.08	0.51	1.47	0.00	0.57	0.07	
2039 - 2063	0.08	0.68	1.38	0.00	0.58	0.08	0.09	0.51	1.52	0.00	0.57	0.07	
2066	0.21	1.27	2.13	0.01	0.64	0.11	0.20	0.83	2.30	0.01	0.62	0.10	
<b>Maximum</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>0.20</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>	
	<b>Percent Change</b>						<b>-50%</b>	<b>-51%</b>	<b>-10%</b>	<b>-1%</b>	<b>-16%</b>	<b>-46%</b>	

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2016</b>															
Offroad Construction Equipment	0.02	0.25	0.10	0.00	0.01	0.01	33	0.01	0.12	0.07	0.00	0.00	0.00	0.00	33
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	58	0.01	0.28	0.06	0.00	0.02	0.01	58	
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--	
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.52</b>	<b>0.15</b>	<b>0.00</b>	<b>0.05</b>	<b>0.02</b>	<b>91</b>	<b>0.01</b>	<b>0.40</b>	<b>0.13</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>91</b>	
<b>2017</b>															
Offroad Construction Equipment	0.39	4.64	2.98	0.01	0.21	0.19	671	0.18	2.22	2.66	0.01	0.07	0.07	663	
Onroad Vehicles	0.01	0.10	0.25	0.00	0.07	0.02	76	0.01	0.10	0.25	0.00	0.07	0.02	76	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2017 Total Emissions</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>747</b>	<b>0.18</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>	<b>739</b>	
<b>2019</b>															
Offroad Construction Equipment	0.21	2.04	1.60	0.00	0.10	0.09	352	0.14	1.56	1.55	0.00	0.08	0.07	356	
Onroad Vehicles	0.00	0.03	0.12	0.00	0.04	0.01	37	0.00	0.03	0.12	0.00	0.04	0.01	37	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2019 Total Emissions</b>	<b>0.22</b>	<b>2.07</b>	<b>1.72</b>	<b>0.00</b>	<b>0.66</b>	<b>0.15</b>	<b>390</b>	<b>0.14</b>	<b>1.58</b>	<b>1.66</b>	<b>0.00</b>	<b>0.64</b>	<b>0.13</b>	<b>393</b>	
<b>2021</b>															
Offroad Construction Equipment	0.19	1.77	1.72	0.00	0.08	0.07	382	0.15	1.49	1.71	0.00	0.08	0.07	380	
Onroad Vehicles	0.00	0.02	0.12	0.00	0.04	0.01	41	0.00	0.02	0.12	0.00	0.04	0.01	41	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2021 Total Emissions</b>	<b>0.20</b>	<b>1.79</b>	<b>1.84</b>	<b>0.00</b>	<b>0.65</b>	<b>0.14</b>	<b>424</b>	<b>0.15</b>	<b>1.51</b>	<b>1.83</b>	<b>0.00</b>	<b>0.65</b>	<b>0.14</b>	<b>422</b>	
<b>2023</b>															
Offroad Construction Equipment	0.17	1.45	1.70	0.00	0.07	0.06	389	0.16	1.44	1.75	0.00	0.08	0.07	395	
Onroad Vehicles	0.00	0.01	0.12	0.00	0.05	0.01	39	0.00	0.01	0.12	0.00	0.05	0.01	39	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2023 Total Emissions</b>	<b>0.17</b>	<b>1.47</b>	<b>1.81</b>	<b>0.00</b>	<b>0.64</b>	<b>0.13</b>	<b>429</b>	<b>0.16</b>	<b>1.45</b>	<b>1.86</b>	<b>0.00</b>	<b>0.65</b>	<b>0.14</b>	<b>434</b>	
<b>2025</b>															
Offroad Construction Equipment	0.11	0.97	1.36	0.00	0.04	0.04	310	0.12	1.11	1.44	0.00	0.07	0.06	309	
Onroad Vehicles	0.00	0.01	0.08	0.00	0.03	0.01	28	0.00	0.01	0.08	0.00	0.03	0.01	28	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2025 Total Emissions</b>	<b>0.11</b>	<b>0.97</b>	<b>1.44</b>	<b>0.00</b>	<b>0.60</b>	<b>0.10</b>	<b>337</b>	<b>0.12</b>	<b>1.12</b>	<b>1.51</b>	<b>0.00</b>	<b>0.63</b>	<b>0.12</b>	<b>337</b>	



Detailed Emissions Summary - Annual

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2027</b>															
Offroad Construction Equipment	0.10	0.84	1.35	0.00	0.03	0.03	310	0.06	0.48	1.25	0.00	0.01	0.01	312	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2027 Total Emissions</b>	<b>0.10</b>	<b>0.85</b>	<b>1.42</b>	<b>0.00</b>	<b>0.59</b>	<b>0.09</b>	<b>337</b>	<b>0.06</b>	<b>0.49</b>	<b>1.32</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>339</b>	
<b>2029</b>															
Offroad Construction Equipment	0.09	0.76	1.34	0.00	0.03	0.02	310	0.07	0.49	1.28	0.00	0.01	0.01	307	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2029 Total Emissions</b>	<b>0.09</b>	<b>0.77</b>	<b>1.41</b>	<b>0.00</b>	<b>0.59</b>	<b>0.09</b>	<b>336</b>	<b>0.07</b>	<b>0.49</b>	<b>1.35</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>334</b>	
<b>2031</b>															
Offroad Construction Equipment	0.09	0.72	1.33	0.00	0.02	0.02	310	0.07	0.49	1.33	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	27	0.00	0.01	0.07	0.00	0.03	0.01	27	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2031 Total Emissions</b>	<b>0.09</b>	<b>0.73</b>	<b>1.40</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.07</b>	<b>0.50</b>	<b>1.39</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>338</b>	
<b>2033</b>															
Offroad Construction Equipment	0.09	0.70	1.33	0.00	0.02	0.02	310	0.07	0.49	1.35	0.00	0.01	0.01	306	
Onroad Vehicles	0.00	0.01	0.07	0.00	0.03	0.01	26	0.00	0.01	0.07	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2033 Total Emissions</b>	<b>0.09</b>	<b>0.71</b>	<b>1.39</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.50</b>	<b>1.41</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>333</b>	
<b>2035</b>															
Offroad Construction Equipment	0.08	0.69	1.32	0.00	0.02	0.02	310	0.08	0.50	1.39	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2035 Total Emissions</b>	<b>0.09</b>	<b>0.69</b>	<b>1.39</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.50</b>	<b>1.45</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>337</b>	
<b>2037</b>															
Offroad Construction Equipment	0.08	0.68	1.32	0.00	0.02	0.01	310	0.08	0.50	1.41	0.00	0.01	0.01	311	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2037 Total Emissions</b>	<b>0.08</b>	<b>0.68</b>	<b>1.38</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>336</b>	<b>0.08</b>	<b>0.51</b>	<b>1.47</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>337</b>	
<b>2039 - 2063</b>															
Offroad Construction Equipment	0.08	0.67	1.32	0.00	0.02	0.01	3,096	0.09	0.50	1.46	0.00	0.01	0.01	3,108	
Onroad Vehicles	0.00	0.01	0.06	0.00	0.03	0.01	26	0.00	0.01	0.06	0.00	0.03	0.01	26	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2039 - 2063 Total Emissions</b>	<b>0.08</b>	<b>0.68</b>	<b>1.38</b>	<b>0.00</b>	<b>0.58</b>	<b>0.08</b>	<b>3,122</b>	<b>0.09</b>	<b>0.51</b>	<b>1.52</b>	<b>0.00</b>	<b>0.57</b>	<b>0.07</b>	<b>3,134</b>	
<b>2066</b>															
Offroad Construction Equipment	0.14	1.12	1.97	0.01	0.03	0.03	606	0.13	0.68	2.15	0.01	0.02	0.01	609	
Onroad Vehicles	0.02	0.15	0.15	0.00	0.08	0.03	164	0.02	0.15	0.15	0.00	0.08	0.03	164	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2066 Total Emissions</b>	<b>0.21</b>	<b>1.27</b>	<b>2.13</b>	<b>0.01</b>	<b>0.64</b>	<b>0.11</b>	<b>770</b>	<b>0.20</b>	<b>0.83</b>	<b>2.30</b>	<b>0.01</b>	<b>0.62</b>	<b>0.10</b>	<b>773</b>	
<b>Maximum Emissions</b>	<b>0.40</b>	<b>4.74</b>	<b>3.23</b>	<b>0.01</b>	<b>0.80</b>	<b>0.26</b>	<b>n/a</b>	<b>0.20</b>	<b>2.32</b>	<b>2.90</b>	<b>0.01</b>	<b>0.67</b>	<b>0.14</b>	<b>n/a</b>	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	No	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							8,327	Total GHG Emissions (metric tons CO2e per project)							8,341
Amortized Emissions (metric tons CO2e per year)							278	Amortized Emissions (metric tons CO2e per year)							278
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Emissions Summary**  
**Alternative 4a - Dam Removal with Hybrid Mechanical and Natural Transport**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)						
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
2016	0.02	0.53	0.16	0.00	0.05	0.02	0.01	0.40	0.13	0.00	0.05	0.01	
2017	0.49	6.47	3.69	0.01	0.87	0.32	0.22	2.79	3.06	0.01	0.68	0.14	
2018	0.81	11.75	5.78	0.02	1.08	0.47	0.49	6.57	5.09	0.02	0.78	0.19	
2019	0.57	7.65	4.51	0.02	0.90	0.34	0.36	4.45	4.13	0.02	0.72	0.17	
2020	0.46	5.78	3.76	0.01	0.84	0.28	0.33	3.72	3.61	0.01	0.71	0.16	
2021	0.54	5.49	4.21	0.02	0.97	0.30	0.46	3.98	4.19	0.02	0.85	0.19	
Maximum	0.81	11.75	5.78	0.02	1.08	0.47	0.49	6.57	5.09	0.02	0.85	0.19	
	Percent Change						-40%	-44%	-12%	-2%	-21%	-59%	

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2016</b>															
Offroad Construction Equipment	0.02	0.25	0.10	0.00	0.01	0.01	34	0.01	0.13	0.07	0.00	0.00	0.00	34	
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	58	0.01	0.28	0.06	0.00	0.02	0.01	58	
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--	
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.53</b>	<b>0.16</b>	<b>0.00</b>	<b>0.05</b>	<b>0.02</b>	<b>92</b>	<b>0.01</b>	<b>0.40</b>	<b>0.13</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>92</b>	
<b>2017</b>															
Offroad Construction Equipment	0.48	6.35	3.42	0.01	0.27	0.24	905	0.21	2.67	2.79	0.01	0.07	0.06	886	
Onroad Vehicles	0.01	0.12	0.27	0.00	0.07	0.02	84	0.01	0.12	0.27	0.00	0.07	0.02	84	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2017 Total Emissions</b>	<b>0.49</b>	<b>6.47</b>	<b>3.69</b>	<b>0.01</b>	<b>0.87</b>	<b>0.32</b>	<b>988</b>	<b>0.22</b>	<b>2.79</b>	<b>3.06</b>	<b>0.01</b>	<b>0.68</b>	<b>0.14</b>	<b>970</b>	
<b>2018</b>															
Offroad Construction Equipment	0.78	10.05	5.45	0.02	0.39	0.36	1,713	0.45	4.87	4.75	0.02	0.10	0.08	1,678	
Onroad Vehicles	0.04	1.69	0.33	0.00	0.15	0.05	402	0.04	1.69	0.33	0.00	0.15	0.05	402	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2018 Total Emissions</b>	<b>0.81</b>	<b>11.75</b>	<b>5.78</b>	<b>0.02</b>	<b>1.08</b>	<b>0.47</b>	<b>2,115</b>	<b>0.49</b>	<b>6.57</b>	<b>5.09</b>	<b>0.02</b>	<b>0.78</b>	<b>0.19</b>	<b>2,080</b>	
<b>2019</b>															
Offroad Construction Equipment	0.54	6.83	4.27	0.01	0.27	0.24	1,259	0.34	3.63	3.90	0.01	0.09	0.08	1,290	
Onroad Vehicles	0.02	0.82	0.23	0.00	0.10	0.03	228	0.02	0.82	0.23	0.00	0.10	0.03	228	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2019 Total Emissions</b>	<b>0.57</b>	<b>7.65</b>	<b>4.51</b>	<b>0.02</b>	<b>0.90</b>	<b>0.34</b>	<b>1,487</b>	<b>0.36</b>	<b>4.45</b>	<b>4.13</b>	<b>0.02</b>	<b>0.72</b>	<b>0.17</b>	<b>1,518</b>	
<b>2020</b>															
Offroad Construction Equipment	0.44	5.12	3.53	0.01	0.21	0.18	1,028	0.31	3.05	3.38	0.01	0.08	0.07	1,032	
Onroad Vehicles	0.02	0.67	0.23	0.00	0.10	0.03	233	0.02	0.67	0.23	0.00	0.10	0.03	233	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2020 Total Emissions</b>	<b>0.46</b>	<b>5.78</b>	<b>3.76</b>	<b>0.01</b>	<b>0.84</b>	<b>0.28</b>	<b>1,261</b>	<b>0.33</b>	<b>3.72</b>	<b>3.61</b>	<b>0.01</b>	<b>0.71</b>	<b>0.16</b>	<b>1,265</b>	
<b>2021</b>															
Offroad Construction Equipment	0.46	4.99	3.95	0.01	0.20	0.18	1,216	0.38	3.48	3.93	0.01	0.09	0.08	1,212	
Onroad Vehicles	0.03	0.50	0.26	0.00	0.12	0.04	281	0.03	0.50	0.26	0.00	0.12	0.04	281	
Fugitive Dust Emissions	--	--	--	--	0.64	0.07	--	--	--	--	--	0.64	0.07	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2021 Total Emissions</b>	<b>0.54</b>	<b>5.49</b>	<b>4.21</b>	<b>0.02</b>	<b>0.97</b>	<b>0.30</b>	<b>1,497</b>	<b>0.46</b>	<b>3.98</b>	<b>4.19</b>	<b>0.02</b>	<b>0.85</b>	<b>0.19</b>	<b>1,493</b>	
<b>Maximum Emissions</b>	<b>0.81</b>	<b>11.75</b>	<b>5.78</b>	<b>0.02</b>	<b>1.08</b>	<b>0.47</b>	n/a	<b>0.49</b>	<b>6.57</b>	<b>5.09</b>	<b>0.02</b>	<b>0.85</b>	<b>0.19</b>	n/a	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	Yes	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							7,441	Total GHG Emissions (metric tons CO2e per project)							7,441
Amortized Emissions (metric tons CO2e per year)							248	Amortized Emissions (metric tons CO2e per year)							248
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Emissions Summary**  
**Alternative 4b - Dam Removal with Hybrid Mechanical and Natural Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Annual**

Year	Unmitigated Annual Emissions (tons per year)						Mitigated Annual Emissions (tons per year)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	0.02	0.53	0.16	0.00	0.05	0.02	0.01	0.40	0.13	0.00	0.05	0.01
2017	0.49	6.47	3.69	0.01	0.87	0.32	0.22	2.79	3.06	0.01	0.68	0.14
2018	0.86	12.13	6.16	0.02	1.11	0.49	0.53	6.95	5.46	0.02	0.81	0.21
2019	0.60	8.05	4.79	0.02	0.93	0.35	0.40	4.85	4.42	0.02	0.75	0.18
2020	0.49	6.19	4.03	0.01	0.87	0.29	0.36	4.12	3.88	0.01	0.74	0.18
2021	0.54	5.49	4.21	0.02	0.97	0.30	0.46	3.98	4.19	0.02	0.85	0.19
Maximum	0.86	12.13	6.16	0.02	1.11	0.49	0.53	6.95	5.46	0.02	0.85	0.21

**Detailed Emissions Summary - Annual**

Source	Unmitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	Mitigated Annual Emissions (tons per year)						Metric Tons CO2e/yr	
	VOC	NOx	CO	SO2	PM10	PM2.5		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>2016</b>															
Offroad Construction Equipment	0.02	0.25	0.10	0.00	0.01	0.01	34	0.01	0.13	0.07	0.00	0.00	0.00	0.00	34
Onroad Vehicles	0.01	0.28	0.06	0.00	0.02	0.01	58	0.01	0.28	0.06	0.00	0.02	0.01	58	
Fugitive Dust Emissions	--	--	--	--	0.02	0.00	--	--	--	--	--	0.02	0.00	--	
<b>2016 Total Emissions</b>	<b>0.02</b>	<b>0.53</b>	<b>0.16</b>	<b>0.00</b>	<b>0.05</b>	<b>0.02</b>	<b>92</b>	<b>0.01</b>	<b>0.40</b>	<b>0.13</b>	<b>0.00</b>	<b>0.05</b>	<b>0.01</b>	<b>92</b>	
<b>2017</b>															
Offroad Construction Equipment	0.48	6.35	3.42	0.01	0.27	0.24	905	0.21	2.67	2.79	0.01	0.07	0.06	886	
Onroad Vehicles	0.01	0.12	0.27	0.00	0.07	0.02	84	0.01	0.12	0.27	0.00	0.07	0.02	84	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2017 Total Emissions</b>	<b>0.49</b>	<b>6.47</b>	<b>3.69</b>	<b>0.01</b>	<b>0.87</b>	<b>0.32</b>	<b>988</b>	<b>0.22</b>	<b>2.79</b>	<b>3.06</b>	<b>0.01</b>	<b>0.68</b>	<b>0.14</b>	<b>970</b>	
<b>2018</b>															
Offroad Construction Equipment	0.82	10.42	5.78	0.02	0.41	0.37	1,771	0.50	5.24	5.08	0.02	0.11	0.10	1,737	
Onroad Vehicles	0.04	1.71	0.38	0.00	0.17	0.06	418	0.04	1.71	0.38	0.00	0.17	0.06	418	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2018 Total Emissions</b>	<b>0.86</b>	<b>12.13</b>	<b>6.16</b>	<b>0.02</b>	<b>1.11</b>	<b>0.49</b>	<b>2,189</b>	<b>0.53</b>	<b>6.95</b>	<b>5.46</b>	<b>0.02</b>	<b>0.81</b>	<b>0.21</b>	<b>2,154</b>	
<b>2019</b>															
Offroad Construction Equipment	0.58	7.22	4.52	0.01	0.29	0.26	1,332	0.38	4.02	4.15	0.01	0.10	0.09	1,362	
Onroad Vehicles	0.02	0.83	0.27	0.00	0.11	0.04	239	0.02	0.83	0.27	0.00	0.11	0.04	239	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2019 Total Emissions</b>	<b>0.60</b>	<b>8.05</b>	<b>4.79</b>	<b>0.02</b>	<b>0.93</b>	<b>0.35</b>	<b>1,570</b>	<b>0.40</b>	<b>4.85</b>	<b>4.42</b>	<b>0.02</b>	<b>0.75</b>	<b>0.18</b>	<b>1,601</b>	
<b>2020</b>															
Offroad Construction Equipment	0.47	5.52	3.76	0.01	0.22	0.20	1,108	0.34	3.45	3.61	0.01	0.10	0.09	1,112	
Onroad Vehicles	0.02	0.67	0.26	0.00	0.12	0.04	244	0.02	0.67	0.26	0.00	0.12	0.04	244	
Fugitive Dust Emissions	--	--	--	--	0.53	0.06	--	--	--	--	--	0.53	0.06	--	
<b>2020 Total Emissions</b>	<b>0.49</b>	<b>6.19</b>	<b>4.03</b>	<b>0.01</b>	<b>0.87</b>	<b>0.29</b>	<b>1,353</b>	<b>0.36</b>	<b>4.12</b>	<b>3.88</b>	<b>0.01</b>	<b>0.74</b>	<b>0.18</b>	<b>1,356</b>	
<b>2021</b>															
Offroad Construction Equipment	0.46	4.99	3.95	0.01	0.20	0.18	1,216	0.38	3.48	3.93	0.01	0.09	0.08	1,212	
Onroad Vehicles	0.03	0.50	0.26	0.00	0.12	0.04	281	0.03	0.50	0.26	0.00	0.12	0.04	281	
Fugitive Dust Emissions	--	--	--	--	0.64	0.07	--	--	--	--	--	0.64	0.07	--	
Fugitive VOC Emissions	0.05	--	--	--	--	--	--	0.05	--	--	--	--	--	--	
<b>2021 Total Emissions</b>	<b>0.54</b>	<b>5.49</b>	<b>4.21</b>	<b>0.02</b>	<b>0.97</b>	<b>0.30</b>	<b>1,497</b>	<b>0.46</b>	<b>3.98</b>	<b>4.19</b>	<b>0.02</b>	<b>0.85</b>	<b>0.19</b>	<b>1,493</b>	
<b>Maximum Emissions</b>	<b>0.86</b>	<b>12.13</b>	<b>6.16</b>	<b>0.02</b>	<b>1.11</b>	<b>0.49</b>	n/a	<b>0.53</b>	<b>6.95</b>	<b>5.46</b>	<b>0.02</b>	<b>0.85</b>	<b>0.21</b>	n/a	
NEPA Significance Thresholds	10	10	100	100	70	100	n/a	10	10	100	100	70	100	n/a	
Exceed Threshold?	No	Yes	No	No	No	No	n/a	No	No	No	No	No	No	n/a	
Total GHG Emissions (metric tons CO2e per project)							7,690	Total GHG Emissions (metric tons CO2e per project)							7,690
Amortized Emissions (metric tons CO2e per year)							256	Amortized Emissions (metric tons CO2e per year)							256
CEQA Significance Threshold (metric tons CO2e per year)							10,000	CEQA Significance Threshold (metric tons CO2e per year)							10,000
Significant Impacts?							No	Significant Impacts?							No

Sources: 40 CFR 93.153(b) (de minimis thresholds); 40 CFR 81.305 (attainment designations)

Note:

Totals may not add exactly due to rounding.

Projec Lifetime 30 years

**Emissions Summary**  
**Alternative 2a - Dam Removal with Mechanical Transport**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	2	33	12	0	5	1	1	23	10	0	4	1
2017	10	134	69	0	14	6	4	58	55	0	10	2
2018	15	224	109	0	17	8	9	126	96	0	11	3
2019	11	142	85	0	13	6	7	82	78	0	10	3
2020	8	106	71	0	12	5	6	67	68	0	10	3
2021	20	111	83	0	16	6	19	81	82	0	13	4
<b>Maximum</b>	<b>20</b>	<b>224</b>	<b>109</b>	<b>0</b>	<b>17</b>	<b>8</b>	<b>19</b>	<b>126</b>	<b>96</b>	<b>0</b>	<b>13</b>	<b>4</b>

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	9	0	1	1	1	10	7	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	13	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>2</b>	<b>33</b>	<b>12</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>10</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	10	127	65	0	5	5	4	50	51	0	1	1
Onroad Vehicles	0	8	4	0	1	0	0	8	4	0	1	0
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>10</b>	<b>134</b>	<b>69</b>	<b>0</b>	<b>14</b>	<b>6</b>	<b>4</b>	<b>58</b>	<b>55</b>	<b>0</b>	<b>10</b>	<b>2</b>
<b>2018</b>												
Offroad Construction Equipment	15	191	103	0	7	7	9	93	90	0	2	2
Onroad Vehicles	1	32	6	0	3	1	1	32	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2018 Total Emissions</b>	<b>15</b>	<b>224</b>	<b>109</b>	<b>0</b>	<b>17</b>	<b>8</b>	<b>9</b>	<b>126</b>	<b>96</b>	<b>0</b>	<b>11</b>	<b>3</b>
<b>2019</b>												
Offroad Construction Equipment	10	127	81	0	5	5	6	67	74	0	2	1
Onroad Vehicles	0	15	4	0	2	1	0	15	4	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>11</b>	<b>142</b>	<b>85</b>	<b>0</b>	<b>13</b>	<b>6</b>	<b>7</b>	<b>82</b>	<b>78</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2020</b>												
Offroad Construction Equipment	8	95	67	0	4	3	6	56	64	0	2	1
Onroad Vehicles	0	11	4	0	2	1	0	11	4	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2020 Total Emissions</b>	<b>8</b>	<b>106</b>	<b>71</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>6</b>	<b>67</b>	<b>68</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2021</b>												
Offroad Construction Equipment	9	98	77	0	4	4	7	68	76	0	2	2
Onroad Vehicles	1	14	6	0	3	1	1	14	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	9	1	--	--	--	--	9	1
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2021 Total Emissions</b>	<b>20</b>	<b>111</b>	<b>83</b>	<b>0</b>	<b>16</b>	<b>6</b>	<b>19</b>	<b>81</b>	<b>82</b>	<b>0</b>	<b>13</b>	<b>4</b>
<b>Maximum Emissions</b>	<b>20</b>	<b>224</b>	<b>109</b>	<b>0</b>	<b>17</b>	<b>8</b>	<b>19</b>	<b>126</b>	<b>96</b>	<b>0</b>	<b>13</b>	<b>4</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	No	Yes	No	No	No	No	No	Yes	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**  
**Alternative 2b - Dam Removal with Mechanical Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	2	33	12	0	5	1	1	23	10	0	4	1
2017	10	134	69	0	14	6	4	58	55	0	10	2
2018	22	269	165	1	20	10	16	172	152	1	14	5
2019	16	199	122	0	16	8	12	138	115	0	13	5
2020	11	136	89	0	14	6	9	97	86	0	11	4
2021	20	111	83	0	16	6	19	81	82	0	13	4
<b>Maximum</b>	<b>22</b>	<b>269</b>	<b>165</b>	<b>1</b>	<b>20</b>	<b>10</b>	<b>19</b>	<b>172</b>	<b>152</b>	<b>1</b>	<b>14</b>	<b>5</b>

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	9	0	1	1	1	10	7	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	13	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>2</b>	<b>33</b>	<b>12</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>10</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	10	127	65	0	5	5	4	50	51	0	1	1
Onroad Vehicles	0	8	4	0	1	0	0	8	4	0	1	0
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>10</b>	<b>134</b>	<b>69</b>	<b>0</b>	<b>14</b>	<b>6</b>	<b>4</b>	<b>58</b>	<b>55</b>	<b>0</b>	<b>10</b>	<b>2</b>
<b>2018</b>												
Offroad Construction Equipment	21	237	157	0	9	8	15	139	144	0	4	3
Onroad Vehicles	1	33	9	0	4	1	1	33	9	0	4	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2018 Total Emissions</b>	<b>22</b>	<b>269</b>	<b>165</b>	<b>1</b>	<b>20</b>	<b>10</b>	<b>16</b>	<b>172</b>	<b>152</b>	<b>1</b>	<b>14</b>	<b>5</b>
<b>2019</b>												
Offroad Construction Equipment	15	183	116	0	7	7	12	122	109	0	4	3
Onroad Vehicles	0	16	6	0	3	1	0	16	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>16</b>	<b>199</b>	<b>122</b>	<b>0</b>	<b>16</b>	<b>8</b>	<b>12</b>	<b>138</b>	<b>115</b>	<b>0</b>	<b>13</b>	<b>5</b>
<b>2020</b>												
Offroad Construction Equipment	11	125	84	0	5	5	8	86	81	0	3	2
Onroad Vehicles	0	11	5	0	2	1	0	11	5	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2020 Total Emissions</b>	<b>11</b>	<b>136</b>	<b>89</b>	<b>0</b>	<b>14</b>	<b>6</b>	<b>9</b>	<b>97</b>	<b>86</b>	<b>0</b>	<b>11</b>	<b>4</b>
<b>2021</b>												
Offroad Construction Equipment	9	98	77	0	4	4	7	68	76	0	2	2
Onroad Vehicles	1	14	6	0	3	1	1	14	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	9	1	--	--	--	--	9	1
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2021 Total Emissions</b>	<b>20</b>	<b>111</b>	<b>83</b>	<b>0</b>	<b>16</b>	<b>6</b>	<b>19</b>	<b>81</b>	<b>82</b>	<b>0</b>	<b>13</b>	<b>4</b>
<b>Maximum Emissions</b>	<b>22</b>	<b>269</b>	<b>165</b>	<b>1</b>	<b>20</b>	<b>10</b>	<b>19</b>	<b>172</b>	<b>152</b>	<b>1</b>	<b>14</b>	<b>5</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	No	Yes	No	No	No	No	No	Yes	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**  
**Alternative 3a - Dam Removal with Natural Transport**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	1	32	10	0	5	1	1	23	8	0	4	1
2017	9	120	73	0	14	6	4	59	66	0	10	3
2019	9	113	74	0	12	5	5	58	67	0	9	3
2021	8	100	76	0	11	5	6	58	71	0	9	3
2023	7	72	74	0	10	4	6	57	74	0	9	3
2025	6	60	72	0	10	3	6	57	71	0	9	3
2027	5	50	71	0	9	3	3	16	65	0	8	1
2029	5	45	70	0	9	3	3	16	65	0	8	1
2031	5	45	69	0	9	2	3	16	69	0	8	1
2033	5	44	68	0	9	2	3	16	67	0	8	1
2035	5	44	67	0	9	2	3	16	70	0	8	1
2037	5	44	67	0	9	2	3	16	68	0	8	1
2039 - 2063	5	44	67	0	9	2	3	16	72	0	8	1
2066	25	119	170	1	7	5	21	51	179	1	4	2
<b>Maximum</b>	<b>25</b>	<b>120</b>	<b>170</b>	<b>1</b>	<b>14</b>	<b>6</b>	<b>21</b>	<b>59</b>	<b>179</b>	<b>1</b>	<b>10</b>	<b>3</b>
<b>Percent Change</b>							<b>-16%</b>	<b>-51%</b>	<b>5%</b>	<b>-1%</b>	<b>-24%</b>	<b>-53%</b>

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	7	0	1	1	1	10	5	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	3	0	1	0	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>1</b>	<b>32</b>	<b>10</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	9	109	68	0	5	4	4	48	60	0	2	1
Onroad Vehicles	0	11	6	0	2	1	0	11	6	0	2	1
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>9</b>	<b>120</b>	<b>73</b>	<b>0</b>	<b>14</b>	<b>6</b>	<b>4</b>	<b>59</b>	<b>66</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2019</b>												
Offroad Construction Equipment	9	111	71	0	5	4	5	56	65	0	2	2
Onroad Vehicles	0	3	2	0	1	0	0	3	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>9</b>	<b>113</b>	<b>74</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>5</b>	<b>58</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>3</b>
<b>2021</b>												
Offroad Construction Equipment	8	99	74	0	4	4	5	57	68	0	2	2
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2021 Total Emissions</b>	<b>8</b>	<b>100</b>	<b>76</b>	<b>0</b>	<b>11</b>	<b>5</b>	<b>6</b>	<b>58</b>	<b>71</b>	<b>0</b>	<b>9</b>	<b>3</b>
<b>2023</b>												
Offroad Construction Equipment	7	72	72	0	3	3	6	56	72	0	2	2
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2023 Total Emissions</b>	<b>7</b>	<b>72</b>	<b>74</b>	<b>0</b>	<b>10</b>	<b>4</b>	<b>6</b>	<b>57</b>	<b>74</b>	<b>0</b>	<b>9</b>	<b>3</b>

Detailed Emissions Summary - Daily

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2025</b>												
Offroad Construction Equipment	6	59	70	0	2	2	6	56	69	0	2	2
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2025 Total Emissions</b>	<b>6</b>	<b>60</b>	<b>72</b>	<b>0</b>	<b>10</b>	<b>3</b>	<b>6</b>	<b>57</b>	<b>71</b>	<b>0</b>	<b>9</b>	<b>3</b>
<b>2027</b>												
Offroad Construction Equipment	5	50	69	0	2	2	3	15	63	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2027 Total Emissions</b>	<b>5</b>	<b>50</b>	<b>71</b>	<b>0</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>16</b>	<b>65</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2029</b>												
Offroad Construction Equipment	5	45	68	0	2	2	3	16	64	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2029 Total Emissions</b>	<b>5</b>	<b>45</b>	<b>70</b>	<b>0</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>16</b>	<b>65</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2031</b>												
Offroad Construction Equipment	5	44	67	0	2	2	3	16	67	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2031 Total Emissions</b>	<b>5</b>	<b>45</b>	<b>69</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>69</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2033</b>												
Offroad Construction Equipment	5	44	66	0	2	2	3	16	66	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2033 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>68</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>67</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2035</b>												
Offroad Construction Equipment	5	43	66	0	2	1	3	16	69	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2035 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>70</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2037</b>												
Offroad Construction Equipment	5	43	65	0	2	1	3	16	67	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2037 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>68</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2039 - 2063</b>												
Offroad Construction Equipment	5	43	65	0	2	1	3	16	70	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2039 - 2063 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>72</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2066</b>												
Offroad Construction Equipment	14	112	165	1	4	4	10	44	174	1	1	1
Onroad Vehicles	1	7	5	0	3	1	1	7	5	0	3	1
Fugitive Dust Emissions	--	--	--	--	--	--	--	--	--	--	--	--
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2066 Total Emissions</b>	<b>25</b>	<b>119</b>	<b>170</b>	<b>1</b>	<b>7</b>	<b>5</b>	<b>21</b>	<b>51</b>	<b>179</b>	<b>1</b>	<b>4</b>	<b>2</b>
<b>Maximum Emissions</b>	<b>25</b>	<b>120</b>	<b>170</b>	<b>1</b>	<b>14</b>	<b>6</b>	<b>21</b>	<b>59</b>	<b>179</b>	<b>1</b>	<b>10</b>	<b>3</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	No	Yes	No	No	No	No	No	No	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**  
**Alternative 3b - Dam Removal with Natural Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	1	32	10	0	5	1	1	23	8	0	4	1
2017	9	120	73	0	14	6	4	59	66	0	10	3
2019	15	155	128	0	14	7	11	100	122	0	11	4
2021	13	146	112	0	14	7	10	104	106	0	12	4
2023	9	91	91	0	12	5	8	76	91	0	10	3
2025	6	60	72	0	10	3	6	57	71	0	9	3
2027	5	50	71	0	9	3	3	16	65	0	8	1
2029	5	45	70	0	9	3	3	16	65	0	8	1
2031	5	45	69	0	9	2	3	16	69	0	8	1
2033	5	44	68	0	9	2	3	16	67	0	8	1
2035	5	44	67	0	9	2	3	16	70	0	8	1
2037	5	44	67	0	9	2	3	16	68	0	8	1
2039 - 2063	5	44	67	0	9	2	3	16	72	0	8	1
2066	25	119	170	1	13	5	21	51	179	1	11	3
Maximum	25	155	170	1	14	7	21	104	179	1	12	4
Percent Change							-16%	-33%	5%	-1%	-19%	-36%

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	7	0	1	1	1	10	5	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	13	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>1</b>	<b>32</b>	<b>10</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>8</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	9	109	68	0	5	4	4	48	60	0	2	1
Onroad Vehicles	0	11	6	0	2	1	0	11	6	0	2	1
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>9</b>	<b>120</b>	<b>73</b>	<b>0</b>	<b>14</b>	<b>6</b>	<b>4</b>	<b>59</b>	<b>66</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2019</b>												
Offroad Construction Equipment	15	153	124	0	6	6	11	98	118	0	4	3
Onroad Vehicles	0	3	4	0	1	0	0	3	4	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>15</b>	<b>155</b>	<b>128</b>	<b>0</b>	<b>14</b>	<b>7</b>	<b>11</b>	<b>100</b>	<b>122</b>	<b>0</b>	<b>11</b>	<b>4</b>
<b>2021</b>												
Offroad Construction Equipment	13	145	108	0	6	6	10	102	103	0	4	3
Onroad Vehicles	0	1	4	0	1	0	0	1	4	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2021 Total Emissions</b>	<b>13</b>	<b>146</b>	<b>112</b>	<b>0</b>	<b>14</b>	<b>7</b>	<b>10</b>	<b>104</b>	<b>106</b>	<b>0</b>	<b>12</b>	<b>4</b>
<b>2023</b>												
Offroad Construction Equipment	9	91	88	0	4	4	8	75	88	0	3	2
Onroad Vehicles	0	1	3	0	1	0	0	1	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2023 Total Emissions</b>	<b>9</b>	<b>91</b>	<b>91</b>	<b>0</b>	<b>12</b>	<b>5</b>	<b>8</b>	<b>76</b>	<b>91</b>	<b>0</b>	<b>10</b>	<b>3</b>



**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
<b>2025</b>												
Offroad Construction Equipment	6	59	70	0	2	2	6	56	69	0	2	2
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2025 Total Emissions</b>	<b>6</b>	<b>60</b>	<b>72</b>	<b>0</b>	<b>10</b>	<b>3</b>	<b>6</b>	<b>57</b>	<b>71</b>	<b>0</b>	<b>9</b>	<b>3</b>
<b>2027</b>												
Offroad Construction Equipment	5	50	69	0	2	2	3	15	63	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2027 Total Emissions</b>	<b>5</b>	<b>50</b>	<b>71</b>	<b>0</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>16</b>	<b>65</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2029</b>												
Offroad Construction Equipment	5	45	68	0	2	2	3	16	64	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2029 Total Emissions</b>	<b>5</b>	<b>45</b>	<b>70</b>	<b>0</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>16</b>	<b>65</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2031</b>												
Offroad Construction Equipment	5	44	67	0	2	2	3	16	67	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2031 Total Emissions</b>	<b>5</b>	<b>45</b>	<b>69</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>69</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2033</b>												
Offroad Construction Equipment	5	44	66	0	2	2	3	16	66	0	0	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2033 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>68</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>67</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2035</b>												
Offroad Construction Equipment	5	43	66	0	2	1	3	16	69	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2035 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>70</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2037</b>												
Offroad Construction Equipment	5	43	65	0	2	1	3	16	67	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2037 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>68</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2039 - 2063</b>												
Offroad Construction Equipment	5	43	65	0	2	1	3	16	70	0	1	0
Onroad Vehicles	0	1	2	0	1	0	0	1	2	0	1	0
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2039 - 2063 Total Emissions</b>	<b>5</b>	<b>44</b>	<b>67</b>	<b>0</b>	<b>9</b>	<b>2</b>	<b>3</b>	<b>16</b>	<b>72</b>	<b>0</b>	<b>8</b>	<b>1</b>
<b>2066</b>												
Offroad Construction Equipment	14	112	165	1	4	4	10	44	174	1	1	1
Onroad Vehicles	1	7	5	0	3	1	1	7	5	0	3	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2066 Total Emissions</b>	<b>25</b>	<b>119</b>	<b>170</b>	<b>1</b>	<b>13</b>	<b>5</b>	<b>21</b>	<b>51</b>	<b>179</b>	<b>1</b>	<b>11</b>	<b>3</b>
<b>Maximum Emissions</b>	<b>25</b>	<b>155</b>	<b>170</b>	<b>1</b>	<b>14</b>	<b>7</b>	<b>21</b>	<b>104</b>	<b>179</b>	<b>1</b>	<b>12</b>	<b>4</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	No	Yes	No	No	No	No	No	Yes	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**  
**Alternative 4a - Dam Removal with Hybrid Mechanical and Natural Transport**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	2	33	11	0	5	1	1	23	9	0	4	1
2017	12	168	88	0	15	7	5	75	74	0	10	3
2018	75	1,096	510	2	49	38	43	486	412	2	15	6
2019	41	581	305	1	30	21	25	276	264	1	12	5
2020	42	567	311	1	29	21	27	285	272	1	12	5
2021	61	606	396	2	35	23	53	394	374	2	17	7
<b>Maximum</b>	<b>75</b>	<b>1,096</b>	<b>510</b>	<b>2</b>	<b>49</b>	<b>38</b>	<b>53</b>	<b>486</b>	<b>412</b>	<b>2</b>	<b>17</b>	<b>7</b>

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	8	0	1	1	1	10	6	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	13	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>2</b>	<b>33</b>	<b>11</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>9</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	12	155	82	0	6	6	5	62	68	0	2	1
Onroad Vehicles	0	13	6	0	2	1	0	13	6	0	2	1
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>12</b>	<b>168</b>	<b>88</b>	<b>0</b>	<b>15</b>	<b>7</b>	<b>5</b>	<b>75</b>	<b>74</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2018</b>												
Offroad Construction Equipment	75	1,063	504	2	40	36	42	454	406	2	5	5
Onroad Vehicles	1	32	6	0	3	1	1	32	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2018 Total Emissions</b>	<b>75</b>	<b>1,096</b>	<b>510</b>	<b>2</b>	<b>49</b>	<b>38</b>	<b>43</b>	<b>486</b>	<b>412</b>	<b>2</b>	<b>15</b>	<b>6</b>
<b>2019</b>												
Offroad Construction Equipment	41	566	301	1	22	20	24	261	260	1	4	3
Onroad Vehicles	0	15	4	0	2	1	0	15	4	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>41</b>	<b>581</b>	<b>305</b>	<b>1</b>	<b>30</b>	<b>21</b>	<b>25</b>	<b>276</b>	<b>264</b>	<b>1</b>	<b>12</b>	<b>5</b>
<b>2020</b>												
Offroad Construction Equipment	41	556	307	1	21	19	27	274	268	1	4	3
Onroad Vehicles	0	11	4	0	2	1	0	11	4	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2020 Total Emissions</b>	<b>42</b>	<b>567</b>	<b>311</b>	<b>1</b>	<b>29</b>	<b>21</b>	<b>27</b>	<b>285</b>	<b>272</b>	<b>1</b>	<b>12</b>	<b>5</b>
<b>2021</b>												
Offroad Construction Equipment	50	593	390	1	23	21	41	380	368	1	6	5
Onroad Vehicles	1	14	6	0	3	1	1	14	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	9	1	--	--	--	--	9	1
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2021 Total Emissions</b>	<b>61</b>	<b>606</b>	<b>396</b>	<b>2</b>	<b>35</b>	<b>23</b>	<b>53</b>	<b>394</b>	<b>374</b>	<b>2</b>	<b>17</b>	<b>7</b>
<b>Maximum Emissions</b>	<b>75</b>	<b>1,096</b>	<b>510</b>	<b>2</b>	<b>49</b>	<b>38</b>	<b>53</b>	<b>486</b>	<b>412</b>	<b>2</b>	<b>17</b>	<b>7</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	Yes	Yes	No	No	No	No	No	Yes	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**

**Alternative 4b - Dam Removal with Hybrid Mechanical and Natural Transport and Upstream Barrier Removal**

**Emissions Summary by Year - Daily**

Year	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
2016	2	33	11	0	5	1	1	23	9	0	4	1
2017	12	168	88	0	15	7	5	75	74	0	10	3
2018	82	1,141	566	2	52	40	49	532	468	2	17	8
2019	47	637	342	1	33	23	30	332	301	1	15	7
2020	44	597	328	1	31	22	30	315	290	1	14	6
2021	61	610	397	2	35	23	53	397	375	2	18	7
<b>Maximum</b>	<b>82</b>	<b>1,141</b>	<b>566</b>	<b>2</b>	<b>52</b>	<b>40</b>	<b>53</b>	<b>532</b>	<b>468</b>	<b>2</b>	<b>18</b>	<b>8</b>

**Detailed Emissions Summary - Daily**

Source	Unmitigated Daily Emissions (pounds per day)						Mitigated Daily Emissions (pounds per day)					
	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
<b>2016</b>												
Offroad Construction Equipment	1	19	8	0	1	1	1	10	6	0	0	0
Onroad Vehicles	0	13	3	0	1	0	0	13	3	0	1	0
Fugitive Dust Emissions	--	--	--	--	3	0	--	--	--	--	3	0
<b>2016 Total Emissions</b>	<b>2</b>	<b>33</b>	<b>11</b>	<b>0</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>9</b>	<b>0</b>	<b>4</b>	<b>1</b>
<b>2017</b>												
Offroad Construction Equipment	12	155	82	0	6	6	5	62	68	0	2	1
Onroad Vehicles	0	13	6	0	2	1	0	13	6	0	2	1
Fugitive Dust Emissions	--	--	--	--	7	1	--	--	--	--	7	1
<b>2017 Total Emissions</b>	<b>12</b>	<b>168</b>	<b>88</b>	<b>0</b>	<b>15</b>	<b>7</b>	<b>5</b>	<b>75</b>	<b>74</b>	<b>0</b>	<b>10</b>	<b>3</b>
<b>2018</b>												
Offroad Construction Equipment	81	1,109	558	2	42	38	48	499	460	2	7	6
Onroad Vehicles	1	33	8	0	4	1	1	33	8	0	4	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2018 Total Emissions</b>	<b>82</b>	<b>1,141</b>	<b>566</b>	<b>2</b>	<b>52</b>	<b>40</b>	<b>49</b>	<b>532</b>	<b>468</b>	<b>2</b>	<b>17</b>	<b>8</b>
<b>2019</b>												
Offroad Construction Equipment	46	622	336	1	24	22	30	317	295	1	6	5
Onroad Vehicles	0	16	6	0	3	1	0	16	6	0	3	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2019 Total Emissions</b>	<b>47</b>	<b>637</b>	<b>342</b>	<b>1</b>	<b>33</b>	<b>23</b>	<b>30</b>	<b>332</b>	<b>301</b>	<b>1</b>	<b>15</b>	<b>7</b>
<b>2020</b>												
Offroad Construction Equipment	44	586	323	1	22	20	29	303	285	1	5	5
Onroad Vehicles	0	11	5	0	2	1	0	11	5	0	2	1
Fugitive Dust Emissions	--	--	--	--	6	1	--	--	--	--	6	1
<b>2020 Total Emissions</b>	<b>44</b>	<b>597</b>	<b>328</b>	<b>1</b>	<b>31</b>	<b>22</b>	<b>30</b>	<b>315</b>	<b>290</b>	<b>1</b>	<b>14</b>	<b>6</b>
<b>2021</b>												
Offroad Construction Equipment	50	593	390	1	23	21	41	380	368	1	6	5
Onroad Vehicles	1	17	7	0	4	1	1	17	7	0	4	1
Fugitive Dust Emissions	--	--	--	--	9	1	--	--	--	--	9	1
Fugitive VOC Emissions	10	--	--	--	--	--	10	--	--	--	--	--
<b>2021 Total Emissions</b>	<b>61</b>	<b>610</b>	<b>397</b>	<b>2</b>	<b>35</b>	<b>23</b>	<b>53</b>	<b>397</b>	<b>375</b>	<b>2</b>	<b>18</b>	<b>7</b>
<b>Maximum Emissions</b>	<b>82</b>	<b>1,141</b>	<b>566</b>	<b>2</b>	<b>52</b>	<b>40</b>	<b>53</b>	<b>532</b>	<b>468</b>	<b>2</b>	<b>18</b>	<b>8</b>
CEQA Significance Thresholds (SCAQMD)	75	100	550	150	150	55	75	100	550	150	150	55
Significant Impact?	Yes	Yes	Yes	No	No	No	No	Yes	No	No	No	No

Source: SCAQMD Air Quality Significance Thresholds (March 2011). Available online at: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf> [Accessed on April 20, 2013].

Note:

Totals may not add exactly due to rounding.

**Emissions Summary**  
**Alternative 2a - Dam Removal with Mechanical Transport**

**Daily Onsite Emissions Summary**  
**Rindge Dam**

Year	NOx	CO	PM10	PM2.5
2016	19	9	4	1
2017	127	65	12	6
2018	148	83	12	6
2019	86	59	10	4
2020	83	60	10	4
2021	96	76	12	5
<b>Maximum</b>	<b>148</b>	<b>83</b>	<b>12</b>	<b>6</b>
Localized significance Thresholds	312	10467	174	95
Significant Impact?	No	No	No	No

**Surfrider Beach**

Year	NOx	CO	PM10	PM2.5
2016	0	0	0	0
2017	0	0	0	0
2018	9	4	0	0
2019	0	0	0	0
2020	0	0	0	0
2021	0	0	0	0
<b>Maximum</b>	<b>9</b>	<b>4</b>	<b>0</b>	<b>0</b>
Localized significance Thresholds	150.8	1502.2	28	8
Significant Impact?	No	No	No	No

**Topanga Beach**

Year	NOx	CO	PM10	PM2.5
2016	0	0	0	0
2017	0	0	0	0
2018	33	15	1	1
2019	2	1	0	0
2020	0	0	0	0
2021	0	0	0	0
<b>Maximum</b>	<b>33</b>	<b>15</b>	<b>1</b>	<b>1</b>
Localized significance Thresholds	103.6	724.6	8.8	3.6
Significant Impact?	No	No	No	No

**Zuma Beach**

Year	NOx	CO	PM10	PM2.5
2016	0	0	0	0
2017	0	0	0	0
2018	0	0	0	0
2019	38	20	1	1
2020	11	6	0	0
2021	0	0	0	0
<b>Maximum</b>	<b>38</b>	<b>20</b>	<b>1</b>	<b>1</b>
Localized significance Thresholds	121	1233	27	8
Significant Impact?	No	No	No	No

**Emissions Summary**  
**Alternative 2b - Dam Removal with Mechanical Transport and Upstream Barrier**  
**Removal**

**Daily Onsite Emissions Summary**

See Alt 2a tables for onsite emissions at Rindge Dam, Surfrider Beach, Topanga Beach, and Zuma Beach.

**Upstream Barriers**

Site	Year	NOx	CO	PM10	PM2.5
CC1	2018	82	53	3	3
Localized significance Thresholds		103	562	4	3
Significant Impact?		No	No	No	No
CC2	2019	39	22	2	1
Localized significance Thresholds		103	562	4	3
Significant Impact?		No	No	No	No
CC3	2019	22	15	1	1
Localized significance Thresholds		103	562	4	3
Significant Impact?		No	No	No	No
CC4	2018	5	3	0	0
Localized significance Thresholds		143	1213	19	5
Significant Impact?		No	No	No	No
CC5	2018	5	27	0	0
Localized significance Thresholds		131.5	934.2	36	11
Significant Impact?		No	No	No	No
LV1	2019	36	24	2	1
Localized significance Thresholds		245	7724	146	77
Significant Impact?		No	No	No	No
LV2	2018	7	4	0	0
	2019	7	5	0	0
	2020	7	6	0	0
Localized significance Thresholds		236.667	6617.67	124	61.6667
Significant Impact?		No	No	No	No
LV3&4	2020	30	17	1	1
Localized significance Thresholds		147	827	6	4
Significant Impact?		No	No	No	No

**Emissions Summary**  
**Alternative 3a - Dam Removal with Natural Transport**

**Daily Onsite Emissions Summary**  
**Rindge Dam**

Year	NOx	CO	PM10	PM2.5
2016	19	7	3	1
2017	84	48	11	4
2019	110	71	11	5
2021	99	74	11	4
2023	71	72	9	3
2025	59	70	9	3
2027	49	69	8	2
2029	44	68	8	2
2031	44	67	8	2
2033	43	66	8	2
2035	43	66	8	2
2037	43	65	8	2
2039 - 2063	43	65	8	2
2066	112	165	11	4
<b>Maximum</b>	<b>112</b>	<b>165</b>	<b>11</b>	<b>5</b>
Localized significance Thresholds	312	10467	174	95
Significant Impact?	No	No	No	No

**Emissions Summary**

**Alternative 3b - Dam Removal with Natural Transport and Upstream Barrier Removal**

**Daily Onsite Emissions Summary**

See Alt 3a tables for onsite emissions at Rindge Dam.

**Upstream Barriers**

Site	Year	NOx	CO	PM10	PM2.5
CC1	2019	75	52	3	3
	Localized significance Thresholds	103	562	4	3
	Significant Impact?	No	No	No	No
CC2	2021	32	21	1	1
	Localized significance Thresholds	103	562	4	3
	Significant Impact?	No	No	No	No
CC3	2021	18	14	1	1
	Localized significance Thresholds	103	562	4	3
	Significant Impact?	No	No	No	No
CC4	2019	4	3	0	0
	Localized significance Thresholds	143	1213	19	5
	Significant Impact?	No	No	No	No
CC5	2019	4	27	0	0
	Localized significance Thresholds	131.5	934.2	36	11
	Significant Impact?	No	No	No	No
LV1	2021	30	23	1	1
	Localized significance Thresholds	245	7724	146	77
	Significant Impact?	No	No	No	No
LV2	2019	7	4	0	0
	2021	6	5	0	0
	2023	5	6	0	0
	Localized significance Thresholds	236.667	6617.67	124	61.6667
	Significant Impact?	No	No	No	No
LV3&4	2023	19	16	1	1
	Localized significance Thresholds	147	827	6	4
	Significant Impact?	No	No	No	No

**Emissions Summary**

**Alternative 4a - Dam Removal with Hybrid Mechanical and Natural Transport**

**Daily Onsite Emissions Summary**

**Rindge Dam**

Year	NOx	CO	PM10	PM2.5	NOx	CO	PM10	PM2.5
2016	19	8	4	1	10	6	0	0
2017	135	70	12	6	53	55	1	1
2018	749	357	35	26	336	307	4	4
2019	435	232	23	16	206	205	3	3
2020	421	235	23	15	211	211	4	3
2021	591	389	31	22	379	368	6	5
<b>Maximum</b>	<b>749</b>	<b>389</b>	<b>35</b>	<b>26</b>	<b>379</b>	<b>368</b>	<b>6</b>	<b>5</b>
Localized significance Thresholds	312	10467	174	95	312	10467	174	95
Significant Impact?	Yes	No	No	No	Yes	No	No	No

**Surfrider Beach**

Year	NOx	CO	PM10	PM2.5	NOx	CO	PM10	PM2.5
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	162	78	6	5	59	52	0	0
2019	0	0	0	0	0	0	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
<b>Maximum</b>	<b>162</b>	<b>78</b>	<b>6</b>	<b>5</b>	<b>59</b>	<b>52</b>	<b>0</b>	<b>0</b>
Localized significance Thresholds	150.8	1502.2	28	8	150.8	1502.2	28	8
Significant Impact?	Yes	No	No	No	No	No	No	No

**Topanga Beach**

Year	NOx	CO	PM10	PM2.5	NOx	CO	PM10	PM2.5
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	145	68	5	5	56	46	1	0
2019	65	35	2	2	28	28	0	0
2020	0	0	0	0	0	0	0	0
2021	0	0	0	0	0	0	0	0
<b>Maximum</b>	<b>145</b>	<b>68</b>	<b>5</b>	<b>5</b>	<b>56</b>	<b>46</b>	<b>1</b>	<b>0</b>
Localized significance Thresholds	103.6	724.6	8.8	3.6	103.6	724.6	8.8	3.6
Significant Impact?	Yes	No	No	Yes	No	No	No	No

**Zuma Beach**

Year	NOx	CO	PM10	PM2.5	NOx	CO	PM10	PM2.5
2016	0	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0	0
2019	60	32	2	2	26	26	0	0
2020	131	70	5	4	61	56	1	0
2021	0	0	0	0	0	0	0	0
<b>Maximum</b>	<b>131</b>	<b>70</b>	<b>5</b>	<b>4</b>	<b>61</b>	<b>56</b>	<b>1</b>	<b>0</b>
Localized significance Thresholds	121	1233	27	8	121	1233	27	8
Significant Impact?	Yes	No	No	No	No	No	No	No



## **Emissions Summary**

### **Alternative 4b - Dam Removal with Hybrid Mechanical and Natural Transport with Upstream Barrier Removal**

#### **Daily Onsite Emissions Summary**

*See Alt 4a tables for onsite emissions at Rindge Dam, Surfrider Beach, Topanga Beach, and Zuma Beach.  
See Alt 2b table for onsite emissions at upstream barriers.*

**Malibu Creek Ecosystem Restoration Feasibility Study  
Localized Significance Thresholds**

Pollutant	Site Acre	Receptor distance from site boundary (m)				
		25	50	100	200	500
CO (lb/day)	1	562	833	1233	237	7724
	2	827	1213	1695	2961	8446
	5	1531	1985	2762	4383	10467
NO2 (lb/day)	1	103	104	121	156	245
	2	147	143	156	186	262
	5	221	212	226	250	312
PM10 (lb/day)	1	4	12	27	57	146
	2	6	19	34	64	154
	5	13	40	55	84	174
PM2.5 (lb/day)	1	3	4	8	18	77
	2	4	5	10	21	82
	5	6	8	14	29	95

Emission thresholds for construction in Northwest Coastal LA County Source Receptor Area. SCAQMD, 2008. Final Localized Significance Threshold Methodology. July.

Site	Acre	Receptor distance (m)	NO2	CO	PM10	PM2.5
Rindge Dam	5	1115	312	10467	174	95
Surfrider Beach	2	80	150.8	1502.2	28	8
Topanga Beach	1	40	103.6	724.6	8.8	3.6
Zuma Beach	1	100	121	1233	27	8
CC1	1	25	103	562	4	3
CC2	1	25	103	562	4	3
CC3	1	25	103	562	4	3
CC4	2	50	143	1213	19	5
CC5	1	130	132	934	36	11
LV1	1	700	245	7724	146	77
LV2	2	400	237	6618	124	62
LV3&4	2	25	147	827	6	4

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Emission Factors - 2016 (g/hp-hr or g/hr)									Emission Factors - 2017 (g/hp-hr or g/hr)								
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
				Construction Survey	3/4 ton pickup truck		96.00	22.2	73.8	52	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507
Dust Control	Water truck	5000 gal	2,320.00	535.4	1,784.6	52	210	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80.00	18.5	61.5	52	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
	Biologist	3/4 ton pickup truck	1,213.00	279.9	933.1	52	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.46	0.5	0	52	0	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
	Tractor/crawler/dozer	250 hp	0.77	0.8	0	52	0	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000
	Chain saw		0.77	0.8	0	52	0	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Brush Piling	Front end loader	540 hp	0.4	0	52	0	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000
		Tractor/crawler/dozer	310 hp	0.4	0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000
		Brush chipper	250 hp	0.4	0	52	0	0.205	2.269	0.800	0.005	0.068	0.063	403.250	0.018	0.000	0.190	2.015	0.785	0.005	0.061	0.056	403.250	0.017	0.000
		Front end loader	540 hp	0.4	0	52	0	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000
	Gravel	Grader	135 hp	11.1	0	52	0	0.273	3.372	1.893	0.004	0.189	0.174	320.916	0.028	0.000	0.256	3.132	1.891	0.004	0.176	0.162	320.916	0.027	0.000
		Vibratory roller	85 hp	16.0	0	52	0	0.195	2.178	1.500	0.003	0.160	0.148	222.777	0.027	0.000	0.180	2.030	1.489	0.003	0.147	0.135	222.777	0.025	0.000
		Tractor/crawler/dozer	310 hp	3.3	0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000
		Tractor/crawler/dozer	440 hp	0.8	0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000
		Asphalt distributor	3000 gal	0.8	0	52	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Guard Railing	Flatbed truck	8.75	8.8	0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135
		Auger Drill	10 hp	8.8	0	52	0	3.341	2.469	132.341	0.006	1.896	1.892	226.175	0.190	0.196	3.339	2.468	132.332	0.006	1.896	1.892	226.176	0.190	0.196
		Loader/backhoe	75 hp	4.0	0	52	0	0.164	1.895	1.307	0.002	0.146	0.134	195.356	0.018	0.000	0.152	1.772	1.300	0.002	0.133	0.123	195.356	0.016	0.000
		Flatbed truck	4.00	4.0	0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135
Clear & Grub - Sediment Removal Area & Access Rd	Clear Brush	1 ton pickup truck	23.16	0	23.2	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
		Excavator	94 hp	0	23.2	0	42	0.150	1.798	1.915	0.003	0.131	0.121	278.045	0.028	0.000	0.139	1.673	1.904	0.003	0.118	0.109	278.045	0.026	0.000
		Front end loader	210 hp	0	23.2	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000
		Dump truck	10cy	0	23.2	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
		Dump truck	10cy	0	23.2	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
		Brush chipper	275 hp	0	23.2	0	42	0.105	1.115	0.439	0.002	0.035	0.033	224.028	0.009	0.000	0.098	0.993	0.427	0.002	0.032	0.029	224.028	0.009	0.000
		Front end loader	210 hp	0	10.7	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000
		1 ton pickup truck	13.20	0	13.2	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
		Tractor/crawler/dozer	250 hp	0	22.0	0	42	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000
		Chain saw	22.00	0	22.0	0	42	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
		Brush Piling	Front end loader	540 hp	11.1	0	42	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000
		Tractor/crawler/dozer	310 hp	11.1	0	42	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000
		Brush chipper	250 hp	11.1	0	42	0	0.205	2.269	0.800	0.005	0.068	0.063	403.250	0.018	0.000	0.190	2.015	0.785	0.005	0.061	0.056	403.250	0.017	0.000
		Front end loader	540 hp	11.1	0	42	0	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2.0	0	178	0	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000
		Front end loader	49 hp	4.0	0	178	0	0.293	1.770	1.893	0.003	0.086	0.079	231.302	0.026	0.000	0.261	1.691	1.864	0.003	0.071	0.066	231.302	0.024	0.000
		Roller	47 hp	4.0	0	178	0	0.723	2.105	2.430	0.003	0.173	0.160	235.507	0.065	0.000	0.660	2.035	2.367	0.003	0.158	0.145	235.507	0.060	0.000
		Water truck	3000 gal	4.0	0	178	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
		Excavator	300 hp	4.0	0	178	0	0.067	1.075	0.440	0.002	0.035	0.032	211.854	0.012	0.000	0.063	0.957	0.432	0.002	0.031	0.028	211.854	0.012	0.000
		Front end loader	180 hp	4.0	0	178	0	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6.0	0	178	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000
		36" Diversion Pipe - pipe	Welder	17 hp	16.0	0	178	2.485	1.571	93.010	0.004	1.249	1.246	148.932	0.142	0.122	2.467	1.576	92.812	0.004	1.249	1.246	148.932	0.141	0.122
		36" Diversion Pipe	Crane 80'	130 hp	273.00	0	178	0.177	2.272	1.239	0.002	0.123	0.113	208.066	0.020	0.000	0.166	2.120	1.236	0.002	0.114	0.10			



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Peak Daily Emissions - 2016 (pounds per day)						Peak Daily Emissions - 2017 (pounds per day)						
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
				Construction Survey	3/4 ton pickup truck		96.00	22.2	73.8	52	210	9.46E-03	7.33E-03	1.13E-01	1.15E-04	9.64E-04	4.47E-04	7.03E-03	5.59E-03	8.43E-02
Dust Control	Water truck	5000 gal	2,320.00	535.4	1,784.6	52	210	3.52E-01	5.69E+00	6.31E-01	4.89E-03	1.26E-01	8.29E-02	2.61E-01	4.29E+00	4.77E-01	4.03E-03	9.00E-02	5.58E-02	
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80.00	18.5	61.5	52	210	7.89E-03	6.11E-03	9.42E-02	9.60E-05	8.03E-04	3.73E-04	5.86E-03	4.66E-03	7.03E-02	7.92E-05	6.56E-04	3.01E-04	
Clear & Grub - Sheriff's Overlook (Staging Area)	Biologist	3/4 ton pickup truck	1,213.00	279.9	933.1	52	210	1.20E-01	9.26E-02	1.43E+00	1.46E-03	1.22E-02	5.65E-03	8.88E-02	7.06E-02	1.07E+00	1.20E-03	9.94E-03	4.56E-03	
	Cutting	1 ton pickup truck	0.46	0.5	0	52	0	1.39E-04	1.38E-04	1.87E-03	2.40E-06	1.96E-05	8.94E-06	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	0.77	0.8	0	52	0	2.58E-03	4.21E-02	1.31E-02	5.50E-05	1.62E-03	1.49E-03	-	-	-	-	-	-	
	Chain saw		0.77	0.8	0	52	0	3.97E-03	6.23E-05	7.19E-03	8.00E-07	1.13E-05	1.13E-05	-	-	-	-	-	-	
	Brush Piling	Front end loader	540 hp	0.39	0.4	0	52	0	1.97E-03	2.67E-02	1.22E-02	5.21E-05	1.05E-03	9.64E-04	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp	0.39	0.4	0	52	0	1.43E-03	2.30E-02	7.26E-03	2.34E-05	8.89E-04	8.18E-04	-	-	-	-	-	-	
	Chipping	Brush chipper	250 hp	0.39	0.4	0	52	0	1.67E-03	1.86E-02	6.54E-03	3.71E-05	5.58E-04	5.14E-04	-	-	-	-	-	-
	Front end loader	540 hp	0.39	0.4	0	52	0	1.97E-03	2.67E-02	1.22E-02	5.21E-05	1.05E-03	9.64E-04	-	-	-	-	-	-	
	Gravel	Grader	135 hp	11.11	11.1	0	52	0	3.48E-02	4.29E-01	2.41E-01	4.59E-04	2.41E-02	2.22E-02	-	-	-	-	-	-
	Vibratory roller	85 hp	16.00	16.0	0	52	0	2.25E-02	2.51E-01	1.73E-01	3.01E-04	1.85E-02	1.70E-02	-	-	-	-	-	-	
	Tractor/crawler/dozer	310 hp	3.26	3.3	0	52	0	1.21E-02	1.94E-01	6.14E-02	1.98E-04	7.51E-03	6.91E-03	-	-	-	-	-	-	
	Tractor/crawler/dozer	440 hp	0.81	0.8	0	52	0	4.29E-03	6.88E-02	2.18E-02	7.01E-05	2.67E-03	2.45E-03	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	0.81	0.8	0	52	0	5.32E-04	8.61E-03	9.56E-04	7.40E-06	1.90E-04	1.25E-04	-	-	-	-	-	-	
	Guard Railing	Flatbed truck		8.75	8.8	0	52	0	6.85E-03	6.71E-03	9.70E-02	4.53E-05	3.70E-04	1.66E-04	-	-	-	-	-	-
	Auger Drill	10 hp	8.75	8.8	0	52	0	2.48E-02	1.83E-02	9.82E-01	4.78E-05	1.41E-02	1.40E-02	-	-	-	-	-	-	
	Loader/backhoe	75 hp	4.00	4.0	0	52	0	4.17E-03	4.82E-02	3.32E-02	5.83E-05	3.71E-03	3.41E-03	-	-	-	-	-	-	
	Flatbed truck		4.00	4.0	0	52	0	3.13E-03	3.07E-03	4.43E-02	2.07E-05	1.69E-04	7.59E-05	-	-	-	-	-	-	
	Clear & Grub - Sediment Removal Area & Access Rd	Clear Brush	1 ton pickup truck	23.16	0	23.2	0	42	-	-	-	-	-	-	7.24E-03	7.70E-03	9.72E-02	1.50E-04	1.21E-03	5.43E-04
		Excavator	94 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	3.17E-02	3.82E-01	4.35E-01	7.45E-04	2.71E-02	2.49E-02
		Front end loader	210 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	5.69E-02	8.78E-01	3.05E-01	1.55E-03	2.99E-02	2.75E-02
		Dump truck	10cy	23.16	0	23.2	0	42	-	-	-	-	-	-	1.70E-02	2.78E-01	3.10E-02	2.62E-04	5.84E-03	3.62E-03
		Dump truck	10cy	23.16	0	23.2	0	42	-	-	-	-	-	-	1.70E-02	2.78E-01	3.10E-02	2.62E-04	5.84E-03	3.62E-03
		Brush chipper	275 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	6.57E-02	6.64E-01	2.86E-01	1.47E-03	2.13E-02	1.96E-02
		Front end loader	210 hp	10.65	0	10.7	0	42	-	-	-	-	-	-	2.62E-02	4.04E-01	1.40E-01	7.13E-04	1.38E-02	1.27E-02
		Cutting	1 ton pickup truck	13.20	0	13.2	0	42	-	-	-	-	-	-	4.13E-03	4.39E-03	5.54E-02	8.52E-05	6.89E-04	3.10E-04
Tractor/crawler/dozer		250 hp	22.00	0	22.0	0	42	-	-	-	-	-	-	8.79E-02	1.43E+00	4.51E-01	1.96E-03	5.44E-02	5.01E-02	
Chain saw			22.00	0	22.0	0	42	-	-	-	-	-	-	1.41E-01	2.22E-03	2.56E-01	2.85E-05	4.03E-04	4.02E-04	
Brush Piling		Front end loader	540 hp	11.09	0	11.1	0	42	-	-	-	-	-	6.90E-02	9.21E-01	4.21E-01	1.85E-03	3.64E-02	3.35E-02	
Tractor/crawler/dozer		310 hp	11.09	0	11.1	0	42	-	-	-	-	-	-	4.92E-02	7.78E-01	2.46E-01	8.32E-04	3.01E-02	2.77E-02	
Brush chipper		250 hp	11.09	0	11.1	0	42	-	-	-	-	-	-	5.53E-02	5.86E-01	2.28E-01	1.32E-03	1.78E-02	1.63E-02	
Front end loader		540 hp	11.09	0	11.1	0	42	-	-	-	-	-	-	6.90E-02	9.21E-01	4.21E-01	1.85E-03	3.64E-02	3.35E-02	
Dewatering		Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2.00	0	2.0	178	-	-	-	-	-	-	1.36E-03	2.20E-02	6.96E-03	3.02E-05	8.41E-04	7.73E-04
		Front end loader	49 hp	4.00	0	4.0	178	-	-	-	-	-	-	-	1.27E-03	8.21E-03	9.05E-03	1.45E-05	3.46E-04	3.18E-04
		Roller	47 hp	4.00	0	4.0	178	-	-	-	-	-	-	-	3.08E-03	9.48E-03	1.10E-02	1.42E-05	7.36E-04	6.77E-04
		Water truck	3000 gal	4.00	0	4.0	178	-	-	-	-	-	-	-	6.91E-04	1.13E-02	1.26E-03	1.07E-05	2.38E-04	1.48E-04
		Excavator	300 hp	4.00	0	4.0	178	-	-	-	-	-	-	-	1.87E-03	2.85E-02	1.28E-02	6.18E-05	9.20E-04	8.47E-04
		Front end loader	180 hp	4.00	0	4.0	178	-	-	-	-	-	-	-	1.99E-03	3.07E-02	1.06E-02	5.42E-05	1.05E-03	9.62E-04
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6.00	0	6.0	178	-	-	-	-	-	-	4.07E-03	6.61E-02	2.09E-02	9.07E-05	2.52E-03	2.32E-03
		36" Diversion Pipe - pipe	Welder	17 hp	16.00	0	16.0	178	-	-	-	-	-	-	1.66E-02	1.06E-02	6.25E-01	2.54E-05	8.41E-03	8.39E-03
		36" Diversion Pipe	Crane 80'	130 hp	273.00	0	273.0	178	-	-	-	-	-	-	1.46E-01	1.86E+00	1.09E+00	2.06E-03	1.01E-01	9.26E-02
		Loader/backhoe	75 hp	0.09	0	0.1	178	-	-	-	-	-	-	-	2.61E-05	3.04E-04	2.23E-04	3.93E-07	2.29E-05	2.10E-05
		Crane 94'	155 hp	155.00	0	155.0	32	-	-	-	-	-	-	-	5.49E-01	7.02E+00	4.09E+00	7.75E-03	3.79E-01	3.49E-01
	1 ton pickup truck		155.00	0	155.0	32	-	-	-	-	-	-	-	6.36E-02	6.77E-02	8.54E-01	1.31E-03	1.06E-02	4.77E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2.00	0	2.0	32	-	-	-	-	-	-	7.55E-03	1.23E-01	3.87E-02	1.68E-04	4.68E-03	4.30E-03	
	Dewatering	Concrete saw	13 hp	8.00	0	8.0	159	-	-	-	-	-	-	8.87E-03	6.55E-03	3.39E-01	1.65E-05	4.86E-03	4.85E-03	
	Crane 80'	130 hp	16.00	0	16.0	159	-	-	-	-	-	-	-	9.56E-03	1.22E-01	7.13E-02	1.35E-04	6.60E-03	6.08E-03	
	Flatbed truck		8.00	0	8.0	159	-	-	-	-	-	-	-	1.73E-03	1.75E-03	2.42E-02	1.35E-05	1.09E-04	4.81E-05	
	Generator	80 hp	5,472.00	0	5,472.0	0	228	-	-	-	-	-	-	2.32E+00	1.80E+01	1.51E+01	2.92E-02	1.22E+00	1.12E+00	
	Generator	7.5 hp	1.59	0	1.6	159	-	-	-	-	-	-	-	6.74E-04	4.67E-04	3.41E-02	1.65E-06	3.05E-05	3.04E-05	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	120.77	120.8	0.0	52	7.53E-01	1.24E+01	5.25E+00	1.73E-02	4.58E-01	4.21E-01	-	-	-	-	-	-
		Tractor/crawler/dozer	600 hp	738.46	0	738.5	178	-	-	-	-	-	-	-	1.26E+00	2.05E+01	8.94E+00	3.10E-02	7.51E-01	6.91E-01
		Push	Tractor/crawler/dozer	600 hp	738.46	0	738.5	178	-	-	-	-	-	-	1.26E+00	2.05E+01	8.94E+00	3.10E-02	7.51E-01	6.91E-01
		Tractor/crawler/dozer	600 hp	738.46	0	738.5	178	-	-	-	-	-	-	-	1.26E+00	2.05E+01	8.94E+00	3.10E-02	7.51E-01	6.91E-01
		Build road	Tractor/crawler/dozer	600 hp	761.54	0	761.5	178	-	-	-	-	-	-	1.30E+00	2.12E+01	9.22E+00	3.20E-02	7.75E-01	7.13E-01
		Cut	Tractor/crawler/dozer	600 hp	20.46	0	20.5	178	-	-	-	-	-	-	3.50E-02	5.69E-01	2.48E-01	8.59E-04	2.08E-02	1.92E-02
		Fine Grading	Grader	135 hp	8.89	0	8.9	178	-	-	-	-	-	-	7.60E-03	9.31E-02	5.62E-02	1.07E-04	5.23E-03	4.81E-03
Graveling		Asphalt distributor	3000 gal	10.00	0	10.0	178	-	-	-	-	-	-	1.73E-03	2.83E-02	3.16E-03	2.66E-05	5.95E-04	3.69E-04	
Vibratory roller		85 hp	30.46	0	30.5	178	-	-	-	-	-	-	-	1.15E-02	1.30E-01	9.55E-02	1.68E-04	9.43E-03	8.68E-03	
Tractor/crawler/dozer																				

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O			
Construction Survey	3/4 ton pickup truck		96	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056			
Dust Control	Water truck	5000 gal	2320	210	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048			
Environmental protection measures	<i>Biologist</i> <i>Fish relocation</i>	3/4 ton pickup truck	1229.3333	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056			
Clear Vegetation	<i>Cutting</i>	1 ton pickup truck	16	19	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056			
		Tractor/crawler/dozer	250 hp	7.3333	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056		
		Chain saw		7.3335	19	0.141	2.268	0.758	0.003	0.086	0.079	301.158	0.022	0.000		
		<i>Brush Piling</i>	Front end loader	540 hp	3.696	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
			Tractor/crawler/dozer	310 hp	3.696	19	0.099	1.282	0.650	0.003	0.051	0.047	293.384	0.016	0.000	
		<i>Chipping</i>	Brush chipper	250 hp	3.696	19	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000	
			Front end loader	540 hp	3.696	19	0.177	1.778	0.772	0.005	0.054	0.050	403.250	0.016	0.000	
Dewatering	<i>Temporary Cofferdam</i>	Tractor/crawler/dozer	180 hp	2	19	0.099	1.282	0.650	0.003	0.051	0.047	293.384	0.016	0.000		
		Front end loader	49 hp	4	19	0.141	2.268	0.758	0.003	0.086	0.079	301.158	0.022	0.000		
			Roller	47 hp	4	19	0.239	1.620	1.844	0.003	0.059	0.054	231.302	0.022	0.000	
			Water truck	3000 gal	4	19	0.600	1.968	2.309	0.003	0.143	0.132	235.507	0.054	0.000	
			Excavator	300 hp	4	19	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
			Front end loader	180 hp	4	19	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000	
			<i>36" Diversion Pipe - gradin</i>	Tractor/crawler/dozer	180 hp	6	19	0.100	1.495	0.587	0.003	0.051	0.047	270.061	0.015	0.000
			Loader/backhoe	75 hp	0.0923	19	0.141	2.268	0.758	0.003	0.086	0.079	301.158	0.022	0.000	
			Crane 94'	155 hp	155	19	0.128	1.531	1.294	0.002	0.108	0.100	195.356	0.015	0.000	
			1 ton pickup truck	155	19	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000		
			Crane 94'	155 hp	155	20	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
			1 ton pickup truck	155	20	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000		
		<i>Demolish cofferdam</i>	Tractor/crawler/dozer	180 hp	2	20	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		<i>Dewatering</i>	Concrete saw	13 hp	8	22	0.141	2.268	0.758	0.003	0.086	0.079	301.158	0.022	0.000	
			Crane 80'	130 hp	16	22	3.075	2.272	117.582	0.006	1.685	1.681	200.981	0.175	0.188	
			Flatbed truck	8	22	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000		
			Generator	80 hp	5,856.00	244	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135	
						244	0.242	1.957	1.773	0.003	0.126	0.116	294.384	0.022	0.000	
	Temporary Access Road	<i>Excavate</i>	Tractor/crawler/dozer	600 hp	184.6154	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		<i>Push</i>	Tractor/crawler/dozer	600 hp	184.6154	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		Tractor/crawler/dozer	600 hp	184.6154	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000		
<i>Build road</i>		Tractor/crawler/dozer	600 hp	184.6154	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000		
<i>Armoring</i>		1 ton pickup truck	2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056			
		Excavator	430 hp	2	19	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		1 ton pickup truck	2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056			
		<i>Maintenance</i>	Grader	215 hp	340	210	0.130	2.154	0.685	0.004	0.070	0.064	312.002	0.018	0.000	
		<i>Material Excavation</i>	1 ton pickup truck	663.5	78	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056		
			Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
Coarse Material (Gravel & Larger) (4/1-7/21)		Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Water truck	3000 gal	663.5	78	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048		
		Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
Sand to Surfrider Beach (32,400 cy) (9/3-18)	<i>Material Excavation</i>	1 ton pickup truck	102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056			
		Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000		
		Water truck	3000 gal	102	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048		
		Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000		
		<i>Beach Crew</i>	1 ton pickup truck	102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056		
			Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
			Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
			Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
			Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
			Water truck	3000 gal	25	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 2**

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	<b>Material Excavation</b>	1 ton pickup truck	382.5	30	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		Front end loader	350 hp	382.5	30	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
		Front end loader	350 hp	382.5	30	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
		Front end loader	350 hp	382.5	30	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
		Front end loader	350 hp	382.5	30	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
		Water truck	3000 gal	382.5	30	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Excavator	400 hp	382.5	30	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
		Excavator	400 hp	382.5	30	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
		Excavator	400 hp	382.5	30	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
		Excavator	400 hp	382.5	30	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	<b>Beach Crew</b>	1 ton pickup truck		382.5	30	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
		Tractor/crawler/dozer	600 hp	382.5	30	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
		Tractor/crawler/dozer	600 hp	382.5	30	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
		Tractor/crawler/dozer	600 hp	382.5	30	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
		Tractor/crawler/dozer	600 hp	382.5	30	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
		Water truck	3000 gal	382.5	30	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Tractor/crawler/dozer	440 hp	720	22	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000
		Tractor/crawler/dozer	440 hp	90	22	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000
		3/4 ton pickup truck		360	22	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		Rotary drill	475 hp	88.1333	128	0.056	0.877	0.500	0.003	0.026	0.024	282.166	0.007	0.000
<b>Demolition</b>	<b>Platform</b>	3/4 ton pickup truck		84.1333	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		3/4 ton pickup truck		376	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	<b>Cut with Diamond wire</b>	Diamond cutting saw	50 hp	376	128	0.445	2.137	2.053	0.004	0.125	0.115	277.562	0.040	0.000
		Crane 260'	375 hp	454.8767	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000
	<b>Lift/Load blocks</b>	3/4 ton pickup truck		454.8767	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		Front end loader	350 hp	32	128	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	<b>Load/Haul</b>	Water truck	3000 gal	521	128	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Crane 260'	375 hp	227.4384	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000
	<b>Landfill</b>	Crane 260'	375 hp	60	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000
		Horizontal boring drill	10 hp	55	128	0.318	2.447	1.909	0.005	0.166	0.152	312.570	0.033	0.000
<b>Demolish spillway</b>	3/4 ton pickup truck		60	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
	Crane 260'	375 hp	100	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
	Air compressor	50 hp	200	128	1.018	1.339	49.027	0.004	0.024	0.023	307.059	0.058	0.075	
	3/4 ton pickup truck		100	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	

Data from Alt2\_EnvrAirQualityReport.pdf

**Total**  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2018 (tons per year)										Metric Tons CO2e/yr
					GWP										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	210	4.30E-04	3.53E-04	5.18E-03	6.48E-06	5.31E-05	2.41E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00
Dust Control	Water truck	5000 gal	2320	210	1.78E-02	2.69E-01	3.27E-02	2.75E-04	5.91E-03	3.60E-03	5.50E+01	1.30E-04	1.23E-04	5.50E+01	4.99E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	5.51E-03	4.52E-03	6.64E-02	8.30E-05	6.80E-04	3.09E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01
	Fish relocation	3/4 ton pickup truck	16	19	7.17E-05	5.88E-05	8.64E-04	1.08E-06	8.86E-06	4.02E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.17E-05	1.38E-05	1.57E-04	2.98E-07	2.38E-06	1.05E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02
	Tractor/crawler/dozer	250 hp	7.3333	19	2.85E-04	4.58E-03	1.53E-03	6.85E-06	1.73E-04	1.60E-04	6.09E-01	4.41E-05	-	6.10E-01	5.53E-01
	Chain saw		7.3335	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03
	Brush Piling	Front end loader	3.696	19	2.18E-04	2.82E-03	1.43E-03	6.49E-06	1.11E-04	1.02E-04	6.45E-01	3.56E-05	-	6.46E-01	5.86E-01
	Tractor/crawler/dozer	310 hp	3.696	19	1.54E-04	2.37E-03	8.24E-04	2.91E-06	9.18E-05	8.44E-05	2.97E-01	2.02E-05	-	2.97E-01	2.70E-01
	Chipping	Brush chipper	3.696	19	1.80E-04	1.81E-03	7.87E-04	4.62E-06	5.53E-05	5.09E-05	4.11E-01	1.63E-05	-	4.11E-01	3.73E-01
	Front end loader	540 hp	3.696	19	2.18E-04	2.82E-03	1.43E-03	6.49E-06	1.11E-04	1.02E-04	6.45E-01	3.56E-05	-	6.46E-01	5.86E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	5.60E-05	9.00E-04	3.01E-04	1.34E-06	3.41E-05	3.13E-05	1.20E-01	8.65E-06	-	1.20E-01	1.09E-01
	Front end loader	49 hp	4	19	5.15E-05	3.50E-04	3.98E-04	6.46E-07	1.27E-05	1.17E-05	5.00E-02	4.65E-06	-	5.01E-02	4.54E-02
	Roller	47 hp	4	19	1.24E-04	4.08E-04	4.78E-04	6.31E-07	2.97E-05	2.73E-05	4.88E-02	1.12E-05	-	4.90E-02	4.45E-02
	Water truck	3000 gal	4	19	3.07E-05	4.64E-04	5.64E-05	4.74E-07	1.02E-05	6.20E-06	9.47E-02	2.25E-07	2.12E-07	9.48E-02	8.60E-02
	Excavator	300 hp	4	19	7.29E-05	1.04E-03	5.62E-04	2.75E-06	3.36E-05	3.09E-05	2.80E-01	1.45E-05	-	2.81E-01	2.55E-01
	Front end loader	180 hp	4	19	7.91E-05	1.19E-03	4.66E-04	2.41E-06	4.02E-05	3.70E-05	2.14E-01	1.23E-05	-	2.15E-01	1.95E-01
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	1.68E-04	2.70E-03	9.02E-04	4.03E-06	1.02E-04	9.40E-05	3.59E-01	2.60E-05	-	3.59E-01	3.26E-01
	Loader/backhoe	75 hp	0.0923	19	9.77E-07	1.17E-05	9.87E-06	1.75E-08	8.28E-07	7.61E-07	1.49E-03	1.13E-07	-	1.49E-03	1.35E-03
	Crane 94"	155 hp	155	19	3.92E-03	5.00E-02	3.27E-02	6.20E-05	2.68E-03	2.46E-03	5.51E+00	4.65E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	4.13E-04	4.85E-04	5.51E-03	1.05E-05	8.38E-05	3.71E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Crane 94"	155 hp	155	20	3.92E-03	5.00E-02	3.27E-02	6.20E-05	2.68E-03	2.46E-03	5.51E+00	4.65E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	20	4.13E-04	4.85E-04	5.51E-03	1.05E-05	8.38E-05	3.71E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	2	20	5.60E-05	9.00E-04	3.01E-04	1.34E-06	3.41E-05	3.13E-05	1.20E-01	8.65E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	13 hp	8	3.53E-04	2.61E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02
	Crane 80"	130 hp	16	22	3.39E-04	4.33E-03	2.83E-03	5.37E-06	2.32E-04	2.13E-04	4.77E-01	4.03E-05	-	4.78E-01	4.34E-01
	Flatbed truck		8	22	5.78E-05	6.04E-05	8.03E-04	5.37E-07	4.27E-06	1.86E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
	Generator	80 hp	5,856.00	244	1.25E-01	1.01E+00	9.15E-01	1.78E-03	6.50E-02	5.98E-02	1.52E+02	1.13E-02	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	1.28E-02	2.01E-01	9.51E-02	3.45E-04	7.41E-03	6.81E-03	3.43E+01	2.35E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	184.6154	19	1.28E-02	2.01E-01	9.51E-02	3.45E-04	7.41E-03	6.81E-03	3.43E+01	2.35E-03	-	3.43E+01	3.11E+01
	Tractor/crawler/dozer	600 hp	184.6154	19	1.28E-02	2.01E-01	9.51E-02	3.45E-04	7.41E-03	6.81E-03	3.43E+01	2.35E-03	-	3.43E+01	3.11E+01
	Build road	Tractor/crawler/dozer	184.6154	19	1.28E-02	2.01E-01	9.51E-02	3.45E-04	7.41E-03	6.81E-03	3.43E+01	2.35E-03	-	3.43E+01	3.11E+01
	Armoring	1 ton pickup truck	2	19	5.33E-06	6.26E-06	7.12E-05	1.35E-07	1.08E-06	4.79E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
	Excavator	430 hp	2	19	5.22E-05	7.42E-04	4.03E-04	1.97E-06	2.40E-05	2.21E-05	2.01E-01	1.04E-05	-	2.01E-01	1.82E-01
	1 ton pickup truck		2	19	5.33E-06	6.26E-06	7.12E-05	1.35E-07	1.08E-06	4.79E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
	Maintenance	Grader	340	210	1.05E-02	1.74E-01	5.52E-02	2.83E-04	5.64E-03	5.19E-03	2.51E+01	1.47E-03	-	2.52E+01	2.28E+01
Coarse Material (Gravel & Larger) (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	1.77E-03	2.08E-03	2.36E-02	4.49E-05	3.59E-04	1.59E-04	1.49E+01	1.48E-03	7.72E-04	1.52E+01	1.38E+01
	Front end loader	350 hp	663.5	78	2.56E-02	3.45E-01	1.22E-01	5.40E-04	1.29E-02	1.19E-02	5.50E+01	3.01E-03	-	5.51E+01	4.99E+01
	Front end loader	350 hp	663.5	78	2.56E-02	3.45E-01	1.22E-01	5.40E-04	1.29E-02	1.19E-02	5.50E+01	3.01E-03	-	5.51E+01	4.99E+01
	Front end loader	350 hp	663.5	78	2.56E-02	3.45E-01	1.22E-01	5.40E-04	1.29E-02	1.19E-02	5.50E+01	3.01E-03	-	5.51E+01	4.99E+01
	Front end loader	350 hp	663.5	78	2.56E-02	3.45E-01	1.22E-01	5.40E-04	1.29E-02	1.19E-02	5.50E+01	3.01E-03	-	5.51E+01	4.99E+01
	Water truck	3000 gal	663.5	78	5.09E-03	7.70E-02	9.36E-03	7.86E-05	1.69E-03	1.03E-03	1.57E+01	3.73E-05	3.51E-05	1.57E+01	1.43E+01
	Excavator	400 hp	663.5	78	1.61E-02	2.29E-01	1.24E-01	6.08E-04	7.42E-03	6.83E-03	6.20E+01	3.20E-03	-	6.20E+01	5.63E+01
	Excavator	400 hp	663.5	78	1.61E-02	2.29E-01	1.24E-01	6.08E-04	7.42E-03	6.83E-03	6.20E+01	3.20E-03	-	6.20E+01	5.63E+01
	Excavator	400 hp	663.5	78	1.61E-02	2.29E-01	1.24E-01	6.08E-04	7.42E-03	6.83E-03	6.20E+01	3.20E-03	-	6.20E+01	5.63E+01
	Excavator	400 hp	663.5	78	1.61E-02	2.29E-01	1.24E-01	6.08E-04	7.42E-03	6.83E-03	6.20E+01	3.20E-03	-	6.20E+01	5.63E+01
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	2.72E-04	3.19E-04	3.63E-03	6.91E-06	5.52E-05	2.44E-05	2.29E+00	2.28E-04	1.19E-04	2.33E+00	2.11E+00
	Front end loader	350 hp	102	11	3.93E-03	5.31E-02	1.87E-02	8.30E-05	1.99E-03	1.83E-03	8.45E+00	4.63E-04	-	8.46E+00	7.68E+00
	Front end loader	350 hp	102	11	3.93E-03	5.31E-02	1.87E-02	8.30E-05	1.99E-03	1.83E-03	8.45E+00	4.63E-04	-	8.46E+00	7.68E+00
	Front end loader	350 hp	102	11	3.93E-03	5.31E-02	1.87E-02	8.30E-05	1.99E-03	1.83E-03	8.45E+00	4.63E-04	-	8.46E+00	7.68E+00
	Front end loader	350 hp	102	11	3.93E-03	5.31E-02	1.87E-02	8.30E-05	1.99E-03	1.83E-03	8.45E+00	4.63E-04	-	8.46E+00	7.68E+00
	Water truck	3000 gal	102	11	7.83E-04	1.18E-02	1.44E-03	1.21E-05	2.60E-04	1.58E-04	2.42E+00	5.73E-06	5.40E-06	2.42E+00	2.19E+00
	Excavator	400 hp	102	11	2.48E-03	3.52E-02	1.91E-02	9.35E-05	1.14E-03	1.05E-03	9.53E+00	4.92E-04	-	9.54E+00	8.65E+00
	Excavator	400 hp	102	11	2.48E-03	3.52E-02	1.91E-02	9.35E-05	1.14E-03	1.05E-03	9.53E+00	4.92E-04	-	9.54E+00	8.65E+00
	Excavator	400 hp	102	11	2.48E-03	3.52E-02	1.91E-02	9.35E-05	1.14E-03	1.05E-03	9.53E+00	4.92E-04	-	9.54E+00	8.65E+00
	Excavator	400 hp	102	11	2.48E-03	3.52E-02	1.91E-02	9.35E-05	1.14E-03	1.05E-03	9.53E+00	4.92E-04	-	9.54E+00	8.65E+00
	Excavator	400 hp	102	11	2.48E-03	3.52E-02	1.91E-02	9.35E-05	1.14E-03	1.05E-03	9.53E+00	4.92E-04	-	9.54E+00	8.65E+00
	Beach Crew	1 ton pickup truck	102	11	2.72E-04	3.19E-04	3.63E-03	6.91E-06	5.52E-05	2.44E-05	2.29E+00	2.28E-04	1.19E-04	2.33E+00	2.11E+00
	Tractor/crawler/dozer	600 hp	102	11	7.07E-03	1.11E-01	5.25E-02	1.90E-04	4.09E-03	3.76E-03	1.89E+01	1.30E-03	-	1.90E+01	1.72E+01
	Tractor/crawler/dozer	600 hp	102	11	7.07E-03	1.11E-01	5.25E-02	1.90E-04	4.09E-03	3.76E-03	1.89E+01	1.30E-03	-	1.90E+01	1.72E+01
	Tractor/crawler/dozer	600 hp	102	11	7.07E-03	1.11E-01									



**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2018 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
<b>Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)</b>	<b>Material Excavation</b>	1 ton pickup truck	382.5	30	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		Front end loader	350 hp	382.5	30	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
		Front end loader	350 hp	382.5	30	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
		Front end loader	350 hp	382.5	30	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
		Front end loader	350 hp	382.5	30	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
		Water truck	3000 gal	382.5	30	2.94E-03	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00	
		Excavator	400 hp	382.5	30	9.30E-03	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
		Excavator	400 hp	382.5	30	9.30E-03	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
		Excavator	400 hp	382.5	30	9.30E-03	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
		Excavator	400 hp	382.5	30	9.30E-03	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
	<b>Beach Crew</b>	1 ton pickup truck	382.5	30	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		Tractor/crawler/dozer	600 hp	382.5	30	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
		Tractor/crawler/dozer	600 hp	382.5	30	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
		Tractor/crawler/dozer	600 hp	382.5	30	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
		Tractor/crawler/dozer	600 hp	382.5	30	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
		Water truck	3000 gal	382.5	30	2.94E-03	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00	
		Tractor/crawler/dozer	440 hp	720	22	4.26E-02	6.55E-01	2.28E-01	8.05E-04	2.54E-02	2.33E-02	8.21E+01	5.60E-03	-	8.22E+01	7.45E+01
		Tractor/crawler/dozer	440 hp	90	22	5.32E-03	8.19E-02	2.85E-02	1.01E-04	3.17E-03	2.92E-03	1.03E+01	6.99E-04	-	1.03E+01	9.32E+00
		3/4 ton pickup truck	360	22	1.61E-03	1.32E-03	1.94E-02	2.43E-05	1.99E-04	9.05E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00	
		<b>Demolition</b>	<b>Platform</b>	Rotary drill	475 hp	88.1333	128	2.58E-03	4.05E-02	2.31E-02	1.28E-04	1.21E-03	1.11E-03	1.30E+01	3.35E-04	-
3/4 ton pickup truck	376			128	3.77E-04	3.09E-04	4.54E-03	5.68E-06	4.66E-05	2.11E-05	1.89E+00	1.88E-04	9.79E-05	1.92E+00	1.74E+00	
3/4 ton pickup truck	376			128	1.69E-03	1.38E-03	2.03E-02	2.54E-05	2.08E-04	9.45E-05	8.44E+00	8.39E-04	4.38E-04	8.59E+00	7.79E+00	
Diamond cutting saw	50 hp			376	128	9.23E-03	4.43E-02	4.25E-02	7.44E-05	2.60E-03	2.39E-03	5.75E+00	8.33E-04	-	5.77E+00	5.23E+00
<b>Lift/Load blocks</b>	Crane 260'		375 hp	454.8767	128	1.66E-02	2.51E-01	6.96E-02	3.01E-04	1.01E-02	9.32E-03	3.07E+01	1.85E-03	-	3.07E+01	2.79E+01
	3/4 ton pickup truck		454.8767	128	2.04E-03	1.67E-03	2.46E-02	3.07E-05	2.52E-04	1.14E-04	1.02E+01	1.01E-03	5.29E-04	1.04E+01	9.43E+00	
<b>Load/Haul</b>	Front end loader		350 hp	32	128	1.23E-03	1.66E-02	5.88E-03	2.60E-05	6.23E-04	5.73E-04	2.65E+00	1.45E-04	-	2.66E+00	2.41E+00
	Water truck		3000 gal	521	128	4.00E-03	6.05E-02	7.35E-03	6.17E-05	1.33E-03	8.08E-04	1.23E+01	2.93E-05	2.76E-05	1.23E+01	1.12E+01
<b>Landfill</b>	Crane 260'		375 hp	227.4384	128	8.28E-03	1.26E-01	3.48E-02	1.51E-04	5.06E-03	4.66E-03	1.53E+01	9.24E-04	-	1.54E+01	1.39E+01
	Crane 260'		375 hp	60	128	2.18E-03	3.31E-02	9.18E-03	3.97E-05	1.34E-03	1.23E-03	4.05E+00	2.44E-04	-	4.05E+00	3.68E+00
<b>Micro-blast</b>	Horizontal boring drill		10 hp	55	128	1.93E-04	1.48E-03	1.16E-03	2.95E-06	1.00E-04	9.23E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
	3/4 ton pickup truck		60	128	2.69E-04	2.20E-04	3.24E-03	4.05E-06	3.32E-05	1.51E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Crane 260'		375 hp	100	128	3.64E-03	5.52E-02	1.53E-02	6.62E-05	2.23E-03	2.05E-03	6.75E+00	4.06E-04	-	6.76E+00	6.13E+00
	Air compressor		50 hp	200	128	1.12E-02	1.48E-02	5.40E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	6.38E-04	8.29E-04	3.66E+00	3.32E+00
<b>Demolish spillway</b>	Air compressor		50 hp	200	128	4.48E-04	3.67E-04	5.40E-03	6.75E-06	5.53E-05	2.51E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00
	3/4 ton pickup truck		100	128	4.48E-04	3.67E-04	5.40E-03	6.75E-06	5.53E-05	2.51E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
<b>Total</b>					<b>7.75E-01</b>	<b>9.47E+00</b>	<b>5.43E+00</b>	<b>1.78E-02</b>	<b>3.91E-01</b>	<b>3.55E-01</b>	<b>1.88E+03</b>	<b>1.14E-01</b>	<b>6.61E-03</b>	<b>1.89E+03</b>	<b>1.71E+03</b>	

Data from Alt2\_EnvrAirQualityReport.pdf

Daily Onsite  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		96	210	8.20E-03	6.72E-03	9.88E-02	1.23E-04	1.01E-03	4.60E-04	
Dust Control	Water truck	5000 gal	2320	210	3.39E-01	5.13E+00	6.23E-01	5.23E-03	1.13E-01	6.85E-02	
Environmental protection measures	<i>Biologist</i> <i>Fish relocation</i>	3/4 ton pickup truck	1229.3333	210	1.05E-01	8.60E-02	1.26E+00	1.58E-03	1.30E-02	5.88E-03	
Clear Vegetation	<i>Cutting</i>	1 ton pickup truck	16	19	1.37E-03	1.12E-03	1.65E-02	2.06E-05	1.69E-04	7.66E-05	
	<i>Tractor/crawler/dozer</i>	250 hp	7.3333	19	2.23E-04	2.62E-04	2.98E-03	5.68E-06	4.53E-05	2.01E-05	
	<i>Chain saw</i>		7.3335	19	5.43E-03	8.73E-02	2.92E-02	1.30E-04	3.30E-03	3.04E-03	
	<i>Brush Piling</i>	Front end loader	540 hp	3.696	19	9.43E-03	1.48E-04	1.71E-02	1.90E-06	2.68E-05	2.68E-05
	<i>Tractor/crawler/dozer</i>	310 hp	3.696	19	4.14E-03	5.37E-02	2.73E-02	1.24E-04	2.12E-03	1.95E-03	
	<i>Brush chipper</i>	250 hp	3.696	19	2.93E-03	4.51E-02	1.57E-02	5.55E-05	1.75E-03	1.61E-03	
	<i>Front end loader</i>	540 hp	3.696	19	3.43E-03	3.45E-02	1.50E-02	8.80E-05	1.05E-03	9.70E-04	
	<i>Tractor/crawler/dozer</i>	180 hp	2	19	4.14E-03	5.37E-02	2.73E-02	1.24E-04	2.12E-03	1.95E-03	
	<i>Roller</i>	49 hp	4	19	1.07E-03	1.71E-02	5.73E-03	2.56E-05	6.49E-04	5.97E-04	
	<i>Water truck</i>	3000 gal	4	19	9.82E-04	6.67E-03	7.59E-03	1.23E-05	2.43E-04	2.23E-04	
Dewatering	<i>Excavator</i>	47 hp	4	19	2.37E-03	7.77E-03	9.11E-03	1.20E-05	5.66E-04	5.21E-04	
	<i>Front end loader</i>	180 hp	4	19	5.85E-04	8.84E-03	1.07E-03	9.02E-06	1.94E-04	1.18E-04	
	<i>36" Diversion Pipe - gradin</i>	Tractor/crawler/dozer	180 hp	6	1.39E-03	1.97E-02	1.07E-02	5.24E-05	6.39E-04	5.88E-04	
	<i>Loader/backhoe</i>	75 hp	0.0923	19	1.51E-03	2.26E-02	8.87E-03	4.59E-05	7.66E-04	7.05E-04	
	<i>Crane 94"</i>	155 hp	155	19	3.20E-03	5.14E-02	1.72E-02	7.68E-05	1.95E-03	1.79E-03	
	<i>1 ton pickup truck</i>		155	19	1.86E-05	2.23E-04	1.88E-04	3.33E-07	1.58E-05	1.45E-05	
	<i>Crane 94"</i>	155 hp	155	20	7.46E-02	9.53E-01	6.23E-01	1.18E-03	5.10E-02	4.69E-02	
	<i>1 ton pickup truck</i>		155	19	7.87E-03	9.23E-03	1.05E-01	2.00E-04	1.60E-03	7.07E-04	
	<i>Crane 94"</i>	155 hp	155	20	7.46E-02	9.53E-01	6.23E-01	1.18E-03	5.10E-02	4.69E-02	
	<i>1 ton pickup truck</i>		155	20	7.87E-03	9.23E-03	1.05E-01	2.00E-04	1.60E-03	7.07E-04	
	<i>Demolish cofferdam</i>	Tractor/crawler/dozer	180 hp	2	20	1.07E-03	1.71E-02	5.73E-03	2.56E-05	6.49E-04	5.97E-04
	<i>Dewatering</i>	Concrete saw	13 hp	8	22	6.71E-03	4.96E-03	2.57E-01	1.25E-05	3.68E-03	3.67E-03
	<i>Crane 80"</i>	130 hp	16	22	6.46E-03	8.25E-02	5.39E-02	1.02E-04	4.42E-03	4.06E-03	
	<i>Flatbed truck</i>		8	22	1.10E-03	1.15E-03	1.53E-02	1.02E-05	8.13E-05	3.54E-05	
	<i>Generator</i>	80 hp	5,856.00	244	2.38E+00	1.92E+01	1.74E+01	3.40E-02	1.24E+00	1.14E+00	
	Temporary Access Road	<i>Excavate</i>	Tractor/crawler/dozer	600 hp	19	2.44E-01	3.82E+00	1.81E+00	6.57E-03	1.41E-01	1.30E-01
		<i>Push</i>	Tractor/crawler/dozer	600 hp	19	2.44E-01	3.82E+00	1.81E+00	6.57E-03	1.41E-01	1.30E-01
		<i>Build road</i>	Tractor/crawler/dozer	600 hp	19	2.44E-01	3.82E+00	1.81E+00	6.57E-03	1.41E-01	1.30E-01
		<i>Armoring</i>	1 ton pickup truck	2	19	1.01E-04	1.19E-04	1.36E-03	2.58E-06	2.06E-05	9.13E-06
		<i>Excavator</i>	430 hp	2	19	9.95E-04	1.41E-02	7.67E-03	3.75E-05	4.58E-04	4.21E-04
<i>1 ton pickup truck</i>			2	19	1.01E-04	1.19E-04	1.36E-03	2.58E-06	2.06E-05	9.13E-06	
<i>Maintenance</i>		Grader	215 hp	340	210	1.99E-01	3.31E+00	1.05E+00	5.39E-03	1.07E-01	9.89E-02
Coarse Material (Gravel & Larger) (4/1-7/21)		<i>Material Excavation</i>	1 ton pickup truck	663.5	78	3.37E-02	3.95E-02	4.50E-01	8.56E-04	6.83E-03	3.03E-03
		<i>Front end loader</i>	350 hp	663.5	78	4.87E-01	6.57E+00	2.32E+00	1.03E-02	2.46E-01	2.26E-01
		<i>Front end loader</i>	350 hp	663.5	78	4.87E-01	6.57E+00	2.32E+00	1.03E-02	2.46E-01	2.26E-01
	<i>Front end loader</i>	350 hp	663.5	78	4.87E-01	6.57E+00	2.32E+00	1.03E-02	2.46E-01	2.26E-01	
	<i>Front end loader</i>	350 hp	663.5	78	4.87E-01	6.57E+00	2.32E+00	1.03E-02	2.46E-01	2.26E-01	
	<i>Water truck</i>	3000 gal	663.5	78	9.70E-02	1.47E+00	1.78E-01	1.50E-03	3.22E-02	1.96E-02	
	<i>Excavator</i>	400 hp	663.5	78	3.07E-01	4.36E+00	2.37E+00	1.16E-02	1.41E-01	1.30E-01	
	<i>Excavator</i>	400 hp	663.5	78	3.07E-01	4.36E+00	2.37E+00	1.16E-02	1.41E-01	1.30E-01	
	<i>Excavator</i>	400 hp	663.5	78	3.07E-01	4.36E+00	2.37E+00	1.16E-02	1.41E-01	1.30E-01	
	<i>Excavator</i>	400 hp	663.5	78	3.07E-01	4.36E+00	2.37E+00	1.16E-02	1.41E-01	1.30E-01	
	Sand to Surfrider Beach (32,400 cy) (9/3-18)	<i>Material Excavation</i>	1 ton pickup truck	102	11	5.18E-03	6.08E-03	6.91E-02	1.32E-04	1.05E-03	4.66E-04
		<i>Front end loader</i>	350 hp	102	11	7.48E-02	1.01E+00	3.57E-01	1.58E-03	3.78E-02	3.48E-02
		<i>Front end loader</i>	350 hp	102	11	7.48E-02	1.01E+00	3.57E-01	1.58E-03	3.78E-02	3.48E-02
		<i>Front end loader</i>	350 hp	102	11	7.48E-02	1.01E+00	3.57E-01	1.58E-03	3.78E-02	3.48E-02
		<i>Front end loader</i>	350 hp	102	11	7.48E-02	1.01E+00	3.57E-01	1.58E-03	3.78E-02	3.48E-02
<i>Water truck</i>		3000 gal	102	11	1.49E-02	2.25E-01	2.74E-02	2.30E-04	4.95E-03	3.01E-03	
<i>Excavator</i>		400 hp	102	11	4.72E-02	6.71E-01	3.64E-01	1.78E-03	2.17E-02	2.00E-02	
<i>Excavator</i>		400 hp	102	11	4.72E-02	6.71E-01	3.64E-01	1.78E-03	2.17E-02	2.00E-02	
<i>Excavator</i>		400 hp	102	11	4.72E-02	6.71E-01	3.64E-01	1.78E-03	2.17E-02	2.00E-02	
<i>Excavator</i>		400 hp	102	11	4.72E-02	6.71E-01	3.64E-01	1.78E-03	2.17E-02	2.00E-02	
<i>Excavator</i>		400 hp	102	11	4.72E-02	6.71E-01	3.64E-01	1.78E-03	2.17E-02	2.00E-02	
<i>Beach Crew</i>		1 ton pickup truck	102	11	5.18E-03	6.08E-03	6.91E-02	1.32E-04	1.05E-03	4.66E-04	
<i>Tractor/crawler/dozer</i>		600 hp	102	11	1.35E-01	2.11E+00	1.00E+00	3.63E-03	7.79E-02	7.17E-02	
<i>Tractor/crawler/dozer</i>		600 hp	102	11	1.35E-01	2.11E+00	1.00E+00	3.63E-03	7.79E-02	7.17E-02	
<i>Tractor/crawler/dozer</i>		600 hp	102	11	1.35E-01	2.11E+00	1.00E+00	3.63E-03	7.79E-02	7.17E-02	
<i>Tractor/crawler/dozer</i>		600 hp	102	11	1.35E-01	2.11E+00	1.00E+00	3.63E-03	7.79E-02	7.17E-02	
<i>Water truck</i>		3000 gal	25	11	3.66E-03	5.53E-02	6.72E-03	5.64E-05	1.21E-03	7.38E-04	

**Conversions**

2000 pounds per ton  
 453.6 grams per pound  
 2 peak day scaling factor  
 0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
 Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL)
Gasoline	0.994	0.992	0.998	117 (VEHICLE)

**Federal Holidays**

New Year's Day	1/1/2018
Birthdays of Martin Luther King, Jr.	1/15/2018
Washington's Birthday	2/19/2018
Memorial Day	5/28/2018
Independence Day	7/4/2018
Labor Day	9/3/2018
Columbus Day	10/8/2018
Veterans Day	11/12/2018
Thanksgiving Day	11/22/2018
Christmas Day	12/25/2018

10  
<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedu>

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	<b>Material Excavation</b>	1 ton pickup truck	382.5	30	1.94E-02	2.28E-02	2.59E-01	4.93E-04	3.94E-03	1.75E-03		
		Front end loader	350 hp	382.5	30	2.81E-01	3.79E+00	1.34E+00	5.93E-03	1.42E-01	1.31E-01	
		Front end loader	350 hp	382.5	30	2.81E-01	3.79E+00	1.34E+00	5.93E-03	1.42E-01	1.31E-01	
		Front end loader	350 hp	382.5	30	2.81E-01	3.79E+00	1.34E+00	5.93E-03	1.42E-01	1.31E-01	
		Front end loader	350 hp	382.5	30	2.81E-01	3.79E+00	1.34E+00	5.93E-03	1.42E-01	1.31E-01	
	<b>Beach Crew</b>	Water truck	3000 gal	382.5	30	5.59E-02	-	1.03E-01	8.63E-04	1.86E-02	1.13E-02	
		Excavator	400 hp	382.5	30	1.77E-01	-	1.37E+00	6.68E-03	8.15E-02	7.50E-02	
		Excavator	400 hp	382.5	30	1.77E-01	-	1.37E+00	6.68E-03	8.15E-02	7.50E-02	
		Excavator	400 hp	382.5	30	1.77E-01	-	1.37E+00	6.68E-03	8.15E-02	7.50E-02	
		Excavator	400 hp	382.5	30	1.77E-01	-	1.37E+00	6.68E-03	8.15E-02	7.50E-02	
		1 ton pickup truck		382.5	30	1.94E-02	-	2.59E-01	4.93E-04	3.94E-03	1.75E-03	
		Tractor/crawler/dozer	600 hp	382.5	30	5.05E-01	7.92E+00	3.75E+00	1.36E-02	2.92E-01	2.69E-01	
		Tractor/crawler/dozer	600 hp	382.5	30	5.05E-01	7.92E+00	3.75E+00	1.36E-02	2.92E-01	2.69E-01	
		Tractor/crawler/dozer	600 hp	382.5	30	5.05E-01	7.92E+00	3.75E+00	1.36E-02	2.92E-01	2.69E-01	
		Tractor/crawler/dozer	600 hp	382.5	30	5.05E-01	7.92E+00	3.75E+00	1.36E-02	2.92E-01	2.69E-01	
	Demolition	<b>Platform</b>	Water truck	3000 gal	382.5	30	5.59E-02	8.45E-01	1.03E-01	8.63E-04	1.86E-02	1.13E-02
			Tractor/crawler/dozer	440 hp	720	22	8.11E-01	1.25E+01	4.34E+00	1.53E-02	4.83E-01	4.45E-01
			Tractor/crawler/dozer	440 hp	90	22	1.01E-01	1.56E+00	5.43E-01	1.92E-03	6.04E-02	5.56E-02
			3/4 ton pickup truck		360	22	3.07E-02	2.52E-02	3.70E-01	4.63E-04	3.80E-03	1.72E-03
			Rotary drill	475 hp	88,1333	128	4.92E-02	7.71E-01	4.39E-01	2.43E-03	2.31E-02	2.12E-02
<b>Drilling</b>		3/4 ton pickup truck		84,1333	128	7.18E-03	5.89E-03	8.65E-02	1.08E-04	8.87E-04	4.03E-04	
		3/4 ton pickup truck		376	128	3.21E-02	2.63E-02	3.87E-01	4.83E-04	3.96E-03	1.80E-03	
		Diamond cutting saw	50 hp	376	128	1.76E-01	8.43E-01	8.10E-01	1.42E-03	4.95E-02	4.55E-02	
		Crane 260'	375 hp	454.8767	128	3.15E-01	4.78E+00	1.33E+00	5.74E-03	1.93E-01	1.78E-01	
		3/4 ton pickup truck		454.8767	128	3.88E-02	3.18E-02	4.68E-01	5.85E-04	4.80E-03	2.18E-03	
<b>Load/Haul</b>		Front end loader	350 hp	32	128	2.35E-02	3.17E-01	1.12E-01	4.96E-04	1.19E-02	1.09E-02	
		Water truck	3000 gal	521	128	7.62E-02	1.15E+00	1.40E-01	1.17E-03	2.53E-02	1.54E-02	
		Crane 260'	375 hp	227.4384	128	1.58E-01	2.39E+00	6.63E-01	2.87E-03	9.65E-02	8.88E-02	
<b>Landfill</b>		Crane 260'	375 hp	60	128	4.16E-02	6.31E-01	1.75E-01	7.57E-04	2.54E-02	2.34E-02	
		Horizontal boring drill	10 hp	55	128	3.68E-03	2.83E-02	2.20E-02	5.62E-05	1.91E-03	1.76E-03	
		3/4 ton pickup truck		60	128	5.12E-03	4.20E-03	6.17E-02	7.72E-05	6.33E-04	2.87E-04	
		Crane 260'	375 hp	100	128	6.93E-02	1.05E+00	2.92E-01	1.26E-03	4.24E-02	3.90E-02	
		Air compressor	50 hp	200	128	2.14E-01	2.81E-01	1.03E+01	7.84E-04	4.94E-03	4.93E-03	
<b>Demolish spillway</b>		3/4 ton pickup truck		100	128	8.54E-03	7.00E-03	1.03E-01	1.29E-04	1.05E-03	4.79E-04	
		<b>Total</b>				<b>1.48E+01</b>	<b>1.80E+02</b>	<b>1.03E+02</b>	<b>3.38E-01</b>	<b>7.45E+00</b>	<b>6.77E+00</b>	

Data from Alt2\_EnvrAirQualityReport.pdf

Daily Onsite	VOC	NOx	CO	SO2	PM10	PM2.5
Rindge	12	137	83	0	6	5
Surfrider	1	9	4	0	0	0
Topanga	2	33	15	0	1	1
Zuma	0	0	0	0	0	0
Landfill	0	2	1	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		96	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
Dust Control	Water truck	5000 gal	2320	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
	Tractor/crawler/dozer	250 hp	7.3333	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Brush Piling	Front end loader	3.696	19	0.088	1.092	0.634	0.003	0.043	0.039	293.384	0.015	0.000
	Tractor/crawler/dozer	310 hp	3.696	19	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000
	Chipping	Brush chipper	3.696	19	0.166	1.567	0.761	0.005	0.048	0.044	403.250	0.015	0.000
	Front end loader	540 hp	3.696	19	0.088	1.092	0.634	0.003	0.043	0.039	293.384	0.015	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
	Front end loader	49 hp	4	19	0.222	1.556	1.830	0.003	0.048	0.044	231.302	0.020	0.000
	Roller	47 hp	4	19	0.544	1.906	2.256	0.003	0.129	0.119	235.507	0.049	0.000
	Water truck	3000 gal	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
	Excavator	300 hp	4	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
	Front end loader	180 hp	4	19	0.093	1.355	0.579	0.003	0.045	0.042	270.061	0.015	0.000
	Tractor/crawler/dozer	180 hp	6	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
	36" Diversion Pipe - grade	Welder	4	19	2.450	1.583	92.611	0.004	1.249	1.246	148.932	0.140	0.122
	36" Diversion Pipe - pipe	Crane 80"	27.3333	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
	36" Diversion Pipe	Loader/backhoe	0.0923	19	0.112	1.361	1.289	0.002	0.091	0.084	195.356	0.014	0.000
		Crane 94"	155	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		1 ton pickup truck	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Crane 94"	155	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		1 ton pickup truck	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	2	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
	Dewatering	Concrete saw	8	21	3.075	2.272	117.574	0.006	1.685	1.681	200.981	0.175	0.188
		Crane 80"	16	21	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		Flatbed truck	8	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135
		Generator	5856	244	0.213	1.796	1.761	0.003	0.108	0.100	294.384	0.019	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Push	Tractor/crawler/dozer	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Push	Tractor/crawler/dozer	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Build road	Tractor/crawler/dozer	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Armoring	1 ton pickup truck	2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Excavator	2	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
		1 ton pickup truck	2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
	Maintenance	Grader	340	209	0.122	1.989	0.675	0.004	0.064	0.059	312.002	0.017	0.000
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Front end loader	59.5	7	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000
		Front end loader	59.5	7	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000
		Water truck	59.5	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Excavator	59.5	7	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
	Beach Crew	1 ton pickup truck	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Tractor/crawler/dozer	59.5	7	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Tractor/crawler/dozer	59.5	7	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Water truck	14.875	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Front end loader	1028.5	131	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000
		Front end loader	1028.5	131	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000
		Water truck	1028.5	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Excavator	1028.5	131	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
	Beach Crew	1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Tractor/crawler/dozer	1028.5	131	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Tractor/crawler/dozer	1028.5	131	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Water truck	257.125	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	22	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000
		Tractor/crawler/dozer	440 hp	90	22	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000
		3/4 ton pickup truck		360	22	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Drilling	Rotary drill	475 hp	54.4	128	0.054	0.779	0.500	0.003	0.024	0.022	282.166	0.007	0.000
		3/4 ton pickup truck		50.4	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Cut with Diamond wire	3/4 ton pickup truck		148	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
		Diamond cutting saw	50 hp	148	128	0.388	2.062	2.000	0.004	0.110	0.101	277.562	0.035	0.000
	Lift/Load blocks	Crane 260'	375 hp	179.6356	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000
		3/4 ton pickup truck		179.6356	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Load/Haul	Front end loader	350 hp	32	128	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000
	Landfill	Crane 260'	375 hp	89.8178	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000
		Crane 260'	375 hp	60	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000
	Micro-blast	Horizontal boring drill	10 hp	55	128	0.300	2.371	1.909	0.005	0.152	0.140	312.570	0.033	0.000
		3/4 ton pickup truck		60	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	100	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000
		Air compressor	50 hp	200	128	0.932	1.229	50.033	0.004	0.024	0.023	307.059	0.053	0.072
		3/4 ton pickup truck		100	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056

Data from All2\_EnvrAirQualityReport.pdf

**Total**  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)											Metric Tons CO2e/yr
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		96	209	3.71E-04	3.21E-04	4.51E-03	6.44E-06	5.25E-05	2.36E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
Dust Control	Water truck	5000 gal	2320	209	1.75E-02	2.47E-01	3.24E-02	2.73E-04	5.70E-03	3.40E-03	5.49E+01	1.30E-04	1.23E-04	5.49E+01	4.98E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	4.75E-03	4.11E-03	5.77E-02	8.24E-05	6.73E-04	3.02E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
	Fish relocation	3/4 ton pickup truck	16	19	6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	9.54E-06	1.22E-05	1.29E-04	2.96E-07	2.35E-06	1.03E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	2.72E-04	4.31E-03	1.49E-03	6.85E-06	1.62E-04	1.49E-04	6.09E-01	4.16E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3333	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03	
	Brush Piling	Front end loader	540 hp	3.696	19	1.93E-04	2.40E-03	1.40E-03	6.49E-06	9.43E-05	8.67E-05	6.45E-01	3.38E-05	-	6.46E-01	5.86E-01
	Tractor/crawler/dozer	310 hp	3.696	19	1.43E-04	2.13E-03	7.91E-04	2.91E-06	8.28E-05	7.62E-05	2.97E-01	1.92E-05	-	2.97E-01	2.70E-01	
	Chipping	Brush chipper	250 hp	3.696	19	1.69E-04	1.60E-03	7.75E-04	4.62E-06	4.92E-05	4.52E-05	4.11E-01	1.52E-05	-	4.11E-01	3.73E-01
	Front end loader	540 hp	3.696	19	1.93E-04	2.40E-03	1.40E-03	6.49E-06	9.43E-05	8.67E-05	6.45E-01	3.38E-05	-	6.46E-01	5.86E-01	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	1.09E-01
	Front end loader	49 hp	4	19	4.80E-05	3.36E-04	3.95E-04	6.46E-07	1.04E-05	9.61E-06	5.00E-02	4.33E-06	-	5.01E-02	4.54E-02	
	Roller	47 hp	4	19	1.13E-04	3.95E-04	4.67E-04	6.31E-07	2.68E-05	2.46E-05	4.88E-02	1.02E-05	-	4.90E-02	4.45E-02	
Water truck	3000 gal	4	19	3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	9.47E-02	8.59E-02		
Excavator	300 hp	4	19	6.77E-05	8.99E-04	5.55E-04	2.75E-06	2.92E-05	2.69E-05	2.80E-01	1.37E-05	-	2.81E-01	2.54E-01		
Front end loader	180 hp	4	19	7.34E-05	1.08E-03	4.60E-04	2.41E-06	3.61E-05	3.32E-05	2.14E-01	1.16E-05	-	2.15E-01	1.95E-01		
36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	19	1.60E-04	2.54E-03	8.77E-04	4.03E-06	9.57E-05	8.81E-05	3.59E-01	2.45E-05	-	3.59E-01	3.26E-01	
36" Diversion Pipe - pipe	Welder	17 hp	4	19	1.84E-04	1.19E-04	6.94E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.05E-05	9.16E-06	1.42E-02	1.29E-02	
36" Diversion Pipe	Crane 80"	130 hp	27.3333	19	5.29E-04	6.71E-03	4.83E-03	9.17E-06	3.59E-04	3.30E-04	8.15E-01	6.40E-05	-	8.16E-01	7.41E-01	
Loader/backhoe	75 hp	0.0923	19	8.55E-07	1.04E-05	9.84E-06	1.75E-08	6.93E-07	6.38E-07	1.49E-03	1.03E-07	-	1.49E-03	1.35E-03		
Crane 94"	155 hp	155	19	3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	5.01E+00		
1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
Crane 94"	155 hp	155	19	3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	5.01E+00		
1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	1.09E-01	
Dewatering	Concrete saw	13 hp	8	21	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02	
Crane 80"	130 hp	16	21	3.10E-04	3.93E-03	2.83E-03	5.37E-06	2.10E-04	1.93E-04	4.77E-01	3.74E-05	-	4.78E-01	4.43E-01		
Flatbed truck		8	21	4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01		
Generator	80 hp	5856	244	19	1.10E-01	9.28E-01	9.09E-01	1.78E-03	5.60E-02	5.15E-02	1.52E+02	9.93E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01
	Armoring	1 ton pickup truck	2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
	Excavator	430 hp	2	19	4.85E-05	6.44E-04	3.98E-04	1.97E-06	2.09E-05	1.92E-05	2.01E-01	9.81E-06	-	2.01E-01	1.82E-01	
	1 ton pickup truck		2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
	Maintenance	Grader	215 hp	340	209	9.80E-03	1.60E-01	5.44E-02	2.83E-04	5.14E-03	4.73E-03	2.51E+01	1.39E-03	-	2.52E+01	2.28E+01
	Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00
			Front end loader	350 hp	59.5	7	2.10E-03	2.73E-02	1.07E-02	4.84E-05	1.02E-03	9.38E-04	4.93E+00	2.57E-04	-	4.94E+00
Front end loader			350 hp	59.5	7	2.10E-03	2.73E-02	1.07E-02	4.84E-05	1.02E-03	9.38E-04	4.93E+00	2.57E-04	-	4.94E+00	4.48E+00
Water truck			3000 gal	59.5	7	4.49E-04	6.32E-03	8.31E-04	7.01E-06	1.46E-04	8.71E-05	1.41E+00	3.34E-06	3.15E-06	1.41E+00	1.28E+00
Excavator			400 hp	59.5	7	1.34E-03	1.78E-02	1.10E-02	5.46E-05	5.79E-04	5.33E-04	5.56E+00	2.72E-04	-	5.56E+00	5.05E+00
Beach Crew		1 ton pickup truck		59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00
		Tractor/crawler/dozer	600 hp	59.5	7	3.71E-03	5.64E-02	2.94E-02	1.11E-04	2.08E-03	1.91E-03	1.10E+01	7.17E-04	-	1.11E+01	1.00E+01
		Tractor/crawler/dozer	600 hp	59.5	7	3.71E-03	5.64E-02	2.94E-02	1.11E-04	2.08E-03	1.91E-03	1.10E+01	7.17E-04	-	1.11E+01	1.00E+01
		Water truck	3000 gal	14.875	7	1.12E-04	1.58E-03	2.08E-04	1.75E-06	3.65E-05	2.18E-05	3.52E-01	8.36E-07	7.87E-07	3.52E-01	3.19E-01
		Water truck	3000 gal	14.875	7	1.12E-04	1.58E-03	2.08E-04	1.75E-06	3.65E-05	2.18E-05	3.52E-01	8.36E-07	7.87E-07	3.52E-01	3.19E-01
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01	
		Front end loader	350 hp	1028.5	131	3.63E-02	4.72E-01	1.84E-01	8.37E-04	1.76E-02	1.62E-02	8.52E+01	4.44E-03	-	8.53E+01	7.74E+01
		Front end loader	350 hp	1028.5	131	3.63E-02	4.72E-01	1.84E-01	8.37E-04	1.76E-02	1.62E-02	8.52E+01	4.44E-03	-	8.53E+01	7.74E+01
		Water truck	3000 gal	1028.5	131	7.77E-03	1.09E-01	1.44E-02	1.21E-04	2.53E-03	1.51E-03	2.43E+01	5.78E-05	5.44E-05	2.43E+01	2.21E+01
		Excavator	400 hp	1028.5	131	2.32E-02	3.08E-01	1.90E-01	9.43E-04	1.00E-02	9.21E-03	9.61E+01	4.69E-03	-	9.62E+01	8.72E+01
	Beach Crew	1 ton pickup truck		1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01
		Tractor/crawler/dozer	600 hp	1028.5	131	6.42E-02	9.75E-01	5.09E-01	1.92E-03	3.59E-02	3.30E-02	1.91E+02	1.24E-02	-	1.91E+02	1.74E+02
		Tractor/crawler/dozer	600 hp	1028.5	131	6.42E-02	9.75E-01	5.09E-01	1.92E-03	3.59E-02	3.30E-02	1.91E+02	1.24E-02	-	1.91E+02	1.74E+02
		Water truck	3000 gal	257.125	131	1.94E-03	2.73E-02	3.59E-03	3.03E-05	6.31E-04	3.77E-04	6.08E+00	1.45E-05	1.36E-05	6.08E+00	5.52E+00
		Water truck	3000 gal	257.125	131	1.94E-03	2.73E-02	3.59E-03	3.03E-05	6.31E-04	3.77E-04	6.08E+00	1.45E-05	1.36E-05	6.08E+00	5.52E+00

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	22	3.94E-02	5.89E-01	2.19E-01	8.05E-04	2.29E-02	2.11E-02	8.21E+01	5.30E-03	-	8.22E+01	7.45E+01	
		Tractor/crawler/dozer	440 hp	90	22	4.93E-03	7.36E-02	2.74E-02	1.01E-04	2.86E-03	2.63E-03	1.03E+01	6.63E-04	-	1.03E+01	9.32E+00	
	Drilling	3/4 ton pickup truck		360	22	1.39E-03	1.20E-03	1.69E-02	2.41E-05	1.97E-04	8.84E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00	
		Rotary drill	475 hp	54.4	128	1.53E-03	2.22E-02	1.42E-02	7.89E-05	6.86E-04	6.31E-04	8.04E+00	1.93E-04	-	8.04E+00	7.29E+00	
	Cut with Diamond wire	3/4 ton pickup truck		50.4	128	1.95E-04	1.68E-04	2.37E-03	3.38E-06	2.76E-05	1.24E-05	1.13E+00	1.12E-04	5.87E-05	1.15E+00	1.04E+00	
		3/4 ton pickup truck		148	128	5.72E-04	4.94E-04	6.95E-03	9.92E-06	8.10E-05	3.64E-05	3.32E+00	3.30E-04	1.72E-04	3.38E+00	3.07E+00	
	Lift/Load blocks	Diamond cutting saw	50 hp	148	128	3.16E-03	1.68E-02	1.63E-02	2.93E-05	8.97E-04	8.25E-04	2.26E+00	2.85E-04	-	2.27E+00	2.06E+00	
		Crane 260'	375 hp	179.6356	128	6.17E-03	9.19E-02	2.66E-02	1.19E-04	3.70E-03	3.41E-03	1.21E+01	6.94E-04	-	1.21E+01	1.10E+01	
	Load/Haul	3/4 ton pickup truck		179.6356	128	6.95E-04	6.00E-04	8.44E-03	1.20E-05	9.83E-05	4.41E-05	4.03E+00	4.01E-04	2.09E-04	4.10E+00	3.72E+00	
		Front end loader	350 hp	32	128	1.13E-03	1.47E-02	5.74E-03	2.60E-05	5.48E-04	5.04E-04	2.65E+00	1.38E-04	-	2.66E+00	2.41E+00	
	Landfill	Crane 260'	375 hp	89.8178	128	3.09E-03	4.60E-02	1.33E-02	5.95E-05	1.85E-03	1.70E-03	6.06E+00	3.47E-04	-	6.07E+00	5.50E+00	
		Crane 260'	375 hp	60	128	2.06E-03		8.88E-03	3.97E-05	1.24E-03	1.14E-03	4.05E+00	2.32E-04	-	4.05E+00	3.68E+00	
	Demolish spillway	Horizontal boring drill	10 hp	55	128	1.82E-04		1.16E-03	2.95E-06	9.22E-05	8.48E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton pickup truck		60	128	2.32E-04		2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
		Crane 260'	375 hp	100	128	3.44E-03		1.48E-02	6.62E-05	2.06E-03	1.90E-03	6.75E+00	3.86E-04	-	6.76E+00	6.13E+00	
		Air compressor	50 hp	200	128	1.03E-02		5.52E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.84E-04	7.95E-04	3.64E+00	3.31E+00	
		3/4 ton pickup truck		100	128	3.87E-04		4.70E-03	6.70E-06	5.47E-05	2.46E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
	<b>Total</b>						<b>5.31E-01</b>	<b>6.56E+00</b>	<b>4.23E+00</b>	<b>1.26E-02</b>	<b>2.66E-01</b>	<b>2.40E-01</b>	<b>1.35E+03</b>	<b>8.17E-02</b>	<b>6.55E-03</b>	<b>1.35E+03</b>	<b>1.23E+03</b>

Data from All2\_EnvrAirQualityReport.pdf

Daily Onsi  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	209	7.11E-03	6.14E-03	8.63E-02	1.23E-04	1.01E-03	4.51E-04		
Dust Control	Water truck	5000 gal	2320	209	3.35E-01	4.72E+00	6.20E-01	5.23E-03	1.09E-01	6.50E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	9.10E-02	7.86E-02	1.11E+00	1.58E-03	1.29E-02	5.78E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.18E-03	1.02E-03	1.44E-02	2.05E-05	1.68E-04	7.52E-05		
	Cutting	1 ton pickup truck	4.4	19	1.83E-04	2.34E-04	2.47E-03	5.66E-06	4.50E-05	1.97E-05		
		Tractor/crawler/dozer	250 hp	7.3333	19	5.20E-03	8.25E-02	2.85E-02	1.31E-04	3.11E-03	2.86E-03	
		Chain saw		7.3333	19	9.48E-03	1.48E-04	1.71E-02	1.91E-06	2.70E-05	2.69E-05	
		Brush Piling	Front end loader	540 hp	3.696	19	3.69E-03	4.60E-02	2.67E-02	1.24E-04	1.80E-03	1.66E-03
			Tractor/crawler/dozer	310 hp	3.696	19	2.73E-03	4.08E-02	1.51E-02	5.57E-05	1.58E-03	1.46E-03
		Chipping	Brush chipper	250 hp	3.696	19	3.23E-03	3.06E-02	1.48E-02	8.84E-05	9.41E-04	8.66E-04
			Front end loader	540 hp	3.696	19	3.69E-03	4.60E-02	2.67E-02	1.24E-04	1.80E-03	1.66E-03
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.02E-03	1.62E-02	5.60E-03	2.57E-05	6.11E-04	5.62E-04
			Front end loader	49 hp	4	19	9.18E-04	6.44E-03	7.57E-03	1.24E-05	2.00E-04	1.84E-04
		Roller	47 hp	4	19	2.16E-03	7.56E-03	8.95E-03	1.21E-05	5.13E-04	4.72E-04	
		Water truck	3000 gal	4	19	5.78E-04	8.14E-03	1.07E-03	9.02E-06	1.88E-04	1.12E-04	
		Excavator	300 hp	4	19	1.30E-03	1.72E-02	1.06E-02	5.26E-05	5.59E-04	5.14E-04	
		Front end loader	180 hp	4	19	1.41E-03	2.06E-02	8.80E-03	4.62E-05	6.90E-04	6.35E-04	
		Tractor/crawler/dozer	180 hp	6	19	3.07E-03	4.86E-02	1.68E-02	7.72E-05	1.83E-03	1.69E-03	
		36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	19	3.51E-03	2.27E-03	1.33E-01	5.41E-06	1.79E-03	1.79E-03
		36" Diversion Pipe - pipe	Welder	17 hp	4	19	1.01E-02	1.28E-01	9.24E-02	1.75E-04	6.86E-03	6.31E-03
		36" Diversion Pipe	Crane 80"	130 hp	27.3333	19	1.64E-05	1.99E-04	1.88E-04	3.35E-07	1.33E-05	1.22E-05
			Loader/backhoe	75 hp	0.0923	19	6.85E-02	8.69E-01	6.25E-01	1.19E-03	4.64E-02	4.27E-02
			Crane 94"	155 hp	155	19	6.43E-03	8.25E-03	8.71E-02	1.99E-04	1.59E-03	6.95E-04
			1 ton pickup truck	155	19	6.85E-02	8.69E-01	6.25E-01	1.19E-03	4.64E-02	4.27E-02	
			Crane 94"	155 hp	155	19	6.43E-03	8.25E-03	8.71E-02	1.99E-04	1.59E-03	6.95E-04
			1 ton pickup truck	155	19	6.43E-03	8.25E-03	8.71E-02	1.99E-04	1.59E-03	6.95E-04	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.02E-03	1.62E-02	5.60E-03	2.57E-05	6.11E-04	5.62E-04
		Dewatering	Concrete saw	13 hp	8	21	6.75E-03	4.99E-03	2.58E-01	1.26E-05	3.70E-03	3.69E-03
			Crane 80"	130 hp	16	21	5.93E-03	7.52E-02	5.41E-02	1.03E-04	4.02E-03	3.70E-03
			Flatbed truck		8	21	9.32E-04	1.01E-03	1.29E-02	1.02E-05	8.08E-05	3.48E-05
			Generator	80 hp	5856	244	2.11E+00	1.78E+01	1.74E+01	3.41E-02	1.07E+00	9.86E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	2.21E-01	3.35E+00	1.75E+00	6.60E-03	1.23E-01	1.13E-01
			Tractor/crawler/dozer	600 hp	184.6154	19	2.21E-01	3.35E+00	1.75E+00	6.60E-03	1.23E-01	1.13E-01
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	2.21E-01	3.35E+00	1.75E+00	6.60E-03	1.23E-01	1.13E-01
			Tractor/crawler/dozer	600 hp	184.6154	19	2.21E-01	3.35E+00	1.75E+00	6.60E-03	1.23E-01	1.13E-01
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	2.21E-01	3.35E+00	1.75E+00	6.60E-03	1.23E-01	1.13E-01
	Armoring	1 ton pickup truck		2	19	8.30E-05	1.06E-04	1.12E-03	2.57E-06	2.05E-05	8.96E-06	
		Excavator	430 hp	2	19	9.28E-04	1.23E-02	7.62E-03	3.77E-05	4.00E-04	3.68E-04	
		1 ton pickup truck		2	19	8.30E-05	1.06E-04	1.12E-03	2.57E-06	2.05E-05	8.96E-06	
		Maintenance	Grader	215 hp	340	209	1.87E-01	3.07E+00	1.04E+00	5.41E-03	9.84E-02	9.06E-02
	Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	2.47E-03	3.17E-03	3.34E-02	7.66E-05	6.09E-04	2.67E-04	
		Front end loader	350 hp	59.5	7	4.02E-02	5.23E-01	2.04E-01	9.26E-04	1.95E-02	1.79E-02	
		Front end loader	350 hp	59.5	7	4.02E-02	5.23E-01	2.04E-01	9.26E-04	1.95E-02	1.79E-02	
		Water truck	3000 gal	59.5	7	8.60E-03	1.21E-01	1.59E-02	1.34E-04	2.80E-03	1.67E-03	
		Excavator	400 hp	59.5	7	2.57E-02	3.41E-01	2.11E-01	1.04E-03	1.11E-02	1.02E-02	
		Beach Crew	1 ton pickup truck	59.5	7	2.47E-03	3.17E-03	3.34E-02	7.66E-05	6.09E-04	2.67E-04	
			Tractor/crawler/dozer	600 hp	59.5	7	7.11E-02	1.08E+00	5.63E-01	2.13E-03	3.97E-02	3.66E-02
			Tractor/crawler/dozer	600 hp	59.5	7	7.11E-02	1.08E+00	5.63E-01	2.13E-03	3.97E-02	3.66E-02
			Water truck	3000 gal	14.875	7	2.15E-03	3.03E-02	3.97E-03	3.36E-05	6.99E-04	4.17E-04
			Water truck		14.875	7	4.27E-02	5.47E-02	5.78E-01	1.32E-03	1.05E-02	4.61E-03
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	6.94E-01	9.03E+00	3.53E+00	1.60E-02	3.37E-01	3.10E-01		
		Front end loader	350 hp	1028.5	131	6.94E-01	9.03E+00	3.53E+00	1.60E-02	3.37E-01	3.10E-01	
		Front end loader	350 hp	1028.5	131	6.94E-01	9.03E+00	3.53E+00	1.60E-02	3.37E-01	3.10E-01	
		Water truck	3000 gal	1028.5	131	1.49E-01	2.09E+00	2.75E-01	2.32E-03	4.83E-02	2.88E-02	
		Excavator	400 hp	1028.5	131	4.44E-01	5.90E+00	3.64E+00	1.80E-02	1.92E-01	1.76E-01	
		Beach Crew	1 ton pickup truck	1028.5	131	4.27E-02	5.47E-02	5.78E-01	1.32E-03	1.05E-02	4.61E-03	
			Tractor/crawler/dozer	600 hp	1028.5	131	1.23E+00	1.87E+01	9.74E+00	3.68E-02	6.87E-01	6.32E-01
			Tractor/crawler/dozer	600 hp	1028.5	131	1.23E+00	1.87E+01	9.74E+00	3.68E-02	6.87E-01	6.32E-01
			Water truck	3000 gal	257.125	131	3.72E-02	5.23E-01	6.87E-02	5.80E-04	1.21E-02	7.21E-03

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL)
Gasoline	0.994	0.992	0.998	117 (VEHICLE)

Federal Holidays

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019

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<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal/>



**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	22	7.55E-01	1.13E+01	4.19E+00	1.54E-02	4.38E-01	4.03E-01
		Tractor/crawler/dozer	440 hp	90	22	9.44E-02	1.41E+00	5.24E-01	1.93E-03	5.48E-02	5.04E-02
		3/4 ton pickup truck		360	22	2.66E-02	2.30E-02	3.24E-01	4.62E-04	3.77E-03	1.69E-03
	Drilling	Rotary drill	475 hp	54.4	128	2.92E-02	4.25E-01	2.72E-01	1.51E-03	1.31E-02	1.21E-02
		3/4 ton pickup truck		50.4	128	3.73E-03	3.22E-03	4.53E-02	6.47E-05	5.28E-04	2.37E-04
	Cut with Diamond wire	3/4 ton pickup truck		148	128	1.10E-02	9.46E-03	1.33E-01	1.90E-04	1.55E-03	6.96E-04
		Diamond cutting saw	50 hp	148	128	6.05E-02	3.22E-01	3.12E-01	5.60E-04	1.72E-02	1.58E-02
	Lift/Load blocks	Crane 260'	375 hp	179.6356	128	1.18E-01	1.76E+00	5.09E-01	2.28E-03	7.08E-02	6.52E-02
		3/4 ton pickup truck		179.6356	128	1.33E-02	1.15E-02	1.61E-01	2.30E-04	1.88E-03	8.44E-04
	Load/Haul	Front end loader	350 hp	32	128	2.16E-02	2.81E-01	1.10E-01	4.98E-04	1.05E-02	9.65E-03
	Landfill	Crane 260'	375 hp	89.8178	128	5.91E-02	8.80E-01	2.54E-01	1.14E-03	3.54E-02	3.26E-02
		Crane 260'	375 hp	60	128	3.95E-02	-	1.70E-01	7.61E-04	2.37E-02	2.18E-02
	Micro-blast	Horizontal boring drill	10 hp	55	128	3.48E-03	-	2.21E-02	5.64E-05	1.76E-03	1.62E-03
		3/4 ton pickup truck		60	128	4.44E-03	-	5.39E-02	7.70E-05	6.28E-04	2.82E-04
	Demolish spillway	Crane 260'	375 hp	100	128	6.58E-02	-	2.83E-01	1.27E-03	3.94E-02	3.63E-02
		Air compressor	50 hp	200	128	1.97E-01	-	1.06E+01	7.88E-04	4.96E-03	4.95E-03
		3/4 ton pickup truck		100	128	7.40E-03	-	8.99E-02	1.28E-04	1.05E-03	4.70E-04
<b>Total</b>					<b>1.02E+01</b>	<b>1.25E+02</b>	<b>8.10E+01</b>	<b>2.41E-01</b>	<b>5.09E+00</b>	<b>4.60E+00</b>	
Daily Onsite											
Rindge					7	85	59	0	4	3	
Surrider					0	0	0	0	0	0	
Topanga					0	2	1	0	0	0	
Zuma					3	38	20	0	1	1	
Landfill					0	1	0	0	0	0	

Data from All2\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		96	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	2320	209	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Fish relocation	3/4 ton pickup truck	16	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	250 hp	7.3333	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Brush Piling	Front end loader	3.696	19	0.083	1.001	0.621	0.003	0.039	0.036	293.384	0.015	0.000
	Tractor/crawler/dozer	310 hp	3.696	19	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000
	Chipping	Brush chipper	3.696	19	0.156	1.378	0.752	0.005	0.043	0.039	403.250	0.014	0.000
	Front end loader	540 hp	3.696	19	0.083	1.001	0.621	0.003	0.039	0.036	293.384	0.015	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Front end loader	49 hp	4	19	0.208	1.500	1.818	0.003	0.039	0.036	231.302	0.019	0.000
	Roller	47 hp	4	19	0.492	1.848	2.208	0.003	0.116	0.106	235.507	0.044	0.000
	Water truck	3000 gal	4	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Excavator	300 hp	4	19	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Front end loader	180 hp	4	19	0.087	1.238	0.573	0.003	0.041	0.038	270.061	0.014	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	36" Diversion Pipe - pipe a	Welder	4	19	2.448	1.584	92.582	0.004	1.249	1.246	148.932	0.140	0.122
	36" Diversion Pipe	Crane 80"	27.3333	19	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	Loader/backhoe	75 hp	0.0923	19	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Crane 94"	155 hp	155	19	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Crane 94"	155 hp	155	19	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	2	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Dewatering	Concrete saw	13	22	3.075	2.272	117.566	0.006	1.685	1.681	200.981	0.175	0.188
	Crane 80"	130 hp	16	22	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	Flatbed truck		8	22	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	Generator	80 hp	5856	244	0.191	1.653	1.753	0.003	0.094	0.087	294.384	0.017	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Push	Tractor/crawler/dozer	184.6154	19	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Push	Tractor/crawler/dozer	184.6154	19	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Build road	Tractor/crawler/dozer	184.6154	19	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Armoring	1 ton pickup truck	0.9333	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Excavator	430 hp	0.9333	19	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	1 ton pickup truck		0.9333	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Compaction	Vibratory roller	7.38	19	0.492	1.848	2.208	0.003	0.116	0.106	235.507	0.044	0.000
	Tractor/crawler/dozer	250 hp	7.38	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Water truck	5000 gal	9.225	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Maintenance	Grader	340	209	0.119	1.912	0.668	0.004	0.061	0.056	312.002	0.016	0.000
Sand to Zuma Beach (19,000 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Front end loader	350 hp	161.5	18	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Front end loader	350 hp	161.5	18	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Water truck	3000 gal	161.5	18	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Excavator	400 hp	161.5	18	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Beach Crew	1 ton pickup truck	161.5	18	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Water truck	3000 gal	161.5	18	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Front end loader	350 hp	1066	120	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Front end loader	350 hp	1066	120	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Water truck	3000 gal	1066	120	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Excavator	400 hp	1066	120	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 4**

Construction Start Year 2020  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000
		Tractor/crawler/dozer	440 hp	90	20	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000
		3/4 ton pickup truck		360	20	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	61.7333	127	0.052	0.708	0.500	0.003	0.022	0.021	282.166	0.006	0.000
		3/4 ton pickup truck		57.7333	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton pickup truck		196	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	196	127	0.344	1.993	1.959	0.004	0.096	0.089	277.562	0.031	0.000
	Lift/Load blocks	Crane 260'	375 hp	239.2283	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
		3/4 ton pickup truck		239.2283	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	32	127	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
		Water truck	3000 gal	14	127	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Landfill	Crane 260'	375 hp	119.6141	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
		Crane 260'	375 hp	60	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
	Micro-blast	Horizontal boring drill	10 hp	55	127	0.297	2.334	1.909	0.005	0.148	0.136	312.570	0.033	0.000
		3/4 ton pickup truck		60	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	100	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
		Air compressor	50 hp	200	127	0.882	1.143	50.704	0.004	0.024	0.023	307.059	0.050	0.070
		3/4 ton pickup truck		100	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056

**Total**  
 Daily Onsite Emissions (lb/day)  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill

Data from AI2\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2020 (tons per year)										Metric Tons CO2e/yr
					GWP										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	209	3.29E-04	2.97E-04	4.01E-03	6.43E-06	5.21E-05	2.31E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00
Dust Control	Water truck	5000 gal	2320	209	1.70E-02	1.99E-01	3.17E-02	2.73E-04	5.18E-03	2.93E-03	5.47E+01	1.30E-04	1.23E-04	5.48E+01	4.97E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	4.22E-03	3.80E-03	5.14E-02	8.24E-05	6.67E-04	2.96E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01
	Fish relocation	3/4 ton pickup truck	16	19	5.49E-05	4.95E-05	6.69E-04	1.07E-06	8.68E-06	3.86E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	8.02E-06	1.11E-05	1.10E-04	2.96E-07	2.33E-06	1.01E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02
	Tractor/crawler/dozer	250 hp	7.3333	19	2.58E-04	4.01E-03	1.45E-03	6.85E-06	1.51E-04	1.39E-04	6.09E-01	3.93E-05	-	6.09E-01	5.53E-01
	Chain saw		7.3335	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03
	Brush Piling	Front end loader	3.696	19	1.82E-04	2.20E-03	1.37E-03	6.49E-06	8.55E-05	7.87E-05	6.45E-01	3.21E-05	-	6.46E-01	5.86E-01
	Tractor/crawler/dozer	310 hp	3.696	19	1.35E-04	1.96E-03	7.63E-04	2.91E-06	7.63E-05	7.02E-05	2.97E-01	1.82E-05	-	2.97E-01	2.70E-01
	Chipping	Brush chipper	3.696	19	1.59E-04	1.40E-03	7.66E-04	4.62E-06	4.36E-05	4.01E-05	4.11E-01	1.43E-05	-	4.11E-01	3.73E-01
	Front end loader	540 hp	3.696	19	1.82E-04	2.20E-03	1.37E-03	6.49E-06	8.55E-05	7.87E-05	6.45E-01	3.21E-05	-	6.46E-01	5.86E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	5.06E-05	7.88E-04	2.85E-04	1.34E-06	2.97E-05	2.73E-05	1.20E-01	7.71E-06	-	1.20E-01	1.09E-01
	Front end loader	49 hp	4	19	4.50E-05	3.24E-04	3.93E-04	6.46E-07	8.46E-06	7.78E-06	5.00E-02	4.06E-06	-	5.01E-02	4.54E-02
	Roller	47 hp	4	19	1.02E-04	3.83E-04	4.58E-04	6.31E-07	2.40E-05	2.21E-05	4.88E-02	9.20E-06	-	4.90E-02	4.45E-02
	Water truck	3000 gal	4	19	2.92E-05	3.43E-04	5.47E-05	4.70E-07	8.94E-06	5.04E-06	9.43E-02	2.25E-07	2.12E-07	9.44E-02	8.56E-02
	Excavator	300 hp	4	19	6.40E-05	7.94E-04	5.50E-04	2.75E-06	2.62E-05	2.41E-05	2.80E-01	1.30E-05	-	2.81E-01	2.54E-01
	Front end loader	180 hp	4	19	6.89E-05	9.82E-04	4.54E-04	2.41E-06	3.26E-05	3.00E-05	2.14E-01	1.10E-05	-	2.15E-01	1.95E-01
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	1.52E-04	2.36E-03	8.56E-04	4.03E-06	8.91E-05	8.20E-05	3.59E-01	2.31E-05	-	3.59E-01	3.26E-01
	36" Diversion Pipe - pipe a	Welder	4	19	1.83E-04	1.19E-04	6.94E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.05E-05	9.16E-06	1.42E-02	1.29E-02
	36" Diversion Pipe	Crane 90'	27.3333	19	5.01E-04	6.29E-03	4.82E-03	9.17E-06	3.36E-04	3.09E-04	8.15E-01	5.93E-05	-	8.16E-01	7.40E-01
	Loader/backhoe	75 hp	0.0923	19	7.69E-07	9.35E-06	9.80E-06	1.75E-08	5.91E-07	5.44E-07	1.49E-03	9.52E-08	-	1.49E-03	1.35E-03
	Crane 94'	155 hp	155	19	3.39E-03	4.25E-02	3.26E-02	6.20E-05	2.27E-03	2.09E-03	5.51E+00	4.01E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Crane 94'	155 hp	155	19	3.39E-03	4.25E-02	3.26E-02	6.20E-05	2.27E-03	2.09E-03	5.51E+00	4.01E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	2	19	5.06E-05	7.88E-04	2.85E-04	1.34E-06	2.97E-05	2.73E-05	1.20E-01	7.71E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	13	22	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02
	Crane 80'	130 hp	16	22	2.93E-04	3.68E-03	2.82E-03	5.37E-06	1.97E-04	1.81E-04	4.77E-01	3.47E-05	-	4.78E-01	4.33E-01
	Flatbed truck		8	22	4.12E-05	4.58E-05	5.67E-04	5.32E-07	4.18E-06	1.78E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
	Generator	80 hp	5856	244	9.87E-02	8.54E-01	9.05E-01	1.78E-03	4.87E-02	4.48E-02	1.52E+02	8.90E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Build road	Tractor/crawler/dozer	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Armoring	1 ton pickup truck	0.9333	19	1.70E-06	2.35E-06	2.32E-05	6.27E-08	4.94E-07	2.14E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02
	Excavator	430 hp	0.9333	19	2.14E-05	2.66E-04	1.84E-04	9.20E-07	8.75E-06	8.05E-06	9.37E-02	4.34E-06	-	9.38E-02	8.51E-02
	1 ton pickup truck		0.9333	19	1.70E-06	2.35E-06	2.32E-05	6.27E-08	4.94E-07	2.14E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02
	Compaction	Vibratory roller	7.38	19	2.00E-04	7.52E-04	8.98E-04	1.24E-06	4.71E-05	4.33E-05	9.58E-02	1.81E-05	-	9.62E-02	8.72E-02
	Tractor/crawler/dozer	250 hp	7.38	19	2.59E-04	4.04E-03	1.46E-03	6.89E-06	1.52E-04	1.40E-04	6.12E-01	3.95E-05	-	6.13E-01	5.56E-01
	Water truck	5000 gal	9.225	19	6.74E-05	7.90E-04	1.26E-04	1.08E-06	2.06E-05	1.16E-05	2.18E-01	5.19E-07	4.88E-07	2.18E-01	1.98E-01
	Maintenance	Grader	340	209	9.58E-03	1.54E-01	5.38E-02	2.83E-04	4.93E-03	4.53E-03	2.51E+01	1.32E-03	-	2.52E+01	2.28E+01
Sand to Zuma Beach (19,000 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	2.94E-04	4.06E-04	4.02E-03	1.09E-05	8.56E-05	3.71E-05	3.62E+00	3.60E-04	1.88E-04	3.69E+00	3.35E+00
	Front end loader	350 hp	161.5	18	5.38E-03	6.80E-02	2.83E-02	1.31E-04	2.53E-03	2.33E-03	1.34E+01	6.64E-04	-	1.34E+01	1.22E+01
	Front end loader	350 hp	161.5	18	5.38E-03	6.80E-02	2.83E-02	1.31E-04	2.53E-03	2.33E-03	1.34E+01	6.64E-04	-	1.34E+01	1.22E+01
	Water truck	3000 gal	161.5	18	1.18E-03	1.38E-02	2.21E-03	1.90E-05	3.61E-04	2.04E-04	3.81E+00	9.08E-06	8.54E-06	3.81E+00	3.46E+00
	Excavator	400 hp	161.5	18	3.45E-03	4.28E-02	2.96E-02	1.48E-04	1.41E-03	1.30E-03	1.51E+01	6.98E-04	-	1.51E+01	1.37E+01
	Beach Crew	1 ton pickup truck	161.5	18	2.94E-04	4.06E-04	4.02E-03	1.09E-05	8.56E-05	3.71E-05	3.62E+00	3.60E-04	1.88E-04	3.69E+00	3.35E+00
	Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
	Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
	Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
	Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
	Water truck	3000 gal	161.5	18	1.18E-03	1.38E-02	2.21E-03	1.90E-05	3.61E-04	2.04E-04	3.81E+00	9.08E-06	8.54E-06	3.81E+00	3.46E+00
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	1.94E-03	2.68E-03	2.65E-02	7.16E-05	6.55E-04	2.45E-04	2.39E+01	2.38E-03	1.24E-03	2.44E+01	2.21E+01
	Front end loader	350 hp	1066	120	3.55E-02	4.49E-01	1.87E-01	8.67E-04	1.67E-02	1.54E-02	8.83E+01	4.38E-03	-	8.84E+01	8.02E+01
	Front end loader	350 hp	1066	120	3.55E-02	4.49E-01	1.87E-01	8.67E-04	1.67E-02	1.54E-02	8.83E+01	4.38E-03	-	8.84E+01	8.02E+01
	Water truck	3000 gal	1066	120	7.79E-03	9.13E-02	1.46E-02	1.25E-04	2.38E-03	1.34E-03	2.51E+01	5.99E-05	5.64E-05	2.52E+01	2.28E+01
	Excavator	400 hp	1066	120	2.28E-02	2.82E-01	1.96E-01	9.77E-04	9.30E-03	8.55E-03	9.96E+01	4.61E-03	-	9.97E+01	9.04E+01

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4**

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2020 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	3.73E-02	5.42E-01	2.11E-01	8.05E-04	2.11E-02	1.94E-02	8.21E+01	5.02E-03	-	8.22E+01	7.45E+01	
		Tractor/crawler/dozer	440 hp	90	20	4.66E-03	6.78E-02	2.64E-02	1.01E-04	2.64E-03	2.43E-03	1.03E+01	6.28E-04	-	1.03E+01	9.32E+00	
		3/4 ton pickup truck		360	20	1.24E-03	1.11E-03	1.50E-02	2.41E-05	1.95E-04	8.68E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00	
	Drilling	Rotary drill	475 hp	61.7333	127	1.67E-03	2.29E-02	1.61E-02	8.95E-05	7.24E-04	6.66E-04	9.12E+00	2.07E-04	-	9.12E+00	8.28E+00	
		3/4 ton pickup truck		57.7333	127	1.98E-04	1.79E-04	2.41E-03	3.87E-06	3.13E-05	1.39E-05	1.30E+00	1.29E-04	6.72E-05	1.32E+00	1.20E+00	
	Cut with Diamond wire	3/4 ton pickup truck		196	127	6.73E-04	6.06E-04	8.19E-03	1.31E-05	1.06E-04	4.73E-05	4.40E+00	4.37E-04	2.28E-04	4.48E+00	4.06E+00	
		Diamond cutting saw	50 hp	196	127	3.71E-03	2.15E-02	2.12E-02	3.88E-05	1.04E-03	9.56E-04	3.00E+00	3.35E-04	-	3.01E+00	2.73E+00	
	Lift/Load blocks	Crane 260'	375 hp	239.2283	127	7.55E-03	1.10E-01	3.44E-02	1.58E-04	4.41E-03	4.06E-03	1.61E+01	8.79E-04	-	1.62E+01	1.47E+01	
		3/4 ton pickup truck		239.2283	127	8.21E-04	7.40E-04	1.00E-02	1.60E-05	1.30E-04	5.77E-05	5.37E+00	5.34E-04	2.78E-04	5.47E+00	4.96E+00	
	Load/Haul	Front end loader	350 hp	32	127	1.07E-03	1.35E-02	5.61E-03	2.60E-05	5.01E-04	4.61E-04	2.65E+00	1.31E-04	-	2.65E+00	2.41E+00	
		Water truck	3000 gal	14	127	1.02E-04		1.92E-04	1.65E-06	3.13E-05	1.77E-05	3.30E-01	7.87E-07	7.41E-07	3.30E-01	3.00E-01	
	Landfill	Crane 260'	375 hp	119.6141	127	3.77E-03		1.72E-02	7.92E-05	2.21E-03	2.03E-03	8.07E+00	4.40E-04	-	8.08E+00	7.33E+00	
		Crane 260'	375 hp	60	127	1.89E-03		8.63E-03	3.97E-05	1.11E-03	1.02E-03	4.05E+00	2.21E-04	-	4.05E+00	3.68E+00	
	Micro-blast	Horizontal boring drill	10 hp	55	127	1.80E-04		1.16E-03	2.95E-06	8.96E-05	8.24E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton pickup truck		60	127	2.06E-04		2.51E-03	4.02E-06	3.25E-05	1.45E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	100	127	3.16E-03		1.44E-02	6.62E-05	1.84E-03	1.70E-03	6.75E+00	3.68E-04	-	6.76E+00	6.13E+00	
		Air compressor	50 hp	200	127	9.72E-03	1.26E-02	5.59E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.53E-04	7.68E-04	3.63E+00	3.30E+00	
		3/4 ton pickup truck		100	127	3.43E-04	3.09E-04	4.18E-03	6.70E-06	5.42E-05	2.41E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
	<b>Total</b>						<b>4.23E-01</b>	<b>4.84E+00</b>	<b>3.49E+00</b>	<b>1.01E-02</b>	<b>2.01E-01</b>	<b>1.81E-01</b>	<b>1.09E+03</b>	<b>6.08E-02</b>	<b>5.74E-03</b>	<b>1.10E+03</b>	<b>9.96E+02</b>

Data from AI2\_EnvrAirQualityReport.pdf

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	209	6.30E-03	5.69E-03	7.68E-02	1.23E-04	9.96E-04	4.43E-04
Dust Control	Water truck	5000 gal	2320	209	3.25E-01	3.80E+00	6.08E-01	5.22E-03	9.92E-02	5.60E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	8.07E-02	7.28E-02	9.83E-01	1.58E-03	1.28E-02	5.67E-03
	Fish relocation	3/4 ton pickup truck	16	19	1.05E-03	9.48E-04	1.28E-02	2.05E-05	1.66E-04	7.38E-05
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.53E-04	2.12E-04	2.10E-03	5.66E-06	4.46E-05	1.93E-05
	Tractor/crawler/dozer	250 hp	7.3333	19	4.93E-03	7.68E-02	2.78E-02	1.31E-04	2.89E-03	2.66E-03
	Chain saw		7.3333	19	9.48E-03	1.48E-04	1.71E-02	1.91E-06	2.70E-05	2.69E-05
	Brush Piling	Front end loader	540 hp	3.696	19	3.49E-03	4.22E-02	2.61E-02	1.24E-04	1.64E-03
	Tractor/crawler/dozer	310 hp	3.696	19	2.58E-03	3.75E-02	1.46E-02	5.57E-05	1.46E-03	1.34E-03
	Chipping	Brush chipper	250 hp	3.696	19	3.04E-03	2.69E-02	1.47E-02	8.84E-05	8.34E-04
	Front end loader	540 hp	3.696	19	3.49E-03	4.22E-02	2.61E-02	1.24E-04	1.64E-03	1.51E-03
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	9.69E-04	1.51E-02	5.46E-03	2.57E-05	5.68E-04
	Front end loader	49 hp	4	19	8.62E-04	6.20E-03	7.52E-03	1.24E-05	1.62E-04	1.49E-04
	Roller	47 hp	4	19	1.95E-03	7.33E-03	8.76E-03	1.21E-05	4.59E-04	4.22E-04
	Water truck	3000 gal	4	19	5.60E-04	6.56E-03	1.05E-03	9.00E-06	1.71E-04	9.66E-05
	Excavator	300 hp	4	19	1.23E-03	1.52E-02	1.05E-02	5.26E-05	5.01E-04	4.61E-04
	Front end loader	180 hp	4	19	1.32E-03	1.88E-02	8.70E-03	4.62E-05	6.24E-04	5.74E-04
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	2.91E-03	4.53E-02	1.64E-02	7.72E-05	1.71E-03
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	3.51E-03	2.27E-03	1.33E-01	5.41E-06	1.79E-03
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	9.58E-03	1.20E-01	9.23E-02	1.75E-04	6.43E-03
	Loader/backhoe	75 hp	0.0923	19	1.47E-05	1.79E-04	1.88E-04	3.35E-07	1.13E-05	1.04E-05
	Crane 94'	155 hp	155	19	6.48E-02	8.13E-01	6.24E-01	1.19E-03	4.35E-02	4.00E-02
	1 ton pickup truck		155	19	5.40E-03	7.46E-03	7.39E-02	1.99E-04	1.57E-03	6.81E-04
	Crane 94'	155 hp	155	19	6.48E-02	8.13E-01	6.24E-01	1.19E-03	4.35E-02	4.00E-02
	1 ton pickup truck		155	19	5.40E-03	7.46E-03	7.39E-02	1.99E-04	1.57E-03	6.81E-04
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	9.69E-04	1.51E-02	5.46E-03	2.57E-05	5.68E-04
	Dewatering	Concrete saw	13 hp	8	22	6.75E-03	4.99E-03	2.58E-01	1.26E-05	3.70E-03
	Crane 80'	130 hp	16	22	5.61E-03	7.04E-02	5.40E-02	1.03E-04	3.77E-03	3.46E-03
	Flatbed truck		8	22	7.88E-04	8.76E-04	1.09E-02	1.02E-05	8.01E-05	3.42E-05
	Generator	80 hp	5856	244	1.89E+00	1.63E+01	1.73E+01	3.41E-02	9.32E-01	8.58E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	2.12E-01	3.14E+00	1.69E+00	6.60E-03	1.15E-01	1.06E-01
	Push	Tractor/crawler/dozer	600 hp	19	2.12E-01	3.14E+00	1.69E+00	6.60E-03	1.15E-01	1.06E-01
	Push	Tractor/crawler/dozer	600 hp	19	2.12E-01	3.14E+00	1.69E+00	6.60E-03	1.15E-01	1.06E-01
	Build road	Tractor/crawler/dozer	600 hp	19	2.12E-01	3.14E+00	1.69E+00	6.60E-03	1.15E-01	1.06E-01
	Armoring	1 ton pickup truck	0.9333	19	3.25E-05	4.49E-05	4.45E-04	1.20E-06	9.46E-06	4.10E-06
	Excavator	430 hp	0.9333	19	4.10E-04	5.08E-03	3.52E-03	1.76E-05	1.67E-04	1.54E-04
	1 ton pickup truck		0.9333	19	3.25E-05	4.49E-05	4.45E-04	1.20E-06	9.46E-06	4.10E-06
	Compaction	Vibratory roller	50 hp	7.38	19	3.83E-03	1.44E-02	1.72E-02	2.37E-05	9.01E-04
	Tractor/crawler/dozer	250 hp	7.38	19	4.97E-03	7.73E-02	2.80E-02	1.32E-04	2.91E-03	2.68E-03
	Water truck	5000 gal	9.225	19	1.29E-03	1.51E-02	2.42E-03	2.08E-05	3.95E-04	2.23E-04
	Maintenance	Grader	215 hp	340	209	1.83E-01	2.95E+00	1.03E+00	5.41E-03	9.43E-02
Sand to Zuma Beach (19,000 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	5.63E-03	7.77E-03	7.70E-02	2.08E-04	1.64E-03	7.09E-04
	Front end loader	350 hp	161.5	18	1.03E-01	1.30E+00	5.42E-01	2.51E-03	4.84E-02	4.45E-02
	Front end loader	350 hp	161.5	18	1.03E-01	1.30E+00	5.42E-01	2.51E-03	4.84E-02	4.45E-02
	Water truck	3000 gal	161.5	18	2.26E-02	2.65E-01	4.23E-02	3.63E-04	6.91E-03	3.90E-03
	Excavator	400 hp	161.5	18	6.60E-02	8.18E-01	5.67E-01	2.83E-03	2.70E-02	2.48E-02
	Beach Crew	1 ton pickup truck	161.5	18	5.63E-03	7.77E-03	7.70E-02	2.08E-04	1.64E-03	7.09E-04
	Tractor/crawler/dozer	600 hp	161.5	18	1.86E-01	2.75E+00	1.47E+00	5.77E-03	1.01E-01	9.28E-02
	Tractor/crawler/dozer	600 hp	161.5	18	1.86E-01	2.75E+00	1.47E+00	5.77E-03	1.01E-01	9.28E-02
	Tractor/crawler/dozer	600 hp	161.5	18	1.86E-01	2.75E+00	1.47E+00	5.77E-03	1.01E-01	9.28E-02
	Tractor/crawler/dozer	600 hp	161.5	18	1.86E-01	2.75E+00	1.47E+00	5.77E-03	1.01E-01	9.28E-02
	Water truck	3000 gal	161.5	18	2.26E-02	2.65E-01	4.23E-02	3.63E-04	6.91E-03	3.90E-03
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	3.72E-02	5.13E-02	5.08E-01	1.37E-03	1.08E-02	4.68E-03
	Front end loader	350 hp	1066	120	6.80E-01	8.59E+00	3.58E+00	1.66E-02	3.19E-01	2.94E-01
	Front end loader	350 hp	1066	120	6.80E-01	8.59E+00	3.58E+00	1.66E-02	3.19E-01	2.94E-01
	Water truck	3000 gal	1066	120	1.49E-01	1.75E+00	2.79E-01	2.40E-03	4.56E-02	2.57E-02
	Excavator	400 hp	1066	120	4.35E-01	5.40E+00	3.74E+00	1.87E-02	1.78E-01	1.64E-01

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL)
Gasoline	0.994	0.992	0.998	117 (VEHIC)

Federal Holidays

New Year's Day	1/1/2020
Birthdays of Martin Luther King, Jr.	1/20/2020
Washington's Birthday	2/17/2020
Memorial Day	5/25/2020
Independence Day	7/3/2020
Labor Day	9/7/2020
Columbus Day	10/12/2020
Veterans Day	11/11/2020
Thanksgiving Day	11/26/2020
Christmas Day	12/25/2020

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<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedu>

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4**

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	7.14E-01	1.04E+01	4.04E+00	1.54E-02	4.04E-01	3.71E-01
		Tractor/crawler/dozer	440 hp	90	20	8.92E-02	1.30E+00	5.05E-01	1.93E-03	5.05E-02	4.64E-02
		3/4 ton pickup truck		360	20	2.36E-02	2.13E-02	2.88E-01	4.62E-04	3.74E-03	1.66E-03
	Drilling	Rotary drill	475 hp	61.7333	127	3.20E-02	4.38E-01	3.09E-01	1.71E-03	1.39E-02	1.27E-02
		3/4 ton pickup truck		57.7333	127	3.79E-03	3.42E-03	4.62E-02	7.40E-05	5.99E-04	2.66E-04
	Cut with Diamond wire	3/4 ton pickup truck		196	127	1.29E-02	1.16E-02	1.57E-01	2.51E-04	2.03E-03	9.04E-04
		Diamond cutting saw	50 hp	196	127	7.11E-02	4.12E-01	4.05E-01	7.42E-04	1.99E-02	1.83E-02
	Lift/Load blocks	Crane 260'	375 hp	239.2283	127	1.44E-01	2.11E+00	6.59E-01	3.03E-03	8.44E-02	7.77E-02
		3/4 ton pickup truck		239.2283	127	1.57E-02	1.42E-02	1.91E-01	3.07E-04	2.48E-03	1.10E-03
	Load/Haul	Front end loader	350 hp	32	127	2.04E-02	2.58E-01	1.07E-01	4.98E-04	9.59E-03	8.82E-03
		Water truck	3000 gal	14	127	1.96E-03	-	3.67E-03	3.15E-05	5.99E-04	3.38E-04
	Landfill	Crane 260'	375 hp	119.6141	127	7.22E-02	-	3.29E-01	1.52E-03	4.22E-02	3.88E-02
		Crane 260'	375 hp	60	127	3.62E-02	-	1.65E-01	7.61E-04	2.12E-02	1.95E-02
	Micro-blast	Horizontal boring drill	10 hp	55	127	3.45E-03	-	2.21E-02	5.64E-05	1.71E-03	1.58E-03
		3/4 ton pickup truck		60	127	3.94E-03	-	4.80E-02	7.69E-05	6.23E-04	2.77E-04
	Demolish spillway	Crane 260'	375 hp	100	127	6.04E-02	-	2.75E-01	1.27E-03	3.53E-02	3.25E-02
		Air compressor	50 hp	200	127	1.86E-01	2.41E-01	1.07E+01	7.88E-04	4.96E-03	4.95E-03
		3/4 ton pickup truck		100	127	6.57E-03	5.92E-03	8.00E-02	1.28E-04	1.04E-03	4.61E-04
	<b>Total</b>					<b>8.10E+00</b>	<b>9.26E+01</b>	<b>6.68E+01</b>	<b>1.94E-01</b>	<b>3.84E+00</b>	<b>3.46E+00</b>
	Daily Onsite										
	Ridge					7	81	60	0	3	3
	Surfrider					0	0	0	0	0	0
	Topanga					0	0	0	0	0	0
Zuma					1	11	6	0	0	0	
Landfill					0	0	0	0	0	0	

Data from AI2\_EnvrAirQualityReport.pdf

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 5**

Construction Start Year 2021  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		96	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	2320	210	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Brush Piling	Front end loader	3.696	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
	Tractor/crawler/dozer	310 hp	3.696	19	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000	
	Chipping	Brush chipper	3.696	19	0.148	1.214	0.746	0.005	0.038	0.035	403.250	0.013	0.000	
	Front end loader	540 hp	3.696	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
Landscaping	Rock from Landfill	Loader/backhoe	75 hp	24	20	0.090	1.104	1.282	0.002	0.065	0.060	195.356	0.012	0.000
	Front end loader	350 hp	20	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
	Front end loader	49 hp	4	19	0.199	1.450	1.811	0.003	0.032	0.030	231.302	0.018	0.000	
	Roller	47 hp	4	19	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000	
	Water truck	3000 gal	4	19	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Excavator	300 hp	4	19	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
	Front end loader	180 hp	4	19	0.080	1.085	0.567	0.003	0.036	0.033	270.061	0.013	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	2.438	1.578	92.570	0.004	1.249	1.246	148.932	0.139	0.122
	36" Diversion Pipe	Crane 80"	130 hp	27.3333	19	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000
	Loader/backhoe	75 hp	0.0923	19	0.090	1.104	1.282	0.002	0.065	0.060	195.356	0.012	0.000	
	Crane 94"	155 hp	155	19	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
	1 ton pickup truck		155	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Crane 94"	155 hp	155	20	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
	1 ton pickup truck		155	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
	Dewatering	Concrete saw	13 hp	8	23	3.070	2.268	117.560	0.006	1.685	1.681	200.981	0.175	0.188
	Crane 80"	130 hp	16	23	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
	Flatbed truck		8	23	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	
	Generator	80 hp	5856	244	0.172	1.509	1.744	0.003	0.081	0.075	294.384	0.016	0.000	
Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Compaction	Vibratory roller	50 hp	17.28	19	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000
	Tractor/crawler/dozer	250 hp	17.28	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
	Water truck	5000 gal	21.6	19	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Maintenance	Grader	215 hp	340	210	0.113	1.791	0.661	0.004	0.057	0.052	312.002	0.015	0.000
Fines to landfill (82,300 cy) (4/1-7/10)	Material Excavation	1 ton pickup truck	597	70	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Front end loader	350 hp	597	70	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Front end loader	350 hp	597	70	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Water truck	3000 gal	597	70	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Excavator	400 hp	597	70	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Water truck	3000 gal	195.5	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
	Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
	Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
	Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Front end loader	350 hp	585	72	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Front end loader	350 hp	585	72	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
	Water truck	3000 gal	585	72	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Excavator	400 hp	585	72	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	



**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
		Tractor/crawler/dozer	440 hp	90	20	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
		3/4 ton pickup truck		360	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	204.4666	126	0.049	0.613	0.500	0.003	0.021	0.019	282.166	0.006	0.000
		3/4 ton pickup truck		208.4666	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton pickup truck		348	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	348	126	0.306	1.918	1.917	0.004	0.082	0.076	277.562	0.028	0.000
	Lift/Load blocks	Crane 260'	375 hp	418.8639	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
		3/4 ton pickup truck		418.8639	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	66	126	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Water truck	3000 gal	14	126	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
	Landfill	Crane 260'	375 hp	209.4319	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
		Crane 260'	375 hp	60	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
	Micro-blast	Horizontal boring drill	10 hp	55	126	0.295	2.329	1.909	0.005	0.146	0.135	312.570	0.033	0.000
		3/4 ton pickup truck		60	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	100	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
		Air compressor	50 hp	200	126	0.837	1.059	50.665	0.004	0.024	0.023	307.059	0.048	0.067
	Fracture	3/4 ton pickup truck		100	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Excavator	400 hp	540	126	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	300 hp	540	126	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	300 hp	270	126	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Tractor/crawler/dozer	440 hp	270	126	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
		3/4 ton pickup truck		540	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
Road Improvement Plan	Stabilize	Grader	135 hp	30.4	20	0.171	1.978	1.884	0.004	0.110	0.102	320.916	0.020	0.000
		Tractor/crawler/dozer	250 hp	30.4	20	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
		Excavator	400 hp	30.4	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	0.071	0.746	0.490	0.002	0.027	0.025	246.840	0.012	0.000
		Line Striper	23 hp	92.576	20	0.110	0.330	8.519	0.003	0.021	0.021	260.327	0.006	0.021
		Roller	70 hp	442.5143	20	0.110	1.347	1.455	0.003	0.082	0.076	222.777	0.018	0.000
		Vibratory roller	33 hp	442.5143	20	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000
		Flatbed truck		92.576	20	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135
		3/4 ton pickup truck		92.576	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056

**Total**  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt2\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2021 (tons per year)										Metric Tons CO2e/yr
					GWP										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	210	2.89E-04	2.75E-04	3.55E-03	6.45E-06	5.16E-05	2.27E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00
Dust Control	Water truck	5000 gal	2320	210	1.79E-02	1.28E-01	3.40E-02	2.72E-04	4.72E-03	2.50E-03	5.45E+01	1.30E-04	1.23E-04	5.45E+01	4.94E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	3.70E-03	3.52E-03	4.54E-02	8.26E-05	6.61E-04	2.91E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01
	Fish relocation	3/4 ton pickup truck	16	19	4.82E-05	4.58E-05	5.91E-04	1.07E-06	8.60E-06	3.79E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	6.69E-06	1.00E-05	9.27E-05	2.97E-07	2.31E-06	9.92E-07	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02
	Tractor/crawler/dozer	250 hp	7.3333	19	2.45E-04	3.76E-03	1.42E-03	6.85E-06	1.41E-04	1.30E-04	6.09E-01	3.71E-05	-	6.09E-01	5.53E-01
	Chain saw		7.3335	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03
	Brush Piling	Front end loader	3.696	19	1.79E-04	2.10E-03	1.34E-03	6.49E-06	8.15E-05	7.49E-05	6.45E-01	3.06E-05	-	6.46E-01	5.86E-01
	Tractor/crawler/dozer	310 hp	3.696	19	1.27E-04	1.77E-03	7.39E-04	2.91E-06	6.99E-05	6.43E-05	2.97E-01	1.72E-05	-	2.97E-01	2.70E-01
	Chipping	Brush chipper	3.696	19	1.50E-04	1.24E-03	7.59E-04	4.62E-06	3.87E-05	3.56E-05	4.11E-01	1.36E-05	-	4.11E-01	3.73E-01
	Front end loader	540 hp	3.696	19	1.79E-04	2.10E-03	1.34E-03	6.49E-06	8.15E-05	7.49E-05	6.45E-01	3.06E-05	-	6.46E-01	5.86E-01
Landscaping	Rock from Landfill	Loader/backhoe	24	20	1.79E-04	2.19E-03	2.54E-03	4.55E-06	1.29E-04	1.19E-04	3.88E-01	2.30E-05	-	3.88E-01	3.52E-01
	Front end loader	350 hp	20	20	6.10E-04	7.29E-03	3.44E-03	1.63E-05	2.72E-04	2.50E-04	1.66E+00	7.82E-05	-	1.66E+00	1.51E+00
	Dump truck	20cy/24 ton	20	20	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01
	Dump truck	20cy/24 ton	20	20	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	4.82E-05	7.37E-04	2.79E-04	1.34E-06	2.77E-05	2.55E-05	1.20E-01	7.29E-06	-	1.20E-01	1.09E-01
	Front end loader	49 hp	4	19	4.30E-05	3.13E-04	3.91E-04	6.46E-07	6.99E-06	6.43E-06	5.00E-02	3.88E-06	-	5.01E-02	4.54E-02
	Roller	47 hp	4	19	9.22E-05	3.72E-04	4.49E-04	6.31E-07	2.13E-05	1.96E-05	4.88E-02	8.32E-06	-	4.90E-02	4.44E-02
	Water truck	3000 gal	4	19	3.08E-05	2.20E-04	5.86E-05	4.69E-07	8.14E-06	4.31E-06	9.39E-02	2.25E-07	2.12E-07	9.40E-02	8.53E-02
	Excavator	300 hp	4	19	5.97E-05	6.73E-04	5.47E-04	2.75E-06	2.25E-05	2.07E-05	2.80E-01	1.23E-05	-	2.80E-01	2.54E-01
	Front end loader	180 hp	4	19	6.32E-05	8.61E-04	4.50E-04	2.41E-06	2.87E-05	2.64E-05	2.14E-01	1.04E-05	-	2.15E-01	1.95E-01
	Tractor/crawler/dozer	180 hp	6	19	1.45E-04	2.21E-03	8.37E-04	4.03E-06	8.32E-05	7.66E-05	3.59E-01	2.19E-05	-	3.59E-01	3.26E-01
	36" Diversion Pipe - gradin	Welder	4	19	1.83E-04	1.18E-04	6.94E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.04E-05	9.14E-06	1.42E-02	1.29E-02
	36" Diversion Pipe - pipe a	Crane 80"	27.3333	19	4.65E-04	5.77E-03	4.82E-03	9.17E-06	3.08E-04	2.83E-04	8.15E-01	5.50E-05	-	8.16E-01	7.40E-01
	36" Diversion Pipe	Loader/backhoe	0.0923	19	6.88E-07	8.42E-06	9.78E-06	1.75E-08	4.97E-07	4.57E-07	1.49E-03	8.84E-08	-	1.49E-03	1.35E-03
	Crane 94"	155 hp	155	19	3.14E-03	3.90E-02	3.26E-02	6.20E-05	2.08E-03	1.91E-03	5.51E+00	3.72E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Crane 94"	155 hp	155	20	3.14E-03	3.90E-02	3.26E-02	6.20E-05	2.08E-03	1.91E-03	5.51E+00	3.72E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	20	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	2	20	4.82E-05	7.37E-04	2.79E-04	1.34E-06	2.77E-05	2.55E-05	1.20E-01	7.29E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.73E-02
	Crane 80"	130 hp	16	23	2.72E-04	3.38E-03	2.82E-03	5.37E-06	1.80E-04	1.66E-04	4.77E-01	3.22E-05	-	4.78E-01	4.33E-01
	Flatbed truck		8	23	3.47E-05	3.98E-05	4.78E-04	5.33E-07	4.15E-06	1.76E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
	Generator	80 hp	5856	244	8.88E-02	7.79E-01	9.00E-01	1.78E-03	4.19E-02	3.86E-02	1.52E+02	8.02E-03	-	1.52E+02	1.38E+02
Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	1.04E-02	1.48E-01	8.53E-02	3.45E-04	5.43E-03	5.00E-03	3.43E+01	2.00E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	184.6154	19	1.04E-02	1.48E-01	8.53E-02	3.45E-04	5.43E-03	5.00E-03	3.43E+01	2.00E-03	-	3.43E+01	3.11E+01
	Tractor/crawler/dozer	600 hp	184.6154	19	1.04E-02	1.48E-01	8.53E-02	3.45E-04	5.43E-03	5.00E-03	3.43E+01	2.00E-03	-	3.43E+01	3.11E+01
	Build road	Tractor/crawler/dozer	184.6154	19	1.04E-02	1.48E-01	8.53E-02	3.45E-04	5.43E-03	5.00E-03	3.43E+01	2.00E-03	-	3.43E+01	3.11E+01
	Compaction	Vibratory roller	17.28	19	4.24E-04	1.71E-03	2.06E-03	2.90E-06	9.81E-05	9.03E-05	2.24E-01	3.82E-05	-	2.25E-01	2.04E-01
	Tractor/crawler/dozer	250 hp	17.28	19	5.78E-04	8.85E-03	3.35E-03	1.61E-05	3.33E-04	3.06E-04	1.43E+00	8.75E-05	-	1.44E+00	1.30E+00
	Water truck	5000 gal	21.6	19	1.67E-04	1.19E-03	3.16E-04	2.53E-06	4.40E-05	2.33E-05	5.07E-01	1.21E-06	1.14E-06	5.07E-01	4.60E-01
	Maintenance	Grader	340	210	9.12E-03	1.44E-01	5.33E-02	2.83E-04	4.57E-03	4.21E-03	2.51E+01	1.25E-03	-	2.52E+01	2.28E+01
Fines to landfill (82,300 cy) (4/1-7/10)	Material Excavation	1 ton pickup truck	597	70	9.08E-04	1.36E-03	1.26E-02	4.02E-05	3.14E-04	1.35E-04	1.34E+01	1.33E-03	6.95E-04	1.36E+01	1.24E+01
	Front end loader	350 hp	597	70	1.82E-02	2.18E-01	1.03E-01	4.86E-04	8.12E-03	7.47E-03	4.95E+01	2.34E-03	-	4.95E+01	4.49E+01
	Front end loader	350 hp	597	70	1.82E-02	2.18E-01	1.03E-01	4.86E-04	8.12E-03	7.47E-03	4.95E+01	2.34E-03	-	4.95E+01	4.49E+01
	Water truck	3000 gal	597	70	4.60E-03	3.29E-02	8.74E-03	6.99E-05	1.22E-03	6.44E-04	1.40E+01	3.36E-05	3.16E-05	1.40E+01	1.27E+01
	Excavator	400 hp	597	70	1.19E-02	1.34E-01	1.09E-01	5.47E-04	4.48E-03	4.12E-03	5.58E+01	2.45E-03	-	5.58E+01	5.06E+01
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	2.97E-04	4.46E-04	4.12E-03	1.32E-05	1.03E-04	4.41E-05	4.39E+00	4.36E-04	2.28E-04	4.47E+00	4.05E+00
	Front end loader	350 hp	195.5	20	5.96E-03	7.12E-02	3.36E-02	1.59E-04	2.66E-03	2.45E-03	1.62E+01	7.65E-04	-	1.62E+01	1.47E+01
	Front end loader	350 hp	195.5	20	5.96E-03	7.12E-02	3.36E-02	1.59E-04	2.66E-03	2.45E-03	1.62E+01	7.65E-04	-	1.62E+01	1.47E+01
	Front end loader	350 hp	195.5	20	5.96E-03	7.12E-02	3.36E-02	1.59E-04	2.66E-03	2.45E-03	1.62E+01	7.65E-04	-	1.62E+01	1.47E+01
	Front end loader	350 hp	195.5	20	5.96E-03	7.12E-02	3.36E-02	1.59E-04	2.66E-03	2.45E-03	1.62E+01	7.65E-04	-	1.62E+01	1.47E+01
	Water truck	3000 gal	195.5	20	1.51E-03	1.08E-02	2.86E-03	2.29E-05	3.98E-04	2.11E-04	4.59E+00	1.10E-05	1.03E-05	4.47E+00	4.17E+00
	Excavator	400 hp	195.5	20	3.89E-03	4.38E-02	3.56E-02	1.79E-04	1.47E-03	1.35E-03	1.83E+01	8.01E-04	-	1.83E+01	1.66E+01
	Excavator	400 hp	195.5	20	3.89E-03	4.38E-02	3.56E-02	1.79E-04	1.47E-03	1.35E-03	1.83E+01	8.01E-04	-	1.83E+01	1.66E+01
	Excavator	400 hp	195.5	20	3.89E-03	4.38E-02	3.56E-02	1.79E-04	1.47E-03	1.35E-03	1.83E+01	8.01E-04	-	1.83E+01	1.66E+01
	Excavator	400 hp	195.5	20	3.89E-03	4.38E-02	3.56E-02	1.79E-04	1.47E-03	1.35E-03	1.83E+01	8.01E-04	-	1.83E+01	1.66E+01
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	8.89E-04	1.33E-03	1.23E-02	3.94E-05	3.07E-04	1.32E-04	1.31E+01	1.31E-03	6.81E-04	1.34E+01	1.21E+01
	Front end loader	350 hp	585	72	1.78E-02	2.13E-01	1.01E-01	4.76E-04	7.96E-03	7.32E-03	4.85E+01	2.29E-03	-	4.85E+01	4.40E+01
	Front end loader	350 hp	585	72	1.78E-02	2.13E-01	1.01E-01	4.76E-04	7.96E-03	7.32E-03	4.85E+01	2.29E-03	-	4.85E+01	4.40E+01

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 5**

Construction Start Year 2021  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2021 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	3.51E-02	4.91E-01	2.04E-01	8.05E-04	1.93E-02	1.78E-02	8.21E+01	4.77E-03	-	8.22E+01	7.45E+01
		Tractor/crawler/dozer	440 hp	90	20	4.38E-03	6.13E-02	2.55E-02	1.01E-04	2.41E-03	2.22E-03	1.03E+01	5.96E-04	-	1.03E+01	9.32E+00
		3/4 ton pickup truck		360	20	1.08E-03	1.03E-03	1.33E-02	2.42E-05	1.94E-04	8.53E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00
	Drilling	Rotary drill	475 hp	204.4666	126	5.20E-03	6.57E-02	5.35E-02	2.96E-04	2.20E-03	2.02E-03	3.02E+01	6.60E-04	-	3.02E+01	2.74E+01
		3/4 ton pickup truck		208.4666	126	6.28E-04	5.97E-04	7.70E-03	1.40E-05	1.12E-04	4.94E-05	4.68E+00	4.65E-04	2.43E-04	4.76E+00	4.32E+00
	Cut with Diamond wire	3/4 ton pickup truck		348	126	1.05E-03		1.29E-02	2.34E-05	1.87E-04	8.24E-05	7.81E+00	7.76E-04	4.05E-04	7.95E+00	7.21E+00
		Diamond cutting saw	50 hp	348	126	5.87E-03		3.68E-02	6.88E-05	1.58E-03	1.46E-03	5.32E+00	5.30E-04	-	5.33E+00	4.84E+00
	Lift/Load blocks	Crane 260'	375 hp	418.8639	126	1.22E-02		5.88E-02	2.77E-04	6.91E-03	6.36E-03	2.83E+01	1.47E-03	-	2.83E+01	2.57E+01
		3/4 ton pickup truck		418.8639	126	1.26E-03		1.55E-02	2.81E-05	2.25E-04	9.92E-05	9.40E+00	9.35E-04	4.88E-04	9.57E+00	8.68E+00
	Load/Haul	Front end loader	350 hp	66	126	2.01E-03		1.14E-02	5.37E-05	8.98E-04	8.26E-04	5.47E+00	2.58E-04	-	5.48E+00	4.97E+00
		Water truck	3000 gal	14	126	1.08E-04		2.05E-04	1.64E-06	2.85E-05	1.51E-05	3.29E-01	7.87E-07	7.41E-07	3.29E-01	2.98E-01
	Landfill	Crane 260'	375 hp	209.4319	126	6.09E-03	8.59E-02	2.94E-02	1.39E-04	3.45E-03	3.18E-03	1.41E+01	7.33E-04	-	1.41E+01	1.28E+01
		Crane 260'	375 hp	60	126	1.74E-03	2.46E-02	8.42E-03	3.97E-05	9.90E-04	9.11E-04	4.05E+00	2.10E-04	-	4.05E+00	3.68E+00
	Micro-blast	Horizontal boring drill	10 hp	55	126	1.79E-04	1.41E-03	1.16E-03	2.95E-06	8.86E-05	8.15E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
		3/4 ton pickup truck		60	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	375 hp	100	126	2.91E-03	4.10E-02	1.40E-02	6.62E-05	1.65E-03	1.52E-03	6.75E+00	3.50E-04	-	6.76E+00	6.13E+00
		Air compressor	50 hp	200	126	9.23E-03	1.17E-02	5.58E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.25E-04	7.40E-04	3.63E+00	3.29E+00
	Fracture	3/4 ton pickup truck		100	126	3.01E-04	2.86E-04	3.70E-03	6.72E-06	5.38E-05	2.37E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00
		Excavator	400 hp	540	126	1.07E-02	1.21E-01	9.84E-02	4.95E-04	4.05E-03	3.73E-03	5.04E+01	2.21E-03	-	5.05E+01	4.58E+01
		Excavator	300 hp	540	126	8.06E-03	9.08E-02	7.38E-02	3.71E-04	3.04E-03	2.80E-03	3.78E+01	1.66E-03	-	3.79E+01	3.44E+01
		Excavator	300 hp	270	126	4.03E-03	4.54E-02	3.69E-02	1.86E-04	1.52E-03	1.40E-03	1.89E+01	8.30E-04	-	1.89E+01	1.72E+01
		Tractor/crawler/dozer	440 hp	270	126	1.31E-02	1.84E-01	7.66E-02	3.02E-04	7.24E-03	6.66E-03	3.08E+01	1.79E-03	-	3.08E+01	2.79E+01
		3/4 ton pickup truck		540	126	1.63E-03	1.55E-03	2.00E-02	3.63E-05	2.90E-04	1.28E-04	1.21E+01	1.20E-03	6.29E-04	1.23E+01	1.12E+01
Road Improvement Plan	Stabilize	Grader	135 hp	30.4	20	7.72E-04	8.95E-03	8.52E-03	1.63E-05	4.99E-04	4.59E-04	1.45E+00	9.02E-05	-	1.45E+00	1.32E+00
		Tractor/crawler/dozer	250 hp	30.4	20	1.02E-03	1.56E-02	5.89E-03	2.84E-05	5.86E-04	5.39E-04	2.52E+00	1.54E-04	-	2.53E+00	2.29E+00
		Excavator	400 hp	30.4	20	6.05E-04	6.82E-03	5.54E-03	2.79E-05	2.28E-04	2.10E-04	2.84E+00	1.25E-04	-	2.84E+00	2.58E+00
		Asphalt hopper	300 hp	442.5143	20	1.04E-02	1.09E-01	7.17E-02	3.55E-04	4.00E-03	3.68E-03	3.61E+01	1.69E-03	-	3.62E+01	3.28E+01
	Asphalt Road	Line Striper	23 hp	92.576	20	2.59E-04	7.76E-04	2.00E-02	6.07E-06	4.87E-05	4.86E-05	6.11E-01	1.47E-05	5.01E-05	6.27E-01	5.69E-01
		Roller	70 hp	442.5143	20	3.74E-03	4.60E-02	4.97E-02	8.92E-05	2.81E-03	2.59E-03	7.61E+00	6.15E-04	-	7.62E+00	6.91E+00
		Vibratory roller	33 hp	442.5143	20	7.16E-03	2.89E-02	3.48E-02	4.90E-05	1.66E-03	1.53E-03	3.79E+00	6.46E-04	-	3.80E+00	3.45E+00
		Flatbed truck		92.576	20	4.02E-04	4.61E-04	5.53E-03	6.16E-06	4.81E-05	2.03E-05	2.08E+00	4.70E-04	2.18E-04	2.16E+00	1.96E+00
		3/4 ton pickup truck		92.576	20	2.79E-04	2.65E-04	3.42E-03	6.22E-06	4.98E-05	2.19E-05	2.08E+00	2.07E-04	1.08E-04	2.12E+00	1.92E+00
		<b>Total</b>					<b>4.73E-01</b>	<b>4.89E+00</b>	<b>4.02E+00</b>	<b>1.26E-02</b>	<b>2.08E-01</b>	<b>1.87E-01</b>	<b>1.37E+03</b>	<b>7.11E-02</b>	<b>7.27E-03</b>	<b>1.37E+03</b>

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt2\_EnvrAirQualityReport.pdf

Daily Onsite  
 Rindge  
 Surftrider  
 Topanga  
 Zuma  
 Landfill

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	210	5.50E-03	5.23E-03	6.76E-02	1.23E-04	9.83E-04	4.33E-04
Dust Control	Water truck	5000 gal	2320	210	3.41E-01	2.43E+00	6.47E-01	5.18E-03	9.00E-02	4.76E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	7.05E-02	6.70E-02	8.65E-01	1.57E-03	1.26E-02	5.55E-03
	Fish relocation	3/4 ton pickup truck	16	19	9.17E-04	8.72E-04	1.13E-02	2.05E-05	1.64E-04	7.22E-05
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.27E-04	1.91E-04	1.76E-03	5.65E-06	4.40E-05	1.89E-05
	Tractor/crawler/dozer	250 hp	7.3333	19	4.67E-03	7.15E-02	2.71E-02	1.30E-04	2.69E-03	2.48E-03
	Chain saw		7.3335	19	9.43E-03	1.48E-04	1.71E-02	1.90E-06	2.68E-05	2.68E-05
	Brush Piling	Front end loader	540 hp	3.696	19	3.40E-03	4.00E-02	2.55E-02	1.24E-04	1.55E-03
	Tractor/crawler/dozer	310 hp	3.696	19	2.41E-03	3.38E-02	1.41E-02	5.55E-05	1.33E-03	1.22E-03
	Chipping	Brush chipper	250 hp	3.696	19	2.86E-03	2.36E-02	1.45E-02	8.80E-05	7.36E-04
	Front end loader	540 hp	3.696	19	3.40E-03	4.00E-02	2.55E-02	1.24E-04	1.55E-03	1.43E-03
Landscaping	Rock from Landfill	Loader/backhoe	75 hp	24	20	3.41E-03	4.17E-02	4.84E-02	8.66E-05	2.46E-03
	Front end loader	350 hp	20	20	1.16E-02	1.39E-01	6.55E-02	3.10E-04	5.18E-03	4.77E-03
	Dump truck	20cy/24 ton	20	20	2.94E-03	2.10E-02	5.58E-03	4.46E-05	7.75E-04	4.11E-04
	Dump truck	20cy/24 ton	20	20	2.94E-03	2.10E-02	5.58E-03	4.46E-05	7.75E-04	4.11E-04
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	9.18E-04	1.40E-02	5.32E-03	2.56E-05	5.28E-04
	Front end loader	49 hp	4	19	8.19E-04	5.97E-03	7.45E-03	1.23E-05	1.33E-04	1.23E-04
	Roller	47 hp	4	19	1.76E-03	7.08E-03	8.55E-03	1.20E-05	4.07E-04	3.74E-04
	Water truck	3000 gal	4	19	5.87E-04	4.19E-03	1.12E-03	8.93E-06	1.55E-04	8.21E-05
	Excavator	300 hp	4	19	1.14E-03	1.28E-02	1.04E-02	5.24E-05	4.29E-04	3.95E-04
	Front end loader	180 hp	4	19	1.20E-03	1.64E-02	8.57E-03	4.59E-05	5.47E-04	5.03E-04
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	2.75E-03	4.21E-02	1.60E-02	7.68E-05	1.59E-03
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	3.48E-03	2.25E-03	1.32E-01	5.39E-06	1.78E-03
	36" Diversion Pipe	Crane 80"	130 hp	27.3333	19	8.85E-03	1.10E-01	9.18E-02	1.75E-04	5.86E-03
	Loader/backhoe	75 hp	0.0923	19	1.31E-05	1.60E-04	1.86E-04	3.33E-07	9.46E-06	8.70E-06
	Crane 94'	155 hp	155	19	5.99E-02	7.43E-01	6.21E-01	1.18E-03	3.96E-02	3.65E-02
	1 ton pickup truck		155	19	4.49E-03	6.73E-03	6.22E-02	1.99E-04	1.55E-03	6.66E-04
	Crane 94'	155 hp	155	20	5.99E-02	7.43E-01	6.21E-01	1.18E-03	3.96E-02	3.65E-02
	1 ton pickup truck		155	20	4.49E-03	6.73E-03	6.22E-02	1.99E-04	1.55E-03	6.66E-04
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	9.18E-04	1.40E-02	5.32E-03	2.56E-05	5.28E-04
	Dewatering	Concrete saw	13 hp	8	23	6.70E-03	4.95E-03	2.57E-01	1.25E-05	3.68E-03
	Crane 80"	130 hp	16	23	5.18E-03	6.43E-02	5.37E-02	1.02E-04	3.43E-03	3.16E-03
	Flatbed truck		8	23	6.61E-04	7.59E-04	9.11E-03	1.01E-05	7.91E-05	3.35E-05
	Generator	80 hp	5856	244	1.69E+00	1.48E+01	1.72E+01	3.40E-02	7.98E-01	7.35E-01
Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.97E-01	2.82E+00	1.62E+00	6.57E-03	1.04E-01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.97E-01	2.82E+00	1.62E+00	6.57E-03	1.04E-01
	Tractor/crawler/dozer	600 hp	184.6154	19	1.97E-01	2.82E+00	1.62E+00	6.57E-03	1.04E-01	9.52E-02
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.97E-01	2.82E+00	1.62E+00	6.57E-03	1.04E-01
	Compaction	Vibratory roller	50 hp	17.28	19	8.07E-03	3.25E-02	3.93E-02	5.52E-05	1.87E-03
	Tractor/crawler/dozer	250 hp	17.28	19	1.10E-02	1.69E-01	6.38E-02	3.07E-04	6.34E-03	5.83E-03
	Water truck	5000 gal	21.6	19	3.17E-03	2.26E-02	6.02E-03	4.82E-05	8.37E-04	4.44E-04
	Maintenance	Grader	215 hp	340	210	1.74E-01	2.75E+00	1.01E+00	5.39E-03	8.71E-02
Fines to landfill (82,300 cy) (4/1-7/10)	Material Excavation	1 ton pickup truck	597	70	1.73E-02	2.59E-02	2.39E-01	7.66E-04	5.97E-03	2.56E-03
	Front end loader	350 hp	597	70	3.47E-01	4.14E+00	1.96E+00	9.25E-03	1.55E-01	1.42E-01
	Front end loader	350 hp	597	70	3.47E-01	4.14E+00	1.96E+00	9.25E-03	1.55E-01	1.42E-01
	Water truck	3000 gal	597	70	8.77E-02	6.26E-01	1.66E-01	1.33E-03	2.31E-02	1.23E-02
	Excavator	400 hp	597	70	2.26E-01	2.55E+00	2.07E+00	1.04E-02	8.53E-02	7.85E-02
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	5.66E-03	8.49E-03	7.84E-02	2.51E-04	1.96E-03	8.40E-04
	Front end loader	350 hp	195.5	20	1.14E-01	1.36E+00	6.41E-01	3.03E-03	5.06E-02	4.66E-02
	Front end loader	350 hp	195.5	20	1.14E-01	1.36E+00	6.41E-01	3.03E-03	5.06E-02	4.66E-02
	Front end loader	350 hp	195.5	20	1.14E-01	1.36E+00	6.41E-01	3.03E-03	5.06E-02	4.66E-02
	Front end loader	350 hp	195.5	20	1.14E-01	1.36E+00	6.41E-01	3.03E-03	5.06E-02	4.66E-02
	Water truck	3000 gal	195.5	20	2.87E-02	2.05E-01	5.45E-02	4.36E-04	7.58E-03	4.01E-03
	Excavator	400 hp	195.5	20	7.41E-02	8.35E-01	6.79E-01	3.41E-03	2.79E-02	2.57E-02
	Excavator	400 hp	195.5	20	7.41E-02	8.35E-01	6.79E-01	3.41E-03	2.79E-02	2.57E-02
	Excavator	400 hp	195.5	20	7.41E-02	8.35E-01	6.79E-01	3.41E-03	2.79E-02	2.57E-02
	Excavator	400 hp	195.5	20	7.41E-02	8.35E-01	6.79E-01	3.41E-03	2.79E-02	2.57E-02
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	1.69E-02	2.54E-02	2.35E-01	7.51E-04	5.85E-03	2.51E-03
	Front end loader	350 hp	585	72	3.40E-01	4.06E+00	1.92E+00	9.06E-03	1.52E-01	1.39E-01
	Front end loader	350 hp	585	72	3.40E-01	4.06E+00	1.92E+00	9.06E-03	1.52E-01	1.39E-01
	Water truck	3000 gal	585	72	8.59E-02	6.13E-01	1.63E-01	1.31E-03	2.27E-02	1.20E-02
	Excavator	400 hp	585	72	2.22E-01	2.50E+00	2.03E+00	1.02E-02	8.36E-02	7.69E-02

Conversions

- 2000 pounds per ton
- 453.6 grams per pound
- 2 peak day scaling factor
- 0.9072 metric tons per short ton

Legend

- Data from OFFROAD2011 (g/hp-hr)
- Data from OFFROAD2007 (g/hp-hr)
- Data from EMFAC2011 (g/hr)
- Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL)
Gasoline	0.994	0.992	0.998	117 (VEHICLE)

Federal Holidays

- New Year's Day 1/1/2021
- Birthday of Martin Luther King, Jr. 1/18/2021
- Washington's Birthday 2/15/2021
- Memorial Day 5/31/2021
- Independence Day 7/5/2021
- Labor Day 9/6/2021
- Columbus Day 10/11/2021
- Veterans Day 11/11/2021
- Thanksgiving Day 11/25/2021
- Christmas Day 12/24/2021

10

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	6.68E-01	9.34E+00	3.89E+00	1.53E-02	3.68E-01	3.38E-01	
		Tractor/crawler/dozer	440 hp	90	20	8.35E-02	1.17E+00	4.86E-01	1.92E-03	4.60E-02	4.23E-02	
		3/4 ton pickup truck		360	20	2.06E-02	1.96E-02	2.53E-01	4.61E-04	3.69E-03	1.62E-03	
	Drilling	Rotary drill	475 hp	204.4666	126	9.91E-02	1.25E+00	1.02E+00	5.65E-03	4.19E-02	3.85E-02	
		3/4 ton pickup truck		208.4666	126	1.20E-02	1.14E-02	1.47E-01	2.67E-04	2.14E-03	9.41E-04	
	Cut with Diamond wire	3/4 ton pickup truck		348	126	2.00E-02	-	2.45E-01	4.45E-04	3.56E-03	1.57E-03	
		Diamond cutting saw	50 hp	348	126	1.12E-01	-	7.00E-01	1.31E-03	3.01E-02	2.77E-02	
	Lift/Load blocks	Crane 260'	375 hp	418.8639	126	2.32E-01	-	1.12E+00	5.28E-03	1.32E-01	1.21E-01	
		3/4 ton pickup truck		418.8639	126	2.40E-02	-	2.95E-01	5.36E-04	4.29E-03	1.89E-03	
	Load/Haul	Front end loader	350 hp	66	126	3.83E-02	-	2.16E-01	1.02E-03	1.71E-02	1.57E-02	
		Water truck	3000 gal	14	126	2.06E-03	-	3.90E-03	3.12E-05	5.43E-04	2.87E-04	
	Landfill	Crane 260'	375 hp	209.4319	126	1.16E-01	1.64E+00	5.60E-01	2.64E-03	6.58E-02	6.05E-02	
		Crane 260'	375 hp	60	126	3.32E-02	4.69E-01	1.60E-01	7.57E-04	1.89E-02	1.73E-02	
	Micro-blast	Horizontal boring drill	10 hp	55	126	3.41E-03	2.69E-02	2.20E-02	5.62E-05	1.69E-03	1.55E-03	
		3/4 ton pickup truck		60	126	3.44E-03	3.27E-03	4.22E-02	7.68E-05	6.15E-04	2.71E-04	
	Demolish spillway	Crane 260'	375 hp	100	126	5.54E-02	7.81E-01	2.67E-01	1.26E-03	3.14E-02	2.89E-02	
		Air compressor	50 hp	200	126	1.76E-01	2.22E-01	1.06E+01	7.84E-04	4.94E-03	4.93E-03	
	Fracture	3/4 ton pickup truck		100	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04	
		Excavator	400 hp	540	126	2.05E-01	2.31E+00	1.88E+00	9.43E-03	7.72E-02	7.10E-02	
		Excavator	300 hp	540	126	1.53E-01	1.73E+00	1.41E+00	7.07E-03	5.79E-02	5.33E-02	
		Excavator	300 hp	270	126	7.67E-02	8.65E-01	7.03E-01	3.54E-03	2.89E-02	2.66E-02	
		Tractor/crawler/dozer	440 hp	270	126	2.50E-01	3.50E+00	1.46E+00	5.75E-03	1.38E-01	1.27E-01	
		3/4 ton pickup truck		540	126	3.10E-02	2.94E-02	3.80E-01	6.91E-04	5.53E-03	2.44E-03	
Road Improvement Plan	Stabilize	Grader	135 hp	30.4	20	1.47E-02	1.70E-01	1.62E-01	3.11E-04	9.51E-03	8.75E-03	
		Tractor/crawler/dozer	250 hp	30.4	20	1.94E-02	2.97E-01	1.12E-01	5.41E-04	1.12E-02	1.03E-02	
		Excavator	400 hp	30.4	20	1.15E-02	1.30E-01	1.06E-01	5.31E-04	4.35E-03	4.00E-03	
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	1.98E-01	2.08E+00	1.37E+00	6.75E-03	7.63E-02	7.02E-02	
		Line Striper	23 hp	92.576	20	4.93E-03	1.48E-02	3.81E-01	1.16E-04	9.27E-04	9.25E-04	
		Roller	70 hp	442.5143	20	7.13E-02	8.76E-01	9.47E-01	1.70E-03	5.35E-02	4.93E-02	
		Vibratory roller	33 hp	442.5143	20	1.36E-01	5.50E-01	6.64E-01	9.33E-04	3.16E-02	2.91E-02	
		Flatbed truck		92.576	20	7.65E-03	8.78E-03	1.05E-01	1.17E-04	9.15E-04	3.87E-04	
		3/4 ton pickup truck		92.576	20	5.31E-03	5.05E-03	6.52E-02	1.18E-04	9.48E-04	4.18E-04	
		<b>Total</b>					<b>9.01E+00</b>	<b>9.31E+01</b>	<b>7.65E+01</b>	<b>2.41E-01</b>	<b>3.96E+00</b>	<b>3.56E+00</b>
		Daily Onsite										
		Rindge					9	91	76	0	4	4
Surfrider					0	0	0	0	0	0		
Topanga					0	0	0	0	0	0		
Zuma					0	0	0	0	0	0		
Landfill					0	2	1	0	0	0		

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt2\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Emission Factors - 2016 (g/hp-hr or g/hr)							Emission Factors - 2017 (g/hp-hr or g/hr)												
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
				Construction Survey	3/4 ton pickup truck		48	11.1	36.9	52	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281
Dust Control	Water truck	5000 gal	2320	535.4	1,784.6	52	210	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048		
Environmental protection measures	3/4 ton Pickup truck		1213	0.0	1,213.0	0	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056		
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck		0.4591	0.5	0.0	52	210	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056	
		Tractor/crawler/dozer	250 hp	0.7652	0.8	0.0	52	0	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000	
		Chain saw		0.7652	0.8	0.0	52	0	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000	
		Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000	
		Brush chipper	250 hp	0.3857	0.4	0.0	52	0	0.205	2.269	0.800	0.005	0.068	0.063	403.250	0.018	0.000	0.190	2.015	0.785	0.005	0.061	0.056	403.250	0.017	0.000	
	Gravel	Front end loader	540 hp	0.3857	0.4	0.0	52	0	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000	
		Vibratory roller	85 hp	16	16.0	0.0	52	0	0.195	2.178	1.500	0.003	0.160	0.148	222.777	0.027	0.000	0.180	2.030	1.489	0.003	0.147	0.135	222.777	0.025	0.000	
		Tractor/crawler/dozer	310 hp	3,7481	3.7	0.0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000	
	Guard Railing	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000	
		Asphalt distributor	3000 gal	0.8106	0.8	0.0	52	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048	
		Flatbed truck		8.75	8.8	0.0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135	
		Auger drill	10 hp	8.75	8.8	0.0	52	0	3.341	2.469	132.341	0.006	1.896	1.892	226.175	0.190	0.196	3.339	2.468	132.332	0.006	1.896	1.892	226.176	0.190	0.196	
		Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	0.164	1.895	1.307	0.002	0.146	0.134	195.356	0.018	0.000	0.152	1.772	1.300	0.002	0.133	0.123	195.356	0.016	0.000	
		Flatbed truck		4	4.0	0.0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135	
Clear & Grub - Sediment Removal		Clear Brush	1 ton pickup truck		0.3026	0.0	0.3	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
			Excavator	94 hp	0.3026	0.0	0.3	0	42	0.150	1.798	1.915	0.003	0.131	0.121	278.045	0.028	0.000	0.139	1.673	1.904	0.003	0.118	0.109	278.045	0.026	0.000
			Front end loader	210 hp	0.3026	0.0	0.3	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000
		Dump truck	10cy		0.3026	0.0	0.3	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	10cy			0.3026	0.0	0.3	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048	
	Brush chipper		275 hp	0.3026	0.0	0.3	0	42	0.105	1.115	0.439	0.002	0.035	0.033	224.028	0.009	0.000	0.098	0.993	0.427	0.002	0.032	0.029	224.028	0.009	0.000	
	Cutting	Front end loader	210 hp	0.1392	0.0	0.1	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000	
		1 ton pickup truck		8.625	0.0	8.6	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056	
		Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	0	42	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000	
	Brush Piling	Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	0	42	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000	
		Chain saw		0.2875	0.0	0.3	0	42	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
		Front end loader	540 hp	0.1449	0.0	0.1	0	42	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000	
		Tractor/crawler/dozer	310 hp	0.1449	0.0	0.1	0	42	0.141	2.264	0.716	0.002	0.088	0.081	234.962	0.018	0.000	0.136	2.157	0.683	0.002	0.083	0.077	234.962	0.017	0.000	
		Brush chipper	250 hp	0.1449	0.0	0.1	0	42	0.205	2.269	0.800	0.005	0.068	0.063	403.250	0.018	0.000	0.190	2.015	0.785	0.005	0.061	0.056	403.250	0.017	0.000	
		Front end loader	540 hp	0.1449	0.0	0.1	0	42	0.111	1.509	0.692	0.003	0.059	0.055	293.384	0.018	0.000	0.110	1.465	0.669	0.003	0.058	0.053	293.384	0.017	0.000	
Clear & Grub - Access Rd		Clear Brush	1 ton pickup truck		5.1316	0.0	5.1	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
			Excavator	94 hp	5.1316	0.0	5.1	0	42	0.150	1.798	1.915	0.003	0.131	0.121	278.045	0.028	0.000	0.139	1.673	1.904	0.003	0.118	0.109	278.045	0.026	0.000
			Front end loader	210 hp	5.1316	0.0	5.1	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000
		Dump truck	10cy		5.1316	0.0	5.1	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	10cy			5.1316	0.0	5.1	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048	
	Brush chipper		275 hp	5.1316	0.0	5.1	0	42	0.105	1.115	0.439	0.002	0.035	0.033	224.028	0.009	0.000	0.098	0.993	0.427	0.002	0.032	0.029	224.028	0.009	0.000	
	Cutting	Front end loader	210 hp	2.3595	0.0	2.4	0	42	0.118	1.851	0.609	0.003	0.063	0.058	270.061	0.017	0.000	0.111	1.720	0.596	0.003	0.059	0.054	270.061	0.016	0.000	
		1 ton pickup truck		2.925	0.0	2.9	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056	
		Tractor/crawler/dozer	250 hp	4.8751	0.0	4.9	0	42	0.159	2.593	0.807	0.003	0.100	0.092	301.158	0.024	0.000	0.152	2.470	0.781	0.003	0.094	0.087	301.158	0.023	0.000	
	Brush Piling	Tractor/crawler/dozer	250 hp	4.875	0.0	4.9	0</																				

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Emission Factors - 2016 (g/hp-hr or g/hr )									Emission Factors - 2017 (g/hp-hr or g/hr )									
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
				Excavation/Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	0.0	6.8	0	41	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402
		Excavator	430 hp	4.445	0.0	4.4	0	41	0.067	1.075	0.440	0.002	0.035	0.032	211.854	0.012	0.000	0.063	0.957	0.432	0.002	0.031	0.028	211.854	0.012	0.000
		Tractor/crawler/dozer	850 hp	3.2327	0.0	3.2	0	41	0.171	3.216	1.011	0.003	0.095	0.087	298.249	0.024	0.000	0.172	3.230	0.960	0.003	0.096	0.088	298.249	0.023	0.000
	Drilling	Rotary drill	475 hp	7.3333	0.0	7.3	0	41	0.071	1.261	0.499	0.003	0.039	0.036	282.166	0.008	0.000	0.069	1.190	0.500	0.003	0.036	0.033	282.166	0.008	0.000
		3/4 ton Pickup truck		7.3333	0.0	7.3	0	41	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
		Cut with Diamond wire	3/4 ton Pickup truck	48	0.0	48.0	0	41	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
		Diamond cutting saw	50 hp	48	0.0	48.0	0	41	0.571	2.295	2.169	0.004	0.158	0.145	277.562	0.052	0.000	0.506	2.214	2.108	0.004	0.141	0.130	277.562	0.046	0.000
		Lift/Load blocks	Crane 260'	60.0214	0.0	60.0	0	41	0.105	1.627	0.402	0.002	0.067	0.062	163.241	0.011	0.000	0.098	1.507	0.385	0.002	0.061	0.056	163.241	0.010	0.000
		3/4 ton Pickup truck		60.0214	0.0	60.0	0	41	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
		Landfill	Crane 260'	30.0107	0.0	30.0	0	41	0.105	1.627	0.402	0.002	0.067	0.062	163.241	0.011	0.000	0.098	1.507	0.385	0.002	0.061	0.056	163.241	0.010	0.000
		FloodWall	Crane 50'	1240	0.0	1,240.0	0	190	0.105	1.627	0.402	0.002	0.067	0.062	163.241	0.011	0.000	0.098	1.507	0.385	0.002	0.061	0.056	163.241	0.010	0.000
		Pile hammer driver	325 hp	1240	0.0	1,240.0	0	190	0.071	1.261	0.499	0.003	0.039	0.036	282.166	0.008	0.000	0.069	1.190	0.500	0.003	0.036	0.033	282.166	0.008	0.000
		Generator	7.5 hp	636.7029	0.0	636.7	0	190	2.138	1.453	103.697	0.005	0.092	0.092	175.214	0.122	0.147	2.040	1.414	103.256	0.005	0.092	0.092	175.214	0.116	0.145
		Concrete pump		394.214	0.0	394.2	0	190	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill  
Floodwall

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Annual Emissions - 2016 (tons per year)											Metric Tons CO2e/yr	Annual Emissions - 2017 (tons per year)											Metric Tons CO2e/yr		
				2016	2017	2016	2017	GWP												2016	2017	GWP											
				1	21	1	21	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	1		21	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	11.1	36.9	52	210	6.15E-05	4.76E-05	7.35E-04	7.49E-07	6.26E-06	2.91E-06	2.49E-01	2.47E-05	1.29E-05	2.53E-01	2.30E-01	1.85E-04	1.47E-04	2.21E-03	2.49E-06	2.07E-05	9.47E-06	8.29E-01	8.24E-05	4.30E-05	8.44E-01	7.65E-01				
Dust Control	Water truck	5000 gal	2320	535.4	1,784.6	52	210	4.57E-03	7.40E-02	8.21E-03	6.36E-05	1.63E-03	1.08E-03	1.27E+01	3.01E-05	2.83E-05	1.27E+01	1.15E+01	1.37E-02	2.25E-01	2.51E-02	2.12E-04	4.72E-03	2.93E-03	4.23E+01	1.00E-04	9.44E-05	4.24E+01	3.84E+01				
Environmental protection measures	3/4 ton Pickup truck		1213	0.0	1,213.0	0	210	-	-	-	-	-	-	-	-	-	-	-	6.06E-03	4.82E-03	7.27E-02	8.19E-05	6.78E-04	3.11E-04	2.72E+01	2.71E-03	1.41E-03	2.77E+01	2.51E+01				
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	210	1.81E-06	1.79E-06	2.43E-05	3.11E-08	2.55E-07	1.16E-07	1.03E-02	1.02E-06	5.34E-07	1.05E-02	9.52E-03	-	-	-	-	-	-	-	-	-	-	-	-			
	Tractor/crawler/dozer	250 hp	0.7652	0.8	0.0	52	0	3.35E-05	5.47E-04	1.70E-04	7.15E-07	2.11E-05	1.94E-05	6.35E-02	5.16E-06	-	6.36E-02	5.77E-02	-	-	-	-	-	-	-	-	-	-	-	-			
		Chain saw		0.7652	0.8	0.0	52	0	5.17E-05	8.09E-07	9.34E-05	1.04E-08	1.47E-07	1.47E-07	2.53E-04	3.21E-06	2.77E-07	4.06E-04	3.68E-04	-	-	-	-	-	-	-	-	-	-	-	-		
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	2.56E-05	3.47E-04	1.59E-04	6.77E-07	1.36E-05	1.25E-05	6.74E-02	4.11E-06	-	6.74E-02	6.12E-02	-	-	-	-	-	-	-	-	-	-	-	-		
		Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	1.86E-05	2.98E-04	9.44E-05	3.04E-07	1.16E-05	1.06E-05	3.10E-02	2.35E-06	-	3.10E-02	2.81E-02	-	-	-	-	-	-	-	-	-	-	-			
	Chipping	Brush chipper	250 hp	0.3857	0.4	0.0	52	0	2.17E-05	2.41E-04	8.51E-05	4.82E-07	7.26E-06	6.68E-06	4.29E-02	1.96E-06	-	4.29E-02	3.89E-02	-	-	-	-	-	-	-	-	-	-	-	-		
		Front end loader	540 hp	0.3857	0.4	0.0	52	0	2.56E-05	3.47E-04	1.59E-04	6.77E-07	1.36E-05	1.25E-05	6.74E-02	4.11E-06	-	6.74E-02	6.12E-02	-	-	-	-	-	-	-	-	-	-	-	-		
	Gravel	Vibratory roller	85 hp	16	16.0	0.0	52	0	2.92E-04	3.27E-03	2.25E-03	3.82E-06	2.40E-04	2.21E-04	3.34E-01	4.06E-05	-	3.35E-01	3.04E-01	-	-	-	-	-	-	-	-	-	-	-	-		
		Tractor/crawler/dozer	310 hp	3,7481	3.7	0.0	52	0	1.81E-04	2.90E-03	9.17E-04	2.95E-06	1.12E-04	1.03E-04	3.01E-01	2.29E-05	-	3.01E-01	2.73E-01	-	-	-	-	-	-	-	-	-	-	-	-		
	Asphalt distributor	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	5.58E-05	8.95E-04	2.83E-04	9.11E-07	3.47E-05	3.19E-05	9.29E-02	7.05E-06	-	9.30E-02	8.44E-02	-	-	-	-	-	-	-	-	-	-	-	-		
		Asphalt distributor	3000 gal	0.8106	0.8	0.0	52	0	6.92E-06	1.12E-04	1.24E-05	9.62E-08	1.47E-06	1.63E-06	1.93E-02	4.56E-08	4.29E-08	1.93E-02	1.75E-02	-	-	-	-	-	-	-	-	-	-	-	-		
	Guard Railing	Flatbed truck		8.75	8.8	0.0	52	0	8.91E-05	8.72E-05	1.26E-03	5.89E-07	4.81E-06	2.16E-06	1.96E-01	4.44E-05	2.06E-05	2.04E-01	1.85E-01	-	-	-	-	-	-	-	-	-	-	-	-		
		Auger drill	10 hp	8.75	8.8	0.0	52	0	3.22E-04	2.38E-04	1.28E-02	6.22E-07	1.83E-04	1.83E-04	2.18E-02	1.84E-05	1.89E-05	2.81E-02	2.55E-02	-	-	-	-	-	-	-	-	-	-	-	-		
	Demo Existing Gate	Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	5.69E-05	6.58E-04	4.54E-04	7.96E-07	5.07E-05	4.66E-05	6.78E-02	6.20E-06	-	6.80E-02	6.17E-02	-	-	-	-	-	-	-	-	-	-	-	-		
		Flatbed truck		4	4.0	0.0	52	0	4.07E-05	3.99E-05	5.76E-04	2.69E-07	2.20E-06	9.87E-07	8.98E-02	2.03E-05	9.41E-06	9.31E-02	8.45E-02	-	-	-	-	-	-	-	-	-	-	-	-		
	Clear & Grub - Sediment Removal	Clear Brush	1 ton pickup truck	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	9.93E-07	1.06E-06	1.33E-05	2.05E-08	1.66E-07	7.45E-08	6.79E-03	6.75E-07	3.52E-07	6.91E-03	6.27E-03			
		Excavator	94 hp	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	-	4.35E-06	5.24E-05	5.97E-05	1.02E-07	3.72E-06	3.42E-06	8.72E-03	8.12E-07	-	8.73E-03	7.92E-03		
			Front end loader	210 hp	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	7.81E-06	1.20E-04	4.18E-05	2.13E-07	4.10E-06	3.78E-06	1.89E-02	1.15E-06	-	1.89E-02	1.72E-02		
Dump truck		10cy	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	-	2.33E-06	3.82E-05	4.25E-06	3.59E-08	8.01E-07	4.97E-07	7.18E-03	1.70E-08	1.60E-08	7.18E-03	6.52E-03			
		10cy	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	-	2.33E-06	3.82E-05	4.25E-06	3.59E-08	8.01E-07	4.97E-07	7.18E-03	1.70E-08	1.60E-08	7.18E-03	6.52E-03			
Brush chipper		275 hp	0.3026	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	-	9.01E-06	9.11E-05	3.92E-05	2.02E-07	2.93E-06	2.69E-06	2.05E-02	8.13E-07	-	2.06E-02	1.87E-02			
		Front end loader	210 hp	0.1392	0.0	0.1	0	42	-	-	-	-	-	-	-	-	-	-	-	3.59E-06	5.54E-05	1.92E-05	9.79E-08	1.89E-06	1.74E-06	8.70E-03	5.27E-07	-	8.71E-03	7.90E-03			
Cutting		1 ton pickup truck		8.625	0.0	8.6	0	42	-	-	-	-	-	-	-	-	-	-	-	2.83E-05	3.01E-05	3.80E-04	5.85E-07	4.73E-06	2.12E-06	1.94E-01	1.92E-05	1.00E-05	1.97E-01	1.79E-01			
		Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	1.21E-05	1.96E-04	6.19E-05	2.68E-07	7.47E-06	6.87E-06	2.39E-02	1.83E-06	-	2.39E-02	2.17E-02			
Tractor/crawler/dozer		250 hp	0.2875	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	-	1.21E-05	1.96E-04	6.19E-05	2.68E-07	7.47E-06	6.87E-06	2.39E-02	1.83E-06	-	2.39E-02	2.17E-02			
		Chain saw		0.2875	0.0	0.3	0	42	-	-	-	-	-	-	-	-	-	-	-	1.94E-05	3.04E-07	3.51E-05	3.91E-09	5.52E-08	5.51E-08	9.49E-05	1.21E-06	1.04E-07	1.53E-04	1.38E-04			
Brush Piling		Front end loader	540 hp	0.1449	0.0	0.1	0	42	-	-	-	-	-	-	-	-	-	-	-	9.47E-06	1.26E-04	5.77E-05	2.54E-07	4.99E-06	4.59E-06	2.53E-02	1.47E-06	-	2.53E-02	2.30E-02			
		Tractor/crawler/dozer	310 hp	0.1449	0.0	0.1	0	42	-	-	-	-	-	-	-	-	-	-	-	6.75E-06	1.07E-04	3.38E-05	1.14E-07	4.13E-06	3.80E-06	1.16E-02	8.38E-07	-	1.17E-02	1.06E-02			
Chipping		Brush chipper	250 hp	0.1449	0.0	0.1	0	42	-	-	-	-	-	-	-	-	-	-	-	7.59E-06	8.05E-05	3.14E-05	1.81E-07	2.44E-06	2.24E-06	1.61E-02	6.85E-07	-	1.61E-02	1.46E-02			
		Front end loader	540 hp	0.1449	0.0	0.1	0	42	-	-	-	-	-	-	-	-	-	-	-	9.47E-06	1.26E-04	5.77E-05	2.54E-07	4.99E-06	4.59E-06	2.53E-02	1.47E-06	-	2.53E-02	2.30E-02			
Clear & Grub - Access Rd		Clear Brush	1 ton pickup truck	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	1.68E-05	1.79E-05	2.26E-04	3.48E-07	2.81E-06	1.26E-06	1.15E-01	1.14E-05	5.97E-06	1.17E-01	1.06E-01			
		Excavator	94 hp	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	-	7.38E-05	8.89E-04	1.01E-03	1.73E-06	6.30E-05	5.80E-05	1.48E-01	1.38E-05	-	1.48E-01	1.34E-01		
			Front end loader	210 hp	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	1.32E-04	2.04E-03	7.09E-04	3.61E-06	6.96E-05	6.40E-05	3.21E-01	1.94E-05	-	3.21E-01	2.91E-01		
	Dump truck	10cy	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	-	3.95E-05	6.47E-04	7.21E-05	6.08E-07	1.36E-05	8.42E-06	1.22E-01	2.88E-07	2.72E-07	1.22E-01	1.11E-01			
		10cy	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	-	3.95E-05	6.47E-04	7.21E-05	6.08E-07	1.36E-05	8.42E-06	1.22E-01	2.88E-07	2.72E-07	1.22E-01	1.11E-01			
	Brush chipper	275 hp	5.1316	0.0	5.1	0	42	-	-	-	-	-	-	-	-	-	-	-	-	1.53E-04	1.54E-03	6.64E-04	3.42E-06	4.96E-05	4.57E-05	3.48E-01	1.38E-05	-	3.48E-01	3.16E-01			
		Front end loader	210 hp	2.3595	0.0	2.4	0																										







Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Peak Daily Emissions - 2016 (pounds per day)						Peak Daily Emissions - 2017 (pounds per day)							
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5		
				Excavation/Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	0.0	6.8	0	41	-	-	-	-	-	-	-	5.09E-03	8.34E-02
		Excavator	430 hp	4.445	0.0	4.4	0	41	-	-	-	-	-	-	-	1.30E-02	1.97E-01	8.87E-02	4.27E-04	6.36E-03	5.86E-03
		Tractor/crawler/dozer	850 hp	3.2327	0.0	3.2	0	41	-	-	-	-	-	-	-	5.09E-02	9.54E-01	2.84E-01	8.86E-04	2.83E-02	2.60E-02
	Drilling	Rotary drill	475 hp	7.3333	0.0	7.3	0	41	-	-	-	-	-	-	-	2.58E-02	4.46E-01	1.87E-01	1.04E-03	1.36E-02	1.25E-02
		3/4 ton Pickup truck		7.3333	0.0	7.3	0	41	-	-	-	-	-	-	-	3.58E-03	2.84E-03	4.29E-02	4.83E-05	4.00E-04	1.84E-04
	Cut with Diamond wire	3/4 ton Pickup truck		48	0.0	48.0	0	41	-	-	-	-	-	-	-	2.34E-02	1.86E-02	2.81E-01	3.16E-04	2.62E-03	1.20E-03
		Diamond cutting saw	50 hp	48	0.0	48.0	0	41	-	-	-	-	-	-	-	1.31E-01	5.71E-01	5.44E-01	9.26E-04	3.65E-02	3.36E-02
	Lift/Load blocks	Crane 260'	375 hp	60.0214	0.0	60.0	0	41	-	-	-	-	-	-	-	2.36E-01	3.65E+00	9.31E-01	3.88E-03	1.48E-01	1.36E-01
		3/4 ton Pickup truck		60.0214	0.0	60.0	0	41	-	-	-	-	-	-	-	2.93E-02	2.33E-02	3.51E-01	3.96E-04	3.28E-03	1.50E-03
	Landfill	Crane 260'	375 hp	30.0107	0.0	30.0	0	41	-	-	-	-	-	-	-	1.18E-01	1.82E+00	4.65E-01	1.94E-03	7.41E-02	6.81E-02
		Crane 50'	263 hp	1240	0.0	1,240.0	0	190	-	-	-	-	-	-	-	7.39E-01	1.14E+01	2.91E+00	1.21E-02	4.63E-01	4.26E-01
	FloodWall	Pile hammer driver	325 hp	1240	0.0	1,240.0	0	190	-	-	-	-	-	-	-	6.44E-01	1.11E+01	4.67E+00	2.59E-02	3.40E-01	3.13E-01
		Generator	7.5 hp	636.7029	0.0	636.7	0	190	-	-	-	-	-	-	-	2.26E-01	1.57E-01	1.14E+01	5.54E-04	1.02E-02	1.02E-02
		Concrete pump		394.214	0.0	394.2	0	190	-	-	-	-	-	-	-	6.38E-02	1.05E+00	1.17E-01	9.84E-04	2.20E-02	1.36E-02
<b>Total</b>									<b>1.20E+00</b>	<b>1.89E+01</b>	<b>7.42E+00</b>	<b>2.33E-02</b>	<b>6.38E-01</b>	<b>5.54E-01</b>	<b>8.84E+00</b>	<b>1.09E+02</b>	<b>6.78E+01</b>	<b>1.64E-01</b>	<b>4.77E+00</b>	<b>4.34E+00</b>	

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
Rindge	1	19	7	0	1	1	7	84	48	0	4	4
Surfrider	0	0	0	0	0	0	0	0	0	0	0	0
Topanga	0	0	0	0	0	0	0	0	0	0	0	0
Zuma	0	0	0	0	0	0	0	0	0	0	0	0
Landfill	0	0	0	0	0	0	0	2	0	0	0	0
Floodwall	0	0	0	0	0	0	2	24	19	0	1	1

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Brush Piling	Front end loader	0.8673	19	0.088	1.092	0.634	0.003	0.043	0.039	293.384	0.015	0.000	
		Tractor/crawler/dozer	0.8673	19	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000	
	Chipping	Brush chipper	0.8673	19	0.166	1.567	0.761	0.005	0.048	0.044	403.250	0.015	0.000	
		Front end loader	0.8673	19	0.088	1.092	0.634	0.003	0.043	0.039	293.384	0.015	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
		Front end loader	49 hp	4	19	0.222	1.556	1.830	0.003	0.048	0.044	231.302	0.020	0.000
		Roller	47 hp	4	19	0.544	1.906	2.256	0.003	0.129	0.119	235.507	0.049	0.000
		Water truck	3000 gal	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Excavator	300 hp	4	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
		Front end loader	180 hp	4	19	0.093	1.355	0.579	0.003	0.045	0.042	270.061	0.015	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
		Loader/backhoe	75 hp	0.0923	19	0.112	1.361	1.289	0.002	0.091	0.084	195.356	0.014	0.000
		Crane 94'	155 hp	155	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		1 ton pickup truck	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Crane 94'	155 hp	155	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		1 ton pickup truck	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000
	Dewatering	Concrete saw	13 hp	8	21	3.075	2.272	117.574	0.006	1.685	1.681	200.981	0.175	0.188
		Crane 80'	130 hp	16	21	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		Flatbed truck	8	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
		Generator	80 hp	5856	244	0.213	1.796	1.761	0.003	0.108	0.100	294.384	0.019	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
	Armoring	1 ton pickup truck	1.0667	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
		1 ton pickup truck	1.0667	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Maintenance	Grader	215 hp	144	209	0.122	1.989	0.675	0.004	0.064	0.059	312.002	0.017	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Excavator	430 hp	4,445	22	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
		Tractor/crawler/dozer	850 hp	3,2327	22	0.163	3.093	0.873	0.003	0.090	0.083	298.249	0.021	0.000
	Drilling	Rotary drill	475 hp	7,3333	128	0.054	0.779	0.500	0.003	0.024	0.022	282.166	0.007	0.000
		3/4 ton Pickup truck		7,3333	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
		Diamond cutting saw	50 hp	48	128	0.388	2.062	2.000	0.004	0.110	0.101	277.562	0.035	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000
		3/4 ton Pickup truck		60.0214	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
		Water truck	3000 gal	507	128	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Year	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr	
						VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	2019		1.86E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	2019		1.28E-02	1.80E-01	2.37E-02	2.00E-04	4.17E-03	2.48E-03	4.01E+01	9.53E-05	8.97E-05	4.01E+01	3.64E+01	
Environmental protection measures	Biologist		709	2019		2.74E-03	2.37E-03	3.33E-02	4.75E-05	3.88E-04	1.74E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation		16	19		6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19		2.24E-06	2.87E-06	3.03E-05	6.94E-08	5.52E-07	2.42E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19		6.38E-05	1.01E-03	3.49E-04	1.61E-06	3.81E-05	3.51E-05	1.43E-01	9.76E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19		1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19		4.53E-05	5.64E-04	3.27E-04	1.52E-06	2.21E-05	2.04E-05	1.51E-01	7.94E-06	-	1.52E-01	1.38E-01	
		Tractor/crawler/dozer	0.8673	19		3.35E-05	5.00E-04	1.86E-04	6.83E-07	1.94E-05	1.79E-05	6.96E-02	4.50E-06	-	6.97E-02	6.33E-02	
	Chipping	Brush chipper	0.8673	19		3.96E-05	3.75E-04	1.82E-04	1.08E-06	1.15E-05	1.06E-05	9.64E-02	3.57E-06	-	9.65E-02	8.75E-02	
		Front end loader	0.8673	19		4.53E-05	5.64E-04	3.27E-04	1.52E-06	2.21E-05	2.04E-05	1.51E-01	7.94E-06	-	1.52E-01	1.38E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19		5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	1.09E-01	
		Front end loader	4	19		4.80E-05	3.36E-04	3.95E-04	6.46E-07	1.04E-05	9.61E-06	5.00E-02	4.33E-06	-	5.01E-02	4.54E-02	
		Roller	4	19		1.13E-04	3.95E-04	4.67E-04	6.47E-07	2.68E-05	2.46E-05	4.88E-02	1.02E-05	-	4.90E-02	4.45E-02	
		Water truck	4	19		3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	9.47E-02	8.59E-02	
		Excavator	4	19		6.77E-05	8.99E-04	5.55E-04	2.75E-06	2.92E-05	2.69E-05	2.80E-01	1.37E-05	-	2.81E-01	2.54E-01	
		Front end loader	4	19		7.34E-05	1.08E-03	4.60E-04	2.41E-06	3.61E-05	3.32E-05	2.14E-01	1.16E-05	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19		1.60E-04	2.54E-03	8.77E-04	4.03E-06	9.57E-05	8.81E-05	3.59E-01	2.45E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	0.0923	19		8.55E-07	1.04E-05	9.84E-06	1.75E-08	6.93E-07	6.38E-07	1.49E-03	1.03E-07	-	1.49E-03	1.35E-03	
		Crane 94'	155	19		3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	19		3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155	19		3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	19		3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	2	19		5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	8	21		3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02	
		Crane 80'	16	21		3.10E-04	3.93E-03	2.83E-03	5.37E-06	2.10E-04	1.93E-04	4.77E-01	3.74E-05	-	4.78E-01	4.33E-01	
		Flatbed truck	8	21		4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	5856	244		1.10E-01	9.28E-01	9.09E-01	1.78E-03	5.60E-02	5.15E-02	1.52E+02	9.93E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	78.8462	19		4.92E-03	7.47E-02	3.90E-02	1.47E-04	2.75E-03	2.53E-03	1.46E+01	9.50E-04	-	1.47E+01	1.33E+01	
	Push	Tractor/crawler/dozer	78.8462	19		4.92E-03	7.47E-02	3.90E-02	1.47E-04	2.75E-03	2.53E-03	1.46E+01	9.50E-04	-	1.47E+01	1.33E+01	
		Tractor/crawler/dozer	78.8462	19		4.92E-03	7.47E-02	3.90E-02	1.47E-04	2.75E-03	2.53E-03	1.46E+01	9.50E-04	-	1.47E+01	1.33E+01	
	Build road	Tractor/crawler/dozer	78.8462	19		4.92E-03	7.47E-02	3.90E-02	1.47E-04	2.75E-03	2.53E-03	1.46E+01	9.50E-04	-	1.47E+01	1.33E+01	
	Armoring	1 ton pickup truck	1,0667	19		2.31E-06	2.97E-06	3.13E-05	7.17E-08	5.71E-07	2.50E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	1,0667	19		2.59E-05	3.44E-04	2.12E-04	1.05E-06	1.12E-05	1.03E-05	1.07E-01	5.23E-06	-	1.07E-01	9.73E-02	
		1 ton pickup truck	1,0667	19		2.31E-06	2.97E-06	3.13E-05	7.17E-08	5.71E-07	2.50E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	144	2019		4.15E-03	6.79E-02	2.31E-02	1.20E-04	2.18E-03	2.00E-03	1.06E+01	5.89E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	6,7805	22		5.12E-05	7.21E-04	9.47E-05	7.99E-07	1.67E-05	9.93E-06	1.60E-01	3.81E-07	3.59E-07	1.60E-01	1.46E-01	
		Excavator	4,445	22		1.08E-04	1.43E-03	8.85E-04	4.38E-06	4.65E-05	4.28E-05	4.46E-01	2.18E-05	-	4.47E-01	4.05E-01	
		Tractor/crawler/dozer	3,237	22		4.94E-04	9.37E-03	2.64E-03	9.08E-06	2.74E-04	2.52E-04	9.03E-01	6.32E-05	-	9.05E-01	8.21E-01	
	Drilling	Rotary drill	7,3333	128		2.06E-04	2.99E-03	1.92E-03	1.06E-05	9.24E-05	8.50E-05	1.09E+00	2.60E-05	-	1.08E+00	9.83E-01	
		3/4 ton Pickup truck	7,3333	128		2.84E-05	2.45E-05	3.44E-04	4.92E-07	4.01E-06	1.80E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01	
		3/4 ton Pickup truck	48	128		1.86E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
	Cut with Diamond wire	Diamond cutting saw	48	128		1.03E-03	5.45E-03	5.29E-03	9.49E-06	2.91E-04	2.68E-04	7.34E-01	9.25E-05	-	7.36E-01	6.68E-01	
	Lift/Load blocks	Crane 260'	60,0214	128		2.06E-03	3.07E-02	8.89E-03	3.98E-05	1.24E-03	1.14E-03	4.05E+00	2.32E-04	-	4.05E+00	3.68E+00	
		3/4 ton Pickup truck	60,0214	128		2.32E-04	2.00E-04	2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
		Water truck	507	128		3.83E-03	5.39E-02	7.08E-03	5.98E-05	1.25E-03	7.43E-04	1.20E+01	2.85E-05	2.68E-05	1.20E+01	1.09E+01	
	Landfill	Crane 260'	30,0107	128		1.03E-03	1.54E-02	4.44E-03	1.99E-05	6.18E-04	5.69E-04	2.03E+00	1.16E-04	-	2.03E+00	1.84E+00	
						<b>Total</b>	<b>1.68E-01</b>	<b>1.70E+00</b>	<b>1.28E+00</b>	<b>3.08E-03</b>	<b>8.35E-02</b>	<b>7.48E-02</b>	<b>3.23E+02</b>	<b>1.88E-02</b>	<b>1.56E-03</b>	<b>3.24E+02</b>	<b>2.94E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	209	3.55E-03	3.07E-03	4.32E-02	6.16E-05	5.03E-04	2.26E-04	
Dust Control	Water truck	5000 gal	1696	209	2.45E-01	3.45E+00	4.53E-01	3.83E-03	7.97E-02	4.75E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	209	5.25E-02	4.53E-02	6.37E-01	9.10E-04	7.43E-03	3.33E-03	
	Fish relocation	3/4 ton pickup truck	16	19	1.30E-02	1.12E-02	1.58E-01	2.26E-04	1.84E-03	8.27E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	4.71E-04	6.04E-04	6.38E-03	1.46E-05	1.16E-04	5.09E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	1.34E-02	2.13E-01	7.36E-02	3.38E-04	8.03E-03	7.38E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	540 hp	0.8673	19	9.53E-03	1.19E-01	6.89E-02	3.21E-04	4.66E-03	4.28E-03	
	Tractor/crawler/dozer	310 hp	0.8673	19	7.05E-03	1.05E-01	3.91E-02	1.44E-04	4.09E-03	3.76E-03	
	Chipping	250 hp	0.8673	19	8.33E-03	7.89E-02	3.83E-02	2.28E-04	2.43E-03	2.23E-03	
	Front end loader	540 hp	0.8673	19	9.53E-03	1.19E-01	6.89E-02	3.21E-04	4.66E-03	4.28E-03	
Dewatering	Temporary Cofferdam	180 hp	2	19	1.12E-02	1.78E-01	6.16E-02	2.83E-04	6.72E-03	6.18E-03	
	Front end loader	49 hp	4	19	1.01E-02	7.08E-02	8.32E-02	1.36E-04	2.20E-03	2.02E-03	
	Roller	47 hp	4	19	2.37E-02	8.32E-02	9.84E-02	1.33E-04	5.64E-03	5.19E-03	
	Water truck	3000 gal	4	19	6.36E-03	8.95E-02	1.18E-02	9.93E-05	2.07E-03	1.23E-03	
	Excavator	300 hp	4	19	1.42E-02	1.89E-01	1.17E-01	5.79E-04	6.15E-03	5.85E-03	
	Front end loader	180 hp	4	19	1.55E-02	2.26E-01	9.67E-02	5.08E-04	7.59E-03	6.89E-03	
	36" Diversion Pipe - gradir	180 hp	6	19	3.37E-02	5.34E-01	1.85E-01	8.49E-04	2.02E-02	1.85E-02	
	Loader/backhoe	75 hp	0.0923	19	1.80E-04	2.19E-03	2.07E-03	3.68E-06	1.46E-04	1.34E-04	
	Crane 94'	155 hp	155	19	7.54E-01	9.55E+00	6.87E+00	1.31E-02	5.10E-01	4.70E-01	
	1 ton pickup truck	155 hp	155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
	Crane 94'	155 hp	155	19	7.54E-01	9.55E+00	6.87E+00	1.31E-02	5.10E-01	4.70E-01	
	1 ton pickup truck	155 hp	155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.12E-02	1.78E-01	6.16E-02	2.83E-04	6.72E-03	6.18E-03	
	Dewatering	Concrete saw	13 hp	8	6.71E-02	4.96E-02	2.57E+00	1.25E-04	3.68E-02	3.67E-02	
		Crane 80'	130 hp	16	5.90E-02	7.48E-01	5.38E-01	1.02E-03	4.00E-02	3.68E-02	
		Flatbed truck	8	21	9.27E-03	1.00E-02	1.29E-01	1.01E-04	8.04E-04	3.47E-04	
		Generator	80 hp	5856	244	1.80E+00	1.52E+01	1.49E+01	2.92E-02	9.18E-01	8.45E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.04E+00	1.57E+01	8.21E+00	3.10E-02	5.79E-01	5.33E-01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.04E+00	1.57E+01	8.21E+00	3.10E-02	5.79E-01	5.33E-01
		Tractor/crawler/dozer	600 hp	78.8462	19	1.04E+00	1.57E+01	8.21E+00	3.10E-02	5.79E-01	5.33E-01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.04E+00	1.57E+01	8.21E+00	3.10E-02	5.79E-01	5.33E-01
	Armoring	1 ton pickup truck	1,0667	19	4.87E-04	6.24E-04	6.59E-03	1.51E-05	1.20E-04	5.26E-05	
		Excavator	430 hp	1,0667	19	5.45E-03	7.24E-02	4.47E-02	2.21E-04	2.35E-03	2.16E-03
		1 ton pickup truck	1,0667	19	4.87E-04	6.24E-04	6.59E-03	1.51E-05	1.20E-04	5.26E-05	
	Maintenance	Grader	215 hp	144	7.94E-02	1.30E+00	4.41E-01	2.29E-03	4.17E-02	3.84E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	9.31E-03	1.31E-01	1.72E-02	1.45E-04	3.03E-03	1.81E-03
		Excavator	430 hp	4,445	22	1.96E-02	2.60E-01	1.61E-01	7.97E-04	8.46E-03	7.78E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	8.97E-02	1.70E+00	4.81E-01	1.65E-03	4.97E-02	4.58E-02
	Drilling	Rotary drill	475 hp	7,3333	128	6.44E-03	9.35E-02	5.99E-02	3.32E-04	2.89E-03	2.66E-03
		3/4 ton Pickup truck			128	8.86E-04	7.65E-04	1.08E-02	1.54E-05	1.25E-04	5.83E-05
	Cut with Diamond wire	3/4 ton Pickup truck		48	128	5.80E-03	5.01E-03	7.05E-02	1.01E-04	8.21E-04	3.68E-04
		Diamond cutting saw	50 hp	48	128	3.20E-02	1.70E-01	1.65E-01	2.97E-04	9.09E-03	8.36E-03
	Lift/Load blocks	Crane 260'	375 hp	60,0214	128	6.44E-02	9.60E-01	2.78E-01	1.24E-03	3.87E-02	3.56E-02
		3/4 ton Pickup truck		60,0214	128	7.25E-03	6.26E-03	8.81E-02	1.26E-04	1.03E-03	4.61E-04
		Water truck	3000 gal	507	128	1.20E-01	1.68E+00	2.21E-01	1.87E-03	3.89E-02	2.32E-02
	Landfill	Crane 260'	375 hp	30,0107	128	3.22E-02	4.80E-01	1.39E-01	6.21E-04	1.93E-02	1.78E-02
					<b>Total</b>	<b>8.72E+00</b>	<b>1.11E+02</b>	<b>7.12E+01</b>	<b>2.04E-01</b>	<b>4.76E+00</b>	<b>4.31E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019
10	

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/?url=2019>

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite						
Rindge	9	110	71	0	5	4
Surfrider	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	0	0	0	0	0	0
Landfill	0	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 3

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Brush Piling	Front end loader	0.8673	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
		Tractor/crawler/dozer	0.8673	19	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000	
	Chipping	Brush chipper	0.8673	19	0.148	1.214	0.746	0.005	0.038	0.035	403.250	0.013	0.000	
		Front end loader	0.8673	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
		Front end loader	49 hp	4	0.199	1.450	1.811	0.003	0.032	0.030	231.302	0.018	0.000	
		Roller	47 hp	4	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000	
		Water truck	3000 gal	4	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
		Excavator	300 hp	4	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
		Front end loader	180 hp	4	0.080	1.085	0.567	0.003	0.036	0.033	270.061	0.013	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
		Loader/backhoe	75 hp	0.0923	0.090	1.104	1.282	0.002	0.065	0.060	195.356	0.012	0.000	
		Crane 94'	155 hp	155	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
		1 ton pickup truck	155	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
		1 ton pickup truck	155	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
	Dewatering	Concrete saw	13 hp	8	3.070	2.268	117.560	0.006	1.685	1.681	200.981	0.175	0.188	
		Crane 80'	130 hp	16	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000	
		Flatbed truck	8	23	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.172	1.509	1.744	0.003	0.081	0.075	294.384	0.016	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000	
	Push	Tractor/crawler/dozer	600 hp	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000	
		Tractor/crawler/dozer	600 hp	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000	
	Build road	Tractor/crawler/dozer	600 hp	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000	
	Armoring	1 ton pickup truck	1,0667	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Excavator	430 hp	19	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000	
		1 ton pickup truck	1,0667	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	0.113	1.791	0.661	0.004	0.057	0.052	312.002	0.015	0.000	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.993	49.941	13.281	0.106	1.847	21,297.572	0.051	0.048	
		Excavator	430 hp	4,445	22	0.045	0.509	0.413	0.002	0.017	211.854	0.009	0.000	
		Tractor/crawler/dozer	850 hp	3,2327	22	0.142	2.744	0.804	0.003	0.078	298.249	0.019	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000	
		Tractor/crawler/dozer	440 hp	5	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000	
		3/4 ton Pickup truck	20	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.049	0.613	0.500	0.003	0.021	282.166	0.006	0.000	
		3/4 ton Pickup truck	34,0003	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
		Diamond cutting saw	50 hp	48	0.306	1.918	1.917	0.004	0.082	0.076	277.562	0.028	0.000	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.070	0.992	0.340	0.002	0.040	163.241	0.008	0.000	
		3/4 ton Pickup truck	60,0214	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000	
		Water truck	3000 gal	507	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
	Landfill	Crane 260'	375 hp	30,0107	126	0.070	0.992	0.340	0.002	0.040	163.241	0.008	0.000	
	Micro-blast	Crane 260'	375 hp	49	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000	
		Horizontal boring drill	10 hp	55	0.295	2.329	1.909	0.005	0.146	0.135	312.570	0.033	0.000	
		3/4 ton Pickup truck	60	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000	
		Air compressor	50 hp	40	0.837	1.059	50.665	0.004	0.024	0.023	307.059	0.048	0.067	
		3/4 ton Pickup truck	20	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 3

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2021 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	1.44E-04	1.37E-04	1.77E-03	3.22E-06	2.58E-05	1.14E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.31E-02	9.34E-02	2.48E-02	1.99E-04	3.45E-03	1.83E-03	3.98E+01	9.53E-05	8.97E-05	3.98E+01	3.61E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.13E-03	2.03E-03	2.62E-02	4.76E-05	3.81E-04	1.68E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	4.82E-05	4.58E-05	5.91E-04	1.07E-06	8.60E-06	3.79E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.57E-06	2.36E-06	2.17E-05	6.96E-08	5.42E-07	2.33E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	5.76E-05	8.81E-04	3.34E-04	1.61E-06	3.32E-05	3.05E-05	1.43E-01	8.71E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19	4.19E-05	4.93E-04	3.14E-04	1.52E-06	1.91E-05	1.76E-05	1.51E-01	7.17E-06	-	1.52E-01	1.38E-01	
		Tractor/crawler/dozer	0.8673	19	2.97E-05	4.16E-04	1.73E-04	6.83E-07	1.64E-05	1.51E-05	6.96E-02	4.05E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	3.53E-05	2.90E-04	1.78E-04	1.08E-06	9.07E-06	8.35E-06	9.64E-02	3.18E-06	-	9.64E-02	8.75E-02	
		Front end loader	0.8673	19	4.19E-05	4.93E-04	3.14E-04	1.52E-06	1.91E-05	1.76E-05	1.51E-01	7.17E-06	-	1.52E-01	1.38E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	4.82E-05	7.37E-04	2.79E-04	1.34E-06	2.77E-05	2.55E-05	1.20E-01	7.29E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	4.30E-05	3.13E-04	3.91E-04	6.46E-07	6.99E-06	6.43E-06	5.00E-02	3.88E-06	-	5.01E-02	4.44E-02	
		Roller	47 hp	4	9.22E-05	3.72E-04	4.49E-04	6.31E-07	1.23E-05	1.96E-05	4.88E-02	8.32E-06	-	4.90E-02	4.42E-02	
		Water truck	3000 gal	4	3.08E-05	2.20E-04	5.86E-05	4.69E-07	8.14E-06	4.31E-06	9.39E-02	2.25E-07	2.12E-07	9.40E-02	8.53E-02	
		Excavator	300 hp	4	5.97E-05	6.73E-04	5.47E-04	2.75E-06	2.25E-05	2.07E-05	2.80E-01	1.23E-05	-	2.80E-01	2.54E-01	
		Front end loader	180 hp	4	6.32E-05	8.61E-04	4.50E-04	2.41E-06	2.87E-05	2.64E-05	2.14E-01	1.04E-05	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.46E-04	2.21E-03	8.37E-04	4.03E-06	8.32E-05	7.66E-05	3.69E-01	2.19E-05	-	3.69E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	6.88E-07	8.42E-06	9.78E-06	1.75E-08	4.97E-07	4.57E-07	1.49E-03	8.84E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	3.14E-03	3.90E-02	3.26E-02	6.20E-05	2.08E-03	1.91E-03	5.51E+00	3.72E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	19	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	3.14E-03	3.90E-02	3.26E-02	6.20E-05	2.08E-03	1.91E-03	5.51E+00	3.72E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	20	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	4.82E-05	7.37E-04	2.79E-04	1.34E-06	2.77E-05	2.55E-05	1.20E-01	7.29E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.73E-02	
		Crane 80'	130 hp	16	2.72E-04	3.38E-03	2.82E-03	5.37E-06	1.80E-04	1.66E-04	4.77E-01	3.22E-05	-	4.78E-01	4.33E-01	
		Flatbed truck	8	23	3.47E-05	3.98E-05	4.78E-04	5.33E-07	4.15E-06	1.76E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	8.88E-02	7.79E-01	9.00E-01	1.78E-03	4.19E-02	3.86E-02	1.52E+02	8.02E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	4.42E-03	6.32E-02	3.64E-02	1.47E-04	2.32E-03	2.14E-03	1.46E+01	8.55E-04	-	1.47E+01	1.33E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	4.42E-03	6.32E-02	3.64E-02	1.47E-04	2.32E-03	2.14E-03	1.46E+01	8.55E-04	-	1.47E+01	1.33E+01
		Tractor/crawler/dozer	600 hp	78.8462	19	4.42E-03	6.32E-02	3.64E-02	1.47E-04	2.32E-03	2.14E-03	1.46E+01	8.55E-04	-	1.47E+01	1.33E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	4.42E-03	6.32E-02	3.64E-02	1.47E-04	2.32E-03	2.14E-03	1.46E+01	8.55E-04	-	1.47E+01	1.33E+01
	Armoring	1 ton pickup truck	1,0667	19	1.62E-06	2.43E-06	2.25E-05	7.19E-08	5.60E-07	2.41E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1,0667	19	2.28E-05	2.57E-04	2.09E-04	1.05E-06	8.61E-06	7.92E-06	1.07E-01	4.70E-06	-	1.07E-01	9.73E-02
		1 ton pickup truck	1,0667	19	1.62E-06	2.43E-06	2.25E-05	7.19E-08	5.60E-07	2.41E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	3.86E-03	6.11E-02	2.26E-02	1.20E-04	1.94E-03	1.78E-03	1.06E+01	5.29E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	5.23E-05	3.73E-04	9.93E-05	7.94E-07	1.38E-05	1.59E-01	3.81E-07	3.59E-07	1.59E-01	1.45E-01	
		Excavator	430 hp	4,445	22	9.51E-05	1.07E-03	8.71E-04	4.38E-06	3.59E-05	3.30E-05	4.46E-01	1.96E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	4.29E-04	8.31E-03	2.44E-03	9.08E-06	2.36E-04	2.17E-04	9.03E-01	5.68E-05	-	9.05E-01	8.21E-01
	Platform	Tractor/crawler/dozer	440 hp	40	2.43E-04	3.41E-03	1.42E-03	4.47E-05	1.07E-03	9.87E-04	4.56E+00	2.65E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	440 hp	5	2.43E-04	3.41E-03	1.42E-03	4.47E-05	1.07E-03	9.87E-04	4.56E+00	2.65E-04	-	4.56E+00	4.14E+00	
		3/4 ton Pickup truck	20	20	6.02E-05	5.72E-05	7.39E-04	1.34E-06	1.08E-05	4.74E-06	4.49E-01	4.46E-05	2.33E-05	-	4.57E-01	4.15E-01
	Drilling	Rotary drill	475 hp	34,0003	126	8.65E-04	1.09E-02	8.89E-03	4.93E-05	3.65E-04	3.36E-04	5.02E+00	1.10E-04	-	5.03E+00	4.56E+00
		3/4 ton Pickup truck	34,0003	126	1.02E-04	9.73E-05	1.26E-03	2.28E-06	1.83E-05	8.06E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.44E-04	1.37E-04	1.77E-03	3.22E-06	2.58E-05	1.14E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
		Diamond cutting saw	50 hp	48	8.10E-04	5.07E-03	5.07E-03	9.49E-06	2.18E-04	2.01E-04	7.34E-01	7.31E-05	-	7.36E-01	6.68E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.74E-03	2.46E-02	8.43E-03	3.98E-05	9.90E-04	9.11E-04	4.05E+00	2.10E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck	60,0214	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	1.22E-04	1.46E-03	6.88E-04	3.25E-06	5.44E-05	5.01E-05	3.32E-01	1.56E-05	-	3.32E-01	3.01E-01	
		Water truck	3000 gal	507	3.91E-03	2.79E-02	7.42E-03	5.94E-05	1.03E-03	5.47E-04	1.19E+01	2.85E-05	2.68E-05	1.19E+01	1.08E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	8.72E-04	1.23E-02	4.21E-03	1.99E-05	4.95E-04	2.03E+00	1.05E-04	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	375 hp	49	1.42E-03	2.01E-02	6.88E-03	3.25E-05	8.08E-04	7.44E-04	3.31E+00	1.71E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	10 hp	55	1.79E-04	1.41E-03	1.16E-03	2.95E-06	8.86E-05	8.15E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton Pickup truck	60	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	5.81E-04	8.20E-03	2.81E-03	1.32E-05	3.30E-04	3.04E-04	1.35E+00	7.00E-05	-	1.35E+00	1.23E+00	
		Air compressor	50 hp	40	1.85E-03	2.33E-03	1.12E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	1.05E-04	1.48E-04	7.25E-01	6.58E-01	
		3/4 ton Pickup truck	20	126	6.02E-05	5.72E-05	7.39E-04	1.34E-06	1.08E-05	4.74E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>Total</b>	<b>1.50E-01</b>	<b>1.44E+00</b>	<b>1.40E+00</b>	<b>3.23E-03</b>	<b>6.81E-02</b>	<b>6.06E-02</b>	<b>3.41E+02</b>	<b>1.73E-02</b>	<b>1.85E-03</b>	<b>3.42E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surridge  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 3

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		48	210	2.75E-03	2.62E-03	3.38E-02	6.14E-05	4.92E-04	2.17E-04
Dust Control	Water truck	5000 gal	1696	210	2.49E-01	1.78E+00	4.73E-01	3.78E-03	6.58E-02	3.48E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	4.07E-02	3.86E-02	4.99E-01	9.07E-04	7.26E-03	3.20E-03
	Fish relocation	3/4 ton pickup truck	16	19	1.01E-02	9.64E-03	1.24E-01	2.26E-04	1.81E-03	7.98E-04
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.30E-04	4.96E-04	4.58E-03	1.46E-05	1.14E-04	4.90E-05
	Tractor/crawler/dozer	250 hp	1,7208	19	1.21E-02	1.86E-01	7.02E-02	3.38E-04	6.98E-03	6.42E-03
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05
	Brush Piling	Front end loader	540 hp	0.8673	19	8.82E-03	1.04E-01	6.62E-02	3.21E-04	4.02E-03
		Tractor/crawler/dozer	310 hp	0.8673	19	6.26E-03	8.77E-02	3.65E-02	1.44E-04	3.45E-03
	Chipping	Brush chipper	250 hp	0.8673	19	7.43E-03	6.11E-02	3.75E-02	2.28E-04	1.91E-03
		Front end loader	540 hp	0.8673	19	8.82E-03	1.04E-01	6.62E-02	3.21E-04	4.02E-03
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.01E-02	1.55E-01	5.88E-02	2.83E-04	5.84E-03
		Front end loader	49 hp	4	19	9.05E-03	6.59E-02	8.24E-02	1.36E-04	1.47E-03
		Roller	47 hp	4	19	1.94E-02	7.83E-02	9.45E-02	1.33E-04	4.49E-03
		Water truck	3000 gal	4	19	6.49E-03	4.64E-02	1.23E-02	9.87E-05	1.71E-03
		Excavator	300 hp	4	19	1.26E-02	1.42E-01	1.15E-01	5.79E-04	4.74E-03
		Front end loader	180 hp	4	19	1.33E-02	1.81E-01	9.48E-02	5.08E-04	6.04E-03
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	3.04E-02	4.66E-01	1.76E-01	8.49E-04	1.75E-02
		Loader/backhoe	75 hp	0.0923	19	1.45E-04	1.77E-03	2.06E-03	3.68E-06	1.05E-04
		Crane 94'	155 hp	155	19	6.62E-01	8.21E+00	6.86E+00	1.31E-02	4.38E-01
		1 ton pickup truck	155	19	4.96E-02	7.44E-02	6.87E-01	2.20E-03	1.71E-02	7.36E-03
		Crane 94'	155 hp	155	20	6.29E-01	7.80E+00	6.52E+00	1.24E-02	4.16E-01
		1 ton pickup truck	155	20	4.71E-02	7.07E-02	6.53E-01	2.09E-03	1.63E-02	6.99E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	9.64E-03	1.47E-01	5.58E-02	2.69E-04	5.55E-03
	Dewatering	Concrete saw	13 hp	8	23	6.12E-02	4.52E-02	2.34E+00	1.14E-04	3.36E-02
		Crane 80'	130 hp	16	23	4.73E-02	5.87E-01	4.91E-01	9.33E-04	3.13E-02
		Flatbed truck	8	23	6.03E-03	6.93E-03	8.32E-02	9.26E-05	7.22E-04	3.06E-04
		Generator	80 hp	5856	244	1.46E+00	1.28E+01	1.48E+01	2.92E-02	6.87E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	9.31E-01	1.33E+01	7.67E+00	3.10E-02	4.89E-01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	9.31E-01	1.33E+01	7.67E+00	3.10E-02	4.89E-01
		Tractor/crawler/dozer	600 hp	78,8462	19	9.31E-01	1.33E+01	7.67E+00	3.10E-02	4.89E-01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	9.31E-01	1.33E+01	7.67E+00	3.10E-02	4.89E-01
	Armoring	1 ton pickup truck	1,0667	19	3.41E-04	5.12E-04	4.73E-03	1.51E-05	1.18E-04	5.06E-05
		Excavator	430 hp	1,0667	19	4.80E-03	5.41E-02	4.40E-02	2.21E-04	1.81E-03
		1 ton pickup truck	1,0667	19	3.41E-04	5.12E-04	4.73E-03	1.51E-05	1.18E-04	5.06E-05
	Maintenance	Grader	215 hp	144	210	7.36E-02	1.16E+00	4.30E-01	2.28E-03	3.69E-02
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	9.50E-03	6.79E-02	1.80E-02	1.44E-04	2.51E-03
		Excavator	430 hp	4,445	22	1.73E-02	1.95E-01	1.58E-01	7.97E-04	6.52E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	7.79E-02	1.51E+00	4.43E-01	1.65E-03	4.29E-02
	Platform	Tractor/crawler/dozer	440 hp	40	20	3.89E-01	5.45E+00	2.27E+00	8.95E-03	2.15E-01
		Tractor/crawler/dozer	440 hp	5	20	4.87E-02	6.81E-01	2.84E-01	1.12E-03	2.68E-02
		3/4 ton Pickup truck	20	20	1.20E-02	1.14E-02	1.48E-01	2.69E-04	2.15E-03	9.48E-04
	Drilling	Rotary drill	475 hp	34,0003	126	2.75E-02	3.47E-01	2.82E-01	1.57E-03	1.16E-02
		3/4 ton Pickup truck	34,0003	126	3.25E-03	3.09E-03	3.99E-02	7.25E-05	5.80E-04	2.56E-04
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	4.59E-03	4.36E-03	5.63E-02	1.02E-04	8.19E-04	3.61E-04
		Diamond cutting saw	50 hp	48	126	2.57E-02	1.61E-01	1.61E-01	3.01E-04	6.93E-03
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	5.54E-02	7.81E-01	2.67E-01	1.26E-03	3.14E-02
		3/4 ton Pickup truck	60,0214	126	5.74E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04
	Load/Haul	Front end loader	350 hp	4	126	3.87E-03	4.63E-02	2.18E-02	1.03E-04	1.73E-03
		Water truck	3000 gal	507	126	1.24E-01	8.86E-01	2.36E-01	1.89E-03	3.28E-02
	Landfill	Crane 260'	375 hp	30,0107	126	2.77E-02	3.91E-01	1.34E-01	6.31E-04	1.57E-02
	Micro-blast	Crane 260'	375 hp	49	126	4.52E-02	6.38E-01	2.18E-01	1.03E-03	2.57E-02
		Horizontal boring drill	10 hp	55	126	5.68E-03	4.48E-02	3.67E-02	9.36E-05	2.81E-03
		3/4 ton Pickup truck	60	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04
	Demolish spillway	Crane 260'	375 hp	20	126	1.85E-02	2.60E-01	8.91E-02	4.21E-04	1.05E-02
		Air compressor	50 hp	40	126	5.86E-02	7.41E-02	3.55E+00	2.61E-04	1.65E-03
		3/4 ton Pickup truck	20	126	1.91E-03	1.82E-03	2.35E-02	4.27E-05	3.41E-04	1.50E-04
						<b>8.21E+00</b>	<b>9.92E+01</b>	<b>7.43E+01</b>	<b>2.17E-01</b>	<b>4.22E+00</b>
									<b>3.82E+00</b>	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite									
Rindge	8	99	74	0	4	4			
Surridge	0	0	0	0	0	0			
Topanga	0	0	0	0	0	0			
Zuma	0	0	0	0	0	0			
Landfill	0	0	0	0	0	0			

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 4

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2023 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Front end loader	540 hp	0.8673	19	0.068	0.697	0.590	0.003	0.027	0.025	293.384	0.013	0.000	
	Tractor/crawler/dozer	310 hp	0.8673	19	0.085	1.062	0.554	0.002	0.044	0.040	234.962	0.012	0.000	
	Chipping	Brush chipper	0.8673	19	0.132	0.923	0.735	0.005	0.029	0.027	403.250	0.012	0.000	
	Front end loader	540 hp	0.8673	19	0.068	0.697	0.590	0.003	0.027	0.025	293.384	0.013	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.098	1.367	0.680	0.003	0.053	301.159	0.017	0.000	
	Front end loader	49 hp	4	19	0.185	1.368	1.799	0.003	0.022	0.020	231.302	0.017	0.000	
	Roller	47 hp	4	19	0.366	1.695	2.095	0.003	0.080	0.074	235.507	0.033	0.000	
	Water truck	3000 gal	4	19	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
	Excavator	300 hp	4	19	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000	
	Front end loader	180 hp	4	19	0.063	0.745	0.558	0.003	0.025	0.023	270.061	0.012	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.098	1.367	0.680	0.003	0.053	301.159	0.017	0.000	
	Loader/backhoe	75 hp	0.0923	19	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000	
	Crane 94'	155 hp	155	19	0.101	1.216	1.229	0.002	0.064	0.059	208.066	0.012	0.000	
	1 ton pickup truck		155	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Crane 94'	155 hp	155	20	0.101	1.216	1.229	0.002	0.064	0.059	208.066	0.012	0.000	
	1 ton pickup truck		155	20	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.098	1.367	0.680	0.003	0.053	301.159	0.017	0.000	
	Dewatering	Concrete saw	13 hp	8	23	3.076	2.273	117.548	0.006	1.685	200.981	0.175	0.188	
	Crane 80'	130 hp	16	23	0.101	1.216	1.229	0.002	0.064	0.059	208.066	0.012	0.000	
	Flatbed truck		8	23	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135	
	Generator	80 hp	5856	244	0.147	1.295	1.736	0.003	0.062	0.057	294.384	0.013	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.065	0.800	0.662	0.003	0.030	0.027	280.790	0.015	0.000	
	Push	Tractor/crawler/dozer	600 hp	19	0.065	0.800	0.662	0.003	0.030	0.027	280.790	0.015	0.000	
	Build road	Tractor/crawler/dozer	600 hp	19	0.065	0.800	0.662	0.003	0.030	0.027	280.790	0.015	0.000	
	Armoring	1 ton pickup truck	1,0667	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Excavator	430 hp	1,0667	19	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000	
	1 ton pickup truck		1,0667	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.096	1.406	0.651	0.004	0.046	312.002	0.014	0.000	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.360	24.855	12.079	0.106	1.801	21,149.122	0.051	0.048	
	Excavator	430 hp	4,445	22	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000	
	Tractor/crawler/dozer	850 hp	3,2327	22	0.095	2.045	0.750	0.003	0.051	0.047	298.249	0.017	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.085	1.062	0.554	0.002	0.044	234.962	0.012	0.000	
	Tractor/crawler/dozer	440 hp	5	20	0.085	1.062	0.554	0.002	0.044	0.040	234.962	0.012	0.000	
	3/4 ton Pickup truck		20	20	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.042	0.451	0.500	0.003	0.015	0.014	282.166	0.006	0.000
	3/4 ton Pickup truck		34,0003	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Diamond cutting saw	50 hp	48	126	0.257	1.805	1.874	0.004	0.062	0.057	277.562	0.023	0.000	
	Lift/Load blocks	Crane 260'	60,0214	126	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000	
	3/4 ton Pickup truck		60,0214	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	126	0.065	0.675	0.432	0.002	0.025	214.821	0.009	0.000	
	Water truck	3000 gal	507	126	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
	Landfill	Crane 260'	30,0107	126	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000	
	Micro-blast	Crane 260'	49	126	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000	
	Horizontal boring drill	10 hp	55	126	0.252	2.115	1.909	0.005	0.113	0.104	312.570	0.033	0.000	
	3/4 ton Pickup truck		60	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	126	0.056	0.723	0.327	0.002	0.029	163.241	0.008	0.000	
	Air compressor	50 hp	40	126	0.782	0.953	52.049	0.004	0.024	0.023	307.059	0.045	0.064	
	3/4 ton Pickup truck		20	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surridge  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 4

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2023 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	1.08E-04	1.17E-04	1.39E-03	3.22E-06	2.54E-05	1.10E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.19E-02	4.65E-02	2.26E-02	1.97E-04	3.37E-03	1.75E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.60E-03	1.73E-03	2.05E-02	4.76E-05	3.76E-04	1.63E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	3.60E-05	3.90E-05	4.62E-04	1.07E-06	8.48E-06	3.67E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.08E-06	1.94E-06	1.58E-05	6.96E-08	5.35E-07	2.26E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	4.64E-05	6.48E-04	3.22E-04	1.61E-06	2.51E-05	2.31E-05	1.43E-01	7.85E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19	3.50E-05	3.60E-04	3.04E-04	1.52E-06	1.39E-05	1.28E-05	1.51E-01	6.51E-06	-	1.52E-01	1.38E-01	
		Tractor/crawler/dozer	0.8673	19	2.53E-05	3.15E-04	1.64E-04	6.83E-07	1.29E-05	1.19E-05	6.96E-02	3.67E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	3.15E-05	2.21E-04	1.76E-04	1.08E-06	6.88E-06	6.33E-06	9.64E-02	2.85E-06	-	9.64E-02	8.75E-02	
		Front end loader	0.8673	19	3.50E-05	3.60E-04	3.04E-04	1.52E-06	1.39E-05	1.28E-05	1.51E-01	6.51E-06	-	1.52E-01	1.38E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	3.88E-05	5.42E-04	2.70E-04	1.34E-06	2.10E-05	1.94E-05	1.20E-01	6.57E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	3.99E-05	2.96E-04	3.89E-04	6.46E-07	4.66E-06	4.29E-06	5.00E-02	3.60E-06	-	5.00E-02	4.54E-02	
		Roller	47 hp	4	7.59E-05	3.51E-04	4.34E-04	6.31E-07	4.68E-05	1.53E-05	4.88E-02	6.85E-06	-	4.89E-02	4.44E-02	
		Water truck	3000 gal	4	2.80E-05	1.10E-04	5.33E-05	4.65E-07	7.94E-06	4.13E-06	9.33E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	300 hp	4	5.09E-05	4.51E-04	5.42E-04	2.75E-06	1.53E-05	1.40E-05	2.80E-01	1.11E-05	-	2.80E-01	2.54E-01	
		Front end loader	180 hp	4	4.98E-05	5.91E-04	4.43E-04	2.41E-06	1.98E-05	1.82E-05	2.14E-01	9.41E-06	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.17E-04	1.63E-03	8.09E-04	4.03E-06	6.31E-05	5.81E-05	3.69E-01	1.97E-05	-	3.69E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	5.56E-07	6.82E-06	9.75E-06	1.75E-08	3.37E-07	3.10E-07	1.49E-03	7.91E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	2.67E-03	3.22E-02	3.25E-02	6.20E-05	1.71E-03	1.57E-03	5.51E+00	3.23E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	19	1.63E-04	2.92E-04	2.37E-03	1.04E-05	8.03E-05	3.39E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	2.67E-03	3.22E-02	3.25E-02	6.20E-05	1.71E-03	1.57E-03	5.51E+00	3.23E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	20	1.63E-04	2.92E-04	2.37E-03	1.04E-05	8.03E-05	3.39E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	3.88E-05	5.42E-04	2.70E-04	1.34E-06	2.10E-05	1.94E-05	1.20E-01	6.57E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	2.53E-04	2.61E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02	
		Crane 80'	130 hp	16	2.31E-04	2.79E-03	2.82E-03	5.37E-06	1.48E-04	1.36E-04	4.77E-01	2.79E-05	-	4.78E-01	4.33E-01	
		Flatbed truck	8	23	2.44E-05	3.03E-05	3.45E-04	5.32E-07	4.11E-06	1.72E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	7.61E-02	6.69E-01	8.97E-01	1.78E-03	3.21E-02	2.95E-02	1.52E+02	6.87E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	3.39E-03	4.17E-02	3.45E-02	1.47E-04	1.55E-03	1.43E-03	1.46E+01	7.76E-04	-	1.47E+01	1.33E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	3.39E-03	4.17E-02	3.45E-02	1.47E-04	1.55E-03	1.43E-03	1.46E+01	7.76E-04	-	1.47E+01	1.33E+01
		Tractor/crawler/dozer	600 hp	78.8462	19	3.39E-03	4.17E-02	3.45E-02	1.47E-04	1.55E-03	1.43E-03	1.46E+01	7.76E-04	-	1.47E+01	1.33E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	3.39E-03	4.17E-02	3.45E-02	1.47E-04	1.55E-03	1.43E-03	1.46E+01	7.76E-04	-	1.47E+01	1.33E+01
	Armoring	1 ton pickup truck	1,0667	19	1.12E-06	2.01E-06	1.63E-05	7.19E-08	5.53E-07	2.34E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1,0667	19	1.95E-05	1.72E-04	2.07E-04	1.05E-06	5.83E-06	5.37E-06	1.07E-01	4.26E-06	-	1.07E-01	9.73E-02
		1 ton pickup truck	1,0667	19	1.12E-06	2.01E-06	1.63E-05	7.19E-08	5.53E-07	2.34E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	3.27E-03	4.80E-02	2.22E-02	1.20E-04	1.56E-03	1.43E-03	1.06E+01	4.78E-04	-	1.07E+01	9.67E+00	
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.75E-05	1.86E-04	9.03E-05	7.89E-07	1.35E-05	6.99E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.44E-01
		Excavator	430 hp	4,445	22	8.11E-05	7.19E-04	8.64E-04	4.38E-06	2.43E-05	2.24E-05	4.46E-01	1.78E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	2.88E-04	6.19E-03	2.27E-03	9.08E-06	1.54E-04	1.41E-04	9.03E-01	5.11E-05	-	9.04E-01	8.21E-01
	Platform	Tractor/crawler/dozer	440 hp	40	2.07E-04	2.06E-02	1.08E-02	4.47E-05	8.46E-04	7.78E-04	4.56E+00	2.40E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	440 hp	5	2.07E-04	2.06E-03	1.34E-03	5.59E-06	1.06E-04	9.73E-05	5.70E-01	3.00E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck	20	20	4.50E-05	4.88E-05	5.78E-04	1.34E-06	1.06E-05	4.69E-06	4.49E-01	4.46E-05	2.33E-05	-	4.57E-01	4.15E-01
	Drilling	Rotary drill	475 hp	34,0003	126	7.47E-04	8.03E-03	8.89E-03	4.93E-05	2.70E-04	2.49E-04	5.02E+00	1.04E-04	-	5.03E+00	4.66E+00
		3/4 ton Pickup truck	34,0003	126	7.65E-05	8.30E-05	9.83E-04	2.28E-06	1.80E-05	7.81E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.08E-04	1.17E-04	1.39E-03	3.22E-06	2.54E-05	1.10E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
		Diamond cutting saw	50 hp	48	6.80E-04	4.78E-03	4.96E-03	9.49E-06	1.63E-04	1.50E-04	7.34E-01	6.14E-05	-	7.36E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.40E-03	1.79E-02	8.12E-03	3.98E-05	7.26E-04	6.68E-04	4.05E+00	1.91E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck	60,0214	126	1.35E-04	1.46E-04	1.73E-03	4.03E-06	3.18E-05	1.38E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	1.00E-04	1.04E-03	6.67E-04	3.25E-06	3.88E-05	3.57E-05	3.32E-01	1.42E-05	-	3.32E-01	3.01E-01	
		Water truck	3000 gal	507	3.55E-03	1.39E-02	6.75E-03	5.90E-05	1.01E-03	5.23E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	6.98E-04	8.97E-03	4.06E-03	1.99E-05	3.63E-04	3.34E-04	2.03E+00	9.53E-05	-	2.03E+00	1.84E+00
	Micro-blast	Crane 260'	375 hp	49	1.14E-03	1.46E-02	6.63E-03	3.25E-05	5.93E-04	5.45E-04	3.31E+00	1.56E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	10 hp	55	1.53E-04	1.28E-03	1.16E-03	2.95E-06	6.88E-05	6.33E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton Pickup truck	60	126	1.35E-04	1.46E-04	1.73E-03	4.03E-06	3.18E-05	1.38E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	4.65E-04	5.98E-03	2.71E-03	1.32E-05	2.42E-04	2.23E-04	1.35E+00	6.35E-05	-	1.35E+00	1.23E+00	
		Air compressor	50 hp	40	1.72E-03	2.10E-03	1.15E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	9.81E-05	1.41E-04	7.23E-01	6.56E-01	
		3/4 ton Pickup truck	20	126	4.50E-05	4.88E-05	5.78E-04	1.34E-06	1.06E-05	4.59E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>Total</b>	<b>1.27E-01</b>	<b>1.12E+00</b>	<b>1.37E+00</b>	<b>3.23E-03</b>	<b>5.26E-02</b>	<b>4.63E-02</b>	<b>3.40E+02</b>	<b>1.55E-02</b>	<b>1.85E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 4

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2023 (pounds per day)						
					VOC	Nox	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	2.06E-03	2.23E-03	2.64E-02	6.14E-05	4.84E-04	2.10E-04	
Dust Control	Water truck	5000 gal	1696	210	2.26E-01	8.85E-01	4.30E-01	3.76E-03	6.41E-02	3.33E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.04E-02	3.29E-02	3.90E-01	9.07E-04	7.16E-03	3.10E-03	
	Fish relocation	3/4 ton pickup truck	16	19	7.58E-03	8.22E-03	9.74E-02	2.26E-04	1.78E-03	7.73E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	2.28E-04	4.09E-04	3.33E-03	1.46E-05	1.13E-04	4.76E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	9.77E-03	1.36E-01	6.78E-02	3.38E-04	5.29E-03	4.87E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	540 hp	0.8673	19	7.36E-03	7.58E-02	6.41E-02	3.21E-04	2.93E-03	
		Tractor/crawler/dozer	310 hp	0.8673	19	5.32E-03	6.63E-02	3.46E-02	1.44E-04	2.72E-03	
	Chipping	Brush chipper	250 hp	0.8673	19	6.64E-03	4.64E-02	3.70E-02	2.28E-04	1.45E-03	
		Front end loader	540 hp	0.8673	19	7.36E-03	7.58E-02	6.41E-02	3.21E-04	2.93E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	8.18E-03	1.14E-01	5.68E-02	2.83E-04	4.43E-03	
		Front end loader	49 hp	4	19	8.40E-03	6.22E-02	8.18E-02	1.36E-04	9.82E-04	
		Roller	47 hp	4	19	1.60E-02	7.40E-02	9.14E-02	1.33E-04	3.49E-03	
		Water truck	3000 gal	4	19	5.90E-03	2.31E-02	1.12E-02	9.80E-05	1.67E-03	
		Excavator	300 hp	4	19	1.07E-02	9.50E-02	1.14E-01	5.79E-04	3.21E-03	
		Front end loader	180 hp	4	19	1.05E-02	1.25E-01	9.33E-02	5.08E-04	4.17E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	2.45E-02	3.43E-01	1.70E-01	8.49E-04	1.33E-02	
		Loader/backhoe	75 hp	0.0923	19	1.17E-04	1.44E-03	2.05E-03	3.68E-06	7.09E-05	
		Crane 94'	155 hp	155	19	5.62E-01	6.78E+00	6.85E+00	1.31E-02	3.59E-01	
		1 ton pickup truck	155 hp	155	19	3.42E-02	6.14E-02	4.99E-01	2.20E-03	1.69E-02	
		Crane 94'	155 hp	155	20	5.34E-01	6.44E+00	6.51E+00	1.24E-02	3.41E-01	
		1 ton pickup truck	155 hp	155	20	3.25E-02	5.83E-02	4.74E-01	2.09E-03	1.61E-02	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	7.77E-03	1.08E-01	5.39E-02	2.69E-04	4.21E-03	
	Dewatering	Concrete saw	13 hp	8	23	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	
		Crane 80'	130 hp	16	23	4.02E-02	4.85E-01	4.90E-01	9.33E-04	2.57E-02	
		Flatbed truck	8	23	4.25E-03	5.26E-03	6.00E-02	9.25E-05	7.15E-04	2.99E-04	
		Generator	80 hp	5856	244	1.25E+00	1.10E+01	1.47E+01	2.92E-02	5.26E-01	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	7.14E-01	8.79E+00	7.27E+00	3.10E-02	3.27E-01	
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	7.14E-01	8.79E+00	7.27E+00	3.10E-02	3.27E-01	
		Tractor/crawler/dozer	600 hp	78.8462	19	7.14E-01	8.79E+00	7.27E+00	3.10E-02	3.27E-01	
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	7.14E-01	8.79E+00	7.27E+00	3.10E-02	3.27E-01	
	Armoring	1 ton pickup truck	1,0667	19	2.36E-04	4.23E-04	3.44E-03	1.51E-05	1.16E-04	4.92E-05	
		Excavator	430 hp	1,0667	19	4.10E-03	3.63E-02	4.36E-02	2.21E-04	1.23E-03	
		1 ton pickup truck	1,0667	19	2.36E-04	4.23E-04	3.44E-03	1.51E-05	1.16E-04	4.92E-05	
	Maintenance	Grader	215 hp	144	210	6.23E-02	9.14E-01	4.23E-01	2.28E-03	2.96E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.64E-03	3.38E-02	1.64E-02	1.43E-04	2.45E-03	
		Excavator	430 hp	4,445	22	1.47E-02	1.31E-01	1.57E-01	7.97E-04	4.42E-03	
		Tractor/crawler/dozer	850 hp	3,2327	22	5.24E-02	1.13E+00	4.13E-01	1.65E-03	2.80E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	20	3.31E-01	4.12E+00	2.15E+00	8.95E-03	1.69E-01	
		Tractor/crawler/dozer	440 hp	5	20	4.13E-02	5.15E-01	2.69E-01	1.12E-03	2.11E-02	
		3/4 ton Pickup truck	20	20	9.00E-03	9.76E-03	1.16E-01	2.69E-04	2.12E-03	9.18E-04	
	Drilling	Rotary drill	475 hp	34,0003	126	2.37E-02	2.55E-01	2.82E-01	1.57E-03	8.58E-03	
		3/4 ton Pickup truck	34,0003	126	2.43E-03	2.63E-03	3.12E-02	7.25E-05	5.72E-04	2.48E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	3.43E-03	3.72E-03	4.40E-02	1.02E-04	8.07E-04	3.50E-04	
		Diamond cutting saw	50 hp	48	126	2.16E-02	1.52E-01	1.57E-01	3.01E-04	5.19E-03	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	4.43E-02	5.70E-01	2.58E-01	1.26E-03	2.30E-02	
		3/4 ton Pickup truck	60,0214	126	4.29E-03	4.65E-03	5.51E-02	1.28E-04	1.01E-03	4.38E-04	
	Load/Haul	Front end loader	350 hp	4	126	3.18E-03	3.31E-02	2.12E-02	1.03E-04	1.23E-03	
		Water truck	3000 gal	507	126	1.13E-01	4.41E-01	2.14E-01	1.87E-03	3.20E-02	
	Landfill	Crane 260'	375 hp	30,0107	126	2.22E-02	2.85E-01	1.29E-01	6.31E-04	1.15E-02	
	Micro-blast	Crane 260'	375 hp	49	126	3.62E-02	4.65E-01	2.10E-01	1.03E-03	1.88E-02	
		Horizontal boring drill	10 hp	55	126	4.84E-03	4.07E-02	3.67E-02	9.36E-05	2.18E-03	
		3/4 ton Pickup truck	60	126	4.29E-03	4.65E-03	5.51E-02	1.28E-04	1.01E-03	4.37E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	1.48E-02	1.90E-01	8.59E-02	4.21E-04	7.68E-03	
		Air compressor	50 hp	40	126	5.48E-02	6.67E-02	3.64E+00	2.61E-04	1.65E-03	
		3/4 ton Pickup truck	20	126	1.43E-03	1.55E-03	1.84E-02	4.26E-05	3.36E-04	1.46E-04	
					<b>Total</b>	<b>6.67E+00</b>	<b>7.17E+01</b>	<b>7.18E+01</b>	<b>2.17E-01</b>	<b>3.12E+00</b>	<b>2.81E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	7	0	0	0	0
	71	0	0	0	0
	72	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 5

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2025 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.082	1.056	0.664	0.003	0.041	0.038	301.159	0.015	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Front end loader	540 hp	0.8673	19	0.063	0.598	0.576	0.003	0.023	0.021	293.384	0.012	0.000	
	Tractor/crawler/dozer	310 hp	0.8673	19	0.074	0.823	0.533	0.002	0.035	0.032	234.962	0.011	0.000	
	Chipping	Brush chipper	0.8673	19	0.118	0.696	0.729	0.005	0.021	0.019	403.250	0.011	0.000	
	Front end loader	540 hp	0.8673	19	0.063	0.598	0.576	0.003	0.023	0.021	293.384	0.012	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.082	1.056	0.664	0.003	0.041	0.038	301.159	0.015	0.000
	Front end loader	49 hp	4	19	0.176	1.310	1.792	0.003	0.014	0.013	231.302	0.016	0.000	
	Roller	47 hp	4	19	0.312	1.610	2.047	0.003	0.061	0.056	235.507	0.028	0.000	
	Water truck	3000 gal	4	19	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048	
	Excavator	300 hp	4	19	0.036	0.277	0.407	0.002	0.010	0.009	211.854	0.008	0.000	
	Front end loader	180 hp	4	19	0.053	0.522	0.551	0.003	0.018	0.016	270.061	0.011	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.082	1.056	0.664	0.003	0.041	0.038	301.159	0.015	0.000
	Loader/backhoe	75 hp	0.0923	19	0.064	0.777	1.276	0.002	0.031	0.029	195.356	0.010	0.000	
	Crane 94'	155 hp	155	19	0.080	0.911	1.229	0.002	0.048	0.044	208.066	0.011	0.000	
	1 ton pickup truck		155	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Crane 94'	155 hp	155	20	0.080	0.911	1.229	0.002	0.048	0.044	208.066	0.011	0.000	
	1 ton pickup truck		155	20	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.082	1.056	0.664	0.003	0.041	0.038	301.159	0.015	0.000
	Concrete saw	13 hp	8	23	3.075	2.272	117.535	0.006	1.685	1.681	200.981	0.175	0.188	
	Crane 80'	130 hp	16	23	0.080	0.911	1.229	0.002	0.048	0.044	208.066	0.011	0.000	
	Flatbed truck		8	23	1.975	2.645	28.336	0.061	0.463	0.191	20,361.282	4.604	2.135	
	Generator	80 hp	5856	244	0.128	1.141	1.731	0.003	0.046	0.042	294.384	0.012	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.059	0.662	0.636	0.003	0.024	0.022	280.790	0.014	0.000	
	Push	Tractor/crawler/dozer	600 hp	19	0.059	0.662	0.636	0.003	0.024	0.022	280.790	0.014	0.000	
	Build road	Tractor/crawler/dozer	600 hp	19	0.059	0.662	0.636	0.003	0.024	0.022	280.790	0.014	0.000	
	Armoring	1 ton pickup truck	1,0667	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Excavator	430 hp	1,0667	19	0.036	0.277	0.407	0.002	0.010	0.009	211.854	0.008	0.000	
	1 ton pickup truck		1,0667	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.078	1.045	0.643	0.004	0.034	0.031	312.002	0.013	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048
	Excavator	430 hp	4,445	22	0.036	0.277	0.407	0.002	0.010	0.009	211.854	0.008	0.000	
	Tractor/crawler/dozer	850 hp	3,2327	22	0.092	1.972	0.708	0.003	0.048	0.044	298.249	0.015	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.074	0.823	0.533	0.002	0.035	0.032	234.962	0.011	0.000
	Tractor/crawler/dozer	440 hp	5	20	0.074	0.823	0.533	0.002	0.035	0.032	234.962	0.011	0.000	
	3/4 ton Pickup truck		20	20	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.042	0.414	0.500	0.003	0.014	0.013	282.166	0.006	0.000
	3/4 ton Pickup truck		34,0003	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
	Diamond cutting saw	50 hp	48	126	0.220	1.705	1.844	0.004	0.046	0.043	277.562	0.020	0.000	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.052	0.621	0.320	0.002	0.025	0.023	163.241	0.007	0.000
	3/4 ton Pickup truck		60,0214	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	126	0.058	0.518	0.422	0.002	0.019	0.017	214.821	0.008	0.000
	Water truck	3000 gal	507	126	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048	
	Landfill	Crane 260'	375 hp	30,0107	126	0.052	0.621	0.320	0.002	0.025	0.023	163.241	0.007	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.052	0.621	0.320	0.002	0.025	0.023	163.241	0.007	0.000
	Horizontal boring drill	10 hp	55	126	0.245	1.999	1.909	0.005	0.097	0.089	312.570	0.033	0.000	
	3/4 ton Pickup truck		60	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	126	0.052	0.621	0.320	0.002	0.025	0.023	163.241	0.007	0.000
	Air compressor	50 hp	40	126	0.736	0.891	53.516	0.004	0.024	0.023	307.059	0.042	0.062	
	3/4 ton Pickup truck		20	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 5

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2025 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	7.96E-05	9.96E-05	1.07E-03	3.25E-06	2.51E-05	1.07E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.22E-02	4.82E-02	2.31E-02	1.98E-04	3.39E-03	1.77E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.18E-03	1.47E-03	1.58E-02	4.80E-05	3.71E-04	1.58E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
Fish relocation	3/4 ton pickup truck		16	19	2.65E-05	3.32E-05	3.56E-04	1.08E-06	8.37E-06	3.57E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	7.72E-07	1.61E-06	1.17E-05	7.02E-08	5.29E-07	2.20E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.91E-05	5.01E-04	3.15E-04	1.61E-06	1.95E-05	1.80E-05	1.43E-01	7.17E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19	3.28E-05	3.09E-04	2.97E-04	1.52E-06	1.19E-05	1.10E-05	1.51E-01	5.96E-06	-	1.52E-01	1.38E-01	
		Tractor/crawler/dozer	0.8673	19	2.18E-05	2.44E-04	1.58E-04	6.83E-07	1.02E-05	9.41E-06	6.96E-02	3.37E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	2.82E-05	1.66E-04	1.74E-04	1.08E-06	4.94E-06	4.55E-06	9.64E-02	2.54E-06	-	9.64E-02	8.75E-02	
		Front end loader	0.8673	19	3.28E-05	3.09E-04	2.97E-04	1.52E-06	1.19E-05	1.10E-05	1.51E-01	5.96E-06	-	1.52E-01	1.38E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	3.27E-05	4.19E-04	2.63E-04	1.34E-06	1.63E-05	1.50E-05	1.20E-01	6.00E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	3.79E-05	2.83E-04	3.87E-04	6.46E-07	2.96E-06	2.72E-06	5.00E-02	3.42E-06	-	5.00E-02	4.54E-02	
		Roller	47 hp	4	6.47E-05	3.34E-04	4.24E-04	6.31E-07	1.27E-05	1.17E-05	4.88E-02	5.84E-06	-	4.89E-02	4.44E-02	
		Water truck	3000 gal	4	2.87E-05	1.14E-04	5.45E-05	4.67E-07	7.99E-06	4.17E-06	9.33E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	300 hp	4	4.81E-05	3.67E-04	5.39E-04	2.75E-06	1.30E-05	1.19E-05	2.80E-01	1.02E-05	-	2.80E-01	2.54E-01	
		Front end loader	180 hp	4	4.21E-05	4.14E-04	4.38E-04	2.41E-06	1.39E-05	1.28E-05	2.14E-01	8.58E-06	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	9.81E-05	1.26E-03	7.90E-04	4.03E-06	4.90E-05	4.51E-05	3.69E-01	1.80E-05	-	3.69E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	4.85E-07	5.93E-06	9.74E-06	1.75E-08	2.40E-07	2.21E-07	1.49E-03	7.30E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	2.11E-03	2.41E-02	3.25E-02	6.20E-05	1.27E-03	1.17E-03	5.51E+00	2.86E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	19	1.16E-04	2.41E-04	1.76E-03	1.05E-05	7.94E-05	3.31E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	2.11E-03	2.41E-02	3.25E-02	6.20E-05	1.27E-03	1.17E-03	5.51E+00	2.86E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	20	1.16E-04	2.41E-04	1.76E-03	1.05E-05	7.94E-05	3.31E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	3.27E-05	4.19E-04	2.63E-04	1.34E-06	1.63E-05	1.50E-05	1.20E-01	6.00E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02	
		Crane 80'	130 hp	16	2.18E-04	2.09E-03	2.82E-03	5.37E-06	1.10E-04	1.01E-04	4.77E-01	2.48E-05	-	4.78E-01	4.33E-01	
		Flatbed truck	8	23	1.74E-05	2.33E-05	2.50E-04	5.36E-07	4.08E-06	1.69E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	6.62E-02	5.89E-01	8.94E-01	1.78E-03	2.38E-02	1.52E+02	5.98E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.09E-03	3.45E-02	3.32E-02	1.47E-04	1.27E-03	1.17E-03	1.46E+01	7.12E-04	-	1.47E+01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.09E-03	3.45E-02	3.32E-02	1.47E-04	1.27E-03	1.17E-03	1.46E+01	7.12E-04	-	1.47E+01	
		Tractor/crawler/dozer	600 hp	78,8462	19	3.09E-03	3.45E-02	3.32E-02	1.47E-04	1.27E-03	1.17E-03	1.46E+01	7.12E-04	-	1.47E+01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.09E-03	3.45E-02	3.32E-02	1.47E-04	1.27E-03	1.17E-03	1.46E+01	7.12E-04	-	1.47E+01	
	Armoring	1 ton pickup truck	1,0667	19	7.98E-07	1.66E-06	1.21E-05	7.25E-08	5.47E-07	2.28E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1,0667	19	1.84E-05	1.40E-04	2.06E-04	1.05E-06	4.96E-06	4.57E-06	1.07E-01	3.91E-06	-	1.07E-01	
		1 ton pickup truck	1,0667	19	7.98E-07	1.66E-06	1.21E-05	7.25E-08	5.47E-07	2.28E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	2.65E-03	3.57E-02	2.20E-02	1.20E-04	1.15E-03	1.06E-03	1.06E+01	4.36E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.87E-05	1.93E-04	9.25E-05	7.91E-07	1.35E-05	7.08E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	
		Excavator	430 hp	4,445	22	7.66E-05	5.84E-04	8.58E-04	4.38E-06	2.07E-05	1.90E-05	4.46E-01	1.63E-05	-	4.47E-01	
		Tractor/crawler/dozer	850 hp	3,2327	22	2.79E-04	5.97E-03	2.14E-03	9.08E-06	1.45E-04	1.33E-04	9.03E-01	4.64E-05	-	9.04E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	1.43E-03	1.60E-02	1.03E-02	4.47E-05	6.70E-04	6.16E-04	4.56E+00	2.21E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	440 hp	5	1.79E-04	2.00E-03	1.29E-03	5.59E-06	8.37E-05	7.70E-05	5.70E-01	2.76E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck	20	20	3.32E-05	4.15E-05	4.46E-04	1.36E-06	1.05E-05	4.46E-06	4.49E-01	4.46E-05	-	4.57E-01	4.15E-01	
	Drilling	Rotary drill	475 hp	34,0003	126	7.51E-04	7.36E-03	8.89E-03	4.93E-05	2.62E-04	2.32E-04	5.02E+00	1.03E-04	-	5.03E+00	
		3/4 ton Pickup truck	34,0003	126	5.64E-05	7.05E-05	7.57E-04	2.30E-06	1.78E-05	7.59E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	7.96E-05	9.96E-05	1.07E-03	3.25E-06	2.51E-05	1.07E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
		Diamond cutting saw	50 hp	48	5.81E-04	4.51E-03	4.88E-03	9.49E-06	1.23E-04	1.13E-04	7.34E-01	5.24E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.29E-03	1.54E-02	7.95E-03	3.98E-05	6.28E-04	5.78E-04	4.05E+00	1.74E-04	-	4.05E+00	
		3/4 ton Pickup truck	60,0214	126	9.95E-05	1.25E-04	1.34E-03	4.07E-06	3.14E-05	1.34E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	8.91E-05	8.00E-04	6.51E-04	3.25E-06	2.93E-05	2.70E-05	3.32E-01	1.30E-05	-	3.32E-01	3.01E-01	
		Water truck	3000 gal	507	3.64E-03	1.44E-02	6.91E-03	5.92E-05	1.01E-03	5.29E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	6.45E-04	7.70E-03	3.97E-03	1.99E-05	3.14E-04	2.89E-04	2.03E+00	8.70E-05	-	2.03E+00	
	Micro-blast	Crane 260'	375 hp	49	1.05E-03	1.26E-02	6.49E-03	3.25E-05	5.13E-04	4.72E-04	3.31E+00	1.42E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	10 hp	55	1.49E-04	1.21E-03	1.16E-03	2.95E-06	5.88E-05	5.41E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton Pickup truck	60	126	9.95E-05	1.24E-04	1.34E-03	4.07E-06	3.14E-05	1.34E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	4.30E-04	5.13E-03	2.65E-03	1.32E-05	2.09E-04	1.93E-04	1.35E+00	5.80E-05	-	1.35E+00	1.23E+00	
		Air compressor	50 hp	40	1.62E-03	1.96E-03	1.18E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	9.23E-05	1.38E-04	7.22E-01	6.55E-01	
		3/4 ton Pickup truck	20	126	3.32E-05	4.15E-05	4.46E-04	1.36E-06	1.05E-05	4.46E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>Total</b>	<b>1.13E-01</b>	<b>9.66E-01</b>	<b>1.36E+00</b>	<b>3.23E-03</b>	<b>4.13E-02</b>	<b>3.59E-02</b>	<b>3.40E+02</b>	<b>1.42E-02</b>	<b>1.84E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 5

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2025 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	1.52E-03	1.90E-03	2.04E-02	6.20E-05	4.78E-04	2.04E-04	
Dust Control	Water truck	5000 gal	1696	210	2.32E-01	9.19E-01	4.41E-01	3.77E-03	6.46E-02	3.37E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.24E-02	2.80E-02	3.01E-01	9.15E-04	7.06E-03	3.01E-03	
	Fish relocation	3/4 ton pickup truck	16	19	5.59E-03	6.99E-03	7.50E-02	2.28E-04	1.76E-03	7.52E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.63E-04	3.39E-04	2.47E-03	1.48E-05	1.11E-04	4.64E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	8.22E-03	1.05E-01	6.63E-02	3.38E-04	4.11E-03	3.78E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.90E-03	6.50E-02	6.26E-02	3.21E-04	2.52E-03	2.31E-03	
		Tractor/crawler/dozer	0.8673	19	4.60E-03	5.14E-02	3.32E-02	1.44E-04	2.15E-03	1.98E-03	
	Chipping	Brush chipper	0.8673	19	5.94E-03	3.50E-02	3.67E-02	2.28E-04	1.04E-03	9.58E-04	
		Front end loader	0.8673	19	6.90E-03	6.50E-02	6.26E-02	3.21E-04	2.52E-03	2.31E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	6.88E-03	8.82E-02	5.55E-02	2.83E-04	3.44E-03	3.17E-03	
		Front end loader	49 hp	4	7.99E-03	5.96E-02	8.15E-02	1.36E-04	6.23E-04	5.73E-04	
		Roller	47 hp	4	1.36E-02	7.02E-02	8.93E-02	1.33E-04	2.67E-03	2.46E-03	
		Water truck	3000 gal	4	6.05E-03	2.40E-02	1.15E-02	9.62E-05	1.68E-03	8.79E-04	
		Excavator	300 hp	4	1.01E-02	7.73E-02	1.13E-01	5.79E-04	2.73E-03	2.51E-03	
		Front end loader	180 hp	4	8.86E-03	8.72E-02	9.21E-02	5.08E-04	2.93E-03	2.89E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	2.06E-02	2.65E-01	1.66E-01	8.49E-04	1.03E-02	9.50E-03	
		Loader/backhoe	75 hp	0.0923	1.02E-04	1.25E-03	2.05E-03	3.68E-06	5.06E-05	4.65E-05	
		Crane 94'	155 hp	155	4.44E-01	5.08E+00	6.85E+00	1.31E-02	2.67E-01	2.46E-01	
		1 ton pickup truck	155	19	2.44E-02	5.08E-02	3.70E-01	2.22E-03	1.67E-02	6.97E-03	
		Crane 94'	155 hp	155	4.21E-01	4.82E+00	6.51E+00	1.24E-02	2.54E-01	2.34E-01	
		1 ton pickup truck	155	20	2.32E-02	4.83E-02	3.52E-01	2.11E-03	1.59E-02	6.62E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	6.54E-03	8.38E-02	5.27E-02	2.69E-04	3.27E-03	3.01E-03	
Dewatering	Concrete saw	13 hp	8	23	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
	Crane 80'	130 hp	16	23	3.17E-02	3.63E-01	4.90E-01	9.33E-04	1.91E-02	1.76E-02	
	Flatbed truck		8	23	3.03E-03	4.06E-03	4.35E-02	9.32E-05	7.09E-04	2.94E-04	
	Generator	80 hp	5856	244	1.09E+00	9.66E+00	1.47E+01	2.92E-02	3.90E-01	3.59E-01	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	6.50E-01	7.27E+00	6.98E+00	3.10E-02	2.67E-01	2.46E-01	
	Push	Tractor/crawler/dozer	600 hp	19	6.50E-01	7.27E+00	6.98E+00	3.10E-02	2.67E-01	2.46E-01	
		Tractor/crawler/dozer	600 hp	19	6.50E-01	7.27E+00	6.98E+00	3.10E-02	2.67E-01	2.46E-01	
	Build road	Tractor/crawler/dozer	600 hp	19	6.50E-01	7.27E+00	6.98E+00	3.10E-02	2.67E-01	2.46E-01	
	Armoring	1 ton pickup truck	1,0667	19	1.68E-04	3.50E-04	2.55E-03	1.53E-05	1.15E-04	4.79E-05	
		Excavator	430 hp	1,0667	3.87E-03	2.95E-02	4.34E-02	2.21E-04	1.04E-03	9.61E-04	
		1 ton pickup truck	1,0667	19	1.68E-04	3.50E-04	2.55E-03	1.53E-05	1.15E-04	4.79E-05	
	Maintenance	Grader	215 hp	144	5.05E-02	6.79E-01	4.18E-01	2.28E-03	2.19E-02	2.01E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	8.85E-03	3.51E-02	1.68E-02	1.44E-04	2.46E-03	1.29E-03	
		Excavator	430 hp	4,445	1.39E-02	1.06E-01	1.56E-01	7.97E-04	3.76E-03	3.46E-03	
		Tractor/crawler/dozer	850 hp	3,2327	5.06E-02	1.09E+00	3.90E-01	1.65E-03	2.63E-02	2.42E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.86E-01	3.19E+00	2.07E+00	8.95E-03	1.34E-01	1.23E-01	
		Tractor/crawler/dozer	440 hp	5	3.57E-02	3.99E-01	2.58E-01	1.12E-03	1.67E-02	1.54E-02	
		3/4 ton Pickup truck	20	20	6.63E-03	8.30E-03	8.91E-02	2.71E-04	2.09E-03	8.83E-04	
	Drilling	Rotary drill	475 hp	34,0003	2.39E-02	2.34E-01	2.82E-01	1.67E-03	7.99E-03	7.35E-03	
		3/4 ton Pickup truck	34,0003	126	1.79E-03	2.24E-03	2.40E-02	7.31E-05	5.65E-04	2.41E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.53E-03	3.16E-03	3.39E-02	1.03E-04	7.97E-04	3.40E-04	
		Diamond cutting saw	50 hp	48	1.85E-02	1.43E-01	1.55E-01	3.01E-04	3.90E-03	3.59E-03	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	4.10E-02	4.89E-01	2.52E-01	1.26E-03	1.99E-02	1.84E-02	
		3/4 ton Pickup truck	60,0214	126	3.16E-03	3.95E-03	4.24E-02	1.29E-04	9.97E-04	4.25E-04	
	Load/Haul	Front end loader	350 hp	4	2.83E-03	2.54E-02	2.07E-02	1.03E-04	9.31E-04	8.56E-04	
		Water truck	3000 gal	507	1.16E-01	4.58E-01	2.19E-01	1.88E-03	3.22E-02	1.68E-02	
	Landfill	Crane 260'	375 hp	30,0107	2.05E-02	2.44E-01	1.26E-01	6.31E-04	9.97E-03	9.18E-03	
	Micro-blast	Crane 260'	375 hp	49	3.34E-02	3.99E-01	2.06E-01	1.03E-03	1.63E-02	1.50E-02	
		Horizontal boring drill	10 hp	55	4.72E-03	3.85E-02	3.67E-02	9.36E-05	1.87E-03	1.72E-03	
		3/4 ton Pickup truck	60	126	3.16E-03	3.95E-03	4.24E-02	1.29E-04	9.96E-04	4.25E-04	
	Demolish spillway	Crane 260'	375 hp	20	1.36E-02	1.63E-01	8.41E-02	4.21E-04	6.65E-03	6.12E-03	
		Air compressor	50 hp	40	5.15E-02	6.24E-02	3.75E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	1.05E-03	1.32E-03	1.41E-02	4.30E-05	3.32E-04	1.42E-04	
					<b>Total</b>	<b>5.89E+00</b>	<b>5.90E+01</b>	<b>7.01E+01</b>	<b>2.17E-01</b>	<b>2.49E+00</b>	<b>2.23E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

10

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite						
Rindge	6	59	70	0	2	2
Surridge	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	0	0	0	0	0	0
Landfill	0	0	0	0	0	0



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 6

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2027 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		48	210	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056		
Dust Control	Water truck	5000 gal	1696	210	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056		
	Fish relocation	3/4 ton pickup truck	16	19	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056		
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056		
		Tractor/crawler/dozer	250 hp	1,7208	19	0.076	0.887	0.652	0.003	0.035	0.033	301.159	0.014	0.000	
		Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
		Front end loader	540 hp	0.8673	19	0.057	0.465	0.567	0.003	0.017	0.016	293.384	0.011	0.000	
		Tractor/crawler/dozer	310 hp	0.8673	19	0.068	0.697	0.516	0.002	0.030	0.027	234.962	0.011	0.000	
		Chipping	Brush chipper	250 hp	0.8673	19	0.107	0.515	0.727	0.005	0.015	0.014	403.250	0.010	0.000
			Front end loader	540 hp	0.8673	19	0.057	0.465	0.567	0.003	0.017	0.016	293.384	0.011	0.000
			Tractor/crawler/dozer	180 hp	2	19	0.076	0.887	0.652	0.003	0.035	0.033	301.159	0.014	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.170	1.291	1.788	0.003	0.010	0.010	231.302	0.015	0.000	
		Front end loader	49 hp	4	19	0.277	1.536	2.015	0.003	0.046	0.043	235.507	0.025	0.000	
		Roller	47 hp	4	19	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048	
		Water truck	3000 gal	4	19	0.035	0.240	0.406	0.002	0.009	0.008	211.854	0.007	0.000	
		Excavator	300 hp	4	19	0.048	0.378	0.546	0.003	0.013	0.012	270.061	0.010	0.000	
		Front end loader	180 hp	4	19	0.076	0.887	0.652	0.003	0.035	0.033	301.159	0.014	0.000	
		36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.058	0.709	1.275	0.002	0.024	0.022	195.356	0.009	0.000
			Loader/backhoe	75 hp	0.0923	19	0.068	0.738	1.229	0.002	0.038	0.035	208.066	0.010	0.000
			Crane 94'	155 hp	155	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056
			1 ton pickup truck	155	19	0.068	0.738	1.229	0.002	0.038	0.035	208.066	0.010	0.000	
			Crane 94'	155 hp	155	20	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056
			1 ton pickup truck	155	20	0.068	0.738	1.229	0.002	0.038	0.035	208.066	0.010	0.000	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.076	0.887	0.652	0.003	0.035	0.033	301.159	0.014	0.000
		Dewatering	Concrete saw	13 hp	8	23	3.073	2.271	117.522	0.006	1.685	1.681	200.981	0.175	0.188
			Crane 80'	130 hp	16	23	0.068	0.738	1.229	0.002	0.038	0.035	208.066	0.010	0.000
			Flatbed truck	8	23	1.465	2.125	21.302	0.061	0.460	0.189	20,361.282	4.604	2.135	
			Generator	80 hp	5856	244	0.112	1.009	1.727	0.003	0.032	0.029	294.384	0.010	0.000
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.055	0.549	0.616	0.003	0.020	0.019	280.790	0.013	0.000
			Tractor/crawler/dozer	600 hp	78.8462	19	0.055	0.549	0.616	0.003	0.020	0.019	280.790	0.013	0.000
			Tractor/crawler/dozer	600 hp	78.8462	19	0.055	0.549	0.616	0.003	0.020	0.019	280.790	0.013	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.055	0.549	0.616	0.003	0.020	0.019	280.790	0.013	0.000	
		Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.055	0.549	0.616	0.003	0.020	0.019	280.790	0.013	0.000
		Armoring	1 ton pickup truck	1,0667	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
			Excavator	430 hp	1,0667	19	0.035	0.240	0.406	0.002	0.009	0.008	211.854	0.007	0.000
			1 ton pickup truck	1,0667	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
Demolition	Maintenance	Grader	215 hp	144	210	0.065	0.765	0.637	0.004	0.025	0.023	312.002	0.012	0.000	
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048	
		Excavator	430 hp	4,445	22	0.035	0.240	0.406	0.002	0.009	0.008	211.854	0.007	0.000	
		Tractor/crawler/dozer	850 hp	3,2327	22	0.079	1.715	0.676	0.003	0.039	0.036	298.249	0.014	0.000	
		Platform	Tractor/crawler/dozer	440 hp	40	20	0.068	0.697	0.516	0.002	0.030	0.027	234.962	0.011	0.000
			Tractor/crawler/dozer	440 hp	5	20	0.068	0.697	0.516	0.002	0.030	0.027	234.962	0.011	0.000
			3/4 ton Pickup truck	20	20	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
		Drilling	Rotary drill	475 hp	34,0003	126	0.041	0.378	0.500	0.003	0.013	0.012	282.166	0.006	0.000
			3/4 ton Pickup truck	34,0003	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
			Diamond cutting saw	50 hp	48	126	0.189	1.609	1.816	0.004	0.033	0.030	277.562	0.017	0.000
		Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.050	0.552	0.317	0.002	0.023	0.021	163.241	0.006	0.000
			3/4 ton Pickup truck	60,0214	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
		Load/Haul	Front end loader	350 hp	4	126	0.054	0.422	0.415	0.002	0.016	0.014	214.821	0.008	0.000
			Water truck	3000 gal	507	126	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048
		Landfill	Crane 260'	375 hp	30,0107	126	0.050	0.552	0.317	0.002	0.023	0.021	163.241	0.006	0.000
		Micro-blast	Crane 260'	375 hp	49	126	0.050	0.552	0.317	0.002	0.023	0.021	163.241	0.006	0.000
			Horizontal boring drill	10 hp	55	126	0.245	1.938	1.909	0.005	0.088	0.081	312.570	0.033	0.000
			3/4 ton Pickup truck	60	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
		Demolish spillway	Crane 260'	375 hp	20	126	0.050	0.552	0.317	0.002	0.023	0.021	163.241	0.006	0.000
		Air compressor	50 hp	40	126	0.693	0.839	54.516	0.004	0.024	0.023	307.059	0.039	0.061	
		3/4 ton Pickup truck	20	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056		

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surridge  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 6

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2027 (tons per year)										Metric Tons CO2e/yr
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		48	210	5.97E-05	8.62E-05	8.41E-04	3.25E-06	2.49E-05	1.05E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.89E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	8.82E-04	1.27E-03	1.24E-02	4.80E-05	3.67E-04	1.55E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01
	Fish relocation	3/4 ton pickup truck	16	19	1.99E-05	2.87E-05	2.80E-04	1.08E-06	8.29E-06	3.50E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	5.95E-07	1.37E-06	9.26E-06	7.02E-08	5.25E-07	2.17E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02
	Tractor/crawler/dozer	250 hp	1,7208	19	3.59E-05	4.21E-04	3.09E-04	1.61E-06	1.68E-05	1.54E-05	1.43E-01	6.61E-06	-	1.43E-01	1.30E-01
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04
	Brush Piling	Front end loader	0.8673	19	2.93E-05	2.40E-04	2.93E-04	1.52E-06	8.83E-06	8.13E-06	1.51E-01	5.52E-06	-	1.52E-01	1.38E-01
		Tractor/crawler/dozer	0.8673	19	2.03E-05	2.07E-04	1.53E-04	6.83E-07	8.77E-06	8.07E-06	6.96E-02	3.13E-06	-	6.97E-02	6.32E-02
	Chipping	Brush chipper	0.8673	19	2.55E-05	1.23E-04	1.74E-04	1.08E-06	3.63E-06	3.34E-06	9.64E-02	2.30E-06	-	9.64E-02	8.75E-02
		Front end loader	0.8673	19	2.93E-05	2.40E-04	2.93E-04	1.52E-06	8.83E-06	8.13E-06	1.51E-01	5.52E-06	-	1.52E-01	1.38E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	3.01E-05	3.52E-04	2.59E-04	1.34E-06	1.41E-05	1.29E-05	1.20E-01	5.53E-06	-	1.20E-01	1.09E-01
		Front end loader	49 hp	4	3.68E-05	2.79E-04	3.86E-04	6.46E-07	2.24E-06	2.07E-06	5.00E-02	3.32E-06	-	5.00E-02	4.44E-02
		Roller	47 hp	4	5.75E-05	3.18E-04	4.17E-04	6.31E-07	9.63E-06	8.86E-06	4.88E-02	5.19E-06	-	4.89E-02	4.44E-02
		Water truck	3000 gal	4	2.90E-05	1.15E-04	5.51E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02
		Excavator	300 hp	4	4.67E-05	3.17E-04	5.37E-04	2.75E-06	1.13E-05	1.04E-05	2.80E-01	9.56E-06	-	2.80E-01	2.54E-01
		Front end loader	180 hp	4	3.82E-05	3.00E-04	4.33E-04	2.41E-06	1.04E-05	9.58E-06	2.14E-01	7.91E-06	-	2.14E-01	1.95E-01
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	9.02E-05	1.06E-03	7.77E-04	4.03E-06	4.22E-05	3.88E-05	3.69E-01	1.66E-05	-	3.69E-01	3.26E-01
		Loader/backhoe	75 hp	0.0923	4.46E-07	5.41E-06	9.73E-06	1.75E-08	1.80E-07	1.66E-07	1.49E-03	6.87E-08	-	1.49E-03	1.35E-03
		Crane 94'	155 hp	155	1.80E-03	1.95E-02	3.25E-02	6.20E-05	1.01E-03	9.27E-04	5.51E+00	2.57E-04	-	5.52E+00	5.00E+00
		1 ton pickup truck	155	19	8.93E-05	2.05E-04	1.39E-03	1.05E-05	7.89E-05	3.26E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Crane 94'	155 hp	155	1.80E-03	1.95E-02	3.25E-02	6.20E-05	1.01E-03	9.27E-04	5.51E+00	2.57E-04	-	5.52E+00	5.00E+00
		1 ton pickup truck	155	20	8.93E-05	2.05E-04	1.39E-03	1.05E-05	7.89E-05	3.26E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	3.01E-05	3.52E-04	2.59E-04	1.34E-06	1.41E-05	1.29E-05	1.20E-01	5.53E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02
		Crane 80'	130 hp	16	2.16E-04	1.69E-03	2.82E-03	5.37E-06	8.72E-05	8.03E-05	4.77E-01	2.22E-05	-	4.78E-01	4.33E-01
		Flatbed truck	8	23	1.29E-05	1.87E-05	1.88E-04	5.36E-07	4.06E-06	1.67E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
		Generator	80 hp	5856	244	5.77E-02	5.21E-01	8.92E-01	1.78E-03	1.63E-02	1.50E-02	5.21E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	2.86E-03	2.86E-02	3.21E-02	1.47E-04	1.06E-03	9.75E-04	1.46E+01	6.60E-04	-	1.47E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	2.86E-03	2.86E-02	3.21E-02	1.47E-04	1.06E-03	9.75E-04	1.46E+01	6.60E-04	-	1.47E+01
		Tractor/crawler/dozer	600 hp	78,8462	19	2.86E-03	2.86E-02	3.21E-02	1.47E-04	1.06E-03	9.75E-04	1.46E+01	6.60E-04	-	1.47E+01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	2.86E-03	2.86E-02	3.21E-02	1.47E-04	1.06E-03	9.75E-04	1.46E+01	6.60E-04	-	1.47E+01
	Armoring	1 ton pickup truck	1,0667	19	6.14E-07	1.41E-06	9.57E-06	7.25E-08	5.43E-07	2.24E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
		Excavator	430 hp	1,0667	19	1.79E-05	1.21E-04	2.05E-04	1.05E-06	4.33E-06	3.98E-06	1.07E-01	3.65E-06	-	1.07E-01
		1 ton pickup truck	1,0667	19	6.14E-07	1.41E-06	9.57E-06	7.25E-08	5.43E-07	2.24E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
	Maintenance	Grader	215 hp	144	2.23E-03	2.61E-02	2.17E-02	1.20E-04	8.59E-04	7.91E-04	1.06E+01	4.03E-04	-	1.07E+01	9.67E+00
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.92E-05	1.96E-04	9.34E-05	7.91E-07	1.36E-05	7.11E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01
		Excavator	430 hp	4,445	22	7.44E-05	5.05E-04	8.56E-04	4.38E-06	1.80E-05	1.66E-05	4.46E-01	1.52E-05	-	4.47E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	2.40E-04	5.20E-03	2.05E-03	9.08E-06	1.17E-04	1.08E-04	9.03E-01	4.26E-05	-	9.04E-01
	Platform	Tractor/crawler/dozer	440 hp	40	1.33E-03	1.35E-02	1.00E-02	4.47E-05	5.74E-04	5.28E-04	4.56E+00	2.05E-04	-	4.56E+00	4.14E+00
		Tractor/crawler/dozer	440 hp	5	1.66E-04	1.69E-03	1.25E-03	5.59E-06	7.17E-05	6.60E-05	5.70E-01	2.56E-05	-	5.70E-01	5.17E-01
		3/4 ton Pickup truck	20	20	2.49E-05	3.59E-05	3.50E-04	1.36E-06	1.04E-05	4.37E-06	4.49E-01	4.46E-05	2.33E-05	-	4.15E-01
	Drilling	Rotary drill	475 hp	34,0003	126	7.38E-04	6.73E-03	8.89E-03	4.93E-05	2.34E-04	2.16E-04	5.02E+00	1.02E-04	-	5.03E+00
		3/4 ton Pickup truck	34,0003	126	4.23E-05	6.11E-05	5.95E-04	2.30E-06	1.76E-05	7.43E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	5.97E-05	8.62E-05	8.41E-04	3.25E-06	2.49E-05	1.05E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
		Diamond cutting saw	50 hp	48	4.99E-04	4.26E-03	4.80E-03	9.49E-06	8.68E-05	7.99E-05	7.34E-01	4.50E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.24E-03	1.37E-02	7.86E-03	3.98E-05	5.65E-04	5.20E-04	4.05E+00	1.60E-04	-	4.05E+00
		3/4 ton Pickup truck	60,0214	126	7.46E-05	1.08E-04	1.05E-03	4.07E-06	3.11E-05	1.31E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
	Load/Haul	Front end loader	350 hp	4	8.39E-05	6.52E-04	6.41E-04	3.25E-06	2.42E-05	2.23E-05	3.32E-01	1.21E-05	-	3.32E-01	3.01E-01
		Water truck	3000 gal	507	3.68E-03	1.46E-02	6.99E-03	5.91E-05	1.02E-03	5.32E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	375 hp	30,0107	126	6.18E-04	6.85E-03	3.93E-03	1.99E-05	2.83E-04	2.60E-04	2.03E+00	7.98E-05	-	2.03E+00
	Micro-blast	Crane 260'	375 hp	49	1.01E-03	1.12E-02	6.41E-03	3.25E-05	4.61E-04	4.24E-04	3.31E+00	1.30E-04	-	3.31E+00	3.00E+00
		Horizontal boring drill	10 hp	55	1.49E-04	1.17E-03	1.16E-03	2.95E-06	5.35E-05	4.92E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
		3/4 ton Pickup truck	60	126	7.46E-05	1.08E-04	1.05E-03	4.07E-06	3.11E-05	1.31E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	375 hp	20	4.12E-04	4.56E-03	2.62E-03	1.32E-05	1.88E-04	1.73E-04	1.35E+00	5.32E-05	-	1.35E+00	1.23E+00
		Air compressor	50 hp	40	1.53E-03	1.85E-03	1.20E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	8.69E-05	1.35E-04	7.21E-01	6.54E-01
		3/4 ton Pickup truck	20	126	2.49E-05	3.59E-05	3.50E-04	1.36E-06	1.04E-05	4.37E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01
	<b>Total</b>				<b>1.02E-01</b>	<b>8.45E-01</b>	<b>1.35E+00</b>	<b>3.23E-03</b>	<b>3.17E-02</b>	<b>2.71E-02</b>	<b>3.40E+02</b>	<b>1.30E-02</b>	<b>1.84E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 6

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2027 (pounds per day)						
					VOC	Nox	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	1.14E-03	1.64E-03	1.60E-02	6.19E-05	4.74E-04	2.00E-04	
Dust Control	Water truck	5000 gal	1696	210	2.34E-01	9.32E-01	4.45E-01	3.77E-03	6.47E-02	3.39E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.68E-02	2.43E-02	2.37E-01	9.15E-04	6.99E-03	2.95E-03	
	Fish relocation	3/4 ton pickup truck	16	19	4.19E-03	6.05E-03	5.90E-02	2.28E-04	1.74E-03	7.36E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.25E-04	2.88E-04	1.95E-03	1.48E-05	1.11E-04	4.57E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	7.56E-03	8.85E-02	6.51E-02	3.38E-04	3.54E-03	3.25E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.17E-03	5.05E-02	6.16E-02	3.21E-04	1.86E-03	1.71E-03	
		Tractor/crawler/dozer	0.8673	19	4.27E-03	4.35E-02	3.22E-02	1.44E-04	1.85E-03	1.70E-03	
	Chipping	Brush chipper	0.8673	19	5.37E-03	2.59E-02	3.66E-02	2.28E-04	7.64E-04	7.03E-04	
		Front end loader	0.8673	19	6.17E-03	5.05E-02	6.16E-02	3.21E-04	1.86E-03	1.71E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	6.33E-03	7.41E-02	5.45E-02	2.83E-04	2.96E-03	2.72E-03	
		Front end loader	49 hp	4	7.74E-03	5.87E-02	8.13E-02	1.36E-04	4.73E-04	4.35E-04	
		Roller	47 hp	4	1.21E-02	6.70E-02	8.79E-02	1.33E-04	2.03E-03	1.86E-03	
		Water truck	3000 gal	4	6.11E-03	2.43E-02	1.16E-02	9.62E-05	1.69E-03	8.94E-04	
		Excavator	300 hp	4	8.83E-03	6.68E-02	1.13E-01	5.79E-04	2.38E-03	2.19E-03	
		Front end loader	180 hp	4	8.05E-03	6.31E-02	9.12E-02	5.08E-04	2.19E-03	2.02E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.90E-02	2.22E-01	1.64E-01	8.49E-04	8.88E-03	8.17E-03	
		Loader/backhoe	75 hp	0.0923	9.40E-05	1.14E-03	2.05E-03	3.88E-06	3.79E-05	3.49E-05	
		Crane 94'	155 hp	155	3.78E-01	4.11E+00	6.85E+00	1.31E-02	2.12E-01	1.95E-01	
		1 ton pickup truck	155	19	1.88E-02	4.32E-02	2.93E-01	2.22E-03	1.66E-02	6.85E-03	
		Crane 94'	155 hp	155	3.60E-01	3.91E+00	6.51E+00	1.24E-02	2.02E-01	1.85E-01	
		1 ton pickup truck	155	20	1.79E-02	4.10E-02	2.78E-01	2.11E-03	1.58E-02	6.51E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	6.01E-03	7.04E-02	5.18E-02	2.69E-04	2.81E-03	2.59E-03	
Dewatering	Concrete saw		13	8	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
	Crane 80'		130	16	2.71E-02	2.94E-01	4.90E-01	9.33E-04	1.52E-02	1.40E-02	
	Flatbed truck		8	23	2.25E-03	3.26E-03	3.27E-02	9.32E-05	7.06E-04	2.90E-04	
	Generator	80 hp	5856	244	9.46E-01	8.54E+00	1.46E+01	2.92E-02	2.68E-01	2.46E-01	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	6.02E-01	6.02E+00	6.76E+00	3.10E-02	2.23E-01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	6.02E-01	6.02E+00	6.76E+00	3.10E-02	2.23E-01	
		Tractor/crawler/dozer	600 hp	78,8462	19	6.02E-01	6.02E+00	6.76E+00	3.10E-02	2.23E-01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	6.02E-01	6.02E+00	6.76E+00	3.10E-02	2.23E-01	
	Armoring	1 ton pickup truck	1,0667	19	1.29E-04	2.97E-04	2.01E-03	1.53E-05	1.14E-04	4.72E-05	
		Excavator	430 hp	1,0667	19	3.76E-03	2.55E-02	4.32E-02	2.21E-04	9.11E-04	
		1 ton pickup truck	1,0667	19	1.29E-04	2.97E-04	2.01E-03	1.53E-05	1.14E-04	4.72E-05	
	Maintenance	Grader	215 hp	144	4.24E-02	4.97E-01	4.14E-01	2.28E-03	1.64E-02	1.51E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.95E-03	3.56E-02	1.70E-02	1.44E-04	2.47E-03	
		Excavator	430 hp	4,445	22	1.35E-02	9.19E-02	1.56E-01	7.97E-04	3.28E-03	
		Tractor/crawler/dozer	850 hp	3,2327	22	4.37E-02	9.45E-01	3.72E-01	1.65E-03	2.13E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.65E-01	2.70E+00	2.00E+00	8.95E-03	1.15E-01	1.06E-01	
		Tractor/crawler/dozer	440 hp	5	3.32E-02	3.38E-01	2.50E-01	1.12E-03	1.43E-02	1.32E-02	
		3/4 ton Pickup truck	20	20	4.97E-03	7.18E-03	7.01E-02	2.71E-04	2.07E-03	8.74E-04	
	Drilling	Rotary drill	475 hp	34,0003	126	2.34E-02	2.14E-01	2.82E-01	1.57E-03	7.44E-03	
		3/4 ton Pickup truck	34,0003	126	1.34E-03	1.94E-03	1.89E-02	7.31E-05	5.59E-04	2.36E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.89E-03	2.74E-03	2.67E-02	1.03E-04	7.89E-04	3.33E-04	
		Diamond cutting saw	50 hp	48	1.58E-02	1.35E-01	1.53E-01	3.01E-04	2.76E-03	2.54E-03	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	3.92E-02	4.35E-01	2.49E-01	1.26E-03	1.79E-02	
		3/4 ton Pickup truck	60,0214	126	2.37E-03	3.42E-03	3.34E-02	1.29E-04	9.87E-04	4.16E-04	
	Load/Haul	Front end loader	350 hp	4	2.66E-03	2.07E-02	2.03E-02	1.03E-04	7.69E-04	7.07E-04	
		Water truck	3000 gal	507	1.17E-01	4.64E-01	2.22E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30,0107	126	1.96E-02	2.17E-01	1.25E-01	6.31E-04	8.97E-03	
	Micro-blast	Crane 260'	375 hp	49	3.20E-02	3.55E-01	2.04E-01	1.03E-03	1.46E-02	1.35E-02	
		Horizontal boring drill	10 hp	55	4.72E-03	3.73E-02	3.67E-02	9.36E-05	1.70E-03	1.56E-03	
		3/4 ton Pickup truck	60	126	2.37E-03	3.42E-03	3.34E-02	1.29E-04	9.87E-04	4.16E-04	
	Demolish spillway	Crane 260'	375 hp	20	1.31E-02	1.45E-01	8.31E-02	4.21E-04	5.98E-03	5.50E-03	
		Air compressor	50 hp	40	4.85E-02	5.87E-02	3.82E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	7.89E-04	1.14E-03	1.11E-02	4.30E-05	3.29E-04	1.39E-04	
					<b>Total</b>	<b>5.35E+00</b>	<b>4.97E+01</b>	<b>6.88E+01</b>	<b>2.17E-01</b>	<b>2.04E+00</b>	<b>1.81E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	5	49	69	0	2
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 7

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2029 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.644	0.003	0.030	0.028	301.159	0.013	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.562	0.003	0.016	0.014	293.384	0.010	0.000	
	Tractor/crawler/dozer	310 hp	0.8673	19	0.065	0.604	0.502	0.002	0.026	0.024	234.962	0.010	0.000	
	Chipping	Brush chipper	0.8673	19	0.099	0.388	0.726	0.005	0.013	0.012	403.250	0.009	0.000	
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.562	0.003	0.016	0.014	293.384	0.010	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.644	0.003	0.030	301.159	0.013	0.000	
	Front end loader	49 hp	4	19	0.168	1.278	1.786	0.003	0.008	0.008	231.302	0.015	0.000	
	Roller	47 hp	4	19	0.253	1.471	1.992	0.003	0.035	0.032	235.507	0.023	0.000	
	Water truck	3000 gal	4	19	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048	
	Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	Front end loader	180 hp	4	19	0.047	0.313	0.542	0.003	0.011	0.010	270.061	0.009	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.644	0.003	0.030	301.159	0.013	0.000	
	Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.274	0.002	0.020	0.018	195.356	0.009	0.000	
	Crane 94'	155 hp	155	19	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.009	0.000	
	1 ton pickup truck	155 hp	155	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Crane 94'	155 hp	155	20	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.009	0.000	
	1 ton pickup truck	155 hp	155	20	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.644	0.003	0.030	301.159	0.013	0.000	
	Dewatering	Concrete saw	13 hp	8	23	3.073	2.271	117.507	0.006	1.685	200.981	0.175	0.188	
	Crane 80'	130 hp	16	23	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.009	0.000	
	Flatbed truck		8	23	1.131	1.787	16.593	0.061	0.459	0.188	20,361.282	4.604	2.135	
	Generator	80 hp	5856	244	0.099	0.901	1.722	0.003	0.022	0.020	294.384	0.009	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.600	0.003	0.018	0.017	280.790	0.012	0.000	
	Push	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.600	0.003	0.018	0.017	280.790	0.012	0.000	
	Build road	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.600	0.003	0.018	0.017	280.790	0.012	0.000	
	Armoring	1 ton pickup truck	1,0667	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Excavator	430 hp	1,0667	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	1 ton pickup truck		1,0667	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.061	0.631	0.633	0.004	0.021	312.002	0.011	0.000	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048
	Excavator	430 hp	4,445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	Tractor/crawler/dozer	850 hp	3,2327	22	0.076	1.647	0.653	0.003	0.036	0.033	298.249	0.013	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.502	0.002	0.026	234.962	0.010	0.000	
	Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.502	0.002	0.026	0.024	234.962	0.010	0.000	
	3/4 ton Pickup truck		20	20	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.041	0.370	0.500	0.003	0.013	282.166	0.006	0.000	
	3/4 ton Pickup truck		34,0003	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
	Diamond cutting saw	50 hp	48	126	0.165	1.539	1.793	0.004	0.022	0.021	277.562	0.015	0.000	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.048	0.489	0.314	0.002	0.021	163.241	0.006	0.000	
	3/4 ton Pickup truck		60,0214	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.411	0.002	0.014	214.821	0.007	0.000	
	Water truck	3000 gal	507	126	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048	
	Landfill	Crane 260'	375 hp	30,0107	126	0.048	0.489	0.314	0.002	0.021	163.241	0.006	0.000	
	Micro-blast	Crane 260'	375 hp	49	126	0.048	0.489	0.314	0.002	0.021	163.241	0.006	0.000	
	Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000	
	3/4 ton Pickup truck		60	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.314	0.002	0.021	163.241	0.006	0.000	
	Air compressor	50 hp	40	126	0.657	0.796	54.990	0.004	0.024	0.023	307.059	0.037	0.060	
	3/4 ton Pickup truck		20	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 7

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2029 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	4.46E-05	7.53E-05	6.55E-04	3.25E-06	2.47E-05	1.03E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.91E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	6.59E-04	1.11E-03	9.68E-03	4.80E-05	3.64E-04	1.52E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	1.49E-05	2.51E-05	2.18E-04	1.08E-06	8.22E-06	3.44E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	4.70E-07	1.17E-06	7.47E-06	7.02E-08	5.23E-07	2.15E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	3.05E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	6.15E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19	2.92E-05	2.17E-04	2.90E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	5.17E-06	-	1.52E-01	1.38E-01	
		Tractor/crawler/dozer	0.8673	19	1.92E-05	1.79E-04	1.49E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.93E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	2.37E-05	9.28E-05	1.74E-04	1.08E-06	3.03E-06	2.78E-06	9.64E-02	2.14E-06	-	9.64E-02	8.75E-02	
		Front end loader	0.8673	19	2.92E-05	2.17E-04	2.90E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	5.17E-06	-	1.52E-01	1.38E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	2.75E-05	2.87E-04	2.55E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	5.14E-06	-	1.20E-01	1.09E-01	
		Front end loader	4	19	3.63E-05	2.76E-04	3.86E-04	6.46E-07	1.81E-06	1.66E-06	5.00E-02	3.27E-06	-	5.00E-02	4.54E-02	
		Roller	4	19	5.25E-05	3.05E-04	4.13E-04	6.31E-07	7.27E-06	6.69E-06	4.88E-02	4.74E-06	-	4.89E-02	4.44E-02	
		Water truck	4	19	4.91E-05	1.16E-04	5.52E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	9.15E-06	-	2.80E-01	2.54E-01	
		Front end loader	4	19	3.76E-05	2.48E-04	4.30E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	7.37E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	8.24E-05	8.62E-04	7.66E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.54E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	0.0923	19	4.31E-07	5.13E-06	9.72E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.56E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155	19	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	2.32E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	19	7.05E-05	1.76E-04	1.12E-03	1.05E-05	7.85E-05	3.22E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155	20	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	2.32E-04	-	5.52E+00	5.00E+00	
		1 ton pickup truck	155	20	7.05E-05	1.76E-04	1.12E-03	1.05E-05	7.85E-05	3.22E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	2	20	2.75E-05	2.87E-04	2.55E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	5.14E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02	
		Crane 80'	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	2.01E-05	-	4.77E-01	4.33E-01	
		Flatbed truck	8	23	9.98E-06	1.58E-05	1.46E-04	5.35E-07	4.05E-06	1.66E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	5.09E-02	4.65E-01	8.89E-01	1.78E-03	1.13E-02	1.04E-02	1.52E+02	4.59E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	3.13E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	6.17E-04	-	1.47E+01	1.33E+01	
	Push	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	3.13E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	6.17E-04	-	1.47E+01	1.33E+01	
		Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	3.13E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	6.17E-04	-	1.47E+01	1.33E+01	
	Build road	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	3.13E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	6.17E-04	-	1.47E+01	1.33E+01	
	Armoring	1 ton pickup truck	1.0667	19	4.85E-07	1.21E-06	7.72E-06	7.25E-08	5.40E-07	2.22E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	1.0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.50E-06	-	1.07E-01	9.72E-01	
		1 ton pickup truck	1.0667	19	4.85E-07	1.21E-06	7.72E-06	7.25E-08	5.40E-07	2.22E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	144	210	2.07E-03	2.15E-02	2.16E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.77E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	6.7805	22	4.93E-05	1.96E-04	9.36E-05	7.91E-07	1.36E-05	7.12E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01	
		Excavator	4.445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.46E-05	-	4.47E-01	4.05E-01	
		Tractor/crawler/dozer	3.2327	22	2.31E-04	4.99E-03	1.98E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.95E-05	-	9.04E-01	8.20E-01	
	Platform	Tractor/crawler/dozer	40	20	1.25E-03	1.17E-02	9.74E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.92E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	5	20	1.57E-04	1.46E-03	1.22E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.40E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck	20	20	1.86E-05	3.14E-05	2.73E-04	1.35E-06	1.03E-05	4.30E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	34.0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.56E+00	
		3/4 ton Pickup truck	34.0003	126	3.16E-05	5.33E-05	4.64E-04	2.30E-06	1.75E-05	7.30E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	4.46E-05	7.53E-05	6.55E-04	3.25E-06	2.47E-05	1.03E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
		Diamond cutting saw	48	126	4.36E-04	4.07E-03	4.74E-03	9.49E-06	5.92E-05	5.45E-05	7.34E-01	3.93E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	60.0214	126	1.18E-03	1.21E-02	7.79E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.48E-04	-	4.05E+00	3.68E+00	
		3/4 ton Pickup truck	60.0214	126	5.58E-05	9.41E-05	8.19E-04	4.07E-06	3.08E-05	1.29E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	4	126	8.25E-05	5.72E-04	6.35E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.13E-05	-	3.32E-01	3.01E-01	
		Water truck	507	126	3.68E-03	1.47E-02	7.00E-03	5.91E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	30.0107	126	5.90E-04	6.07E-03	3.90E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	7.39E-05	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	49	126	9.64E-04	9.91E-03	6.36E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.21E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	55	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton Pickup truck	60	126	5.58E-05	9.41E-05	8.19E-04	4.06E-06	3.08E-05	1.29E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	20	126	3.93E-04	4.04E-03	2.60E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.92E-05	-	1.35E+00	1.23E+00	
		Air compressor	40	126	1.45E-03	1.76E-03	1.21E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	8.25E-05	1.32E-04	7.20E-01	6.53E-01	
		3/4 ton Pickup truck	20	126	1.86E-05	3.14E-05	2.73E-04	1.35E-06	1.03E-05	4.30E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	<b>Total</b>				<b>9.35E-02</b>	<b>7.61E-01</b>	<b>1.34E+00</b>	<b>3.23E-03</b>	<b>2.56E-02</b>	<b>2.15E-02</b>	<b>3.40E+02</b>	<b>1.21E-02</b>	<b>1.84E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>	

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 7

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2029 (pounds per day)						
					VOC	Nox	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	8.50E-04	1.43E-03	1.25E-02	6.19E-05	4.70E-04	1.96E-04	
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.36E-01	4.46E-01	3.77E-03	6.48E-02	3.39E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.26E-02	2.12E-02	1.84E-01	9.15E-04	6.94E-03	2.90E-03	
	Fish relocation	3/4 ton pickup truck	16	19	3.13E-03	5.28E-03	4.60E-02	2.28E-04	1.73E-03	7.24E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	9.89E-05	2.47E-04	1.57E-03	1.48E-05	1.10E-04	4.52E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.43E-02	3.38E-04	2.99E-03	2.75E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.14E-03	4.58E-02	6.10E-02	3.21E-04	1.70E-03	1.56E-03	
		Tractor/crawler/dozer	0.8673	19	4.03E-03	3.77E-02	3.13E-02	1.44E-04	1.62E-03	1.49E-03	
	Chipping	Brush chipper	0.8673	19	4.99E-03	1.95E-02	3.65E-02	2.28E-04	6.37E-04	5.86E-04	
		Front end loader	0.8673	19	6.14E-03	4.58E-02	6.10E-02	3.21E-04	1.70E-03	1.56E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.79E-03	6.05E-02	5.38E-02	2.83E-04	2.50E-03	2.30E-03	
		Front end loader	49 hp	4	7.63E-03	5.81E-02	8.12E-02	1.36E-04	3.80E-04	3.50E-04	
		Roller	47 hp	4	1.10E-02	6.42E-02	8.69E-02	1.33E-04	1.53E-03	1.41E-03	
		Water truck	3000 gal	4	6.12E-03	2.44E-02	1.16E-02	9.82E-05	1.69E-03	8.84E-04	
		Excavator	300 hp	4	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
		Front end loader	180 hp	4	7.92E-03	5.22E-02	9.06E-02	5.08E-04	1.84E-03	1.69E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.74E-02	1.82E-01	1.61E-01	8.49E-04	7.51E-03	6.91E-03	
		Loader/backhoe	75 hp	0.0923	9.07E-05	1.08E-03	2.05E-03	3.68E-06	3.13E-05	2.88E-05	
		Crane 94'	155 hp	155	3.63E-01	3.77E+00	6.85E+00	1.31E-02	1.94E-01	1.79E-01	
		1 ton pickup truck	155	19	1.48E-02	3.70E-02	2.36E-01	2.22E-03	1.65E-02	6.78E-03	
		Crane 94'	155 hp	155	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
		1 ton pickup truck	155	20	1.41E-02	3.52E-02	2.24E-01	2.11E-03	1.57E-02	6.44E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.50E-03	5.75E-02	5.11E-02	2.69E-04	2.38E-03	2.19E-03	
	Dewatering	Concrete saw	13 hp	8	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02	
		Flatbed truck	8	23	1.73E-03	2.74E-03	2.54E-02	9.31E-05	7.04E-04	2.88E-04	
		Generator	80 hp	5856	8.34E-01	7.63E+00	1.46E+01	2.92E-02	1.85E-01	1.70E-01	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.58E+00	3.10E-02	2.00E-01	1.84E-01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.58E+00	3.10E-02	2.00E-01	1.84E-01	
		Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.58E+00	3.10E-02	2.00E-01	1.84E-01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.58E+00	3.10E-02	2.00E-01	1.84E-01	
	Armoring	1 ton pickup truck	1,0667	19	1.02E-04	2.55E-04	1.63E-03	1.53E-05	1.14E-04	4.67E-05	
		Excavator	430 hp	1,0667	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	7.64E-04	
		1 ton pickup truck	1,0667	19	1.02E-04	2.55E-04	1.63E-03	1.53E-05	1.14E-04	4.67E-05	
	Maintenance	Grader	215 hp	144	3.95E-02	4.10E-01	4.11E-01	2.28E-03	1.37E-02	1.26E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	8.96E-03	3.57E-02	1.70E-02	1.44E-04	2.47E-03	1.29E-03	
		Excavator	430 hp	4,445	1.32E-02	8.26E-02	1.55E-01	7.97E-04	2.99E-03	2.75E-03	
		Tractor/crawler/dozer	850 hp	3,2327	4.20E-02	9.07E-01	3.59E-01	1.65E-03	1.97E-02	1.82E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.51E-01	2.34E+00	1.95E+00	8.95E-03	1.01E-01	9.29E-02	
		Tractor/crawler/dozer	440 hp	5	3.13E-02	2.93E-01	2.44E-01	1.12E-03	1.26E-02	1.16E-02	
		3/4 ton Pickup truck	20	20	3.72E-03	6.27E-03	5.46E-02	2.71E-04	2.06E-03	8.59E-04	
	Drilling	Rotary drill	475 hp	34,0003	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	6.72E-03	
		3/4 ton Pickup truck	34,0003	126	1.00E-03	1.69E-03	1.47E-02	7.31E-05	5.55E-04	2.32E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.42E-03	2.39E-03	2.08E-02	1.03E-04	7.83E-04	3.27E-04	
		Diamond cutting saw	50 hp	48	1.38E-02	1.29E-01	1.51E-01	3.01E-04	1.88E-03	1.73E-03	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	3.75E-02	3.85E-01	2.47E-01	1.26E-03	1.62E-02	1.49E-02	
		3/4 ton Pickup truck	60,0214	126	1.77E-03	2.99E-03	2.60E-02	1.29E-04	9.79E-04	4.09E-04	
	Load/Haul	Front end loader	350 hp	4	2.62E-03	1.82E-02	2.01E-02	1.03E-04	6.78E-04	6.24E-04	
		Water truck	3000 gal	507	1.17E-01	4.66E-01	2.22E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30,0107	1.87E-02	1.93E-01	1.24E-01	6.31E-04	8.08E-03	7.43E-03	
	Micro-blast	Crane 260'	375 hp	49	3.06E-02	3.15E-01	2.02E-01	1.03E-03	1.32E-02	1.21E-02	
		Horizontal boring drill	10 hp	55	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	1.44E-03	
		3/4 ton Pickup truck	60	126	1.77E-03	2.99E-03	2.60E-02	1.29E-04	9.79E-04	4.09E-04	
	Demolish spillway	Crane 260'	375 hp	20	1.25E-02	1.28E-01	8.25E-02	4.21E-04	5.38E-03	4.95E-03	
		Air compressor	50 hp	40	4.60E-02	5.57E-02	3.85E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	5.90E-04	9.96E-04	8.66E-03	4.30E-05	3.26E-04	1.36E-04	
					<b>Total</b>	<b>5.08E+00</b>	<b>4.46E+01</b>	<b>6.78E+01</b>	<b>2.17E-01</b>	<b>1.79E+00</b>	<b>1.59E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthdays of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	5	44	68	0	2
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 8

Construction Start Year 2031  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2031 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		48	210	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	1696	210	6.597	26.369	12.528	0.106	1.820	0.953	21,147.638	0.051	0.048
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Fish relocation	3/4 ton pickup truck	16	19	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.637	0.003	0.030	0.028	301.158	0.012	0.000
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Brush Piling	Front end loader	0.8673	19	0.057	0.421	0.559	0.003	0.016	0.014	293.384	0.009	0.000
		Tractor/crawler/dozer	0.8673	19	0.065	0.604	0.491	0.002	0.026	0.024	234.962	0.009	0.000
	Chipping	Brush chipper	0.8673	19	0.095	0.315	0.726	0.005	0.011	0.010	403.250	0.009	0.000
		Front end loader	0.8673	19	0.057	0.421	0.559	0.003	0.016	0.014	293.384	0.009	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.637	0.003	0.030	301.158	0.012	0.000
		Front end loader	49 hp	4	19	0.167	1.269	1.785	0.003	0.007	231.302	0.015	0.000
		Roller	47 hp	4	19	0.235	1.418	1.975	0.003	0.027	235.507	0.021	0.000
		Water truck	3000 gal	4	19	6.597	26.369	12.528	0.106	1.820	21,147.638	0.051	0.048
		Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	211.854	0.007	0.000
		Front end loader	180 hp	4	19	0.047	0.313	0.540	0.003	0.011	270.061	0.009	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.637	0.003	0.030	301.158	0.012	0.000
		Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.274	0.002	0.018	195.356	0.008	0.000
		Crane 94'	155 hp	155	19	0.065	0.677	1.229	0.002	0.035	208.066	0.008	0.000
		1 ton pickup truck	155	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056
		Crane 94'	155 hp	155	20	0.065	0.677	1.229	0.002	0.035	208.066	0.008	0.000
		1 ton pickup truck	155	20	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.637	0.003	0.030	301.158	0.012	0.000
	Dewatering	Concrete saw	13 hp	8	23	3.073	2.271	117.492	0.006	1.685	200.981	0.175	0.188
		Crane 80'	130 hp	16	23	0.065	0.677	1.229	0.002	0.035	208.066	0.008	0.000
		Flatbed truck	8	23	0.873	1.543	12.845	0.061	0.457	0.187	20,361.282	4.604	2.135
		Generator	80 hp	5856	244	0.089	0.826	1.718	0.003	0.016	294.384	0.008	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.586	0.003	0.018	0.017	280.790	0.011	0.000
	Push	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.586	0.003	0.018	0.017	280.790	0.011	0.000
		Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.586	0.003	0.018	0.017	280.790	0.011	0.000
	Build road	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.586	0.003	0.018	0.017	280.790	0.011	0.000
	Armoring	1 ton pickup truck	1,0667	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056
		Excavator	430 hp	1,0667	19	0.035	0.216	0.406	0.002	0.008	211.854	0.007	0.000
		1 ton pickup truck	1,0667	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056
	Maintenance	Grader	215 hp	144	210	0.061	0.631	0.629	0.004	0.021	312.002	0.010	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.597	26.369	12.528	0.106	1.820	21,147.638	0.051	0.048
		Excavator	430 hp	4,445	22	0.035	0.216	0.406	0.002	0.008	211.854	0.007	0.000
		Tractor/crawler/dozer	850 hp	3,2327	22	0.076	1.647	0.635	0.003	0.036	298.249	0.012	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.491	0.002	0.026	234.962	0.009	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.491	0.002	0.026	234.962	0.009	0.000
		3/4 ton Pickup truck	20	20	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34,0003	126	0.041	0.370	0.500	0.003	0.013	282.166	0.006	0.000
		3/4 ton Pickup truck	34,0003	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.149	1.505	1.777	0.004	0.016	277.562	0.013	0.000
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.048	0.489	0.313	0.002	0.021	163.241	0.006	0.000
		3/4 ton Pickup truck	60,0214	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.409	0.002	0.014	214.821	0.007	0.000
		Water truck	3000 gal	507	126	6.597	26.369	12.528	0.106	1.820	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30,0107	126	0.048	0.489	0.313	0.002	0.021	163.241	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.048	0.489	0.313	0.002	0.021	163.241	0.006	0.000
		Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	312.570	0.033	0.000
		3/4 ton Pickup truck	60	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.313	0.002	0.021	163.241	0.006	0.000
		Air compressor	50 hp	40	126	0.633	0.764	55.206	0.004	0.024	307.059	0.036	0.059
		3/4 ton Pickup truck	20	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 8

Construction Start Year 2031  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2031 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	3.18E-05	6.58E-05	4.90E-04	3.25E-06	2.45E-05	1.02E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.93E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	4.69E-04	9.72E-04	7.24E-03	4.80E-05	3.62E-04	1.50E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	1.06E-05	2.19E-05	1.63E-04	1.08E-06	8.17E-06	3.39E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.89E-07	1.03E-06	6.29E-06	7.02E-08	5.21E-07	2.13E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	3.02E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.77E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.89E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.90E-06	-	1.52E-01	1.37E-01	
	Tractor/crawler/dozer	310 hp	0.8673	19	1.92E-05	1.79E-04	1.46E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.76E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	250 hp	0.8673	19	2.26E-05	7.53E-05	1.74E-04	1.08E-06	2.57E-06	2.36E-06	9.64E-02	2.04E-06	-	9.64E-02	8.75E-02
	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.89E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.90E-06	-	1.52E-01	1.37E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.75E-05	2.87E-04	2.53E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.83E-06	-	1.20E-01	1.09E-01	
	Front end loader	49 hp	4	19	3.61E-05	2.74E-04	3.86E-04	6.46E-07	1.55E-06	1.43E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02	
	Roller	47 hp	4	19	4.87E-05	2.94E-04	4.09E-04	6.31E-07	5.49E-06	5.05E-06	4.88E-02	4.39E-06	-	4.89E-02	4.44E-02	
	Water truck	3000 gal	4	19	2.91E-05	1.16E-04	5.52E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
	Excavator	300 hp	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.92E-06	-	2.80E-01	2.54E-01	
	Front end loader	180 hp	4	19	3.76E-05	2.48E-04	4.28E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.97E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	8.24E-05	8.62E-04	7.58E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.45E-05	-	3.59E-01	3.26E-01	
	Loader/backhoe	75 hp	0.0923	19	4.31E-07	5.13E-06	9.72E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.34E-08	-	1.49E-03	1.35E-03	
	Crane 94'	155 hp	155	19	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	2.12E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	19	5.84E-05	1.55E-04	9.44E-04	1.05E-05	7.82E-05	3.20E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Crane 94'	155 hp	155	20	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	2.12E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	20	5.84E-05	1.55E-04	9.44E-04	1.05E-05	7.82E-05	3.20E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.75E-05	2.87E-04	2.53E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.83E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02	
	Crane 80'	130 hp	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.83E-05	-	4.77E-01	4.33E-01	
	Flatbed truck	8	23	7.70E-06	1.36E-05	1.13E-04	5.34E-07	4.03E-06	1.65E-06	1.80E-01	4.06E-05	1.88E-05	-	1.86E-01	1.69E-01	
	Generator	80 hp	5856	244	4.62E-02	4.27E-01	8.87E-01	1.78E-03	8.07E-03	7.42E-03	1.52E+02	4.17E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	3.06E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.81E-04	-	1.47E+01	1.33E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	3.06E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.81E-04	-	1.47E+01	1.33E+01
	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	3.06E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.81E-04	-	1.47E+01	1.33E+01	
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	3.06E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.81E-04	-	1.47E+01	1.33E+01
	Armoring	1 ton pickup truck	1.0667	19	4.02E-07	1.06E-06	6.50E-06	7.25E-08	5.38E-07	2.20E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Excavator	430 hp	1.0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.41E-06	-	1.07E-01	9.72E-02	
	1 ton pickup truck	1.0667	1.0667	19	4.02E-07	1.06E-06	6.50E-06	7.25E-08	5.38E-07	2.20E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	2.07E-03	2.15E-02	2.15E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.56E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.93E-05	1.97E-04	9.36E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01
	Excavator	430 hp	4.445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.42E-05	-	4.47E-01	4.05E-01	
	Tractor/crawler/dozer	850 hp	3.2327	22	2.31E-04	4.99E-03	1.92E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.69E-05	-	9.04E-01	8.20E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	1.25E-03	1.17E-02	9.52E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.81E-04	-	4.56E+00	4.14E+00	
	Tractor/crawler/dozer	440 hp	5	20	1.57E-04	1.46E-03	1.19E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.26E-05	-	5.70E-01	5.17E-01	
	3/4 ton Pickup truck	20	20	1.32E-05	2.74E-05	2.04E-04	1.35E-06	1.02E-05	4.23E-06	4.49E-01	4.46E-05	2.33E-05	-	4.57E-01	4.15E-01	
	Drilling	Rotary drill	475 hp	34.0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.56E+00
	3/4 ton Pickup truck	34.0003	34.0003	126	2.25E-05	4.66E-05	3.47E-04	2.30E-06	1.74E-05	7.19E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	3.18E-05	6.58E-05	4.90E-04	3.25E-06	2.45E-05	1.02E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
	Diamond cutting saw	50 hp	48	126	3.94E-04	3.98E-03	4.70E-03	9.49E-06	4.32E-05	3.98E-05	7.34E-01	3.56E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	1.18E-03	1.21E-02	7.76E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.39E-04	-	4.05E+00	3.68E+00
	3/4 ton Pickup truck	60.0214	60.0214	126	3.97E-05	8.23E-05	6.13E-04	4.06E-06	3.06E-05	1.27E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	8.25E-05	5.72E-04	6.32E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.07E-05	-	3.32E-01	3.01E-01	
	Water truck	3000 gal	507	126	3.69E-03	1.47E-02	7.00E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	375 hp	30.0107	126	5.90E-04	6.07E-03	3.88E-03	1.99E-05	2.54E-04	2.03E+00	6.95E-05	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	375 hp	49	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.13E-04	-	3.31E+00	3.00E+00	
	Horizontal boring drill	10 hp	55	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
	3/4 ton Pickup truck	60	60	126	3.97E-05	8.23E-05	6.13E-04	4.06E-06	3.06E-05	1.27E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	3.93E-04	4.04E-03	2.59E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.63E-05	-	1.35E+00	1.23E+00	
	Air compressor	50 hp	40	126	1.39E-03	1.68E-03	1.22E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	7.94E-05	1.30E-04	7.19E-01	6.52E-01	
	3/4 ton Pickup truck	20	20	126	1.32E-05	2.74E-05	2.04E-04	1.35E-06	1.02E-05	4.23E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	<b>Total</b>				<b>8.84E-02</b>	<b>7.22E-01</b>	<b>1.33E+00</b>	<b>3.23E-03</b>	<b>2.24E-02</b>	<b>1.85E-02</b>	<b>3.40E+02</b>	<b>1.14E-02</b>	<b>1.83E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>	

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 8

Construction Start Year 2031  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2031 (pounds per day)							
					VOC	Nox	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	6.05E-04	1.25E-03	9.34E-03	6.19E-05	4.67E-04	1.93E-04		
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.39E-01	4.46E-01	3.77E-03	6.48E-02	3.39E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	8.94E-03	1.85E-02	1.38E-01	9.14E-04	6.89E-03	2.86E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	2.23E-03	4.62E-03	3.44E-02	2.28E-04	1.72E-03	7.13E-04		
	Cutting	1 ton pickup truck	1,0325	19	1.89E-05	2.17E-04	1.32E-03	1.48E-05	1.10E-04	4.48E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.36E-02	3.38E-04	2.99E-03	2.75E-03	
		Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	540 hp	0.8673	19	6.14E-03	4.58E-02	6.07E-02	3.21E-04	1.70E-03	1.56E-03	
		Tractor/crawler/dozer	310 hp	0.8673	19	4.03E-03	3.77E-02	3.06E-02	1.44E-04	1.62E-03	1.49E-03	
		Brush chipper	250 hp	0.8673	19	4.77E-03	1.59E-02	3.65E-02	2.28E-04	5.40E-04	4.97E-04	
	Dewatering	Temporary Cofferdam	Front end loader	540 hp	0.8673	19	6.14E-03	4.58E-02	6.07E-02	3.21E-04	1.70E-03	1.56E-03
			Tractor/crawler/dozer	180 hp	2	19	5.79E-03	6.05E-02	5.32E-02	2.83E-04	2.50E-03	2.30E-03
			Front end loader	49 hp	4	19	7.61E-03	5.77E-02	8.12E-02	1.36E-04	3.26E-04	3.00E-04
		Roller	47 hp	4	19	1.03E-02	6.19E-02	8.62E-02	1.33E-04	1.16E-03	1.06E-03	
		Water truck	3000 gal	4	19	6.12E-03	2.45E-02	1.16E-02	9.83E-05	1.69E-03	8.85E-04	
		Excavator	300 hp	4	19	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
		Front end loader	180 hp	4	19	7.92E-03	5.22E-02	9.01E-02	5.08E-04	1.84E-03	1.69E-03	
36" Diversion Pipe - gradin		Tractor/crawler/dozer	180 hp	6	19	1.74E-02	1.82E-01	1.60E-01	8.49E-04	7.51E-03	6.91E-03	
		Loader/backhoe	75 hp	0.0923	19	9.07E-05	1.08E-03	2.05E-03	3.88E-06	3.13E-05	2.88E-05	
		Crane 94'	155 hp	155	19	3.63E-01	3.77E+00	6.85E+00	1.31E-02	1.94E-01	1.79E-01	
		1 ton pickup truck	155	155	19	1.23E-02	3.26E-02	1.99E-01	2.22E-03	1.65E-02	6.73E-03	
		Crane 94'	155 hp	155	20	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
		1 ton pickup truck	155	155	20	1.17E-02	3.09E-02	1.89E-01	2.11E-03	1.56E-02	6.39E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	5.50E-03	5.75E-02	5.05E-02	2.69E-04	2.38E-03	2.19E-03
		Dewatering	Concrete saw	13 hp	8	23	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02
			Crane 80'	130 hp	16	23	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02
			Flatbed truck	8	23	1.34E-03	2.37E-03	1.97E-02	9.29E-05	7.02E-04	2.86E-04	
			Generator	80 hp	5856	244	7.57E-01	6.99E+00	1.45E+01	2.92E-02	1.32E-01	1.22E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.44E+00	3.10E-02	2.00E-01	1.84E-01
			Push	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.44E+00	3.10E-02	2.00E-01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.44E+00	3.10E-02	2.00E-01	1.84E-01	
		Armoring	1 ton pickup truck	1.0667	19	8.46E-05	2.24E-04	1.37E-03	1.53E-05	1.13E-04	4.63E-05	
		Excavator	430 hp	1.0667	19	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	7.64E-04	
		1 ton pickup truck	1.0667	19	8.46E-05	2.24E-04	1.37E-03	1.53E-05	1.13E-04	4.63E-05		
		Maintenance	Grader	215 hp	144	210	3.95E-02	4.10E-01	4.09E-01	2.28E-03	1.37E-02	1.26E-02
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	8.96E-03	3.58E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03
			Excavator	430 hp	4.445	22	1.32E-02	8.26E-02	1.55E-01	7.97E-04	2.99E-03	2.75E-03
			Tractor/crawler/dozer	850 hp	3.2327	22	4.20E-02	9.07E-01	3.49E-01	1.65E-03	1.97E-02	1.82E-02
Platform		Tractor/crawler/dozer	440 hp	40	20	2.51E-01	2.34E+00	1.90E+00	8.95E-03	1.01E-01	9.29E-02	
		Tractor/crawler/dozer	440 hp	5	20	3.13E-02	2.93E-01	2.38E-01	1.12E-03	1.26E-02	1.16E-02	
		3/4 ton Pickup truck	20	20	2.65E-03	5.49E-03	4.09E-02	2.71E-04	2.04E-03	8.46E-04		
Drilling		Rotary drill	475 hp	34.0003	126	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	6.72E-03	
		3/4 ton Pickup truck	34.0003	126	7.14E-04	1.48E-03	1.10E-02	7.30E-05	5.51E-04	2.28E-04		
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.01E-03	2.09E-03	1.56E-02	1.03E-04	7.78E-04	3.22E-04	
		Diamond cutting saw	50 hp	48	126	1.25E-02	1.26E-01	1.49E-01	3.01E-04	1.37E-03	1.26E-03	
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	3.75E-02	3.85E-01	2.46E-01	1.26E-03	1.62E-02	1.49E-02	
	Load/Haul	3/4 ton Pickup truck	60.0214	126	1.26E-03	2.61E-03	1.95E-02	1.29E-04	9.73E-04	4.03E-04		
		Front end loader	350 hp	4	126	2.62E-03	1.82E-02	2.00E-02	1.03E-04	6.78E-04	6.24E-04	
		Water truck	3000 gal	507	126	1.17E-01	4.68E-01	2.22E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30.0107	126	1.87E-02	1.93E-01	1.23E-01	6.31E-04	8.08E-03	7.43E-03	
	Micro-blast	Crane 260'	375 hp	49	126	3.06E-02	3.15E-01	2.01E-01	1.03E-03	1.32E-02	1.21E-02	
		Horizontal boring drill	10 hp	55	126	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	1.44E-03	
		3/4 ton Pickup truck	60	126	1.26E-03	2.61E-03	1.95E-02	1.29E-04	9.72E-04	4.03E-04		
	Demolish spillway	Crane 260'	375 hp	20	126	1.25E-02	1.28E-01	8.21E-02	4.21E-04	5.38E-03	4.95E-03	
		Air compressor	50 hp	40	126	4.43E-02	5.35E-02	3.86E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	4.20E-04	8.71E-04	6.49E-03	4.30E-05	3.24E-04	1.34E-04		
<b>Total</b>					<b>4.99E+00</b>	<b>4.40E+01</b>	<b>6.69E+01</b>	<b>2.17E-01</b>	<b>1.74E+00</b>	<b>1.54E+00</b>		

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	5	0	0	0	0
	44	0	0	0	0
	67	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 9

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2033 (g/hp-hr or g/hr)											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O			
Construction Survey	3/4 ton pickup truck		48	210	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056			
Dust Control	Water truck	5000 gal	1696	210	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048			
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056			
	Fish relocation	3/4 ton pickup truck	16	19	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056			
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056			
		Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.631	0.003	0.030	0.028	301.159	0.012	0.000		
		Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039		
		Brush Piling	Front end loader	540 hp	0.8673	19	0.057	0.421	0.557	0.003	0.016	0.014	293.384	0.009	0.000	
			Tractor/crawler/dozer	310 hp	0.8673	19	0.065	0.604	0.482	0.002	0.026	0.024	234.962	0.009	0.000	
		Chipping	Brush chipper	250 hp	0.8673	19	0.092	0.268	0.726	0.005	0.009	0.009	403.250	0.008	0.000	
			Front end loader	540 hp	0.8673	19	0.057	0.421	0.557	0.003	0.016	0.014	293.384	0.009	0.000	
			Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.631	0.003	0.030	0.028	301.159	0.012	0.000	
			Front end loader	49 hp	4	19	0.167	1.264	1.786	0.003	0.007	0.006	231.302	0.015	0.000	
			Roller	47 hp	4	19	0.221	1.381	1.962	0.003	0.020	0.019	235.508	0.020	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.631	0.003	0.030	0.028	301.159	0.012	0.000		
		Front end loader	49 hp	4	19	0.167	1.264	1.786	0.003	0.007	0.006	231.302	0.015	0.000		
		Water truck	3000 gal	4	19	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048		
		Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000		
		Front end loader	180 hp	4	19	0.047	0.313	0.538	0.003	0.011	0.010	270.061	0.008	0.000		
		36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.631	0.003	0.030	0.028	301.159	0.012	0.000	
			Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.273	0.002	0.020	0.018	195.356	0.008	0.000	
			Crane 94'	155 hp	155	19	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
			1 ton pickup truck	155	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056		
			Crane 94'	155 hp	155	20	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
			1 ton pickup truck	155	20	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056		
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.631	0.003	0.030	0.028	301.159	0.012	0.000	
		Dewatering	Concrete saw	13 hp	8	23	3.072	2.271	117.478	0.006	1.685	1.681	200.981	0.175	0.188	
			Crane 80'	130 hp	16	23	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
			Flatbed truck	8	23	0.723	1.394	10.684	0.061	0.457	0.186	20,361.282	4.604	2.135		
			Generator	80 hp	5856	244	0.084	0.784	1.716	0.003	0.011	0.010	294.384	0.008	0.000	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.575	0.003	0.018	0.017	280.790	0.011	0.000	
			Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.575	0.003	0.018	0.017	280.790	0.011	0.000
				Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.575	0.003	0.018	0.017	280.790	0.011	0.000
			Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.575	0.003	0.018	0.017	280.790	0.011	0.000
		Armoring	1 ton pickup truck	1.0667	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056		
			Excavator	430 hp	1.0667	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
			1 ton pickup truck	1.0667	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056		
		Maintenance	Grader	215 hp	144	210	0.061	0.631	0.626	0.004	0.021	0.019	312.002	0.010	0.000	
		Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048	
			Excavator	430 hp	4.445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
Demolition		Tractor/crawler/dozer	850 hp	3.2327	22	0.076	1.647	0.620	0.003	0.036	0.033	298.249	0.012	0.000		
		Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.482	0.002	0.026	0.024	234.962	0.009	0.000	
			Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.482	0.002	0.026	0.024	234.962	0.009	0.000	
			3/4 ton Pickup truck	20	20	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		
		Drilling	Rotary drill	475 hp	34.0003	126	0.041	0.370	0.500	0.003	0.013	0.012	282.166	0.006	0.000	
			3/4 ton Pickup truck	34.0003	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		
			Diamond cutting saw	50 hp	48	126	0.140	1.480	1.768	0.004	0.012	0.011	277.562	0.013	0.000	
		Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			3/4 ton Pickup truck	60.0214	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		
		Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.408	0.002	0.014	0.013	214.821	0.007	0.000	
			Water truck	3000 gal	507	126	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Landfill	Crane 260'	375 hp	30.0107	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
		Micro-blast	Crane 260'	375 hp	49	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000	
			3/4 ton Pickup truck	60	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		
		Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			Air compressor	50 hp	40	126	0.619	0.743	55.359	0.004	0.024	0.023	307.059	0.035	0.058	
			3/4 ton Pickup truck	20	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056		

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 9

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2033 (tons per year)										Metric Tons CO2e/yr
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		48	210	2.48E-05	5.98E-05	3.96E-04	3.25E-06	2.44E-05	1.00E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.94E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.66E-04	8.83E-04	5.85E-03	4.80E-05	3.60E-04	1.48E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01
	Fish relocation	3/4 ton pickup truck	16	19	8.25E-06	1.99E-05	1.32E-04	1.08E-06	8.13E-06	3.35E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.48E-07	9.50E-07	5.69E-06	7.02E-08	5.20E-07	2.12E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	2.99E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.46E-06	-	1.43E-01	1.30E-01
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04
	Brush Piling	Front end loader	0.8673	19	2.92E-05	2.17E-04	2.88E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.71E-06	-	1.52E-01	1.37E-01
		Tractor/crawler/dozer	0.8673	19	1.92E-05	1.79E-04	1.43E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.62E-06	-	6.97E-02	6.32E-02
	Chipping	Brush chipper	0.8673	19	2.19E-05	6.40E-05	1.74E-04	1.08E-06	2.23E-06	2.05E-06	9.64E-02	1.98E-06	-	9.64E-02	8.75E-02
		Front end loader	0.8673	19	2.92E-05	2.17E-04	2.88E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.71E-06	-	1.52E-01	1.37E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	2.75E-05	2.87E-04	2.51E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.57E-06	-	1.20E-01	1.09E-01
		Front end loader	4	19	3.61E-05	2.73E-04	3.86E-04	6.46E-07	1.40E-06	1.29E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02
		Roller	4	19	4.58E-05	2.86E-04	4.07E-04	4.22E-06	3.88E-06	4.88E-02	4.13E-06	-	-	4.89E-02	4.44E-02
		Water truck	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02
		Excavator	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.79E-06	-	2.80E-01	2.54E-01
		Front end loader	4	19	3.76E-05	2.48E-04	4.27E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.70E-06	-	2.14E-01	1.95E-01
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	8.24E-05	8.62E-04	7.52E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.37E-05	-	3.59E-01	3.26E-01
		Loader/backhoe	0.0923	19	4.31E-07	5.13E-06	9.72E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.20E-08	-	1.49E-03	1.35E-03
		Crane 94'	155	19	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.96E-04	-	5.51E+00	5.00E+00
		1 ton pickup truck	155	19	5.22E-05	1.43E-04	1.05E-05	7.80E-05	3.18E-05	3.48E+00	3.46E-04	1.80E-04	-	3.54E+00	3.21E+00
		Crane 94'	155	20	1.73E-03	1.79E-02	3.25E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.96E-04	-	5.51E+00	5.00E+00
		1 ton pickup truck	155	20	5.22E-05	1.43E-04	1.05E-05	7.80E-05	3.18E-05	3.48E+00	3.46E-04	1.80E-04	-	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	2	20	2.75E-05	2.87E-04	2.51E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.57E-06	-	1.20E-01	1.09E-01
Dewatering	Concrete saw	13 hp	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02
	Crane 80'	130 hp	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.70E-05	-	4.77E-01	4.33E-01
	Flatbed truck	8	23	6.38E-06	1.23E-05	9.42E-05	5.34E-07	4.03E-06	1.64E-06	1.80E-01	4.06E-05	1.88E-05	-	1.86E-01	1.69E-01
	Generator	80 hp	5856	244	4.35E-02	4.05E-01	8.86E-01	1.78E-03	5.88E-03	5.41E-03	1.52E+02	3.92E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	78,8462	19	2.78E-03	2.55E-02	3.00E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.52E-04	-	1.47E+01	1.33E+01
	Push	Tractor/crawler/dozer	78,8462	19	2.78E-03	2.55E-02	3.00E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.52E-04	-	1.47E+01	1.33E+01
		Tractor/crawler/dozer	78,8462	19	2.78E-03	2.55E-02	3.00E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.52E-04	-	1.47E+01	1.33E+01
	Build road	Tractor/crawler/dozer	78,8462	19	2.78E-03	2.55E-02	3.00E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.52E-04	-	1.47E+01	1.33E+01
	Armoring	1 ton pickup truck	1,0667	19	3.59E-07	9.81E-07	5.88E-06	7.25E-08	5.37E-07	2.19E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
		Excavator	1,0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.36E-06	-	1.07E-01	9.72E-02
		1 ton pickup truck	1,0667	19	3.59E-07	9.81E-07	5.88E-06	7.25E-08	5.37E-07	2.19E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
	Maintenance	Grader	144	210	2.07E-03	2.15E-02	2.14E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.42E-04	-	1.07E+01	9.67E+00
Demolition	Excavation for Dam Demo	Asphalt distributor	6,7805	22	4.94E-05	1.98E-04	9.38E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01
		Excavator	4,445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.40E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	3,2327	22	2.31E-04	4.99E-03	1.88E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.49E-05	-	9.04E-01	8.20E-01
	Platform	Tractor/crawler/dozer	40	20	1.25E-03	1.17E-02	9.34E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.72E-04	-	4.56E+00	4.14E+00
		Tractor/crawler/dozer	5	20	1.57E-04	1.46E-03	1.17E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.15E-05	-	5.70E-01	5.17E-01
		3/4 ton Pickup truck	20	20	1.03E-05	2.49E-05	1.65E-04	1.35E-06	1.02E-05	4.18E-06	4.49E-01	4.46E-05	2.33E-05	-	4.57E-01
	Drilling	Rotary drill	34,0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.56E+00
		3/4 ton Pickup truck	34,0003	126	1.75E-05	4.24E-05	2.81E-04	2.30E-06	1.73E-05	7.11E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.48E-05	5.98E-05	3.96E-04	3.25E-06	2.44E-05	1.00E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
		Diamond cutting saw	48	126	3.70E-04	3.92E-03	4.68E-03	9.49E-06	3.19E-05	2.93E-05	7.34E-01	3.34E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	60,0214	126	1.18E-03	1.21E-02	7.75E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.34E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck	60,0214	126	3.10E-05	7.48E-05	4.96E-04	4.06E-06	3.05E-05	1.26E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
	Load/Haul	Front end loader	4	126	8.25E-05	5.72E-04	6.29E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.03E-05	-	3.32E-01	3.01E-01
		Water truck	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	30,0107	126	5.90E-04	6.07E-03	3.87E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	6.68E-05	-	2.03E+00	1.84E+00
	Micro-blast	Crane 260'	49	126	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.09E-04	-	3.31E+00	3.00E+00
		Horizontal boring drill	60	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
		3/4 ton Pickup truck	60	126	3.09E-05	7.47E-05	4.95E-04	4.06E-06	3.05E-05	1.26E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	20	126	3.93E-04	4.04E-03	2.58E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.45E-05	-	1.35E+00	1.23E+00
		Air compressor	40	126	1.36E-03	1.64E-03	1.22E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	7.77E-05	1.29E-04	7.19E-01	6.52E-01
		3/4 ton Pickup truck	20	126	1.03E-05	2.49E-05	1.65E-04	1.35E-06	1.02E-05	4.18E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01
	<b>Total</b>				<b>8.55E-02</b>	<b>7.01E-01</b>	<b>1.33E+00</b>	<b>3.23E-03</b>	<b>2.02E-02</b>	<b>1.65E-02</b>	<b>3.40E+02</b>	<b>1.09E-02</b>	<b>1.83E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 9

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2033 (pounds per day)						
					VOc	Nox	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	4.72E-04	1.14E-03	7.55E-03	6.19E-05	4.64E-04	1.91E-04	
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.42E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	6.97E-03	1.68E-02	1.11E-01	9.14E-04	6.86E-03	2.82E-03	
	Fish relocation	3/4 ton pickup truck	16	19	1.74E-03	4.20E-03	2.78E-02	2.28E-04	1.71E-03	7.05E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	7.32E-05	2.00E-04	1.20E-03	1.48E-05	1.09E-04	4.46E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.30E-02	3.38E-04	2.99E-03	2.75E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.14E-03	4.58E-02	6.05E-02	3.21E-04	1.70E-03	1.56E-03	
		Tractor/crawler/dozer	0.8673	19	4.03E-03	3.77E-02	3.00E-02	1.44E-04	1.62E-03	1.49E-03	
	Chipping	Brush chipper	0.8673	19	4.61E-03	1.35E-02	3.65E-02	2.28E-04	4.70E-04	4.32E-04	
		Front end loader	0.8673	19	6.14E-03	4.58E-02	6.05E-02	3.21E-04	1.70E-03	1.56E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.79E-03	6.05E-02	5.27E-02	2.83E-04	2.50E-03	2.30E-03	
		Front end loader	49 hp	4	7.61E-03	5.75E-02	8.12E-02	1.36E-04	2.96E-04	2.72E-04	
		Roller	47 hp	4	9.64E-03	6.03E-02	8.56E-02	1.33E-04	8.88E-04	8.17E-04	
		Water truck	3000 gal	4	6.13E-03	2.45E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04	
		Excavator	300 hp	4	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
		Front end loader	180 hp	4	7.92E-03	5.22E-02	8.98E-02	5.08E-04	1.84E-03	1.69E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.74E-02	1.82E-01	1.58E-01	8.49E-04	7.51E-03	6.91E-03	
		Loader/backhoe	75 hp	0.0923	9.07E-05	1.08E-03	2.05E-03	3.68E-06	3.13E-05	2.88E-05	
		Crane 94'	155 hp	155	3.63E-01	3.77E+00	6.85E+00	1.31E-02	1.94E-01	1.79E-01	
		1 ton pickup truck	155	19	1.10E-02	3.00E-02	1.80E-01	2.22E-03	1.64E-02	6.69E-03	
		Crane 94'	155 hp	155	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
		1 ton pickup truck	155	20	1.04E-02	2.85E-02	1.71E-01	2.11E-03	1.56E-02	6.36E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.50E-03	5.75E-02	5.01E-02	2.69E-04	2.38E-03	2.19E-03	
	Dewatering	Concrete saw	13 hp	8	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02	
		Flatbed truck	8	23	2.11E-03	2.14E-03	1.64E-02	9.29E-05	7.00E-04	2.85E-04	
		Generator	80 hp	5856	244	7.13E-01	6.64E+00	1.45E+01	2.92E-02	9.63E-02	
		Tractor/crawler/dozer	600 hp	78,8462	19	5.85E-01	5.36E+00	6.32E+00	3.10E-02	2.00E-01	
		Tractor/crawler/dozer	600 hp	78,8462	19	5.85E-01	5.36E+00	6.32E+00	3.10E-02	2.00E-01	
		Tractor/crawler/dozer	600 hp	78,8462	19	5.85E-01	5.36E+00	6.32E+00	3.10E-02	2.00E-01	
		Tractor/crawler/dozer	600 hp	78,8462	19	5.85E-01	5.36E+00	6.32E+00	3.10E-02	2.00E-01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	5.85E-01	5.36E+00	6.32E+00	3.10E-02	2.00E-01	
	Armoring	1 ton pickup truck	1,0667	19	7.56E-05	2.07E-04	1.24E-03	1.53E-05	1.13E-04	4.61E-05	
		Excavator	430 hp	1,0667	19	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	
		1 ton pickup truck	1,0667	19	7.56E-05	2.07E-04	1.24E-03	1.53E-05	1.13E-04	4.61E-05	
	Maintenance	Grader	215 hp	144	3.95E-02	4.10E-01	4.07E-01	2.28E-03	1.37E-02	1.26E-02	
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.98E-03	3.59E-02	1.70E-02	1.44E-04	2.47E-03	
		Excavator	430 hp	4,445	22	1.32E-02	8.26E-02	1.56E-01	7.97E-04	2.99E-03	
		Tractor/crawler/dozer	850 hp	3,2327	22	4.20E-02	9.07E-01	3.41E-01	1.65E-03	1.97E-02	
		Tractor/crawler/dozer	440 hp	40	20	2.51E-01	2.34E+00	1.87E+00	8.95E-03	1.01E-01	
		Tractor/crawler/dozer	440 hp	5	20	3.13E-02	2.93E-01	2.34E-01	1.12E-03	1.26E-02	
		3/4 ton Pickup truck	20	20	2.06E-03	4.98E-03	3.30E-02	2.71E-04	2.03E-03	8.37E-04	
	Drilling	Rotary drill	475 hp	34,0003	126	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	
		3/4 ton Pickup truck	34,0003	126	5.57E-04	1.34E-03	8.91E-03	7.31E-05	5.48E-04	2.26E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	7.86E-04	1.90E-03	1.26E-02	1.03E-04	7.74E-04	3.19E-04	
		Diamond cutting saw	50 hp	48	126	1.17E-02	1.24E-01	1.49E-01	3.01E-04	1.01E-03	
		Crane 260'	375 hp	60,0214	126	3.75E-02	3.85E-01	2.46E-01	1.26E-03	1.62E-02	
		3/4 ton Pickup truck	60,0214	126	9.83E-04	2.37E-03	1.57E-02	1.29E-04	9.68E-04	3.99E-04	
	Load/Haul	Front end loader	350 hp	4	126	2.62E-03	1.82E-02	2.00E-02	1.03E-04	6.78E-04	
		Water truck	3000 gal	507	126	1.17E-01	4.69E-01	2.23E-01	1.88E-03	3.23E-02	
	Landfill	Crane 260'	375 hp	30,0107	126	1.87E-02	1.93E-01	1.23E-01	6.31E-04	8.08E-03	
	Micro-blast	Crane 260'	375 hp	49	126	3.06E-02	3.15E-01	2.01E-01	1.03E-03	1.32E-02	
		Horizontal boring drill	10 hp	55	126	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	
		3/4 ton Pickup truck	60	126	9.82E-04	2.37E-03	1.57E-02	1.29E-04	9.67E-04	3.98E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	1.25E-02	1.28E-01	8.20E-02	4.21E-04	5.38E-03	
		Air compressor	50 hp	40	126	4.33E-02	5.20E-02	3.87E+00	2.61E-04	1.65E-03	
		3/4 ton Pickup truck	20	126	3.27E-04	7.91E-04	5.24E-03	4.30E-05	3.22E-04	1.33E-04	
<b>Total</b>						<b>4.93E+00</b>	<b>4.36E+01</b>	<b>6.63E+01</b>	<b>2.17E-01</b>	<b>1.70E+00</b>	<b>1.50E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	5	0	0	0	0
	43	0	0	0	0
	66	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 10

Construction Start Year 2035  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2035 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Fish relocation	3/4 ton pickup truck	16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.627	0.003	0.030	0.028	301.158	0.011	0.000
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Brush Piling	Front end loader	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000
		Tractor/crawler/dozer	0.8673	19	0.065	0.604	0.474	0.002	0.026	0.024	234.962	0.008	0.000
	Chipping	Brush chipper	0.8673	19	0.089	0.236	0.726	0.005	0.008	0.008	403.250	0.008	0.000
		Front end loader	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	0.069	0.724	0.627	0.003	0.030	0.028	301.158	0.011	0.000
		Front end loader	4	19	0.167	1.261	1.787	0.003	0.006	0.006	231.302	0.015	0.000
		Roller	4	19	0.210	1.359	1.952	0.003	0.016	0.015	235.507	0.019	0.000
		Water truck	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Excavator	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
		Front end loader	4	19	0.047	0.313	0.537	0.003	0.011	0.010	270.061	0.008	0.000
		36" Diversion Pipe - grad	6	19	0.069	0.724	0.627	0.003	0.030	0.028	301.158	0.011	0.000
		Loader/backhoe	0.0923	19	0.056	0.672	1.273	0.002	0.020	0.018	195.356	0.008	0.000
		Crane 94'	155	19	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000
		1 ton pickup truck	155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
		Crane 94'	155	20	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000
		1 ton pickup truck	155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	2	20	0.069	0.724	0.627	0.003	0.030	0.028	301.158	0.011	0.000
	Dewatering	Concrete saw	8	23	3.072	2.271	117.463	0.006	1.685	1.681	200.981	0.175	0.188
		Crane 80'	16	23	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000
		Flatbed truck	8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135
		Generator	5856	244	0.081	0.757	1.716	0.003	0.009	0.008	294.384	0.007	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	78.8462	19	0.053	0.489	0.566	0.003	0.018	0.017	280.790	0.010	0.000
	Push	Tractor/crawler/dozer	78.8462	19	0.053	0.489	0.566	0.003	0.018	0.017	280.790	0.010	0.000
		Tractor/crawler/dozer	78.8462	19	0.053	0.489	0.566	0.003	0.018	0.017	280.790	0.010	0.000
	Build road	Tractor/crawler/dozer	78.8462	19	0.053	0.489	0.566	0.003	0.018	0.017	280.790	0.010	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
		Excavator	1.0667	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
		1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Maintenance	Grader	144	210	0.061	0.631	0.624	0.004	0.021	0.019	312.002	0.010	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	6.7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Excavator	4.445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
		Tractor/crawler/dozer	3.2327	22	0.076	1.647	0.809	0.003	0.036	0.033	298.249	0.011	0.000
	Platform	Tractor/crawler/dozer	40	20	0.065	0.604	0.474	0.002	0.026	0.024	234.962	0.008	0.000
		Tractor/crawler/dozer	5	20	0.065	0.604	0.474	0.002	0.026	0.024	234.962	0.008	0.000
		3/4 ton Pickup truck	20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Drilling	Rotary drill	34.0003	126	0.041	0.370	0.500	0.003	0.013	0.012	282.166	0.006	0.000
		3/4 ton Pickup truck	34.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Cut with Diamond wire	Diamond cutting saw	48	126	0.136	1.463	1.765	0.004	0.009	0.009	277.562	0.012	0.000
		Crane 260'	60.0214	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000
	Lift/Load blocks	3/4 ton Pickup truck	60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Front end loader	4	126	0.053	0.371	0.407	0.002	0.014	0.013	214.821	0.007	0.000
	Load/Haul	Water truck	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Crane 260'	30.0107	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000
	Landfill	Crane 260'	49	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000
	Micro-blast	Crane 260'	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000
		Horizontal boring drill	60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		3/4 ton Pickup truck	20	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000
	Demolish spillway	Crane 260'	40	126	0.615	0.730	55.449	0.004	0.024	0.023	307.059	0.035	0.058
		Air compressor	20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		3/4 ton Pickup truck	20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056

Total  
Daily Onsite Emissions (lb/day)  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 10

Construction Start Year 2035  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2035 (tons per year)										Metric Tons CO2e/yr		
					GWP												
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01		
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02		
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	2.97E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01		
		Chain saw	1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04		
		Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
	Brush Piling	Tractor/crawler/dozer	310 hp	0.8673	19	1.92E-05	1.79E-04	1.40E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.51E-06	-	6.97E-02	6.32E-02	
		Brush chipper	250 hp	0.8673	19	2.13E-05	5.64E-05	1.74E-04	1.08E-06	1.98E-06	1.83E-06	9.64E-02	1.92E-06	-	9.64E-02	8.75E-02	
		Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	2.75E-05	2.87E-04	2.49E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01
		Front end loader	49 hp	4	19	3.62E-05	2.72E-04	3.86E-04	6.46E-07	1.33E-06	1.22E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02	
Roller		47 hp	4	19	4.36E-05	2.82E-04	4.05E-04	6.31E-07	3.35E-06	3.08E-06	4.88E-02	3.93E-06	-	4.89E-02	4.44E-02		
Water truck		3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02		
Excavator		300 hp	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.70E-06	-	2.80E-01	2.54E-01		
Front end loader		180 hp	4	19	3.76E-05	2.48E-04	4.26E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.53E-06	-	2.14E-01	1.95E-01		
36" Diversion Pipe - grad		Tractor/crawler/dozer	180 hp	6	19	8.24E-05	8.62E-04	7.46E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.31E-05	-	3.59E-01	3.26E-01	
Loader/backhoe		75 hp	0.0923	19	4.31E-07	5.13E-06	9.72E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.12E-08	-	1.49E-03	1.35E-03		
Crane 94'		155 hp	155	19	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00		
1 ton pickup truck		155 hp	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
Demolish cofferdam	Crane 94'	155 hp	155	20	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00		
	1 ton pickup truck	155 hp	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
	Tractor/crawler/dozer	180 hp	2	20	2.75E-05	2.87E-04	2.49E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01		
	Concrete saw	13 hp	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02		
	Crane 80'	130 hp	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.61E-05	-	4.77E-01	4.33E-01		
	Flatbed truck	8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	-	1.86E-01	1.69E-01		
	Generator	80 hp	5856	244	4.21E-02	3.91E-01	8.86E-01	1.78E-03	4.55E-03	4.19E-03	1.52E+02	3.80E-03	-	1.52E+02	1.38E+02		
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.95E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.95E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
		Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.95E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
Build road		Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.95E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
Armoring		1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02		
Excavator		430 hp	1.0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.32E-06	-	1.07E-01	9.72E-02		
1 ton pickup truck		1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02			
Maintenance		Grader	215 hp	144	210	2.07E-03	2.15E-02	2.13E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.32E-04	-	1.07E+01	9.67E+00	
Demolition		Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	
		Excavator	430 hp	4.445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.39E-05	-	4.47E-01	4.05E-01	
	Tractor/crawler/dozer	850 hp	3.2327	22	2.31E-04	4.99E-03	1.84E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.32E-05	-	9.04E-01	8.20E-01		
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.25E-03	1.17E-02	9.19E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.64E-04	-	4.56E+00	4.14E+00	
	Tractor/crawler/dozer	440 hp	5	20	1.57E-04	1.46E-03	1.15E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.06E-05	-	5.70E-01	5.17E-01		
	3/4 ton Pickup truck	5	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	-	4.46E-05	4.15E-01			
	Drilling	Rotary drill	475 hp	34.0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.56E+00	
	3/4 ton Pickup truck	34.0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	-	7.77E-01	7.05E-01		
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	-	1.10E+00	9.95E-01	
	Diamond cutting saw	50 hp	48	126	3.59E-04	3.87E-03	4.67E-03	9.49E-06	2.46E-05	2.28E-05	7.34E-01	3.24E-05	-	7.35E-01	6.67E-01		
Lift/Load blocks	Crane 260'	375 hp	60.0214	126	1.18E-03	1.21E-02	7.75E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.30E-04	-	4.05E+00	3.68E+00		
	3/4 ton Pickup truck	350 hp	60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00		
	Front end loader	350 hp	4	126	8.25E-05	5.72E-04	6.28E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.01E-05	-	3.32E-01	3.01E-01		
	Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01		
	Crane 260'	375 hp	30.107	126	5.90E-04	6.07E-03	3.88E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	6.51E-05	-	2.03E+00	1.84E+00		
	Micro-blast	Crane 260'	375 hp	49	126	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.06E-04	-	3.31E+00	3.00E+00	
	Horizontal boring drill	10 hp	55	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01		
	3/4 ton Pickup truck	60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	-	1.37E+00	1.24E+00		
	Demolish spillway	Crane 260'	375 hp	20	126	3.93E-04	4.04E-03	2.58E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.34E-05	-	1.35E+00	1.23E+00	
	Air compressor	50 hp	40	126	1.36E-03	1.61E-03	1.22E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	7.72E-05	1.28E-04	7.18E-01	6.52E-01		
3/4 ton Pickup truck	20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	-	4.57E-01			
<b>Total</b>					<b>8.40E-02</b>	<b>6.86E-01</b>	<b>1.32E+00</b>	<b>3.23E-03</b>	<b>1.88E-02</b>	<b>1.53E-02</b>	<b>3.40E+02</b>	<b>1.07E-02</b>	<b>1.83E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>		

Daily Onsite Emissions  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 10

Construction Start Year 2035  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2035 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04	
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02	
Environmental protection measures	Biologist		709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03	
	Fish relocation		16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.26E-02	3.38E-04	2.99E-03	2.75E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	540 hp	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
	Tractor/crawler/dozer	310 hp	0.8673	19	4.03E-03	3.77E-02	2.96E-02	1.44E-04	1.62E-03	1.49E-03	
	Chipping	250 hp	0.8673	19	4.49E-03	1.19E-02	3.65E-02	2.28E-04	4.18E-04	3.84E-04	
	Front end loader	540 hp	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
Dewatering	Temporary Cofferdam	180 hp	2	19	5.79E-03	6.05E-02	5.24E-02	2.83E-04	2.50E-03	2.30E-03	
	Front end loader	49 hp	4	19	7.62E-03	5.73E-02	8.13E-02	1.36E-04	2.80E-04	2.58E-04	
	Roller	47 hp	4	19	9.17E-03	5.93E-02	8.52E-02	1.33E-04	7.05E-04	6.49E-04	
	Water truck	3000 gal	4	19	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04	
	Excavator	300 hp	4	19	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
	Front end loader	180 hp	4	19	7.92E-03	5.22E-02	8.97E-02	5.08E-04	1.84E-03	1.69E-03	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	1.74E-02	1.82E-01	1.57E-01	8.49E-04	7.51E-03	6.91E-03	
	Loader/backhoe	75 hp	0.0923	19	9.07E-05	1.08E-03	2.05E-03	3.68E-06	3.13E-05	2.88E-05	
	Crane 94'	155 hp	155	19	3.63E-01	3.77E+00	6.85E+00	1.31E-02	1.94E-01	1.79E-01	
	1 ton pickup truck		155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03	
	Crane 94'	155 hp	155	20	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
	1 ton pickup truck		155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.50E-03	5.75E-02	4.97E-02	2.69E-04	2.38E-03	2.19E-03	
	Dewatering	Concrete saw	13 hp	8	6.13E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
	Crane 80'	130 hp	16	23	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02	
	Flatbed truck		8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04	
	Generator	80 hp	5856	244	6.90E-01	6.41E+00	1.45E+01	2.92E-02	7.46E-02	6.86E-02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.21E+00	3.10E-02	2.00E-01	1.84E-01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.21E+00	3.10E-02	2.00E-01	1.84E-01
	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.21E+00	3.10E-02	2.00E-01	1.84E-01	
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	5.85E-01	5.36E+00	6.21E+00	3.10E-02	2.00E-01	1.84E-01
	Armoring	1 ton pickup truck	1.0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
	Excavator	430 hp	1.0667	19	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	7.64E-04	
	1 ton pickup truck		1.0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
	Maintenance	Grader	215 hp	144	210	3.95E-02	4.10E-01	4.06E-01	2.28E-03	1.37E-02	1.26E-02
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03
	Excavator	430 hp	4.445	22	1.32E-02	8.26E-02	1.56E-01	7.97E-04	2.99E-03	2.75E-03	
	Tractor/crawler/dozer	850 hp	3.2327	22	4.20E-02	9.07E-01	3.85E-01	1.65E-03	1.97E-02	1.82E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.51E-01	2.34E+00	1.84E+00	8.95E-03	1.01E-01	9.29E-02	
	Tractor/crawler/dozer	440 hp	5	20	3.13E-02	2.93E-01	2.30E-01	1.12E-03	1.26E-02	1.16E-02	
	3/4 ton Pickup truck		5	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	8.28E-04	
	Drilling	Rotary drill	475 hp	34.0003	126	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	6.72E-03
	3/4 ton Pickup truck		34.0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	2.23E-04	
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04	3.15E-04
	Diamond cutting saw	50 hp	48	126	1.14E-02	1.23E-01	1.48E-01	3.01E-04	7.80E-04	7.17E-04	
	Lift/Load blocks	Crane 260'	60.0214	126	3.75E-02	3.85E-01	2.46E-01	1.26E-03	1.62E-02	1.49E-02	
	3/4 ton Pickup truck		60.0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Load/Haul	Front end loader	350 hp	4	126	2.62E-03	1.82E-02	1.99E-02	1.03E-04	6.78E-04	6.24E-04
	Water truck	3000 gal	507	126	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30.0107	126	1.87E-02	1.93E-01	1.23E-01	6.31E-04	8.08E-03	7.43E-03
	Micro-blast	Crane 260'	375 hp	49	126	3.06E-02	3.15E-01	2.01E-01	1.03E-03	1.32E-02	1.21E-02
	Horizontal boring drill	10 hp	55	126	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	1.44E-03	
	3/4 ton Pickup truck		60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	1.25E-02	1.28E-01	8.20E-02	4.21E-04	5.38E-03	4.95E-03
	Air compressor	50 hp	40	126	4.30E-02	5.11E-02	3.88E+00	2.61E-04	1.65E-03	1.64E-03	
	3/4 ton Pickup truck		20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	1.31E-04	
	<b>Total</b>				<b>4.91E+00</b>	<b>4.34E+01</b>	<b>6.58E+01</b>	<b>2.17E-01</b>	<b>1.68E+00</b>	<b>1.48E+00</b>	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthdays of Martin Luther K	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021
	10

Data from Air3\_EnvrAirQualityReport.pdf

Daily Onsite Emissions						
Rindge	5	43	66	0	2	1
Surfrider	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	0	0	0	0	0	0
Landfill	0	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 11

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2037 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.623	0.003	0.030	0.028	301.158	0.011	0.000	
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000	
	Tractor/crawler/dozer	310 hp	0.8673	19	0.065	0.604	0.467	0.002	0.026	0.024	234.962	0.008	0.000	
	Chipping	Brush chipper	0.8673	19	0.088	0.215	0.726	0.005	0.008	0.007	403.250	0.008	0.000	
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.623	0.003	0.030	0.028	301.158	0.011	0.000
	Front end loader	49 hp	4	19	0.168	1.259	1.787	0.003	0.006	0.006	231.302	0.015	0.000	
	Roller	47 hp	4	19	0.202	1.345	1.946	0.003	0.013	0.012	235.507	0.019	0.000	
	Water truck	3000 gal	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
	Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	Front end loader	180 hp	4	19	0.047	0.313	0.536	0.003	0.011	0.010	270.061	0.008	0.000	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.623	0.003	0.030	0.028	301.158	0.011	0.000
	Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.273	0.002	0.020	0.018	195.356	0.008	0.000	
	Crane 94'	155 hp	155	19	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
	1 ton pickup truck		155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Crane 94'	155 hp	155	20	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
	1 ton pickup truck		155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.623	0.003	0.030	0.028	301.158	0.011	0.000
	Concrete saw	13 hp	8	23	3.072	2.271	117.450	0.006	1.685	1.681	200.981	0.175	0.188	
	Crane 80'	130 hp	16	23	0.065	0.677	1.229	0.002	0.035	0.032	208.066	0.007	0.000	
	Flatbed truck		8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135	
	Generator	80 hp	5856	244	0.080	0.739	1.715	0.003	0.007	0.007	294.384	0.007	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.558	0.003	0.018	0.017	280.790	0.010	0.000	
	Push	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.558	0.003	0.018	0.017	280.790	0.010	0.000	
	Build road	Tractor/crawler/dozer	600 hp	19	0.053	0.489	0.558	0.003	0.018	0.017	280.790	0.010	0.000	
	Armoring	1 ton pickup truck	1,0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Excavator	430 hp	1,0667	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	1 ton pickup truck		1,0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.061	0.631	0.623	0.004	0.021	0.019	312.002	0.010	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Excavator	430 hp	4,445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
	Tractor/crawler/dozer	850 hp	3,2327	22	0.076	1.647	0.599	0.003	0.036	0.033	298.249	0.011	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.467	0.002	0.026	0.024	234.962	0.008	0.000
	Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.467	0.002	0.026	0.024	234.962	0.008	0.000	
	3/4 ton Pickup truck		20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.041	0.370	0.500	0.003	0.013	0.012	282.166	0.006	0.000
	3/4 ton Pickup truck		34,0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Diamond cutting saw	50 hp	48	126	0.134	1.449	1.762	0.004	0.008	0.007	277.562	0.012	0.000	
	Lift/Load blocks	Crane 260'	60,0214	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
	3/4 ton Pickup truck		60,0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.407	0.002	0.014	0.013	214.821	0.007	0.000
	Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
	Landfill	Crane 260'	30,0107	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
	Micro-blast	Crane 260'	49	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
	Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000	
	3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000
	Air compressor	50 hp	40	126	0.613	0.723	55.206	0.004	0.024	0.023	307.059	0.035	0.058	
	3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 11

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2037 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	2.95E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Brush Piling	Front end loader	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
		Tractor/crawler/dozer	0.8673	19	1.92E-05	1.79E-04	1.39E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.51E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	2.09E-05	5.14E-05	1.74E-04	1.08E-06	1.82E-06	1.68E-06	9.64E-02	1.92E-06	-	9.64E-02	8.75E-02	
		Front end loader	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	2.75E-05	2.87E-04	2.47E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01	
		Front end loader	4	19	3.62E-05	2.72E-04	3.86E-04	6.46E-07	1.30E-06	1.19E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02	
		Roller	4	19	4.19E-05	2.79E-04	4.03E-04	6.31E-07	2.73E-06	2.51E-06	4.88E-02	3.93E-06	-	4.89E-02	4.44E-02	
		Water truck	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.70E-06	-	2.80E-01	2.54E-01	
		Front end loader	4	19	3.76E-05	2.48E-04	4.26E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.53E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	6	19	8.24E-05	8.62E-04	7.42E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.31E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	0.0923	19	4.31E-07	5.13E-06	9.71E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.12E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155	19	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155	20	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	2	20	2.75E-05	2.87E-04	2.47E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02	
		Crane 80'	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.61E-05	-	4.77E-01	4.33E-01	
		Flatbed truck	8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	244	4.13E-02	3.82E-01	8.86E-01	1.78E-03	3.80E-03	3.49E-03	1.52E+02	3.80E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	2.91E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
	Push	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	2.91E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
		Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	2.91E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
	Build road	Tractor/crawler/dozer	78.8462	19	2.78E-03	2.55E-02	2.91E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01	
	Armoring	1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	1.0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.32E-06	-	1.07E-01	9.72E-01	
		1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	144	210	2.07E-03	2.15E-02	2.13E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.32E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01	
		Excavator	4.445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.39E-05	-	4.47E-01	4.05E-01	
		Tractor/crawler/dozer	3.2327	22	2.31E-04	4.99E-03	1.82E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.32E-05	-	9.04E-01	8.20E-01	
	Platform	Tractor/crawler/dozer	40	20	1.25E-03	1.17E-02	9.07E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.64E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	5	20	1.57E-04	1.46E-03	1.13E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.06E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck	20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	34.0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.56E+00	
		3/4 ton Pickup truck	34.0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
		Diamond cutting saw	48	126	3.56E-04	3.83E-03	4.66E-03	9.49E-06	1.99E-05	1.83E-05	7.34E-01	3.24E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	60.0214	126	1.18E-03	1.21E-02	7.75E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.30E-04	-	4.05E+00	3.68E+00	
		3/4 ton Pickup truck	60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
		Front end loader	4	126	8.25E-05	5.72E-04	6.28E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.01E-05	-	3.32E-01	3.01E-01	
		Water truck	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	30.0107	126	5.90E-04	6.07E-03	3.88E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	6.51E-05	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	49	126	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.06E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	60	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
		3/4 ton Pickup truck	60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	20	126	3.93E-04	4.04E-03	2.58E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.34E-05	-	1.35E+00	1.23E+00	
		Air compressor	40	126	1.35E-03	1.59E-03	1.22E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	7.72E-05	1.28E-04	7.18E-01	6.52E-01	
		3/4 ton Pickup truck	20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>Total</b>	<b>8.32E-02</b>	<b>6.77E-01</b>	<b>1.32E+00</b>	<b>3.23E-03</b>	<b>1.81E-02</b>	<b>1.46E-02</b>	<b>3.40E+02</b>	<b>1.07E-02</b>	<b>1.83E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 11

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2037 (pounds per day)						
					VOc	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04	
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03	
	Fish relocation	3/4 ton pickup truck	16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.22E-02	3.38E-04	2.99E-03	2.75E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
		Tractor/crawler/dozer	0.8673	19	4.03E-03	3.77E-02	2.92E-02	1.44E-04	1.62E-03	1.49E-03	
	Chipping	Brush chipper	0.8673	19	4.41E-03	1.08E-02	3.65E-02	2.28E-04	3.84E-04	3.53E-04	
		Front end loader	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.79E-03	6.05E-02	5.20E-02	2.83E-04	2.50E-03	2.30E-03	
		Front end loader	49 hp	4	7.62E-03	5.73E-02	8.13E-02	1.36E-04	2.73E-04	2.51E-04	
		Roller	47 hp	4	8.82E-03	5.87E-02	8.49E-02	1.33E-04	5.74E-04	5.28E-04	
		Water truck	3000 gal	4	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04	
		Excavator	300 hp	4	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
		Front end loader	180 hp	4	7.92E-03	5.22E-02	8.98E-02	5.08E-04	1.84E-03	1.69E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.74E-02	1.82E-01	1.56E-01	8.49E-04	7.51E-03	6.91E-03	
		Loader/backhoe	75 hp	0.0923	9.07E-05	1.08E-03	2.05E-03	3.68E-06	3.13E-05	2.88E-05	
		Crane 94'	155 hp	155	3.63E-01	3.77E+00	6.85E+00	1.31E-02	1.94E-01	1.79E-01	
		1 ton pickup truck	155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03	
		Crane 94'	155 hp	155	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
		1 ton pickup truck	155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.50E-03	5.75E-02	4.94E-02	2.69E-04	2.38E-03	2.19E-03	
		Concrete saw	13 hp	8	6.12E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02	
		Flatbed truck	8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04	
		Generator	80 hp	5856	6.78E-01	6.26E+00	1.45E+01	2.92E-02	6.23E-02	5.73E-02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.13E+00	3.10E-02	2.00E-01	1.84E-01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.13E+00	3.10E-02	2.00E-01	1.84E-01	
		Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.13E+00	3.10E-02	2.00E-01	1.84E-01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.13E+00	3.10E-02	2.00E-01	1.84E-01	
	Armoring	1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
		Excavator	430 hp	1,0667	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	7.64E-04	
		1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
	Maintenance	Grader	215 hp	144	3.95E-02	4.10E-01	4.05E-01	2.28E-03	1.37E-02	1.26E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03	
		Excavator	430 hp	4,445	1.32E-02	8.26E-02	1.56E-01	7.97E-04	2.99E-03	2.75E-03	
		Tractor/crawler/dozer	850 hp	3,2327	4.20E-02	9.07E-01	3.30E-01	1.65E-03	1.97E-02	1.82E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.51E-01	2.34E+00	1.81E+00	8.95E-03	1.01E-01	9.29E-02	
		Tractor/crawler/dozer	440 hp	5	3.13E-02	2.93E-01	2.27E-01	1.12E-03	1.26E-02	1.16E-02	
		3/4 ton Pickup truck	20	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	8.28E-04	
	Drilling	Rotary drill	475 hp	34,0003	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	6.72E-03	
		3/4 ton Pickup truck	34,0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	2.23E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04	3.15E-04	
		Diamond cutting saw	50 hp	48	1.13E-02	1.22E-01	1.48E-01	3.01E-04	6.33E-04	5.82E-04	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	3.75E-02	3.85E-01	2.46E-01	1.26E-03	1.62E-02	1.49E-02	
		3/4 ton Pickup truck	60,0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Load/Haul	Front end loader	350 hp	4	2.62E-03	1.82E-02	1.99E-02	1.03E-04	6.78E-04	6.24E-04	
		Water truck	3000 gal	507	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30,0107	1.87E-02	1.93E-01	1.23E-01	6.31E-04	8.08E-03	7.43E-03	
	Micro-blast	Crane 260'	375 hp	49	3.06E-02	3.15E-01	2.01E-01	1.03E-03	1.32E-02	1.21E-02	
		Horizontal boring drill	10 hp	55	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	1.44E-03	
		3/4 ton Pickup truck	60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Demolish spillway	Crane 260'	375 hp	20	1.25E-02	1.28E-01	8.20E-02	4.21E-04	5.38E-03	4.95E-03	
		Air compressor	50 hp	40	4.29E-02	5.06E-02	3.86E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	1.31E-04	
					<b>Total</b>	<b>4.89E+00</b>	<b>4.32E+01</b>	<b>6.54E+01</b>	<b>2.17E-01</b>	<b>1.67E+00</b>	<b>1.47E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite						
Rindge	5	43	65	0	2	1
Surridge	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	0	0	0	0	0	0
Landfill	0	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 12 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2039 (g/hp-hr or g/hr)											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O			
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056			
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048			
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056			
	Fish relocation	3/4 ton pickup truck	16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056			
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056			
		Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.620	0.003	0.030	0.028	301.158	0.011	0.000		
		Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039		
		Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000		
		Tractor/crawler/dozer	310 hp	0.8673	19	0.065	0.604	0.462	0.002	0.026	0.024	234.962	0.008	0.000		
		Chipping	Brush chipper	250 hp	0.8673	19	0.086	0.203	0.727	0.005	0.007	0.007	403.250	0.008	0.000	
		Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000		
		Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.620	0.003	0.030	0.028	301.158	0.011	0.000		
		Front end loader	49 hp	4	19	0.168	1.259	1.788	0.003	0.006	0.006	231.302	0.015	0.000		
		Roller	47 hp	4	19	0.197	1.334	1.942	0.003	0.011	0.010	235.507	0.019	0.000		
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.620	0.003	0.030	0.028	301.158	0.011	0.000		
		Front end loader	49 hp	4	19	0.168	1.259	1.788	0.003	0.006	0.006	231.302	0.015	0.000		
		Water truck	3000 gal	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048		
		Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000		
		Front end loader	180 hp	4	19	0.047	0.313	0.536	0.003	0.011	0.010	270.061	0.008	0.000		
		36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.620	0.003	0.030	0.028	301.158	0.011	0.000	
		Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.273	0.002	0.020	0.018	195.356	0.008	0.000		
		Crane 94'	155 hp	155	19	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000		
		1 ton pickup truck		155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
		Crane 94'	155 hp	155	20	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000		
		1 ton pickup truck		155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.620	0.003	0.030	0.028	301.158	0.011	0.000	
		Dewatering	Concrete saw	13 hp	8	23	3.072	2.270	117.436	0.006	1.685	1.681	200.981	0.175	0.188	
			Crane 80'	130 hp	16	23	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000	
			Flatbed truck	8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135		
			Generator	80 hp	5856	244	0.079	0.729	1.715	0.003	0.007	0.006	294.384	0.007	0.000	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.552	0.003	0.018	0.017	280.790	0.010	0.000	
			Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.552	0.003	0.018	0.017	280.790	0.010	0.000
				Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.552	0.003	0.018	0.017	280.790	0.010	0.000
			Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.552	0.003	0.018	0.017	280.790	0.010	0.000
		Armoring	1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
			Excavator	430 hp	1.0667	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
			1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
		Maintenance	Grader	215 hp	144	210	0.061	0.631	0.622	0.004	0.021	0.019	312.002	0.010	0.000	
		Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
			Excavator	430 hp	4.445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000	
Demolition		Tractor/crawler/dozer	850 hp	3.2327	22	0.076	1.647	0.592	0.003	0.036	0.033	298.249	0.011	0.000		
		Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.462	0.002	0.026	0.024	234.962	0.008	0.000	
			Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.462	0.002	0.026	0.024	234.962	0.008	0.000	
			3/4 ton Pickup truck	20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
		Drilling	Rotary drill	475 hp	34.0003	126	0.041	0.370	0.500	0.003	0.013	0.012	282.166	0.006	0.000	
			3/4 ton Pickup truck	34.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
			Diamond cutting saw	50 hp	48	126	0.134	1.440	1.763	0.004	0.007	0.006	277.562	0.012	0.000	
		Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			3/4 ton Pickup truck	60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
		Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.407	0.002	0.014	0.013	214.821	0.007	0.000	
			Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Landfill	Crane 260'	375 hp	30.0107	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
		Micro-blast	Crane 260'	375 hp	49	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000	
			3/4 ton Pickup truck	60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
		Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.312	0.002	0.021	0.019	163.241	0.005	0.000	
			Air compressor	50 hp	40	126	0.613	0.723	55.276	0.004	0.024	0.023	307.059	0.035	0.058	
			3/4 ton Pickup truck	20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		

Total  
Daily Onsite Emissions (lb/day)

- Rindge
- Surfrider
- Topanga
- Zuma
- Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 12 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2039 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	2.94E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04	
	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
	Tractor/crawler/dozer	310 hp	0.8673	19	1.92E-05	1.79E-04	1.37E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.51E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	250 hp	0.8673	19	2.07E-05	4.85E-05	1.74E-04	1.08E-06	1.73E-06	1.59E-06	9.64E-02	1.92E-06	-	9.64E-02	8.75E-02
	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.75E-05	2.87E-04	2.46E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01	
	Front end loader	49 hp	4	19	3.62E-05	2.72E-04	3.86E-04	6.46E-07	1.29E-06	1.19E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02	
	Roller	47 hp	4	19	4.08E-05	2.76E-04	4.02E-04	6.31E-07	2.26E-06	2.08E-06	4.88E-02	3.93E-06	-	4.89E-02	4.44E-02	
	Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
	Excavator	300 hp	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.70E-06	-	2.80E-01	2.54E-01	
	Front end loader	180 hp	4	19	3.76E-05	2.48E-04	4.26E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.53E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	8.24E-05	8.62E-04	7.38E-04	4.03E-06	3.67E-05	3.28E-05	3.69E-01	1.31E-05	-	3.69E-01	3.26E-01	
	Loader/backhoe	75 hp	0.0923	19	4.31E-07	5.13E-06	9.71E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.12E-08	-	1.49E-03	1.35E-03	
	Crane 94'	155 hp	155	19	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Crane 94'	155 hp	155	20	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.75E-05	2.87E-04	2.46E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01	1.09E-01	
	Concrete saw	13 hp	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02	
	Crane 80'	130 hp	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.61E-05	-	4.77E-01	4.33E-01	
	Flatbed truck	8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	-	1.86E-01	1.69E-01	
	Generator	80 hp	5856	244	4.10E-02	3.76E-01	8.86E-01	1.78E-03	3.38E-03	3.11E-03	1.52E+02	3.80E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	2.78E-03	2.55E-02	2.88E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	2.78E-03	2.55E-02	2.88E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	2.78E-03	2.55E-02	2.88E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
	Armoring	1 ton pickup truck	1,0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Excavator	430 hp	1,0667	19	1.75E-05	1.09E-04	2.05E-04	1.05E-06	3.94E-06	3.63E-06	1.07E-01	3.32E-06	-	1.07E-01	9.72E-02	
	1 ton pickup truck		1,0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	210	2.07E-03	2.15E-02	2.12E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.32E-04	-	1.07E+01	9.67E+00
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01
	Excavator	430 hp	4,445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.39E-05	-	4.47E-01	4.05E-01	
	Tractor/crawler/dozer	850 hp	3,2327	22	2.31E-04	4.99E-03	1.79E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.32E-05	-	9.04E-01	8.20E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.25E-03	1.17E-02	8.97E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.64E-04	-	4.56E+00	4.14E+00
	Tractor/crawler/dozer	440 hp	5	20	1.57E-04	1.46E-03	1.12E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.06E-05	-	5.70E-01	5.17E-01	
	3/4 ton Pickup truck		20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	-	4.57E-01	4.15E-01
	Drilling	Rotary drill	475 hp	34,0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00	4.66E+00
	3/4 ton Pickup truck		34,0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
	Diamond cutting saw	50 hp	48	126	3.56E-04	3.81E-03	4.66E-03	9.49E-06	1.74E-05	1.60E-05	7.34E-01	3.24E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.18E-03	1.21E-02	7.75E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.30E-04	-	4.05E+00	3.68E+00
	3/4 ton Pickup truck		60,0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	126	8.25E-05	5.72E-04	6.28E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.01E-05	-	3.32E-01	3.01E-01
	Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	5.90E-04	6.07E-03	3.88E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	6.51E-05	-	2.03E+00	1.84E+00
	Micro-blast	Crane 260'	375 hp	49	126	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.06E-04	-	3.31E+00	3.00E+00
	Horizontal boring drill	10 hp	55	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
	3/4 ton Pickup truck		60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	126	3.93E-04	4.04E-03	2.58E-03	1.32E-05	1.70E-04	1.56E-04	1.35E+00	4.34E-05	-	1.35E+00	1.23E+00
	Air compressor	50 hp	40	126	1.35E-03	1.59E-03	1.22E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	7.72E-05	1.28E-04	7.18E-01	6.52E-01	
	3/4 ton Pickup truck		20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	<b>Total</b>				<b>8.29E-02</b>	<b>6.72E-01</b>	<b>1.32E+00</b>	<b>3.23E-03</b>	<b>1.77E-02</b>	<b>1.42E-02</b>	<b>3.40E+02</b>	<b>1.07E-02</b>	<b>1.83E-03</b>	<b>3.41E+02</b>	<b>3.10E+02</b>	

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 12 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2039 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04	
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03	
	Fish relocation	3/4 ton pickup truck	16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05	
	Tractor/crawler/dozer	250 hp	1,7208	19	6.91E-03	7.23E-02	6.19E-02	3.38E-04	2.99E-03	2.75E-03	
	Chain saw		1,7209	19	2.45E-02	3.83E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
		Tractor/crawler/dozer	0.8673	19	4.03E-03	3.77E-02	2.88E-02	1.44E-04	1.62E-03	1.49E-03	
	Chipping	Brush chipper	0.8673	19	4.35E-03	1.02E-02	3.66E-02	2.28E-04	3.64E-04	3.35E-04	
		Front end loader	0.8673	19	6.14E-03	4.58E-02	6.04E-02	3.21E-04	1.70E-03	1.56E-03	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.79E-03	6.05E-02	5.18E-02	2.83E-04	2.50E-03	2.30E-03	
		Front end loader	49 hp	4	7.62E-03	5.73E-02	8.13E-02	1.36E-04	2.72E-04	2.51E-04	
		Roller	47 hp	4	8.58E-03	5.82E-02	8.47E-02	1.33E-04	4.75E-04	4.37E-04	
		Water truck	3000 gal	4	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04	
		Excavator	300 hp	4	9.61E-03	6.01E-02	1.13E-01	5.79E-04	2.17E-03	2.00E-03	
		Front end loader	180 hp	4	7.92E-03	5.22E-02	8.98E-02	5.08E-04	1.84E-03	1.69E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.74E-02	1.82E-01	1.55E-01	8.49E-04	7.51E-03	6.91E-03	
		Loader/backhoe	75 hp	0.0923	9.07E-05	1.08E-03	2.05E-03	3.68E-06	3.13E-05	2.88E-05	
		Crane 94'	155 hp	155	3.63E-01	3.77E+00	6.86E+00	1.31E-02	1.94E-01	1.79E-01	
		1 ton pickup truck	155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03	
		Crane 94'	155 hp	155	3.45E-01	3.59E+00	6.51E+00	1.24E-02	1.85E-01	1.70E-01	
		1 ton pickup truck	155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.50E-03	5.75E-02	4.92E-02	2.69E-04	2.38E-03	2.19E-03	
		Concrete saw	13 hp	8	6.12E-02	4.53E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	2.60E-02	2.70E-01	4.90E-01	9.33E-04	1.39E-02	1.28E-02	
		Flatbed truck	8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04	
		Generator	80 hp	5856	6.72E-01	6.17E+00	1.45E+01	2.92E-02	5.54E-02	5.10E-02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.07E+00	3.10E-02	2.00E-01	1.84E-01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.07E+00	3.10E-02	2.00E-01	1.84E-01	
		Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.07E+00	3.10E-02	2.00E-01	1.84E-01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	5.85E-01	5.36E+00	6.07E+00	3.10E-02	2.00E-01	1.84E-01	
	Armoring	1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
		Excavator	430 hp	1,0667	3.67E-03	2.30E-02	4.32E-02	2.21E-04	8.30E-04	7.64E-04	
		1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
	Maintenance	Grader	215 hp	144	3.95E-02	4.10E-01	4.05E-01	2.28E-03	1.37E-02	1.26E-02	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03	
		Excavator	430 hp	4,445	1.32E-02	8.26E-02	1.56E-01	7.97E-04	2.99E-03	2.75E-03	
		Tractor/crawler/dozer	850 hp	3,2327	4.20E-02	9.07E-01	3.26E-01	1.65E-03	1.97E-02	1.82E-02	
	Platform	Tractor/crawler/dozer	440 hp	40	2.51E-01	2.34E+00	1.79E+00	8.95E-03	1.01E-01	9.29E-02	
		Tractor/crawler/dozer	440 hp	5	3.13E-02	2.93E-01	2.24E-01	1.12E-03	1.26E-02	1.16E-02	
		3/4 ton Pickup truck	20	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	8.28E-04	
	Drilling	Rotary drill	475 hp	34,0003	2.34E-02	2.09E-01	2.82E-01	1.57E-03	7.31E-03	6.72E-03	
		3/4 ton Pickup truck	34,0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	2.23E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04	3.15E-04	
		Diamond cutting saw	50 hp	48	1.13E-02	1.21E-01	1.48E-01	3.01E-04	5.52E-04	5.08E-04	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	3.75E-02	3.85E-01	2.46E-01	1.26E-03	1.62E-02	1.49E-02	
		3/4 ton Pickup truck	60,0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Load/Haul	Front end loader	350 hp	4	2.62E-03	1.82E-02	1.99E-02	1.03E-04	6.78E-04	6.24E-04	
		Water truck	3000 gal	507	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30,0107	1.87E-02	1.93E-01	1.23E-01	6.31E-04	8.08E-03	7.43E-03	
	Micro-blast	Crane 260'	375 hp	49	3.06E-02	3.15E-01	2.01E-01	1.03E-03	1.32E-02	1.21E-02	
		Horizontal boring drill	10 hp	55	4.61E-03	3.64E-02	3.67E-02	9.36E-05	1.57E-03	1.44E-03	
		3/4 ton Pickup truck	60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Demolish spillway	Crane 260'	375 hp	20	1.25E-02	1.28E-01	8.20E-02	4.21E-04	5.38E-03	4.95E-03	
		Air compressor	50 hp	40	4.29E-02	5.06E-02	3.87E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	1.31E-04	
					<b>Total</b>	<b>4.89E+00</b>	<b>4.31E+01</b>	<b>6.51E+01</b>	<b>2.17E-01</b>	<b>1.66E+00</b>	<b>1.47E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite						
Rindge	5	43	65	0	2	1
Surridge	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	0	0	0	0	0	0
Landfill	0	0	0	0	0	0

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2066 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
Environmental protection measures	Biologist		1229.3333	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Fish relocation	3/4 ton pickup truck		16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	1,7208	19	0.069	0.724	0.619	0.003	0.030	0.028	301.158	0.011	0.000
	Chain saw		1,7209	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000
	Tractor/crawler/dozer	310 hp	0.8673	19	0.065	0.604	0.460	0.002	0.026	0.024	234.962	0.008	0.000
	Chipping	Brush chipper	250 hp	0.8673	19	0.086	0.199	0.727	0.005	0.007	403.250	0.008	0.000
	Front end loader	540 hp	0.8673	19	0.057	0.421	0.556	0.003	0.016	0.014	293.384	0.009	0.000
Landscaping	Fish Passage	Excavator	454 hp	24	20	0.035	0.216	0.406	0.002	0.008	211.854	0.007	0.000
	Loader/backhoe	75 hp	24	20	0.056	0.672	1.273	0.002	0.020	0.018	195.356	0.008	0.000
	Tractor/crawler/dozer	440 hp	24	20	0.065	0.604	0.460	0.002	0.026	0.024	234.962	0.008	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.069	0.724	0.619	0.003	0.030	301.158	0.011	0.000
	Front end loader	49 hp	4	19	0.168	1.259	1.788	0.003	0.006	0.028	231.302	0.015	0.000
	Roller	47 hp	4	19	0.195	1.329	1.941	0.003	0.010	0.009	235.507	0.019	0.000
	Water truck	3000 gal	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Excavator	300 hp	4	19	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	Front end loader	180 hp	4	19	0.047	0.313	0.536	0.003	0.011	0.010	270.061	0.008	0.000
	Tractor/crawler/dozer	180 hp	6	19	0.069	0.724	0.619	0.003	0.030	0.028	301.158	0.011	0.000
	36" Diversion Pipe - gradin	Loader/backhoe	75 hp	0.0923	19	0.056	0.672	1.273	0.002	0.020	195.356	0.008	0.000
	Crane 94'	155 hp	155	19	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000
	1 ton pickup truck		155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Crane 94'	155 hp	155	20	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000
	1 ton pickup truck		155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.069	0.724	0.619	0.003	0.030	301.158	0.011	0.000
	Dewatering	Concrete saw	13 hp	8	23	3.072	2.270	117.429	0.006	1.685	200.981	0.175	0.188
	Crane 80'	130 hp	16	23	0.065	0.677	1.230	0.002	0.035	0.032	208.066	0.007	0.000
	Flatbed truck		8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135
	Generator	80 hp	5856	244	0.079	0.726	1.716	0.003	0.006	0.006	294.384	0.007	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.550	0.003	0.018	280.790	0.010	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.550	0.003	0.018	280.790	0.010	0.000
	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.550	0.003	0.018	0.017	280.790	0.010	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.489	0.550	0.003	0.018	280.790	0.010	0.000
	Maintenance	Grader	215 hp	144	210	0.061	0.631	0.622	0.004	0.021	312.002	0.010	0.000
	Dismantling	Tractor/crawler/dozer	600 hp	157.6923	20	0.053	0.489	0.550	0.003	0.018	280.790	0.010	0.000
	Tractor/crawler/dozer	600 hp	157.6923	20	0.053	0.489	0.550	0.003	0.018	0.017	280.790	0.010	0.000
	1 ton pickup truck		0.9333	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Excavator	430 hp	0.9333	20	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	Excavator	300 hp	341.6667	20	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	1 ton pickup truck		0.9333	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
Rindge Dam & Spillway Demolition*	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.471	12.542	0.106	1.821	21,147.638	0.051	0.048
	Excavator	430 hp	4.445	22	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	Tractor/crawler/dozer	850 hp	3.2327	22	0.076	1.647	0.589	0.003	0.036	0.033	298.249	0.011	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.065	0.604	0.460	0.002	0.026	234.962	0.008	0.000
	Tractor/crawler/dozer	440 hp	5	20	0.065	0.604	0.460	0.002	0.026	0.024	234.962	0.008	0.000
	3/4 ton Pickup truck		20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.041	0.370	0.500	0.003	0.013	282.166	0.006	0.000
	3/4 ton Pickup truck		30.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Diamond cutting saw	50 hp	48	126	0.135	1.438	1.764	0.004	0.006	0.006	277.562	0.012	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.048	0.489	0.312	0.002	0.021	163.241	0.005	0.000
	3/4 ton Pickup truck		60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.053	0.371	0.407	0.002	0.014	214.821	0.007	0.000
	Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.048	0.489	0.312	0.002	0.021	163.241	0.005	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.048	0.489	0.312	0.002	0.021	163.241	0.005	0.000
	Horizontal boring drill	10 hp	55	126	0.239	1.891	1.909	0.005	0.081	0.075	312.570	0.033	0.000
	3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.048	0.489	0.312	0.002	0.021	163.241	0.005	0.000
	Air compressor	50 hp	40	126	0.614	0.724	55.416	0.004	0.024	0.023	307.059	0.035	0.058
	3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	40	0.041	0.370	0.500	0.003	0.013	282.166	0.006	0.000
	3/4 ton Pickup truck		128.7333	40	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	34	40	0.053	0.371	0.407	0.002	0.014	214.821	0.007	0.000
	Water truck	3000 gal	15	40	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Fracture	Excavator	400 hp	540	40	0.035	0.216	0.406	0.002	0.008	211.854	0.007	0.000
	Excavator	300 hp	540	40	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	Excavator	300 hp	270	40	0.035	0.216	0.406	0.002	0.008	0.007	211.854	0.007	0.000
	Tractor/crawler/dozer	440 hp	270	40	0.065	0.604	0.460	0.002	0.026	0.024	234.962	0.008	0.000
	3/4 ton Pickup truck		540	40	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 3 - Episode 22**

Construction Start Year 2066  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2066 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Road Improvement Plan	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	0.054	0.308	0.480	0.002	0.011	0.010	246.840	0.008	0.000
		Line Striper	23 hp	92.576	20	0.110	0.330	8.518	0.003	0.021	0.021	260.327	0.006	0.021
		Roller	70 hp	442.5143	20	0.068	0.874	1.421	0.003	0.037	0.034	222.777	0.009	0.000
		Vibratory roller	33 hp	442.5143	20	0.195	1.329	1.941	0.003	0.010	0.009	235.507	0.019	0.000
		Flatbed truck		92.576	20	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135
		3/4 ton Pickup truck		92.576	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		<b>Total</b>												

Daily Onsite Emissions (lb/day)  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2066 (tons per year)										Metric Tons CO2e/yr
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	5.28E-04	1.42E-03	8.59E-03	8.32E-05	6.21E-04	2.54E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01
	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02
	Tractor/crawler/dozer	250 hp	1,7208	19	3.28E-05	3.43E-04	2.93E-04	1.61E-06	1.42E-05	1.31E-05	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01
	Chain saw		1,7209	19	1.16E-04	1.82E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	7.22E-06	6.24E-07	9.13E-04	8.28E-04
	Brush Piling	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01
	Tractor/crawler/dozer	310 hp	0.8673	19	1.92E-05	1.79E-04	1.36E-04	6.83E-07	7.71E-06	7.10E-06	6.96E-02	2.51E-06	-	6.97E-02	6.32E-02
	Chipping	Brush chipper	250 hp	0.8673	19	2.06E-05	4.76E-05	1.74E-04	1.08E-06	1.70E-06	1.56E-06	9.64E-02	1.92E-06	-	9.64E-02
	Front end loader	540 hp	0.8673	19	2.92E-05	2.17E-04	2.87E-04	1.52E-06	8.07E-06	7.42E-06	1.51E-01	4.60E-06	-	1.52E-01	1.37E-01
Landscaping	Fish Passage	Excavator	454 hp	24	20	4.15E-04	2.59E-03	4.88E-03	2.90E-05	9.37E-05	8.62E-05	2.54E+00	7.90E-05	-	2.58E+00
	Loader/backhoe	75 hp	24	20	1.12E-04	1.33E-03	2.53E-03	4.55E-06	3.87E-05	3.56E-05	3.88E-01	1.59E-05	-	3.88E-01	3.52E-01
	Tractor/crawler/dozer	440 hp	24	20	7.52E-04	7.03E-03	5.36E-03	2.88E-05	3.03E-04	2.79E-04	2.74E+00	9.88E-05	-	2.74E+00	2.48E+00
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	2.75E-05	2.87E-04	2.45E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01
	Front end loader	49 hp	4	19	3.62E-05	2.72E-04	3.86E-04	6.46E-07	1.29E-06	1.19E-06	5.00E-02	3.26E-06	-	5.00E-02	4.54E-02
	Roller	47 hp	4	19	4.04E-05	2.75E-04	4.02E-04	6.31E-07	2.07E-06	1.90E-06	4.88E-02	3.93E-06	-	4.89E-02	4.44E-02
	Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02
	Excavator	300 hp	4	19	4.57E-05	2.85E-04	5.37E-04	2.75E-06	1.03E-05	9.49E-06	2.80E-01	8.70E-06	-	2.80E-01	2.54E-01
	Front end loader	180 hp	4	19	3.78E-05	2.48E-04	4.26E-04	2.41E-06	8.73E-06	8.04E-06	2.14E-01	6.53E-06	-	2.14E-01	1.95E-01
	36" Diversion Pipe - graditi	Tractor/crawler/dozer	180 hp	6	19	8.24E-05	8.62E-04	7.36E-04	4.03E-06	3.57E-05	3.28E-05	3.59E-01	1.31E-05	-	3.59E-01
	Loader/backhoe	75 hp	0.0923	19	4.31E-07	5.13E-06	9.71E-06	1.75E-08	1.49E-07	1.37E-07	1.49E-03	6.12E-08	-	1.49E-03	1.35E-03
	Crane 94'	155 hp	155	19	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00
	1 ton pickup truck		155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Crane 94'	155 hp	155	20	1.73E-03	1.79E-02	3.26E-02	6.20E-05	9.23E-04	8.49E-04	5.51E+00	1.86E-04	-	5.51E+00	5.00E+00
	1 ton pickup truck		155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	2.75E-05	2.87E-04	2.45E-04	1.34E-06	1.19E-05	1.09E-05	1.20E-01	4.36E-06	-	1.20E-01
	Dewatering	Concrete saw	13 hp	8	23	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.01E-02	2.74E-02
	Crane 80'	130 hp	16	23	1.49E-04	1.55E-03	2.82E-03	5.37E-06	7.99E-05	7.35E-05	4.77E-01	1.61E-05	-	4.77E-01	4.33E-01
	Flatbed truck		8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
	Generator	80 hp	5856	244	4.09E-02	3.75E-01	8.86E-01	1.78E-03	3.25E-03	2.99E-03	1.52E+02	3.80E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.87E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.87E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01
	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.87E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01	1.33E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	2.78E-03	2.55E-02	2.87E-02	1.47E-04	9.48E-04	8.72E-04	1.46E+01	5.28E-04	-	1.47E+01
	Maintenance	Grader	215 hp	144	210	2.07E-03	2.15E-02	2.12E-02	1.20E-04	7.20E-04	6.62E-04	1.06E+01	3.32E-04	-	1.07E+01
	Dismantling	Tractor/crawler/dozer	600 hp	157.6923	20	5.55E-03	5.10E-02	5.74E-02	2.94E-04	1.90E-03	1.74E-03	2.93E+01	1.06E-03	-	2.93E+01
	Tractor/crawler/dozer	600 hp	157.6923	20	5.55E-03	5.10E-02	5.74E-02	2.94E-04	1.90E-03	1.74E-03	2.93E+01	1.06E-03	-	2.93E+01	2.66E+01
	1 ton pickup truck		0.9333	20	2.96E-07	8.14E-07	4.85E-06	6.34E-08	4.69E-07	1.91E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02
	Excavator	430 hp	0.9333	20	1.53E-05	9.54E-05	1.80E-04	9.20E-07	3.45E-06	3.17E-06	9.37E-02	2.91E-06	-	9.38E-02	8.51E-02
	Excavator	300 hp	341.6667	20	3.90E-03	2.44E-02	4.59E-02	2.35E-04	8.81E-04	8.11E-04	2.39E+01	7.43E-04	-	2.40E+01	2.17E+01
	1 ton pickup truck		0.9333	20	2.96E-07	8.14E-07	4.85E-06	6.34E-08	4.69E-07	1.91E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02
Rindge Dam & Spillway Demolition*	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01
	Excavator	430 hp	4.445	22	7.27E-05	4.55E-04	8.55E-04	4.38E-06	1.64E-05	1.51E-05	4.46E-01	1.39E-05	-	4.47E-01	4.05E-01
	Tractor/crawler/dozer	850 hp	3.2327	22	2.31E-04	4.99E-03	1.78E-03	9.08E-06	1.09E-04	9.99E-05	9.03E-01	3.32E-05	-	9.04E-01	8.20E-01
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.25E-03	1.17E-02	8.93E-03	4.47E-05	5.05E-04	4.65E-04	4.56E+00	1.64E-04	-	4.56E+00
	Tractor/crawler/dozer	440 hp	5	20	1.57E-04	1.46E-03	1.12E-03	5.59E-06	6.31E-05	5.81E-05	5.70E-01	2.06E-05	-	5.70E-01	5.17E-01
	3/4 ton Pickup truck		20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01
	Drilling	Rotary drill	475 hp	34.0003	126	7.37E-04	6.59E-03	8.90E-03	4.93E-05	2.30E-04	2.12E-04	5.02E+00	1.01E-04	-	5.03E+00
	3/4 ton Pickup truck		30.0003	126	1.29E-05	3.47E-05	2.10E-04	2.03E-06	1.52E-05	6.21E-06	6.73E-01	6.69E-05	3.49E-05	6.86E-01	6.22E-01
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
	Diamond cutting saw	50 hp	48	126	3.56E-04	3.80E-03	4.67E-03	9.49E-06	1.67E-05	1.54E-05	7.34E-01	3.24E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	1.18E-03	1.21E-02	7.75E-03	3.98E-05	5.09E-04	4.68E-04	4.05E+00	1.30E-04	-	4.05E+00
	3/4 ton Pickup truck		60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
	Load/Haul	Front end loader	350 hp	4	126	8.25E-05	5.72E-04	6.28E-04	3.25E-06	2.14E-05	1.96E-05	3.32E-01	1.01E-05	-	3.32E-01
	Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	375 hp	30.0107	126	5.90E-04	6.07E-03	3.88E-03	1.99E-05	2.54E-04	2.34E-04	2.03E+00	6.51E-05	-	2.03E+00
	Micro-blast	Crane 260'	375 hp	49	126	9.64E-04	9.91E-03	6.33E-03	3.25E-05	4.15E-04	3.82E-04	3.31E+00	1.06E-04	-	3.31E+00
	Horizontal boring drill		10 hp	55	126	1.45E-04	1.15E-03	1.16E-03	2.95E-06	4.94E-05	4.55E-05	1.89E-01	1.99E-05	-	1.90E-01
	3/4 ton Pickup truck		60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	375 hp	20	126	3.93E-04	4.04E-03	2.58E-03	1.32E-						

Malibu Creek Ecosystem Restoration Feasibility Study  
 Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2066 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Road Improvement Plan	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	7.94E-03	4.50E-02	7.02E-02	3.55E-04	1.61E-03	1.48E-03	3.61E+01	1.20E-03	-	3.61E+01	3.28E+01
		Line Striper	23 hp	92.576	20	2.59E-04	7.75E-04	2.00E-02	6.07E-06	4.87E-05	4.86E-05	6.11E-01	1.47E-05	5.00E-05	6.27E-01	5.69E-01
		Roller	70 hp	442.5143	20	2.32E-03	2.98E-02	4.85E-02	8.92E-05	1.25E-03	1.15E-03	7.61E+00	3.12E-04	-	7.61E+00	6.91E+00
		Vibratory roller	33 hp	442.5143	20	3.13E-03	2.14E-02	3.12E-02	4.90E-05	1.61E-04	1.48E-04	3.79E+00	3.05E-04	-	3.80E+00	3.44E+00
		Flatbed truck		92.576	20	6.43E-05	1.33E-04	9.54E-04	6.19E-06	4.65E-05	1.89E-05	2.08E+00	4.70E-04	2.18E-04	2.16E+00	1.96E+00
		3/4 ton Pickup truck		92.576	20	3.98E-05	1.07E-04	6.47E-04	6.27E-06	4.68E-05	1.92E-05	2.08E+00	2.07E-04	1.08E-04	2.12E+00	1.92E+00
<b>Total</b>					<b>1.43E-01</b>	<b>1.12E+00</b>	<b>1.97E+00</b>	<b>6.26E-03</b>	<b>3.48E-02</b>	<b>2.96E-02</b>	<b>6.66E+02</b>	<b>2.37E-02</b>	<b>3.59E-03</b>	<b>6.68E+02</b>	<b>6.06E+02</b>	

Data from Alt3\_EnvrAirQualityReport.pdf

Daily Onsite  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill







Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Peak Daily Emissions - 2016 (pounds per day)						Peak Daily Emissions - 2017 (pounds per day)						
				VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		96	9.46E-03	7.33E-03	1.13E-01	1.15E-04	9.64E-04	4.47E-04	7.03E-03	5.59E-03	8.43E-02	9.50E-05	7.87E-04	3.61E-04	
Dust Control	Water truck	5000 gal	2320	3.52E-01	5.69E+00	6.31E-01	4.89E-03	1.26E-01	8.29E-02	2.61E-01	4.29E+00	4.77E-01	4.03E-03	9.00E-02	5.58E-02	
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80	-	-	-	-	-	-	1.16E-01	9.18E-02	1.39E+00	1.56E-03	1.29E-02	5.93E-03	
	Biologist	3/4 ton pickup truck	1213	-	-	-	-	-	-	-	-	-	-	-	-	
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	1.39E-04	1.38E-04	1.87E-03	2.40E-06	1.96E-05	8.94E-06	-	-	-	-	-	-	
		Tractor/crawler/dozer	250 hp	0.7652	2.58E-03	4.21E-02	1.31E-02	5.50E-05	1.62E-03	1.49E-03	-	-	-	-	-	-
		Chain saw		0.7652	3.97E-03	6.23E-05	7.19E-03	8.00E-07	1.13E-05	1.13E-05	-	-	-	-	-	-
	Brush Piling	Front end loader	540 hp	0.3857	1.97E-03	2.67E-02	1.22E-02	5.21E-05	1.05E-03	9.64E-04	-	-	-	-	-	-
		Tractor/crawler/dozer	310 hp	0.3857	1.43E-03	2.30E-02	7.26E-03	2.34E-05	8.89E-04	8.18E-04	-	-	-	-	-	-
	Chipping	Brush chipper	250 hp	0.3857	1.67E-03	1.86E-02	6.54E-03	3.71E-05	5.58E-04	5.14E-04	-	-	-	-	-	-
		Front end loader	540 hp	0.3857	1.97E-03	2.67E-02	1.22E-02	5.21E-05	1.05E-03	9.64E-04	-	-	-	-	-	-
	Gravel	Grader	135 hp	11.1111	3.48E-02	4.29E-01	2.41E-01	4.59E-04	2.41E-02	2.22E-02	-	-	-	-	-	-
		Vibratory roller	85 hp	16	2.25E-02	2.51E-01	1.73E-01	3.01E-04	1.85E-02	1.70E-02	-	-	-	-	-	-
		Tractor/crawler/dozer	310 hp	3.2593	1.21E-02	1.94E-01	6.14E-02	1.98E-04	7.51E-03	6.91E-03	-	-	-	-	-	-
		Tractor/crawler/dozer	440 hp	0.8148	4.29E-03	6.88E-02	2.18E-02	7.01E-05	2.67E-03	2.45E-03	-	-	-	-	-	-
		Asphalt distributor	3000 gal	0.8106	5.32E-04	8.61E-03	9.56E-04	7.40E-06	1.90E-04	1.25E-04	-	-	-	-	-	-
		Flatbed truck		8.75	6.85E-03	6.71E-03	9.70E-02	4.53E-05	3.70E-04	1.66E-04	-	-	-	-	-	-
	Guard Railing	Auger drill	10 hp	8.75	2.48E-02	1.83E-02	9.82E-01	4.78E-05	1.41E-02	1.40E-02	-	-	-	-	-	-
		Loader/backhoe	75 hp	4.2	4.38E-03	5.06E-02	3.49E-02	6.12E-05	3.90E-03	3.59E-03	-	-	-	-	-	-
		Flatbed truck		4	3.13E-03	3.07E-03	4.43E-02	2.07E-05	1.69E-04	7.59E-05	-	-	-	-	-	-

**Conversions**  
2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**  
Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

Holiday	Date
New Year's Day	1/1/2016
Birthday of Martin Luther King, Jr.	1/18/2016
Washington's Birthday	2/15/2016
Memorial Day	5/30/2016
Independence Day	7/4/2016
Labor Day	9/5/2016
Columbus Day	10/10/2016
Veterans Day	11/11/2016
Thanksgiving Day	11/24/2016
Christmas Day	12/26/2016
New Year's Day	1/2/2017
Birthday of Martin Luther King, Jr.	1/16/2017
Washington's Birthday	2/20/2017
Memorial Day	5/29/2017
Independence Day	7/4/2017
Labor Day	9/4/2017
Columbus Day	10/9/2017
Veterans Day	11/10/2017
Thanksgiving Day	11/23/2017
Christmas Day	12/25/2017

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2016>  
<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2017>

Data from Alt4\_EnvrAirQualityReport.pdf

1	19	8	0	1	1	10	135	70	0	6	5
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	1	21	13	0	1	1

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		96	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	2320	210	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
Environmental protection measures	Biologist		1229.3333	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	Fish relocation		16	19	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	7.3333	19	0.141	2.268	0.758	0.003	0.086	0.079	301.158	0.022	0.000
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Front end loader	540 hp	3.696	19	0.099	1.282	0.650	0.003	0.051	0.047	293.384	0.016	0.000
	Tractor/crawler/dozer	310 hp	3.696	19	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000
	Chipping	Brush chipper	250 hp	3.696	19	0.177	1.778	0.772	0.005	0.054	403.250	0.016	0.000
	Front end loader	540 hp	3.696	19	0.099	1.282	0.650	0.003	0.051	0.047	293.384	0.016	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.141	2.268	0.758	0.003	0.086	301.158	0.022	0.000
	Front end loader	49 hp	4	19	0.239	1.620	1.844	0.003	0.059	0.054	231.302	0.022	0.000
	Roller	47 hp	4	19	0.600	1.968	2.309	0.003	0.143	0.132	235.507	0.054	0.000
	Water truck	3000 gal	4	19	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Excavator	300 hp	4	19	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Front end loader	180 hp	4	19	0.100	1.495	0.587	0.003	0.051	0.047	270.061	0.015	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.141	2.268	0.758	0.003	0.086	301.158	0.022	0.000
	Loader/backhoe	75 hp	0.0923	19	0.128	1.531	1.294	0.002	0.108	0.100	195.356	0.015	0.000
	Crane 94'	155 hp	155	19	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000
	1 ton pickup truck	155 hp	155	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Crane 94'	155 hp	155	20	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000
	1 ton pickup truck	155 hp	155	20	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.141	2.268	0.758	0.003	0.086	301.158	0.022	0.000
	Concrete saw	13 hp	8	22	3.075	2.272	117.582	0.006	1.685	1.681	200.981	0.175	0.188
	Crane 80'	130 hp	16	22	0.148	1.889	1.234	0.002	0.101	0.093	208.066	0.018	0.000
	Flatbed truck	8	8	22	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
	Generator	80 hp	5856	244	0.242	1.957	1.773	0.003	0.126	0.116	294.384	0.022	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Push	Tractor/crawler/dozer	600 hp	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Tractor/crawler/dozer	600 hp	184.6154	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Build road	Tractor/crawler/dozer	600 hp	19	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Armoring	1 ton pickup truck	2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Excavator	430 hp	2	19	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	1 ton pickup truck		2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Maintenance	Grader	215 hp	340	210	0.130	2.154	0.685	0.004	0.070	312.002	0.018	0.000
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	663.5	78	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Water truck	3000 gal	663.5	78	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	663.5	78	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Front end loader	350 hp	102	11	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000
	Water truck	3000 gal	102	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Excavator	400 hp	102	11	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
	Beach Crew	1 ton pickup truck	102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Tractor/crawler/dozer	600 hp	102	11	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000
	Water truck	3000 gal	25	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056		
		Front end loader	350 hp	382.5	48	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
		Front end loader	350 hp	382.5	48	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
		Front end loader	350 hp	382.5	48	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
		Front end loader	350 hp	382.5	48	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
		Water truck	3000 gal	382.5	48	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
		Excavator	400 hp	382.5	48	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000	
		Excavator	400 hp	382.5	48	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000	
		Excavator	400 hp	382.5	48	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000	
	Beach Crew	1 ton pickup truck		382.5	48	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		Tractor/crawler/dozer	600 hp	382.5	48	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		Tractor/crawler/dozer	600 hp	382.5	48	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		Tractor/crawler/dozer	600 hp	382.5	48	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		Tractor/crawler/dozer	600 hp	382.5	48	0.105	1.644	0.779	0.003	0.061	0.056	280.790	0.019	0.000	
		Water truck	3000 gal	382.5	48	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
		Tractor/crawler/dozer	440 hp	720	22	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000	
		Tractor/crawler/dozer	440 hp	90	22	0.122	1.875	0.653	0.002	0.073	0.067	234.962	0.016	0.000	
		3/4 ton pickup truck		360	22	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
Demolition - Concrete Arc & Spillway	Platform	Rotary drill	475 hp	88.1333	128	0.056	0.877	0.500	0.003	0.026	0.024	282.166	0.007	0.000	
		3/4 ton pickup truck		84.1333	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Cut with Diamond wire	3/4 ton pickup truck		376	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	Diamond cutting saw	Diamond cutting saw	50 hp	376	128	0.445	2.137	2.053	0.004	0.125	0.115	277.562	0.040	0.000	
		Lift/Load blocks	Crane 260'	375 hp	454.8767	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000
		3/4 ton pickup truck		454.8767	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
	Load/Haul	Front end loader	350 hp	32	128	0.100	1.348	0.476	0.002	0.050	0.046	214.821	0.012	0.000	
		Crane 260'	375 hp	227.4384	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
		Micro-blast	Crane 260'	375 hp	60	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000
	Horizontal boring drill	Horizontal boring drill	10 hp	55	128	0.318	2.447	1.909	0.005	0.166	0.152	312.570	0.033	0.000	
		3/4 ton pickup truck		60	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Crane 260'	375 hp	100	128	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
	Demolish spillway	Air compressor	50 hp	200	128	1.018	1.339	49.027	0.004	0.024	0.023	307.059	0.058	0.075	
		3/4 ton pickup truck		100	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Asphalt distributor	3000 gal	6.7805	20	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
	Demolition - Notch 5'	Excavation for Dam Demo	Excavator	430 hp	4.445	20	0.055	0.783	0.425	0.002	0.025	0.023	211.854	0.011	0.000
			Tractor/crawler/dozer	850 hp	3.2327	20	0.173	3.243	0.914	0.003	0.096	0.089	298.249	0.022	0.000
			Rotary drill	475 hp	7.3333	20	0.056	0.877	0.500	0.003	0.026	0.024	282.166	0.007	0.000
Drilling		3/4 ton Pickup truck		7.3333	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		3/4 ton Pickup truck		48	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Diamond cutting saw	50 hp	48	20	0.445	2.137	2.053	0.004	0.125	0.115	277.562	0.040	0.000	
Lift/Load blocks		Crane 260'	375 hp	60.0214	20	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
		3/4 ton Pickup truck		60.0214	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Crane 260'	375 hp	30.0107	20	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
Landfill		Crane 260'	375 hp	30.0107	20	0.088	1.335	0.370	0.002	0.054	0.050	163.241	0.010	0.000	
		<b>Total</b>													

Data from Alt4\_EnvrAirQualityReport.pdf

**Daily Onsite Emissions (lb/day)**  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill





**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 2**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2018 (tons per year)										Metric Tons CO2e/yr	
					GWP											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		Front end loader	350 hp	382.5	48	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
		Front end loader	350 hp	382.5	48	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01
	Front end loader	350 hp	382.5	48	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01	
		350 hp	382.5	48	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01	
		350 hp	382.5	48	1.47E-02	1.99E-01	7.03E-02	3.11E-04	7.45E-03	6.85E-03	3.17E+01	1.74E-03	-	3.17E+01	2.88E+01	
	Water truck	3000 gal	382.5	48	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00	
		Excavator	400 hp	382.5	48	9.30E-03	1.32E-01	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01
		Excavator	400 hp	382.5	48	9.30E-03	1.32E-01	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01
	Excavator	400 hp	382.5	48	9.30E-03	1.32E-01	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
		400 hp	382.5	48	9.30E-03	1.32E-01	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
		400 hp	382.5	48	9.30E-03	1.32E-01	7.17E-02	3.51E-04	4.28E-03	3.94E-03	3.57E+01	1.85E-03	-	3.58E+01	3.24E+01	
	Beach Crew	1 ton pickup truck	382.5	48	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		Tractor/crawler/dozer	600 hp	382.5	48	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
		Tractor/crawler/dozer	600 hp	382.5	48	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01
Tractor/crawler/dozer	600 hp	382.5	48	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01		
	600 hp	382.5	48	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01		
	600 hp	382.5	48	2.65E-02	4.16E-01	1.97E-01	7.14E-04	1.53E-02	1.41E-02	7.10E+01	4.87E-03	-	7.11E+01	6.45E+01		
Demolition - Concrete Arc & Spillway	Platform	Water truck	3000 gal	382.5	30	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	
		Tractor/crawler/dozer	440 hp	720	22	4.26E-02	6.55E-01	2.28E-01	8.05E-04	2.54E-02	2.33E-02	8.21E+01	5.60E-03	-	8.22E+01	7.45E+01
		Tractor/crawler/dozer	440 hp	90	22	5.32E-03	8.19E-02	2.85E-02	1.01E-04	3.17E-03	2.92E-03	1.03E+01	6.99E-04	-	1.03E+01	9.32E+00
	3/4 ton pickup truck	360	22	1.61E-03	1.32E-03	1.94E-02	2.43E-05	1.99E-04	9.05E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00		
		Rotary drill	475 hp	88.1333	128	2.58E-03	4.05E-02	2.31E-02	1.28E-04	1.21E-03	1.11E-03	1.30E+01	3.35E-04	-	1.30E+01	1.18E+01
		3/4 ton pickup truck	84.1333	128	3.77E-04	3.09E-04	4.54E-03	5.68E-06	4.66E-05	2.11E-05	1.89E+00	1.88E-04	9.79E-05	1.92E+00	1.74E+00	
	Cut with Diamond wire	3/4 ton pickup truck	376	128	1.69E-03	1.38E-03	2.03E-02	2.54E-05	2.08E-04	9.45E-05	8.44E+00	8.39E-04	4.38E-04	8.59E+00	7.79E+00	
		Diamond cutting saw	50 hp	376	128	9.23E-03	4.43E-02	4.25E-02	7.44E-05	2.60E-03	2.39E-03	5.75E+00	8.33E-04	-	5.77E+00	5.23E+00
		Lift/Load blocks	Crane 260'	375 hp	454.8767	128	1.66E-02	2.51E-01	6.96E-02	3.01E-04	1.01E-02	9.32E-03	3.07E+01	1.85E-03	-	3.07E+01
	Load/Haul	3/4 ton pickup truck	454.8767	128	2.04E-03	1.67E-03	2.46E-02	3.07E-05	2.52E-04	1.14E-04	1.02E+01	1.01E-03	5.29E-04	1.04E+01	9.43E+00	
		Front end loader	350 hp	32	128	1.23E-03	1.66E-02	5.88E-03	2.60E-05	6.23E-04	5.73E-04	2.65E+00	1.45E-04	-	2.66E+00	2.41E+00
		Crane 260'	375 hp	227.4384	128	8.28E-03	1.26E-01	3.48E-02	1.51E-04	5.06E-03	4.66E-03	1.53E+01	9.24E-04	-	1.54E+01	1.39E+01
	Micro-blast	Crane 260'	375 hp	60	128	2.18E-03	3.31E-02	9.18E-03	3.97E-05	1.34E-03	1.23E-03	4.05E+00	2.44E-04	-	4.05E+00	3.68E+00
		Horizontal boring drill	10 hp	55	128	1.93E-04	1.48E-03	1.16E-03	2.95E-06	1.00E-04	9.23E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
		3/4 ton pickup truck	60	128	2.69E-04	2.20E-04	3.24E-03	4.05E-06	3.32E-05	1.51E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
Demolish spillway	Crane 260'	375 hp	100	128	3.64E-03	5.52E-02	1.53E-02	6.62E-05	2.23E-03	2.05E-03	6.75E+00	4.06E-04	-	6.76E+00	6.13E+00	
	Air compressor	50 hp	200	128	1.12E-02	1.48E-02	5.40E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	6.38E-04	8.29E-04	3.66E+00	3.32E+00	
	3/4 ton pickup truck	100	128	4.48E-04	3.67E-04	5.40E-03	6.75E-06	5.53E-05	2.51E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00		
Demolition - Notch 5'	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	20	5.21E-05	7.87E-04	9.57E-05	8.03E-07	1.73E-05	1.05E-05	1.61E-01	3.81E-07	3.59E-07	1.61E-01	
		Excavator	430 hp	4.445	20	1.16E-04	1.65E-03	8.95E-04	4.38E-06	5.34E-05	4.92E-05	4.46E-01	2.31E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3.2327	20	5.25E-04	9.82E-03	2.77E-03	9.08E-06	2.92E-04	2.69E-04	9.03E-01	6.66E-05	-	9.05E-01	8.21E-01
	Drilling	Rotary drill	475 hp	7.3333	20	2.15E-04	3.37E-03	1.92E-03	1.06E-05	1.01E-04	9.27E-05	1.08E+00	2.78E-05	-	1.08E+00	9.83E-01
		3/4 ton Pickup truck	7.3333	20	3.29E-05	2.69E-05	3.96E-04	4.95E-07	4.06E-06	1.84E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01	
		3/4 ton Pickup truck	48	20	2.15E-04	1.76E-04	2.59E-03	3.24E-06	2.66E-05	1.21E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
	Cut with Diamond wire	Diamond cutting saw	50 hp	48	20	1.18E-03	5.65E-03	5.43E-03	9.49E-06	3.32E-04	3.05E-04	7.34E-01	1.06E-04	-	7.37E-01	6.68E-01
		Crane 260'	375 hp	60.0214	20	2.18E-03	3.31E-02	9.19E-03	3.98E-05	1.34E-03	1.23E-03	4.05E+00	2.44E-04	-	4.06E+00	3.68E+00
		3/4 ton Pickup truck	60.0214	20	2.69E-04	2.20E-04	3.24E-03	4.05E-06	3.32E-05	1.51E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Landfill	Crane 260'	375 hp	30.0107	20	1.09E-03	1.66E-02	4.59E-03	1.99E-05	6.68E-04	6.15E-04	2.03E+00	1.22E-04	-	2.03E+00	1.84E+00
		<b>Total</b>				<b>7.77E-01</b>	<b>1.01E+01</b>	<b>5.45E+00</b>	<b>1.78E-02</b>	<b>3.93E-01</b>	<b>3.57E-01</b>	<b>1.88E+03</b>	<b>1.14E-01</b>	<b>6.71E-03</b>	<b>1.89E+03</b>	<b>1.71E+03</b>

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite  
 Rindge  
 Surfridge  
 Topanga  
 Zuma  
 Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	210	8.20E-03	6.72E-03	9.88E-02	1.23E-04	1.01E-03	4.60E-04
Dust Control	Water truck	5000 gal	2320	210	3.39E-01	5.13E+00	6.23E-01	5.23E-03	1.13E-01	6.85E-02
Environmental protection measures	Biologist		1229.3333	210	1.05E-01	8.60E-02	1.26E+00	1.58E-03	1.30E-02	5.88E-03
	Fish relocation		16	19	1.51E-02	1.24E-02	1.82E-01	2.27E-04	1.86E-03	8.46E-04
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.47E-03	2.90E-03	3.30E-02	6.27E-05	5.01E-04	2.22E-04
	Tractor/crawler/dozer	250 hp	7.3333	19	6.00E-02	9.65E-01	3.22E-01	1.44E-03	3.65E-02	3.36E-02
	Chain saw		7.3335	19	1.04E-01	1.63E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04
	Brush Piling	Front end loader	3.696	19	4.58E-02	5.94E-01	3.01E-01	1.37E-03	2.35E-02	2.16E-02
		Tractor/crawler/dozer	3.696	19	3.24E-02	4.99E-01	1.74E-01	6.13E-04	1.93E-02	1.78E-02
	Chipping	Brush chipper	3.696	19	3.80E-02	3.81E-01	1.66E-01	9.73E-04	1.17E-02	1.07E-02
		Front end loader	3.696	19	4.58E-02	5.94E-01	3.01E-01	1.37E-03	2.35E-02	2.16E-02
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.18E-02	1.89E-01	6.33E-02	2.83E-04	7.17E-03	6.60E-03
		Front end loader	49 hp	4	1.09E-02	7.37E-02	8.39E-02	1.36E-04	2.68E-03	2.47E-03
		Roller	47 hp	4	2.62E-02	8.59E-02	1.01E-01	1.33E-04	6.26E-03	5.76E-03
		Water truck	3000 gal	4	6.46E-03	9.77E-02	1.19E-02	9.97E-05	2.15E-03	1.31E-03
		Excavator	300 hp	4	1.53E-02	2.18E-01	1.18E-01	5.79E-04	7.06E-03	6.50E-03
		Front end loader	180 hp	4	1.67E-02	2.50E-01	9.80E-02	5.08E-04	8.47E-03	7.79E-03
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	3.54E-02	5.68E-01	1.90E-01	8.49E-04	2.15E-02	1.98E-02
		Loader/backhoe	75 hp	0.0923	2.06E-04	2.48E-03	2.08E-03	3.68E-06	1.74E-04	1.60E-04
		Crane 94'	155 hp	155	8.25E-01	1.05E+01	6.88E+00	1.31E-02	5.64E-01	5.19E-01
		1 ton pickup truck	155	19	8.69E-02	1.02E-01	1.16E+00	2.21E-03	1.76E-02	7.82E-03
		Crane 94'	155 hp	155	7.83E-01	1.00E+01	6.54E+00	1.24E-02	5.36E-01	4.93E-01
		1 ton pickup truck	155	20	8.26E-02	9.70E-02	1.10E+00	2.10E-03	1.68E-02	7.43E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.12E-02	1.80E-01	6.01E-02	2.69E-04	6.81E-03	6.27E-03
		Concrete saw	13 hp	8	6.41E-02	4.74E-02	2.45E+00	1.19E-04	3.51E-02	3.50E-02
		Crane 80'	130 hp	16	6.17E-02	7.88E-01	5.15E-01	9.76E-04	4.22E-02	3.88E-02
		Flatbed truck	8	22	1.05E-02	1.10E-02	1.46E-01	9.76E-05	7.76E-04	3.38E-04
		Generator	80 hp	5856	2.05E+00	1.66E+01	1.50E+01	2.92E-02	1.06E+00	9.80E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	2.69E+00	4.23E+01	2.00E+01	7.26E-02	1.56E+00	1.43E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	2.69E+00	4.23E+01	2.00E+01	7.26E-02	1.56E+00	1.43E+00
		Tractor/crawler/dozer	600 hp	184.6154	2.69E+00	4.23E+01	2.00E+01	7.26E-02	1.56E+00	1.43E+00
	Build road	Tractor/crawler/dozer	600 hp	184.6154	2.69E+00	4.23E+01	2.00E+01	7.26E-02	1.56E+00	1.43E+00
	Armoring	1 ton pickup truck	2	19	1.12E-03	1.32E-03	1.50E-02	2.85E-05	2.28E-04	1.01E-04
		Excavator	430 hp	2	1.10E-02	1.56E-01	8.48E-02	4.15E-04	5.06E-03	4.66E-03
		1 ton pickup truck	2	19	1.12E-03	1.32E-03	1.50E-02	2.85E-05	2.28E-04	1.01E-04
	Maintenance	Grader	215 hp	340	1.99E-01	3.31E+00	1.05E+00	5.39E-03	1.07E-01	9.89E-02
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	9.07E-02	1.06E-01	1.21E+00	2.30E-03	1.84E-02	8.15E-03
		Front end loader	350 hp	78	1.31E+00	1.77E+01	6.25E+00	2.77E-02	6.63E-01	6.10E-01
		Front end loader	350 hp	78	1.31E+00	1.77E+01	6.25E+00	2.77E-02	6.63E-01	6.10E-01
		Front end loader	350 hp	78	1.31E+00	1.77E+01	6.25E+00	2.77E-02	6.63E-01	6.10E-01
		Front end loader	350 hp	78	1.31E+00	1.77E+01	6.25E+00	2.77E-02	6.63E-01	6.10E-01
		Water truck	3000 gal	663.5	2.61E-01	3.95E+00	4.80E-01	4.03E-03	8.67E-02	5.28E-02
		Excavator	400 hp	663.5	8.27E-01	1.17E+01	6.38E+00	3.12E-02	3.81E-01	3.50E-01
		Excavator	400 hp	663.5	8.27E-01	1.17E+01	6.38E+00	3.12E-02	3.81E-01	3.50E-01
		Excavator	400 hp	663.5	8.27E-01	1.17E+01	6.38E+00	3.12E-02	3.81E-01	3.50E-01
		Excavator	400 hp	663.5	8.27E-01	1.17E+01	6.38E+00	3.12E-02	3.81E-01	3.50E-01
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	9.88E-02	1.16E-01	1.32E+00	2.51E-03	2.01E-02	8.89E-03
		Front end loader	350 hp	102	1.43E+00	1.93E+01	6.82E+00	3.02E-02	7.22E-01	6.64E-01
		Front end loader	350 hp	102	1.43E+00	1.93E+01	6.82E+00	3.02E-02	7.22E-01	6.64E-01
		Front end loader	350 hp	102	1.43E+00	1.93E+01	6.82E+00	3.02E-02	7.22E-01	6.64E-01
		Front end loader	350 hp	102	1.43E+00	1.93E+01	6.82E+00	3.02E-02	7.22E-01	6.64E-01
		Water truck	3000 gal	102	2.85E-01	4.30E+00	5.23E-01	4.39E-03	9.46E-02	5.75E-02
		Excavator	400 hp	102	9.01E-01	1.28E+01	6.95E+00	3.40E-02	4.15E-01	3.82E-01
		Excavator	400 hp	102	9.01E-01	1.28E+01	6.95E+00	3.40E-02	4.15E-01	3.82E-01
		Excavator	400 hp	102	9.01E-01	1.28E+01	6.95E+00	3.40E-02	4.15E-01	3.82E-01
		Excavator	400 hp	102	9.01E-01	1.28E+01	6.95E+00	3.40E-02	4.15E-01	3.82E-01
	Beach Crew	1 ton pickup truck	102	11	9.88E-02	1.16E-01	1.32E+00	2.51E-03	2.01E-02	8.89E-03
		Tractor/crawler/dozer	600 hp	102	2.57E+00	4.03E+01	1.91E+01	6.93E-02	1.49E+00	1.37E+00
		Tractor/crawler/dozer	600 hp	102	2.57E+00	4.03E+01	1.91E+01	6.93E-02	1.49E+00	1.37E+00
		Tractor/crawler/dozer	600 hp	102	2.57E+00	4.03E+01	1.91E+01	6.93E-02	1.49E+00	1.37E+00
		Tractor/crawler/dozer	600 hp	102	2.57E+00	4.03E+01	1.91E+01	6.93E-02	1.49E+00	1.37E+00
		Water truck	3000 gal	25	6.98E-02	1.05E+00	1.28E-01	1.08E-03	2.32E-02	1.41E-02

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day 1/1/2018  
 Birthday of Martin Luther King, Jr. 1/15/2018  
 Washington's Birthday 2/19/2018  
 Memorial Day 5/28/2018  
 Independence Day 7/4/2018  
 Labor Day 9/3/2018  
 Columbus Day 10/8/2018  
 Veterans Day 11/12/2018  
 Thanksgiving Day 11/22/2018  
 Christmas Day 12/25/2018  
 10

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	8.49E-02	9.97E-02	1.13E+00	2.16E-03	1.72E-02	7.64E-03	
		350 hp Front end loader	382.5	48	1.23E+00	1.66E+01	5.86E+00	2.59E-02	6.21E-01	5.71E-01	
		350 hp Front end loader	382.5	48	1.23E+00	1.66E+01	5.86E+00	2.59E-02	6.21E-01	5.71E-01	
		350 hp Front end loader	382.5	48	1.23E+00	1.66E+01	5.86E+00	2.59E-02	6.21E-01	5.71E-01	
		350 hp Front end loader	382.5	48	1.23E+00	1.66E+01	5.86E+00	2.59E-02	6.21E-01	5.71E-01	
		3000 gal Water truck	382.5	48	2.45E-01	3.70E+00	4.50E-01	3.77E-03	8.13E-02	4.94E-02	
		400 hp Excavator	382.5	48	7.75E-01	1.10E+01	5.97E+00	2.92E-02	3.56E-01	3.28E-01	
		400 hp Excavator	382.5	48	7.75E-01	1.10E+01	5.97E+00	2.92E-02	3.56E-01	3.28E-01	
		400 hp Excavator	382.5	48	7.75E-01	1.10E+01	5.97E+00	2.92E-02	3.56E-01	3.28E-01	
		400 hp Excavator	382.5	48	7.75E-01	1.10E+01	5.97E+00	2.92E-02	3.56E-01	3.28E-01	
	Beach Crew	1 ton pickup truck	382.5	48	8.49E-02	9.97E-02	1.13E+00	2.16E-03	1.72E-02	7.64E-03	
		600 hp Tractor/crawler/dozer	382.5	48	2.21E+00	3.47E+01	1.64E+01	5.95E-02	1.28E+00	1.18E+00	
		600 hp Tractor/crawler/dozer	382.5	48	2.21E+00	3.47E+01	1.64E+01	5.95E-02	1.28E+00	1.18E+00	
		600 hp Tractor/crawler/dozer	382.5	48	2.21E+00	3.47E+01	1.64E+01	5.95E-02	1.28E+00	1.18E+00	
		600 hp Tractor/crawler/dozer	382.5	48	2.21E+00	3.47E+01	1.64E+01	5.95E-02	1.28E+00	1.18E+00	
		3000 gal Water truck	382.5	30	3.91E-01	5.92E+00	7.19E-01	6.04E-03	1.30E-01	7.91E-02	
		440 hp Tractor/crawler/dozer	720	22	7.74E+00	1.19E+02	4.14E+01	1.46E-01	4.51E+00	4.24E+00	
		440 hp Tractor/crawler/dozer	90	22	9.67E-01	1.49E+01	5.18E+00	1.83E-02	5.77E-01	5.30E-01	
		3/4 ton pickup truck	360	22	2.93E-01	2.40E-01	3.53E+00	4.42E-03	3.62E-02	1.64E-02	
		475 hp Rotary drill	88.1333	128	8.08E-02	1.26E+00	7.20E-01	3.99E-03	3.79E-02	3.48E-02	
Demolition - Concrete Arc & Spillway	Platform	3/4 ton pickup truck	84.1333	128	1.18E-02	9.66E-03	1.42E-01	1.77E-04	1.46E-03	6.61E-04	
		3/4 ton pickup truck	376	128	5.27E-02	4.32E-02	6.35E-01	7.93E-04	6.50E-03	2.95E-03	
	Drilling	Diamond cutting saw	50 hp	376	128	2.88E-01	1.38E+00	1.33E+00	2.32E-03	8.12E-02	7.47E-02
		Crane 260'	375 hp	454.8767	128	5.17E-01	7.85E+00	2.18E+00	9.41E-03	3.17E-01	2.91E-01
	Lift/Load blocks	3/4 ton pickup truck	454.8767	128	6.37E-02	5.22E-02	7.68E-01	9.60E-04	7.87E-03	3.57E-03	
		350 hp Front end loader	32	128	3.85E-02	5.20E-01	1.84E-01	8.13E-04	1.95E-02	1.79E-02	
	Landfill	Crane 260'	375 hp	227.4384	128	2.59E-01	3.92E+00	1.09E+00	4.71E-03	1.58E-01	1.46E-01
		Crane 260'	375 hp	60	128	6.82E-02	1.03E+00	2.87E-01	1.24E-03	4.18E-02	3.84E-02
	Micro-blast	Horizontal boring drill	10 hp	55	128	6.03E-03	4.64E-02	3.62E-02	9.21E-05	3.14E-03	2.88E-03
		3/4 ton pickup truck	60	128	8.41E-03	6.89E-03	1.01E-01	1.27E-04	1.04E-03	4.71E-04	
Demolish spillway	Crane 260'	375 hp	100	128	1.14E-01	1.72E+00	4.78E-01	2.07E-03	6.96E-02	6.40E-02	
	50 hp Air compressor	200	128	3.51E-01	4.61E-01	1.69E+01	1.29E-03	8.10E-03	8.09E-03		
Demolition - Notch 5'	Excavation for Dam Demo	3/4 ton pickup truck	100	128	1.40E-02	1.15E-02	1.69E-01	2.11E-04	1.73E-03	7.85E-04	
		3000 gal Asphalt distributor	6.7805	20	1.04E-02	1.57E-01	1.91E-02	1.61E-04	3.46E-03	2.10E-03	
	Excavator	430 hp	4.445	20	2.32E-02	3.30E-01	1.79E-01	8.76E-04	1.07E-02	9.83E-03	
	850 hp Tractor/crawler/dozer	3.2327	20	1.05E-01	1.96E+00	5.54E-01	1.82E-03	5.84E-02	5.37E-02		
	475 hp Rotary drill	7.3333	20	4.30E-02	6.74E-01	3.84E-01	2.13E-03	2.02E-02	1.85E-02		
	3/4 ton Pickup truck	7.3333	20	6.58E-03	5.39E-03	7.92E-02	9.90E-05	8.12E-04	3.69E-04		
	3/4 ton Pickup truck	48	20	4.30E-02	3.53E-02	5.18E-01	6.48E-04	5.31E-03	2.41E-03		
	Diamond cutting saw	50 hp	48	20	2.36E-01	1.13E+00	1.09E+00	1.90E-03	6.83E-02	6.10E-02	
	Crane 260'	60.0214	20	4.37E-01	6.63E+00	1.84E+00	7.95E-03	2.87E-01	2.46E-01		
	3/4 ton Pickup truck	60.0214	20	5.38E-02	4.41E-02	6.48E-01	8.10E-04	6.64E-03	3.02E-03		
	Crane 260'	375 hp	30.0107	20	2.18E-01	3.31E+00	9.19E-01	3.98E-03	1.34E-01	1.23E-01	
<b>Total</b>					<b>7.46E+01</b>	<b>1.06E+03</b>	<b>5.04E+02</b>	<b>1.85E+00</b>	<b>3.97E+01</b>	<b>3.63E+01</b>	
Daily Onsite											
Rindge					54	749	357	1	28	26	
Surridge					10	162	78	0	6	5	
Topanga					9	145	68	0	5	5	
Zuma					0	0	0	0	0	0	
Landfill					0	7	2	0	0	0	

Data from Alt4\_EnvrAirQualityReport.pdf

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		96	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
Dust Control	Water truck	5000 gal	2320	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056		
		Tractor/crawler/dozer	250 hp	7.3333	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000	
		Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
		Brush Piling	Front end loader	540 hp	3.696	19	0.088	1.092	0.634	0.003	0.043	293.384	0.015	0.000	
			Tractor/crawler/dozer	310 hp	3.696	19	0.113	1.687	0.627	0.002	0.066	234.962	0.015	0.000	
		Chipping	Brush chipper	250 hp	3.696	19	0.166	1.567	0.761	0.005	0.048	403.250	0.015	0.000	
			Front end loader	540 hp	3.696	19	0.088	1.092	0.634	0.003	0.043	293.384	0.015	0.000	
			Tractor/crawler/dozer	180 hp	2	19	0.135	2.132	0.737	0.003	0.080	301.159	0.021	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.222	1.556	1.830	0.003	0.048	0.044	231.302	0.020	0.000	
		Front end loader	49 hp	4	19	0.544	1.906	2.256	0.003	0.129	0.119	235.507	0.049	0.000	
		Roller	47 hp	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Water truck	3000 gal	4	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000	
		Excavator	300 hp	4	19	0.093	1.355	0.579	0.003	0.045	0.042	270.061	0.015	0.000	
		Front end loader	180 hp	4	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000	
		36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	2.450	1.583	92.611	0.004	1.249	1.246	148.932	0.140	0.122
		36" Diversion Pipe - pipe a	Welder	17 hp	4	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
		36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.112	1.361	1.289	0.002	0.091	0.084	195.356	0.014	0.000
			Loader/backhoe	75 hp	0.0923	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
			Crane 94'	155 hp	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
			1 ton pickup truck	155	19	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000	
			Crane 94'	155 hp	155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
			1 ton pickup truck	155	19	0.135	2.132	0.737	0.003	0.080	0.074	301.159	0.021	0.000	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	3.075	2.272	117.574	0.006	1.685	1.681	200.981	0.175	0.188
		Dewatering	Concrete saw	13 hp	8	21	0.135	1.714	1.233	0.002	0.092	0.084	208.066	0.016	0.000
			Crane 80'	130 hp	16	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135
			Flatbed truck	8	21	0.213	1.796	1.761	0.003	0.108	0.100	294.384	0.019	0.000	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
			Tractor/crawler/dozer	600 hp	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Armoring	1 ton pickup truck	2	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000	
			Excavator	430 hp	2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
			1 ton pickup truck	2	19	0.122	1.989	0.675	0.004	0.064	0.059	312.002	0.017	0.000	
Sand to Topanga Beach (7,200 cy) (4/1-9)	Maintenance	Grader	215 hp	340	209	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Material Excavation	1 ton pickup truck	59.5	7	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000		
		Front end loader	350 hp	59.5	7	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000	
		Front end loader	350 hp	59.5	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Water truck	3000 gal	59.5	7	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000	
		Excavator	400 hp	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Beach Crew	1 ton pickup truck	59.5	7	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000	
			Tractor/crawler/dozer	600 hp	59.5	7	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000
			Tractor/crawler/dozer	600 hp	59.5	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
			Water truck	3000 gal	14.875	7	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 3**

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056		
		Front end loader	350 hp	1028.5	131	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000	
		Front end loader	350 hp	1028.5	131	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000	
	Water truck	3000 gal	1028.5	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048		
		Excavator	400 hp	1028.5	131	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000	
		1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056		
	Beach Crew	Tractor/crawler/dozer	600 hp	1028.5	131	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000	
		Tractor/crawler/dozer	600 hp	1028.5	131	0.094	1.433	0.748	0.003	0.053	0.049	280.790	0.018	0.000	
		Water truck	3000 gal	257.125	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Tractor/crawler/dozer	440 hp	720	22	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000	
Demolition	Platform	Tractor/crawler/dozer	440 hp	90	0.113	1.687	0.627	0.002	0.066	0.060	234.962	0.015	0.000		
		Tractor/crawler/dozer	440 hp	360	22	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		3/4 ton pickup truck	475 hp	54.4	128	0.054	0.779	0.500	0.003	0.024	0.022	282.166	0.007	0.000	
	Drilling	Rotary drill	475 hp	50.4	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		3/4 ton pickup truck	475 hp	148	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Cut with Diamond wire	Diamond cutting saw	50 hp	148	128	0.388	2.062	2.000	0.004	0.110	0.101	277.562	0.035	0.000	
		Crane 260'	375 hp	179.6356	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	
	Lift/Load blocks	3/4 ton pickup truck	475 hp	179.6356	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Front end loader	350 hp	32	128	0.091	1.189	0.465	0.002	0.044	0.041	214.821	0.011	0.000	
	Load/Haul	Water truck	3000 gal	521	128	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Crane 260'	375 hp	89.8178	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	
	Landfill	Crane 260'	375 hp	60	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	
		Micro-blast	Horizontal boring drill	10 hp	55	128	0.300	2.371	1.909	0.005	0.152	0.140	312.570	0.033	0.000
	Demolish spillway	3/4 ton pickup truck	475 hp	60	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Crane 260'	375 hp	100	128	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	
	Demolition - Notch 5'	Excavation for Dam Demo	Asphalt Distributor	3000 gal	6.7805	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
			Excavator	430 hp	4.445	19	0.051	0.680	0.420	0.002	0.022	0.020	211.854	0.010	0.000
		Drilling	Tractor/crawler/dozer	850 hp	3.2327	19	0.163	3.093	0.873	0.003	0.090	0.083	298.249	0.021	0.000
			Rotary drill	475 hp	7.3333	19	0.054	0.779	0.500	0.003	0.024	0.022	282.166	0.007	0.000
		Cut with Diamond wire	3/4 ton Pickup truck	475 hp	7.3333	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
Diamond cutting saw			50 hp	48	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Lift/Load blocks		Crane 260'	375 hp	60.0214	19	0.388	2.062	2.000	0.004	0.110	0.101	277.562	0.035	0.000	
		3/4 ton Pickup truck	475 hp	60.0214	19	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	
Landfill		Water truck	3000 gal	507	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Crane 260'	375 hp	30.0107	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
<b>Total</b>					19	0.083	1.238	0.358	0.002	0.050	0.046	163.241	0.009	0.000	

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite Emissions (lb/day)  
 Rindge  
 Surfrider  
 Topanga  
 Zuma  
 Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr	
					GWP											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		96	209	3.71E-04	3.21E-04	4.51E-03	6.44E-06	5.25E-05	2.36E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
Dust Control	Water truck	5000 gal	2320	209	1.75E-02	2.47E-01	3.24E-02	2.73E-04	5.70E-03	3.40E-03	5.49E+01	1.30E-04	1.23E-04	5.49E+01	4.98E+01	
Environmental protection measures	Biologist		1229.3333	209	4.75E-03	4.11E-03	5.77E-02	8.24E-05	6.73E-04	3.02E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
	Fish relocation		16	19	6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	9.54E-06	1.22E-05	1.29E-04	2.96E-07	2.35E-06	1.03E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	2.72E-04	4.31E-03	1.49E-03	6.85E-06	1.62E-04	1.49E-04	6.09E-01	4.16E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3335	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03	
	Brush Piling	Front end loader	3.696	19	1.93E-04	2.40E-03	1.40E-03	6.49E-06	9.43E-05	8.67E-05	6.45E-01	3.38E-05	-	6.46E-01	5.86E-01	
		Tractor/crawler/dozer	3.696	19	1.43E-04	2.13E-03	7.91E-04	2.91E-06	8.28E-05	7.62E-05	2.97E-01	1.92E-05	-	2.97E-01	2.70E-01	
	Chipping	Brush chipper	3.696	19	1.69E-04	1.60E-03	7.75E-04	4.62E-06	4.92E-05	4.52E-05	4.11E-01	1.52E-05	-	4.11E-01	3.73E-01	
		Front end loader	3.696	19	1.93E-04	2.40E-03	1.40E-03	6.49E-06	9.43E-05	8.67E-05	6.45E-01	3.38E-05	-	6.46E-01	5.86E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	4.80E-05	3.36E-04	3.95E-04	6.46E-07	1.04E-05	9.61E-06	5.00E-02	4.33E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	1.13E-04	3.95E-04	4.67E-04	6.31E-07	2.68E-05	2.46E-05	4.88E-02	1.02E-05	-	4.90E-02	4.45E-02	
		Water truck	3000 gal	4	3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	9.47E-02	8.59E-02	
		Excavator	300 hp	4	6.77E-05	8.99E-04	5.55E-04	2.75E-06	2.92E-05	2.69E-05	2.80E-01	1.37E-05	-	2.81E-01	2.54E-01	
		Front end loader	180 hp	4	7.34E-05	1.08E-03	4.60E-04	2.41E-06	3.61E-05	3.32E-05	2.14E-01	1.16E-05	-	2.15E-01	1.95E-01	
		36" Diversion Pipe - graditi	Tractor/crawler/dozer	180 hp	6	1.60E-04	2.54E-03	8.77E-04	4.03E-06	9.57E-05	8.81E-05	3.59E-01	2.45E-05	-	3.59E-01	
		36" Diversion Pipe - pipe a	Welder	17 hp	4	1.84E-04	1.19E-04	6.94E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.05E-05	9.16E-06	1.42E-02	
		36" Diversion Pipe	Crane 80'	130 hp	27.3333	5.29E-04	6.71E-03	4.83E-03	9.17E-06	3.59E-04	3.30E-04	8.15E-01	6.40E-05	-	8.16E-01	
			Loader/backhoe	75 hp	0.0923	8.55E-07	1.04E-05	9.84E-06	1.75E-08	6.93E-07	6.38E-07	1.49E-03	1.03E-07	-	1.49E-03	
			Crane 94'	155 hp	155	3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	
			1 ton pickup truck	155	19	3.36E-04	4.31E-04	4.25E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	
			Crane 94'	155 hp	155	3.58E-03	4.54E-02	3.26E-02	6.20E-05	2.42E-03	2.23E-03	5.51E+00	4.32E-04	-	5.52E+00	
			1 ton pickup truck	155	19	3.36E-04	4.31E-04	4.25E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.34E-05	8.46E-04	2.92E-04	1.34E-06	3.19E-05	2.94E-05	1.20E-01	8.17E-06	-	1.20E-01	
		Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	
			Crane 80'	130 hp	16	3.10E-04	3.93E-03	2.83E-03	5.37E-06	2.10E-04	1.93E-04	4.77E-01	3.74E-05	-	4.78E-01	
			Flatbed truck	8	21	4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	
			Generator	80 hp	5856	244	1.10E-01	9.28E-01	9.09E-01	1.78E-03	5.60E-02	5.15E-02	1.52E+02	9.93E-03	-	1.52E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01	
	Push	Tractor/crawler/dozer	600 hp	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01	
	Push	Tractor/crawler/dozer	600 hp	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01	
	Build road	Tractor/crawler/dozer	600 hp	19	1.15E-02	1.75E-01	9.13E-02	3.45E-04	6.44E-03	5.93E-03	3.43E+01	2.23E-03	-	3.43E+01	3.11E+01	
	Armoring	1 ton pickup truck	2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
		Excavator	430 hp	2	4.85E-05	6.44E-04	3.98E-04	1.97E-06	2.09E-05	1.92E-05	2.01E-01	9.81E-06	-	2.01E-01	1.82E-01	
		1 ton pickup truck	2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
	Maintenance	Grader	215 hp	340	9.80E-03	1.60E-01	5.44E-02	2.83E-04	5.14E-03	4.73E-03	2.51E+01	1.39E-03	-	2.52E+01	2.28E+01	
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00	
		Front end loader	350 hp	7	2.10E-03	2.73E-02	1.07E-02	4.84E-05	1.02E-03	9.38E-04	4.93E+00	2.57E-04	-	4.94E+00	4.48E+00	
		Front end loader	350 hp	7	2.10E-03	2.73E-02	1.07E-02	4.84E-05	1.02E-03	9.38E-04	4.93E+00	2.57E-04	-	4.94E+00	4.48E+00	
		Water truck	3000 gal	7	4.49E-04	6.32E-03	8.31E-04	7.01E-06	1.46E-04	8.71E-05	1.41E+00	3.34E-06	3.15E-06	1.41E+00	1.29E+00	
		Excavator	400 hp	7	1.34E-03	1.78E-02	1.10E-02	5.46E-05	5.79E-04	5.33E-04	5.56E+00	2.72E-04	-	5.56E+00	5.05E+00	
	Beach Crew	1 ton pickup truck	59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00	
		Tractor/crawler/dozer	600 hp	7	3.71E-03	5.64E-02	2.94E-02	1.11E-04	2.08E-03	1.91E-03	1.10E+01	7.17E-04	-	1.11E+01	1.00E+01	
		Tractor/crawler/dozer	600 hp	7	3.71E-03	5.64E-02	2.94E-02	1.11E-04	2.08E-03	1.91E-03	1.10E+01	7.17E-04	-	1.11E+01	1.00E+01	
		Water truck	3000 gal	7	1.12E-04	1.58E-03	2.08E-04	1.75E-06	3.65E-05	2.18E-05	3.52E-01	8.36E-07	7.87E-07	3.52E-01	3.19E-01	

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)								Metric Tons CO2e/yr			
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4		N2O	CO2e	
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01	
		Front end loader	350 hp	1028.5	131	3.63E-02	4.72E-01	1.84E-01	8.37E-04	1.76E-02	1.62E-02	8.52E+01	4.44E-03	-	8.53E+01	7.74E+01
		Water truck	3000 gal	1028.5	131	7.77E-03	1.09E-01	1.44E-02	1.21E-04	2.53E-03	1.51E-03	2.43E+01	5.78E-05	5.44E-05	2.43E+01	2.21E+01
	Beach Crew	Excavator	400 hp	1028.5	131	2.32E-02	3.08E-01	1.90E-01	9.43E-04	1.00E-02	9.21E-03	9.61E+01	4.69E-03	-	9.62E+01	8.72E+01
		1 ton pickup truck	350 hp	1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01
		Tractor/crawler/dozer	600 hp	1028.5	131	6.42E-02	9.75E-01	5.09E-01	1.92E-03	3.59E-02	3.30E-02	1.91E+02	1.24E-02	-	1.91E+02	1.74E+02
	Demolition	Platform	Tractor/crawler/dozer	440 hp	720	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01
			Tractor/crawler/dozer	440 hp	90	4.93E-03	7.36E-02	2.74E-02	1.01E-04	2.86E-03	2.63E-03	1.03E+01	6.63E-04	-	1.03E+01	9.32E+00
			3/4 ton pickup truck	475 hp	360	1.39E-03	1.20E-03	1.69E-02	2.41E-05	1.97E-04	8.84E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00
	Demolition - Notch 5'	Drilling	Rotary drill	475 hp	54.4	1.53E-03	2.22E-02	1.42E-02	7.89E-05	6.86E-04	6.31E-04	8.04E+00	1.93E-04	-	8.04E+00	7.29E+00
3/4 ton pickup truck			475 hp	50.4	1.95E-04	1.68E-04	2.37E-03	3.38E-06	2.76E-05	1.24E-05	1.13E+00	1.12E-04	5.87E-05	1.15E+00	1.04E+00	
Cut with Diamond wire		Diamond cutting saw	50 hp	148	5.72E-04	4.94E-04	6.95E-03	9.92E-06	8.10E-05	3.64E-05	3.32E+00	3.30E-04	1.72E-04	3.38E+00	3.07E+00	
		Crane 260'	375 hp	179.6356	6.17E-03	9.19E-02	2.68E-02	1.19E-04	3.70E-03	3.41E-03	1.21E+01	6.94E-04	-	1.21E+01	1.10E+01	
Lift/Load blocks		3/4 ton pickup truck	475 hp	179.6356	1.28E-03	6.95E-04	6.00E-04	8.44E-03	1.20E-05	9.83E-05	4.41E-05	4.03E+00	4.01E-04	2.09E-04	4.10E+00	3.72E+00
		Front end loader	350 hp	32	1.13E-03	1.47E-02	5.74E-03	2.60E-05	5.48E-04	5.04E-04	2.65E+00	1.38E-04	-	2.65E+00	2.41E+00	
Landfill		Crane 260'	Water truck	3000 gal	521	3.93E-03	5.54E-02	7.27E-03	6.14E-05	1.28E-03	7.63E-04	1.23E+01	2.93E-05	2.76E-05	1.23E+01	1.12E+01
			Crane 260'	375 hp	89.8178	3.09E-03	4.60E-02	1.33E-02	5.95E-05	1.85E-03	1.70E-03	6.06E+00	3.47E-04	-	6.07E+00	5.50E+00
Demolition - Notch 5'		Micro-blast	Crane 260'	375 hp	60	2.06E-03	3.07E-02	8.88E-03	3.97E-05	1.24E-03	1.14E-03	4.05E+00	2.32E-04	-	4.05E+00	3.68E+00
			Horizontal boring drill	10 hp	55	1.82E-04	1.44E-03	1.16E-03	2.95E-06	9.22E-05	8.48E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01
	Demolish spillway	3/4 ton pickup truck	475 hp	60	2.32E-04	2.00E-04	2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
		Crane 260'	375 hp	100	3.44E-03	5.12E-02	1.48E-02	6.62E-05	2.08E-03	1.90E-03	6.75E+00	3.86E-04	-	6.76E+00	6.13E+00	
	Excavation for Dam Demo	Air compressor	50 hp	200	1.03E-02	1.35E-02	5.52E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.84E-04	7.95E-04	3.64E+00	3.31E+00	
		3/4 ton pickup truck	475 hp	100	3.87E-04	3.34E-04	4.70E-03	6.70E-06	5.47E-05	2.46E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
	Drilling	Asphalt Distributor	3000 gal	6.7805	19	5.12E-05	7.21E-04	9.47E-05	7.99E-07	1.67E-05	9.93E-06	1.60E-01	3.81E-07	3.59E-07	1.60E-01	1.46E-01
		Excavator	430 hp	4.445	19	1.08E-04	1.43E-03	8.85E-04	4.38E-06	4.65E-05	4.28E-05	4.46E-01	2.18E-05	-	4.47E-01	4.05E-01
	Cut with Diamond wire	Tractor/crawler/dozer	850 hp	3.2327	19	4.94E-04	9.37E-03	2.64E-03	9.08E-06	2.74E-04	2.52E-04	9.03E-01	6.32E-05	-	9.05E-01	8.21E-01
		Rotary drill	475 hp	7.3333	19	2.06E-04	2.99E-03	1.92E-03	1.06E-05	9.24E-05	8.50E-05	1.08E+00	2.60E-05	-	1.08E+00	9.83E-01
Lift/Load blocks	3/4 ton Pickup truck	475 hp	7.3333	19	2.84E-05	2.45E-05	3.44E-04	4.92E-07	4.01E-06	1.80E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01	
	Diamond cutting saw	50 hp	48	19	1.86E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Landfill	Crane 260'	3/4 ton Pickup truck	60.0214	19	2.06E-03	3.07E-02	8.89E-03	3.98E-05	1.24E-03	1.14E-03	4.05E+00	2.32E-04	-	4.05E+00	3.68E+00	
		Water truck	3000 gal	507	19	3.83E-03	5.39E-02	7.08E-03	5.98E-05	1.25E-03	7.43E-04	1.20E+01	2.85E-05	2.68E-05	1.20E+01	1.09E+01
Total	Crane 260'	375 hp	30.0107	19	1.03E-03	1.54E-02	4.44E-03	1.99E-05	6.18E-04	5.69E-04	2.03E+00	1.16E-04	-	2.03E+00	1.84E+00	
					5.44E-01	6.83E+00	4.27E+00	1.28E-02	2.71E-01	2.44E-01	1.38E+03	8.26E-02	6.74E-03	1.39E+03	1.26E+03	

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	209	7.11E-03	6.14E-03	8.63E-02	1.23E-04	1.01E-03	4.51E-04
Dust Control	Water truck	5000 gal	2320	209	3.35E-01	4.72E+00	6.20E-01	5.23E-03	1.09E-01	6.50E-02
Environmental protection measures	Biologist		1229.3333	209	9.10E-02	7.86E-02	1.11E+00	1.58E-03	1.29E-02	5.78E-03
	Fish relocation		16	19	1.30E-02	1.12E-02	1.58E-01	2.26E-04	1.84E-03	8.27E-04
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.01E-03	2.57E-03	2.72E-02	6.23E-05	4.95E-04	2.17E-04
	Tractor/crawler/dozer	250 hp	7.3333	19	5.72E-02	9.07E-01	3.14E-01	1.44E-03	3.42E-02	3.15E-02
	Chain saw		7.3333	19	1.04E-01	1.63E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04
	Front end loader	540 hp	3.696	19	4.06E-02	5.06E-01	2.94E-01	1.37E-03	1.98E-02	1.83E-02
	Tractor/crawler/dozer	310 hp	3.696	19	3.00E-02	4.49E-01	1.67E-01	6.13E-04	1.74E-02	1.60E-02
	Chipping	250 hp	3.696	19	3.55E-02	3.36E-01	1.63E-01	9.73E-04	1.04E-02	9.52E-03
	Front end loader	540 hp	3.696	19	4.06E-02	5.06E-01	2.94E-01	1.37E-03	1.98E-02	1.83E-02
Dewatering	Temporary Cofferdam	180 hp	2	19	1.12E-02	1.78E-01	6.16E-02	2.83E-04	6.72E-03	6.18E-03
	Front end loader	49 hp	4	19	1.01E-02	7.08E-02	8.32E-02	1.36E-04	2.20E-03	2.02E-03
	Roller	47 hp	4	19	2.37E-02	8.32E-02	9.84E-02	1.33E-04	5.64E-03	5.19E-03
	Water truck	3000 gal	4	19	6.36E-03	8.95E-02	1.18E-02	9.93E-05	2.07E-03	1.23E-03
	Excavator	300 hp	4	19	1.42E-02	1.89E-01	1.17E-01	5.79E-04	6.15E-03	5.85E-03
	Front end loader	180 hp	4	19	1.55E-02	2.26E-01	9.67E-02	5.08E-04	7.59E-03	6.98E-03
	36" Diversion Pipe - graditi	Tractor/crawler/dozer	180 hp	6	3.37E-02	5.34E-01	1.85E-01	8.49E-04	2.02E-02	1.85E-02
	36" Diversion Pipe - pipe a	Welder	17 hp	4	3.87E-02	2.50E-02	1.46E+00	5.96E-05	1.97E-02	1.97E-02
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	1.11E-01	1.41E+00	1.02E+00	1.93E-03	7.55E-02
		Loader/backhoe	75 hp	0.0923	19	1.80E-04	2.19E-03	2.07E-03	3.68E-06	1.46E-04
		Crane 94'	155 hp	155	19	7.54E-01	9.55E+00	6.87E+00	1.31E-02	5.10E-01
		1 ton pickup truck	155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03
		Crane 94'	155 hp	155	19	7.54E-01	9.55E+00	6.87E+00	1.31E-02	5.10E-01
		1 ton pickup truck	155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.12E-02	1.78E-01	6.16E-02	2.83E-04	6.72E-03
	Dewatering	Concrete saw	13 hp	8	21	6.71E-02	4.98E-02	2.57E+00	1.25E-04	3.68E-02
		Crane 80'	130 hp	16	21	5.90E-02	7.48E-01	5.38E-01	1.02E-03	4.00E-02
		Flatbed truck	8	21	9.27E-03	1.00E-02	1.29E-01	1.01E-04	8.04E-04	3.47E-04
		Generator	80 hp	5856	244	1.80E+00	1.52E+01	1.49E+01	2.92E-02	9.18E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	2.43E+00	3.68E+01	1.92E+01	7.26E-02	1.36E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	2.43E+00	3.68E+01	1.92E+01	7.26E-02	1.36E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	2.43E+00	3.68E+01	1.92E+01	7.26E-02	1.36E+00
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	2.43E+00	3.68E+01	1.92E+01	7.26E-02	1.36E+00
	Armoring	1 ton pickup truck	2	19	9.13E-04	1.17E-03	1.24E-02	2.83E-05	2.25E-04	9.86E-05
		Excavator	430 hp	2	19	1.02E-02	1.36E-01	8.38E-02	4.15E-04	4.41E-03
		1 ton pickup truck	2	19	9.13E-04	1.17E-03	1.24E-02	2.83E-05	2.25E-04	9.86E-05
	Maintenance	Grader	215 hp	340	209	1.87E-01	3.07E+00	1.04E+00	5.41E-03	9.84E-02
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	7.37E-02	9.45E-02	9.98E-01	2.29E-03	1.82E-02	7.96E-03
		Front end loader	350 hp	59.5	7	1.20E+00	1.56E+01	6.10E+00	2.77E-02	5.82E-01
		Front end loader	350 hp	59.5	7	1.20E+00	1.56E+01	6.10E+00	2.77E-02	5.82E-01
		Water truck	3000 gal	59.5	7	2.57E-01	3.61E+00	4.75E-01	4.01E-03	8.35E-02
		Excavator	400 hp	59.5	7	7.67E-01	1.02E+01	6.29E+00	3.12E-02	3.31E-01
	Beach Crew	1 ton pickup truck	59.5	7	7.37E-02	9.45E-02	9.98E-01	2.29E-03	1.82E-02	7.96E-03
		Tractor/crawler/dozer	600 hp	59.5	7	2.12E+00	3.22E+01	1.68E+01	6.35E-02	1.19E+00
		Tractor/crawler/dozer	600 hp	59.5	7	2.12E+00	3.22E+01	1.68E+01	6.35E-02	1.19E+00
		Water truck	3000 gal	14.875	7	6.42E-02	9.03E-01	1.19E-01	1.00E-03	2.09E-02

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day 1/1/2019  
 Birthday of Martin Luther King, Jr. 1/21/2019  
 Washington's Birthday 2/18/2019  
 Memorial Day 5/27/2019  
 Independence Day 7/4/2019  
 Labor Day 9/2/2019  
 Columbus Day 10/14/2019  
 Veterans Day 11/11/2019  
 Thanksgiving Day 11/28/2019  
 Christmas Day 12/25/2019  
 10

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2019>

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 3**

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	6.81E-02	8.73E-02	9.22E-01	2.11E-03	1.68E-02	7.35E-03		
		Front end loader	350 hp	1028.5	131	1.11E+00	1.44E+01	5.63E+00	2.55E-02	5.38E-01	4.95E-01	
		Water truck	3000 gal	1028.5	131	2.37E-01	3.34E+00	4.38E-01	3.70E-03	7.71E-02	4.60E-02	
	Beach Crew	Excavator	400 hp	1028.5	131	7.08E-01	9.41E+00	5.81E+00	2.88E-02	3.06E-01	2.81E-01	
		1 ton pickup truck	1028.5	131	6.81E-02	8.73E-02	9.22E-01	2.11E-03	1.68E-02	7.35E-03		
		Tractor/crawler/dozer	600 hp	1028.5	131	1.96E+00	2.98E+01	1.56E+01	5.86E-02	1.10E+00	1.01E+00	
	Demolition	Platform	Tractor/crawler/dozer	440 hp	720	22	7.17E+00	1.07E+02	3.98E+01	1.46E-01	4.16E+00	3.83E+00
			Tractor/crawler/dozer	440 hp	90	22	8.96E-01	1.34E+01	4.97E+00	1.83E-02	5.20E-01	4.79E-01
			3/4 ton pickup truck	360	22	2.53E-01	2.19E-01	3.07E+00	4.39E-03	3.58E-02	1.61E-02	
		Drilling	Rotary drill	475 hp	54.4	128	4.78E-02	6.94E-01	4.45E-01	2.47E-03	2.14E-02	1.97E-02
3/4 ton pickup truck			50.4	128	6.09E-03	5.26E-03	7.40E-02	1.06E-04	8.62E-04	3.87E-04		
Cut with Diamond wire		Diamond cutting saw	50 hp	148	128	1.79E-02	1.54E-02	2.17E-01	3.10E-04	2.53E-03	1.14E-03	
		Crane 260'	375 hp	179.6356	128	9.88E-02	5.25E-01	5.10E-01	9.15E-04	2.80E-02	2.58E-02	
Lift/Load blocks		3/4 ton pickup truck	179.6356	128	1.93E-01	2.87E+00	8.31E-01	3.72E-03	1.16E-01	1.06E-01		
		Front end loader	350 hp	32	128	2.17E-02	1.87E-02	2.64E-01	3.76E-04	3.07E-03	1.38E-03	
Load/Haul		Water truck	3000 gal	521	128	3.53E-02	4.59E-01	1.79E-01	8.13E-04	1.71E-02	1.58E-02	
	Crane 260'	375 hp	89.8178	128	1.23E-01	1.73E+00	2.27E-01	1.92E-03	4.00E-02	2.38E-02		
Landfill	Crane 260'	375 hp	60	128	9.64E-02	1.44E+00	4.16E-01	1.86E-03	5.78E-02	5.32E-02		
	Micro-blast	10 hp	55	128	6.44E-02	9.59E-01	2.78E-01	1.24E-03	3.86E-02	3.55E-02		
Demolition - Notch 5'	Excavation for Dam Demo	Horizontal boring drill	10 hp	60	128	5.68E-03	4.49E-02	3.62E-02	9.21E-05	2.88E-03	2.65E-03	
		3/4 ton pickup truck	100	128	7.25E-03	6.26E-03	8.81E-02	1.26E-04	1.03E-03	4.61E-04		
		Crane 260'	375 hp	100	128	1.07E-01	1.60E+00	4.63E-01	2.07E-03	6.44E-02	5.92E-02	
	Demolish spillway	Air compressor	50 hp	200	128	3.21E-01	4.23E-01	1.72E-01	1.29E-03	8.10E-03	8.09E-03	
		3/4 ton pickup truck	100	128	1.21E-02	1.04E-02	1.47E-01	2.10E-04	1.71E-03	7.68E-04		
	Asphalt Distributor	Asphalt Distributor	3000 gal	6.7805	19	1.08E-02	1.52E-01	1.99E-02	1.68E-04	3.51E-03	2.09E-03	
		Excavator	430 hp	4.445	19	2.27E-02	3.01E-01	1.86E-01	9.22E-04	9.79E-03	9.01E-03	
	Drilling	Tractor/crawler/dozer	850 hp	3.2327	19	1.04E-01	1.97E+00	5.57E-01	1.91E-03	5.76E-02	5.30E-02	
		Rotary drill	475 hp	7.3333	19	4.34E-02	6.30E-01	4.04E-01	2.24E-03	1.95E-02	1.79E-02	
	Cut with Diamond wire	3/4 ton Pickup truck	48	19	5.97E-03	5.16E-03	7.25E-02	1.04E-04	8.45E-04	3.79E-04		
Diamond cutting saw		50 hp	48	19	3.91E-02	3.37E-02	4.75E-01	6.77E-04	5.53E-03	2.48E-03		
Lift/Load blocks	Crane 260'	375 hp	60.0214	19	2.16E-01	1.15E+00	1.11E+00	2.00E-03	6.12E-02	5.63E-02		
	3/4 ton Pickup truck	60.0214	19	4.34E-01	6.47E+00	1.87E+00	8.37E-03	2.60E-01	2.40E-01			
Landfill	Water truck	3000 gal	507	19	4.89E-02	4.22E-02	5.94E-01	8.47E-04	6.92E-03	3.10E-03		
	Crane 260'	375 hp	30.0107	19	8.06E-01	1.13E+01	1.49E+00	1.26E-02	2.62E-01	1.56E-01		
<b>Total</b>					<b>4.11E+01</b>	<b>5.66E+02</b>	<b>3.01E+02</b>	<b>1.02E+00</b>	<b>2.16E+01</b>	<b>1.96E+01</b>		

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite	VOC	NOx	CO	SO2	PM10	PM2.5
Rindge	32	435	232	1	17	15
Surfrider	0	0	0	0	0	0
Topanga	4	65	35	0	2	2
Zuma	4	60	32	0	2	2
Landfill	0	5	1	0	0	0

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		96	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	2320	209	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
Environmental protection measures	Biologist		1229.3333	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Fish relocation		16	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	250 hp	7.3333	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	Front end loader	540 hp	3.696	19	0.083	1.001	0.621	0.003	0.039	0.036	293.384	0.015	0.000
	Tractor/crawler/dozer	310 hp	3.696	19	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000
	Chipping	Brush chipper	250 hp	3.696	19	0.156	1.378	0.752	0.005	0.043	403.250	0.014	0.000
	Front end loader	540 hp	3.696	19	0.083	1.001	0.621	0.003	0.039	0.036	293.384	0.015	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.128	1.986	0.719	0.003	0.075	301.159	0.019	0.000
	Front end loader	49 hp	4	19	0.208	1.500	1.818	0.003	0.039	0.036	231.302	0.019	0.000
	Roller	47 hp	4	19	0.492	1.848	2.208	0.003	0.116	0.106	235.507	0.044	0.000
	Water truck	3000 gal	4	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Excavator	300 hp	4	19	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Front end loader	180 hp	4	19	0.087	1.238	0.573	0.003	0.041	0.038	270.061	0.014	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.128	1.986	0.719	0.003	0.075	301.159	0.019	0.000
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	2.448	1.584	92.582	0.004	1.249	148.932	0.140	0.122
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.128	1.605	1.231	0.002	0.086	208.066	0.015	0.000
	Loader/backhoe	75 hp	0.0923	19	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Crane 94'	155 hp	155	19	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Crane 94'	155 hp	155	19	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.128	1.986	0.719	0.003	0.075	301.159	0.019	0.000
	Dewatering	Concrete saw	13 hp	8	22	3.075	2.272	117.566	0.006	1.685	200.981	0.175	0.188
	Crane 80'	130 hp	16	22	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	Flatbed truck		8	22	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	Generator	80 hp	5856	244	0.191	1.653	1.753	0.003	0.094	0.087	294.384	0.017	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.091	1.345	0.721	0.003	0.049	280.790	0.017	0.000
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.091	1.345	0.721	0.003	0.049	280.790	0.017	0.000
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.091	1.345	0.721	0.003	0.049	280.790	0.017	0.000
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.091	1.345	0.721	0.003	0.049	280.790	0.017	0.000
	Armoring	1 ton pickup truck	2	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Excavator	430 hp	2	19	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	1 ton pickup truck		2	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Compaction	Vibratory roller	50 hp	7.38	19	0.492	1.848	2.208	0.003	0.116	235.507	0.044	0.000
	Tractor/crawler/dozer	250 hp	7.38	19	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Water truck	5000 gal	9.225	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
Maintenance	Grader	215 hp	340	209	0.119	1.912	0.688	0.004	0.061	0.056	312.002	0.016	0.000
Sand to Zuma Beach (19,500 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Front end loader	350 hp	161.5	18	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Front end loader	350 hp	161.5	18	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000
	Water truck	3000 gal	161.5	18	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Excavator	400 hp	161.5	18	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Beach Crew	1 ton pickup truck	161.5	18	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Tractor/crawler/dozer	600 hp	161.5	18	0.091	1.345	0.721	0.003	0.049	0.045	280.790	0.017	0.000
	Water truck	3000 gal	161.5	18	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048



**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 4**

Construction Start Year 2020  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Fines to landfill (147,700 cy) (4/27-10/15)	<i>Material Excavation</i>	1 ton pickup truck	1066	120	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056		
		Front end loader	350 hp	1066	120	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000	
		Front end loader	350 hp	1066	120	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000	
		Water truck	3000 gal	1066	120	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
		Excavator	400 hp	1066	120	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000	
Demolition	<i>Platform</i>	Tractor/crawler/dozer	440 hp	720	20	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000	
		Tractor/crawler/dozer	440 hp	90	20	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000	
	3/4 ton pickup truck		360	20	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
	<i>Drilling</i>	Rotary drill	475 hp	61,7333	127	0.052	0.708	0.500	0.003	0.022	0.021	282.166	0.006	0.000	
		3/4 ton pickup truck		57,7333	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	<i>Cut with Diamond wire</i>	3/4 ton pickup truck		196	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	<i>Diamond cutting saw</i>	50 hp		196	127	0.344	1.993	1.959	0.004	0.096	0.089	277.562	0.031	0.000	
	<i>Lift/Load blocks</i>	Crane 260'	375 hp	239,2283	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000	
	3/4 ton pickup truck		239,2283	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
	<i>Load/Haul</i>	Front end loader	350 hp	32	127	0.086	1.091	0.455	0.002	0.041	0.037	214.821	0.011	0.000	
	<i>Landfill</i>	Water truck	3000 gal	521	127	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Crane 260'	375 hp	119,6141	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000		
	<i>Micro-blast</i>	Crane 260'	375 hp	60	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000	
	Horizontal boring drill	10 hp	55	127	0.297	2.334	1.909	0.005	0.148	0.136	312.570	0.033	0.000		
	3/4 ton pickup truck		60	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
	<i>Demolish spillway</i>	Crane 260'	375 hp	100	127	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000	
	Air compressor	50 hp	200	127	0.882	1.143	50.704	0.004	0.024	0.023	307.059	0.050	0.070		
	3/4 ton pickup truck		100	127	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
	Demolition - Notch 5'	<i>Excavation for Dam Demo</i>	Asphalt Distributor	3000 gal	6,7805	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
			Excavator	430 hp	4,445	19	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
Tractor/crawler/dozer		850 hp	3,2327	19	0.164	3.103	0.836	0.003	0.091	0.084	298.249	0.020	0.000		
<i>Drilling</i>		Rotary drill	475 hp	7,3333	19	0.052	0.708	0.500	0.003	0.022	0.021	282.166	0.006	0.000	
3/4 ton Pickup truck			7,3333	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
<i>Cut with Diamond wire</i>		3/4 ton Pickup truck		48	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
Diamond cutting saw		50 hp	48	19	0.344	1.993	1.959	0.004	0.096	0.089	277.562	0.031	0.000		
<i>Lift/Load blocks</i>		Crane 260'	375 hp	60,0214	19	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000	
3/4 ton Pickup truck			60,0214	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056		
Water truck		3000 gal	507	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048		
<i>Landfill</i>	Crane 260'	375 hp	30,0107	19	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000		

Data from Alt4\_EnvrAirQualityReport.pdf

**Total**  
 Daily Onsite Emissions (lb/day)  
 Rindge  
 Surridge  
 Topanga  
 Zuma  
 Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2020 (tons per year)										Metric Tons CO2e/yr	
					GWP											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		96	209	3.29E-04	2.97E-04	4.01E-03	6.43E-06	5.21E-05	2.31E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
Dust Control	Water truck	5000 gal	2320	209	1.70E-02	1.99E-01	3.17E-02	2.73E-04	5.18E-03	2.93E-03	5.47E+01	1.30E-04	1.23E-04	5.48E+01	4.97E+01	
Environmental protection measures	Biologist		1229.3333	209	4.22E-03	3.80E-03	5.14E-02	8.24E-05	6.67E-04	2.96E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
	Fish relocation		16	19	5.49E-05	4.95E-05	6.69E-04	1.07E-06	8.68E-06	3.86E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	8.02E-06	1.11E-05	1.10E-04	2.96E-07	2.33E-06	1.01E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	2.58E-04	4.01E-03	1.45E-03	6.85E-06	1.51E-04	1.39E-04	6.09E-01	3.93E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3335	19	4.95E-04	7.76E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	3.08E-05	2.66E-06	3.89E-03	3.53E-03	
	Brush Piling	Front end loader	3.696	19	1.82E-04	2.20E-03	1.37E-03	6.49E-06	8.55E-05	7.87E-05	6.45E-01	3.21E-05	-	6.46E-01	5.86E-01	
		Tractor/crawler/dozer	3.696	19	1.35E-04	1.96E-03	7.63E-04	2.91E-06	7.63E-05	7.02E-05	2.97E-01	1.82E-05	-	2.97E-01	2.70E-01	
	Chipping	Brush chipper	3.696	19	1.59E-04	1.40E-03	7.66E-04	4.62E-06	4.36E-05	4.01E-05	4.11E-01	1.43E-05	-	4.11E-01	3.73E-01	
		Front end loader	3.696	19	1.82E-04	2.20E-03	1.37E-03	6.49E-06	8.55E-05	7.87E-05	6.45E-01	3.21E-05	-	6.46E-01	5.86E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.06E-05	7.88E-04	2.85E-04	1.34E-06	2.97E-05	2.73E-05	1.20E-01	7.71E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	4.50E-05	3.24E-04	3.93E-04	6.46E-07	8.46E-06	7.78E-06	5.00E-02	4.06E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	1.02E-04	3.83E-04	4.58E-04	6.31E-07	2.40E-05	2.21E-05	4.88E-02	9.20E-06	-	4.90E-02	4.45E-02	
		Water truck	3000 gal	4	2.92E-05	3.43E-04	5.47E-05	4.70E-07	8.94E-06	5.04E-06	9.43E-02	2.25E-07	2.12E-07	9.44E-02	8.56E-02	
		Excavator	300 hp	4	6.40E-05	7.94E-04	5.50E-04	2.75E-06	2.62E-05	2.41E-05	2.80E-01	1.30E-05	-	2.81E-01	2.54E-01	
		Front end loader	180 hp	4	6.89E-05	9.82E-04	4.54E-04	2.41E-06	3.26E-05	3.00E-05	2.14E-01	1.10E-05	-	2.15E-01	1.95E-01	
		36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	1.52E-04	2.36E-03	8.56E-04	4.03E-06	8.91E-05	8.20E-05	3.59E-01	2.31E-05	-	3.59E-01	3.26E-01
		36" Diversion Pipe - pipe a	Welder	17 hp	4	1.89E-04	1.19E-04	6.94E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.05E-05	9.16E-06	1.42E-02	1.29E-02
		36" Diversion Pipe	Crane 80'	130 hp	27.3333	5.01E-04	6.29E-03	4.82E-03	9.17E-06	3.36E-04	3.09E-04	8.15E-01	5.93E-05	-	8.16E-01	7.40E-01
			Loader/backhoe	75 hp	0.0923	7.69E-07	9.35E-06	9.80E-06	1.75E-08	5.91E-07	5.44E-07	1.49E-03	9.52E-08	-	1.49E-03	1.35E-03
			Crane 94'	155 hp	155	3.39E-03	4.25E-02	3.26E-02	6.20E-05	2.27E-03	2.09E-03	5.51E+00	4.01E-04	-	5.52E+00	5.01E+00
			1 ton pickup truck	155	19	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
			Crane 94'	155 hp	155	3.39E-03	4.25E-02	3.26E-02	6.20E-05	2.27E-03	2.09E-03	5.51E+00	4.01E-04	-	5.52E+00	5.01E+00
			1 ton pickup truck	155	19	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.06E-05	7.88E-04	2.85E-04	1.34E-06	2.97E-05	2.73E-05	1.20E-01	7.71E-06	-	1.20E-01	1.09E-01
		Dewatering	Concrete saw	13 hp	8	3.52E-04	2.60E-04	1.35E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.01E-05	2.16E-05	3.02E-02	2.74E-02
			Crane 80'	130 hp	16	2.93E-04	3.68E-03	2.82E-03	5.37E-06	1.97E-04	1.81E-04	4.77E-01	3.47E-05	-	4.78E-01	4.33E-01
			Flatbed truck	8	22	4.12E-05	4.58E-05	5.67E-04	5.32E-07	4.18E-06	1.78E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
			Generator	80 hp	5856	9.87E-02	8.54E-01	9.05E-01	1.78E-03	4.87E-02	4.48E-02	1.52E+02	8.90E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.11E-02	1.64E-01	8.81E-02	3.45E-04	6.03E-03	5.54E-03	3.43E+01	2.11E-03	-	3.43E+01	3.11E+01
	Armoring	1 ton pickup truck	2	19	3.64E-06	5.03E-06	4.98E-05	1.34E-07	1.06E-06	4.59E-07	4.49E-02	4.46E-06	2.33E-06	4.47E-02	4.15E-02	
		Excavator	430 hp	2	4.59E-05	5.69E-04	3.94E-04	1.97E-06	1.88E-05	1.73E-05	2.01E-01	9.29E-06	-	2.01E-01	1.82E-01	
		1 ton pickup truck	2	19	3.64E-06	5.03E-06	4.98E-05	1.34E-07	1.06E-06	4.59E-07	4.49E-02	4.46E-06	2.33E-06	4.47E-02	4.15E-02	
	Compaction	Vibratory roller	50 hp	7.38	2.00E-04	7.52E-04	8.98E-04	1.24E-06	4.71E-05	4.33E-05	9.58E-02	1.81E-05	-	9.62E-02	8.72E-02	
		Tractor/crawler/dozer	250 hp	7.38	2.59E-04	4.04E-03	1.46E-03	6.89E-06	1.52E-04	1.40E-04	6.12E-01	3.95E-05	-	6.13E-01	5.56E-01	
		Water truck	5000 gal	9.225	19	6.74E-05	7.90E-04	1.26E-04	1.08E-06	2.06E-05	1.16E-05	2.16E-01	5.19E-07	4.88E-07	2.18E-01	1.98E-01
	Maintenance	Grader	215 hp	340	9.59E-03	1.54E-01	5.38E-02	2.83E-04	4.93E-03	4.53E-03	2.51E+01	1.32E-03	-	2.52E+01	2.28E+01	
Sand to Zuma Beach (19,500 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	2.94E-04	4.06E-04	4.02E-03	1.09E-05	8.56E-05	3.71E-05	3.62E+00	3.60E-04	1.88E-04	3.69E+00	3.35E+00	
		Front end loader	350 hp	161.5	18	5.38E-03	6.80E-02	2.83E-02	1.31E-04	2.53E-03	2.33E-03	1.34E+01	6.64E-04	-	1.34E+01	1.22E+01
		Front end loader	350 hp	161.5	18	5.38E-03	6.80E-02	2.83E-02	1.31E-04	2.53E-03	2.33E-03	1.34E+01	6.64E-04	-	1.34E+01	1.22E+01
		Water truck	3000 gal	161.5	18	1.18E-03	1.38E-02	2.21E-03	1.90E-05	3.61E-04	2.04E-04	3.81E+00	9.08E-06	8.54E-06	3.81E+00	3.46E+00
		Excavator	400 hp	161.5	18	3.45E-03	4.28E-02	2.96E-02	1.48E-04	1.41E-03	1.30E-03	1.51E+01	6.98E-04	-	1.51E+01	1.37E+01
	Beach Crew	1 ton pickup truck	161.5	18	2.94E-04	4.06E-04	4.02E-03	1.09E-05	8.56E-05	3.71E-05	3.62E+00	3.60E-04	1.88E-04	3.69E+00	3.35E+00	
		Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
		Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
		Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
		Tractor/crawler/dozer	600 hp	161.5	18	9.70E-03	1.44E-01	7.70E-02	3.02E-04	5.27E-03	4.85E-03	3.00E+01	1.85E-03	-	3.00E+01	2.72E+01
		Water truck	3000 gal	161.5	18	1.18E-03	1.38E-02	2.21E-03	1.90E-05	3.61E-04	2.04E-04	3.81E+00	9.08E-06	8.54E-06	3.81E+00	3.46E+00

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 4**

Construction Start Year 2020  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2020 (tons per year)										Metric Tons CO2e/yr		
					GWP												
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	1.94E-03	2.68E-03	2.65E-02	7.16E-05	5.65E-04	2.45E-04	2.39E+01	2.38E-03	1.24E-03	2.44E+01	2.21E+01		
	Front end loader	350 hp	1066	120	3.55E-02	4.49E-01	1.87E-01	8.67E-04	1.67E-02	1.54E-02	8.83E+01	4.38E-03	-	8.84E+01	8.02E+01		
	Front end loader	350 hp	1066	120	3.55E-02	4.49E-01	1.87E-01	8.67E-04	1.67E-02	1.54E-02	8.83E+01	4.38E-03	-	8.84E+01	8.02E+01		
	Water truck	3000 gal	1066	120	7.79E-03	9.13E-02	1.46E-02	1.25E-04	2.38E-03	1.34E-03	2.51E+01	5.99E-05	5.64E-05	2.52E+01	2.28E+01		
	Excavator	400 hp	1066	120	2.28E-02	2.82E-01	1.96E-01	9.77E-04	9.30E-03	8.55E-03	9.96E+01	4.61E-03	-	9.97E+01	9.04E+01		
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	3.73E-02	5.42E-01	2.11E-01	8.05E-04	2.11E-02	1.94E-02	8.21E+01	5.02E-03	-	8.22E+01	7.45E+01	
	Tractor/crawler/dozer	440 hp	90	20	4.66E-03	6.78E-02	2.64E-02	1.01E-04	2.64E-03	2.43E-03	1.03E+01	6.28E-04	-	1.03E+01	9.32E+00		
	3/4 ton pickup truck		360	20	1.24E-03	1.11E-03	1.50E-02	2.41E-05	1.95E-04	8.68E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00		
	Drilling	Rotary drill	475 hp	61,7333	127	1.67E-03	2.29E-02	1.61E-02	8.95E-05	7.24E-04	6.66E-04	9.12E+00	2.07E-04	-	9.12E+00	8.28E+00	
	3/4 ton pickup truck		57,7333	127	1.98E-04	1.79E-04	2.41E-03	3.87E-06	3.13E-05	1.39E-05	1.30E+00	1.29E-04	6.72E-05	1.32E+00	1.20E+00		
	Cut with Diamond wire	3/4 ton pickup truck		196	127	6.73E-04	6.06E-04	8.19E-03	1.31E-05	1.06E-04	4.73E-05	4.40E+00	4.37E-04	2.28E-04	4.48E+00	4.06E+00	
	Diamond cutting saw	50 hp	196	127	3.71E-03	2.15E-02	2.12E-02	3.88E-05	1.04E-03	9.56E-04	3.00E+00	3.35E-04	-	3.01E+00	2.73E+00		
	Lift/Load blocks	Crane 260'	375 hp	239,2283	127	7.55E-03	1.10E-01	3.44E-02	1.58E-04	4.41E-03	4.06E-03	1.61E+01	8.79E-04	-	1.62E+01	1.47E+01	
	3/4 ton pickup truck		239,2283	127	8.21E-04	7.40E-04	1.00E-02	1.60E-05	1.30E-04	5.77E-05	5.37E+00	5.34E-04	2.78E-04	-	5.47E+00	4.96E+00	
	Load/Haul	Front end loader	350 hp	32	127	1.07E-03	1.35E-02	5.61E-03	2.60E-05	5.01E-04	4.61E-04	2.65E+00	1.31E-04	-	2.65E+00	2.41E+00	
	Water truck	3000 gal	521	127	3.81E-03	4.46E-02	7.13E-03	6.12E-05	1.16E-03	6.57E-04	1.23E+01	2.93E-05	2.76E-05	1.23E+01	1.12E+01		
	Landfill	Crane 260'	375 hp	119,6141	127	3.77E-03	5.50E-02	1.72E-02	7.92E-05	2.21E-03	2.03E-03	8.07E+00	4.40E-04	-	8.08E+00	7.33E+00	
	Micro-blast	Crane 260'	375 hp	60	127	1.89E-03	2.76E-02	8.63E-03	3.97E-05	1.11E-03	1.02E-03	4.05E+00	2.21E-04	-	4.05E+00	3.68E+00	
	Horizontal boring drill	10 hp	55	127	1.80E-04	1.42E-03	1.16E-03	2.95E-06	8.96E-05	8.24E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01		
	3/4 ton pickup truck		60	127	2.06E-04	1.86E-04	2.51E-03	4.02E-06	3.25E-05	1.45E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00		
	Demolish spillway	Crane 260'	375 hp	100	127	3.16E-03	4.60E-02	1.44E-02	6.62E-05	1.84E-03	1.70E-03	6.75E+00	3.68E-04	-	6.76E+00	6.13E+00	
	Air compressor	50 hp	200	127	9.72E-03	1.26E-02	5.59E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.53E-04	7.68E-04	3.63E+00	3.30E+00		
	3/4 ton pickup truck		100	127	3.43E-04	3.09E-04	4.18E-03	6.70E-06	5.42E-05	2.41E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00		
	Demolition - Notch 5'	Excavation for Dam Demo	Asphalt Distributor	3000 gal	6,7805	19	4.96E-05	5.81E-04	9.28E-05	7.97E-07	1.52E-05	8.55E-06	1.60E-01	3.81E-07	3.59E-07	1.60E-01	1.45E-01
		Excavator	430 hp	4,445	19	1.02E-04	1.26E-03	8.77E-04	4.38E-06	4.17E-05	3.83E-05	4.46E-01	2.06E-05	-	4.47E-01	4.05E-01	
Tractor/crawler/dozer		850 hp	3,2327	19	4.97E-04	9.40E-03	2.53E-03	9.08E-06	2.75E-04	2.53E-04	9.03E-01	5.99E-05	-	9.05E-01	8.21E-01		
Drilling		Rotary drill	475 hp	7,3333	19	1.99E-04	2.72E-03	1.92E-03	1.06E-05	8.60E-05	7.91E-05	1.08E+00	2.46E-05	-	1.08E+00	9.83E-01	
3/4 ton Pickup truck			7,3333	19	2.52E-05	2.27E-05	3.06E-04	4.91E-07	3.98E-06	1.77E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01		
Cut with Diamond wire		3/4 ton Pickup truck		48	19	1.65E-04	1.49E-04	2.01E-03	3.22E-06	2.60E-05	1.16E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Diamond cutting saw		50 hp	48	19	9.10E-04	5.27E-03	5.18E-03	9.49E-06	2.55E-04	2.34E-04	7.34E-01	8.21E-05	-	7.36E-01	6.68E-01		
Lift/Load blocks		Crane 260'	375 hp	60,0214	19	1.89E-03	2.76E-02	8.63E-03	3.98E-05	1.11E-03	1.02E-03	4.05E+00	2.21E-04	-	4.05E+00	3.68E+00	
3/4 ton pickup truck			60,0214	19	2.06E-04	1.86E-04	2.51E-03	4.02E-06	3.26E-05	1.45E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00		
Water truck		3000 gal	507	19	3.71E-03	4.34E-02	6.94E-03	5.96E-05	1.13E-03	6.39E-04	1.20E+01	2.85E-05	2.68E-05	1.20E+01	1.09E+01		
Landfill	Crane 260'	375 hp	30,0107	19	9.47E-04	1.38E-02	4.32E-03	1.99E-05	5.53E-04	5.09E-04	2.03E+00	1.10E-04	-	2.03E+00	1.84E+00		
<b>Total</b>					<b>4.36E-01</b>	<b>5.12E+00</b>	<b>3.53E+00</b>	<b>1.03E-02</b>	<b>2.05E-01</b>	<b>1.84E-01</b>	<b>1.13E+03</b>	<b>6.16E-02</b>	<b>5.93E-03</b>	<b>1.13E+03</b>	<b>1.03E+03</b>		

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite  
 Rindge  
 Surridge  
 Topanga  
 Zuma  
 Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	209	6.30E-03	5.69E-03	7.68E-02	1.23E-04	9.96E-04	4.43E-04
Dust Control	Water truck	5000 gal	2320	209	3.25E-01	3.80E+00	6.08E-01	5.22E-03	9.92E-02	5.60E-02
Environmental protection measures	Biologist		1229.3333	209	8.07E-02	7.28E-02	9.83E-01	1.58E-03	1.28E-02	5.67E-03
	Fish relocation		16	19	1.16E-02	1.04E-02	1.41E-01	2.26E-04	1.83E-03	8.12E-04
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.69E-03	2.33E-03	2.31E-02	6.23E-05	4.91E-04	2.13E-04
	Tractor/crawler/dozer	250 hp	7.3333	19	5.43E-02	8.45E-01	3.06E-01	1.44E-03	3.18E-02	2.93E-02
	Chain saw		7.3335	19	1.04E-01	1.63E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04
	Brush Piling	Front end loader	3.696	19	3.83E-02	4.64E-01	2.87E-01	1.37E-03	1.80E-02	1.66E-02
		Tractor/crawler/dozer	3.696	19	2.84E-02	4.13E-01	1.61E-01	6.13E-04	1.61E-02	1.48E-02
	Chipping	Brush chipper	3.696	19	3.34E-02	2.96E-01	1.61E-01	9.73E-04	9.17E-03	8.44E-03
		Front end loader	3.696	19	3.83E-02	4.64E-01	2.87E-01	1.37E-03	1.80E-02	1.66E-02
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.07E-02	1.66E-01	6.01E-02	2.83E-04	6.25E-03	5.75E-03
		Front end loader	49 hp	4	9.48E-03	6.82E-02	8.27E-02	1.36E-04	1.78E-03	1.64E-03
		Roller	47 hp	4	2.15E-02	8.06E-02	9.63E-02	1.33E-04	5.05E-03	4.65E-03
		Water truck	3000 gal	4	6.16E-03	7.22E-02	1.15E-02	9.90E-05	1.88E-03	1.06E-03
		Excavator	300 hp	4	1.35E-02	1.67E-01	1.16E-01	5.79E-04	5.51E-03	5.07E-03
		Front end loader	180 hp	4	1.45E-02	2.07E-01	9.57E-02	5.08E-04	6.87E-03	6.32E-03
	36" Diversion Pipe - graditi	Tractor/crawler/dozer	180 hp	6	3.20E-02	4.98E-01	1.80E-01	8.49E-04	1.88E-02	1.73E-02
	36" Diversion Pipe - pipe a	Welder	17 hp	4	3.86E-02	2.50E-02	1.46E+00	5.96E-05	1.97E-02	1.97E-02
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	1.05E-01	1.32E+00	1.02E+00	1.93E-03	7.08E-02	6.51E-02
		Loader/backhoe	75 hp	0.0923	1.62E-04	1.97E-03	2.06E-03	3.68E-06	1.24E-04	1.15E-04
		Crane 94'	155 hp	155	7.13E-01	8.95E+00	6.86E+00	1.31E-02	4.78E-01	4.40E-01
		1 ton pickup truck	155	19	5.95E-02	8.21E-02	8.12E-01	2.19E-03	1.73E-02	7.49E-03
		Crane 94'	155 hp	155	7.13E-01	8.95E+00	6.86E+00	1.31E-02	4.78E-01	4.40E-01
		1 ton pickup truck	155	19	5.95E-02	8.21E-02	8.12E-01	2.19E-03	1.73E-02	7.49E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.07E-02	1.66E-01	6.01E-02	2.83E-04	6.25E-03	5.75E-03
	Dewatering	Concrete saw	13 hp	8	6.41E-02	4.74E-02	2.45E+00	1.19E-04	3.51E-02	3.50E-02
		Crane 80'	130 hp	16	5.33E-02	6.69E-01	5.13E-01	9.76E-04	3.58E-02	3.29E-02
		Flatbed truck	8	22	7.49E-03	8.32E-03	1.03E-01	9.67E-05	7.61E-04	3.25E-04
		Generator	80 hp	5856	1.62E+00	1.40E+01	1.48E+01	2.92E-02	7.98E-01	7.35E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	2.33E+00	3.46E+01	1.85E+01	7.26E-02	1.27E+00	1.17E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	2.33E+00	3.46E+01	1.85E+01	7.26E-02	1.27E+00	1.17E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	2.33E+00	3.46E+01	1.85E+01	7.26E-02	1.27E+00	1.17E+00
	Build road	Tractor/crawler/dozer	600 hp	184.6154	2.33E+00	3.46E+01	1.85E+01	7.26E-02	1.27E+00	1.17E+00
	Armoring	1 ton pickup truck	2	19	7.67E-04	1.06E-03	1.05E-02	2.83E-05	2.23E-04	9.66E-05
		Excavator	430 hp	2	9.66E-03	1.20E-01	8.30E-02	4.15E-04	3.95E-03	3.63E-03
		1 ton pickup truck	2	19	7.67E-04	1.06E-03	1.05E-02	2.83E-05	2.23E-04	9.66E-05
	Compaction	Vibratory roller	50 hp	7.38	4.21E-02	1.58E-01	1.89E-01	2.61E-04	9.91E-03	9.12E-03
		Tractor/crawler/dozer	250 hp	7.38	5.46E-02	8.50E-01	3.08E-01	1.45E-03	3.20E-02	2.95E-02
		Water truck	5000 gal	9.225	1.42E-02	1.66E-01	2.66E-02	2.28E-04	4.34E-03	2.45E-03
	Maintenance	Grader	215 hp	340	1.83E-01	2.95E+00	1.03E+00	5.41E-03	9.43E-02	8.67E-02
Sand to Zuma Beach (19,500 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	6.54E-02	9.03E-02	8.94E-01	2.41E-03	1.90E-02	8.24E-03
		Front end loader	350 hp	161.5	1.20E+00	1.51E+01	6.29E+00	2.92E-02	5.62E-01	5.17E-01
		Front end loader	350 hp	161.5	1.20E+00	1.51E+01	6.29E+00	2.92E-02	5.62E-01	5.17E-01
		Water truck	3000 gal	161.5	2.62E-01	3.08E+00	4.91E-01	4.22E-03	8.02E-02	4.53E-02
		Excavator	400 hp	161.5	7.66E-01	9.50E+00	6.58E+00	3.29E-02	3.13E-01	2.88E-01
	Beach Crew	1 ton pickup truck	161.5	18	6.54E-02	9.03E-02	8.94E-01	2.41E-03	1.90E-02	8.24E-03
		Tractor/crawler/dozer	600 hp	161.5	2.15E+00	3.19E+01	1.71E+01	6.70E-02	1.17E+00	1.08E+00
		Tractor/crawler/dozer	600 hp	161.5	2.15E+00	3.19E+01	1.71E+01	6.70E-02	1.17E+00	1.08E+00
		Tractor/crawler/dozer	600 hp	161.5	2.15E+00	3.19E+01	1.71E+01	6.70E-02	1.17E+00	1.08E+00
		Tractor/crawler/dozer	600 hp	161.5	2.15E+00	3.19E+01	1.71E+01	6.70E-02	1.17E+00	1.08E+00
		Water truck	3000 gal	161.5	2.62E-01	3.08E+00	4.91E-01	4.22E-03	8.02E-02	4.53E-02

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2020
Birthday of Martin Luther King, Jr.	1/20/2020
Washington's Birthday	2/17/2020
Memorial Day	5/25/2020
Independence Day	7/3/2020
Labor Day	9/7/2020
Columbus Day	10/12/2020
Veterans Day	11/11/2020
Thanksgiving Day	11/26/2020
Christmas Day	12/25/2020

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2020>

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**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4**

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	6.47E-02	8.94E-02	8.85E-01	2.39E-03	1.88E-02	8.16E-03		
		Front end loader	350 hp	1066	1.18E+00	1.50E+01	6.23E+00	2.89E-02	5.56E-01	5.12E-01		
		Front end loader	350 hp	1066	1.18E+00	1.50E+01	6.23E+00	2.89E-02	5.56E-01	5.12E-01		
		Water truck	3000 gal	1066	2.60E-01	3.04E+00	4.86E-01	4.18E-03	7.94E-02	4.48E-02		
Demolition		Excavator	400 hp	1066	7.58E-01	9.41E+00	6.52E+00	3.26E-02	3.10E-01	2.85E-01		
	Platform	Tractor/crawler/dozer	440 hp	720	7.46E+00	1.08E+02	4.22E+01	1.61E-01	4.22E+00	3.88E+00		
		Tractor/crawler/dozer	440 hp	90	9.32E-01	1.36E+01	5.27E+00	2.01E-02	5.27E-01	4.85E-01		
		3/4 ton pickup truck		360	2.47E-01	2.23E-01	3.01E+00	4.82E-03	3.90E-02	1.74E-02		
	Drilling	Rotary drill	475 hp	61,7333	5.26E-02	7.21E-01	5.09E-01	2.82E-03	2.28E-02	2.10E-02		
		3/4 ton pickup truck		57,7333	6.24E-03	5.63E-03	7.60E-02	1.22E-04	9.86E-04	4.38E-04		
		Cut with Diamond wire	3/4 ton pickup truck	196	127	2.12E-02	1.91E-02	2.58E-01	4.14E-04	3.35E-03	1.49E-03	
		Diamond cutting saw	50 hp	196	127	1.17E-01	6.78E-01	6.66E-01	1.22E-03	3.27E-02	3.01E-02	
		Lift/Load blocks	Crane 260'	375 hp	239,2283	2.38E-01	3.47E+00	1.08E+00	4.99E-03	1.39E-01	1.28E-01	
			3/4 ton pickup truck		239,2283	2.59E-02	2.33E-02	3.15E-01	5.05E-04	4.09E-03	1.82E-03	
		Load/Haul	Front end loader	350 hp	32	3.36E-02	4.24E-01	1.77E-01	8.20E-04	1.58E-02	1.45E-02	
			Water truck	3000 gal	521	1.20E-01	1.41E+00	2.25E-01	1.93E-03	3.87E-02	2.07E-02	
		Landfill	Crane 260'	375 hp	119,6141	1.19E-01	1.73E+00	5.42E-01	2.50E-03	6.95E-02	6.39E-02	
		Micro-blast	Crane 260'	375 hp	60	5.96E-02	8.69E-01	2.72E-01	1.25E-03	3.48E-02	3.21E-02	
			Horizontal boring drill	10 hp	55	5.68E-03	4.48E-02	3.64E-02	9.29E-05	2.82E-03	2.60E-03	
			3/4 ton pickup truck		60	6.48E-03	5.85E-03	7.90E-02	1.27E-04	1.02E-03	4.56E-04	
		Demolish spillway	Crane 260'	375 hp	100	9.94E-02	1.45E+00	4.53E-01	2.09E-03	5.81E-02	5.34E-02	
			Air compressor	50 hp	200	3.06E-01	3.97E-01	1.76E+01	1.30E-03	8.17E-03	8.15E-03	
			3/4 ton pickup truck		100	1.08E-02	9.75E-03	1.32E-01	2.11E-04	1.71E-03	7.59E-04	
	Demolition - Notch 5'	Excavation for Dam Demo	Asphalt Distributor	3000 gal	6,7805	19	1.04E-02	1.22E-01	1.95E-02	1.68E-04	3.19E-03	1.80E-03
		Excavator	430 hp	4,445	19	2.15E-02	2.66E-01	1.85E-01	9.22E-04	8.77E-03	8.07E-03	
		Tractor/crawler/dozer	850 hp	3,2327	19	1.05E-01	1.98E+00	5.33E-01	1.91E-03	5.80E-02	5.33E-02	
Drilling		Rotary drill	475 hp	7,3333	19	4.18E-02	5.72E-01	4.04E-01	2.24E-03	1.81E-02	1.67E-02	
		3/4 ton Pickup truck		7,3333	19	5.30E-03	4.78E-03	6.45E-02	1.03E-04	8.37E-04	3.72E-04	
		Cut with Diamond wire	3/4 ton Pickup truck	48	19	3.47E-02	3.13E-02	4.22E-01	6.77E-04	5.48E-03	2.44E-03	
			Diamond cutting saw	50 hp	48	1.91E-01	1.11E+00	1.09E+00	2.00E-03	5.36E-02	4.93E-02	
		Lift/Load blocks	Crane 260'	375 hp	60,0214	19	3.99E-01	5.81E+00	1.82E+00	8.37E-03	2.33E-01	2.14E-01
			3/4 ton Pickup truck		60,0214	19	4.34E-02	3.91E-02	5.28E-01	8.47E-04	6.85E-03	3.05E-03
			Water truck	3000 gal	507	19	7.80E-01	9.15E+00	1.46E+00	1.25E-02	2.39E-01	1.35E-01
		Landfill	Crane 260'	375 hp	30,0107	19	1.99E-01	2.91E+00	9.09E-01	4.18E-03	1.16E-01	1.07E-01
<b>Total</b>					<b>4.15E+01</b>	<b>5.56E+02</b>	<b>3.07E+02</b>	<b>1.09E+00</b>	<b>2.12E+01</b>	<b>1.92E+01</b>		

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite	VOC	NOx	CO	SO2	PM10	PM2.5
Rindge	32	421	235	1	16	15
Surfrider	0	0	0	0	0	0
Topanga	0	0	0	0	0	0
Zuma	9	131	70	0	5	4
Landfill	0	5	1	0	0	0

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		96	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	2320	210	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
Environmental protection measures	Biologist		1229.3333	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Fish relocation		16	19	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000	
	Chain saw		7.3335	19	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039	
	Brush Piling	Front end loader	3.696	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
		Tractor/crawler/dozer	3.696	19	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000	
	Chipping	Brush chipper	3.696	19	0.148	1.214	0.746	0.005	0.038	0.035	403.250	0.013	0.000	
		Front end loader	3.696	19	0.081	0.956	0.609	0.003	0.037	0.034	293.384	0.014	0.000	
Landscaping	Rock from Landfill	Loader/backhoe	75 hp	24	20	0.090	1.104	1.282	0.002	0.065	0.060	195.356	0.012	0.000
		Front end loader	350 hp	20	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
		Front end loader	49 hp	4	19	0.199	1.450	1.811	0.003	0.032	0.030	231.302	0.018	0.000
		Roller	47 hp	4	19	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000
		Water truck	3000 gal	4	19	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Excavator	300 hp	4	19	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Front end loader	180 hp	4	19	0.080	1.085	0.567	0.003	0.036	0.033	270.061	0.013	0.000
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	2.438	1.578	92.570	0.004	1.249	1.246	148.932	0.139	0.122
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000
		Loader/backhoe	75 hp	0.0923	19	0.090	1.104	1.282	0.002	0.065	0.060	195.356	0.012	0.000
		Crane 94'	155 hp	155	19	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000
		1 ton pickup truck	155	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	20	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000
		1 ton pickup truck	155	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
	Dewatering	Concrete saw	13 hp	8	23	3.070	2.268	117.560	0.006	1.685	1.681	200.981	0.175	0.188
		Crane 80'	130 hp	16	23	0.119	1.473	1.230	0.002	0.079	0.072	208.066	0.014	0.000
		Flatbed truck	8	23	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.172	1.509	1.744	0.003	0.081	0.075	294.384	0.016	0.000
Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
		Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.085	1.211	0.698	0.003	0.045	0.041	280.790	0.016	0.000
	Armoring	1 ton pickup truck	2	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Excavator	430 hp	2	19	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		1 ton pickup truck	2	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Compaction	Vibratory roller	50 hp	17.28	19	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000
		Tractor/crawler/dozer	250 hp	17.28	19	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
		Water truck	5000 gal	21.6	19	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
	Maintenance	Grader	215 hp	340	210	0.113	1.791	0.661	0.004	0.057	0.052	312.002	0.015	0.000
Fines to landfill (82,300 cy) (4/1-7/10)	Material Excavation	1 ton pickup truck	597	70	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Front end loader	350 hp	597	70	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Front end loader	350 hp	597	70	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Water truck	3000 gal	597	70	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Excavator	400 hp	597	70	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Front end loader	350 hp	195.5	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Water truck	3000 gal	195.5	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	400 hp	195.5	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Front end loader	350 hp	585	72	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Front end loader	350 hp	585	72	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Water truck	3000 gal	585	72	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Excavator	400 hp	585	72	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000

**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Rindge Dam & Spillway Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
		Tractor/crawler/dozer	440 hp	90	20	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
	Drilling	3/4 ton pickup truck		360	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Rotary drill	475 hp	61.733	126	0.049	0.613	0.500	0.003	0.021	0.019	282.166	0.006	0.000
	Cut with Diamond wire	3/4 ton pickup truck		57.733	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		3/4 ton pickup truck		204	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Lift/Load blocks	Diamond cutting saw	50 hp	204	126	0.306	1.918	1.917	0.004	0.082	0.076	277.562	0.028	0.000
		Crane 260'	375 hp	239.2283	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
	Load/Haul	3/4 ton pickup truck		239.2283	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Front end loader	350 hp	32	126	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
	Landfill	Water truck	3000 gal	14	126	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Crane 260'	375 hp	119.6141	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
	Micro-blast	Crane 260'	375 hp	60	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
		Horizontal boring drill	10 hp	55	126	0.295	2.329	1.909	0.005	0.146	0.135	312.570	0.033	0.000
	Demolish spillway	3/4 ton pickup truck		60	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Crane 260'	375 hp	100	126	0.070	0.992	0.340	0.002	0.040	0.037	163.241	0.008	0.000
	Rindge Dam Concrete Arc Foundation Demolition	Air compressor	50 hp	200	126	0.837	1.059	50.665	0.004	0.024	0.023	307.059	0.048	0.067
		3/4 ton pickup truck		100	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Road Improvement Plan	Rotary drill	475 hp	120.7333	20	0.049	0.613	0.500	0.003	0.021	0.019	282.166	0.006	0.000
		3/4 ton Pickup truck		128.7333	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
Road Improvement Plan	Stabilize	Front end loader	350 hp	34	20	0.079	0.944	0.446	0.002	0.035	0.032	214.821	0.010	0.000
		Excavator	400 hp	540	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
	Asphalt Road	Excavator	300 hp	540	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Excavator	300 hp	270	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
	Asphalt Road	Tractor/crawler/dozer	440 hp	270	20	0.100	1.405	0.585	0.002	0.055	0.051	234.962	0.014	0.000
		3/4 ton Pickup truck		540	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Asphalt Road	Grader	135 hp	30.4	20	0.171	1.978	1.884	0.004	0.110	0.102	320.916	0.020	0.000
		Tractor/crawler/dozer	250 hp	30.4	20	0.121	1.858	0.703	0.003	0.070	0.064	301.158	0.018	0.000
		Excavator	400 hp	30.4	20	0.045	0.509	0.413	0.002	0.017	0.016	211.854	0.009	0.000
		Asphalt hopper	300 hp	442.5143	20	0.071	0.746	0.490	0.002	0.027	0.025	246.840	0.012	0.000
		Line Striper	23 hp	92.576	20	0.110	0.330	8.519	0.003	0.021	0.021	260.327	0.006	0.021
		Roller	70 hp	442.5143	20	0.110	1.347	1.455	0.003	0.082	0.076	222.777	0.018	0.000
Asphalt Road	Vibratory roller	33 hp	442.5143	20	0.445	1.794	2.165	0.003	0.103	0.095	235.507	0.040	0.000	
	Flatbed truck		92.576	20	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	
Asphalt Road	3/4 ton pickup truck		92.576	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	

**Total**  
**Daily Onsite Emissions (lb/day)**  
Rindge  
Surridge  
Topanga  
Zuma  
Landfill

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt4\_EnvrAirQualityReport.pdf





**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2021 (tons per year)										Metric Tons CO2e/yr		
					GWP												
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Rindge Dam & Spillway Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	3.51E-02	4.91E-01	2.04E-01	8.05E-04	1.93E-02	1.78E-02	8.21E+01	4.77E-03	-	8.22E+01	7.45E+01	
		Tractor/crawler/dozer	440 hp	90	20	4.38E-03	6.13E-02	2.55E-02	1.01E-04	2.41E-03	2.22E-03	1.03E+01	5.96E-04	-	1.03E+01	9.32E+00	
	3/4 ton pickup truck			360	20	1.08E-03	1.03E-03	1.33E-02	2.42E-05	1.94E-04	8.53E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00	
		Rotary drill	475 hp	61.733	126	1.57E-03	1.98E-02	1.61E-02	8.95E-05	6.64E-04	6.10E-04	9.12E+00	1.99E-04	-	9.12E+00	8.28E+00	
	3/4 ton pickup truck			57.733	126	1.74E-04	1.65E-04	2.13E-03	3.88E-06	3.10E-05	1.37E-05	1.30E+00	1.29E-04	6.72E-05	1.32E+00	1.20E+00	
		Cut with Diamond wire		204	126	6.14E-04	5.84E-04	7.54E-03	1.37E-05	1.10E-04	4.83E-05	4.58E+00	4.55E-04	2.37E-04	4.66E+00	4.23E+00	
	Diamond cutting saw		50 hp	204	126	3.44E-03	2.16E-02	2.16E-02	4.03E-05	9.27E-04	8.53E-04	3.12E+00	3.11E-04	-	3.13E+00	2.84E+00	
		Crane 260'	375 hp	239.2283	126	6.95E-03	9.81E-02	3.36E-02	1.58E-04	3.95E-03	3.63E-03	1.61E+01	8.37E-04	-	1.62E+01	1.47E+01	
	Lift/Load blocks	3/4 ton pickup truck		239.2283	126	7.20E-04	6.85E-04	8.84E-03	1.61E-05	1.29E-04	5.67E-05	5.37E+00	5.34E-04	2.78E-04	5.47E+00	4.96E+00	
		Front end loader	350 hp	32	126	9.76E-04	1.17E-02	5.51E-03	2.60E-05	4.35E-04	4.00E-04	2.65E+00	1.25E-04	-	2.65E+00	2.41E+00	
	Water truck		3000 gal	14	126	1.08E-04	7.71E-04	2.05E-04	1.64E-06	2.85E-05	1.51E-05	3.29E-01	7.87E-07	7.41E-07	3.29E-01	2.98E-01	
		Crane 260'	375 hp	119.6141	126	3.48E-03	4.90E-02	1.68E-02	7.92E-05	1.97E-03	1.82E-03	8.07E+00	4.18E-04	-	8.08E+00	7.33E+00	
	Micro-blast	Crane 260'	375 hp	60	126	1.74E-03	2.46E-02	8.42E-03	3.97E-05	9.90E-04	9.11E-04	4.05E+00	2.10E-04	-	4.05E+00	3.68E+00	
		Horizontal boring drill	10 hp	55	126	1.79E-04	1.41E-03	1.16E-03	2.95E-06	8.86E-05	8.15E-05	1.89E-01	1.99E-05	-	1.90E-01	1.72E-01	
	3/4 ton pickup truck			80	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
		Crane 260'	375 hp	100	126	2.91E-03	4.10E-02	1.40E-02	6.62E-05	1.65E-03	1.52E-03	6.75E+00	3.50E-04	-	6.75E+00	6.13E+00	
	Demolish spillway	Air compressor	50 hp	200	126	9.23E-03	1.17E-02	5.58E-01	4.12E-05	2.59E-04	2.59E-04	3.38E+00	5.25E-04	7.40E-04	3.63E+00	3.29E+00	
		3/4 ton pickup truck		100	126	3.01E-04	2.86E-04	3.70E-03	6.72E-06	5.38E-05	2.37E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
	Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	20	3.07E-03	3.88E-02	3.16E-02	1.75E-04	1.30E-03	1.19E-03	1.78E+01	3.89E-04	-	1.78E+01	1.62E+01
			3/4 ton Pickup truck		128.7333	20	3.88E-04	3.68E-04	4.76E-03	8.65E-06	6.92E-05	3.05E-05	2.89E+00	2.87E-04	1.50E-04	2.94E+00	2.67E+00
Load/Haul		Front end loader	350 hp	34	20	1.04E-03	1.24E-02	5.85E-03	2.77E-05	4.62E-04	4.25E-04	2.82E+00	1.33E-04	-	2.82E+00	2.56E+00	
		Fracture	Excavator	400 hp	540	20	1.07E-02	1.21E-01	9.84E-02	4.95E-04	4.05E-03	3.73E-03	5.04E+01	2.21E-03	-	5.05E+01	4.58E+01
Excavator			300 hp	540	20	8.06E-03	9.08E-02	7.38E-02	3.71E-04	3.04E-03	2.80E-03	3.78E+01	1.66E-03	-	3.79E+01	3.44E+01	
		Excavator	300 hp	270	20	4.03E-03	4.54E-02	3.69E-02	1.86E-04	1.52E-03	1.40E-03	1.89E+01	8.30E-04	-	1.89E+01	1.72E+01	
Tractor/crawler/dozer			440 hp	270	20	1.31E-02	1.84E-01	7.66E-02	3.02E-04	7.24E-03	6.66E-03	3.08E+01	1.79E-03	-	3.08E+01	2.79E+01	
		3/4 ton Pickup truck		540	20	1.63E-03	1.55E-03	2.00E-02	1.63E-05	2.90E-04	1.28E-04	1.21E+01	1.20E-03	6.29E-04	1.23E+01	1.12E+01	
Road Improvement Plan		Stabilize	Grader	135 hp	30.4	20	7.72E-04	8.95E-03	8.52E-03	1.63E-05	4.99E-04	4.59E-04	1.45E+00	9.02E-05	-	1.45E+00	1.32E+00
			Tractor/crawler/dozer	250 hp	30.4	20	1.02E-03	1.56E-02	5.89E-03	2.84E-05	5.86E-04	5.39E-04	2.52E+00	1.54E-04	-	2.53E+00	2.29E+00
	Excavator		400 hp	30.4	20	6.05E-04	6.82E-03	5.54E-03	2.79E-05	2.28E-04	2.10E-04	2.84E+00	1.25E-04	-	2.84E+00	2.58E+00	
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	1.04E-02	1.09E-01	7.17E-02	3.55E-04	4.00E-03	3.68E-03	3.61E+01	1.69E-03	-	3.62E+01	3.28E+01	
		Line Striper	23 hp	92.576	20	2.59E-04	7.76E-04	2.00E-02	6.07E-06	4.87E-05	4.86E-05	6.11E-01	1.47E-05	5.01E-05	6.27E-01	5.69E-01	
	Roller		70 hp	442.5143	20	3.74E-03	4.60E-02	4.97E-02	8.92E-05	2.81E-03	2.59E-03	7.61E+00	6.15E-04	-	7.62E+00	6.91E+00	
		Vibratory roller	33 hp	442.5143	20	7.16E-03	2.89E-02	3.48E-02	4.90E-05	1.66E-03	1.53E-03	3.79E+00	6.46E-04	-	3.80E+00	3.45E+00	
	Flatbed truck			92.576	20	4.02E-04	4.61E-04	5.53E-03	6.16E-06	4.81E-05	2.03E-05	2.08E+00	4.70E-04	2.18E-04	2.16E+00	1.96E+00	
		3/4 ton pickup truck		92.576	20	2.79E-04	2.65E-04	3.42E-03	6.22E-06	4.98E-05	2.19E-05	2.08E+00	2.07E-04	1.08E-04	2.12E+00	1.92E+00	
	<b>Total</b>					<b>4.61E-01</b>	<b>4.99E+00</b>	<b>3.95E+00</b>	<b>1.24E-02</b>	<b>2.03E-01</b>	<b>1.82E-01</b>	<b>1.34E+03</b>	<b>6.91E-02</b>	<b>6.87E-03</b>	<b>1.34E+03</b>	<b>1.22E+03</b>	

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite  
Rindge  
Surrider  
Topanga  
Zuma  
Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		96	210	5.50E-03	5.23E-03	6.76E-02	1.23E-04	9.83E-04	4.33E-04	
Dust Control	Water truck	5000 gal	2320	210	3.41E-01	2.43E+00	6.47E-01	5.18E-03	9.00E-02	4.76E-02	
Environmental protection measures	Biologist		1229.3333	210	7.05E-02	6.70E-02	8.65E-01	1.57E-03	1.26E-02	5.55E-03	
	Fish relocation		16	19	1.01E-02	9.64E-03	1.24E-01	2.26E-04	1.81E-03	7.98E-04	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.41E-03	2.11E-03	1.95E-02	6.24E-05	4.87E-04	2.09E-04	
	Tractor/crawler/dozer	250 hp	7.3333	19	5.17E-02	7.91E-01	2.99E-01	1.44E-03	2.97E-02	2.74E-02	
	Chain saw		7.3335	19	1.04E-01	1.63E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04	
	Brush Piling	Front end loader	3.696	19	3.76E-02	4.43E-01	2.82E-01	1.37E-03	1.72E-02	1.58E-02	
	Tractor/crawler/dozer	310 hp	3.696	19	2.67E-02	3.74E-01	1.55E-01	6.13E-04	1.47E-02	1.35E-02	
	Chipping	Brush chipper	3.696	19	3.17E-02	2.60E-01	1.60E-01	9.73E-04	8.14E-03	7.49E-03	
	Front end loader	540 hp	3.696	19	3.76E-02	4.43E-01	2.82E-01	1.37E-03	1.72E-02	1.58E-02	
Landscaping	Rock from Landfill	Loader/backhoe	75 hp	24	20	3.58E-02	4.38E-01	5.09E-01	9.09E-04	2.58E-02	2.38E-02
	Front end loader	350 hp	20	20	1.22E-01	1.46E+00	6.88E-01	3.25E-03	5.44E-02	5.01E-02	
	Dump truck	20cy/24 ton	20	20	3.08E-02	2.20E-01	5.86E-02	4.69E-04	8.14E-03	4.31E-03	
	Tractor/crawler/dozer	180 hp	2	19	1.01E-02	1.55E-01	5.88E-02	2.83E-04	5.84E-03	5.37E-03	
Dewatering	Temporary Cofferdam	Front end loader	49 hp	4	19	9.05E-03	6.99E-02	8.24E-02	1.36E-04	1.47E-03	1.35E-03
	Roller	47 hp	4	19	1.94E-02	7.83E-02	9.45E-02	1.33E-04	4.49E-03	4.13E-03	
	Water truck	3000 gal	4	19	6.49E-03	4.64E-02	1.23E-02	9.87E-05	1.71E-03	9.08E-04	
	Excavator	300 hp	4	19	1.26E-02	1.42E-01	1.15E-01	5.79E-04	4.74E-03	4.36E-03	
	Front end loader	180 hp	4	19	1.33E-02	1.81E-01	9.48E-02	5.08E-04	6.04E-03	5.56E-03	
	36" Diversion Pipe - gradin	Tractor/crawler/dozer	180 hp	6	19	3.04E-02	4.66E-01	1.76E-01	8.49E-04	1.75E-02	1.61E-02
	36" Diversion Pipe - pipe a	Welder	17 hp	4	19	3.85E-02	2.49E-02	1.46E+00	5.96E-05	1.97E-02	1.97E-02
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	9.79E-02	1.21E+00	1.01E+00	1.93E-03	6.48E-02	5.96E-02
	Loader/backhoe	75 hp	0.0923	19	1.45E-04	1.77E-03	2.06E-03	3.68E-06	1.05E-04	9.62E-05	
	Crane 94'	155 hp	155	19	6.62E-01	8.21E+00	6.86E+00	1.31E-02	4.38E-01	4.03E-01	
	1 ton pickup truck		155	19	4.96E-02	7.44E-02	6.87E-01	2.20E-03	1.71E-02	7.36E-03	
	Crane 94'	155 hp	155	20	6.29E-01	7.80E+00	6.52E+00	1.24E-02	4.16E-01	3.83E-01	
	1 ton pickup truck		155	20	4.71E-02	7.07E-02	6.53E-01	2.09E-03	1.63E-02	6.99E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	9.64E-03	1.47E-01	5.58E-02	2.69E-04	5.55E-03	5.11E-03
	Dewatering	Concrete saw	13 hp	8	23	6.12E-02	4.52E-02	2.34E+00	1.14E-04	3.36E-02	3.35E-02
	Crane 80'	130 hp	16	23	4.73E-02	5.87E-01	4.91E-01	9.33E-04	3.13E-02	2.88E-02	
	Flatbed truck		8	23	6.03E-03	6.93E-03	8.32E-02	9.26E-05	7.22E-04	3.06E-04	
	Generator	80 hp	5856	244	1.46E+00	1.28E+01	1.48E+01	2.92E-02	6.87E-01	6.32E-01	
Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	2.18E+00	3.11E+01	1.79E+01	7.26E-02	1.14E+00	1.05E+00
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	2.18E+00	3.11E+01	1.79E+01	7.26E-02	1.14E+00	1.05E+00
	Tractor/crawler/dozer	600 hp	184.6154	19	2.18E+00	3.11E+01	1.79E+01	7.26E-02	1.14E+00	1.05E+00	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	2.18E+00	3.11E+01	1.79E+01	7.26E-02	1.14E+00	1.05E+00
	Armoring	1 ton pickup truck	2	19	6.40E-04	9.61E-04	8.87E-03	2.84E-05	2.21E-04	9.49E-05	
	Excavator	430 hp	2	19	9.00E-03	1.02E-01	8.25E-02	4.15E-04	3.40E-03	3.13E-03	
	1 ton pickup truck		2	19	6.40E-04	9.61E-04	8.87E-03	2.84E-05	2.21E-04	9.49E-05	
	Compaction	Vibratory roller	50 hp	17.28	19	8.92E-02	3.60E-01	4.34E-01	6.10E-04	2.07E-02	1.90E-02
	Tractor/crawler/dozer	250 hp	17.28	19	1.22E-01	1.86E+00	7.05E-01	3.40E-03	7.01E-02	6.45E-02	
	Water truck	5000 gal	21.6	19	3.51E-02	2.50E-01	6.66E-02	5.33E-04	9.26E-03	4.90E-03	
	Maintenance	Grader	215 hp	340	210	1.74E-01	2.75E+00	1.01E+00	5.39E-03	8.71E-02	8.01E-02
Fines to landfill (82,300 cy) (4/1-7/10)	Material Excavation	1 ton pickup truck	597	70	5.19E-02	7.78E-02	7.18E-01	2.30E-03	1.79E-02	7.69E-03	
	Front end loader	350 hp	597	70	1.04E+00	1.24E+01	5.87E+00	2.78E-02	4.64E-01	4.27E-01	
	Front end loader	350 hp	597	70	1.04E+00	1.24E+01	5.87E+00	2.78E-02	4.64E-01	4.27E-01	
	Water truck	3000 gal	597	70	2.63E-01	1.88E+00	4.99E-01	4.00E-03	6.94E-02	3.68E-02	
	Excavator	400 hp	597	70	6.79E-01	7.65E+00	6.22E+00	3.13E-02	2.56E-01	2.36E-01	
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	5.94E-02	8.92E-02	8.23E-01	2.64E-03	2.05E-02	8.82E-03	
	Front end loader	350 hp	195.5	20	1.19E+00	1.42E+01	6.73E+00	3.18E-02	5.32E-01	4.89E-01	
	Front end loader	350 hp	195.5	20	1.19E+00	1.42E+01	6.73E+00	3.18E-02	5.32E-01	4.89E-01	
	Front end loader	350 hp	195.5	20	1.19E+00	1.42E+01	6.73E+00	3.18E-02	5.32E-01	4.89E-01	
	Water truck	3000 gal	195.5	20	3.01E-01	2.15E+00	5.72E-01	4.58E-03	7.96E-02	4.22E-02	
	Excavator	400 hp	195.5	20	7.78E-01	8.77E+00	7.13E+00	3.58E-02	2.93E-01	2.70E-01	
	Excavator	400 hp	195.5	20	7.78E-01	8.77E+00	7.13E+00	3.58E-02	2.93E-01	2.70E-01	
	Excavator	400 hp	195.5	20	7.78E-01	8.77E+00	7.13E+00	3.58E-02	2.93E-01	2.70E-01	
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	4.94E-02	7.41E-02	6.84E-01	2.19E-03	1.71E-02	7.33E-03	
	Front end loader	350 hp	585	72	9.91E-01	1.18E+01	5.59E+00	2.64E-02	4.42E-01	4.07E-01	
	Front end loader	350 hp	585	72	9.91E-01	1.18E+01	5.59E+00	2.64E-02	4.42E-01	4.07E-01	
	Water truck	3000 gal	585	72	2.51E-01	1.79E+00	4.76E-01	3.81E-03	6.62E-02	3.50E-02	
	Excavator	400 hp	585	72	6.47E-01	7.29E+00	5.92E+00	2.98E-02	2.44E-01	2.24E-01	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021
	10

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2020>

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 5**

Construction Start Year 2021  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Rindge Dam & Spillway Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	7.01E+00	9.81E+01	4.08E+01	1.61E-01	3.86E+00	3.55E+00	
		Tractor/crawler/dozer	440 hp	90	20	8.76E-01	1.23E+01	5.11E+00	2.01E-02	4.83E-01	4.44E-01	
	3/4 ton pickup truck			360	20	2.17E-01	2.06E-01	2.66E+00	4.84E-03	3.87E-02	1.71E-02	
		Rotary drill	475 hp	61.733	126	4.99E-02	6.29E-01	5.13E-01	2.84E-03	2.11E-02	1.94E-02	
	3/4 ton pickup truck			57.733	126	5.52E-03	5.25E-03	6.77E-02	1.23E-04	9.86E-04	4.34E-04	
		Cut with Diamond wire	3/4 ton pickup truck		204	126	1.95E-02	1.85E-02	2.39E-01	4.35E-04	3.48E-03	1.53E-03
	Diamond cutting saw		50 hp	204	126	1.09E-01	6.85E-01	6.84E-01	1.28E-03	2.94E-02	2.71E-02	
		Crane 260'	375 hp	239.2283	126	2.21E-01	3.11E+00	1.07E+00	5.03E-03	1.25E-01	1.15E-01	
	3/4 ton pickup truck			239.2283	126	2.29E-02	2.17E-02	2.81E-01	5.10E-04	4.08E-03	1.80E-03	
		Load/Haul	Front end loader	350 hp	32	126	3.10E-02	3.70E-01	1.75E-01	8.26E-04	1.38E-02	1.27E-02
	Water truck		3000 gal	14	126	3.43E-03	2.45E-02	6.51E-03	5.21E-05	9.05E-04	4.79E-04	
		Crane 260'	375 hp	119.6141	126	1.10E-01	1.56E+00	5.33E-01	2.51E-03	6.26E-02	5.76E-02	
	Micro-blast	Crane 260'	375 hp	60	126	5.54E-02	7.81E-01	2.67E-01	1.26E-03	3.14E-02	2.89E-02	
		Horizontal boring drill	10 hp	55	126	5.68E-03	4.48E-02	3.67E-02	9.36E-05	2.81E-03	2.59E-03	
	3/4 ton pickup truck			80	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04	
		Crane 260'	375 hp	100	126	9.23E-02	1.30E+00	4.46E-01	2.10E-03	5.24E-02	4.82E-02	
	Demolish spillway	Air compressor	50 hp	200	126	2.93E-01	3.71E-01	1.77E+01	1.31E-03	8.23E-03	8.21E-03	
		3/4 ton pickup truck		100	126	9.56E-03	9.09E-03	1.17E-01	2.13E-04	1.71E-03	7.52E-04	
	Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	20	6.14E-01	7.76E+00	6.32E+00	3.50E-02	2.60E-01	2.39E-01
			3/4 ton Pickup truck		128.7333	20	7.75E-02	7.37E-02	9.52E-01	1.73E-03	1.38E-02	6.10E-03
Load/Haul		Front end loader	350 hp	34	20	2.07E-01	2.48E+00	1.17E+00	5.53E-03	9.25E-02	8.51E-02	
		Fracture	Excavator	400 hp	540	20	2.15E+00	2.42E+01	1.97E+01	9.90E-02	8.11E-01	7.46E-01
Excavator			300 hp	540	20	1.61E+00	1.82E+01	1.48E+01	7.43E-02	6.08E-01	5.59E-01	
		Excavator	300 hp	270	20	8.06E-01	9.08E+00	7.38E+00	3.71E-02	3.04E-01	2.80E-01	
Tractor/crawler/dozer			440 hp	270	20	2.63E+00	3.68E+01	1.53E+01	6.04E-02	1.45E+00	1.33E+00	
		3/4 ton Pickup truck		540	20	3.25E-01	3.09E-01	3.99E+00	7.26E-03	5.81E-02	2.56E-02	
Road Improvement Plan		Stabilize	Grader	135 hp	30.4	20	1.54E-01	1.79E+00	1.70E+00	3.27E-03	9.98E-02	9.18E-02
			Tractor/crawler/dozer	250 hp	30.4	20	2.03E-01	3.11E+00	1.18E+00	5.68E-03	1.17E-01	1.08E-01
	Excavator		400 hp	30.4	20	1.21E-01	1.36E+00	1.11E+00	5.57E-03	4.56E-02	4.20E-02	
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	2.08E+00	2.18E+01	1.43E+01	7.09E-02	8.01E-01	7.37E-01	
		Line Striper	23 hp	92.576	20	5.18E-02	1.55E-01	4.00E+00	1.21E-03	9.73E-03	9.71E-03	
		Roller	70 hp	442.5143	20	7.48E-01	9.20E+00	9.94E+00	1.78E-02	5.62E-01	5.17E-01	
		Vibratory roller	33 hp	442.5143	20	1.43E+00	5.77E+00	6.97E+00	9.80E-03	3.32E-01	3.05E-01	
		Flatbed truck		92.576	20	8.03E-02	9.22E-02	1.11E+00	1.23E-03	9.61E-03	4.07E-03	
		3/4 ton pickup truck		92.576	20	5.57E-02	5.30E-02	6.84E-01	1.24E-03	9.96E-03	4.39E-03	
		<b>Total</b>					<b>5.00E+01</b>	<b>5.93E+02</b>	<b>3.90E+02</b>	<b>1.49E+00</b>	<b>2.30E+01</b>	<b>2.10E+01</b>

Note: Road improvements would begin after sediment excavation/disposal and concrete removal is completed

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite	Rindge	Surridge	Topanga	Zuma	Landfill
	50	591	389	1	23
	0	0	0	0	0
	0	0	0	0	0
	0	0	0	0	0
	0	2	1	0	0







**Construction Equipment - Upstream Barriers - Year 1**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (LV2) - 2018 (pounds per day)								
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5			
			15	15	15		days per const								
<b>Water Control - Installation</b>	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	2.32E-03	2.39E-02	1.38E-02	2.32E-05	1.76E-03	1.62E-03	-	-	
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	7.22E-02	1.16E+00	3.87E-01	1.73E-03	4.39E-02	4.04E-02	-	-	
	Truck		0.3077			3.0769	5.67E-03	8.57E-02	1.04E-02	8.74E-05	1.88E-03	1.15E-03	-	-	
<b>Water Control - Removal</b>	Water pump	3.5 hp		4		4	-	-	-	-	-	-	-	-	
	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	2.32E-03	2.39E-02	1.38E-02	2.32E-05	1.76E-03	1.62E-03	-	-	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	5.53E-02	8.89E-01	2.97E-01	1.33E-03	3.36E-02	3.09E-02	-	-	
<b>Clear &amp; Grub</b>	Truck		0.3077			0.3077	-	-	-	-	-	-	-	-	
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	1.49E-03	1.29E-02	1.34E-02	2.84E-05	6.11E-04	5.62E-04	-	-	
	Crane 50'	200 hp	9.4118	18.8236		28.2354	-	-	-	-	-	-	-	-	
	Man lift	210 hp				0	-	-	-	-	-	-	-	-	
	Loader	190 hp	28.2353	37.6471		65.8824	-	-	-	-	-	-	-	-	
	Chainsaw		56.7647	75.2941	0.2941	132.3529	5.29E-03	8.30E-05	9.58E-03	1.07E-06	1.51E-05	1.50E-05	-	-	
	1 ton pickup		0.1765			0.353	1.25E-04	1.47E-04	1.67E-03	3.19E-06	2.55E-05	1.13E-05	-	-	
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	3.05E-03	4.90E-02	1.64E-02	7.32E-05	1.85E-03	1.71E-03	-	-	
	Front end loader	540 hp	0.2964		0.2964	0.5928	4.65E-03	6.03E-02	3.06E-02	1.39E-04	2.38E-03	2.19E-03	-	-	
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	1.65E-03	2.53E-02	8.81E-03	3.11E-05	9.81E-04	9.03E-04	-	-	
	Dump truck	20cy/24 ton			1.4866	1.4866	3.04E-03	4.60E-02	5.59E-03	4.69E-05	1.01E-03	6.15E-04	-	-	
	<b>Demolition</b>	Air Compressor	250 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-
		Air Compressor	50 hp		32		32	-	-	-	-	-	-	-	-
Crane 126'		350 hp	5.1111	5.1111		10.2222	-	-	-	-	-	-	-	-	
Crane 50'		263 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-	
Crane 210'		230 hp	16	16		32	-	-	-	-	-	-	-	-	
Excavator		115 hp	32	16	24	72	9.43E-02	1.17E+00	1.54E+00	2.65E-03	7.76E-02	7.14E-02	-	-	
Excavator		430 hp	8	8	12	28	8.36E-02	1.19E+00	6.45E-01	3.15E-03	3.85E-02	3.54E-02	-	-	
Loader		190 hp	72	64	12	148	9.46E-02	1.52E+00	5.08E-01	2.27E-03	5.75E-02	5.29E-02	-	-	
Front end loader		180 hp	4.6667	4.6667		9.3334	-	-	-	-	-	-	-	-	
Loader/Backhoe		75 hp	11.1	11.1		22.2	-	-	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	4	4		8	-	-	-	-	-	-	-	-	
3/4 ton pickup			72	80	12	164	1.43E-02	1.18E-02	1.73E-01	2.16E-04	1.77E-03	8.04E-04	-	-	
Chainsaw			44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-	
<b>Road Realignment</b>		Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-
		Vibrating compactor	5.5 hp	4	4		8	-	-	-	-	-	-	-	-
	Vibratory compactor	7.5 hp				0	-	-	-	-	-	-	-	-	
	Truck		16	16		32	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	4	4		8	-	-	-	-	-	-	-	-	
<b>Disposal</b>	Suburban	3/4 ton	4	4		8	-	-	-	-	-	-	-	-	
	Truck	35 ton	40	40		80	-	-	-	-	-	-	-	-	
	Truck	75 ton	11.2	11.2		22.4	-	-	-	-	-	-	-	-	
<b>Bridge Installation</b>	Suburban	3/4 ton	12	12		24	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp	24	24		48	-	-	-	-	-	-	-	-	
	Crane 270'	430 hp	24	24		48	-	-	-	-	-	-	-	-	
	3/4 ton pickup		24	24		48	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	8	8		16	-	-	-	-	-	-	-	-	
	Excavator	430 hp	0.6137	0.6137		1.2274	-	-	-	-	-	-	-	-	
	Truck		2.9609	2.9609		5.9218	-	-	-	-	-	-	-	-	
	Generator	7.5 hp	15.8865	15.8865		31.773	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	-	-	-	-	-	-	-	-	
<b>Highway Replacement</b>	Truck		4.3678			8.7356	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp	0.208	0.208		0.416	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	-	-	-	-	-	-	-	-	
	Chip spreader truck		0.64	0.64		1.28	-	-	-	-	-	-	-	-	
	Line striper	23 hp	0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	Flatbed Truck		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	3/4 ton pickup		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	<b>Abutments</b>	Roto trowel concrete finisher	9 hp				0	-	-	-	-	-	-	-	-
		Crane 80'	130 hp				0	-	-	-	-	-	-	-	-
Crane 114'		430 hp				0	-	-	-	-	-	-	-	-	
Auger drill		100 hp				0	-	-	-	-	-	-	-	-	
Water pump		80 hp				0	-	-	-	-	-	-	-	-	
Excavator		430 hp	9.4118	9.4118		18.8236	-	-	-	-	-	-	-	-	
Loader/Backhoe		75 hp	18.8236	18.8236	9.4118	47.059	2.66E-02	3.18E-01	2.68E-01	4.75E-04	2.25E-02	2.07E-02	-	-	
Loader/Backhoe		92 hp	4.7059	9.4118	9.4118	23.5295	3.26E-02	3.90E-01	3.29E-01	5.83E-04	2.76E-02	2.54E-02	-	-	
<b>Landscaping</b>	Vibratory roller	44 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.93E-02	2.91E-01	3.54E-02	2.97E-04	6.40E-03	3.89E-03	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	
	3/4 ton pickup		4	4	2	10	2.39E-03	1.96E-03	2.88E-02	3.60E-05	2.95E-04	1.34E-04	-	-	
	<b>Total</b>						<b>5.25E-01</b>	<b>7.26E+00</b>	<b>4.33E+00</b>	<b>1.32E-02</b>	<b>3.22E-01</b>	<b>2.92E-01</b>			

**Conversions**

2000 pounds per ton  
 453.6 grams per pound  
 2 peak day scaling factor  
 0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
 Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/2/2017
Birthdays of Martin Luther King, Jr.	1/16/2017
Washington's Birthday	2/20/2017
Memorial Day	5/29/2017
Independence Day	7/4/2017
Labor Day	9/4/2017
Columbus Day	10/9/2017
Veterans Day	11/11/2017
Thanksgiving Day	11/23/2017
Christmas Day	12/25/2017

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**On-highway vehicles**

**Source:**

CC1 Equipment Report.pdf  
 CC4 Equipment Report.pdf  
 CC5 Equipment Report.pdf  
 LV2 Equipment Report.pdf







**Construction Equipment - Upstream Barriers - Year 1**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2018**  
 Speed of Onsite Trucks **10 mph**

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC5) - 2018 (pounds per day)						
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	
			15	15	15		CC1 & CC4	CC1 & CC5	LV2				
<b>Water Control - Installation</b>	Flatbed Truck		4	12		16	1.54E-02	1.61E-02	2.14E-01	1.43E-04	1.14E-03	4.96E-04	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	-	-	-	-	-	-	
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	2.05E-03	2.45E-02	2.07E-02	3.67E-05	1.74E-03	1.60E-03	
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	-	-	-	-	-	-	
	Truck		0.3077			3.0769	-	-	-	-	-	-	
	Water pump	3.5 hp				4	1.93E-02	8.65E-03	2.33E-01	2.53E-05	2.44E-04	2.44E-04	
<b>Water Control - Removal</b>	Flatbed Truck		4	12		16	1.54E-02	1.61E-02	2.14E-01	1.43E-04	1.14E-03	4.96E-04	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	-	-	-	-	-	-	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	-	-	-	-	-	-	
	Truck		0.3077			0.3077	-	-	-	-	-	-	
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	9.44E-02	8.20E-01	8.48E-01	1.81E-03	3.88E-02	3.57E-02	
<b>Clean &amp; Grub</b>	Crane 50'	200 hp	9.4118	18.8236		28.2354	6.36E-02	9.20E-01	2.53E-01	1.27E-03	3.98E-02	3.66E-02	
	Man lift	210 hp				0	-	-	-	-	-	-	
	Chainsaw	190 hp	28.2353	37.6471		65.8824	7.42E-02	1.19E+00	3.98E-01	1.78E-03	4.51E-02	4.15E-02	
	Loader	190 hp	56.7647	75.2941	0.2941	132.3529	3.39E-01	5.31E-03	6.13E-01	6.82E-05	9.64E-04	9.62E-04	
	1 ton pickup		0.1765		0.1765	0.353	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	-	-	-	-	-	-	
	Front end loader	540 hp	0.2964		0.2964	0.5928	-	-	-	-	-	-	
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	-	-	-	-	-	-	
	Dump truck	20cy/24 ton			1.4866	1.4866	-	-	-	-	-	-	
	Air Compressor	250 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	
	Air Compressor	50 hp		32		32	4.79E-01	6.30E-01	2.31E+01	1.76E-03	1.11E-02	1.10E-02	
	Crane 126'	350 hp	5.1111	5.1111		10.2222	-	-	-	-	-	-	
	Crane 50'	263 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	
	<b>Demolition</b>	Crane 210'	230 hp	16	16		32	-	-	-	-	-	-
Excavator		115 hp	32	16	24	72	-	-	-	-	-	-	
Excavator		430 hp	8	8	12	28	-	-	-	-	-	-	
Loader		190 hp	72	64	12	148	-	-	-	-	-	-	
Front end loader		180 hp	4.6667	4.6667		9.3334	-	-	-	-	-	-	
Loader/Backhoe		75 hp	11.1	11.1		22.2	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	4	4		8	-	-	-	-	-	-	
3/4 ton pickup			72	80	12	164	1.91E-02	1.57E-02	2.30E-01	2.88E-04	2.36E-03	1.07E-03	
Chainsaw			44.4571	44.4571		88.9142	-	-	-	-	-	-	
<b>Road Realignment</b>		Vibratory roller	145 hp				0	-	-	-	-	-	-
		Vibrating compactor	5.5 hp	4	4		8	-	-	-	-	-	-
		Vibrating compactor	7.5 hp				0	-	-	-	-	-	-
		Truck		16	16		32	-	-	-	-	-	-
		Asphalt distributor	3000 gal	4	4		8	-	-	-	-	-	-
	Suburban	3/4 ton	4	4		8	-	-	-	-	-	-	
<b>Disposal</b>	Truck	35 ton	40	40		80	-	-	-	-	-	-	
	Truck	75 ton	11.2	11.2		22.4	-	-	-	-	-	-	
	Suburban	3/4 ton	12	12		24	-	-	-	-	-	-	
<b>Bridge Installation</b>	Crane 210'	230 hp	24	24		48	-	-	-	-	-	-	
	Crane 270'	430 hp	24	24		48	-	-	-	-	-	-	
	3/4 ton pickup		24	24		48	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	8	8		16	-	-	-	-	-	-	
	Excavator	430 hp	0.6137	0.6137		1.2274	-	-	-	-	-	-	
	Truck		2.9609	2.9609		5.9218	-	-	-	-	-	-	
	Generator	7.5 hp	15.8865	15.8865		31.773	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	-	-	-	-	-	-	
	Truck		4.3678	4.3678		8.7356	-	-	-	-	-	-	
<b>Highway Replacement</b>	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	-	-	-	-	-	-	
	Asphalt paver	120 hp	0.208	0.208		0.416	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	-	-	-	-	-	-	
	Chip spreader truck		0.64	0.64		1.28	-	-	-	-	-	-	
	Line striper	23 hp	0.0713	0.0713		0.1426	-	-	-	-	-	-	
	Flatbed Truck		0.0713	0.0713		0.1426	-	-	-	-	-	-	
	3/4 ton pickup		0.0713	0.0713		0.1426	-	-	-	-	-	-	
	<b>Abutments</b>	Roto trowel concrete finisher	9 hp				0	-	-	-	-	-	-
		Crane 80'	130 hp				0	-	-	-	-	-	-
		Crane 114'	430 hp				0	-	-	-	-	-	-
Auger drill		100 hp				0	-	-	-	-	-	-	
Water pump		80 hp				0	-	-	-	-	-	-	
<b>Landscaping</b>		Excavator	430 hp	9.4118	9.4118		18.8236	-	-	-	-	-	-
		Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	2.66E-02	3.18E-01	2.68E-01	4.76E-04	2.25E-02	2.07E-02
		Loader/Backhoe	92 hp	4.7059	9.4118	9.4118	23.5295	3.26E-02	3.90E-01	3.29E-01	5.83E-04	2.76E-02	2.54E-02
		Vibratory roller	44 hp				0	-	-	-	-	-	-
		Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.93E-02	2.91E-01	3.54E-02	2.97E-04	6.40E-03	3.89E-03	
	3/4 ton pickup					0	-	-	-	-	-	-	
	3/4 ton pickup		4	4	2	10	2.39E-03	1.96E-03	2.88E-02	3.60E-05	2.95E-04	1.34E-04	
	<b>Total</b>						<b>1.20E+00</b>	<b>4.65E+00</b>	<b>2.67E+01</b>	<b>8.71E-03</b>	<b>1.99E-01</b>	<b>1.80E-01</b>	





**Construction Equipment - Upstream Barriers - Year 2**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2019**  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC2 & LV1) - 2019 (pounds per day)						Peak Daily Emissions (CC2 & LV2) - 2019 (pounds per day)										
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5					
			15	15	15		days per const																
			CC2 & LV1			CC2 & LV2			CC3														
<b>Water Control - Installation</b>	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04					
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	9.99E-03	1.05E-01	6.84E-02	1.16E-04	7.53E-03	6.93E-03	7.99E-03	8.38E-02	5.47E-02	9.29E-05	6.03E-03	5.55E-03					
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	1.30E-02	1.57E-01	1.49E-01	2.65E-04	1.05E-02	9.67E-03	6.48E-03	7.87E-02	7.46E-02	1.33E-04	5.26E-03	4.83E-03					
	Tractor/crawler/dozer	250 hp	10.9583	5.625		16.5833	1.08E-01	1.72E+00	5.93E-01	2.73E-03	6.47E-02	5.96E-02	5.56E-02	8.81E-01	3.05E-01	1.40E-03	3.32E-02	3.06E-02					
	Truck		2.7692	2.7692		5.5384	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03					
<b>Water Control - Removal</b>	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04					
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	9.99E-03	1.05E-01	6.84E-02	1.16E-04	7.53E-03	6.93E-03	7.99E-03	8.38E-02	5.47E-02	9.29E-05	6.03E-03	5.55E-03					
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	250 hp				8	3.95E-02	6.27E-01	2.17E-01	9.96E-04	2.36E-02	2.17E-02	3.95E-02	6.27E-01	2.17E-01	9.96E-04	2.36E-02	2.17E-02					
<b>Clear &amp; Grub</b>	Truck		2.7692			2.7692	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03					
	Brush chopper	170 hp	28.2352	14.1324	14.1176	56.4852	2.59E-01	2.19E+00	2.55E+00	5.42E-03	1.03E-01	9.47E-02	1.30E-01	1.09E+00	1.27E+00	2.71E-03	5.15E-02	4.74E-02					
	Crane 50'	200 hp	9.4118			9.4118	5.62E-02	8.10E-01	2.49E-01	1.27E-03	3.44E-02	3.16E-02	4.18E-02	4.15E-01	2.02E-01	1.10E-03	1.28E-02	1.18E-02					
	Man lift	210 hp	9.4118	9.4118		28.2354	4.18E-02	4.15E-01	2.02E-01	1.10E-03	1.28E-02	1.18E-02	1.07E-01	1.70E+00	5.87E-01	2.70E-03	6.41E-02	5.89E-02					
	Loader	190 hp	28.2352	14.2656		42.5008	2.12E-01	3.36E+00	1.16E+00	5.34E-03	1.27E-01	1.17E-01	5.08E-01	7.96E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03					
	Chainsaw		56.4706	28.2353	28.2353	112.9412	1.02E+00	1.59E-02	1.84E+00	2.05E-04	2.89E-03	2.89E-03	1.02E-05	1.30E-05	1.38E-04	3.16E-07	2.51E-06	1.10E-06					
	1 ton pickup					0.0176	-	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Front end loader	540 hp		0.0148		0.0148	-	-	-	-	-	-	2.06E-04	2.57E-03	1.49E-03	6.93E-06	1.01E-04	9.26E-05					
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	-	-	-	-	-	-	1.52E-04	2.28E-03	8.45E-04	3.11E-06	8.84E-05	8.13E-05					
	Dump truck	20cy/24 ton		0.1487		0.1487	-	-	-	-	-	-	2.99E-04	4.21E-03	5.54E-04	4.67E-06	9.74E-05	5.81E-05					
<b>Demolition</b>	Air Compressor	250 hp	3.3028	3.3028		6.6056	3.11E-02	2.53E-01	1.15E-01	6.50E-04	8.06E-03	7.41E-03	3.11E-02	2.53E-01	1.15E-01	6.50E-04	8.06E-03	7.41E-03					
	Air Compressor	50 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Crane 126'	350 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Crane 50'	263 hp	3.3028	3.3028		6.6056	2.12E-02	3.16E-01	9.14E-02	4.09E-04	1.27E-02	1.17E-02	2.12E-02	3.16E-01	9.14E-02	4.09E-04	1.27E-02	1.17E-02					
	Crane 210'	230 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Excavator	115 hp	128	32	48	208	4.44E-01	5.57E+00	8.16E+00	1.41E-02	3.48E-01	3.20E-01	1.11E-01	1.39E+00	2.04E+00	3.53E-03	8.70E-02	8.01E-02					
	Excavator	430 hp	80	32	48	160	5.17E-01	6.87E+00	4.25E+00	2.10E-02	2.23E-01	2.05E-01	2.07E-01	2.75E+00	1.70E+00	8.41E-03	8.93E-02	8.21E-02					
	Loader	190 hp	112	64	48	224	8.41E-01	1.33E+01	4.61E+00	2.12E-02	5.03E-01	4.63E-01	4.81E-01	7.62E+00	2.63E+00	1.21E-02	2.87E-01	2.64E-01					
	Front end loader	180 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	2.05E-01	3.25E+00	1.12E+00	5.17E-03	1.23E-01	1.13E-01	5.35E-02	8.48E-01	2.93E-01	1.35E-03	3.20E-02	2.94E-02					
	3/4 ton pickup		112	64	48	224	1.16E-01	9.97E-02	1.40E+00	2.00E-03	1.63E-02	7.34E-03	6.60E-02	5.70E-02	8.02E-01	1.14E-03	9.34E-03	4.19E-03					
Chainsaw		3.3028	3.3028		6.6056	5.95E-02	9.32E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04	5.95E-02	9.32E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04						
<b>Road Realignment</b>	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Vibratory compactor	7.5 hp	14.31	3.735	3.735	21.78	9.51E-03	5.50E-02	3.68E-02	9.37E-05	4.13E-03	3.80E-03	2.48E-03	1.44E-02	9.60E-03	2.45E-05	1.08E-03	9.93E-04					
	Truck		39.6577	6.1748	6.1748	52.0073	7.98E-02	1.12E+00	1.48E-01	1.25E-03	2.60E-02	1.55E-02	1.24E-02	1.75E-01	2.30E-02	1.94E-04	4.04E-03	2.41E-03					
	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	6.23E-03	1.16E-01	1.52E-02	1.29E-04	2.68E-03	1.60E-03	2.15E-03	3.02E-02	3.97E-03	3.35E-05	6.99E-04	4.17E-04					
	Suburban	3/4 ton				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Truck	35 ton	4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04					
<b>Bridge Installation</b>	Truck	75 ton				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	1.94E-02	1.89E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03	9.71E-03	8.38E-03	1.18E-01	1.68E-04	1.37E-03	6.16E-04					
	Crane 210'	230 hp	18.8235			18.8235	1.29E-01	1.86E+00	5.72E-01	2.91E-03	7.90E-02	7.27E-02	1.98E-01	2.95E+00	8.52E-01	3.81E-03	1.19E-01	1.09E-01					
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	1.98E-01	2.95E+00	8.52E-01	3.31E-03	1.19E-01	1.09E-01	1.98E-01	2.95E+00	8.52E-01	3.81E-03	1.19E-01	1.09E-01					
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	3.88E-02	3.35E-02	4.72E-01	6.73E-04	5.49E-03	2.47E-03	1.94E-02	1.68E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03					
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Excavator	430 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Truck					0	-	-	-	-	-	-	-	-	-	-	-	-					
	Generator	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
<b>Highway Replacement</b>	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Truck					0	-	-	-	-	-	-	-	-	-	-	-	-					
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Asphalt paver	120 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Chip spreader truck					0	-	-	-	-	-	-	-	-	-	-	-	-					
	Line stripper	23 hp				0	-	-	-	-	-	-	-	-	-	-	-	-					
	Flatbed Truck					0	-	-	-	-	-	-	-	-	-	-	-	-					
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	-	-	-	-					
	3/4 ton pickup			2		2	-	-	-	-	-	-	2.06E-03	1.78E-03	2.51E-02	3.58E-05	2.92E-04	1.31E-04					
<b>Total</b>						<b>5.26E+00</b>	<b>5.56E+01</b>	<b>3.52E+01</b>	<b>1.09E-01</b>	<b>2.30E+00</b>	<b>2.09E+00</b>	<b>2.59E+00</b>	<b>2.65E+01</b>	<b>1.61E+01</b>	<b>5.05E-02</b>	<b>1.09E+00</b>	<b>9.88E-01</b>						

**Construction Equipment - Upstream Barriers - Year 2**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2019**  
 Speed of Onsite Trucks **10** mph

15 15 15 days per const  
 CC2 & LV1 CC2 & LV2 CC3

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC3) - 2019 (pounds per day)						
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	
<b>Water Control - Installation</b>	Flatbed Truck		4		4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	6.00E-03	6.29E-02	4.10E-02	6.97E-05	4.52E-03	4.16E-03	
	Loader/Backhoe	75 hp		5.248	2.624	10.496	6.48E-03	7.87E-02	7.46E-02	1.33E-04	5.26E-03	4.83E-03	
	Tractor/crawler/dozer	250 hp	10.9583	5.625		16.5833	-	-	-	-	-	-	
	Truck		2.7692	2.7692		5.5384	-	-	-	-	-	-	
<b>Water Control - Removal</b>	Water pump	3.5 hp				0	-	-	-	-	-	-	
	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	6.00E-03	6.29E-02	4.10E-02	6.97E-05	4.52E-03	4.16E-03	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp		4	4	8	-	-	-	-	-	-	
<b>Clean &amp; Grub</b>	Truck		2.7692			2.7692	-	-	-	-	-	-	
	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	1.30E-01	1.09E+00	1.27E+00	2.71E-03	5.15E-02	4.74E-02	
	Crane 50'	200 hp	9.4118			9.4118	-	-	-	-	-	-	
	Man lift	210 hp	9.4118		9.4118	28.2354	4.18E-02	4.15E-01	2.02E-01	1.10E-03	1.28E-02	1.18E-02	
	Loader	190 hp		14.2656		42.5008	-	-	-	-	-	-	
	Chainsaw		28.2352	28.2353	28.2353	112.9412	5.08E-01	7.96E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03	
	1 ton pickup			0.0176		0.0176	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	
	Front end loader	540 hp		0.0148		0.0148	-	-	-	-	-	-	
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	-	-	-	-	-	-	
	Dump truck	20cy/24 ton		0.1487		0.1487	-	-	-	-	-	-	
	<b>Demolition</b>	Air Compressor	250 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
		Air Compressor	50 hp				0	-	-	-	-	-	-
Crane 126'		350 hp				0	-	-	-	-	-		
Crane 50'		263 hp	3.3028	3.3028		6.6056	-	-	-	-	-		
Crane 210'		230 hp				0	-	-	-	-	-		
Excavator		115 hp	128	32	48	208	1.66E-01	2.09E+00	3.06E+00	5.29E-03	1.31E-01	1.20E-01	
Excavator		430 hp	80	32	48	160	3.10E-01	4.12E+00	2.55E+00	1.26E-02	1.34E-01	1.23E-01	
Loader		190 hp	112	64	48	224	3.61E-01	5.72E+00	1.98E+00	9.08E-03	2.16E-01	1.98E-01	
Front end loader		180 hp				0	-	-	-	-	-	-	
Loader/Backhoe		75 hp				0	-	-	-	-	-	-	
<b>Road Realignment</b>	Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	5.35E-02	8.48E-01	2.93E-01	1.35E-03	3.20E-02	2.94E-02	
	3/4 ton pickup		112	64	48	224	4.95E-02	4.27E-02	6.01E-01	8.58E-04	7.01E-03	3.14E-03	
	Chainsaw		3.3028	3.3028		6.6056	-	-	-	-	-	-	
	Vibratory roller	145 hp				0	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	
	Vibratory compactor	7.5 hp	14.31	3.735	3.735	21.78	2.48E-03	1.44E-02	9.60E-03	2.45E-05	1.08E-03	9.93E-04	
	Truck		39.6577	6.1748	6.1748	52.0073	1.24E-02	1.75E-01	2.30E-02	1.94E-04	4.04E-03	2.41E-03	
<b>Disposal</b>	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	2.15E-03	3.02E-02	3.97E-03	3.35E-05	6.99E-04	4.17E-04	
	Suburban	3/4 ton				0	-	-	-	-	-	-	
	Truck	35 ton	4		4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Truck	75 ton				0	-	-	-	-	-	-	
<b>Bridge Installation</b>	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	9.71E-03	8.38E-03	1.18E-01	1.68E-04	1.37E-03	6.16E-04	
	Crane 210'	230 hp	18.8235			18.8235	-	-	-	-	-	-	
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	1.98E-01	2.95E+00	8.52E-01	3.81E-03	1.19E-01	1.09E-01	
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	1.94E-02	1.68E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	
	Excavator	430 hp				0	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	
	Generator	7.5 hp				0	-	-	-	-	-	-	
<b>Highway Replacement</b>	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-	
	Asphalt paver	120 hp				0	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-	
	Chip spreader truck					0	-	-	-	-	-	-	
	Line striper	23 hp				0	-	-	-	-	-	-	
	Flatbed Truck					0	-	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	
<b>Abutments</b>	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	3.43E-03	1.03E-02	2.65E-01	8.05E-05	6.45E-04	6.44E-04	
	Crane 80'	130 hp	11.7648	5.8824	5.8824	23.5296	3.04E-02	3.85E-01	2.77E-01	5.26E-04	2.06E-02	1.89E-02	
	Crane 114'	430 hp	35.2941	11.7647	11.7647	58.8235	1.24E-01	1.84E+00	5.33E-01	2.38E-03	7.41E-02	6.82E-02	
	Auger drill	100 hp	11.7648	5.8824	5.8824	23.5296	1.92E-02	2.89E-01	3.05E-01	5.91E-04	1.57E-02	1.44E-02	
	Water pump	80 hp	11.7648	5.8824	5.8824	23.5296	3.12E-02	2.52E-01	2.47E-01	4.78E-04	1.58E-02	1.45E-02	
<b>Landscaping</b>	Excavator	430 hp	18.8236	9.4118	9.4118	37.6472	6.09E-02	8.09E-01	4.99E-01	2.47E-03	2.63E-02	2.42E-02	
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	2.32E-02	2.82E-01	2.67E-01	4.75E-04	1.88E-02	1.73E-02	
	Loader/Backhoe	92 hp		9.4118		9.4118	-	-	-	-	-	-	
	Vibratory roller	44 hp				0	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.89E-02	2.67E-01	3.50E-02	2.96E-04	6.16E-03	3.68E-03	
	3/4 ton pickup					0	-	-	-	-	-	-	
	3/4 ton pickup			2		2	-	-	-	-	-	-	
<b>Total</b>						<b>2.21E+00</b>	<b>2.19E+01</b>	<b>1.50E+01</b>	<b>4.55E-02</b>	<b>9.07E-01</b>	<b>8.25E-01</b>		

**Conversions**

2000 pounds per ton  
 453.6 grams per pound  
 2 peak day scaling factor  
 0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
 Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's I 1/1/2018  
 Birthday of M 1/15/2018  
 Washington' 2/19/2018  
 Memorial Da 5/28/2018  
 Independenc 7/4/2018  
 Labor Day 9/3/2018  
 Columbus D 10/8/2018  
 Veterans Da 11/12/2018  
 Thanksgiving 11/22/2018  
 Christmas D 12/25/2018  
 10

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**Source:**

CC1 Equipment Report.pdf  
 CC2 Equipment Report.pdf  
 CC3 Equipment Report.pdf  
 CC4 Equipment Report.pdf  
 CC5 Equipment Report.pdf  
 LV1 Equipment Report.pdf  
 LV2 Equipment Report.pdf



**Construction Equipment - Upstream Barriers - Year 2**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (LV2 - Yr 2) - 2019 (pounds per day)					
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5
			15	15	15		days per const					
<b>Water Control - Installation</b>	Flatbed Truck		4	4	4	12	-	-	-	-	-	-
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.00E-03	2.09E-02	1.37E-02	2.32E-05	1.51E-03	1.39E-03
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	10.9583	5.625		16.5833	5.56E-02	8.81E-01	3.05E-01	1.40E-03	3.32E-02	3.06E-02
	Truck		2.7692	2.7692		5.5384	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03
<b>Water Control - Removal</b>	Water pump	3.5 hp				0	-	-	-	-	-	-
	Flatbed Truck		4	4	4	12	-	-	-	-	-	-
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.00E-03	2.09E-02	1.37E-02	2.32E-05	1.51E-03	1.39E-03
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	4	4		8	3.95E-02	6.27E-01	2.17E-01	9.96E-04	2.36E-02	2.17E-02
<b>Clean &amp; Grub</b>	Truck		2.7692			2.7692	-	-	-	-	-	-
	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	1.36E-04	1.15E-03	1.33E-03	2.84E-06	5.40E-05	4.96E-05
	Crane 50'	200 hp	9.4118			9.4118	-	-	-	-	-	-
	Man lift	210 hp	9.4118		9.4118	28.2354	-	-	-	-	-	-
	Loader	190 hp	28.2352	14.2656		42.5008	1.12E-04	1.78E-03	6.15E-04	2.83E-06	6.71E-05	6.17E-05
	Chainsaw		56.4706		28.2353	112.9412	-	-	-	-	-	-
	1 ton pickup			0.0176		0.0176	1.02E-05	1.30E-05	1.38E-04	3.16E-07	2.51E-06	1.10E-06
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Front end loader	540 hp		0.0148		0.0148	2.06E-04	2.57E-03	1.49E-03	6.93E-06	1.01E-04	9.26E-05
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	1.52E-04	2.28E-03	8.45E-04	3.11E-06	8.84E-05	8.13E-05
	Dump truck	20cy/24 ton		0.1487		0.1487	2.99E-04	4.21E-03	5.54E-04	4.67E-06	9.74E-05	5.81E-05
<b>Demolition</b>	Air Compressor	250 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
	Air Compressor	50 hp				0	-	-	-	-	-	-
	Crane 126'	350 hp				0	-	-	-	-	-	-
	Crane 50'	263 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
	Crane 210'	230 hp				0	-	-	-	-	-	-
	Excavator	115 hp	128	32	48	208	1.11E-01	1.39E+00	2.04E+00	3.53E-03	8.70E-02	8.01E-02
	Excavator	430 hp	80	32	48	160	1.03E-01	1.37E+00	8.49E-01	4.21E-03	4.46E-02	4.11E-02
	Loader	190 hp	112	64	48	224	1.20E-01	1.91E+00	6.59E-01	3.03E-03	7.18E-02	6.61E-02
	Front end loader	180 hp				0	-	-	-	-	-	-
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	-	-	-	-	-	-
3/4 ton pickup		112	64	48	224	1.65E-02	1.42E-02	2.00E-01	2.86E-04	2.34E-03	1.05E-03	
Chainsaw		3.3028	3.3028		6.6056	-	-	-	-	-	-	
<b>Road Realignment</b>	Vibratory roller	145 hp				0	-	-	-	-	-	-
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-
	Vibrating compactor	7.5 hp				0	-	-	-	-	-	-
	Truck		14.31	3.735	3.735	21.78	-	-	-	-	-	-
	Asphalt distributor	3000 gal	39.6577	6.1748	6.1748	52.0073	-	-	-	-	-	-
<b>Disposal</b>	Suburban	3/4 ton	4.0885	1.0671	1.0671	6.2227	-	-	-	-	-	-
	Truck	35 ton	4	4	4	12	-	-	-	-	-	-
	Truck	75 ton				0	-	-	-	-	-	-
	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	-	-	-	-	-	-
	Crane 210'	230 hp	18.8235			18.8235	-	-	-	-	-	-
<b>Bridge Installation</b>	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	-	-	-	-	-	-
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Excavator	430 hp				0	-	-	-	-	-	-
	Truck					0	-	-	-	-	-	-
	Generator	7.5 hp				0	-	-	-	-	-	-
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-
<b>Highway Replacement</b>	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Truck					0	-	-	-	-	-	-
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-
	Asphalt paver	120 hp				0	-	-	-	-	-	-
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-
	Chip spreader truck					0	-	-	-	-	-	-
	Line striper	23 hp				0	-	-	-	-	-	-
	Flatbed Truck					0	-	-	-	-	-	-
	3/4 ton pickup					0	-	-	-	-	-	-
	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	-	-	-	-	-	-
	<b>Abutments</b>	Crane 80'	130 hp	11.7648	5.8824	5.8824	23.5296	-	-	-	-	-
Crane 114		430 hp	35.2941	11.7647	11.7647	58.8235	-	-	-	-	-	-
Auger drill		100 hp	11.7648	5.8824	5.8824	23.5296	-	-	-	-	-	-
Water pump		80 hp	11.7648	5.8824	5.8824	23.5296	-	-	-	-	-	-
Excavator		430 hp	18.8236	9.4118	9.4118	37.6472	-	-	-	-	-	-
<b>Landscaping</b>	Excavator	430 hp	18.8236	18.8236	9.4118	47.059	2.32E-02	2.82E-01	2.67E-01	4.75E-04	1.88E-02	1.73E-02
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	9.4118	2.85E-02	3.46E-01	3.28E-01	5.83E-04	2.31E-02	2.13E-02
	Loader/Backhoe	92 hp				0	-	-	-	-	-	-
	Vibratory roller	44 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.89E-02	2.67E-01	3.50E-02	2.96E-04	6.16E-03	3.68E-03
	3/4 ton pickup					0	-	-	-	-	-	-
	3/4 ton pickup			2		2	2.06E-03	1.78E-03	2.51E-02	3.58E-05	2.92E-04	1.31E-04
	3/4 ton pickup					0	-	-	-	-	-	-
<b>Total</b>						<b>5.29E-01</b>	<b>7.22E+00</b>	<b>4.97E+00</b>	<b>1.50E-02</b>	<b>3.16E-01</b>	<b>2.87E-01</b>	

**Construction Equipment - Upstream Barriers - Year 3**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2020**  
 Speed of Onsite Trucks **10 mph**

Activity	Equipment Type	Equipment Size	50 days per construction period (5 days per week)		Annual Hours	Emission Factors - 2020 (g/hp-hr or g/hr)								
			Hours of Operation			VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
			4/1-6/9	6/10-6/30										
<b>Water Control - Installation</b>	Flatbed Truck				0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	Crane 44'	80 hp	49.6732	0.4444	50.1176	0.174	1.838	1.301	0.002	0.130	0.120	189.389	0.018	0.000
	Loader/Backhoe	75 hp	34.624		34.624	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Truck		34.1719	2.7692	36.9411	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Water pump	3.5 hp			0	4.688	2.102	56.569	0.006	0.058	0.058	177.791	0.267	0.301
<b>Water Control - Removal</b>	Flatbed Truck				0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	Crane 44'	80 hp		0.4444	0.4444	0.174	1.838	1.301	0.002	0.130	0.120	189.389	0.018	0.000
	Loader/Backhoe	75 hp		0.32	0.32	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Truck		34.1719		34.1719	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	5.9294	0.0074	5.9368	0.170	1.377	1.804	0.004	0.065	0.060	341.375	0.015	0.000
	Crane 50'	200 hp			0	0.091	1.315	0.442	0.002	0.054	0.050	203.318	0.012	0.000
	Main lift	210 hp			0	0.068	0.631	0.345	0.002	0.020	0.018	192.930	0.006	0.000
	Loader	190 hp	5.9294	0.0074	5.9368	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Chainsaw		5.8824	0.0147	5.8971	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	1 ton pickup			0.0088	0.0088	1.653	2.282	22.688	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Front end loader	540 hp	5.9294	0.0074	5.9368	0.083	1.001	0.621	0.003	0.039	0.036	293.384	0.015	0.000
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	0.107	1.553	0.604	0.002	0.060	0.056	234.962	0.014	0.000
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
<b>Demolition</b>	Air Compressor	250 hp			0	0.121	0.919	0.470	0.003	0.029	0.027	237.872	0.011	0.000
	Air Compressor	50 hp			0	0.882	1.143	50.704	0.004	0.024	0.023	307.059	0.050	0.070
	Crane 126'	350 hp			0	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
	Crane 50'	263 hp			0	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
	Crane 210'	230 hp			0	0.091	1.315	0.442	0.002	0.054	0.050	203.318	0.012	0.000
	Excavator	115 hp		40	40	0.094	1.180	1.881	0.003	0.071	0.065	278.045	0.020	0.000
	Excavator	430 hp	80	20	100	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Loader	190 hp		20	20	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Front end loader	180 hp			0	0.087	1.238	0.573	0.003	0.041	0.038	270.061	0.014	0.000
	Loader/Backhoe	75 hp	350		350	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Tractor/crawler/dozer	250 hp	50.068		50.068	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	3/4 ton pickup		72	20	92	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Chainsaw				0	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
<b>Road Realignment</b>	Vibratory roller	145 hp	19.0893		19.0893	0.067	0.920	1.583	0.003	0.042	0.039	280.063	0.018	0.000
	Vibrating compactor	5.5 hp	5.1724		5.1724	1.925	1.423	73.688	0.004	1.056	1.054	125.971	0.110	0.147
	Vibratory compactor	7.5 hp			0	0.287	1.701	1.166	0.003	0.123	0.114	190.952	0.020	0.000
	Truck		372.9363		372.9363	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Asphalt distributor	3000 gal	22.9363		22.9363	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Suburban	3/4 ton			0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
<b>Disposal</b>	Truck	35 ton			0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	Truck	75 ton			0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Suburban	3/4 ton			0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
<b>Bridge Installation</b>	Crane 210'	230 hp			0	0.091	1.315	0.442	0.002	0.054	0.050	203.318	0.012	0.000
	Crane 270'	430 hp			0	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
	3/4 ton pickup				0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp			0	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Excavator	430 hp			0	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Truck				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Generator	7.5 hp			0	1.929	1.379	102.648	0.005	0.092	0.092	175.214	0.110	0.144
<b>Highway Replacement</b>	Vibrating compactor	5.5 hp			0	1.925	1.423	73.688	0.004	1.056	1.054	125.971	0.110	0.147
	Tractor/crawler/dozer	250 hp			0	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Truck				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Asphalt distributor	3000 gal			0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Asphalt paver	120 hp			0	0.161	1.839	1.815	0.003	0.135	0.124	261.328	0.031	0.000
	Vibrating roller/compactor	33 hp			0	0.492	1.848	2.208	0.003	0.116	0.106	235.507	0.044	0.000
	Chip spreader truck				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	Line striper	23 hp			0	0.110	0.330	8.518	0.003	0.021	0.021	260.327	0.006	0.021
	Flatbed Truck				0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135
	3/4 ton pickup				0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
<b>Abutments</b>	Roto trowel concrete finisher	9 hp			0	0.110	0.330	8.518	0.003	0.021	0.021	260.327	0.006	0.021
	Crane 80'	130 hp			0	0.128	1.605	1.231	0.002	0.086	0.079	208.066	0.015	0.000
	Crane 114'	430 hp			0	0.076	1.113	0.348	0.002	0.045	0.041	163.241	0.009	0.000
	Auger drill	100 hp			0	0.102	1.541	1.761	0.003	0.080	0.073	291.259	0.010	0.000
	Water pump	80 hp			0	0.203	1.678	1.780	0.003	0.099	0.091	294.384	0.018	0.000
<b>Landscaping</b>	Excavator	430 hp	144.7059		144.7059	0.048	0.600	0.416	0.002	0.020	0.018	211.854	0.010	0.000
	Loader/Backhoe	75 hp	8	9.4118	17.4118	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Loader/Backhoe	92 hp		9.4118	9.4118	0.101	1.226	1.285	0.002	0.077	0.071	195.356	0.012	0.000
	Vibratory roller	44 hp	144.7059		144.7059	0.492	1.848	2.208	0.003	0.116	0.106	235.507	0.044	0.000
	Tractor/crawler/dozer	250 hp	144.7059		144.7059	0.128	1.986	0.719	0.003	0.075	0.069	301.159	0.019	0.000
	Dump truck	12 cy	8	9.4118	17.4118	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048
	3/4 ton pickup		181.1765		181.1765	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	3/4 ton pickup		8	2	10	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056
	<b>Total</b>													







**Construction Equipment - Upstream Barriers - Year 3**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year 2020  
 Speed of Onsite Trucks 10 mph

50 15  
 LV3 & LV4 LV2 days per const

Activity	Equipment Type	Equipment Size	Hours of Operation		Annual Hours	
			4/1-6/9	6/10-6/30		
<b>Water Control - Installation</b>	Flatbed Truck				0	
	Crane 44'	80 hp	49.6732	0.4444	50.1176	
	Loader/Backhoe	75 hp	34.624		34.624	
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	
	Truck		34.1719	2.7692	36.9411	
	Water pump	3.5 hp			0	
<b>Water Control - Removal</b>	Flatbed Truck				0	
	Crane 44'	80 hp		0.4444	0.4444	
	Loader/Backhoe	75 hp	32		32	
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	
	Truck		34.1719		34.1719	
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	5.9294	0.0074	5.9368	
	Crane 50'	200 hp			0	
	Man lift	210 hp			0	
	Loader	190 hp	5.9294	0.0074	5.9368	
	Chainsaw		5.8824	0.0147	5.8971	
	1 ton pickup			0.0088	0.0088	
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	
	Front end loader	540 hp	5.9294	0.0074	5.9368	
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	
		Air Compressor	250 hp			0
<b>Demolition</b>	Air Compressor	50 hp			0	
	Crane 126'	350 hp			0	
	Crane 50'	263 hp			0	
	Crane 210'	230 hp			0	
	Excavator	115 hp		40	40	
	Excavator	430 hp	80	20	100	
	Loader	190 hp		20	20	
	Front end loader	180 hp			0	
	Loader/Backhoe	75 hp	350		350	
	Tractor/crawler/dozer	250 hp	50.068		50.068	
	3/4 ton pickup		72	20	92	
	Chainsaw				0	
	<b>Road Realignment</b>	Vibratory roller	145 hp	19.0893		19.0893
		Vibrating compactor	5.5 hp	5.1724		5.1724
		Vibratory compactor	7.5 hp			0
Truck			372.9363		372.9363	
Asphalt distributor		3000 gal	22.9363		22.9363	
<b>Disposal</b>	Suburban	3/4 ton			0	
	Truck	75 ton			0	
<b>Bridge Installation</b>	Suburban	3/4 ton			0	
	Crane 210'	230 hp			0	
	Crane 270'	430 hp			0	
	3/4 ton pickup				0	
	Tractor/crawler/dozer	250 hp			0	
	Excavator	430 hp			0	
	Truck				0	
<b>Highway Replacement</b>	Generator	7.5 hp			0	
	Vibrating compactor	5.5 hp			0	
	Tractor/crawler/dozer	250 hp			0	
	Truck				0	
	Asphalt distributor	3000 gal			0	
	Asphalt paver	120 hp			0	
	Vibrating roller/compactor	33 hp			0	
	Chip spreader truck				0	
	Line striper	23 hp			0	
	Flatbed Truck				0	
	3/4 ton pickup				0	
<b>Abutments</b>	Roto trowel concrete finisher	9 hp			0	
	Crane 80'	130 hp			0	
	Crane 114'	430 hp			0	
	Auger drill	100 hp			0	
	Water pump	80 hp			0	
<b>Landscaping</b>	Excavator	430 hp	144.7059		144.7059	
	Loader/Backhoe	75 hp	8	9.4118	17.4118	
	Loader/Backhoe	92 hp		9.4118	9.4118	
	Vibratory roller	44 hp	144.7059		144.7059	
	Tractor/crawler/dozer	250 hp	144.7059		144.7059	
	Dump truck	12 cy	8	9.4118	17.4118	
	3/4 ton pickup		181.1765		181.1765	
	3/4 ton pickup		8	2	10	
<b>Total</b>						

**Conversions**

2000 pounds per ton  
 453.6 grams per pound  
 2 peak day scaling factor  
 0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
 Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL)
Gasoline	0.994	0.992	0.998	117 (VEHIC)

**Federal Holidays**

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-proced/>

**Source:**

- CC1 Equipment Report.pdf
- CC2 Equipment Report.pdf
- CC3 Equipment Report.pdf
- CC4 Equipment Report.pdf
- CC5 Equipment Report.pdf
- LV1 Equipment Report.pdf
- LV2 Equipment Report.pdf
- LV3 and LV4 Equipment Report.pdf







**Construction Equipment - Upstream Barriers - Year 1  
Alternative 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

15 15 15 days per const  
CC1 & CC4 CC1 & CC5 LV2

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (LV2) - 2019 (pounds per day)							
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5		
<b>Water Control - Installation</b>	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	2.00E-03	2.09E-02	1.37E-02	2.32E-05	1.51E-03	1.39E-03		
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	6.88E-02	1.09E+00	3.77E-01	1.73E-03	4.11E-02	3.78E-02		
	Truck		0.3077			3.0769	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03		
<b>Water Control - Removal</b>	Water pump	3.5 hp		4		4	-	-	-	-	-	-	-	-
	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	2.00E-03	2.09E-02	1.37E-02	2.32E-05	1.51E-03	1.39E-03		
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	5.27E-02	8.36E-01	2.89E-01	1.33E-03	3.15E-02	2.90E-02		
<b>Clean &amp; Grub</b>	Truck		0.3077			0.3077	-	-	-	-	-	-	-	-
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	1.36E-03	1.15E-02	1.34E-02	2.84E-05	5.40E-04	4.97E-04		
	Crane 50'	200 hp	9.4118	18.8236		28.2354	-	-	-	-	-	-	-	-
	Man lift	210 hp				0	-	-	-	-	-	-	-	-
	Loader	190 hp	28.2353	37.6471		65.8824	-	-	-	-	-	-	-	-
	Chainsaw		56.7647	75.2941	0.2941	132.3529	5.29E-03	8.30E-05	9.58E-03	1.07E-06	1.51E-05	1.50E-05		
	1 ton pickup		0.1765		0.1765	0.353	1.02E-04	1.31E-04	1.38E-03	3.17E-06	2.52E-05	1.10E-05		
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	2.91E-03	4.61E-02	1.59E-02	7.32E-05	1.74E-03	1.60E-03		
	Front end loader	540 hp	0.2964		0.2964	0.5928	4.12E-03	5.14E-02	2.98E-02	1.39E-04	2.02E-03	1.85E-03		
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	1.53E-03	2.28E-02	8.46E-03	3.11E-05	8.85E-04	8.14E-04		
	Dump truck	20cy/24 ton			1.4866	1.4866	2.99E-03	4.21E-02	5.53E-03	4.67E-05	9.74E-04	5.81E-04		
<b>Demolition</b>	Air Compressor	250 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-
	Air Compressor	50 hp		32		32	-	-	-	-	-	-	-	-
	Crane 126'	350 hp	5.1111	5.1111		10.2222	-	-	-	-	-	-	-	-
	Crane 50'	263 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-
	Crane 210'	230 hp	16	16		32	-	-	-	-	-	-	-	-
	Excavator	115 hp	32	16	24	72	8.32E-02	1.04E+00	1.53E+00	2.65E-03	6.53E-02	6.01E-02		
	Excavator	430 hp	8	8	12	28	7.76E-02	1.03E+00	6.37E-01	3.15E-03	3.35E-02	3.08E-02		
	Loader	190 hp	72	64	12	148	9.02E-02	1.43E+00	4.94E-01	2.27E-03	5.39E-02	4.96E-02		
	Front end loader	180 hp	4.6667	4.6667		9.3334	-	-	-	-	-	-	-	-
	Loader/Backhoe	75 hp	11.1	11.1		22.2	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	4	4		8	-	-	-	-	-	-	-	-
	3/4 ton pickup		72	80	12	164	1.24E-02	1.07E-02	1.50E-01	2.15E-04	1.75E-03	7.86E-04		
	Chainsaw		44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-
<b>Road Realignment</b>	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	4	4		8	-	-	-	-	-	-	-	-
	Vibrating compactor	7.5 hp				0	-	-	-	-	-	-	-	-
	Truck		16	16		32	-	-	-	-	-	-	-	-
	Asphalt distributor	3000 gal	4	4		8	-	-	-	-	-	-	-	-
<b>Disposal</b>	Suburban	3/4 ton	4	4		8	-	-	-	-	-	-	-	-
	Truck	35 ton	40	40		80	-	-	-	-	-	-	-	-
<b>Bridge Installation</b>	Truck	75 ton	11.2	11.2		22.4	-	-	-	-	-	-	-	-
	Suburban	3/4 ton	12	12		24	-	-	-	-	-	-	-	-
	Crane 210'	230 hp	24	24		48	-	-	-	-	-	-	-	-
	Crane 270'	430 hp	24	24		48	-	-	-	-	-	-	-	-
	3/4 ton pickup		24	24		48	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	8	8		16	-	-	-	-	-	-	-	-
	Excavator	430 hp	0.6137	0.6137		1.2274	-	-	-	-	-	-	-	-
<b>Highway Replacement</b>	Truck		2.9609			5.9218	-	-	-	-	-	-	-	-
	Generator	7.5 hp	15.8865	15.8865		31.773	-	-	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	-	-	-	-	-	-	-	-
	Truck		4.3678			8.7356	-	-	-	-	-	-	-	-
	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	-	-	-	-	-	-	-	-
	Asphalt paver	120 hp	0.208	0.208		0.416	-	-	-	-	-	-	-	-
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	-	-	-	-	-	-	-	-
	Chip spreader truck		0.64	0.64		1.28	-	-	-	-	-	-	-	-
	Line striper	23 hp	0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-
	Flatbed Truck		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-
3/4 ton pickup		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
<b>Abutments</b>	Roto trowel concrete finisher	9 hp				0	-	-	-	-	-	-	-	-
	Crane 80'	130 hp				0	-	-	-	-	-	-	-	-
	Crane 114'	430 hp				0	-	-	-	-	-	-	-	-
	Auger drill	100 hp				0	-	-	-	-	-	-	-	-
	Water pump	80 hp				0	-	-	-	-	-	-	-	-
	Excavator	430 hp	9.4118	9.4118		18.8236	-	-	-	-	-	-	-	-
<b>Landscaping</b>	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	2.32E-02	2.82E-01	2.67E-01	4.75E-04	1.88E-02	1.73E-02		
	Loader/Backhoe	92 hp	4.7059	9.4118	9.4118	23.5295	2.85E-02	3.46E-01	3.28E-01	5.83E-04	2.31E-02	2.13E-02		
	Vibratory roller	44 hp				0	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.89E-02	2.67E-01	3.50E-02	2.96E-04	6.16E-03	3.68E-03		
	3/4 ton pickup					0	-	-	-	-	-	-	-	-
	3/4 ton pickup		4	4	2	10	2.06E-03	1.78E-03	2.51E-02	3.58E-05	2.92E-04	1.31E-04		
	<b>Total</b>						<b>4.85E-01</b>	<b>6.63E+00</b>	<b>4.25E+00</b>	<b>1.32E-02</b>	<b>2.86E-01</b>	<b>2.60E-01</b>		

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/2/2017
Birthdays of Martin Luther King, Jr.	1/16/2017
Washington's Birthday	2/20/2017
Memorial Day	5/29/2017
Independence Day	7/4/2017
Labor Day	9/4/2017
Columbus Day	10/9/2017
Veterans Day	10/10/2017
Thanksgiving Day	11/23/2017
Christmas Day	12/25/2017

<http://beta.epm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays?url=2018>







**Construction Equipment - Upstream Barriers - Year 1  
Alternative 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC5) - 2019 (pounds per day)					
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5
			15	15	15		CC1 & CC4	CC1 & CC5	LV2			
<b>Water Control - Installation</b>	Flatbed Truck		4	12		16	1.30E-02	1.40E-02	1.80E-01	1.42E-04	1.13E-03	4.85E-04
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	-	-	-	-	-	-
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	1.80E-03	2.18E-02	2.07E-02	3.67E-05	1.46E-03	1.34E-03
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	-	-	-	-	-	-
	Truck		0.3077			3.0769	-	-	-	-	-	-
<b>Water Control - Removal</b>	Water pump	3.5 hp		4		4	1.93E-02	8.65E-03	2.33E-01	2.53E-05	2.39E-04	2.38E-04
	Flatbed Truck		4	12		16	1.30E-02	1.40E-02	1.80E-01	1.42E-04	1.13E-03	4.85E-04
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	-	-	-	-	-	-
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	-	-	-	-	-	-
<b>Clean &amp; Grub</b>	Truck		0.3077			0.3077	-	-	-	-	-	-
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	8.64E-02	7.28E-01	8.48E-01	1.81E-03	3.43E-02	3.16E-02
	Crane 50'	200 hp	9.4118	18.8236		28.2354	5.62E-02	8.10E-01	2.49E-01	1.27E-03	3.44E-02	3.16E-02
	Main lift	210 hp				0	-	-	-	-	-	-
	Chainsaw	190 hp	28.2353	37.6471		65.8824	7.07E-02	1.12E+00	3.87E-01	1.78E-03	4.23E-02	3.89E-02
	Loader	190 hp	56.7647	75.2941	0.2941	132.3629	3.39E-01	5.31E-03	6.13E-01	6.82E-05	9.64E-04	9.62E-04
	1 ton pickup		0.1765			0.353	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	-	-	-	-	-	-
	Front end loader	540 hp	0.2964		0.2964	0.5928	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	-	-	-	-	-	-
	Dump truck	20cy/24 ton			1.4866	1.4866	-	-	-	-	-	-
<b>Demolition</b>	Air Compressor	250 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-
	Air Compressor	50 hp		32		32	4.38E-01	5.78E-01	2.35E+01	1.76E-03	1.11E-02	1.10E-02
	Crane 126'	350 hp	5.1111	5.1111		10.2222	-	-	-	-	-	-
	Crane 50'	263 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-
	Crane 210'	230 hp	16	16		32	-	-	-	-	-	-
	Excavator	115 hp	32	16	24	72	-	-	-	-	-	-
	Excavator	430 hp	8	8	12	28	-	-	-	-	-	-
	Loader	190 hp	72	64	12	148	-	-	-	-	-	-
	Front end loader	180 hp	4.6667	4.6667		9.3334	-	-	-	-	-	-
	Loader/Backhoe	75 hp	11.1	11.1		22.2	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	4	4		8	-	-	-	-	-	-
	3/4 ton pickup		72	80	12	164	1.65E-02	1.42E-02	2.00E-01	2.86E-04	2.34E-03	1.05E-03
	Chainsaw		44.4571	44.4571		88.9142	-	-	-	-	-	-
<b>Road Realignment</b>	Vibratory roller	145 hp				0	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	4	4		8	-	-	-	-	-	-
	Vibratory compactor	7.5 hp				0	-	-	-	-	-	-
	Truck		16	16		32	-	-	-	-	-	-
<b>Disposal</b>	Asphalt distributor	3000 gal	4	4		8	-	-	-	-	-	-
	Suburban	3/4 ton	4	4		8	-	-	-	-	-	-
	Truck	35 ton	40	40		80	-	-	-	-	-	-
<b>Bridge Installation</b>	Truck	75 ton	11.2	11.2		22.4	-	-	-	-	-	-
	Suburban	3/4 ton	12	12		24	-	-	-	-	-	-
	Crane 210'	230 hp	24	24		48	-	-	-	-	-	-
	Crane 270'	430 hp	24	24		48	-	-	-	-	-	-
	3/4 ton pickup		24	24		48	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	8	8		16	-	-	-	-	-	-
<b>Highway Replacement</b>	Excavator	430 hp	0.6137	0.6137		1.2274	-	-	-	-	-	-
	Truck		2.9609	2.9609		5.9218	-	-	-	-	-	-
	Generator	7.5 hp	15.8865	15.8865		31.773	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	-	-	-	-	-	-
	Truck		4.3678	4.3678		8.7356	-	-	-	-	-	-
	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	-	-	-	-	-	-
	Asphalt paver	120 hp	0.208	0.208		0.416	-	-	-	-	-	-
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	-	-	-	-	-	-
	Chip spreader truck		0.64	0.64		1.28	-	-	-	-	-	-
<b>Abutments</b>	Line striper	23 hp	0.0713	0.0713		0.1426	-	-	-	-	-	-
	Flatbed Truck		0.0713	0.0713		0.1426	-	-	-	-	-	-
	3/4 ton pickup		0.0713	0.0713		0.1426	-	-	-	-	-	-
	Roto trowel concrete finisher	9 hp				0	-	-	-	-	-	-
	Crane 80'	130 hp				0	-	-	-	-	-	-
	Crane 114'	430 hp				0	-	-	-	-	-	-
	Auger drill	100 hp				0	-	-	-	-	-	-
<b>Landscaping</b>	Water pump	80 hp				0	-	-	-	-	-	-
	Excavator	430 hp	9.4118	9.4118		18.8236	-	-	-	-	-	-
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	2.32E-02	2.82E-01	2.67E-01	4.75E-04	1.88E-02	1.73E-02
	Loader/Backhoe	92 hp	4.7059	9.4118	9.4118	23.5295	2.85E-02	3.46E-01	3.28E-01	5.83E-04	2.31E-02	2.13E-02
	Vibratory roller	44 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.89E-02	2.67E-01	3.50E-02	2.96E-04	6.16E-03	3.68E-03
	3/4 ton pickup					0	-	-	-	-	-	-
3/4 ton pickup		4	4	2	10	2.06E-03	1.78E-03	2.51E-02	3.58E-05	2.92E-04	1.31E-04	
<b>Total</b>						<b>1.13E+00</b>	<b>4.21E+00</b>	<b>2.71E+01</b>	<b>8.70E-03</b>	<b>1.78E-01</b>	<b>1.60E-01</b>	



Construction Equipment - Upstream Barriers - Year 2  
Alternative 3

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Annual Emissions - 2021 (tons per year)											Metric Tons	
			4/1-21	4/22-5/12	5/13-6/2		GWP											CO2e/yr	CO2/yr
							15	15	15	CC2 & LV1	CC2 & LV2	CC3	1	21	310				
Water Control - Installation	Flatbed Truck		4	4	4	12	5.20E-05	5.98E-05	7.17E-04	7.99E-07	6.23E-06	2.64E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01		
	Crane 44'	80 hp	2,222	1,777	1,333	5,332	7.29E-05	7.77E-04	6.09E-04	1.04E-06	5.40E-05	4.96E-05	8.91E-02	7.99E-06	-	8.92E-02	8.10E-02		
	Loader/Backhoe	75 hp	5,248	2,624	2,624	10,496	7.82E-05	9.58E-04	1.11E-03	1.99E-06	5.65E-05	5.19E-05	1.70E-01	1.01E-05	-	1.70E-01	1.54E-01		
	Tractor/crawler/dozer	250 hp	10,958	5,625	5,625	16,583	5.55E-04	8.49E-03	3.21E-03	1.55E-05	3.20E-04	2.94E-04	1.38E+00	8.40E-05	-	1.38E+00	1.25E+00		
Water Control - Removal	Tractor/crawler/dozer	250 hp	2,769	2,769		5,538	4.27E-05	3.05E-04	8.11E-05	6.49E-07	1.13E-05	5.97E-06	1.30E-01	3.11E-07	2.93E-07	1.30E-01	1.18E-01		
	Water pump	3.5 hp	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-		
	Flatbed Truck		4	4	4	12	5.20E-05	5.98E-05	7.17E-04	7.99E-07	6.23E-06	2.64E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01		
	Crane 44'	80 hp	2,222	1,777	1,333	5,332	7.29E-05	7.77E-04	6.09E-04	1.04E-06	5.40E-05	4.96E-05	8.91E-02	7.99E-06	-	8.92E-02	8.10E-02		
Clear & Grub	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	4	4		8	2.68E-04	4.10E-03	1.55E-03	7.47E-06	1.54E-04	1.42E-04	6.64E-01	4.05E-05	-	6.65E-01	6.03E-01		
	Truck		2,769			2,769	2.13E-05	1.52E-04	4.05E-05	3.24E-07	5.64E-06	2.99E-06	6.50E-02	1.56E-07	1.47E-07	6.51E-02	5.90E-02		
	Brush chipper	170 hp	28,235	14,132	14,117	56,482	1.69E-03	1.30E-02	1.91E-02	4.07E-05	6.14E-04	5.65E-04	3.61E+00	1.52E-04	-	3.62E+00	3.28E+00		
	Crane 50'	200 hp	9,411			9,411	1.73E-04	2.45E-03	9.05E-04	4.75E-06	9.96E-05	9.16E-05	4.22E-01	2.28E-05	-	4.22E-01	3.83E-01		
	Man lift	210 hp	9,411	9,411	9,411	28,235	4.16E-04	3.57E-03	2.23E-03	1.24E-05	1.12E-04	1.03E-04	1.26E+00	3.76E-05	-	1.26E+00	1.14E+00		
	Loader	190 hp	28,235	14,266		42,500	1.08E-03	1.65E-02	6.26E-03	3.02E-05	6.22E-04	5.73E-04	2.68E+00	1.64E-04	-	2.68E+00	2.44E+00		
	Chainsaw		56,470		28,235	112,942	7.62E-03	1.19E-04	1.38E-02	1.54E-06	2.17E-05	2.17E-05	3.73E-02	4.74E-04	4.09E-05	5.99E-02	5.44E-02		
	1 ton pickup			0,176		0,176	2.68E-08	4.01E-08	3.71E-07	1.19E-09	9.25E-09	3.97E-09	3.95E-04	3.93E-08	2.05E-08	4.02E-04	3.65E-04		
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Front end loader	540 hp		0,148		0,148	7.15E-07	8.42E-06	5.36E-06	2.60E-08	3.26E-07	3.00E-07	2.58E-03	1.22E-07	-	2.59E-03	2.35E-03		
	Tractor/crawler/dozer	310 hp		0,148		0,148	5.08E-07	7.11E-06	2.95E-06	1.47E-08	2.89E-07	2.57E-07	1.19E-03	6.90E-08	-	1.19E-03	1.08E-03		
Demolition	Dump truck	20cy/24 ton				0,148	1.15E-06	8.19E-06	2.19E-06	1.74E-08	3.03E-07	1.60E-07	3.48E-03	8.36E-09	7.87E-09	3.48E-03	3.17E-03		
	Air Compressor	250 hp	3,302	3,302		6,606	2.07E-04	1.44E-03	8.46E-04	4.87E-06	4.66E-05	4.28E-05	4.33E-01	1.86E-05	-	4.33E-01	3.93E-01		
	Air Compressor	50 hp				0	-	-	-	-	-	-	-	-	-	-	-		
	Crane 126'	350 hp				0	-	-	-	-	-	-	-	-	-	-	-		
	Crane 50'	263 hp	3,302	3,302		6,606	1.35E-04	1.90E-03	6.50E-04	3.07E-06	7.64E-05	7.03E-05	3.13E-01	1.62E-05	-	3.13E-01	2.84E-01		
	Crane 210'	230 hp				0	-	-	-	-	-	-	-	-	-	-	-		
	Excavator	115 hp	128	32	48	208	2.29E-03	2.87E-02	4.95E-02	8.60E-05	1.62E-03	1.49E-03	7.33E+00	4.88E-04	-	7.34E+00	6.66E+00		
	Excavator	430 hp	80	32	48	160	3.42E-03	3.86E-02	3.14E-02	1.58E-04	1.29E-03	1.19E-03	1.61E+01	7.05E-04	-	1.61E+01	1.46E+01		
	Loader	190 hp	112	64	48	224	5.70E-03	8.72E-02	3.30E-02	1.59E-04	3.28E-03	3.02E-03	1.41E+01	8.62E-04	-	1.41E+01	1.28E+01		
	Front end loader	180 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Road Realignment	Tractor/crawler/dozer	250 hp	20,745	5,413	5,413	31,574	1.06E-03	1.62E-02	6.12E-03	2.95E-05	6.08E-04	5.60E-04	2.62E+00	1.60E-04	-	2.62E+00	2.38E+00	
3/4 ton pickup			112	64	48	224	6.74E-04	6.41E-04	8.28E-03	1.50E-05	1.20E-04	5.31E-05	5.03E+00	5.00E-04	2.61E-04	5.12E+00	4.64E+00		
Chainsaw			3,302	3,302		6,606	4.46E-04	6.99E-06	8.07E-04	8.98E-08	1.27E-06	1.27E-06	2.18E-03	2.77E-05	2.39E-06	3.50E-03	3.18E-03		
Vibratory roller		145 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Vibrating compactor		5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Vibrating compactor		7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Truck			14,31	3,735	3,735	21,78	4.73E-05	2.94E-04	2.10E-04	5.35E-07	1.99E-05	1.83E-05	3.44E-02	3.61E-06	-	3.45E-02	3.13E-02		
Asphalt distributor		3000 gal	39,657	6,174	6,174	52,007	4.01E-04	2.86E-03	7.61E-04	6.09E-06	1.06E-04	5.61E-05	1.22E+00	2.92E-06	2.75E-06	1.22E+00	1.11E+00		
Suburban		3/4 ton	4,085	1,067	1,067	6,222	4.80E-05	3.43E-04	9.11E-05	7.29E-07	1.27E-05	6.71E-06	1.46E-01	3.50E-07	3.29E-07	1.46E-01	1.33E-01		
Truck		35 ton	4	4	4	12	5.20E-05	5.98E-05	7.17E-04	7.99E-07	6.23E-06	2.64E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01		
Bridge Installation		Truck	75 ton				0	-	-	-	-	-	-	-	-	-	-	-	-
		Suburban	3/4 ton	18,826	9,411	9,411	37,647	1.13E-04	1.08E-04	1.39E-03	2.53E-06	2.02E-05	8.92E-06	8.45E-01	8.40E-05	4.38E-05	8.60E-01	7.80E-01	
	Crane 210'	230 hp	18,826			18,826	3.97E-04	5.64E-03	2.08E-03	1.09E-05	2.29E-04	2.11E-04	9.70E-01	5.20E-05	-	9.71E-01	8.81E-01		
	Crane 210'	430 hp	18,826	18,826	18,826	56,470	1.88E-03	2.65E-02	9.09E-03	4.29E-05	1.07E-03	9.83E-04	4.37E+00	2.27E-04	-	4.37E+00	3.97E+00		
	3/4 ton pickup		37,647	18,826	18,826	75,294	2.27E-04	2.15E-04	2.78E-03	5.06E-06	4.05E-05	1.78E-05	1.69E+00	1.68E-04	8.76E-05	1.72E+00	1.56E+00		
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	430 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	-	-	-	-	-	-	
	Generator	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Highway Replacement	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-
		Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-
		Truck					0	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt distributor		3000 gal				0	-	-	-	-	-	-	-	-	-	-	-	-	
Asphalt paver		120 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Vibrating roller/compactor		33 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Chip spreader truck						0	-	-	-	-	-	-	-	-	-	-	-	-	
Line striper		23 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Flatbed Truck						0	-	-	-	-	-	-	-	-	-	-	-	-	
3/4 ton pickup						0	-	-	-	-	-	-	-	-	-	-	-	-	
Abutments		Roto trowel concrete finisher	9 hp	35,294	11,764	11,764	58,825	6.44E-05	1.93E-04	4.97E-03	1.51E-06	1.21E-05	1.21E-05	1.52E-01	3.67E-06	1.24E-05	1.56E-01	1.41E-01	
		Crane 80'	130 hp	11,764	5,882	5,882	23,526	4.00E-04	4.97E-03	4.15E-03	7.89E-06	2.65E-04	2.44E-04	7.02E-01	4.73E-05	-	7.03E-01	6.37E-01	
	Crane 114'	430 hp	35,294	11,764	11,764	58,825	1.98E-03	2.77E-02	9.47E-03	4.47E-05	1.11E-03	1.02E-03	4.55E+00	2.98E-04	-	4.56E+00	4.13E+00		
	Auger drill	100 hp	11,764	5,882	5,882	23,526	2.34E-04	3.57E-03	4.57E-03	8.86E-06	1.71E-04	1.57E-04	7.55E-01	2.38E-05	-	7.56E-01	6.86E-01		
	Water pump	80 hp	11,764	5,882	5,882	23,526	3.80E-04	3.18E-03	3.67E-03	7.17E-06	1.78E-04	1.63E-04	6.11E-01	3.43E-05	-	6.12E-01	5.55E-01		
	Excavator	430 hp	18,826	9,411	9,411	37,647	8.05E-04	9.08E-03	7.38E-03	3.71E-05	3.04E-04	2.79E							

**Construction Equipment - Upstream Barriers - Year 2  
Alternative 3**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC2 & LV1) - 2021 (pounds per day)						Peak Daily Emissions (CC2 & LV2) - 2021 (pounds per day)													
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5								
																			days per const							
			15			15			15																	
			CC2 & LV1			CC2 & LV2			CC3																	
<b>Water Control - Installation</b>	Flatbed Truck		4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04		
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	8.10E-03	8.63E-02	6.77E-02	1.16E-04	6.00E-03	5.52E-03	6.48E-03	6.90E-02	5.41E-02	9.29E-05	4.80E-03	4.41E-03	6.48E-03	6.90E-02	5.41E-02	9.29E-05	4.80E-03	4.41E-03		
	Loader/Backhoe	75 hp	5,248	2,624	2,624	10,496	1.04E-02	1.28E-01	1.48E-01	2.65E-04	7.53E-03	6.93E-03	5.21E-03	6.38E-02	7.42E-02	1.33E-04	3.76E-03	3.46E-03	5.21E-03	6.38E-02	7.42E-02	1.33E-04	3.76E-03	3.46E-03		
	Tractor/crawler/dozer	250 hp	10,9583	5,625	5,625	16,5833	9.79E-02	1.50E+00	5.67E-01	2.73E-03	5.63E-02	5.18E-02	5.02E-02	7.69E-01	2.91E-01	1.40E-03	2.89E-02	2.66E-02	5.02E-02	7.69E-01	2.91E-01	1.40E-03	2.89E-02	2.66E-02		
	Truck		2,7692	2,7692		5,5384	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04		
	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Water Control - Removal</b>	Flatbed Truck		4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04		
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	8.10E-03	8.63E-02	6.77E-02	1.16E-04	6.00E-03	5.52E-03	6.48E-03	6.90E-02	5.41E-02	9.29E-05	4.80E-03	4.41E-03	6.48E-03	6.90E-02	5.41E-02	9.29E-05	4.80E-03	4.41E-03		
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Truck		4	4		8	3.57E-02	5.46E-01	2.07E-01	9.96E-04	2.08E-02	1.89E-02	3.57E-02	5.46E-01	2.07E-01	9.96E-04	2.08E-02	1.89E-02	3.57E-02	5.46E-01	2.07E-01	9.96E-04	2.08E-02	1.89E-02		
	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Brush chipper	170 hp	28,2352			2,7692	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04		
<b>Clear &amp; Grub</b>	Crane 50'	200 hp	9,4118			28,2352	2.25E-01	1.73E+00	2.55E+00	5.42E-03	8.19E-02	7.53E-02	1.12E-01	8.67E-01	1.28E+00	2.71E-03	4.10E-02	3.77E-02	1.12E-01	8.67E-01	1.28E+00	2.71E-03	4.10E-02	3.77E-02		
	Man lift	210 hp	9,4118			28,2354	3.70E-02	3.17E-01	1.98E-01	1.10E-03	9.96E-03	9.16E-03	3.70E-02	3.17E-01	1.98E-01	1.10E-03	9.96E-03	9.16E-03	3.70E-02	3.17E-01	1.98E-01	1.10E-03	9.96E-03	9.16E-03		
	Loader	190 hp	28,2352	14,2656		42,5008	1.91E-01	2.93E+00	1.11E+00	5.34E-03	1.10E-01	1.01E-01	9.67E-02	1.48E+00	5.60E-01	2.70E-03	5.57E-02	5.13E-02	9.67E-02	1.48E+00	5.60E-01	2.70E-03	5.57E-02	5.13E-02		
	Chainsaw		56,4706	28,2353	28,2353	112,9412	1.02E+00	1.59E-02	1.84E+00	2.05E-04	2.89E-03	2.89E-03	5.08E-01	7.96E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03	5.08E-01	7.96E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03		
	1 ton pickup					0.0176	-	-	-	-	-	-	7.14E-06	1.07E-05	9.88E-05	3.16E-07	2.47E-06	1.06E-06	7.14E-06	1.07E-05	9.88E-05	3.16E-07	2.47E-06	1.06E-06		
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Front end loader	540 hp		0.0148		0.0148	-	-	-	-	-	-	1.91E-04	2.24E-03	1.43E-03	6.93E-06	8.70E-05	8.00E-05	1.91E-04	2.24E-03	1.43E-03	6.93E-06	8.70E-05	8.00E-05		
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	-	-	-	-	-	-	1.35E-04	1.89E-03	7.89E-04	3.11E-06	7.46E-05	6.86E-05	1.35E-04	1.89E-03	7.89E-04	3.11E-06	7.46E-05	6.86E-05		
	Dump truck	20cy/24 ton		0.1487		0.1487	-	-	-	-	-	-	3.06E-04	2.18E-03	5.81E-04	4.65E-06	8.07E-05	4.27E-05	3.06E-04	2.18E-03	5.81E-04	4.65E-06	8.07E-05	4.27E-05		
<b>Demolition</b>	Air Compressor	250 hp	3,3028	3,3028		6,6056	2.75E-02	1.92E-01	1.13E-01	6.50E-04	6.21E-03	5.71E-03	2.75E-02	1.92E-01	1.13E-01	6.50E-04	6.21E-03	5.71E-03	2.75E-02	1.92E-01	1.13E-01	6.50E-04	6.21E-03	5.71E-03		
	Air Compressor	50 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Crane 126'	350 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Crane 50'	263 hp	3,3028	3,3028		6,6056	1.80E-02	2.53E-01	8.67E-02	4.09E-04	1.02E-02	9.37E-03	1.80E-02	2.53E-01	8.67E-02	4.09E-04	1.02E-02	9.37E-03	1.80E-02	2.53E-01	8.67E-02	4.09E-04	1.02E-02	9.37E-03		
	Crane 210'	230 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Excavator	115 hp	128	32	48	208	3.76E-01	4.71E+00	8.12E+00	1.41E-02	2.65E-01	2.44E-01	9.39E-02	1.18E+00	2.03E+00	3.53E-03	6.64E-02	6.11E-02	9.39E-02	1.18E+00	2.03E+00	3.53E-03	6.64E-02	6.11E-02		
	Excavator	430 hp	80	32	48	160	4.56E-01	5.14E+00	4.18E+00	2.10E-02	1.72E-01	1.58E-01	1.82E-01	2.06E+00	1.67E+00	8.41E-03	6.89E-02	6.33E-02	1.82E-01	2.06E+00	1.67E+00	8.41E-03	6.89E-02	6.33E-02		
	Loader	180 hp	112	64	48	224	7.60E-01	1.16E+01	4.40E+00	2.12E-02	4.37E-01	4.02E-01	4.34E-01	6.64E+00	2.51E+00	1.21E-02	2.50E-01	2.30E-01	4.34E-01	6.64E+00	2.51E+00	1.21E-02	2.50E-01	2.30E-01		
	Front end loader	180 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Tractor/crawler/dozer	250 hp	20,7454	5,413	5,413	31,5714	1.85E-01	2.83E+00	1.07E+00	5.17E-03	1.07E-01	9.81E-02	4.83E-02	7.39E-01	2.80E-01	1.35E-03	2.78E-02	2.56E-02	4.83E-02	7.39E-01	2.80E-01	1.35E-03	2.78E-02	2.56E-02		
	3/4 ton pickup		112	64	48	224	8.99E-02	8.55E-02	1.10E+00	2.01E-03	1.61E-02	7.08E-03	5.14E-02	4.88E-02	6.31E-01	1.12E-03	9.18E-03	4.04E-03	5.14E-02	4.88E-02	6.31E-01	1.12E-03	9.18E-03	4.04E-03		
	Chainsaw		3,3028	3,3028		6,6056	5.95E-02	9.32E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04	5.95E-02	9.32E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04	5.95E-02	9.32E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04		
	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Vibratory compactor	7.5 hp	14,31	3,735	3,735	21,78	8.29E-03	5.15E-02	3.68E-02	9.37E-05	3.48E-03	3.20E-03	2.16E-03	1.34E-02	9.60E-03	2.45E-05	9.08E-04	8.35E-04	2.16E-03	1.34E-02	9.60E-03	2.45E-05	9.08E-04	8.35E-04		
	Truck		39,6577	6,1748	6,1748	52,0073	8.15E-02	5.82E-01	1.55E-01	1.24E-03	2.15E-02	1.14E-02	1.27E-02	9.06E-02	2.41E-02	1.93E-04	3.35E-03	1.78E-03	1.27E-02	9.06E-02	2.41E-02	1.93E-04	3.35E-03	1.78E-03		
	Asphalt distributor	3000 gal	4,0885	1,0671	1,0671	6,2227	8.40E-03	6.00E-02	1.60E-02	1.28E-04	2.22E-03	1.18E-03	2.19E-03	1.57E-02	4.17E-03	3.33E-05	5.79E-04	3.07E-04	2.19E-03	1.57E-02	4.17E-03	3.33E-05	5.79E-04	3.07E-04		
	Suburban	3/4 ton				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Disposal</b>	Truck	35 ton	4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04		
	Truck	75 ton				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
<b>Bridge Installation</b>	Suburban	3/4 ton	18,8236	9,4118	9,4118	37,6472	1.51E-02	1.44E-02	1.86E-01	3.37E-04	2.70E-03	1.19E-03	7.56E-03	7.18E-03	9.28E-02	1.69E-04	1.35E-03	5.95E-04	7.56E-03	7.18E-03	9.					

**Construction Equipment - Upstream Barriers - Year 2  
Alternative 3**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

15 15 15 days per const  
CC2 & LV1 CC2 & LV2 CC3

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC3) - 2021 (pounds per day)					
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5
<b>Water Control - Installation</b>	Flatbed Truck		4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	4.86E-03	5.18E-02	4.06E-02	6.97E-05	3.60E-03	3.31E-03
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	5.21E-03	6.38E-02	7.42E-02	1.33E-04	3.76E-03	3.46E-03
	Tractor/crawler/dozer	250 hp	10.9583	5.625		16.5833	-	-	-	-	-	-
	Truck		2.7692	2.7692		5.5384	-	-	-	-	-	-
	Water pump	3.5 hp				0	-	-	-	-	-	-
<b>Water Control - Removal</b>	Flatbed Truck		4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	4.86E-03	5.18E-02	4.06E-02	6.97E-05	3.60E-03	3.31E-03
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				8	-	-	-	-	-	-
	Truck		4	4		2.7692	-	-	-	-	-	-
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	1.12E-01	8.66E-01	1.27E+00	2.71E-03	4.09E-02	3.77E-02
	Crane 50'	200 hp	9.4118			9.4118	-	-	-	-	-	-
	Man lift	210 hp	9.4118	9.4118		18.8236	3.70E-02	3.17E-01	1.98E-01	1.10E-03	9.96E-03	9.16E-03
	Loader	190 hp	28.2352	14.2656		42.5008	-	-	-	-	-	-
	Chainsaw		56.4706	28.2353	28.2353	112.9412	5.08E-01	7.96E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03
	1 ton pickup			0.0176		0.0176	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Front end loader	540 hp		0.0148		0.0148	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	-	-	-	-	-	-
	Dump truck	23cy/24 ton		0.1487		0.1487	-	-	-	-	-	-
<b>Demolition</b>	Air Compressor	250 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
	Air Compressor	50 hp				0	-	-	-	-	-	-
	Crane 126'	350 hp				0	-	-	-	-	-	-
	Crane 50'	263 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
	Crane 210'	230 hp				0	-	-	-	-	-	-
	Excavator	115 hp	128	32	48	208	1.41E-01	1.77E+00	3.04E+00	5.29E-03	9.95E-02	9.16E-02
	Excavator	430 hp	80	32	48	160	2.74E-01	3.09E+00	2.51E+00	1.26E-02	1.03E-01	9.50E-02
	Loader	180 hp	112	64	48	224	3.26E-01	4.98E+00	1.89E+00	9.08E-03	1.87E-01	1.72E-01
	Front end loader	180 hp				0	-	-	-	-	-	-
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
<b>Road Realignment</b>	Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	4.83E-02	7.39E-01	2.80E-01	1.35E-03	2.78E-02	2.56E-02
	3/4 ton pickup		112	64	48	224	3.85E-02	3.66E-02	4.73E-01	8.60E-04	6.88E-03	3.03E-03
	Chainsaw		3.3028	3.3028		6.6056	-	-	-	-	-	-
	Vibratory roller	145 hp				0	-	-	-	-	-	-
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-
	Vibrating compactor	7.5 hp	14.31	3.735	3.735	21.78	2.16E-03	1.34E-02	9.60E-03	2.45E-05	9.08E-04	8.35E-04
	Truck		39.6577	6.1748	6.1748	52.0073	1.27E-02	9.06E-02	2.41E-02	1.93E-04	3.35E-03	1.78E-03
	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	2.19E-03	1.57E-02	4.17E-03	3.33E-05	5.79E-04	3.07E-04
	Suburban	3/4 ton				0	-	-	-	-	-	-
	Truck	35 ton	4	4	4	12	4.63E-03	5.31E-03	6.38E-02	7.10E-05	5.54E-04	2.34E-04
<b>Bridge Installation</b>	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	7.56E-03	7.18E-03	9.28E-02	1.69E-04	1.35E-03	5.95E-04
	Crane 210'	230 hp	18.8235			18.8235	-	-	-	-	-	-
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	1.67E-01	2.36E+00	8.08E-01	3.81E-03	9.49E-02	8.73E-02
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	1.51E-02	1.44E-02	1.86E-01	3.37E-04	2.70E-03	1.19E-03
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
<b>Highway Replacement</b>	Excavator	430 hp				0	-	-	-	-	-	-
	Truck					0	-	-	-	-	-	-
	Generator	7.5 hp				0	-	-	-	-	-	-
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Truck					0	-	-	-	-	-	-
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-
	Asphalt paver	120 hp				0	-	-	-	-	-	-
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-
	Chip spreader truck					0	-	-	-	-	-	-
<b>Abutments</b>	Line striper	23 hp				0	-	-	-	-	-	-
	Flatbed Truck					0	-	-	-	-	-	-
	3/4 ton pickup					0	-	-	-	-	-	-
	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	3.43E-03	1.03E-02	2.65E-01	8.05E-05	6.45E-04	6.44E-04
	Crane 80'	130 hp	11.7648	5.8824	5.8824	23.5296	2.67E-02	3.31E-01	2.77E-01	5.26E-04	1.77E-02	1.63E-02
<b>Landscaping</b>	Crane 114'	430 hp	35.2941	11.7647	11.7647	58.8235	1.05E-01	1.47E+00	5.05E-01	2.38E-03	5.93E-02	5.46E-02
	Auger drill	100 hp	11.7648	5.8824	5.8824	23.5296	1.56E-02	2.38E-01	3.04E-01	5.91E-04	1.14E-02	1.05E-02
	Water pump	80 hp	11.7648	5.8824	5.8824	23.5296	2.53E-02	2.12E-01	2.45E-01	4.78E-04	1.18E-02	1.09E-02
	Excavator	430 hp	18.8236	9.4118	9.4118	37.6472	5.37E-02	6.05E-01	4.92E-01	2.47E-03	2.03E-02	1.86E-02
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	1.87E-02	2.29E-01	2.66E-01	4.75E-04	1.35E-02	1.24E-02
	Loader/Backhoe	92 hp		9.4118		9.4118	-	-	-	-	-	-
	Vibratory roller	44 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.93E-02	1.38E-01	3.87E-02	2.94E-04	5.11E-03	2.71E-03
	3/4 ton pickup					0	-	-	-	-	-	-
3/4 ton pickup			2		2	-	-	-	-	-	-	
<b>Total</b>						<b>1.99E+00</b>	<b>1.77E+01</b>	<b>1.44E+01</b>	<b>4.55E-02</b>	<b>7.33E-01</b>	<b>6.65E-01</b>	

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/1/2018
Birthdays of ML	1/15/2018
Washington's	2/19/2018
Memorial Day	5/29/2018
Independence	7/4/2018
Labor Day	9/3/2018
Columbus Day	10/8/2018
Veterans Day	11/12/2018
Thanksgiving	11/22/2018
Christmas Day	12/25/2018

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<http://beta.com.gov/policy-data-oversight/snow-dismissal-procedures-federal-holidays/#url=2018>



**Construction Equipment - Upstream Barriers - Year 2  
Alternative 3**

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (LV2 - Yr 2) - 2021 (pounds per day)								
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5			
													15	15	15
			CC2 & LV1	CC2 & LV2	CC3										
<b>Water Control - Installation</b>	Flatbed Truck		4	4	4	12	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	2,222	1,777	1,333	5,332	1.62E-03	1.73E-02	1.35E-02	2.32E-05	1.20E-03	1.10E-03	-	-	
	Loader/Backhoe	75 hp	5,248	2,624	2,624	10,496	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	10,958	5,625	5,625	16,583	5.02E-02	7.68E-01	2.91E-01	1.40E-03	2.89E-02	2.66E-02	-	-	
	Truck		2,762	2,762		5,524	5.69E-03	4.07E-02	1.08E-02	8.65E-05	1.50E-03	7.96E-04	-	-	
<b>Water Control - Removal</b>	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	
	Flatbed Truck		4	4	4	12	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	2,222	1,777	1,333	5,332	1.62E-03	1.73E-02	1.35E-02	2.32E-05	1.20E-03	1.10E-03	-	-	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	4	4		8	3.57E-02	5.46E-01	2.07E-01	9.96E-04	2.06E-02	1.89E-02	-	-	
<b>Clear &amp; Grub</b>	Truck		2,762			2,762	-	-	-	-	-	-	-	-	
	Brush chipper	170 hp	28,235	14,118	14,118	56,472	1.18E-04	9.08E-04	1.34E-03	2.84E-06	4.29E-05	3.95E-05	-	-	
	Crane 50'	200 hp	9,411			9,411	-	-	-	-	-	-	-	-	
	Man lift	210 hp	9,411			9,411	-	-	-	-	-	-	-	-	
	Loader	190 hp	28,235	14,266	14,266	42,500	1.01E-04	1.55E-03	5.87E-04	2.83E-06	5.83E-05	5.37E-05	-	-	
	Chainsaw		56,476		28,235	112,942	-	-	-	-	-	-	-	-	
	1 ton pickup			0,017		0,017	7.14E-06	1.07E-05	9.88E-05	3.16E-07	2.47E-06	1.06E-06	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Front end loader	540 hp		0,014		0,014	1.91E-04	2.24E-03	1.43E-03	6.93E-06	8.70E-05	8.00E-05	-	-	
	Tractor/crawler/dozer	310 hp		0,014		0,014	1.35E-04	1.89E-03	7.89E-04	3.11E-06	7.46E-05	6.86E-05	-	-	
	Dump truck	20cy/24 ton		0,148		0,148	3.06E-04	2.18E-03	5.81E-04	4.65E-06	8.07E-05	4.27E-05	-	-	
	<b>Demolition</b>	Air Compressor	250 hp	3,302	3,302		6,606	-	-	-	-	-	-	-	-
Air Compressor		50 hp				0	-	-	-	-	-	-	-	-	
Crane 126'		350 hp				0	-	-	-	-	-	-	-	-	
Crane 50'		263 hp	3,302	3,302		6,606	-	-	-	-	-	-	-	-	
Crane 210'		230 hp				0	-	-	-	-	-	-	-	-	
Excavator		115 hp	128	32	48	208	9.39E-02	1.18E+00	2.03E+00	3.53E-03	6.64E-02	6.11E-02	-	-	
Excavator		430 hp	80	32	48	160	9.12E-02	1.03E+00	8.36E-01	4.21E-03	3.44E-02	3.17E-02	-	-	
Loader		180 hp	112	64	48	224	1.09E-01	1.66E+00	6.29E-01	3.03E-03	6.25E-02	5.75E-02	-	-	
Front end loader		180 hp				0	-	-	-	-	-	-	-	-	
Loader/Backhoe		75 hp				0	-	-	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	20,745	5,413	5,413	31,571	-	-	-	-	-	-	-	-	
3/4 ton pickup			112	64	48	224	1.28E-02	1.22E-02	1.68E-01	2.87E-04	2.29E-03	1.01E-03	-	-	
Chainsaw			3,302	3,302		6,606	-	-	-	-	-	-	-	-	
<b>Road Realignment</b>		Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-
		Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-
	Vibratory compactor	7.5 hp				0	-	-	-	-	-	-	-	-	
	Truck		14,31	3,735	3,735	21,78	-	-	-	-	-	-	-	-	
	Truck		39,657	6,174	6,174	52,007	-	-	-	-	-	-	-	-	
<b>Disposal</b>	Asphalt distributor	3000 gal	4,085	1,067	1,067	6,222	-	-	-	-	-	-	-	-	
	Suburban	3/4 ton				0	-	-	-	-	-	-	-	-	
	Truck	35 ton	4	4	4	12	-	-	-	-	-	-	-	-	
<b>Bridge Installation</b>	Truck	75 ton				0	-	-	-	-	-	-	-	-	
	Suburban	3/4 ton	18,826	9,411	9,411	37,642	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp	18,826			18,826	-	-	-	-	-	-	-	-	
	Crane 270'	430 hp	18,826	18,826	18,826	56,476	-	-	-	-	-	-	-	-	
	3/4 ton pickup		37,647	18,826	18,826	75,299	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Excavator	430 hp				0	-	-	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	-	-	
	Generator	7.5 hp				0	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	
<b>Highway Replacement</b>	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp				0	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-	-	-	
	Chip spreader truck					0	-	-	-	-	-	-	-	-	
	Line striper	23 hp				0	-	-	-	-	-	-	-	-	
	Flatbed Truck					0	-	-	-	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	
	<b>Abutments</b>	Roto trowel concrete finisher	9 hp	35,294	11,764	11,764	58,826	-	-	-	-	-	-	-	-
Crane 80'		130 hp	11,764	5,882	5,882	23,529	-	-	-	-	-	-	-	-	
Crane 114'		430 hp	35,294	11,764	11,764	58,826	-	-	-	-	-	-	-	-	
Auger drill		100 hp	11,764	5,882	5,882	23,529	-	-	-	-	-	-	-	-	
Water pump		80 hp	11,764	5,882	5,882	23,529	-	-	-	-	-	-	-	-	
Excavator		430 hp	18,826	9,411	9,411	37,642	-	-	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	18,826	18,826	18,826	56,476	1.87E-02	2.29E-01	2.66E-01	4.75E-04	1.35E-02	1.24E-02	-	-	
<b>Landscaping</b>	Loader/Backhoe	75 hp	18,826	18,826	18,826	56,476	2.29E-02	2.81E-01	3.26E-01	5.83E-04	1.66E-02	1.52E-02	-	-	
	Loader/Backhoe	92 hp	9,411	9,411	9,411	28,235	-	-	-	-	-	-	-	-	
	Vibratory roller	44 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Dump truck	12 cy	18,826	18,826	18,826	56,476	1.93E-02	1.38E-01	3.67E-02	2.94E-04	5.11E-03	2.71E-03	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	
	3/4 ton pickup			2		2	1.61E-03	1.53E-03	1.97E-02	3.58E-05	2.87E-04	1.26E-04	-	-	
	<b>Total</b>						<b>4.65E-01</b>	<b>5.93E+00</b>	<b>4.84E+00</b>	<b>1.50E-02</b>	<b>2.55E-01</b>	<b>2.30E-01</b>			

**Construction Equipment - Upstream Barriers - Year 3  
Alternative 3**

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	50		15		Emission Factors - 2023 (g/hp-hr or g/hr)									
			LV3 & LV4		LV2		Annual Hours	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
			4/1-6/9	6/10-6/30	4/1-6/9	6/10-6/30										
<b>Water Control - Installation</b>	Flatbed Truck						0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135
	Crane 44'	80 hp	49.6732	0.4444			50.1176	0.131	1.404	1.284	0.002	0.093	0.086	189.389	0.015	0.000
	Loader/Backhoe	75 hp	34.624				34.624	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000
	Tractor/crawler/dozer	250 hp	127.6318	4			131.6318	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Truck		34.1719	2.7692			36.9411	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Water pump	3.5 hp				0	4.687	2.102	56.571	0.006	0.058	0.058	177.791	0.267	0.301	
<b>Water Control - Removal</b>	Flatbed Truck						0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135
	Crane 44'	80 hp		0.4444			0.4444	0.131	1.404	1.284	0.002	0.093	0.086	189.389	0.015	0.000
	Loader/Backhoe	75 hp	32				32	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000
	Tractor/crawler/dozer	250 hp	8.7059	4			12.7059	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Truck		34.1719				34.1719	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	5.9294	0.0074			5.9368	0.139	0.961	1.806	0.004	0.045	0.041	341.375	0.013	0.000
	Crane 50'	200 hp					0	0.071	0.930	0.427	0.002	0.039	0.036	203.318	0.010	0.000
	Man lift	210 hp					0	0.058	0.430	0.338	0.002	0.013	0.012	192.930	0.005	0.000
	Loader	190 hp	5.9294	0.0074			5.9368	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Chainsaw		5.8824	0.0147			5.8971	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
	1 ton pickup		0.0088	0.0088			0.0088	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	5.8824	0.0147			5.8971	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Front end loader	540 hp	5.9294	0.0074			5.9368	0.068	0.697	0.590	0.003	0.027	0.025	293.384	0.013	0.000
	Tractor/crawler/dozer	310 hp	5.9294	0.0074			5.9368	0.085	1.062	0.554	0.002	0.044	0.040	234.962	0.012	0.000
	Dump truck	20cy/24 ton	59.4635	0.0743			59.5378	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	<b>Demolition</b>	Air Compressor	250 hp					0	0.103	0.605	0.461	0.003	0.020	0.018	237.872	0.009
Air Compressor		50 hp					0	0.782	0.953	52.049	0.004	0.024	0.023	307.059	0.045	0.064
Crane 126'		350 hp					0	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000
Crane 50'		263 hp					0	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000
Crane 210'		230 hp					0	0.071	0.930	0.427	0.002	0.039	0.036	203.318	0.010	0.000
Excavator		115 hp		40			40	0.073	0.909	1.870	0.003	0.044	0.041	278.045	0.017	0.000
Excavator		430 hp	80	20			100	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000
Loader		190 hp		20			20	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
Front end loader		180 hp					0	0.063	0.745	0.558	0.003	0.025	0.023	270.061	0.012	0.000
Loader/Backhoe		75 hp	350				350	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000
Tractor/crawler/dozer		250 hp	50.068				50.068	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
3/4 ton pickup			72	20			92	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
Chainsaw							0	7.291	0.114	13.187	0.001	0.021	0.021	35.644	0.453	0.039
<b>Road Realignment</b>		Vibratory roller	145 hp	19.0893				19.0893	0.046	0.557	1.580	0.003	0.025	0.023	280.063	0.015
	Vibrating compactor	5.5 hp	5.1724				5.1724	1.926	1.423	73.677	0.004	1.056	1.054	125.971	0.110	0.147
	Vibratory compactor	7.5 hp					0	0.205	1.471	1.166	0.003	0.079	0.073	190.952	0.020	0.000
	Truck		372.9363				372.9363	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Asphalt distributor	3000 gal	22.9363				22.9363	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
<b>Disposal</b>	Suburban	3/4 ton					0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
	Truck	35 ton					0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135
	Truck	75 ton					0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
<b>Bridge Installation</b>	Suburban	3/4 ton					0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
	Crane 210'	230 hp					0	0.071	0.930	0.427	0.002	0.039	0.036	203.318	0.010	0.000
	Crane 270'	430 hp					0	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000
	3/4 ton pickup						0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
	Tractor/crawler/dozer	250 hp					0	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Excavator	430 hp					0	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000
	Truck						0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Generator	7.5 hp					0	1.898	1.356	102.593	0.005	0.092	0.092	175.215	0.108	0.143
<b>Highway Replacement</b>	Vibrating compactor	5.5 hp					0	1.926	1.423	73.677	0.004	1.056	1.054	125.971	0.110	0.147
	Tractor/crawler/dozer	250 hp					0	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Truck						0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Asphalt distributor	3000 gal					0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Asphalt paver	120 hp					0	0.120	1.423	1.788	0.003	0.094	0.086	261.328	0.026	0.000
	Vibrating roller/compactor	33 hp					0	0.366	1.695	2.095	0.003	0.080	0.074	235.507	0.033	0.000
	Chip spreader truck						0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Line stripper	23 hp					0	0.110	0.330	8.518	0.003	0.021	0.021	260.327	0.006	0.021
	Flatbed Truck						0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135
	3/4 ton pickup						0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
<b>Abutments</b>	Roto trowel concrete finisher	9 hp					0	0.110	0.330	8.518	0.003	0.021	0.021	260.327	0.006	0.021
	Crane 80'	130 hp					0	0.101	1.216	1.229	0.002	0.064	0.059	208.066	0.012	0.000
	Crane 114'	430 hp					0	0.056	0.723	0.327	0.002	0.029	0.027	163.241	0.008	0.000
	Auger drill	100 hp					0	0.078	1.184	1.760	0.003	0.051	0.047	291.259	0.009	0.000
	Water pump	80 hp					0	0.158	1.313	1.763	0.003	0.066	0.060	294.384	0.014	0.000
<b>Landscaping</b>	Excavator	430 hp	144.7059				144.7059	0.039	0.341	0.410	0.002	0.012	0.011	211.854	0.008	0.000
	Loader/Backhoe	75 hp	8	9.4118			17.4118	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000
	Loader/Backhoe	92 hp		9.4118			9.4118	0.073	0.894	1.278	0.002	0.044	0.041	195.356	0.010	0.000
	Vibratory roller	44 hp	144.7059				144.7059	0.366	1.695	2.095	0.003	0.080	0.074	235.507	0.033	0.000
	Tractor/crawler/dozer	250 hp	144.7059				144.7059	0.098	1.367	0.680	0.003	0.053	0.049	301.159	0.017	0.000
	Dump truck	12 cy	8	9.4118			17.4118	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	3/4 ton pickup		181.1765				181.1765	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056
3/4 ton pickup		8	2			10	2.041	2.								





**Construction Equipment - Upstream Barriers - Year 3  
Alternative 3**

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	50 15		Annual Hours	Peak Daily Emissions (LV3 & LV4) - 2023 (pounds per day)						Peak Daily Emissions (LV2) - 2023 (pounds per day)								
			LV3 & LV4			LV3 & LV4						LV2								
			4/1-6/9	6/10-6/30		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5			
<b>Water Control - Installation</b>	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 44'	80 hp	49.6732	0.4444	50.1176	4.60E-02	4.92E-01	4.50E-01	7.79E-04	3.26E-02	3.00E-02	1.37E-03	1.47E-02	1.34E-02	2.32E-05	9.72E-04	8.94E-04	-	-	-
	Loader/Backhoe	75 hp	34.624		34.624	1.67E-02	2.05E-01	2.93E-01	5.25E-04	1.01E-02	9.30E-03	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	2.75E-01	3.85E+00	1.91E+00	9.53E-03	1.49E-01	1.37E-01	2.88E-02	4.02E-01	2.00E-01	9.96E-04	1.56E-02	1.43E-02	-	-	-
	Truck		34.1719	2.7692	36.9411	1.92E-02	7.49E-02	3.64E-02	3.18E-04	5.43E-03	2.82E-03	5.18E-03	2.02E-02	9.83E-03	8.59E-05	1.47E-03	7.62E-04	-	-	-
	Water pump	3.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Water Control - Removal</b>	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 44'	80 hp		0.4444	0.4444	-	-	-	-	-	-	1.37E-03	1.47E-02	1.34E-02	2.32E-05	9.72E-04	8.94E-04	-	-	-
	Loader/Backhoe	75 hp	32		32	1.54E-02	1.89E-01	2.71E-01	4.85E-04	9.34E-03	8.59E-03	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	1.88E-02	2.62E-01	1.30E-01	6.50E-04	1.02E-02	9.36E-03	2.88E-02	4.02E-01	2.00E-01	9.96E-04	1.56E-02	1.43E-02	-	-	-
	Truck		34.1719		34.1719	1.92E-02	7.49E-02	3.64E-02	3.18E-04	5.43E-03	2.82E-03	-	-	-	-	-	-	-	-	-
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	5.9294	0.0074	5.9368	1.23E-02	8.55E-02	1.61E-01	3.41E-04	3.98E-03	3.66E-03	5.13E-05	3.55E-04	6.68E-04	1.42E-06	1.66E-05	1.52E-05	-	-	-
	Crane 50'	200 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Man lift	210 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Loader	190 hp	5.9294	0.0074	5.9368	9.73E-03	1.36E-01	6.75E-02	3.37E-04	5.27E-03	4.84E-03	4.05E-05	5.66E-04	2.81E-04	1.40E-06	2.19E-05	2.02E-05	-	-	-
	Chainsaw		5.8824		0.0147	3.18E-02	4.98E-04	5.75E-02	6.40E-06	9.04E-05	9.02E-05	2.65E-04	4.15E-06	4.79E-04	5.33E-08	7.53E-07	7.52E-07	-	-	-
	1 ton pickup				0.0088	-	-	-	-	-	-	2.46E-06	4.42E-06	3.59E-05	1.58E-07	1.22E-06	5.14E-07	-	-	-
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	1.27E-02	1.77E-01	8.81E-02	4.39E-04	6.87E-03	6.32E-03	1.06E-04	1.48E-03	7.34E-04	3.66E-06	5.73E-05	5.27E-05	-	-	-
	Front end loader	540 hp	5.9294	0.0074	5.9368	1.91E-02	1.97E-01	1.66E-01	8.33E-04	7.61E-03	7.00E-03	7.95E-05	8.19E-04	6.93E-04	3.46E-06	3.17E-05	2.91E-05	-	-	-
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	1.38E-02	1.72E-01	8.99E-02	3.74E-04	7.07E-03	6.50E-03	5.75E-05	7.16E-04	3.74E-04	1.56E-06	2.94E-05	2.70E-05	-	-	-
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	3.34E-02	1.30E-01	6.33E-02	5.53E-04	9.44E-03	4.91E-03	1.39E-04	5.43E-04	2.64E-04	2.31E-06	3.93E-05	2.04E-05	-	-	-
<b>Demolition</b>	Air Compressor	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Air Compressor	50 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 126'	350 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 50'	263 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 210'	230 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Excavator	115 hp		40	40	-	-	-	-	-	-	9.82E-02	1.23E+00	2.53E+00	4.41E-03	6.00E-02	5.52E-02	-	-	-
	Excavator	430 hp	80	20	100	1.17E-01	1.03E+00	1.24E+00	6.31E-03	3.50E-02	3.22E-02	9.73E-02	8.62E-01	1.04E+00	5.26E-03	2.92E-02	2.68E-02	-	-	-
	Loader	190 hp		20	20	-	-	-	-	-	-	1.09E-01	1.53E+00	7.59E-01	3.78E-03	5.92E-02	5.45E-02	-	-	-
	Front end loader	180 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Loader/Backhoe	75 hp		350	350	1.69E-01	2.07E+00	2.96E+00	5.30E-03	1.02E-01	9.40E-02	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	50.068		50.068	1.08E-01	1.51E+00	7.50E-01	3.74E-03	5.85E-02	5.38E-02	-	-	-	-	-	-	-	-	-
	3/4 ton pickup		72	20	92	1.30E-02	1.41E-02	1.66E-01	3.87E-04	3.05E-03	1.32E-03	1.20E-02	1.30E-02	1.54E-01	3.58E-04	2.83E-03	1.22E-03	-	-	-
	Chainsaw				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Road Realignment</b>	Vibratory roller	145 hp	19.0893		19.0893	1.13E-02	1.36E-01	3.86E-01	7.69E-04	6.20E-03	5.70E-03	-	-	-	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	5.1724		5.1724	4.83E-03	3.57E-03	1.85E-01	9.01E-06	2.65E-03	2.64E-03	-	-	-	-	-	-	-	-	-
	Vibratory compactor	7.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck		372.9363		372.9363	2.09E-01	8.17E-01	3.97E-01	3.47E-03	5.92E-02	3.08E-02	-	-	-	-	-	-	-	-	-
	Asphalt distributor	3000 gal	22.9363		22.9363	1.29E-02	5.03E-02	2.44E-02	2.13E-04	3.64E-03	1.89E-03	-	-	-	-	-	-	-	-	-
	Suburban	3/4 ton			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Disposal</b>	Truck	35 ton			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck	75 ton			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Bridge Installation</b>	Suburban	3/4 ton			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 210'	230 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 270'	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Excavator	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Generator	7.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Highway Replacement</b>	Vibrating compactor	5.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asphalt distributor	3000 gal			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Asphalt paver	120 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Vibrating roller/compactor	33 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chip spreader truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Line stripper	23 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Abutments</b>	Roto trowel concrete finisher	9 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 80'	130 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Crane 114'	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Auger drill	100 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Water pump	80 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Landscaping</b>	Excavator	430 hp	144.7059		144.7059	2.11E-01	1.87E+00	2.25E+00	1.14E-02	6.33E-02	5.82E-02	-	-	-	-	-	-	-	-	-
	Loader/Backhoe	75 hp	8	9.4118	17.4118	3.85E-03	4.73E-02	6.76E-02	1.21E-04	2.34E-03	2.15E-03	1.51E-02	1.86E-01	2.65E-01	4.75E-04	9.16E-03	8.43E-03	-	-	-
	Loader/Backhoe	92 hp		9.4118	9.4118	-	-	-	-	-	-	1.85E-02	2.28E-01	3.25E-01	5.83E-04	1.12E-02				

**Construction Equipment - Upstream Barriers - Year 3  
Alternative 3**

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

50 15  
LV3 & LV4 LV2  
days per const

Activity	Equipment Type	Equipment Size	Hours of Operation 4/1-6/9	Hours of Operation 6/10-6/30	Annual Hours	
<b>Water Control - Installation</b>	Flatbed Truck				0	
	Crane 44'	80 hp	49.6732	0.4444	50.1176	
	Loader/Backhoe	75 hp	34.624		34.624	
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	
	Truck		34.1719	2.7692	36.9411	
	Water pump	3.5 hp			0	
<b>Water Control - Removal</b>	Flatbed Truck				0	
	Crane 44'	80 hp		0.4444	0.4444	
	Loader/Backhoe	75 hp	32		32	
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	
	Truck		34.1719		34.1719	
<b>Clean &amp; Grub</b>	Brush chipper	170 hp	5.9294	0.0074	5.9368	
	Crane 50'	200 hp			0	
	Man lift	210 hp			0	
	Loader	190 hp	5.9294	0.0074	5.9368	
	Chainsaw		5.8824	0.0147	5.8971	
	1 ton pickup			0.0088	0.0088	
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	
	Front end loader	540 hp	5.9294	0.0074	5.9368	
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	
		Air Compressor	250 hp			0
<b>Demolition</b>	Air Compressor	50 hp			0	
	Crane 126'	350 hp			0	
	Crane 50'	263 hp			0	
	Crane 210'	230 hp			0	
	Excavator	115 hp		40	40	
	Excavator	430 hp	80	20	100	
	Loader	190 hp		20	20	
	Front end loader	180 hp			0	
	Loader/Backhoe	75 hp		350	350	
	Tractor/crawler/dozer	250 hp	50.068		50.068	
	3/4 ton pickup		72	20	92	
	Chainsaw				0	
	<b>Road Realignment</b>	Vibratory roller	145 hp	19.0893		19.0893
		Vibrating compactor	5.5 hp	5.1724		5.1724
Vibratory compactor		7.5 hp			0	
Truck			372.9363		372.9363	
Asphalt distributor		3000 gal	22.9363		22.9363	
<b>Disposal</b>	Suburban	3/4 ton			0	
	Truck	35 ton			0	
<b>Bridge Installation</b>	Truck	75 ton			0	
	Suburban	3/4 ton			0	
	Crane 210'	230 hp			0	
	Crane 270'	430 hp			0	
	3/4 ton pickup				0	
	Tractor/crawler/dozer	250 hp			0	
	Excavator	430 hp			0	
	Truck				0	
<b>Highway Replacement</b>	Generator	7.5 hp			0	
	Vibrating compactor	5.5 hp			0	
	Tractor/crawler/dozer	250 hp			0	
	Truck				0	
	Asphalt distributor	3000 gal			0	
	Asphalt paver	120 hp			0	
	Vibrating roller/compactor	33 hp			0	
	Chip spreader truck				0	
	Line stripper	23 hp			0	
	Flatbed Truck				0	
	3/4 ton pickup				0	
<b>Abutments</b>	Rototrowel concrete finisher	9 hp			0	
	Crane 80'	130 hp			0	
	Crane 114'	430 hp			0	
	Auger drill	100 hp			0	
	Water pump	80 hp			0	
	Excavator	430 hp	144.7059		144.7059	
<b>Landscaping</b>	Loader/Backhoe	75 hp	8	9.4118	17.4118	
	Loader/Backhoe	92 hp		9.4118	9.4118	
	Vibratory roller	44 hp	144.7059		144.7059	
	Tractor/crawler/dozer	250 hp	144.7059		144.7059	
	Dump truck	12 cy	8	9.4118	17.4118	
	3/4 ton pickup		181.1765		181.1765	
	3/4 ton pickup		8	2	10	
					<b>Total</b>	

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's 1/1/2019  
Birthdays of 1/21/2019  
Washington 2/18/2019  
Memorial D: 5/27/2019  
Independen 7/4/2019  
Labor Day 9/2/2019  
Columbus C 10/14/2019  
Veterans Da 11/11/2019  
Thanksgivin 11/28/2019  
Christmas C 12/25/2019  
10  
<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**Truck Loading/Unloading Fugitive Dust Emissions**

**Drop Operation Dust Equation** (AP-42 Section 13.2.4)

$$E = k (0.0032) \left[ \frac{\left(\frac{U}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \right]$$

where: E = emission factor (lb/ton)  
 k = 0.35 for PM10  
 = 0.053 for PM2.5  
 U = mean wind speed (mph)  
 M = material moisture content (%)

**Assumptions**

Mean wind speed 5 mph (National Climatic Data Center)  
 Moisture content 2.4 % (AP-42 Table 11.9-3 haul truck moisture content)

**Emission Factors**

PM10 (lb/ton)	PM2.5 (lb/ton)
0.001	0.0001

lb/ton = pounds per ton of material

**Construction Data**

	Construction Dates	Construction Year	Soil Amount	
			Annual cy	Daily cy
Existing ramp (SB)	9/15 - 11/30	2016	15,700	334
New ramp (NB)	8/7 - 11/19	2021	45,100	1,961
New ramp (SB)	7/11 - 8/6	2021	60,500	776

Assume material handling and grading of sediment from Rindge would not produce fugitive dust.

Construction Year	Soil Amount (cy)	
	Annual	Daily
2016	15,700	334
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	105,600	1,961

**Loading/Unloading Emissions**

Construction Year	PM10 (tpy)	PM2.5 (tpy)	PM10 (lb/day)	PM2.5 (lb/day)
2016	0.017	0.003	0.366	0.055
2017	0.000	0.000	0.000	0.000
2018	0.000	0.000	0.000	0.000
2019	0.000	0.000	0.000	0.000
2020	0.000	0.000	0.000	0.000
2021	0.116	0.018	2.151	0.326

*This occurs in 2066 for Alt 3.*

cy = cubic yards  
 tpy = tons per year

**Conversion factors**

1.26 ton/cubic yard (CalEEMod Default)  
 2,000 pound/ton

**Sources:**

- Wind Statistics: [http://www.windfinder.com/windstats/windstatistic\\_malibu.htm](http://www.windfinder.com/windstats/windstatistic_malibu.htm)
- South Coast Air Quality Management District. 2011. California Emissions Estimator Model User's Guide Version 2011.1. February.
- USEPA. 2006. Compilation of Air Pollutant Emission Factors (AP-42). Fifth Edition, Volume I. Chapter 13.2.4 Aggregate Handling and Storage Piles. November.

**Grading Fugitive Dust Emissions**

**Grading Dust Equation** (AP-42 Table 11.9-1)

$PM_{10} = 0.60 \times 0.051 (S)^2$   
 $PM_{2.5} = 0.031 \times 0.040 (S)^{2.5}$   
 where: S = mean vehicle speed (mph).

**Assumptions**

S = 7.1 mph (AP-42 Table 11.9-3)

**Emission Factors**

PM10 (lb/VMT)	PM2.5 (lb/VMT)
1.543	0.167

lb/VMT = pounds per vehicle mile traveled

**Construction Data**

Blade width 12 feet (CalEEMod Default)  
 Number of passes 2 (Access road maintenance information from MII report.)  
 Dust suppression 61% reduced by water application (CalEEMod Default for water application 3 times a day)

	Construction Dates	Construction Year	Annual		Daily	
			Area sq ft	Grading Mile	Area sq ft	Grading Mile
Sherriff's Overlook	9/15 - 11/30	2016	200,000	6.3	50,000	1.6
Diversion Pipeline Installation	2/1 - 2/28	2016-2021	24,600	0.8	1,295	0.0
Cofferdam	2/1 - 2/28	2016-2021	400	0.0	400	0.0
Temporary Access Roads						
Existing ramp (SB)	9/15 - 11/30	2016	12,000	0.4	800	0.0
Existing ramp (SB)	2/1 - 10/31	2017	15,000	0.5	395	0.0
New ramp (NB)	2/1 - 10/31	2017	21,900	0.7	7,300	0.2
New ramp (SB)	2/1 - 10/31	2017	80,000	2.5	1,600	0.1
Access Road Maintenance	2/1 - 11/30	2017-2021	21,655,200	684	128,900	4

Assume material handling and grading of sediment from impoundment would not produce fugitive dust.  
Assume minimal grading needed at upstream barrier sites.

Construction Year	Grading Mile	
	Annual	Daily
2016	7.5	1.6
2017	688.0	4.4
2018	684.3	4.1
2019	684.3	4.1
2020	684.3	4.1
2021	684.3	4.1

**Uncontrolled Grading Emissions**

	PM10 (tpy)	PM2.5 (tpy)	PM10 (lb/day)	PM2.5 (lb/day)
2016	0.006	0.001	2.474	0.267
2017	0.531	0.057	6.811	0.735
2018	0.528	0.057	6.359	0.687
2019	0.528	0.057	6.359	0.687
2020	0.528	0.057	6.359	0.687
2021	0.528	0.057	6.359	0.687

These emissions occur in 2019, 2021, 2023, 2025, 2027, 2029, 2031, 2033, 2035, 2037, 2039, 2041, 2043, 2045, 2048, 2051, 2054, 2057, 2060, 2063, and 2066 for Alts 3a and 3b.

tpy = tons per year

**Controlled Grading Emissions**

	PM10 (tpy)	PM2.5 (tpy)	PM10 (lb/day)	PM2.5 (lb/day)
2016	0.002	0.000	0.965	0.104
2017	0.207	0.022	2.656	0.287
2018	0.206	0.022	2.480	0.268
2019	0.206	0.022	2.480	0.268
2020	0.206	0.022	2.480	0.268
2021	0.206	0.022	2.480	0.268

tpy = tons per year

**Conversion factors**

43,560 square feet/acre  
 5,280 feet/mile  
 2,000 pound/ton

**Sources:**

- South Coast Air Quality Management District. 2011. California Emissions Estimator Model User's Guide Version 2011.1. February.
- USEPA. 1998 Compilation of Air Pollutant Emission Factors (AP-42). Fifth Edition, Volume I. Chapter 11.9 Western Surface Coal Mining. July.

**Material Handling & Grading**

**Temporary Access Road Hauling**

		Haul Days	Haul Dates	Construction Year		Soil cy	Soil cy/day
				Alt 2 & 4	Alt 3		
Existing ramp (SB)	Imported	47	9/15 - 11/30	2016	2016	15,700	334
New ramp (NB)	Exported	23	8/7 - 11/19	2021	2066	45,100	1,961
New ramp (SB)	Exported	78	7/11 - 8/6	2021	2066	60,500	776
				<b>Total</b>		<b>121,300</b>	<b>3,071</b>

**Temporary Access Road Grading**

	Construction Hours	Construction Days	Construction Dates	Construction Year		Width ft	Length ft	Area sq ft
				Alt 2 & 4	Alt 3			
Existing ramp (SB)	120	15	9/15 - 11/30	2016	2016	12	1,000	12,000
Existing ramp (SB)	315	38	2/1 - 10/31	2017	2017	15	1,000	15,000
New ramp (NB)	23	3	2/1 - 10/31	2017	2017	30	730	21,900
New ramp (SB)	423	50	2/1 - 10/31	2017	2017	40	2,000	80,000
							<b>Total</b>	<b>128,900</b>

**Other Graded Areas**

	Construction Hours	Construction Days	Construction Dates	Construction Year		Total Area sq ft	Daily Area sq ft
				Alt 2 & 4	Alt 3		
Sherriff's Overlook	32	4	9/15 - 11/30	2016	2016	200,000	50,000
Diversion Pipeline Installation	155	19	2/1 - 2/28	2016-2021	2016-2066	24,600	1,295
Cofferdam	2	1	2/1 - 2/28	2016-2021	2016-2066	400	400
Access Road Maintenance	340	168	2/1 - 11/30	2017-2021	2016-2066	21,655,200	128,900

Construction days estimated from construction hours.

Assume material handling and grading of sediment from Rindge would not produce fugitive dust.

*Alt2\_EnvrAirQualityReport.pdf*

*Alt3\_EnvrAirQualityReport.pdf*

*Alt4\_EnvrAirQualityReport.pdf*

**Paving Emission Factors**

**Paving Emission Rate**

2.62 pound VOC/acre (CalEEMod default)

**Construction Data**

Alternatives 2-4

Width	30 feet
Length	58,080 feet
Area	1,742,400 square feet
Site Area	40 acre
Start Date	11/1
End Date	11/30
Days	20

Upstream Barrier CC1 has highway replacement phase but the work is less than 0.05% of Alternatives 2-4. Assume negligible. Peak day emissions calculated by dividing by the number of days in the construction phase and multiplying by two.

**Paving Emissions**

	VOC	
	(tpy)	(lb/day)
Emissions	0.052	10.48

tpy = tons per year

**Conversion factor**

2,000 pounds/ton  
43,560 square feet/acre

Source: South Coast Air Quality Management District. 2011. California Emissions Estimator Model User's Guide Version 2011.1. February.

- [Alt2\\_EnvrAirQualityReport.pdf](#)
- [Alt3\\_EnvrAirQualityReport.pdf](#)
- [Alt4\\_EnvrAirQualityReport.pdf](#)
- [CC1 Equipment Report.pdf](#)

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 2a**

**2016**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled										
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Clear & Grub - Sheriff's O	16	5	77	5	9/15/2016	11/30/2016									80	80	80
Ramp Building	20	1,504	30,080	32	9/15/2016	11/30/2016									640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	0	720	720	720

**2017**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled										
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Clear & Grub - Sediment	16	22	352	7	2/1/2017	3/31/2017	112	112									
Removal Area & Access Rd	16	11	175	8	2/1/2017	3/31/2017	128	128									
	16	91	1,456	6	2/1/2017	3/31/2017	96	96									
	16	49	784	7	2/1/2017	3/31/2017	112	112									
Dewatering	20	23	460	8	10/16/2017	11/30/2017											160
<b>TOTAL</b>			3,227				448	448	0	0	0	0	0	0	0	0	160

**2018**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled										
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Clear Vegetation	16	47	752	6	2/1/2018	2/28/2018	96										
Dewatering	20	4	80	4	2/1/2018	2/28/2018	80										
	20	23	460	8	11/1/2018	11/30/2018											160
Coarse Material (Gravel & Larger) (4/1-7/21)	16	4,050	64,800	90	4/1/2018	6/7/2018			1,440	1,440							
	16	3,052	48,832	109	6/8/2018	7/19/2018					1,744	1,744					
	16	1,417	22,672	109	4/1/2018	7/19/2018			1,744	1,744	1,744	1,744					
Sand to Surfrider Beach	8	1,632	13,056	136	9/3/2018	9/18/2018									1,088		
Sand to Topanga Beach (93,200 cy) (7/22-Labor	20	2,835	56,700	105	7/22/2018	9/2/2018								2,100			
	20	1,890	37,800	105	9/19/2018	10/15/2018										2,100	
Demolition	16	111	1,776	1	5/1/2018	10/15/2018				16	16	16	16	16	16	16	
<b>TOTAL</b>			245,152				176	0	1,744	1,760	1,760	1,760	2,116	1,104	2,116	160	

**2019**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled										
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Clear Vegetation	16	47	752	6	2/1/2019	2/28/2019	96										
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80										
	20	23	460	8	11/1/2019	11/30/2019											160
Sand to Topanga Beach	20	371	7,420	53	4/1/2019	4/9/2019			1,060								
Sand to Zuma Beach	20	6,413	128,260	53	4/10/2019	10/15/2019			1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060	
Demolition	16	111	1,776	1	5/1/2019	10/31/2019				16	16	16	16	16	16	16	
<b>TOTAL</b>			138,748				176	0	1,060	1,076	1,076	1,076	1,076	1,076	1,076	1,076	160



2020

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2020	2/28/2020	96									
Dewatering	20	4	80	4	2/1/2020	2/28/2020	80									
	20	23	460	8	11/1/2020	11/30/2020										160
Sand to Zuma Beach (19	20	1,007	20,140	53	4/1/2020	4/26/2020			1,060							
Fines to landfill (147,700 cy) (4/27-10/15)	16	3,000	48,000	50	4/27/2020	10/15/2020			800	800				800	800	
	16	3,060	48,960	50	6/8/2020	8/23/2020					800	800	800	800	800	
	16	1,500	24,000	50	4/27/2020	10/15/2020			800	800	800	800	800	800	800	800
Demolition	16	111	1,776	1	5/1/2020	10/31/2020				16	16	16	16	16	16	16
<b>TOTAL</b>			144,168				176	0	1,060	816	816	816	816	816	816	160

2021

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2021	2/28/2021	96									
Dewatering	20	4	80	4	2/1/2021	2/28/2021	80									
	20	23	460	8	11/1/2021	11/30/2021										160
Fines to landfill (82,300 cy) (4/1-7/10)	16	2,200	35,200	50	4/1/2021	6/7/2021			800	800						
	16	1,380	22,080	60	6/8/2021	7/10/2021					960	960				
	16	660	10,560	60	4/1/2021	7/10/2021			960	960	960	960				
Material from South	16	3,128	50,048	136	7/11/2021	8/6/2021						2,176				
Material from North	16	442	7,072	34	8/6/2021	8/26/2021							544			
Ramp (to landfill) (45,100 cy) (8/7-11/19)	16	1,456	23,296	28	8/26/2021	11/19/2021								448	448	448
	16	442	7,072	34	8/6/2021	11/19/2021							544	544	544	544
Demolition	16	118	1,894	1	5/1/2021	10/31/2021				16	16	16	16	16	16	16
<b>TOTAL</b>			158,514				176	0	960	976	976	2,192	560	560	560	544

Alt2\_EnvrAirQualityReport.pdf  
 Truck Trips Estimate\_20130417 v2.xlsx

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 2b**

**2016**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sheriff's	16	5	77	5	9/15/2016	11/30/2016								80	80	80
Ramp Building	20	1,504	30,080	32	9/15/2016	11/30/2016								640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	720	720	720

**2017**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sediment Removal Area & Access Rd	16	22	352	7	2/1/2017	3/31/2017	112	112								
	16	11	175	8	2/1/2017	3/31/2017	128	128								
	16	91	1,456	6	2/1/2017	3/31/2017	96	96								
	16	49	784	7	2/1/2017	3/31/2017	112	112								
Dewatering	20	23	460	8	10/16/2017	11/30/2017										160
<b>TOTAL</b>			3,227				448	448	0	0	0	0	0	0	0	160

**2018**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2018	2/28/2018	96									
Dewatering	20	4	80	4	2/1/2018	2/28/2018	80									
	20	23	460	8	11/1/2018	11/30/2018										160
Coarse Material (Gravel & Larger) (4/1-7/21)	16	4,050	64,800	90	4/1/2018	6/7/2018			1,440	1,440						
	16	3,052	48,832	109	6/8/2018	7/19/2018					1,744	1,744				
	16	1,417	22,672	109	4/1/2018	7/19/2018			1,744	1,744	1,744	1,744				
Sand to Surfrider Beach	8	1,632	13,056	136	9/3/2018	9/18/2018								1,088		
Sand to Topanga Beach (93,200 cy)	20	2,565	51,300	105	7/22/2018	9/2/2018					2,100	2,100				
	20	1,890	37,800	105	9/19/2018	10/15/2018							2,100	2,100		
Demolition	16	111	1,776	1	4/1/2018	10/15/2018				16	16	16	16	16	16	16
CC1	17	30	495	1	4/1/2018	5/12/2018				17	17					
CC4	18	20	360	2	4/1/2018	4/21/2018			36							
CC5	18	20	360	2	4/22/2018	5/12/2018				36						
LV2	14	20	280	2	5/13/2018	6/2/2018				28						
<b>TOTAL</b>			243,023				176	0	1,744	1,760	1,760	2,116	2,116	2,116	2,116	160

**2019**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2019	2/28/2019	96									
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80									
	20	23	460	8	11/1/2019	11/30/2019										160
Sand to Topanga	20	371	7,420	53	4/1/2019	4/9/2019			1,068							
Sand to Zuma Beach	20	6,413	128,260	53	4/10/2019	10/15/2019			1,060	1,060	1,060	1,060	1,060	1,060	1,060	
Demolition	16	111	1,776	1	5/1/2019	10/31/2019				16	16	16	16	16	16	16
CC2	17	30	510	1	4/1/2019	5/12/2019			17	17						
LV1	16	20	310	2	4/1/2019	4/21/2019			31							
LV2	14	20	280	2	4/22/2019	5/12/2019				28						
CC3	17	20	340	2	5/13/2019	6/2/2019				34						
<b>TOTAL</b>			140,188				176	0	1,108	1,121	1,076	1,076	1,076	1,076	1,076	160

**2020**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2020	2/28/2020	96									
Dewatering	20	4	80	4	2/1/2020	2/28/2020	80									
	20	23	460	8	11/1/2020	11/30/2020										160
Sand to Zuma Beach	20	1,007	20,140	53	4/1/2020	4/26/2020			1,060							
Fines to landfill (147,700 cy) (4/27-10/15)	16	3,000	48,000	50	4/27/2020	10/15/2020			800	800				800	800	
	16	3,060	48,960	50	6/8/2020	8/23/2020					800	800	800			
	16	1,500	24,000	50	4/27/2020	10/15/2020			800	800	800	800	800	800	800	
Demolition	16	111	1,776	1	5/1/2020	10/31/2020				16	16	16	16	16	16	
LV3 & 4	13	30	390	1	4/1/2020	6/9/2020			13	13						
LV2	14	20	280	2	6/10/2020	7/30/2020					28	28				
<b>TOTAL</b>			144,838				176	0	1,073	829	844	844	816	816	816	160

**2021**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2021	2/28/2021	96									
Dewatering	20	4	80	4	2/1/2021	2/28/2021	80									
	20	23	460	8	11/1/2021	11/30/2021										160
Fines to landfill (82,300 cy) (4/1-7/10)	16	2,200	35,200	50	4/1/2021	6/7/2021			800	800						
	16	1,380	22,080	60	6/8/2021	7/10/2021					960	960				
	16	660	10,560	60	4/1/2021	7/10/2021			960	960	960	960				
Material from South	16	3,128	50,048	136	7/11/2021	8/6/2021						2,176				
Material from North Ramp (to landfill) (45,100 cy) (8/7-	16	442	7,072	34	8/6/2021	8/26/2021							544			
	16	1,456	23,296	28	8/26/2021	11/19/2021								448	448	448
	16	442	7,072	34	8/6/2021	11/19/2021							544	544	544	544
Demolition	16	118	1,894	1	5/1/2021	10/31/2021				16	16	16	16	16	16	
<b>TOTAL</b>			158,514				176	0	960	976	976	2,192	560	560	560	704

Alt2\_EnvrAirQualityReport.pdf  
Truck Trips Estimate\_20130417 v2.xlsx

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 3a**

2016

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sheriff's Ov	16	5	77	5	9/15/2016	11/30/2016								80	80	80
Temporary Access Road	20	1,504	30,080	32	9/15/2016	11/30/2016								640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	720	720	720

2017

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sediment	16	7	112	7	2/1/2017	3/31/2017	112	112								
Removal	16	2	29	2	2/1/2017	3/31/2017	32	32								
Clear & Grub - Access Rd	16	7	112	4	2/1/2017	3/31/2017	64	64								
	16	31	493	8	2/1/2017	3/31/2017	128	128								
Dewatering	20	23	460	8	11/1/2017	11/30/2017										160
Floodwall	20	216	4,320	8	2/1/2017	10/30/2017	160	160	160	160	160	160	160	160	160	
	20	152	3,040	4	2/1/2017	10/30/2017	80	80	80	80	80	80	80	80	80	
	20	16	320	4	2/1/2017	10/30/2017	80	80	80	80	80	80	80	80	80	
Demolition	16	5	80	1	9/1/2017	10/30/2017								16	16	
<b>TOTAL</b>			8,966				656	656	320	320	320	320	320	336	336	160

2019, 2021, 2023, 2025, 2027, 2029, 2031, 2033, 2035, 2037, 2039, 2041, 2043, 2045, 2048, 2051, 2054, 2057, 2060, 2063

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2019	2/28/2019	96									
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80									
	20	23	460	8	11/1/2019	11/30/2019										160
Demolition	16	5	80	1	9/1/2019	10/31/2019								16	16	
<b>TOTAL</b>			794				176	0	0	0	0	0	0	16	16	160

2066

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2066	2/28/2066	96									
Dewatering	20	4	80	4	2/1/2066	2/28/2066	80									
	20	23	460	8	11/1/2066	11/30/2066										160
Rindge Dam & Spillway De	16	5	80	1	9/1/2066	10/31/2066								16	16	
Rindge Dam Concrete Arc	16	34	544	1	10/1/2066	11/30/2066									16	16
Material from South Ramp	16	3,128	50,048	136	7/11/2066	8/6/2066						2,176				
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	16	442	7,072	34	8/6/2066	8/26/2066							544			
	16	1,456	23,296	28	8/26/2066	11/19/2066								448	448	448
	16	442	7,072	34	8/6/2066	11/19/2066							544	544	544	544
<b>TOTAL</b>			88,826				176	0	0	0	0	2,176	1,088	1,008	1,024	1,168

Alt3\_EnvrAirQualityReport.pdf  
Truck Trips Estimate\_20130417 v2.xlsx

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 3b**

2016

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sheriff's Ov	16	5	77	5	9/15/2016	11/30/2016								80	80	80
Temporary Access Road	20	1,504	30,080	32	9/15/2016	11/30/2016								640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	720	720	720

2017

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sediment Removal	16	7	112	7	2/1/2017	3/31/2017	112	112								
Clear & Grub - Access Rd	16	2	29	2	2/1/2017	3/31/2017	32	32								
	16	7	112	4	2/1/2017	3/31/2017	64	64								
Dewatering	16	31	493	8	2/1/2017	3/31/2017	128	128								
	20	23	460	8	11/1/2017	11/30/2017										160
Floodwall	20	216	4,320	8	2/1/2017	10/30/2017	160	160	160	160	160	160	160	160	160	
	20	152	3,040	4	2/1/2017	10/30/2017	80	80	80	80	80	80	80	80	80	
	20	16	320	4	2/1/2017	10/30/2017	80	80	80	80	80	80	80	80	80	
Demolition	16	5	80	1	9/1/2017	10/30/2017									16	16
<b>TOTAL</b>			8,966				656	656	320	320	320	320	320	336	336	160

2019

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2019	2/28/2019	96									
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80									
	20	23	460	8	11/1/2019	11/30/2019										160
Demolition	16	5	80	1	9/1/2019	10/31/2019								16	16	
CC1	17	30	495	1	4/1/2019	5/12/2019			17	17						
CC4	18	20	360	2	4/1/2019	4/21/2019			36							
CC5	18	20	360	2	4/22/2019	5/12/2019				36						
LV2	14	20	280	2	5/13/2019	6/2/2019				28						
<b>TOTAL</b>			2,289				176	0	53	53	0	0	0	16	16	160

2021

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2021	2/28/2021	96									
Dewatering	20	4	80	4	2/1/2021	2/28/2021	80									
	20	23	460	8	11/1/2021	11/30/2021										160
Demolition	16	5	80	1	9/1/2021	10/31/2021								16	16	
CC2	17	30	510	1	4/1/2021	5/12/2021			17	17						
LV1	16	20	310	2	4/1/2021	4/21/2021			31							
LV2	14	20	280	2	4/22/2021	5/12/2021				28						
CC3	17	20	340	2	5/13/2021	6/2/2021				34						
<b>TOTAL</b>			2,234				176	0	48	45	0	0	0	16	16	160

**2023**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2023	2/28/2023	96									
Dewatering	20	4	80	4	2/1/2023	2/28/2023	80									
	20	23	460	8	11/1/2023	11/30/2023										160
Demolition	16	5	80	1	9/1/2023	10/31/2023								16	16	
LV3 & 4	13	30	390	1	4/1/2023	6/9/2023			13	13						
LV2	14	20	280	2	6/10/2023	7/30/2023					28	28				
<b>TOTAL</b>			1,464				176	0	13	13	28	28	0	16	16	160

**2025, 2027, 2029, 2031, 2033, 2035, 2037, 2039, 2041, 2043, 2045, 2048, 2051, 2054, 2057, 2060, 2063**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2025	2/28/2025	96									
Dewatering	20	4	80	4	2/1/2025	2/28/2025	80									
	20	23	460	8	11/1/2025	11/30/2025										160
Demolition	16	5	80	1	9/1/2025	10/31/2025								16	16	
<b>TOTAL</b>			794				176	0	0	0	0	0	0	16	16	160

**2066**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Daily Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	11	174	6	2/1/2066	2/28/2066	96									
Dewatering	20	4	80	4	2/1/2066	2/28/2066	80									
	20	23	460	8	11/1/2066	11/30/2066										160
Rindge Dam & Spillway De	16	5	80	1	9/1/2066	10/31/2066								16	16	
Rindge Dam Concrete Arc	16	34	544	1	10/1/2066	11/30/2066									16	16
Material from South Ramp	16	3,128	50,048	136	7/11/2066	8/6/2066						2,176				
Material from North Ramp	16	442	7,072	34	8/6/2066	8/26/2066						544				
(to landfill) (45,100 cy) (8/7-11/19)	16	1,456	23,296	28	8/26/2066	11/19/2066							448	448	448	448
	16	442	7,072	34	8/6/2066	11/19/2066						544	544	544	544	544
<b>TOTAL</b>			88,826				176	0	0	0	0	2,176	1,088	1,008	1,024	1,168

Alt3\_EnvrAirQualityReport.pdf  
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**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 4a**

**2016**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sheriff's	16	5	77	5	9/15/2016	11/30/2016								80	80	80
Temporary Access Road	20	1,504	30,080	32	9/15/2016	11/30/2016								640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	720	720	720

**2017**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sediment Removal Area	16	21	336	7	2/1/2017	3/31/2017	112	112								
Clear & Grub - Access Rd & Cofferdam	16	91	1,453	8	2/1/2017	3/31/2017	128	128								
Dewatering	16	11	175	6	2/1/2017	3/31/2017	96	96								
Dewatering	16	49	784	7	2/1/2017	3/31/2017	112	112								
Dewatering	20	23	460	8	11/1/2017	11/30/2017										160
Floodwall	20	216	4,320	8	2/1/2017	10/31/2017	160	160	160	160	160	160	160	160	160	160
Floodwall	20	152	3,040	4	2/1/2017	10/31/2017	80	80	80	80	80	80	80	80	80	80
Floodwall	20	16	320	4	2/1/2017	10/31/2017	80	80	80	80	80	80	80	80	80	80
<b>TOTAL</b>			10,888				768	768	320	320	320	320	320	320	320	160

**2018**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2018	2/28/2018	96									
Dewatering	20	4	80	4	2/1/2018	2/28/2018	80									
Dewatering	20	23	460	8	11/1/2018	11/30/2018										160
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	16	4,050	64,800	90	4/1/2018	6/7/2018			1,440	1,440						
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	16	3,052	48,832	109	6/8/2018	7/19/2018					1,744	1,744				
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	16	1,417	22,672	109	4/1/2018	7/19/2018			1,744	1,744	1,744	1,744				
Sand to Surfrider Beach (3)	8	1,632	13,056	136	9/3/2018	9/18/2018								1,088		
Sand to Topanga Beach (93,200 cy) (7/22-Labor)	20	2,835	56,700	105	7/22/2018	9/2/2018						2,100	2,100			
Sand to Topanga Beach (93,200 cy) (7/22-Labor)	20	630	12,600	105	9/19/2018	10/15/2018								2,100	2,100	
Demolition - Concrete Arc	16	111	1,776	1	5/1/2018	10/31/2018				16	16	16	16	16	16	
Demolition - Notch 5'	16	5	80	1	11/1/2018	11/30/2018										16
<b>TOTAL</b>			221,808				176	0	1,744	1,760	1,760	2,116	2,116	2,116	2,116	176

**2019**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2019	2/28/2019	96									
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80									
Dewatering	20	23	460	8	11/1/2019	11/30/2019										160
Sand to Topanga Beach (7)	20	371	7,420	53	4/1/2019	4/9/2019			1,060							
Sand to Zuma Beach (124)	20	5,406	108,120	53	4/10/2019	10/15/2019			1,060	1,060	1,060	1,060	1,060	1,060	1,060	
Demolition	16	111	1,776	1	5/1/2019	10/31/2019				16	16	16	16	16	16	
Demolition - Notch 5'	16	5	80	1	11/1/2019	11/30/2019										16
<b>TOTAL</b>			118,688				176	0	1,060	1,076	1,076	1,076	1,076	1,076	1,076	176

**2020**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2020	2/28/2020	96									
Dewatering	20	4	80	4	2/1/2020	2/28/2020	80									
	20	23	460	8	11/1/2020	11/30/2020										160
Sand to Zuma Beach (19,5	20	1,007	20,140	53	4/1/2020	4/26/2020			1,060							
Fines to landfill (147,700 cy) (4/27-10/15)	16	2,150	34,400	50	4/27/2020	10/15/2020			800	800				800	800	
	16	3,060	48,960	60	6/8/2020	8/23/2020					960	960	960			
	16	1,320	21,120	60	4/27/2020	10/15/2020			960	960	960	960	960	960	960	
Demolition	16	111	1,776	1	5/1/2020	10/31/2020				16	16	16	16	16	16	
Demolition - Notch 5'	16	5	80	1	11/1/2020	11/30/2020										16
<b>TOTAL</b>			127,768				176	0	1,060	976	976	976	976	976	976	176

**2021**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2021	2/28/2021	96									
Dewatering	20	4	80	4	2/1/2021	2/28/2021	80									
	20	23	460	8	11/1/2021	11/30/2021										160
Fines to landfill (82,300 cy) (4/1-7/10)	16	2,200	35,200	50	4/1/2021	6/7/2021			800	800						
	16	1,380	22,080	60	6/8/2021	7/10/2021					960	960				
	16	660	10,560	60	4/1/2021	7/10/2021			960	960	960	960				
Material from South Ramp	16	3,128	50,048	136	7/11/2021	8/6/2021						2,176				
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	16	442	7,072	34	8/6/2021	8/26/2021							544			
	16	1,456	23,296	28	8/26/2021	11/19/2021								448	448	448
	16	442	7,072	34	8/6/2021	11/19/2021							544	544	544	544
Rindge Dam & Spillway De	16	118	1,888	1	5/1/2021	10/31/2021				16	16	16	16	16	16	
Rindge Dam Concrete Arc	16	5	80	1	11/1/2021	11/31/2021										16
<b>TOTAL</b>			158,588				176	0	960	976	976	2,192	560	560	576	720

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**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Trucks - Alternative 4b**

**2016**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sheriff's	16	5	77	5	9/15/2016	11/30/2016								80	80	80
Temporary Access Road	20	1,504	30,080	32	9/15/2016	11/30/2016								640	640	640
<b>TOTAL</b>			30,157				0	0	0	0	0	0	0	720	720	720

**2017**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear & Grub - Sediment Removal Area	16	21	336	7	2/1/2017	3/31/2017	112	112								
	16	91	1,453	8	2/1/2017	3/31/2017	128	128								
Clear & Grub - Access Rd & Cofferdam	16	11	175	6	2/1/2017	3/31/2017	96	96								
	16	49	784	7	2/1/2017	3/31/2017	112	112								
Dewatering	20	23	460	8	11/1/2017	11/30/2017										160
Floodwall	20	216	4,320	8	2/1/2017	10/31/2017	160	160	160	160	160	160	160	160	160	160
	20	152	3,040	4	2/1/2017	10/31/2017	80	80	80	80	80	80	80	80	80	80
	20	16	320	4	2/1/2017	10/31/2017	80	80	80	80	80	80	80	80	80	80
<b>TOTAL</b>			10,888				768	768	320	320	320	320	320	320	320	160

**2018**

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2018	2/28/2018	96									
Dewatering	20	4	80	4	2/1/2018	2/28/2018	80									
	20	23	460	8	11/1/2018	11/30/2018										160
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	16	4,050	64,800	90	4/1/2018	6/7/2018			1,440	1,440						
	16	3,052	48,832	109	6/8/2018	7/19/2018					1,744	1,744				
	16	1,417	22,672	109	4/1/2018	7/19/2018			1,744	1,744	1,744	1,744				
Sand to Surfrider Beach (3)	8	1,632	13,056	136	9/3/2018	9/18/2018								1,088		
Sand to Topanga Beach (93,200 cy) (7/22-Labor	20	2,835	56,700	105	7/22/2018	9/2/2018						2,100	2,100			
	20	630	12,600	105	9/19/2018	10/15/2018								2,100	2,100	
Demolition - Concrete Arc	16	111	1,776	1	5/1/2018	10/31/2018				16	16	16	16	16	16	
Demolition - Notch 5'	16	5	80	1	11/1/2018	11/30/2018										16
CC1	17	30	495	1	4/1/2018	5/12/2018				17	17					
CC4	18	20	360	2	4/1/2018	4/21/2018				36						
CC5	18	20	360	2	4/22/2018	5/12/2018				36						
LV2	14	20	280	2	5/13/2018	6/2/2018				28						
<b>TOTAL</b>			223,303				176	0	1,744	1,760	1,760	2,116	2,116	2,116	2,116	176

2019

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2019	2/28/2019	96									
Dewatering	20	4	80	4	2/1/2019	2/28/2019	80									
	20	23	460	8	11/1/2019	11/30/2019										160
Sand to Topanga Beach (7	20	371	7,420	53	4/1/2019	4/9/2019			1,060							
Sand to Zuma Beach (124	20	5,406	108,120	53	4/10/2019	10/15/2019			1,060	1,060	1,060	1,060	1,060	1,060	1,060	1,060
Demolition	16	111	1,776	1	5/1/2019	10/31/2019				16	16	16	16	16	16	16
Demolition - Notch 5'	16	5	80	1	11/1/2019	11/30/2019										16
CC2	17	30	510	1	4/1/2019	5/12/2019				17	17					
LV1	16	20	310	2	4/1/2019	4/21/2019			31							
LV2	14	20	280	2	4/22/2019	5/12/2019				28						
CC3	17	20	340	2	5/13/2019	6/2/2019				34						
<b>TOTAL</b>			118,688				176	0	1,108	1,121	1,076	1,076	1,076	1,076	1,076	176

2020

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2020	2/28/2020	96									
Dewatering	20	4	80	4	2/1/2020	2/28/2020	80									
	20	23	460	8	11/1/2020	11/30/2020										160
Sand to Zuma Beach (19,5	20	1,007	20,140	53	4/1/2020	4/26/2020			1,060							
Fines to landfill (147,700 cy) (4/27-10/15)	16	2,150	34,400	50	4/27/2020	10/15/2020			800	800				800	800	
	16	3,060	48,960	60	6/8/2020	8/23/2020					960	960	960			
	16	1,320	21,120	60	4/27/2020	10/15/2020			960	960	960	960	960	960	960	
Demolition	16	111	1,776	1	5/1/2020	10/31/2020				16	16	16	16	16	16	16
Demolition - Notch 5'	16	5	80	1	11/1/2020	11/30/2020										16
LV3 & 4	13	30	390	1	4/1/2020	6/9/2020			13	13						
LV2	14	20	280	2	6/10/2020	7/30/2020					28	28				
<b>TOTAL</b>			127,768				176	0	1,060	976	976	976	976	976	976	176

2021

Activity	Round Trip (mi)	Total Trips	Total trip (mi)	Daily Trips	Start Date	End Date	Vehicle Miles Traveled									
							Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov
Clear Vegetation	16	47	752	6	2/1/2021	2/28/2021	96									
Dewatering	20	4	80	4	2/1/2021	2/28/2021	80									
	20	23	460	8	11/1/2021	11/30/2021										160
Fines to landfill (82,300 cy) (4/1-7/10)	16	2,200	35,200	50	4/1/2021	6/7/2021			800	800						
	16	1,380	22,080	60	6/8/2021	7/10/2021					960	960				
	16	660	10,560	60	4/1/2021	7/10/2021			960	960	960	960				
Material from South Ramp	16	3,128	50,048	136	7/11/2021	8/6/2021						2,176				
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	16	442	7,072	34	8/6/2021	8/26/2021						544				
	16	1,456	23,296	28	8/26/2021	11/19/2021								448	448	448
	16	442	7,072	34	8/6/2021	11/19/2021						544	544	544	544	
Rindge Dam & Spillway De	16	118	1,888	34	5/1/2021	10/31/2021				544	544	544	544	544	544	
Rindge Dam Concrete Arc	16	5	80	28	11/1/2021	11/31/2021										448
<b>TOTAL</b>			158,588				176	0	960	1,504	1,504	2,720	1,088	1,088	1,536	1,152

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**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Haul Distances**

Distance from Rindge Dam	One-way (mi)	Round trip (mi)
Landfill	8	16
Surfrider	4	8
Topanga	10	20
Zuma	10	20
Dewatering pipes	--	20
Soil - Access Rd	--	20

*Default CalEEMod distance assumed for dewatering pipes and soil hauling distance.*

Distance from	One-way to Landfill (mi)	Roundtrip Materials (mi)	Roundtrip All (mi)
CC1	6.5	20	16.5
CC2	7	20	17
CC3	7	20	17
CC4	8	20	18
CC5	8	20	18
LV1	5.5	20	15.5
LV2	4	20	14
LV3 & 4	3	20	13

*1/2 dump trucks hauling material away; 1/2 low boys transporting equipment/supplies/material*  
*Default CalEEMod distance assumed for equipment/supplies/materials hauling distance.*

Distance from Floodwall	Round trip (mi)
Concrete trucks	20
Flatbed truck	20
Wide load trucks	20

*Default CalEEMod distance assumed for all floodwall-related trips.*

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Truck Emissions**

Year	Emission Factors (grams per mile)					
	VOC	CO	NOX	PM10	PM2.5	SO2
2016	0.1465257	0.716154	8.2653516	0.1761037	0.1075549	0.016433209
2017	0.1338963	0.6660562	7.5321225	0.1637794	0.0962165	0.016418996
2018	0.1374757	0.6886371	6.8574765	0.1638283	0.0962615	0.01639892
2019	0.1393222	0.7083567	6.1838797	0.164175	0.0965805	0.016328131
2020	0.14319	0.7393589	4.6474456	0.1633283	0.0958015	0.016288944
2021	0.1519309	0.7947986	2.8002572	0.1610611	0.0937157	0.016230592
2023	0.1505101	0.7879792	1.3623216	0.1568155	0.0898098	0.01612573
2025	0.154856	0.8003661	1.3988246	0.1576291	0.0905583	0.016166539
2027	0.1562236	0.8075626	1.4184662	0.1584152	0.0912815	0.016165944
2029	0.1568112	0.8107408	1.4274042	0.1588129	0.0916473	0.016165158
2031	0.1584062	0.8105546	1.4355243	0.158423	0.0912887	0.016182993
2033	0.1585184	0.8112093	1.4381384	0.1585352	0.0913919	0.01618256
2035	0.1585526	0.8114404	1.4396334	0.158591	0.0914432	0.016182272
2037	0.1585526	0.8114404	1.4396334	0.158591	0.0914432	0.016182272
2039	0.1585526	0.8114404	1.4396334	0.158591	0.0914432	0.016182272
2066	0.1585526	0.8114404	1.4396334	0.158591	0.0914432	0.016182272

	EF, g/VMT	
	PM10	PM2.5
Daily	0.300	0.075
Annual	0.273	0.068

**Alternative 2a**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	3,227	0.0004763	0.0023693	0.0267933	0.0015548	0.0005853	5.84057E-05
2018	245,152	0.0371506	0.1860932	1.8531236	0.1181305	0.0444778	0.004431546
2019	138,748	0.0213084	0.1083386	0.9457849	0.066911	0.0252217	0.002497283
2020	144,168	0.0227555	0.1174976	0.7385634	0.0693903	0.0260832	0.002588609
2021	158,514	0.0265471	0.1388764	0.4892935	0.0758989	0.0283142	0.002835998

**Alternative 2a**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	448	0.1322456	0.6578449	7.4392645	0.4585358	0.1692242	0.0162166
2018	2,116	0.6413222	3.2124821	31.990027	2.1659909	0.7994921	0.0765007
2019	1,076	0.3304967	1.6803467	14.66925	1.1022432	0.4073037	0.0387332
2020	1,060	0.334621	1.7278093	10.860624	1.0838743	0.3994267	0.0380657
2021	2,192	0.7342116	3.8408932	13.532346	2.230414	0.8159046	0.0784349

**Alternative 2b**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	3,227	0.0004763	0.0023693	0.0267933	0.0015548	0.0005853	5.84057E-05
2018	243,023	0.036828	0.1844771	1.8370303	0.1171046	0.0440915	0.004393061
2019	140,188	0.0215296	0.109463	0.9556008	0.0676055	0.0254835	0.002523201
2020	144,838	0.0228612	0.1180436	0.7419958	0.0697127	0.0262044	0.002600639
2021	158,514	0.0265471	0.1388764	0.4892935	0.0758989	0.0283142	0.002835998

**Alternative 2b**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	448	0.1322456	0.6578449	7.4392645	0.4585358	0.1692242	0.0162166
2018	2,116	0.6413222	3.2124821	31.990027	2.1659909	0.7994921	0.0765007
2019	1,121	0.3443186	1.7506214	15.282741	1.1483408	0.4243378	0.0403531
2020	1,073	0.3387249	1.7489994	10.993821	1.0971671	0.4043253	0.0385325
2021	2,192	0.7342116	3.8408932	13.532346	2.230414	0.8159046	0.0784349

**Alternative 3a**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	8,966	0.0013233	0.0065827	0.0744406	0.0043198	0.0016262	0.00016227
2019	794	0.0001219	0.0006199	0.005412	0.0003829	0.0001443	1.42902E-05
2021	794	0.000133	0.0006956	0.0024507	0.0003802	0.0001418	1.42048E-05
2023	794	0.0001317	0.0006896	0.0011923	0.0003764	0.0001384	1.4113E-05
2025	794	0.0001355	0.0007005	0.0012242	0.0003772	0.0001391	1.41487E-05
2027	794	0.0001367	0.0007068	0.0012414	0.0003778	0.0001397	1.41482E-05
2029	794	0.0001372	0.0007095	0.0012492	0.0003782	0.00014	1.41475E-05
2031	794	0.0001386	0.0007094	0.0012564	0.0003778	0.0001397	1.41631E-05
2033	794	0.0001387	0.00071	0.0012586	0.0003779	0.0001398	1.41628E-05
2035	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2037	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2039 - 2063	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2066	88,826	0.0155245	0.0794513	0.1409602	0.0422894	0.0156439	0.00158447

**Alternative 3a**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	656	0.1936453	0.9632729	10.893209	0.6714274	0.2477926	0.0237457
2019	176	0.0540589	0.2748523	2.3994312	0.1802926	0.0666222	0.0063355
2021	176	0.0589513	0.3083929	1.0865387	0.1790843	0.0655106	0.0062977
2023	176	0.0584	0.3057469	0.5285997	0.177437	0.063995	0.006257
2025	176	0.0600863	0.3105532	0.5427634	0.1777527	0.0642855	0.0062728
2027	176	0.0606169	0.3133455	0.5503846	0.1780577	0.0645661	0.0062726
2029	176	0.0608449	0.3145787	0.5538527	0.178212	0.064708	0.0062723
2031	176	0.0614638	0.3145064	0.5570034	0.1780607	0.0645689	0.0062792
2033	176	0.0615073	0.3147605	0.5580177	0.1781042	0.0646089	0.0062791
2035	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2037	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2039 - 2063	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2066	2,176	0.7606186	3.8926926	6.9062995	2.2022837	0.7990472	0.0776306

**Alternative 3b**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	8,966	0.0013233	0.0065827	0.0744406	0.0043198	0.0016262	0.00016227
2019	2,289	0.0003515	0.0017873	0.0156028	0.0011038	0.0004161	4.11982E-05
2021	2,234	0.0003741	0.0019572	0.0068957	0.0010697	0.000399	3.99681E-05
2023	794	0.0001317	0.0006896	0.0011923	0.0003764	0.0001384	1.4113E-05
2025	794	0.0001355	0.0007005	0.0012242	0.0003772	0.0001391	1.41487E-05
2027	794	0.0001367	0.0007068	0.0012414	0.0003778	0.0001397	1.41482E-05
2029	794	0.0001372	0.0007095	0.0012492	0.0003782	0.00014	1.41475E-05
2031	794	0.0001386	0.0007094	0.0012564	0.0003778	0.0001397	1.41631E-05
2033	794	0.0001387	0.00071	0.0012586	0.0003779	0.0001398	1.41628E-05
2035	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2037	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2039 - 2063	794	0.0001388	0.0007102	0.0012599	0.000378	0.0001398	1.41625E-05
2066	88,826	0.0155245	0.0794513	0.1409602	0.0422894	0.0156439	0.00158447

**Alternative 3b**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	656	0.1936453	0.9632729	10.893209	0.6714274	0.2477926	0.0237457
2019	176	0.0540589	0.2748523	2.3994312	0.1802926	0.0666222	0.0063355
2021	176	0.0589513	0.3083929	1.0865387	0.1790843	0.0655106	0.0062977
2023	176	0.0584	0.3057469	0.5285997	0.177437	0.063995	0.006257
2025	176	0.0600863	0.3105532	0.5427634	0.1777527	0.0642855	0.0062728
2027	176	0.0606169	0.3133455	0.5503846	0.1780577	0.0645661	0.0062726
2029	176	0.0608449	0.3145787	0.5538527	0.178212	0.064708	0.0062723
2031	176	0.0614638	0.3145064	0.5570034	0.1780607	0.0645689	0.0062792
2033	176	0.0615073	0.3147605	0.5580177	0.1781042	0.0646089	0.0062791
2035	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2037	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2039 - 2063	176	0.0615206	0.3148501	0.5585978	0.1781259	0.0646288	0.0062789
2066	2,176	0.7606186	3.8926926	6.9062995	2.2022837	0.7990472	0.0776306

**Alternative 4a**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	10,888	0.001607	0.0079941	0.0904018	0.0052461	0.0019749	0.000197064
2018	221,808	0.033613	0.1683729	1.6766644	0.1068818	0.0402425	0.004009563
2019	118,688	0.0182277	0.0926752	0.8090446	0.0572371	0.0215752	0.002136229
2020	127,768	0.0201669	0.1041315	0.6545473	0.0614967	0.0231161	0.002294139
2021	158,588	0.0265596	0.1389415	0.4895227	0.0759345	0.0283275	0.002837326

**Alternative 4a**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	768	0.2267067	1.1277341	12.753025	0.7860614	0.2900987	0.0277998
2018	2,116	0.6413222	3.2124821	31.990027	2.1659909	0.7994921	0.0765007
2019	1,076	0.3304967	1.6803467	14.66925	1.1022432	0.4073037	0.0387332
2020	1,060	0.334621	1.7278093	10.860624	1.0838743	0.3994267	0.0380657
2021	2,192	0.7342116	3.8408932	13.532346	2.230414	0.8159046	0.0784349

**Alternative 4b**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	30,157	0.0048709	0.023807	0.2747636	0.0149399	0.0058469	0.000546286
2017	10,888	0.001607	0.0079941	0.0904018	0.0052461	0.0019749	0.000197064
2018	223,303	0.0338396	0.1695078	1.6879653	0.1076022	0.0405137	0.004036588
2019	118,688	0.0182277	0.0926752	0.8090446	0.0572371	0.0215752	0.002136229
2020	127,768	0.0201669	0.1041315	0.6545473	0.0614967	0.0231161	0.002294139
2021	158,588	0.0265596	0.1389415	0.4895227	0.0759345	0.0283275	0.002837326

**Alternative 4b**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	720	0.2325846	1.1367724	13.119837	0.7564953	0.2899652	0.0260849
2017	768	0.2267067	1.1277341	12.753025	0.7860614	0.2900987	0.0277998
2018	2,116	0.6413222	3.2124821	31.990027	2.1659909	0.7994921	0.0765007
2019	1,121	0.3443186	1.7506214	15.282741	1.1483408	0.4243378	0.0403531
2020	1,060	0.334621	1.7278093	10.860624	1.0838743	0.3994267	0.0380657
2021	2,720	0.9110654	4.7660719	16.791962	2.767667	1.0124364	0.097328

453.592 g/lb  
 2000 lb/ton  
 1000000 g/metric ton

**Malibu Creek Ecosystem Restoration Feasibility Study  
Haul Truck Emissions**

Year	Emission Factors (grams per mile)		
	CO2(Pavley)	CH4	N2O
2016	1662.1876	0.0051	0.0048
2017	1634.9352	0.0051	0.0048
2018	1607.1529	0.0051	0.0048
2019	1574.5434	0.0051	0.0048
2020	1536.6175	0.0051	0.0048
2021	1531.1129	0.0051	0.0048
2023	1521.2207	0.0051	0.0048
2025	1525.0705	0.0051	0.0048
2027	1525.0143	0.0051	0.0048
2029	1524.9402	0.0051	0.0048
2031	1526.6226	0.0051	0.0048
2033	1526.5818	0.0051	0.0048
2035	1526.5547	0.0051	0.0048
2037	1526.5547	0.0051	0.0048
2039	1526.5547	0.0051	0.0048
2041	1526.5547	0.0051	0.0048
2043	1526.5547	0.0051	0.0048
2045	1526.5547	0.0051	0.0048
2048	1526.5547	0.0051	0.0048
2051	1526.5547	0.0051	0.0048
2054	1526.5547	0.0051	0.0048
2057	1526.5547	0.0051	0.0048
2060	1526.5547	0.0051	0.0048
2063	1526.5547	0.0051	0.0048
2066	1526.5547	0.0051	0.0048

**Global Warming Potential**

CO2	CH4	N2O
1	21	310

IPCC, 1996.

**Alternative 2a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	3,227	5.2759935	1.646E-05	1.549E-05	5.2759935	0.0003456	0.0048018	5.281141
2018	245,152	393.99674	0.0012503	0.0011767	393.99674	0.0262558	0.3647862	394.38779
2019	138,748	218.46475	0.0007076	0.000666	218.46475	0.0148599	0.206457	218.68607
2020	144,168	221.53108	0.0007353	0.000692	221.53108	0.0154404	0.214522	221.76104
2021	158,514	242.70241	0.0008084	0.0007609	242.70241	0.0169768	0.2358684	242.95526

**Alternative 2b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	3,227	5.2759935	1.646E-05	1.549E-05	5.2759935	0.0003456	0.0048018	5.281141
2018	243,023	390.57512	0.0012394	0.0011665	390.57512	0.0260278	0.3616182	390.96276
2019	140,188	220.7321	0.000715	0.0006729	220.7321	0.0150141	0.2085997	220.95571
2020	144,838	222.56061	0.0007387	0.0006952	222.56061	0.0155121	0.2155189	222.79164
2021	158,514	242.70241	0.0008084	0.0007609	242.70241	0.0169768	0.2358684	242.95526

**Alternative 3a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	8,966	14.65846	4.573E-05	4.304E-05	14.65846	0.0009602	0.0133411	14.672762
2019	794	1.2501169	4.049E-06	3.811E-06	1.2501169	8.503E-05	0.0011814	1.2513834
2021	794	1.215635	4.049E-06	3.811E-06	1.215635	8.503E-05	0.0011814	1.2169015
2023	794	1.2077811	4.049E-06	3.811E-06	1.2077811	8.503E-05	0.0011814	1.2090475
2025	794	1.2108376	4.049E-06	3.811E-06	1.2108376	8.503E-05	0.0011814	1.2121041
2027	794	1.210793	4.049E-06	3.811E-06	1.210793	8.503E-05	0.0011814	1.2120595
2029	794	1.2107342	4.049E-06	3.811E-06	1.2107342	8.503E-05	0.0011814	1.2120007
2031	794	1.21207	4.049E-06	3.811E-06	1.21207	8.503E-05	0.0011814	1.2133364
2033	794	1.2120376	4.049E-06	3.811E-06	1.2120376	8.503E-05	0.0011814	1.213304
2035	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2037	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2039 - 2063	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2066	88,826	135.59768	0.000453	0.0004264	135.59768	0.0095133	0.132173	135.73936

**Alternative 3b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	8,966	14.65846	4.573E-05	4.304E-05	14.65846	0.0009602	0.0133411	14.672762
2019	2,289	3.6040594	1.167E-05	1.099E-05	3.6040594	0.0002451	0.003406	3.6077105
2021	2,234	3.4204376	1.139E-05	1.072E-05	3.4204376	0.0002393	0.0033241	3.424001
2023	794	1.2077811	4.049E-06	3.811E-06	1.2077811	8.503E-05	0.0011814	1.2090475
2025	794	1.2108376	4.049E-06	3.811E-06	1.2108376	8.503E-05	0.0011814	1.2121041
2027	794	1.210793	4.049E-06	3.811E-06	1.210793	8.503E-05	0.0011814	1.2120595
2029	794	1.2107342	4.049E-06	3.811E-06	1.2107342	8.503E-05	0.0011814	1.2120007
2031	794	1.21207	4.049E-06	3.811E-06	1.21207	8.503E-05	0.0011814	1.2133364
2033	794	1.2120376	4.049E-06	3.811E-06	1.2120376	8.503E-05	0.0011814	1.213304
2035	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2037	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2039 - 2063	794	1.212016	4.049E-06	3.811E-06	1.212016	8.503E-05	0.0011814	1.2132824
2066	88,826	135.59768	0.000453	0.0004264	135.59768	0.0095133	0.132173	135.73936

**Alternative 4a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	10,888	17.801462	5.553E-05	5.226E-05	17.801462	0.0011661	0.0162016	17.81883
2018	221,808	356.47937	0.0011312	0.0010647	356.47937	0.0237556	0.3300503	356.83317
2019	118,688	186.87941	0.0006053	0.0005697	186.87941	0.0127115	0.1766077	187.06873
2020	127,768	196.33055	0.0006516	0.0006133	196.33055	0.013684	0.1901188	196.53435
2021	158,588	242.81613	0.0008088	0.0007612	242.81613	0.0169848	0.2359789	243.06909

**Alternative 4b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	30,157	50.127183	0.0001538	0.0001448	50.127183	0.0032299	0.0448741	50.175287
2017	10,888	17.801462	5.553E-05	5.226E-05	17.801462	0.0011661	0.0162016	17.81883
2018	223,303	358.88206	0.0011388	0.0010719	358.88206	0.0239158	0.3322749	359.23825
2019	118,688	186.87941	0.0006053	0.0005697	186.87941	0.0127115	0.1766077	187.06873
2020	127,768	196.33055	0.0006516	0.0006133	196.33055	0.013684	0.1901188	196.53435
2021	158,588	242.81613	0.0008088	0.0007612	242.81613	0.0169848	0.2359789	243.06909

453.592 g/lb  
 2000 lb/ton  
 1000000 g/metric ton

**Construction Equipment - Alternative 2a**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016									27	27	27	686
2017	45	48	38	38	38	38	38	38	38	28	48	1,219
2018	37	14	23	42	39	45	45	45	45	15	45	1,143
2019	39	14	22	40	37	37	37	37	37	15	40	1,016
2020	42	14	24	37	34	34	34	34	34	15	42	1,067
2021	39	14	18	42	39	44	44	39	39	25	44	1,118

**Annual**

	Total	Round Trip Distance (mi)
2016	988	25,095
2017	5,959	151,359
2018	5,257	133,528
2019	4,676	118,770
2020	4,397	111,684
2021	5,275	133,985

**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 2b**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016									27	27	27	686
2017	45	48	38	38	38	38	38	38	38	28	48	1,219
2018	37	14	72	86	57	45	45	45	45	15	86	2,184
2019	39	14	58	76	61	37	37	37	37	15	76	1,930
2020	42	14	50	63	60	53	34	34	34	15	63	1,600
2021	39	14	18	42	39	44	44	39	39	25	44	1,118

**Annual**

	Total	Round Trip Distance (mi)
2016	988	25,095
2017	5,959	151,359
2018	6,847	173,914
2019	5,996	152,298
2020	5,867	149,022
2021	5,275	133,985

Commute distance 12.7 mi/one-way trip



**Construction Equipment - Alternative 3a**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016								24	24	24	24	610
2017	65	68	41	41	41	31	31	41	41	15	68	1,727
2019	37	14	15	20	20	20	20	20	20	15	37	940
2021	37	14	15	31	28	28	28	28	28	15	37	940
2023	37	14	15	31	28	28	28	28	28	15	37	940
2025	37	14	15	31	28	28	28	28	28	15	37	940
2027	37	14	15	31	28	28	28	28	28	15	37	940
2029	37	14	15	31	28	28	28	28	28	15	37	940
2031	37	14	15	31	28	28	28	28	28	15	37	940
2033	37	14	15	31	28	28	28	28	28	15	37	940
2035	37	14	15	31	28	28	28	28	28	15	37	940
2037	37	14	15	31	28	28	28	28	28	15	37	940
2039	37	14	15	31	28	28	28	28	28	15	37	940
2041	37	14	15	31	28	28	28	28	28	15	37	940
2043	37	14	15	31	28	28	28	28	28	15	37	940
2045	37	14	15	31	28	28	28	28	28	15	37	940
2048	37	14	15	31	28	28	28	28	28	15	37	940
2051	37	14	15	31	28	28	28	28	28	15	37	940
2054	37	14	15	31	28	28	28	28	28	15	37	940
2057	37	14	15	31	28	28	28	28	28	15	37	940
2060	37	14	15	31	28	28	28	28	28	15	37	940
2063	37	14	15	31	28	28	28	28	28	15	37	940
2066	34	14	15	31	28	28	28	28	37	38	38	965

**Annual**

	Total	Round Trip Distance (mi)
2016	832	21,133
2017	6,996	177,698
2019	2,500	63,500
2021	3,563	90,500
2023	3,563	90,500
2025	3,563	90,500
2027	3,563	90,500
2029	3,563	90,500
2031	3,563	90,500
2033	3,563	90,500
2035	3,563	90,500
2037	3,563	90,500
2039	3,563	90,500
2041	3,563	90,500
2043	3,563	90,500
2045	3,563	90,500
2048	3,563	90,500
2051	3,563	90,500
2054	3,563	90,500
2057	3,563	90,500
2060	3,563	90,500
2063	3,563	90,500
2066	4,055	103,000

**Construction Equipment - Alternative 3b**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016								24	24	24	24	610
2017	65	68	41	41	41	31	31	41	41	15	68	1,727
2019	37	14	64	64	38	20	20	20	20	15	64	1,626
2021	37	14	51	67	52	28	28	28	28	15	67	1,702
2023	37	14	41	57	54	47	28	28	28	15	57	1,448
2025	37	14	15	31	28	28	28	28	28	15	37	940
2027	37	14	15	31	28	28	28	28	28	15	37	940
2029	37	14	15	31	28	28	28	28	28	15	37	940
2031	37	14	15	31	28	28	28	28	28	15	37	940
2033	37	14	15	31	28	28	28	28	28	15	37	940
2035	37	14	15	31	28	28	28	28	28	15	37	940
2037	37	14	15	31	28	28	28	28	28	15	37	940
2039	37	14	15	31	28	28	28	28	28	15	37	940
2041	37	14	15	31	28	28	28	28	28	15	37	940
2043	37	14	15	31	28	28	28	28	28	15	37	940
2045	37	14	15	31	28	28	28	28	28	15	37	940
2048	37	14	15	31	28	28	28	28	28	15	37	940
2051	37	14	15	31	28	28	28	28	28	15	37	940
2054	37	14	15	31	28	28	28	28	28	15	37	940
2057	37	14	15	31	28	28	28	28	28	15	37	940
2060	37	14	15	31	28	28	28	28	28	15	37	940
2063	37	14	15	31	28	28	28	28	28	15	37	940
2066	34	14	15	31	28	28	28	28	37	38	38	965

**Annual**

	Total	Round Trip Distance (mi)
2016	832	21,133
2017	6,996	177,698
2019	4,090	103,886
2021	4,883	124,028
2023	5,033	127,838
2025	3,563	90,500
2027	3,563	90,500
2029	3,563	90,500
2031	3,563	90,500
2033	3,563	90,500
2035	3,563	90,500
2037	3,563	90,500
2039	3,563	90,500
2041	3,563	90,500
2043	3,563	90,500
2045	3,563	90,500
2048	3,563	90,500
2051	3,563	90,500
2054	3,563	90,500
2057	3,563	90,500
2060	3,563	90,500
2063	3,563	90,500
2066	4,055	103,000

Commute distance 12.7 mi/one-way trip

**Construction Equipment - Alternative 4a**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016								25	25	25	25	635
2017	64	67	43	43	43	43	43	43	43	16	67	1,702
2018	37	14	23	41	38	44	44	44	44	25	44	1,118
2019	39	14	22	41	38	38	38	38	38	26	41	1,041
2020	42	14	24	37	34	34	34	34	34	26	42	1,067
2021	42	14	18	37	34	39	39	34	42	39	42	1,067

**Annual**

	Total	Round Trip Distance (mi)
2016	884	22,454
2017	7,514	190,856
2018	5,329	135,357
2019	5,013	127,330
2020	4,606	116,992
2021	4,862	123,495

**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4b**

**Daily**

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Max	Round Trip Distance (mi)
2016								25	25	25	25	635
2017	64	67	43	43	43	43	43	43	43	16	67	1,702
2018	37	14	72	85	56	44	44	44	44	25	85	2,159
2019	39	14	58	77	62	38	38	38	38	26	77	1,956
2020	42	14	53	63	60	53	34	34	34	26	63	1,600
2021	42	14	18	37	34	39	39	34	42	39	42	1,067

**Annual**

	Total	Round Trip Distance (mi)
2016	884	22,454
2017	7,514	190,856
2018	6,919	175,743
2019	6,333	160,858
2020	6,076	154,330
2021	4862	123,495

Commute distance 12.7 mi/one-way trip

**Construction Worker Commute Emissions**

Year	Emission Factors (grams per mile)					
	VOC	CO	NOX	PM10	PM2.5	SO2
2016	0.0361384	1.3587798	0.1332806	0.0469375	0.0197598	0.003962382
2017	0.0300977	1.2217045	0.119994	0.0468675	0.0197023	0.003961069
2018	0.0249244	1.1038705	0.1087408	0.0468292	0.0196733	0.00396012
2019	0.0212551	1.0096295	0.0997374	0.0468094	0.0196591	0.003952137
2020	0.019425	0.9447248	0.0929257	0.0468171	0.0196668	0.003951756
2021	0.018265	0.8964997	0.087822	0.0468432	0.0196913	0.003961701
2023	0.0161592	0.8134008	0.0795162	0.046884	0.0197296	0.003962419
2025	0.0147751	0.7573173	0.0736389	0.0469558	0.0197966	0.003984718
2027	0.0137404	0.7171272	0.0694261	0.0470136	0.0198502	0.003985937
2029	0.0128779	0.6851973	0.0659387	0.0470535	0.0198873	0.003986952
2031	0.0122162	0.6635757	0.0630347	0.0470817	0.0199135	0.00399421
2033	0.0116462	0.6456555	0.0606571	0.0470862	0.0199177	0.003997891
2035	0.0111395	0.6295081	0.0589165	0.0470793	0.0199112	0.004001202
2037	0.0111395	0.6295081	0.0589165	0.0470793	0.0199112	0.004001202
2039	0.0111395	0.6295081	0.0589165	0.0470793	0.0199112	0.004001202
2066	0.0111395	0.6295081	0.0589165	0.0470793	0.0199112	0.004001202

	EF, g/VMT	
	PM10	PM2.5
Daily	0.300	0.075
Annual	0.273	0.068

**Alternative 2a**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	25,095	0.0009997	0.0375876	0.0036869	0.008859	0.0024368	0.00010961
2017	151,359	0.0050216	0.2038346	0.0200203	0.0534204	0.0146874	0.000660882
2018	133,528	0.0036686	0.162478	0.0160055	0.0471216	0.0129529	0.000582887
2019	118,770	0.0027828	0.1321828	0.0130578	0.0419111	0.0115195	0.000517422
2020	111,684	0.0023914	0.1163055	0.0114401	0.0394114	0.0108331	0.000486502
2021	133,985	0.0026976	0.132407	0.0129707	0.047285	0.0129999	0.000585117

**Alternative 2a**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	686	0.0546388	2.0543818	0.2015111	0.5252714	0.1434517	0.0059908
2017	1,219	0.0808989	3.2837928	0.3225292	0.9336276	0.2548707	0.0106469
2018	1,143	0.0628065	2.7816276	0.2740143	0.8751794	0.2388682	0.009979
2019	1,016	0.0476093	2.2614674	0.2234017	0.7778928	0.2122955	0.0088524
2020	1,067	0.0456856	2.221892	0.2185512	0.8168055	0.2229284	0.0092941
2021	1,118	0.045003	2.2088752	0.2163835	0.8557653	0.2336043	0.0097612

**Alternative 2b**

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	25,095	0.0009997	0.0375876	0.0036869	0.008859	0.0024368	0.00010961
2017	151,359	0.0050216	0.2038346	0.0200203	0.0534204	0.0146874	0.000660882
2018	173,914	0.0047782	0.21162	0.0208464	0.0613737	0.0168705	0.000759184
2019	152,298	0.0035683	0.169497	0.016744	0.0537423	0.0147714	0.000663486
2020	149,022	0.0031909	0.1551886	0.0152648	0.0525873	0.0144548	0.000649149
2021	133,985	0.0026976	0.132407	0.0129707	0.047285	0.0129999	0.000585117

**Alternative 2b**

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	686	0.0546388	2.0543818	0.2015111	0.5252714	0.1434517	0.0059908
2017	1,219	0.0808989	3.2837928	0.3225292	0.9336276	0.2548707	0.0106469
2018	2,184	0.1200303	5.3159994	0.5236719	1.672565	0.4565036	0.0190711
2019	1,930	0.0904578	4.2967881	0.4244633	1.4779964	0.4033614	0.0168195
2020	1,600	0.0685284	3.332838	0.3278269	1.2252083	0.3343925	0.0139412
2021	1,118	0.045003	2.2088752	0.2163835	0.8557653	0.2336043	0.0097612

Alternative 3a

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	21,133	0.0008418	0.0316527	0.0031048	0.0074602	0.002052	9.23035E-05
2017	177,698	0.0058955	0.2393064	0.0235043	0.0627167	0.0172434	0.000775891
2019	63,500	0.0014878	0.0706709	0.0069813	0.0224076	0.0061588	0.000276637
2021	90,500	0.0018221	0.0894343	0.0087611	0.0319386	0.0087808	0.000395217
2023	90,500	0.001612	0.0811444	0.0079325	0.0319427	0.0087846	0.000395289
2025	90,500	0.001474	0.0755496	0.0073462	0.0319499	0.0087913	0.000397513
2027	90,500	0.0013707	0.0715402	0.0069259	0.0319556	0.0087966	0.000397635
2029	90,500	0.0012847	0.0683549	0.006578	0.0319596	0.0088003	0.000397736
2031	90,500	0.0012187	0.066198	0.0062883	0.0319624	0.008803	0.00039846
2033	90,500	0.0011618	0.0644103	0.0060511	0.0319629	0.0088034	0.000398827
2035	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2037	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2039 - 2063	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2066	103,000	0.0012648	0.0714731	0.0066893	0.0363767	0.0100185	0.000454288

Alternative 3a

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	610	0.0485678	1.8261172	0.179121	0.4669079	0.1275127	0.0053252
2017	1,727	0.1146068	4.6520397	0.4569163	1.3226392	0.3610668	0.0150831
2019	940	0.0440386	2.0918574	0.2066466	0.7195509	0.1963733	0.0081885
2021	940	0.0378434	1.8574632	0.1819589	0.7196208	0.19644	0.0082083
2023	940	0.0334804	1.6852899	0.1647501	0.7197054	0.1965195	0.0082098
2025	940	0.0306126	1.5690902	0.152573	0.7198541	0.1966582	0.008256
2027	940	0.0284688	1.4858201	0.1438445	0.7199739	0.1967693	0.0082585
2029	940	0.0266818	1.4196644	0.1366188	0.7200567	0.1968462	0.0082606
2031	940	0.0253109	1.3748665	0.1306019	0.7201151	0.1969004	0.0082756
2033	940	0.0241298	1.3377376	0.1256758	0.7201244	0.1969091	0.0082833
2035	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2037	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2039 - 2063	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2066	965	0.0237038	1.3395325	0.1253686	0.7395724	0.2022172	0.0085142

Alternative 3b

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	21,133	0.0008418	0.0316527	0.0031048	0.0074602	0.002052	9.23035E-05
2017	177,698	0.0058955	0.2393064	0.0235043	0.0627167	0.0172434	0.000775891
2019	103,886	0.002434	0.1156175	0.0114214	0.0366588	0.0100759	0.000452578
2021	124,028	0.0024972	0.1225675	0.0120068	0.0437711	0.0120338	0.000541635
2023	127,838	0.0022771	0.1146225	0.0112052	0.0451214	0.0124089	0.000558375
2025	90,500	0.001474	0.0755496	0.0073462	0.0319499	0.0087913	0.000397513
2027	90,500	0.0013707	0.0715402	0.0069259	0.0319556	0.0087966	0.000397635
2029	90,500	0.0012847	0.0683549	0.006578	0.0319596	0.0088003	0.000397736
2031	90,500	0.0012187	0.066198	0.0062883	0.0319624	0.008803	0.00039846
2033	90,500	0.0011618	0.0644103	0.0060511	0.0319629	0.0088034	0.000398827
2035	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2037	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2039 - 2063	90,500	0.0011113	0.0627994	0.0058775	0.0319622	0.0088027	0.000399158
2066	103,000	0.0012648	0.0714731	0.0066893	0.0363767	0.0100185	0.000454288

Alternative 3b

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	610	0.0485678	1.8261172	0.179121	0.4669079	0.1275127	0.0053252
2017	1,727	0.1146068	4.6520397	0.4569163	1.3226392	0.3610668	0.0150831
2019	1,626	0.076175	3.6183479	0.3574428	1.2446285	0.3396727	0.0141638
2021	1,702	0.0685273	3.3635145	0.3294931	1.3030972	0.3557157	0.0148636
2023	1,448	0.0515779	2.5962575	0.2538041	1.1087353	0.3027462	0.0126475
2025	940	0.0306126	1.5690902	0.152573	0.7198541	0.1966582	0.008256
2027	940	0.0284688	1.4858201	0.1438445	0.7199739	0.1967693	0.0082585
2029	940	0.0266818	1.4196644	0.1366188	0.7200567	0.1968462	0.0082606
2031	940	0.0253109	1.3748665	0.1306019	0.7201151	0.1969004	0.0082756
2033	940	0.0241298	1.3377376	0.1256758	0.7201244	0.1969091	0.0082833
2035	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2037	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2039 - 2063	940	0.02308	1.3042817	0.1220694	0.72011	0.1968957	0.0082901
2066	965	0.0237038	1.3395325	0.1253686	0.7395724	0.2022172	0.0085142

Alternative 4a

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	22,454	0.0008945	0.033631	0.0032988	0.0079265	0.0021803	9.80724E-05
2017	190,856	0.006332	0.2570252	0.0252446	0.0673604	0.0185201	0.000833339
2018	135,357	0.0037188	0.1647033	0.0162247	0.0477669	0.0131303	0.000590871
2019	127,330	0.0029833	0.1417092	0.0139989	0.0449317	0.0123497	0.000554713
2020	116,992	0.0025051	0.1218337	0.0119839	0.0412847	0.0113348	0.000509627
2021	123,495	0.0024864	0.1220404	0.0119552	0.0435828	0.0119821	0.000539306

Alternative 4a

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	635	0.0505915	1.9022054	0.1865844	0.4863624	0.1328257	0.0055471
2017	1,702	0.1129214	4.5836274	0.450197	1.3031886	0.355757	0.0148613
2018	1,118	0.0614108	2.7198136	0.2679251	0.8557309	0.23356	0.0097573
2019	1,041	0.0487996	2.3180041	0.2289868	0.7973401	0.2176028	0.0090737
2020	1,067	0.0456856	2.221892	0.2185512	0.8168055	0.2229284	0.0092941
2021	1,067	0.0429574	2.1084718	0.2065479	0.8168669	0.222986	0.0093175

Alternative 4b

Year	Distance (mi)	Annual emissions (tons per year)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	22,454	0.0008945	0.033631	0.0032988	0.0079265	0.0021803	9.80724E-05
2017	190,856	0.006332	0.2570252	0.0252446	0.0673604	0.0185201	0.000833339
2018	175,743	0.0048284	0.2138453	0.0210656	0.062019	0.017048	0.000767167
2019	160,858	0.0037689	0.1790234	0.017685	0.0567629	0.0156016	0.000700777
2020	154,330	0.0033046	0.1607169	0.0158085	0.0544607	0.0149698	0.000672274
2021	123,495	0.0024864	0.1220404	0.0119552	0.0435828	0.0119821	0.000539306

Alternative 4b

Year	Distance (mi)	Daily emissions (pounds per day)					
		VOC	CO	NOX	PM10	PM2.5	SO2
2016	635	0.0505915	1.9022054	0.1865844	0.4863624	0.1328257	0.0055471
2017	1,702	0.1129214	4.5836274	0.450197	1.3031886	0.355757	0.0148613
2018	2,159	0.1186346	5.2541854	0.5175826	1.6531166	0.4511954	0.0188493
2019	1,956	0.091648	4.3533248	0.4300688	1.4974437	0.4086688	0.0170408
2020	1,600	0.0685284	3.332838	0.3278269	1.2252083	0.3343925	0.0139412
2021	1,067	0.0429574	2.1084718	0.2065479	0.8168669	0.222986	0.0093175

453.592 g/lb  
 2000 lb/ton  
 1000000 g/metric ton

**Construction Worker Commute Emissions**

Year	Emission Factors (grams per mile)		
	CO2(Pavley)	CH4	N2O
2016	331.45119	0.1853353	0.0775654
2017	318.36704	0.1853437	0.0775826
2018	306.18908	0.1853582	0.0776062
2019	294.25476	0.1853717	0.0776269
2020	282.08259	0.185387	0.0776484
2021	277.69523	0.1854308	0.0777164
2023	268.86767	0.1855025	0.0778262
2025	263.28502	0.1855627	0.077922
2027	258.09942	0.1856263	0.078028
2029	254.41983	0.1856897	0.0781317
2031	252.37011	0.1857916	0.0782943
2033	251.00192	0.185914	0.0784923
2035	250.18857	0.1860264	0.078677
2037	250.18857	0.1860264	0.078677
2039	250.18857	0.1860264	0.078677
2041	250.18857	0.1860264	0.078677
2043	250.18857	0.1860264	0.078677
2045	250.18857	0.1860264	0.078677
2048	250.18857	0.1860264	0.078677
2051	250.18857	0.1860264	0.078677
2054	250.18857	0.1860264	0.078677
2057	250.18857	0.1860264	0.078677
2060	250.18857	0.1860264	0.078677
2063	250.18857	0.1860264	0.078677
2066	250.18857	0.1860264	0.078677

Global Warming Potential		
CO2	CH4	N2O
1	21	310

IPCC, 1996.

**Alternative 2a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	25,095	8.3178338	0.004651	0.0019465	8.3178338	0.0976716	0.6034211	9.0189265
2017	151,359	48.18759	0.0280534	0.0117428	48.18759	0.5891207	3.6402682	52.416979
2018	133,528	40.884754	0.0247505	0.0103626	40.884754	0.5197599	3.2124029	44.616917
2019	118,770	34.948755	0.0220167	0.0092198	34.948755	0.4623501	2.8581312	38.269237
2020	111,684	31.504055	0.0207047	0.0086721	31.504055	0.4347992	2.6883396	34.627194
2021	133,985	37.206996	0.0248449	0.0104128	37.206996	0.5217438	3.2279797	40.956719

**Alternative 2b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	25,095	8.3178338	0.004651	0.0019465	8.3178338	0.0976716	0.6034211	9.0189265
2017	151,359	48.18759	0.0280534	0.0117428	48.18759	0.5891207	3.6402682	52.416979
2018	173,914	53.250506	0.0322363	0.0134968	53.250506	0.6769633	4.1840066	58.111476
2019	152,298	44.814529	0.0282318	0.0118225	44.814529	0.5928681	3.6649603	49.072357
2020	149,022	42.036455	0.0276267	0.0115713	42.036455	0.5801608	3.5871021	46.203717
2021	133,985	37.206996	0.0248449	0.0104128	37.206996	0.5217438	3.2279797	40.956719

**Alternative 3a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	21,133	7.0044916	0.0039167	0.0016392	7.0044916	0.0822497	0.5081441	7.5948855
2017	177,698	56.573314	0.0329353	0.0137863	56.573314	0.691641	4.2737568	61.538712
2019	63,500	18.685177	0.0117711	0.0049293	18.685177	0.2471932	1.5280855	20.460456
2021	90,500	25.131474	0.0167815	0.0070334	25.131474	0.352412	2.1803397	27.664226
2023	90,500	24.332578	0.016788	0.0070433	24.332578	0.3525482	2.183418	26.868544
2025	90,500	23.827347	0.0167935	0.007052	23.827347	0.3526628	2.1861076	26.366117
2027	90,500	23.358049	0.0167992	0.0070615	23.358049	0.3527835	2.1890797	25.899912
2029	90,500	23.025046	0.016805	0.0070709	23.025046	0.3529041	2.1919885	25.569939
2031	90,500	22.839545	0.0168142	0.0070857	22.839545	0.3530978	2.1965522	25.389195
2033	90,500	22.715724	0.0168253	0.0071036	22.715724	0.3533303	2.2021066	25.271161
2035	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2037	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2039 - 2063	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2066	103,000	25.769379	0.0191607	0.0081037	25.769379	0.4023745	2.5121514	28.683904

**Alternative 3b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	21,133	7.0044916	0.0039167	0.0016392	7.0044916	0.0822497	0.5081441	7.5948855
2017	177,698	56.573314	0.0329353	0.0137863	56.573314	0.691641	4.2737568	61.538712
2019	103,886	30.56895	0.0192575	0.0080643	30.56895	0.404408	2.4999479	33.473306
2021	124,028	34.44204	0.0229986	0.009639	34.44204	0.4829715	2.9880995	37.913111
2023	127,838	34.371559	0.0237143	0.0099492	34.371559	0.4980004	3.0842388	37.953798
2025	90,500	23.827347	0.0167935	0.007052	23.827347	0.3526628	2.1861076	26.366117
2027	90,500	23.358049	0.0167992	0.0070615	23.358049	0.3527835	2.1890797	25.899912
2029	90,500	23.025046	0.016805	0.0070709	23.025046	0.3529041	2.1919885	25.569939
2031	90,500	22.839545	0.0168142	0.0070857	22.839545	0.3530978	2.1965522	25.389195
2033	90,500	22.715724	0.0168253	0.0071036	22.715724	0.3533303	2.2021066	25.271161
2035	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2037	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2039 - 2063	90,500	22.642116	0.0168354	0.0071203	22.642116	0.353544	2.2072873	25.202947
2066	103,000	25.769379	0.0191607	0.0081037	25.769379	0.4023745	2.5121514	28.683904

**Alternative 4a**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	22,454	7.4422724	0.0041614	0.0017416	7.4422724	0.0873904	0.5399031	8.0695658
2017	190,856	60.762133	0.0353739	0.0148071	60.762133	0.7428516	4.5901956	66.09518
2018	135,357	41.444712	0.0250895	0.0105045	41.444712	0.5268786	3.2564001	45.227991
2019	127,330	37.467517	0.0236034	0.0098842	37.467517	0.4956717	3.0641171	41.027306
2020	116,992	33.001519	0.0216889	0.0090843	33.001519	0.4554662	2.8161228	36.273108
2021	123,495	34.293917	0.0228997	0.0095976	34.293917	0.4808945	2.9752488	37.750061

**Alternative 4b**

Year	Distance (mi)	Annual Emissions (metric tons)			(metric tons CO2 equivalent)			
		CO2	CH4	N2O	CO2	CH4	N2O	Total
2016	22,454	7.4422724	0.0041614	0.0017416	7.4422724	0.0873904	0.5399031	8.0695658
2017	190,856	60.762133	0.0353739	0.0148071	60.762133	0.7428516	4.5901956	66.09518
2018	175,743	53.810464	0.0325753	0.0136387	53.810464	0.684082	4.2280038	58.72255
2019	160,858	47.333291	0.0298186	0.0124869	47.333291	0.6261897	3.8709462	51.830427
2020	154,330	43.533918	0.0286108	0.0119835	43.533918	0.6008278	3.7148854	47.849631
2021	123,495	34.293917	0.0228997	0.0095976	34.293917	0.4808945	2.9752488	37.750061

453.592 g/lb  
 2000 lb/ton  
 1000000 g/metric ton

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Emission Factors - 2016 (g/hp-hr or g/hr)										Emission Factors - 2017 (g/hp-hr or g/hr)									
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		96.00	22.2	73.8	52	211	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056		
Dust Control	Water truck	5000 gal	2,320.00	535.4	1,784.6	52	211	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048		
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80.00	18.5	61.5	52	211	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056		
	Biologist	3/4 ton pickup truck	1,213.00	279.9	933.1	52	211	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056		
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.46	0.5	0	52	0	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056		
	Tractor/crawler/dozer	250 hp	0.77	0.8	0	52	0	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000		
	Chain saw		0.77	0.8	0	52	0	1.786	0.115	13.187	0.001	0.021	0.021	35.645	0.111	0.039	1.889	0.115	13.187	0.001	0.021	0.021	35.643	0.117	0.039		
	Brush Piling	Front end loader	540 hp	0.39	0.4	0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	
		Tractor/crawler/dozer	310 hp	0.39	0.4	0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	
	Chipping	Brush chipper	250 hp	0.39	0.4	0	52	0	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000	
		Front end loader	540 hp	0.39	0.4	0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	
	Gravel	Grader	135 hp	11.11	11.1	0	52	0	0.068	0.996	1.863	0.004	0.066	0.061	320.918	0.019	0.000	0.073	1.005	1.912	0.004	0.069	0.063	320.926	0.021	0.000	
		Vibratory roller	85 hp	16.00	16.0	0	52	0	0.042	1.062	1.354	0.003	0.070	0.065	222.773	0.010	0.000	0.044	1.069	1.378	0.003	0.071	0.066	222.772	0.010	0.000	
		Tractor/crawler/dozer	310 hp	3.26	3.3	0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	
		Tractor/crawler/dozer	440 hp	0.81	0.8	0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	
		Asphalt distributor	3000 gal	0.81	0.8	0	52	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048	
	Guard Railing	Flatbed truck		8.75	8.8	0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135	
		Auger Drill	10 hp	8.75	8.8	0	52	0	3.623	2.678	132.418	0.006	1.877	1.873	223.929	0.205	0.204	3.633	2.686	132.805	0.006	1.883	1.879	224.584	0.205	0.204	
	Demo Existing Gate	Loader/backhoe	75 hp	4.00	4.0	0	52	0	0.057	1.075	1.282	0.002	0.075	0.069	195.357	0.012	0.000	0.061	1.085	1.315	0.002	0.077	0.071	195.356	0.013	0.000	
		Flatbed truck		4.00	4.0	0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135	
	Clear & Grub - Sediment Removal Area & Access Rd	Clear Brush	1 ton pickup truck	23.16	0	23.2	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056	
		Excavator	94 hp	23.16	0	23.2	0	42	0.057	1.099	1.937	0.003	0.077	0.070	278.042	0.020	0.000	0.060	1.098	1.968	0.003	0.078	0.071	278.041	0.021	0.000	
		Front end loader	210 hp	23.16	0	23.2	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000	
		Dump truck	10cy	23.16	0	23.2	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048	
Dump truck		10cy	23.16	0	23.2	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048		
Brush chipper		275 hp	23.16	0	23.2	0	42	0.058	0.528	0.384	0.002	0.004	0.003	224.564	0.005	0.000	0.061	0.528	0.385	0.002	0.004	0.003	223.246	0.006	0.000		
Front end loader		210 hp	10.65	0	10.7	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000		
Cutting		1 ton pickup truck		13.20	0	13.2	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056	
		Tractor/crawler/dozer	250 hp	22.00	0	22.0	0	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	
Chain saw			22.00	0	22.0	0	42	1.786	0.115	13.187	0.001	0.021	0.021	35.645	0.111	0.039	1.889	0.115	13.187	0.001	0.021	0.021	35.643	0.117	0.039		
Brush Piling		Front end loader	540 hp	11.09	0	11.1	0	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	
		Tractor/crawler/dozer	310 hp	11.09	0	11.1	0	42	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	
Chipping		Brush chipper	250 hp	11.09	0	11.1	0	42	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000	
		Front end loader	540 hp	11.09	0	11.1	0	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	
Dewatering		Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2.00	0	2.0	0	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	
		49 hp	4.00	0	4.0	0	178	0.177	2.105	1.842	0.003	0.083	0.076	231.302	0.016	0.000	0.194	2.138	1.939	0.003	0.086	0.079	231.302	0.018	0.000		
		Roller	47 hp	4.00	0	4.0	0	0.149	2.081	1.697	0.003	0.078	0.071	235.481	0.013	0.000	0.164	2.111	1.785	0.003	0.081	0.074	235.494	0.015	0.000		
		Water truck	3000 gal	4.00	0	4.0	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048		
		Excavator	300 hp	4.00	0	4.0	0	0.041	0.523	0.419	0.002	0.004	0.003	211.852	0.011	0.000	0.044	0.526	0.424	0.002	0.004	0.004	211.858	0.012	0.000		
		Front end loader	180 hp	4.00	0	4.0	0	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000		
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6.00	0	6.0	0	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	
		36" Diversion Pipe - pipe	Welder	17 hp	16.00	0	16.0	0	2.544	1.647	93.480	0.004	1.249	1.246	148.934	0.144	0.124	2.544	1.646	93.479	0.004	1.248	1.246	148.931	0.144	0.124	
		36" Diversion Pipe	Crane 80'	130 hp	273.00	0	273.0	0																			





Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Peak Daily Emissions - 2016 (pounds per day)						Peak Daily Emissions - 2017 (pounds per day)						
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
				Construction Survey	3/4 ton pickup truck		96.00	22.2	73.8	52	211	9.46E-03	7.33E-03	1.13E-01	1.15E-04	9.64E-04	4.47E-04	7.00E-03	5.56E-03	8.39E-02
Dust Control	Water truck	5000 gal	2,320.00	535.4	1,784.6	52	211	3.52E-01	5.69E+00	6.31E-01	4.89E-03	1.26E-01	8.29E-02	2.60E-01	4.27E+00	4.75E-01	4.01E-03	8.96E-02	5.55E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	80.00	18.5	61.5	52	211	7.89E-03	6.11E-03	9.42E-02	9.60E-05	8.03E-04	3.73E-04	5.83E-03	4.64E-03	7.00E-02	7.88E-05	6.52E-04	2.99E-04	
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.46	0.5	0	52	0	1.39E-04	1.38E-04	1.87E-03	2.40E-06	1.96E-05	8.94E-06	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	0.77	0.8	0	52	0	6.90E-04	9.38E-03	9.88E-03	5.50E-05	6.74E-05	6.20E-05	-	-	-	-	-	-	
	Chain saw		0.77	0.8	0	52	0	9.73E-04	6.25E-05	7.19E-03	8.00E-07	1.13E-05	1.13E-05	-	-	-	-	-	-	
	Brush Piling	Front end loader	540 hp	0.39	0.4	0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-
		Tractor/crawler/dozer	310 hp	0.39	0.4	0	52	0	4.43E-04	6.01E-03	4.58E-03	2.34E-05	4.32E-05	3.98E-05	-	-	-	-	-	-
	Chipping	Brush chipper	250 hp	0.39	0.4	0	52	0	8.06E-04	7.39E-03	5.46E-03	3.54E-05	5.21E-05	4.79E-05	-	-	-	-	-	-
		Front end loader	540 hp	0.39	0.4	0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-
	Gravel	Grader	135 hp	11.11	11.1	0	52	0	8.59E-03	1.27E-01	2.37E-01	4.59E-04	8.41E-03	7.74E-03	-	-	-	-	-	-
		Vibratory roller	85 hp	16.00	16.0	0	52	0	4.81E-03	1.22E-01	1.56E-01	3.01E-04	8.09E-03	7.44E-03	-	-	-	-	-	-
		Tractor/crawler/dozer	310 hp	3.26	3.3	0	52	0	3.74E-03	5.08E-02	3.87E-02	1.98E-04	3.65E-04	3.36E-04	-	-	-	-	-	-
		Tractor/crawler/dozer	440 hp	0.81	0.8	0	52	0	1.33E-03	1.80E-02	1.37E-02	7.01E-05	1.30E-04	1.19E-04	-	-	-	-	-	-
		Asphalt distributor	3000 gal	0.81	0.8	0	52	0	5.32E-04	8.61E-03	9.56E-04	7.40E-06	1.90E-04	1.25E-04	-	-	-	-	-	-
	Guard Railing	Flatbed truck		8.75	8.8	0	52	0	6.85E-03	6.71E-03	9.70E-02	4.53E-05	3.70E-04	1.66E-04	-	-	-	-	-	-
		Auger Drill	10 hp	8.75	8.8	0	52	0	2.69E-02	1.99E-02	9.82E-01	4.74E-05	1.39E-02	1.39E-02	-	-	-	-	-	-
		Demo Existing Gate	Loader/backhoe	4.00	4.0	0	52	0	1.45E-03	2.73E-02	3.26E-02	5.83E-05	1.92E-03	1.77E-03	-	-	-	-	-	-
		Flatbed truck		4.00	4.0	0	52	0	3.13E-03	3.07E-03	4.43E-02	2.07E-05	1.69E-04	7.59E-05	-	-	-	-	-	-
	Clear & Grub - Sediment Removal Area & Access Rd	Clear Brush	1 ton pickup truck	23.16	0	23.2	0	42	-	-	-	-	-	-	7.24E-03	7.70E-03	9.72E-02	1.50E-04	1.21E-03	5.43E-04
		Excavator	94 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	1.37E-02	2.51E-01	4.50E-01	7.45E-04	1.77E-02	1.63E-02
		Front end loader	210 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	3.02E-02	2.68E-01	2.77E-01	1.55E-03	2.10E-03	1.94E-03
		Dump truck	10cy	23.16	0	23.2	0	42	-	-	-	-	-	-	1.70E-02	2.78E-01	3.10E-02	2.62E-04	5.84E-03	3.62E-03
Dump truck		10cy	23.16	0	23.2	0	42	-	-	-	-	-	-	1.70E-02	2.78E-01	3.10E-02	2.62E-04	5.84E-03	3.62E-03	
Brush chipper		275 hp	23.16	0	23.2	0	42	-	-	-	-	-	-	4.09E-02	3.53E-01	2.57E-01	1.46E-03	2.51E-03	2.31E-03	
Front end loader		210 hp	10.65	0	10.7	0	42	-	-	-	-	-	-	1.39E-02	1.23E-01	1.28E-01	7.13E-04	9.68E-04	8.91E-04	
Cutting		1 ton pickup truck	13.20	0	13.2	0	42	-	-	-	-	-	-	4.13E-03	4.39E-03	5.54E-02	8.52E-05	6.89E-04	3.10E-04	
		Tractor/crawler/dozer	250 hp	22.00	0	22.0	0	42	-	-	-	-	-	2.64E-02	3.36E-01	3.62E-01	1.96E-03	2.45E-03	2.25E-03	
		Chain saw		22.00	0	22.0	0	42	-	-	-	-	-	3.67E-02	2.23E-03	2.56E-01	2.85E-05	4.03E-04	4.02E-04	
Brush Piling		Front end loader	540 hp	11.09	0	11.1	0	42	-	-	-	-	-	3.66E-02	3.25E-01	3.69E-01	1.94E-03	2.55E-03	2.34E-03	
		Tractor/crawler/dozer	310 hp	11.09	0	11.1	0	42	-	-	-	-	-	1.69E-02	2.16E-01	1.67E-01	8.32E-04	1.57E-03	1.44E-03	
Chipping		Brush chipper	250 hp	11.09	0	11.1	0	42	-	-	-	-	-	3.35E-02	2.89E-01	2.15E-01	1.38E-03	2.06E-03	1.89E-03	
		Front end loader	540 hp	11.09	0	11.1	0	42	-	-	-	-	-	3.66E-02	3.25E-01	3.69E-01	1.94E-03	2.55E-03	2.34E-03	
Dewatering		Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2.00	0	2.0	0	178	-	-	-	-	-	4.08E-04	5.19E-03	5.59E-03	3.02E-05	3.78E-05	3.47E-05
	Front end loader	49 hp	4.00	0	4.0	0	178	-	-	-	-	-	-	9.42E-04	1.04E-02	9.42E-03	1.45E-05	4.19E-04	3.86E-04	
	Roller	47 hp	4.00	0	4.0	0	178	-	-	-	-	-	-	7.66E-04	9.83E-03	8.31E-03	1.42E-05	3.76E-04	3.46E-04	
	Water truck	3000 gal	4.00	0	4.0	0	178	-	-	-	-	-	-	6.91E-04	1.13E-02	1.26E-03	1.07E-05	2.38E-04	1.48E-04	
	Excavator	300 hp	4.00	0	4.0	0	178	-	-	-	-	-	-	1.31E-03	1.56E-02	1.26E-02	6.18E-05	1.15E-04	1.06E-04	
	Front end loader	180 hp	4.00	0	4.0	0	178	-	-	-	-	-	-	1.06E-03	9.38E-03	9.69E-03	5.42E-05	7.35E-05	6.76E-05	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6.00	0	6.0	0	178	-	-	-	-	-	1.22E-03	1.56E-02	1.68E-02	9.06E-05	1.13E-04	1.04E-04	
	36" Diversion Pipe - pipe	Welder	17 hp	16.00	0	16.0	0	178	-	-	-	-	-	1.71E-02	1.11E-02	6.30E-01	2.54E-05	8.41E-03	8.39E-03	
	36" Diversion Pipe	Crane 80'	130 hp	273.00	0	273.0	0	178	-	-	-	-	-	3.40E-02	6.15E-01	1.09E+00	2.06E-03	3.77E-02	3.47E-02	
		Loader/backhoe	75 hp	0.09	0	0.1	0	178	-	-	-	-	-	1.05E-05	1.86E-04	2.25E-04	3.93E-07	1.32E-05	1.22E-05	
		Crane 94'	155 hp	155.00	0	155.0	0	33	-	-	-	-	-	1.24E-01	2.25E+00	4.00E+00	7.51E-03	1.38E-01	1.27E-01	
		1 ton pickup truck		155.00	0	155.0	0	33	-	-	-	-	-	6.17E-02	6.56E-02	8.28E-01	1.27E-03	1.03E-02	4.63E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2.00	0	2.0	0	33	-	-	-	-	-	2.20E-03	2.80E-02	3.02E-02	1.63E-04	2.04E-04	1.87E-04	
	Dewatering	Concrete saw	13 hp	8.00	0	8.0	0	159	-	-	-	-	-	9.38E-03	6.93E-03	3.43E-01	1.65E-05	4.86E-03	4.85E-03	
		Crane 80'	130 hp	16.00	0	16.0	0	159	-	-	-	-	-	2.23E-03	4.04E-02	7.18E-02	1.35E-04	2.47E-03	2.28E-03	
	Flatbed truck		8.00	0	8.0	0	159	-	-	-	-	-	1.73E-03	1.75E-03	2.42E-02	1.35E-05	1.09E-04	4.81E-05		
	Generator	80 hp	5,472.00	0	5,472.0	0	228	-	-	-	-	-	8.39E-01	1.24E+01	1.42E+01	2.92E-02	8.23E-01	7.57E-01		
	Generator	7.5 hp	1.59	0	1.6	0	159	-	-	-	-	-	6.67E-04	4.75E-04	3.42E-02	1.65E-06	3.23E-05	3.23E-05		
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	120.77	120.8	0.0	52	0	2.65E-01	3.60E+00	3.32E+00	1.74E-02	2.59E-02	2.38E-02	-	-	-	-	-	
		Tractor/crawler/dozer	600 hp	738.46	0	738.5	0	178	-	-	-	-	-	-	5.08E-01	6.47E+00	5.84E+00	2.99E-02	4.70E-02	4.33E-02
	Push	Tractor/crawler/dozer	600 hp	738.46	0	738.5	0	178	-	-	-	-	-	-	5.08E-01	6.47E+00	5.84E+00	2.99E-02	4.70E-02	4.33E-02
		Tractor/crawler/dozer	600 hp	738.46	0	738.5	0	178	-	-	-	-	-	-	5.08E-01	6.47E+00	5.84E+00	2.99E-02	4.70E-02	4.33E-02
	Build road	Tractor/crawler/dozer	600 hp	761.54	0	761.5	0	178	-	-	-	-	-	-	5.24E-01	6.67E+00	6.02E+00	3.08E-02	4.85E-02	4.46E-02
	Cut	Tractor/crawler/dozer	600 hp	20.46	0	20.5	0	178	-	-	-	-	-	-	1.41E-02	1.79E-01	1.62E-01	8.27E-04	1.30E-03	1.20E-03
	Fine Grading	Grader	135 hp	8.89	0	8.9	0	178	-	-	-	-	-	-	2.17E-03	2.99E-02	5.68E-02	1.07E-04	2.04E-03	1.88E-03
	Graveling	Asphalt distributor	3000 gal	10.00	0	10.0	0	178	-	-	-	-	-	-	1.73E-03	2.83E-02	3.16E-03	2.66E-05	5.95E-04	3.69E-04
		Vibratory roller	85 hp	30.46	0	30.5	0	178	-	-	-	-	-	-	2.82E-03	6.85E-02	8.84E-02	1.68E-04	4.57E-03	4.20E-03
		Tractor/crawler/dozer	310 hp	12.74	0	12.7	0	178	-	-	-	-	-	-	4.59E-03	5.85E-02	4.52E-02	2.26E-04	4.25E-04	3.91E-04



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 2

Construction Start Year: 2018  
Speed of Onsite Trucks: 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Metric Tons CO <sub>2</sub> eq/yr	Peak Daily Emissions - 2018 (pounds per day)					
						VOC	NOx	CO	SO <sub>2</sub>	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		96	210	1.99E+00	8.20E-03	6.72E-03	9.88E-02	1.23E-04	1.01E-03	4.60E-04
Dust Control	Water truck	5000 gal	2320	210	4.99E+01	3.39E-01	5.13E+00	6.23E-01	5.23E-03	1.13E-01	6.85E-02
Environmental protection measures	Biologist			210	2.55E+01	1.05E-01	8.60E-02	1.26E+00	1.58E-03	1.30E-02	5.88E-03
	Fish relocation			16	3.32E-01	1.37E-03	1.12E-03	1.65E-02	2.06E-05	1.69E-04	7.66E-05
Clear Vegetation	1 ton pickup truck		4.4	19	9.12E-02	2.23E-04	2.62E-04	2.98E-03	5.68E-06	4.53E-05	2.01E-05
	Tractor/crawler/dozer	250 hp	7.3333	19	5.53E-01	1.88E-03	2.26E-02	2.47E-02	1.30E-04	1.66E-04	1.53E-04
	Chain saw			19	3.10E-03	2.58E-03	1.48E-04	1.71E-02	1.90E-06	2.68E-05	2.68E-05
	Brush Piling	Front end loader	540 hp	3.696	19	5.81E-01	2.64E-03	2.19E-02	2.38E-02	1.23E-04	1.75E-04
	Tractor/crawler/dozer	310 hp	3.696	19	2.70E-01	1.21E-03	1.45E-02	1.13E-02	5.55E-05	1.06E-04	9.79E-05
	Brush chopper	250 hp	3.696	19	3.80E-01	2.33E-03	1.89E-02	1.42E-02	8.97E-05	1.36E-04	1.25E-04
	Front end loader	540 hp	3.696	19	5.81E-01	2.64E-03	2.19E-02	2.38E-02	1.23E-04	1.75E-04	1.61E-04
Dewatering	Temporary Cofferdam			19	1.09E-01	3.69E-04	4.43E-03	4.85E-03	2.58E-05	3.28E-05	3.00E-05
	Front end loader	49 hp	2	19	4.54E-02	8.63E-04	8.93E-03	8.35E-03	1.23E-05	3.69E-04	3.39E-04
	Roller	47 hp	4	19	4.43E-02	7.08E-04	8.45E-03	7.38E-03	1.20E-05	3.32E-04	3.05E-04
	Water truck	3000 gal	4	19	8.60E-02	5.85E-04	8.84E-03	1.07E-03	9.02E-06	1.94E-04	1.18E-04
	Excavator	300 hp	4	19	2.55E-01	1.18E-03	1.33E-02	1.07E-02	5.24E-05	9.92E-05	9.13E-05
	Front end loader	180 hp	4	19	1.95E-01	9.62E-04	7.98E-03	8.41E-03	4.59E-05	6.36E-05	5.85E-05
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	3.26E-01	1.11E-03	1.33E-02	1.46E-02	7.68E-05	9.77E-05	8.99E-05
	Loader/backhoe	75 hp	0.0923	19	1.35E-03	9.49E-06	1.59E-04	1.95E-04	3.33E-07	1.15E-05	1.05E-05
	Crane 94'	155 hp	155	19	5.01E+00	2.07E-02	3.55E-01	6.46E-01	1.18E-03	2.22E-02	2.04E-02
	1 ton pickup truck		155	19	3.21E+00	7.87E-03	9.23E-03	1.05E-01	2.00E-04	1.60E-03	7.07E-04
	Crane 94'	155 hp	155	20	5.01E+00	2.07E-02	3.55E-01	6.46E-01	1.18E-03	2.22E-02	2.04E-02
	1 ton pickup truck		155	20	3.21E+00	7.87E-03	9.23E-03	1.05E-01	2.00E-04	1.60E-03	7.07E-04
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.09E-01	8.69E-04	4.43E-03	4.85E-03	2.58E-05	3.28E-05	3.00E-05
	Concrete saw	13 hp	8	22	2.75E-02	7.10E-03	5.25E-03	2.59E-01	1.25E-05	3.68E-03	3.67E-03
	Crane 80'	130 hp	16	22	4.34E-01	1.79E-03	3.08E-02	5.59E-02	1.02E-04	1.92E-03	1.77E-03
	Flatbed truck		8	22	1.69E-01	1.10E-03	1.15E-03	1.53E-02	1.02E-05	8.13E-05	3.54E-05
	Generator	80 hp	5,856.00	244	1.38E+02	1.03E+00	1.45E+01	1.67E+01	3.40E-02	9.69E-01	8.91E-01
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	2.88E+01	1.15E-01	1.38E+00	1.21E+00	6.07E-03	1.01E-02
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	2.88E+01	1.15E-01	1.38E+00	1.21E+00	6.07E-03	1.01E-02
	Tractor/crawler/dozer	600 hp	184.6154	19	2.88E+01	1.15E-01	1.38E+00	1.21E+00	6.07E-03	1.01E-02	9.32E-03
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	2.88E+01	1.15E-01	1.38E+00	1.21E+00	6.07E-03	1.01E-02
	Armoring	1 ton pickup truck	2	19	4.15E-02	1.01E-04	1.19E-04	1.36E-03	2.58E-06	2.06E-05	9.13E-06
	Excavator	430 hp	2	19	1.82E-01	8.47E-04	9.56E-03	7.66E-03	3.75E-05	7.11E-05	6.94E-05
	1 ton pickup truck		2	19	4.15E-02	1.01E-04	1.19E-04	1.36E-03	2.58E-06	2.06E-05	9.13E-06
	Maintenance	Grader	340	210	2.28E+01	8.61E-02	8.56E-01	9.98E-01	5.39E-03	6.54E-03	6.02E-03
Coarse Material (Gravel & Larger) (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	1.38E+01	3.37E-02	3.95E-02	4.50E-01	8.56E-04	6.83E-03	3.03E-03
	Front end loader	350 hp	663.5	78	4.99E+01	3.10E-01	2.57E+00	2.04E+00	1.03E-02	2.05E-02	1.89E-02
	Front end loader	350 hp	663.5	78	4.99E+01	3.10E-01	2.57E+00	2.04E+00	1.03E-02	2.05E-02	1.89E-02
	Front end loader	350 hp	663.5	78	4.99E+01	3.10E-01	2.57E+00	2.04E+00	1.03E-02	2.05E-02	1.89E-02
	Front end loader	350 hp	663.5	78	4.99E+01	3.10E-01	2.57E+00	2.04E+00	1.03E-02	2.05E-02	1.89E-02
	Water truck	3000 gal	663.5	78	1.43E+01	9.70E-02	1.47E+00	1.78E-01	1.50E-03	3.22E-02	1.96E-02
	Excavator	400 hp	663.5	78	5.63E+01	2.61E-01	2.95E+00	2.36E+00	1.16E-02	2.19E-02	2.02E-02
	Excavator	400 hp	663.5	78	5.63E+01	2.61E-01	2.95E+00	2.36E+00	1.16E-02	2.19E-02	2.02E-02
	Excavator	400 hp	663.5	78	5.63E+01	2.61E-01	2.95E+00	2.36E+00	1.16E-02	2.19E-02	2.02E-02
	Excavator	400 hp	663.5	78	5.63E+01	2.61E-01	2.95E+00	2.36E+00	1.16E-02	2.19E-02	2.02E-02
	1 ton pickup truck		102	11	2.11E+00	5.18E-03	6.08E-03	6.91E-02	1.32E-04	1.05E-03	4.66E-04
Sand to Surfriider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	7.68E+00	4.77E-02	3.95E-01	3.14E-01	1.58E-03	3.15E-03	2.90E-03
	Front end loader	350 hp	102	11	7.68E+00	4.77E-02	3.95E-01	3.14E-01	1.58E-03	3.15E-03	2.90E-03
	Front end loader	350 hp	102	11	7.68E+00	4.77E-02	3.95E-01	3.14E-01	1.58E-03	3.15E-03	2.90E-03
	Front end loader	350 hp	102	11	7.68E+00	4.77E-02	3.95E-01	3.14E-01	1.58E-03	3.15E-03	2.90E-03
	Front end loader	350 hp	102	11	7.68E+00	4.77E-02	3.95E-01	3.14E-01	1.58E-03	3.15E-03	2.90E-03
	Water truck	3000 gal	102	11	2.19E+00	1.49E-02	2.25E-01	2.74E-02	2.30E-04	4.95E-03	3.01E-03
	Excavator	400 hp	102	11	8.65E+00	4.02E-02	4.54E-01	3.64E-01	1.78E-03	3.37E-03	3.10E-03
	Excavator	400 hp	102	11	8.65E+00	4.02E-02	4.54E-01	3.64E-01	1.78E-03	3.37E-03	3.10E-03
	Excavator	400 hp	102	11	8.65E+00	4.02E-02	4.54E-01	3.64E-01	1.78E-03	3.37E-03	3.10E-03
	Excavator	400 hp	102	11	8.65E+00	4.02E-02	4.54E-01	3.64E-01	1.78E-03	3.37E-03	3.10E-03
	Excavator	400 hp	102	11	8.65E+00	4.02E-02	4.54E-01	3.64E-01	1.78E-03	3.37E-03	3.10E-03
	Beach Crew	1 ton pickup truck	102	11	2.11E+00	5.18E-03	6.08E-03	6.91E-02	1.32E-04	1.05E-03	4.66E-04
	Tractor/crawler/dozer	600 hp	102	11	1.59E+01	6.34E-02	7.62E-01	6.68E-01	3.35E-03	5.60E-03	5.15E-03
	Tractor/crawler/dozer	600 hp	102	11	1.59E+01	6.34E-02	7.62E-01	6.68E-01	3.35E-03	5.60E-03	5.15E-03
	Tractor/crawler/dozer	600 hp	102	11	1.59E+01	6.34E-02	7.62E-01	6.68E-01	3.35E-03	5.60E-03	5.15E-03
	Tractor/crawler/dozer	600 hp	102	11	1.59E+01	6.34E-02	7.62E-01	6.68E-01	3.35E-03	5.60E-03	5.15E-03
	Water truck	3000 gal	25	11	5.38E-01	3.66E-03	5.53E-02	6.72E-03	5.64E-05	1.21E-03	7.38E-04
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	7.93E+00	1.94E-02	2.28E-02	2.59E-01	4.93E-04	3.94E-03	1.75E-03
	Front end loader	350 hp	382.5	48	2.88E+01	1.79E-01	1.48E+00	1.18E+00	5.93E-03	1.18E-02	1.09E-02
	Front end loader	350 hp	382.5	48	2.88E+01	1.79E-01	1.48E+00	1.18E+00	5.93E-03	1.18E-02	1.09E-02
	Front end loader	350 hp	382.5	48	2.88E+01	1.79E-01	1.48E+00	1.18E+00	5.93E-03	1.18E-02	1.09E-02
	Front end loader	350 hp	382.5	48	2.88E+01	1.79E-01	1.48E+00	1.18E+00	5.93E-03	1.18E-02	1.09E-02
	Water truck	3000 gal	382.5	48	8.23E+00	5.59E-02	8.45E-01	1.03E-01	8.63E-04	1.86E-02	1.13E-02
	Excavator	400 hp	382.5	48	3.25E+01	1.51E-01	1.70E+00	1.36E+00	6.68E-03	1.26E-02	1.16E-02
	Excavator	400 hp	382.5	48	3.25E+01	1.51E-01	1.70E+00	1.36E+00	6.68E-03	1.26E-02	1.16E-02
	Excavator	400 hp	382.5	48	3.25E+01	1.51E-01	1.70E+00	1.36E+00	6.68E-03	1.26E-02	1.16E-02
	Excavator	400 hp	382.5	48	3.25E+01	1.51E-01	1.70E+00	1.36E+00	6.68E-03	1.26E-02	1.16E-02
	Beach Crew	1 ton pickup truck	382.5	48	7.93E+00	1.94E-02	2.28E-02	2.59E-01	4.93E-04	3.94E-03	1.75E-03
	Tractor/crawler/dozer	600 hp	382.5	48	5.96E+01	2.38E-01	2.86E+00	2.51E+00	1.26E-02	2.10E-02	1.93E-02
	Tractor/crawler/dozer	600 hp	382.5	48	5.96E+01	2.38E-01	2.86E+00	2.51E+00	1.26E-02	2.10E-02	1.93E-02
	Tractor/crawler/dozer	600 hp	382.5	48	5.96E+01	2.38E-01	2.86E+00	2.51E+00	1.26E-02	2.10E-02	1.93E-02
	Tractor/crawler/dozer	600 hp	382.5	48	5.96E+01	2.38E-01	2.86E+00	2.51E+00	1.26E-02	2.10E-02	1.93E-02
	Water truck	3000 gal	382.5	48	8.23E+00	5.59E-02	8.45E-01	1.03E-01	8.63E-04	1.86E-02	1.13E-02
Demolition	Platform	Tractor/crawler/dozer	440 hp	720	22	7.45E+01	3.33E-01	4.01E+00	3.13E+00	1.53E-02	2.94E-02
	Tractor/crawler/dozer	440 hp	90	22	9.32E+00	4.17E-02	5.01E-01	3.			



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)								Annual Emissions - 2019 (tons per year)								Metric Tons CO2e/yr				
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2		CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	3.71E-04	3.21E-04	4.51E-03	6.44E-06	5.25E-05	2.36E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
Dust Control	Water truck	5000 gal	2320	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	1.75E-02	2.47E-01	3.24E-02	2.73E-04	5.70E-03	3.40E-03	5.49E+01	1.30E-04	1.23E-04	5.49E+01	4.98E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	4.75E-03	4.11E-03	5.77E-02	8.24E-05	6.73E-04	3.02E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	9.54E-06	1.22E-05	1.29E-04	2.96E-07	2.35E-06	1.03E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	1.05E-04	1.19E-03	1.30E-03	6.85E-06	8.85E-06	8.14E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3335	19	2.096	0.115	13.187	0.001	0.021	0.004	35.644	0.130	0.039	1.42E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	8.85E-06	2.66E-06	3.43E-03	3.11E-03	
	Brush Piling	Front end loader	540 hp	3.696	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000	1.49E-04	1.16E-03	1.35E-03	6.84E-06	9.42E-06	8.67E-06	6.80E-01	3.62E-05	-	6.81E-01	6.18E-01
		Tractor/crawler/dozer	310 hp	3.696	19	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000	6.66E-05	7.60E-04	5.94E-04	2.91E-06	5.64E-06	5.19E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01
	Chipping	Brush chipper	250 hp	3.696	19	0.125	0.962	0.724	0.005	0.007	0.006	402.522	0.011	0.000	1.27E-04	9.80E-04	7.37E-04	4.61E-06	7.11E-06	6.54E-06	4.10E-01	1.15E-05	-	4.10E-01	3.72E-01
		Front end loader	540 hp	3.696	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000	1.49E-04	1.16E-03	1.35E-03	6.84E-06	9.42E-06	8.67E-06	6.80E-01	3.62E-05	-	6.81E-01	6.18E-01
	Dewatering	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Front end loader	49 hp	4	19	0.224	2.197	2.112	0.003	0.093	0.085	231.302	0.020	0.000	4.84E-05	4.75E-04	4.56E-04	6.46E-07	2.00E-05	1.84E-05	5.00E-02	4.37E-06	-	5.01E-02	4.54E-02
		Roller	47 hp	4	19	0.194	2.169	1.953	0.003	0.087	0.080	235.458	0.017	0.000	4.02E-05	4.50E-04	4.05E-04	6.31E-07	1.80E-05	1.66E-05	4.88E-02	3.63E-06	-	4.87E-02	4.43E-02
Water truck		3000 gal	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	4.97E-02	8.59E-02	
Excavator		300 hp	4	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	6.57E-05	7.06E-04	5.61E-04	2.75E-06	5.30E-06	4.88E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
Front end loader		180 hp	4	19	0.068	0.534	0.569	0.003	0.004	0.004	270.062	0.014	0.000	5.42E-05	4.23E-04	4.52E-04	2.41E-06	3.43E-06	3.16E-06	2.14E-01	1.14E-05	-	2.15E-01	1.95E-01	
36" Diversion Pipe - graditi		Tractor/crawler/dozer	180 hp	6	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	6.16E-05	7.03E-04	7.64E-04	4.03E-06	5.21E-06	4.80E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01
36" Diversion Pipe - pipe		Welder	17 hp	4	19	2.544	1.646	93.480	0.004	1.249	1.246	148.933	0.144	0.124	1.91E-04	1.23E-04	7.01E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02
36" Diversion Pipe		Crane 80'	130 hp	27.3333	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	1.70E-04	2.77E-03	5.10E-03	9.17E-06	1.77E-04	1.63E-04	8.15E-01	6.22E-05	-	8.16E-01	7.40E-01
		Loader/backhoe	75 hp	0.0923	19	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	5.28E-07	8.42E-06	1.05E-05	1.75E-08	6.15E-07	5.66E-07	1.49E-03	1.11E-07	-	1.49E-03	1.35E-03
		Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	301.172	0.017	0.000	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Dewatering	Concrete saw	13 hp	8	21	3.249	2.402	118.759	0.006	1.684	1.680	300.831	0.184	0.193	3.72E-04	2.75E-04	1.36E-02	6.56E-07	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02
		Crane 80'	130 hp	16	21	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	9.96E-05	1.62E-03	2.99E-03	5.37E-06	1.03E-04	9.52E-05	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01
		Flatbed truck		8	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	1.69E-01	1.69E-01
		Generator	80 hp	5856	244	0.110	1.476	1.708	0.003	0.100	0.092	294.378	0.010	0.000	5.66E-02	7.62E-01	8.82E-01	1.78E-03	5.15E-02	4.74E-02	1.52E+02	5.11E-03	-	1.52E+02	1.38E+02
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01	
	Armoring	1 ton pickup truck		2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
		Excavator	430 hp	2	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	4.71E-05	5.06E-04	4.02E-04	1.97E-06	3.80E-06	3.50E-06	2.01E-01	1.11E-05	-	2.01E-01	1.82E-01
		1 ton pickup truck		2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
		Maintenance	Grader	215 hp	340	209	0.060	0.562	0.664	0.004	0.004	311.990	0.017	0.000	4.82E-03	4.53E-02	5.35E-02	2.83E-04	3.50E-04	3.22E-04	2.51E+01	1.38E-03	-	2.52E+01	2.28E+01
	Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00
			Front end loader	350 hp	59.5	7	0.068	0.534	0.426	0.002	0.004	214.831	0.011	0.000	1.57E-03	1.									

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 3**

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		96	209	7.11E-03	6.14E-03	8.63E-02	1.23E-04	1.01E-03	4.51E-04	
Dust Control	Water truck	5000 gal	2320	209	3.35E-01	4.72E+00	6.20E-01	5.23E-03	1.09E-01	6.50E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	9.10E-02	7.86E-02	1.11E+00	1.58E-03	1.29E-02	5.78E-03	
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.18E-03	1.02E-03	1.44E-02	2.05E-05	1.68E-04	7.52E-05	
	Cutting	1 ton pickup truck	4.4	19	1.83E-04	2.34E-04	2.47E-03	5.66E-06	4.50E-05	1.97E-05	
		Tractor/crawler/dozer	250 hp	7.3333	19	2.00E-03	2.28E-02	2.48E-02	1.31E-04	1.69E-04	1.56E-04
	Brush Piling	Chain saw		7.3335	19	2.72E-03	1.49E-04	1.71E-02	1.91E-06	2.70E-05	2.69E-05
		Front end loader	540 hp	3.696	19	2.85E-03	2.23E-02	2.58E-02	1.31E-04	1.80E-04	1.66E-04
		Tractor/crawler/dozer	310 hp	3.696	19	1.27E-03	1.45E-02	1.14E-02	5.57E-05	1.08E-04	9.93E-05
	Chipping	Tractor/crawler/dozer	250 hp	3.696	19	2.43E-03	1.88E-02	1.41E-02	8.83E-05	1.36E-04	1.25E-04
		Front end loader	540 hp	3.696	19	2.85E-03	2.23E-02	2.58E-02	1.31E-04	1.80E-04	1.66E-04
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	3.93E-04	4.48E-03	4.88E-03	2.57E-05	3.33E-05	3.06E-05
		Front end loader	49 hp	4	19	9.27E-04	9.09E-03	8.73E-03	1.24E-05	3.83E-04	3.53E-04
Roller		47 hp	4	19	7.69E-04	8.60E-03	7.75E-03	1.21E-05	3.45E-04	3.18E-04	
Water truck		3000 gal	4	19	5.78E-04	8.14E-03	1.07E-03	9.02E-06	1.88E-04	1.12E-04	
Excavator		300 hp	4	19	1.26E-03	1.35E-02	1.07E-02	5.26E-05	1.01E-04	9.34E-05	
Front end loader		180 hp	4	19	1.04E-03	8.10E-03	8.64E-03	4.62E-05	6.56E-05	6.04E-05	
36" Diversion Pipe - grad		Tractor/crawler/dozer	180 hp	6	19	1.18E-03	1.34E-02	1.46E-02	7.72E-05	9.98E-05	9.18E-05
36" Diversion Pipe - pipe		Welder	17 hp	4	19	3.65E-03	2.36E-03	1.34E-01	5.41E-06	1.79E-03	1.79E-03
36" Diversion Pipe		Crane 80'	130 hp	27.3333	19	3.26E-03	5.31E-02	9.76E-02	1.75E-04	3.38E-03	3.11E-03
		Loader/backhoe	75 hp	0.0923	19	1.01E-05	1.61E-04	2.01E-04	3.35E-07	1.18E-05	1.08E-05
		Crane 94'	155 hp	155	19	2.20E-02	3.59E-01	6.60E-01	1.19E-03	2.29E-02	2.10E-02
		1 ton pickup truck		155	19	6.43E-03	8.25E-03	8.71E-02	1.99E-04	1.59E-03	6.95E-04
		Crane 94'	155 hp	155	19	2.20E-02	3.59E-01	6.60E-01	1.19E-03	2.29E-02	2.10E-02
		1 ton pickup truck		155	19	6.43E-03	8.25E-03	8.71E-02	1.99E-04	1.59E-03	6.95E-04
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	3.93E-04	4.48E-03	4.88E-03	2.57E-05	3.33E-05	3.06E-05
		Dewatering	Concrete saw	13 hp	8	21	7.13E-03	5.27E-03	2.61E-01	1.26E-05	3.69E-03
			Crane 80'	130 hp	16	21	1.91E-03	3.11E-02	5.71E-02	1.03E-04	1.98E-03
			Flatbed truck		8	21	9.32E-04	1.01E-03	1.29E-02	1.02E-05	8.08E-05
			Generator	80 hp	5856	244	1.08E+00	1.46E+01	1.69E+01	3.41E-02	9.86E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.23E-01	1.41E+00	1.40E+00	7.01E-03	1.04E-02
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.23E-01	1.41E+00	1.40E+00	7.01E-03	1.04E-02	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.23E-01	1.41E+00	1.40E+00	7.01E-03	1.04E-02	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.23E-01	1.41E+00	1.40E+00	7.01E-03	1.04E-02	
	Armoring	1 ton pickup truck		2	19	8.30E-05	1.06E-04	1.12E-03	2.57E-06	2.05E-05	
		Excavator	430 hp	2	19	9.02E-04	9.68E-03	7.70E-03	3.77E-05	7.27E-05	
		1 ton pickup truck		2	19	8.30E-05	1.06E-04	1.12E-03	2.57E-06	2.05E-05	
		Maintenance	Grader	215 hp	340	209	9.22E-02	8.67E-01	1.02E+00	5.41E-03	6.71E-03
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	2.47E-03	3.17E-03	3.34E-02	7.66E-05	6.09E-04	2.67E-04	
	Front end loader	350 hp	59.5	7	3.00E-02	2.35E-01	1.87E-01	9.26E-04	1.90E-03	1.75E-03	
	Front end loader	350 hp	59.5	7	3.00E-02	2.35E-01	1.87E-01	9.26E-04	1.90E-03	1.75E-03	
	Water truck	3000 gal	59.5	7	8.60E-03	1.21E-01	1.59E-02	1.34E-04	2.80E-03	1.67E-03	
	Excavator	400 hp	59.5	7	2.50E-02	2.68E-01	2.13E-01	1.04E-03	2.01E-03	1.85E-03	
	Beach Crew	1 ton pickup truck	59.5	7	2.47E-03	3.17E-03	3.34E-02	7.66E-05	6.09E-04	2.67E-04	
	Tractor/crawler/dozer	600 hp	59.5	7	3.97E-02	4.53E-01	4.50E-01	2.26E-03	3.36E-03	3.09E-03	
	Tractor/crawler/dozer	600 hp	59.5	7	3.97E-02	4.53E-01	4.50E-01	2.26E-03	3.36E-03	3.09E-03	
	Water truck	3000 gal	14.875	7	2.15E-03	3.03E-02	3.97E-03	3.36E-05	6.99E-04	4.17E-04	
		Excavator	400 hp	1028.5	131	4.27E-02	5.47E-02	5.78E-01	1.32E-03	1.05E-02	
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	5.19E-01	4.05E+00	3.24E+00	1.60E-02	3.28E-02		
	Front end loader	350 hp	1028.5	131	5.19E-01	4.05E+00	3.24E+00	1.60E-02	3.28E-02		
	Water truck	3000 gal	1028.5	131	1.49E-01	2.09E+00	2.75E-01	2.32E-03	4.83E-02		
	Excavator	400 hp	1028.5	131	4.31E-01	4.63E+00	3.68E+00	1.80E-02	3.48E-02		
	Beach Crew	1 ton pickup truck	1028.5	131	4.27E-02	5.47E-02	5.78E-01	1.32E-03	1.05E-02		
	Tractor/crawler/dozer	600 hp	1028.5	131	6.87E-01	7.83E+00	7.78E+00	3.91E-02	5.81E-02		
	Tractor/crawler/dozer	600 hp	1028.5	131	6.87E-01	7.83E+00	7.78E+00	3.91E-02	5.81E-02		
	Water truck	3000 gal	257.125	131	3.72E-02	5.23E-01	6.87E-02	5.80E-04	1.21E-02		
		Tractor/crawler/dozer	440 hp	720	22	3.52E-01	4.02E+00	3.15E+00	1.54E-02	2.98E-02	
		Tractor/crawler/dozer	440 hp	90	22	4.41E-02	5.03E-01	3.93E-01	1.93E-03	3.73E-03	
Demolition	3/4 ton pickup truck		360	22	2.66E-02	2.30E-02	3.24E-01	4.62E-04	3.77E-03		
	Drilling	Rotary drill	475 hp	54.4	128	2.86E-02	3.73E-01	2.90E-01	1.51E-03	2.70E-03	
	3/4 ton pickup truck		50.4	128	3.73E-03	3.22E-03	4.53E-02	6.47E-05	5.28E-04		
	Cut with Diamond wire	3/4 ton pickup truck	148	128	1.10E-02	9.46E-03	1.33E-01	1.90E-04	1.55E-03		
	Diamond cutting saw	50 hp	148	128	2.03E-02	3.69E-01	2.71E-01	5.60E-04	1.28E-02		
	Lift/Load blocks	Crane 260'	375 hp	179.6356	128	4.42E-02	5.57E-01	4.65E-01	2.28E-03		
	3/4 ton pickup truck		179.6356	128	1.33E-02	1.15E-02	1.61E-01	2.30E-04	1.88E-03		
	Load/Haul	Front end loader	350 hp	32	128	1.62E-02	1.26E-01	1.01E-01	4.98E-04		
	Landfill	Crane 260'	375 hp	89.8178	128	2.21E-02	2.79E-01	2.32E-01	1.14E-03		
	Micro-blast	Crane 260'	375 hp	60	128	1.48E-02	1.86E-01	1.55E-01	7.60E-04		
		Horizontal boring drill	10 hp	55	128	1.10E-03	2.87E-02	1.37E-02	4.23E-05		
		3/4 ton pickup truck		60	128	4.44E-03	3.83E-03	5.39E-02	7.70E-05		
	Demolish spillway	Crane 260'	375 hp	100	128	2.46E-02	3.10E-01	2.59E-01	1.27E-03		
		Air compressor	50 hp	200	128	1.27E-01	1.51E-01	1.13E+01	7.88E-04		
		3/4 ton pickup truck		100	128	7.40E-03	6.39E-03	8.99E-02	1.28E-04		
						6.26E+00	6.68E+01	7.38E+01	2.47E-01		
						1.61E+00	1.40E+00				

Data from Alt2\_EnvrAirQualityReport.pdf

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019
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<http://beta.epa.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2019>

**Malibu Creek Ecosystem Restoration Feasibility Study**  
**Construction Equipment - Alternative 2 - Year 4**

Construction Start Year **2020**  
 Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/hp-hr or g/hr)							Annual Emissions - 2020 (tons per year)							Metric Tons CO2e/yr						
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10		PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	3.29E-04	2.97E-04	4.01E-03	6.43E-06	5.21E-05	2.31E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
Dust Control	Water truck	5000 gal	2320	209	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	1.70E-02	1.99E-01	3.17E-02	2.73E-04	5.18E-03	2.93E-03	5.47E+01	1.30E-04	1.23E-04	5.48E+01	4.97E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	4.22E-03	3.80E-03	5.14E-02	8.24E-05	6.67E-04	2.96E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
Fish relocation	3/4 ton pickup truck		16	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	5.49E-05	4.95E-05	6.69E-04	1.07E-06	8.68E-06	3.86E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	8.02E-06	1.11E-05	1.10E-04	2.96E-07	2.33E-06	1.01E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	1.10E-04	1.20E-03	1.30E-03	6.85E-06	8.97E-06	8.25E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3335	19	2.199	0.115	13.188	0.001	0.021	0.021	35.645	0.137	0.039	1.49E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	9.28E-06	2.66E-06	3.44E-03	3.12E-03	
	Brush Piling	Front end loader	540 hp	3.696	19	0.072	0.534	0.583	0.003	0.004	291.179	0.016	0.000	1.59E-04	1.18E-03	1.28E-03	6.44E-06	9.66E-06	8.89E-06	6.41E-01	3.54E-05	-	6.41E-01	5.82E-01	
	Tractor/crawler/dozer	310 hp	3.696	19	0.055	0.604	0.471	0.002	0.005	0.004	234.954	0.013	0.000	7.00E-05	7.62E-04	5.94E-04	2.91E-06	5.71E-06	5.25E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01	
	Chipping	Brush chipper	250 hp	3.696	19	0.130	0.950	0.718	0.004	0.007	395.187	0.012	0.000	1.32E-04	9.68E-04	7.32E-04	4.53E-06	7.09E-06	6.52E-06	4.03E-01	1.19E-05	-	4.03E-01	3.65E-01	
	Front end loader	540 hp	3.696	19	0.072	0.534	0.583	0.003	0.004	0.004	291.179	0.016	0.000	1.59E-04	1.18E-03	1.28E-03	6.44E-06	9.66E-06	8.89E-06	6.41E-01	3.54E-05	-	6.41E-01	5.82E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.054	0.593	0.642	0.003	0.004	301.149	0.017	0.000	2.16E-05	2.35E-04	2.55E-04	1.34E-06	1.76E-06	1.62E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
	Front end loader	49 hp	4	19	0.237	2.223	2.188	0.003	0.096	0.088	231.302	0.021	0.000	5.13E-05	4.80E-04	4.73E-04	6.46E-07	2.06E-05	1.90E-05	5.00E-02	4.63E-06	-	5.01E-02	4.54E-02	
	Roller	47 hp	4	19	0.208	2.198	2.035	0.003	0.090	0.083	235.495	0.019	0.000	4.31E-05	4.55E-04	4.22E-04	6.31E-07	1.87E-05	1.72E-05	4.88E-02	3.89E-06	-	4.89E-02	4.43E-02	
	Water truck	3000 gal	4	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	2.92E-05	3.43E-04	5.47E-04	4.70E-07	8.94E-06	5.04E-06	9.43E-02	2.25E-07	2.12E-07	9.44E-02	8.56E-02	
	Excavator	300 hp	4	19	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	6.86E-05	7.04E-04	5.61E-04	2.75E-06	5.34E-06	4.91E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
	Front end loader	180 hp	4	19	0.073	0.539	0.576	0.003	0.004	0.004	270.055	0.015	0.000	5.78E-05	4.28E-04	4.57E-04	2.41E-06	3.52E-06	3.24E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - grading	Tractor/crawler/dozer	180 hp	6	19	0.054	0.593	0.642	0.003	0.004	301.149	0.017	0.000	6.48E-05	7.05E-04	7.64E-04	4.03E-06	5.29E-06	4.86E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01	
	36" Diversion Pipe - pipe anchors	Welder	17 hp	4	19	2.544	1.646	93.478	0.004	1.248	148.930	0.144	0.124	1.91E-04	1.23E-04	7.01E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02	
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.046	0.712	1.302	0.002	0.046	208.093	0.016	0.000	1.79E-04	2.79E-03	5.10E-03	9.17E-06	1.81E-04	1.67E-04	8.15E-01	6.23E-05	-	8.16E-01	7.41E-01	
	Loader/backhoe	75 hp	0.923	19	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	5.53E-07	8.47E-06	1.05E-05	1.75E-08	6.25E-07	5.75E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03	
	Crane 94'	155 hp	155	19	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.21E-03	1.89E-02	3.45E-02	6.20E-05	1.22E-03	1.13E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Crane 94'	155 hp	155	19	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.21E-03	1.89E-02	3.45E-02	6.20E-05	1.22E-03	1.13E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
	1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.054	0.593	0.642	0.003	0.004	301.149	0.017	0.000	2.16E-05	2.35E-04	2.55E-04	1.34E-06	1.76E-06	1.62E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	22	3.254	2.405	118.948	0.006	1.686	1.683	201.151	0.184	0.193	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.22E-05	3.04E-02	2.76E-02
	Crane 80'	130 hp	16	22	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.05E-04	1.63E-03	2.99E-03	5.37E-06	1.06E-04	9.75E-05	4.77E-01	3.64E-05	-	4.78E-01	4.34E-01	
	Flatbed truck		8	22	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	4.12E-05	4.58E-05	5.67E-04	5.32E-07	4.18E-06	1.78E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
	Generator	80 hp	5856	244	0.115	1.482	1.722	0.003	0.101	0.093	294.370	0.010	0.000	5.94E-02	7.65E-01	8.89E-01	1.78E-03	5.22E-02	4.80E-02	1.52E+02	5.36E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01
	Armoring	1 ton pickup truck	0.9333	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	1.70E-06	2.35E-06	2.32E-05	6.27E-08	4.94E-07	2.14E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02	
	Excavator	430 hp	0.9333	19	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	2.29E-05	2.35E-06	1.88E-04	9.20E-07	1.79E-06	1.64E-06	9.37E-02	5.18E-06	-	9.38E-02	8.51E-02	
	1 ton pickup truck		0.9333	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	1.70E-06	2.35E-06	2.32E-05	6.27E-08	4.94E-07	2.14E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02	1.93E-02	
	Compaction	Vibratory roller	50 hp	7.38	19	0.208	2.198	2.035	0.003	0.090	235.495	0.019	0.000	8.47E-05	8.94E-04	8.28E-04	1.24E-06	3.67E-05	3.37E-05	9.58E-02	7.64E-06	-	9.59E-02	8.70E-02	
	Tractor/crawler/dozer	250 hp	7.38	19	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	1.11E-04	1.21E-03	1.31E-03	6.89E-06	9.03E-06	8.31E-06	6.12E-01	3.39E-05	-	6.13E-01	5.56E-01	
	Water truck	5000 gal	9.225	19	6.632	77.738	12.413	0.107	2.027	1.															



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 4

Construction Start Year **2020**  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	209	6.30E-03	5.69E-03	7.68E-02	1.23E-04	9.96E-04	4.43E-04		
Dust Control	Water truck	5000 gal	2320	209	3.25E-01	3.80E+00	6.08E-01	5.22E-03	9.92E-02	5.60E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	8.07E-02	7.28E-02	9.83E-01	1.58E-03	1.28E-02	5.67E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.05E-03	9.48E-04	1.28E-02	2.05E-05	1.66E-04	7.38E-05		
	Cutting	1 ton pickup truck	4.4	19	1.53E-04	2.12E-04	2.10E-03	5.66E-06	4.46E-05	1.93E-05		
		Tractor/crawler/dozer	250 hp	7.3333	19	2.11E-03	2.29E-02	2.48E-02	1.31E-04	1.72E-04	1.58E-04	
		Chain saw		7.3335	19	2.86E-03	1.49E-04	1.71E-02	1.91E-06	2.70E-05	2.69E-05	
		Brush Piling	Front end loader	540 hp	3.696	19	3.04E-03	2.25E-02	2.46E-02	1.23E-04	1.85E-04	1.70E-04
			Tractor/crawler/dozer	310 hp	3.696	19	1.34E-03	1.46E-02	1.14E-02	5.57E-05	1.09E-04	1.01E-04
		Chipping	Brush chipper	250 hp	3.696	19	2.53E-03	1.85E-02	1.40E-02	8.67E-05	1.36E-04	1.25E-04
			Front end loader	540 hp	3.696	19	3.04E-03	2.25E-02	2.46E-02	1.23E-04	1.85E-04	1.70E-04
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.14E-04	4.50E-03	4.88E-03	2.57E-05	3.37E-05	3.10E-05
			Front end loader	49 hp	4	19	9.82E-04	9.19E-03	9.05E-03	1.24E-05	3.95E-04	3.63E-04
		Roller	47 hp	4	19	8.26E-04	8.72E-03	8.07E-03	1.21E-05	3.57E-04	3.29E-04	
		Water truck	3000 gal	4	19	5.60E-04	6.56E-03	1.05E-03	9.00E-06	1.71E-04	9.66E-05	
		Excavator	300 hp	4	19	1.31E-03	1.35E-02	1.07E-02	5.26E-05	1.02E-04	9.40E-05	
		Front end loader	180 hp	4	19	1.11E-03	8.19E-03	8.75E-03	4.62E-05	6.73E-05	6.19E-05	
		36" Diversion Pipe - grading	Tractor/crawler/dozer	180 hp	6	19	1.24E-03	1.35E-02	1.46E-02	7.72E-05	1.01E-04	9.31E-05
		36" Diversion Pipe - pipe anchors	Welder	17 hp	4	19	3.65E-03	2.36E-03	1.34E-01	5.41E-06	1.79E-03	1.79E-03
		36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	3.43E-03	5.34E-02	9.76E-02	1.76E-04	3.47E-03	3.19E-03
			Loader/backhoe	75 hp	0.0923	19	1.06E-05	1.62E-04	2.02E-04	3.35E-07	1.20E-05	1.10E-05
			Crane 94'	155 hp	155	19	2.32E-02	3.61E-01	6.60E-01	1.19E-03	2.34E-02	2.16E-02
			1 ton pickup truck		155	19	5.40E-03	7.46E-03	7.39E-02	1.99E-04	1.57E-03	6.81E-04
			Crane 94'	155 hp	155	19	2.32E-02	3.61E-01	6.60E-01	1.19E-03	2.34E-02	2.16E-02
			1 ton pickup truck		155	19	5.40E-03	7.46E-03	7.39E-02	1.99E-04	1.57E-03	6.81E-04
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.14E-04	4.50E-03	4.88E-03	2.57E-05	3.37E-05	3.10E-05
		Dewatering	Concrete saw	13 hp	8	22	7.14E-03	5.28E-03	2.61E-01	1.26E-05	3.70E-03	3.69E-03
			Crane 80'	130 hp	16	22	2.01E-03	3.12E-02	5.71E-02	1.03E-04	2.03E-03	1.87E-03
			Flatbed truck		8	22	7.88E-04	8.76E-04	1.09E-02	1.02E-05	8.01E-05	3.42E-05
			Generator	80 hp	5856	244	1.14E+00	1.46E+01	1.70E+01	3.41E-02	9.99E-01	9.19E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.30E-01	1.41E+00	1.34E+00	6.70E-03	1.06E-02	9.73E-03
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.30E-01	1.41E+00	1.34E+00	6.70E-03	1.06E-02	9.73E-03
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.30E-01	1.41E+00	1.34E+00	6.70E-03	1.06E-02	9.73E-03
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.30E-01	1.41E+00	1.34E+00	6.70E-03	1.06E-02	9.73E-03
		Armoring	1 ton pickup truck		0.9333	19	3.25E-05	4.49E-05	4.45E-04	1.20E-06	9.46E-06	4.10E-06
			Excavator	430 hp	0.9333	19	4.39E-04	4.50E-03	3.59E-03	1.76E-05	3.42E-05	3.14E-05
		1 ton pickup truck		0.9333	19	3.25E-05	4.49E-05	4.45E-04	1.20E-06	9.46E-06	4.10E-06	
		Compaction	Vibratory roller	50 hp	7.38	19	1.62E-03	1.71E-02	1.58E-02	2.37E-05	7.02E-04	6.46E-04
			Tractor/crawler/dozer	250 hp	7.38	19	2.12E-03	2.31E-02	2.50E-02	1.32E-04	1.73E-04	1.59E-04
			Water truck	5000 gal	9.225	19	1.29E-03	1.51E-02	2.42E-03	2.08E-05	3.95E-04	2.23E-04
		Maintenance	Grader	215 hp	340	209	9.76E-02	8.74E-01	1.03E+00	5.41E-03	6.84E-03	6.29E-03
	Sand to Zuma Beach (19,000 cy) (4/1-26)	Material Excavation	1 ton pickup truck	161.5	18	5.63E-03	7.77E-03	7.70E-02	2.08E-04	1.64E-03	7.09E-04	
			Front end loader	350 hp	161.5	18	8.70E-02	6.44E-01	5.13E-01	2.51E-03	5.29E-03	4.87E-03
		Front end loader	350 hp	161.5	18	8.70E-02	6.44E-01	5.13E-01	2.51E-03	5.29E-03	4.87E-03	
		Water truck	3000 gal	161.5	18	2.26E-02	2.65E-01	4.23E-02	3.63E-04	6.91E-03	3.90E-03	
		Excavator	400 hp	161.5	18	7.07E-02	7.25E-01	5.78E-01	2.83E-03	5.50E-03	5.06E-03	
Beach Crew		1 ton pickup truck	161.5	18	5.63E-03	7.77E-03	7.70E-02	2.08E-04	1.64E-03	7.09E-04		
		Tractor/crawler/dozer	600 hp	161.5	18	1.13E-01	1.23E+00	1.17E+00	5.87E-03	9.25E-03	8.51E-03	
		Tractor/crawler/dozer	600 hp	161.5	18	1.13E-01	1.23E+00	1.17E+00	5.87E-03	9.25E-03	8.51E-03	
		Tractor/crawler/dozer	600 hp	161.5	18	1.13E-01	1.23E+00	1.17E+00	5.87E-03	9.25E-03	8.51E-03	
		Tractor/crawler/dozer	600 hp	161.5	18	1.13E-01	1.23E+00	1.17E+00	5.87E-03	9.25E-03	8.51E-03	
		Water truck	3000 gal	161.5	18	2.26E-02	2.65E-01	4.23E-02	3.63E-04	6.91E-03	3.90E-03	
Fines to landfill (147,700 cy) (4/27-10/15)	Material Excavation	1 ton pickup truck	1066	120	3.72E-02	5.13E-02	5.08E-01	1.37E-03	1.08E-02	4.68E-03		
		Front end loader	350 hp	1066	120	5.74E-01	4.25E+00	3.39E+00	1.66E-02	3.49E-02	3.21E-02	
		Front end loader	350 hp	1066	120	5.74E-01	4.25E+00	3.39E+00	1.66E-02	3.49E-02	3.21E-02	
		Water truck	3000 gal	1066	120	1.49E-01	1.75E+00	2.79E-01	2.40E-03	4.56E-02	2.57E-02	
		Excavator	400 hp	1066	120	4.67E-01	4.79E+00	3.82E+00	1.87E-02	3.63E-02	3.34E-02	
	Platform	Tractor/crawler/dozer	440 hp	720	20	3.71E-01	4.03E+00	3.15E+00	1.54E-02	3.02E-02	2.78E-02	
		Tractor/crawler/dozer	440 hp	90	20	4.63E-02	5.04E-01	3.93E-01	1.93E-03	3.78E-03	3.48E-03	
		3/4 ton pickup truck		360	20	2.36E-02	2.13E-02	2.88E-01	4.62E-04	3.74E-03	1.66E-03	
Demolition	Drilling	Rotary drill	475 hp	61.7333	127	3.29E-02	4.23E-01	3.31E-01	1.71E-03	3.07E-03	2.82E-03	
		3/4 ton pickup truck		57.7333	127	3.79E-03	3.42E-03	4.62E-02	7.40E-05	5.99E-04	2.66E-04	
	Cut with Diamond wire	3/4 ton pickup truck	196	127	1.29E-02	1.16E-02	1.57E-01	2.51E-04	2.03E-03	9.04E-04		
		Diamond cutting saw	50 hp	196	127	2.86E-02	4.92E-01	3.69E-01	7.42E-04	1.73E-02	1.59E-02	
	Lift/Load blocks	Crane 260'	375 hp	239.2283	127	6.21E-02	7.47E-01	6.19E-01	3.03E-03	5.49E-03	5.05E-03	
		3/4 ton pickup truck		239.2283	127	1.57E-02	1.42E-02	1.91E-01	3.07E-04	2.48E-03	1.10E-03	
	Load/Haul	Front end loader	350 hp	32	127	1.72E-02	1.28E-01	1.02E-01	4.98E-04	1.05E-03	9.65E-04	
		Water truck	3000 gal	14	127	1.96E-03	2.30E-02	3.67E-03	3.15E-05	5.99E-04	3.38E-04	
	Landfill	Crane 260'	375 hp	119.6141	127	3.10E-02	3.74E-01	3.09E-01	1.52E-03	2.74E-03	2.52E-03	
		Micro-blast	Crane 260'	375 hp	60	127	1.56E-02	1.87E-01	1.55E-01	7.60E-04	1.38E-03	1.27E-03
			Horizontal boring drill	10 hp	55	127	1.12E-03	2.88E-02	1.36E-02	4.20E-05	1.04E-03	9.60E-04
		3/4 ton pickup truck		60	127	3.94E-03	3.55E-03	4.80E-02	7.69E-05	6.23E-04	2.77E-04	
		Demolish spillway	Crane 260'	375 hp	100	127	2.59E-02	3.12E-01	2.59E-01	1.27E-03	2.29E-03	2.11E-03
		Air compressor	50 hp	200	127	1.34E-01	1.56E-01	1.22E+01	7.88E-04	4.96E-03	4.95E-03	
		3/4 ton pickup truck		100	127	6.57E-03	5.92E-03	8.00E-02	1.28E-04	1.04E-03	4.61E-04	
						<b>5.66E+00</b>	<b>5.62E+01</b>	<b>6.39E+01</b>	<b>1.95E-01</b>	<b>1.54E+00</b>	<b>1.34E+00</b>	

Data from Alt2\_EnvrAirQualityReport.pdf

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2020
Birthday of Martin Luther King, Jr.	1/20/2020
Washington's Birthday	2/17/2020
Memorial Day	5/25/2020
Independence Day	7/3/2020
Labor Day	9/7/2020
Columbus Day	10/12/2020
Veterans Day	11/11/2020

Thanksgiving Day	11/26/2020
Christmas Day	12/25/2020
10	

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2020>



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5

Construction Start Year: 2021  
Speed of Onsite Trucks: 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)													Annual Emissions - 2021 (tons per year)													Metric Tons CO2e/yr										
					VOC						NOx						CO						SO2						PM10						PM2.5						
					CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O	CO2	CH4	N2O													
Construction Survey	3/4 ton pickup truck		96	210	2.731	2.596	33.529	0.061	0.488	0.215	20.361.282	2.024	1.056	2.89E-04	2.75E-04	3.55E-03	6.45E-06	5.16E-05	2.27E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	4.94E+01																
Dust Control	Water truck	5000 gal	2320	210	6.993	49.941	13.281	0.106	1.847	0.978	21.297.572	0.051	0.048	1.79E-02	1.28E-01	3.40E-02	2.72E-04	4.72E-03	2.50E-03	4.54E+01	1.30E-04	1.23E-04	5.45E+01	4.94E+01	3.2E+01																
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	2.731	2.596	33.529	0.061	0.488	0.215	20.361.282	2.024	1.056	3.70E-03	3.52E-03	4.54E-02	8.26E-05	6.61E-04	2.91E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	3.2E+01																
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.379	2.069	19.104	0.061	0.477	0.205	20.361.282	2.024	1.056	6.69E-06	1.00E-05	9.27E-05	2.97E-07	2.31E-06	9.92E-07	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	5.53E-01																
	Tractor/crawler/dozer	250 hp	7.3333	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	1.16E-04	1.21E-03	1.30E-03	6.85E-06	9.13E-06	8.40E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01																	
	Chain saw		7.3333	19	2.303	0.115	13.188	0.001	0.021	0.021	35.645	0.143	0.039	1.56E-04	1.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	9.72E-06	2.66E-06	3.45E-03	3.13E-03																	
	Brush Piling	Front end loader	3.696	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	1.66E-04	1.18E-03	1.38E-03	6.91E-06	9.83E-06	9.05E-06	6.88E-01	3.80E-05	-	6.88E-01	6.25E-01																	
	Tractor/crawler/dozer	310 hp	3.696	19	0.058	0.607	0.471	0.002	0.005	0.004	234.947	0.013	0.000	7.35E-05	7.67E-04	5.94E-04	2.91E-06	5.80E-06	5.33E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01																	
	Chipping	Brush chipper	3.696	19	0.134	0.936	0.711	0.004	0.007	0.006	386.935	0.012	0.000	1.36E-04	9.53E-04	7.24E-04	4.43E-06	7.04E-06	6.48E-06	3.94E-01	1.23E-05	-	3.94E-01	3.58E-01																	
	Front end loader	540 hp	3.696	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	1.66E-04	1.18E-03	1.38E-03	6.91E-06	9.83E-06	9.05E-06	6.88E-01	3.80E-05	-	6.88E-01	6.25E-01																	
Landscaping	Rock from Landfill	Loader/backhoe	24	20	0.076	1.118	1.383	0.002	0.083	0.077	195.356	0.015	0.000	1.50E-04	2.22E-03	2.74E-03	4.55E-06	1.65E-04	1.52E-04	3.88E-01	2.96E-05	-	3.88E-01	3.52E-01																	
	Front end loader	350 hp	20	20	0.076	0.542	0.430	0.002	0.004	0.004	214.819	0.012	0.000	5.86E-04	4.18E-03	3.32E-03	1.63E-05	3.47E-05	3.19E-05	1.66E+00	9.17E-05	-	1.66E+00	1.51E+00																	
	Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21.297.572	0.051	0.048	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01																	
	Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21.297.572	0.051	0.048	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01																	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.057	0.597	0.642	0.003	0.005	0.004	0.000	0.000	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	5.00E-02	4.86E-06	-	5.01E-02	4.54E-02																	
	Front end loader	49 hp	4	19	0.249	2.247	2.257	0.003	0.098	0.090	231.303	0.022	0.000	5.39E-05	4.85E-04	4.88E-04	6.46E-07	2.12E-05	1.95E-05	4.88E-02	4.15E-06	-	4.89E-02	4.44E-02																	
	Roller	47 hp	4	19	0.222	2.225	2.115	0.003	0.093	0.086	235.529	0.020	0.000	4.60E-05	4.61E-04	4.38E-04	6.31E-07	1.93E-05	1.77E-05	4.88E-02	4.15E-06	-	4.89E-02	4.44E-02																	
	Water truck	3000 gal	4	19	6.993	49.941	13.281	0.106	1.847	0.978	21.297.572	0.051	0.048	3.08E-05	2.20E-04	5.86E-05	4.69E-07	6.14E-06	4.31E-06	9.39E-02	2.25E-07	2.12E-07	9.40E-02	8.53E-02																	
	Excavator	300 hp	4	19	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000	7.17E-05	7.07E-04	5.61E-04	2.75E-06	5.41E-06	4.98E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01																	
	Front end loader	180 hp	4	19	0.076	0.543	0.424	0.002	0.005	0.004	270.060	0.015	0.000	6.04E-05	4.31E-04	4.57E-04	2.41E-06	3.58E-06	3.29E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01																	
	Tractor/crawler/dozer	180 hp	6	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	6.82E-05	7.11E-04	7.64E-04	4.03E-06	5.38E-06	4.95E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01																	
	36" Diversion Pipe	Welder	17 hp	4	19	2.545	1.647	93.482	0.004	1.249	148.937	0.144	0.124	1.91E-04	1.23E-04	7.01E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02																	
	36" Diversion Pipe	Crane 80'	130 hp	4	19	0.048	0.715	1.302	0.002	0.047	208.020	0.016	0.000	1.88E-04	2.80E-03	5.10E-03	9.17E-06	1.85E-04	1.70E-04	8.15E-01	6.22E-05	-	8.16E-01	7.40E-01																	
	36" Diversion Pipe	Loader/backhoe	75 hp	0.0923	19	0.076	1.118	1.383	0.002	0.083	0.077	195.356	0.015	0.000	5.78E-07	8.53E-06	1.05E-05	1.75E-08	6.36E-07	5.85E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03																
	Crane 94'	155 hp	155	19	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	1.15E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00																	
	1 ton pickup truck	155 hp	155	19	1.379	2.069	19.104	0.061	0.477	0.205	20.361.282	2.024	1.056	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00																	
	Crane 94'	155 hp	155	20	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	1.15E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00																	
	1 ton pickup truck	155 hp	155	20	1.379	2.069	19.104	0.061	0.477	0.205	20.361.282	2.024	1.056	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00																	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.057	0.597	0.642	0.003	0.005	0.004	0.000	0.000	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01																	
	Dewatering	Concrete saw	13 hp	23	3.253	2.405	118.912	0.006	1.686	1.682	201.089	0.184	0.193	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.21E-05	3.04E-02	2.75E-02																	
	Crane 80'	130 hp	16	23	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.10E-04	1.64E-03	2.99E-03	5.37E-06	1.08E-04	9.96E-05	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01																	
	Flatbed truck	80 hp	8	23	3.935	4.518	54.221	0.060	0.471	0.199	20.361.282	4.604	2.135	3.47E-05	3.98E-05	4.78E-04	5.33E-07	4.15E-06	1.76E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01																	
	Generator	80 hp	5856	244	0.120	1.489	1.736	0.003	0.102	0.094	294.380	0.011	0.000	6.21E-02	7.69E-01	8.96E-01	1.78E-03	5.29E-02	4.86E-02	1.52E+02	5.60E-03	-	1.52E+02	1.38E+02																	
Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01																	
	Push	Tractor/crawler/dozer	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01																	
	Build road	Tractor/crawler/dozer	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01																	
	Compaction	Vibratory roller	17.28	19	0.222	2.225	2.115	0.003	0.093	0.086	235.529	0.020	0.000	2.11E-04	2.12E-03	2.01E-03	2.90E-06	8.87E-05	8.16E-05	2.24E-01	1.91E-05	-	2.25E-01	2.04E-01																	
	Tractor/crawler/dozer	250 hp	17.28	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	2.73E-04	2.84E-03	3.06E-03	1.61E-05	2.15E-05	1.98E-05	1.43E+00	7.93E-05	-	1.44E+00	1.30E+00																	
	Water truck	5000 gal	21.6	19	6.993	49.941	13.281	0.106	1.847	0.978	21.297.572	0.051	0.048	1.67E-04	1.19E-03	3.16E-04	2.53E-06	4.40E-05	2.33E-05	5.07E-01	1.21E-06	1.14E-06	5.07E-01	4.60E-01																	
	Maintenance	Grader	340																																						

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 2 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	210	5.50E-03	5.23E-03	6.76E-02	1.23E-04	9.83E-04	4.33E-04		
Dust Control	Water truck	5000 gal	2320	210	3.41E-01	2.43E+00	6.47E-01	5.18E-03	9.00E-02	4.76E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	7.05E-02	6.70E-02	8.65E-01	1.57E-03	1.26E-02	5.55E-03		
	Fish relocation	3/4 ton pickup truck	16	19	9.17E-04	8.72E-04	1.13E-02	2.05E-05	1.64E-04	7.22E-05		
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.27E-04	1.91E-04	1.76E-03	5.65E-06	4.40E-05	1.89E-05		
	Tractor/crawler/dozer	250 hp	7.3333	19	2.21E-03	2.30E-02	2.47E-02	1.30E-04	1.74E-04	1.60E-04		
	Chain saw		7.3335	19	2.98E-03	1.48E-04	1.71E-02	1.90E-06	2.68E-05	2.68E-05		
	Brush Piling	Front end loader	540 hp	3.696	19	3.16E-03	2.26E-02	2.62E-02	1.32E-04	1.87E-04	1.72E-04	
	Tractor/crawler/dozer	310 hp	3.696	19	1.40E-03	1.46E-02	1.13E-02	5.55E-05	1.10E-04	1.02E-04		
	Chipping	Brush chipper	250 hp	3.696	19	2.60E-03	1.82E-02	1.38E-02	8.45E-05	1.34E-04	1.23E-04	
	Front end loader	540 hp	3.696	19	3.16E-03	2.26E-02	2.62E-02	1.32E-04	1.87E-04	1.72E-04		
Landscaping	Rock from Landfill	Loader/backhoe	75 hp	24	2.86E-03	4.22E-02	5.23E-02	8.66E-05	3.15E-03	2.90E-03		
	Front end loader	350 hp	20	1.12E-02	7.96E-02	6.32E-02	3.10E-04	6.61E-04	6.08E-04			
	Dump truck	20cy/24 ton	20	2.94E-03	2.10E-02	5.58E-03	4.46E-05	7.75E-04	4.11E-04			
	Dump truck	20cy/24 ton	20	2.94E-03	2.10E-02	5.58E-03	4.46E-05	7.75E-04	4.11E-04			
	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	4.33E-04	4.51E-03	4.85E-03	2.56E-05	3.41E-05	3.14E-05		
Dewatering	Front end loader	49 hp	4	19	1.03E-03	9.25E-03	9.29E-03	1.23E-05	4.04E-04	3.71E-04		
	Roller	47 hp	4	19	8.76E-04	8.78E-03	8.35E-03	1.20E-05	3.67E-04	3.38E-04		
	Water truck	3000 gal	4	19	5.87E-04	4.19E-03	1.12E-03	8.93E-06	1.55E-04	8.21E-05		
	Excavator	300 hp	4	19	1.37E-03	1.35E-02	1.07E-02	5.24E-05	1.03E-04	9.48E-05		
	Front end loader	180 hp	4	19	1.15E-03	8.21E-03	8.70E-03	4.59E-05	6.82E-05	6.27E-05		
	36" Diversion Pipe - Tractor/crawler/dozer	180 hp	6	19	1.30E-03	1.35E-02	1.46E-02	7.68E-05	1.02E-04	9.42E-05		
	36" Diversion Pipe - Welder	17 hp	4	19	3.63E-03	2.35E-03	1.33E-01	5.39E-06	1.78E-03	1.78E-03		
	36" Diversion Pipe - Crane 80'	130 hp	27.3333	19	3.58E-03	5.33E-02	9.71E-02	1.75E-04	3.52E-03	3.24E-03		
	Loader/backhoe	75 hp	0.0923	19	1.10E-05	1.62E-04	2.01E-04	3.33E-07	1.21E-05	1.11E-05		
	Crane 94'	155 hp	155	19	2.42E-02	3.61E-01	6.57E-01	1.18E-03	2.38E-02	2.19E-02		
	1 ton pickup truck		155	19	4.49E-03	6.73E-03	6.22E-02	1.99E-04	1.55E-03	6.66E-04		
	Crane 94'	155 hp	155	20	2.42E-02	3.61E-01	6.57E-01	1.18E-03	2.38E-02	2.19E-02		
	1 ton pickup truck		155	20	4.49E-03	6.73E-03	6.22E-02	1.99E-04	1.55E-03	6.66E-04		
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	4.33E-04	4.51E-03	4.85E-03	2.56E-05	3.41E-05	3.14E-05		
	Dewatering	Concrete saw	13 hp	8	23	7.10E-03	5.25E-03	2.60E-01	1.25E-05	3.68E-03	3.67E-03	
	Crane 80'	130 hp	16	23	2.09E-03	3.12E-02	5.69E-02	1.02E-04	2.06E-03	1.90E-03		
	Flatbed truck		8	23	6.61E-04	7.59E-04	9.11E-03	1.01E-05	7.91E-05	3.35E-05		
	Generator	80 hp	5856	244	19	1.18E+00	1.46E+01	1.71E+01	3.40E-02	1.01E+00	9.26E-01	
	Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.35E-01	1.41E+00	1.27E+00	6.37E-03	1.07E-02	9.80E-03
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.35E-01	1.41E+00	1.27E+00	6.37E-03	1.07E-02	9.80E-03
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.35E-01	1.41E+00	1.27E+00	6.37E-03	1.07E-02	9.80E-03
		Compaction	Vibratory roller	50 hp	17.28	19	4.03E-03	4.04E-02	3.84E-02	5.52E-05	1.69E-03	1.55E-03
Tractor/crawler/dozer		250 hp	17.28	19	5.20E-03	5.42E-02	5.82E-02	3.07E-04	4.10E-04	3.77E-04		
Water truck		5000 gal	21.6	19	3.17E-03	2.26E-02	6.02E-03	4.82E-05	8.37E-04	4.44E-04		
Maintenance		Grader	215 hp	340	210	1.02E-01	8.76E-01	1.02E+00	5.39E-03	6.93E-03	6.38E-03	
Fines to landfill (82,300 cy) (4/1-7/10)		Material Excavation	1 ton pickup truck	597	70	1.73E-02	2.59E-02	2.39E-01	7.66E-04	5.97E-03	2.56E-03	
		Front end loader	350 hp	597	70	3.33E-01	2.38E+00	1.89E+00	9.25E-03	1.97E-02	1.81E-02	
		Front end loader	350 hp	597	70	3.33E-01	2.38E+00	1.89E+00	9.25E-03	1.97E-02	1.81E-02	
		Water truck	3000 gal	597	70	8.77E-02	6.26E-01	1.66E-01	1.33E-03	2.31E-02	1.23E-02	
		Excavator	400 hp	597	70	2.72E-01	2.68E+00	2.13E+00	1.04E-02	2.05E-02	1.89E-02	
	Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation	1 ton pickup truck	195.5	20	5.66E-03	8.49E-03	7.84E-02	2.51E-04	1.96E-03	8.40E-04	
Front end loader		350 hp	195.5	20	1.09E-01	7.78E-01	6.18E-01	3.03E-03	6.46E-03	5.94E-03		
Front end loader		350 hp	195.5	20	1.09E-01	7.78E-01	6.18E-01	3.03E-03	6.46E-03	5.94E-03		
Front end loader		350 hp	195.5	20	1.09E-01	7.78E-01	6.18E-01	3.03E-03	6.46E-03	5.94E-03		
Front end loader		350 hp	195.5	20	1.09E-01	7.78E-01	6.18E-01	3.03E-03	6.46E-03	5.94E-03		
Water truck		3000 gal	195.5	20	2.87E-02	2.05E-01	5.45E-02	4.36E-04	7.58E-03	4.01E-03		
Excavator		400 hp	195.5	20	8.91E-02	8.77E-01	6.97E-01	3.41E-03	6.72E-03	6.18E-03		
Excavator		400 hp	195.5	20	8.91E-02	8.77E-01	6.97E-01	3.41E-03	6.72E-03	6.18E-03		
Excavator		400 hp	195.5	20	8.91E-02	8.77E-01	6.97E-01	3.41E-03	6.72E-03	6.18E-03		
Excavator		400 hp	195.5	20	8.91E-02	8.77E-01	6.97E-01	3.41E-03	6.72E-03	6.18E-03		
Material from North Ramp (to landfill) (45,100 cy) (8/7-11/19)	Material Excavation	1 ton pickup truck	585	72	1.69E-02	2.54E-02	2.35E-01	7.51E-04	5.85E-03	2.51E-03		
	Front end loader	350 hp	585	72	3.26E-01	2.33E+00	1.85E+00	9.06E-03	1.93E-02	1.78E-02		
	Front end loader	350 hp	585	72	3.26E-01	2.33E+00	1.85E+00	9.06E-03	1.93E-02	1.78E-02		
	Water truck	3000 gal	585	72	8.59E-02	6.13E-01	1.63E-01	1.31E-03	2.27E-02	1.20E-02		
	Excavator	400 hp	585	72	2.66E-01	2.63E+00	2.09E+00	1.02E-02	2.01E-02	1.85E-02		
	Demolition	Platform	Tractor/crawler/dozer	440 hp	720	20	3.87E-01	4.04E+00	3.13E+00	1.53E-02	3.05E-02	2.81E-02
Tractor/crawler/dozer		440 hp	90	20	4.84E-02	5.05E-01	3.91E-01	1.92E-03	3.82E-03	3.51E-03		
3/4 ton pickup truck			360	20	2.06E-02	1.96E-02	2.53E-01	4.61E-04	3.69E-03	1.62E-03		
Drilling		Rotary drill	475 hp	204.4666	126	1.10E-01	1.39E+00	1.10E+00	5.65E-03	1.01E-02	9.33E-03	
		3/4 ton pickup truck		208.4666	126	1.20E-02	1.14E-02	1.47E-01	2.67E-04	2.14E-03	9.41E-04	
Cut with Diamond wheel		3/4 ton pickup truck	348	126	2.00E-02	1.90E-02	2.45E-01	4.45E-04	3.56E-03	1.57E-03		
Diamond cutting saw		50 hp	348	126	5.34E-02	8.75E-01	6.68E-01	1.31E-03	3.11E-02	2.86E-02		
Lift/Load blocks		Crane 260'	375 hp	418.8639	126	1.14E-01	1.31E+00	1.08E+00	5.29E-03	9.71E-03	8.93E-03	
3/4 ton pickup truck			418.8639	126	2.40E-02	2.28E-02	2.95E-01	5.36E-04	4.29E-03	1.89E-03		
Load/Haul		Front end loader	350 hp	66	126	3.68E-02	2.63E-01	2.09E-01	1.02E-03	2.18E-03	2.01E-03	
Water truck		3000 gal	14	126	2.06E-03	1.47E-02	3.90E-03	3.12E-05	5.43E-04	2.87E-04		
Landfill		Crane 260'	375 hp	209.4319	126	5.69E-02	6.55E-01	5.39E-01	2.64E-03	4.85E-03	4.46E-03	
Micro-blast		Crane 260'	375 hp	60	126	1.63E-02	1.88E-01	1.55E-01	7.57E-04	1.39E-03	1.28E-03	
Horizontal boring drill		10 hp	55	126	1.14E-03	2.87E-02	1.35E-02	4.16E-05	1.05E-03	9.62E-04		
3/4 ton pickup truck			60	126	3.44E-03	3.27E-03	4.22E-02	7.68E-05	6.15E-04	2.71E-04		
Demolish spillway		Crane 260'	375 hp	100	126	2.72E-02	3.13E-01	2.58E-01	1.26E-03	2.32E-03	2.13E-03	
Air compressor		50 hp	200	126	1.40E-01	1.60E-01	1.30E+01	7.84E-04	4.94E-03	4.93E-03		
3/4 ton pickup truck			100	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04		
Fracture		Excavator	400 hp	540	126	2.46E-01	2.42E+00	1.92E+00	9.43E-03	1.86E-02	1.71E-02	
Excavator		300 hp	540	126	1.84E-01	1.82E+00	1.44E+00	7.07E-03	1.39E-02	1.28E-02		
Excavator		300 hp	270	126	9.22E-02	9.09E-01	7.22E-01	3.54E-03	6.96E-03	6.40E-03		
Tractor/crawler/dozer		440 hp	270	126	1.45E-01	1.51E+00	1.17E+00	5.75E-03	1.14E-02	1.05E-02		
3/4 ton pickup truck			540	126	3.10E-02	2.94E-02	3.80E-01	6.91E-04	5.53E-03	2.44E-03		
Road Improvement Plan		Stabilize	Grader	135 hp	30.4	20	8.17E-03	9.11E-02	1.73E-01	3.11E-04	6.86E-03	6.31E-03
		Tractor/crawler/dozer	250 hp	30.4	20	9.14E-03	9.53E-02	1.02E-01	5.41E-04	7.21E-04	6.63E-04	
		Excavator	400 hp	30.4	20	1.38E-02	1.36E-01	1.08E-01	5.31E-04	1.04E-03	9.61E-04	
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	2.27E-01	1.62E+00	1.38E+00	6.75E-03	1.34E-02	1.24E-02	
	Line Striper	23 hp	92.576	20	8.75E-03	2.12E-02	4.13E-01	1.13E-04	9.08E-04	9.06E-04		
	Roller	70 hp	442.5143	20	3.38E-02	7.00E-01	9.56E-01	1.70E-03	4.81E-02	4.42E-02		
	Vibratory roller	33 hp	442.5143	20	6.81E-02	6.82E-01	6.49E-01	9.34E-04	2.85E-02	2.63E-02		
	Flatbed truck		92.576	20								

**Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1**

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours	Hours per Year		Days per Year		Emission Factors - 2016 (gph-hr or g/hr)								Emission Factors - 2017 (gph-hr or g/hr)											
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		48	11.1	36.9	52	211	5.037	3.900	60.209	0.061	0.513	0.238	21.361	282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20.361	281	2.024	1.056
Dust Control	Water truck	5000 gal	2320	534.4	1213.0	52	211	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135
Environmental protection measures	3/4 ton pickup truck		1213	0.0	0.0	211	53.0	3.900	60.209	0.061	0.513	0.238	20.361	282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20.361	281	2.024	1.056	
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	211	3.579	3.535	47.996	0.062	0.504	0.230	20.361	283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20.361	280	2.024	1.056
	Chain saw	Tractor/crawler/dozer	250 hp	0.3857	0.8	0.0	52	0	0.043	0.578	0.609	0.003	0.004	0.004	34.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	0.000
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	0.000
Clear & Grub - Sediment Removal	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	0.000	
	Brush chipper	250 hp	0.3857	0.4	0.0	52	0	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000	0.000	
	Front end loader	540 hp	0.3857	0.4	0.0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	0.000	
	Vibratory roller	85 hp	16	16.0	0.0	52	0	0.042	1.062	1.354	0.003	0.070	0.065	222.773	0.010	0.000	0.044	1.069	1.378	0.003	0.071	0.066	222.772	0.010	0.000	0.000	
	Tractor/crawler/dozer	310 hp	3.7481	3.7	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	0.000	
	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	0.000	
	Asphalt distributor	3000 gal	0.6196	0.8	0.0	52	0	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135
	Flatted truck		8.75	8.8	0.0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20.361	283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20.361	282	4.604	2.135
	Auger drill	10 hp	8.75	8.8	0.0	52	0	3.623	2.678	132.418	0.006	1.877	1.673	223.929	0.205	0.204	0.633	2.686	132.805	0.006	1.883	1.879	224.584	0.205	0.204	0.633	
	Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	0.057	1.075	1.282	0.002	0.075	0.069	195.357	0.012	0.000	0.061	1.085	1.315	0.002	0.077	0.071	195.356	0.013	0.000	0.000	
Demo Existing Gate	10cy	4	4	0.0	52	0	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135	
Clear & Grub - Sediment Removal	Clean Brush	1 ton pickup truck	0.3026	0.0	0.3	42	3.579	3.535	47.996	0.062	0.504	0.230	20.361	283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20.361	280	2.024	1.056	
	Excavator	94 hp	0.3026	0.0	0.3	42	0.057	1.099	1.337	0.003	0.077	0.070	278.042	0.020	0.000	0.060	1.098	1.368	0.003	0.078	0.071	278.041	0.021	0.000	0.000		
	Front end loader	210 hp	0.3026	0.0	0.3	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.528	0.543	0.003	0.004	0.004	270.056	0.012	0.000	0.000		
	Dump truck	10cy	0.3026	0.0	0.3	42	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135	
	Dump truck	10cy	0.3026	0.0	0.3	42	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135	
	Brush chipper	275 hp	0.3026	0.0	0.3	42	0.058	0.528	0.384	0.002	0.004	0.003	224.564	0.005	0.000	0.061	0.528	0.385	0.002	0.004	0.003	223.246	0.006	0.000	0.000		
	Front end loader	210 hp	0.3026	0.0	0.3	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.528	0.543	0.003	0.004	0.004	270.056	0.012	0.000	0.000		
	1 ton pickup truck		8.625	0.0	8.6	42	3.579	3.535	47.996	0.062	0.504	0.230	20.361	283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20.361	280	2.024	1.056	
	Cutting	Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	0.000	
	Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	0.000		
Chain saw		0.2875	0.0	0.3	42	1.786	0.115	13.187	0.001	0.021	0.021	35.645	0.111	0.039	1.889	0.115	0.039	1.889	0.115	0.039	0.021	0.021	35.643	0.117	0.039		
Clear & Grub - Access Rd	Brush Piling	Front end loader	540 hp	0.1449	0.0	0.1	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	0.000	
	Tractor/crawler/dozer	310 hp	0.1449	0.0	0.1	42	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000	0.000		
	Brush chipper	250 hp	0.1449	0.0	0.1	42	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000	0.000		
	Front end loader	540 hp	0.1449	0.0	0.1	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000	0.000		
	Clean Brush	1 ton pickup truck	5.1316	0.0	5.1	42	3.579	3.535	47.996	0.062	0.504	0.230	20.361	283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20.361	280	2.024	1.056	
	Excavator	94 hp	5.1316	0.0	5.1	42	0.057	1.099	1.337	0.003	0.077	0.070	278.042	0.020	0.000	0.060	1.098	1.368	0.003	0.078	0.071	278.041	0.021	0.000	0.000		
	Front end loader	210 hp	5.1316	0.0	5.1	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.528	0.543	0.003	0.004	0.004	270.056	0.012	0.000	0.000		
	Dump truck	10cy	5.1316	0.0	5.1	42	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135	
	Dump truck	10cy	5.1316	0.0	5.1	42	7.746	126.318	13.903	0.108	2.768	1.826	21.547	0.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21.520	0.18	0.048	2.135	
	Brush chipper	275 hp	5.1316	0.0	5.1	42	0.058	0.528	0.384	0.002	0.004	0.003	224.564	0.005	0.000	0.061	0.528	0.385	0.002	0.004	0.003	223.246	0.006	0.000	0.000		
Front end loader	210 hp	2.3595	0.0	2.4	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.528	0.543	0.003	0.004	0.004	270.056	0.012	0.000	0.000			
Dewatering	Cutting	1 ton pickup truck	2.925	0.0	2.9	42	3.579	3.535	47.996	0.062	0.504	0.230	20.361	283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20.361	280	2.024	1.056	
	Tractor/crawler/dozer	250 hp	4.8751	0.0	4.9	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000	0.000		
	Tractor/crawler/dozer	250 hp	4.8751	0.0	4.9	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151														

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year  
Speed of Onsite Trucks  
2016  
10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Annual Emissions - 2016 (tons per year)														Annual Emissions - 2017 (tons per year)													
				2016	2017	2016	2017	VOG	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	VOG	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e								
				2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017						
Construction Survey	3/4 ton pickup truck		48	11.1	36.9	52	211	6.15E-05	4.76E-05	7.39E-04	7.49E-07	6.26E-06	2.91E-08	2.49E-01	2.47E-05	1.23E-05	2.33E-01	2.30E-01	1.85E-04	1.47E-04	2.21E-03	2.49E-06	2.07E-05	9.41E-06	8.29E-01	6.24E-05	8.43E-05	8.44E-01	7.65E-01						
Dust Control	Water truck	5000 gal	201	53.4	21	52	21	4.57E-05	7.49E-02	8.21E-03	6.36E-06	1.63E-03	1.08E-03	1.27E+01	3.01E-05	2.83E-05	1.27E-01	1.15E+01	1.15E+01	6.08E-03	4.82E-03	7.27E-02	8.19E-05	2.70E-05	3.97E-06	4.29E-01	1.00E-04	9.44E-05	4.24E-01	3.94E-01					
Environmental protection measures	3/4 ton Pickup truck		1213	0.0	0.0	0	211	1.81E-06	1.79E-06	2.43E-05	3.11E-08	2.55E-07	1.16E-07	6.93E-02	2.94E-06	6.39E-06	5.77E-02	5.77E-02	6.08E-03	4.82E-03	7.27E-02	8.19E-05	2.70E-05	9.41E-06	8.29E-01	6.24E-05	8.43E-05	8.44E-01	7.65E-01						
Clear & Grub - Sheriff's Overlook (Shoring Area)	Tractor/crawler/dozer	250 hp	0.4591	0.5	0.0	52	211	8.98E-06	1.22E-04	1.28E-04	7.15E-07	8.96E-07	4.30E-09	1.03E-02	1.02E-06	5.34E-07	1.05E-02	9.52E-03	-	-	-	-	-	-	-	-	-	-	-						
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-						
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-						
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.08E-02	-	-	-	-	-	-	-	-	-	-	-					
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-	-					
	Chain saw	0.7652	0.8	0.0	52	0	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-	-	-					
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07</																							



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Year 1

Construction Start Year: 2016  
Speed of Onsite Trucks: 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Peak Daily Emissions - 2016 (pounds per day)										Peak Daily Emissions - 2017 (pounds per day)									
				2016	2017	2016	2017	CO	NOx	SO2	PM10	PM2.5	CO	NOx	SO2	PM10	PM2.5								
				2016	2017	2016	2017	CO	NOx	SO2	PM10	PM2.5	CO	NOx	SO2	PM10	PM2.5								
Construction Survey	3/4 ton pickup truck		48	11.1	36.9	52	211	4.73E-03	3.66E-03	5.62E-02	5.79E-05	4.62E-04	2.24E-04	3.50E-03	2.78E-03	4.20E-02	4.73E-05	3.91E-04	1.60E-04						
Dust Control	Water truck	5000 gal	2534	17.8	57.4	52	211	3.52E-01	6.69E+00	6.31E-01	4.69E-03	1.26E-01	6.29E-02	2.00E-01	4.72E+00	4.73E-01	4.91E-03	8.99E-02	5.59E-02						
Environmental protection measures	3/4 ton Pickup truck		1213	0.0	1,213.0	0	211	-	-	-	-	-	-	1.15E-01	9.14E-02	1.38E+00	1.55E-03	1.29E-02	5.90E-03						
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	211	1.39E-04	1.38E-04	1.87E-03	2.40E-06	1.96E-05	8.94E-06	-	-	-	-	-	-						
	Tractor/crawler/dozer	250 hp	0.3857	0.4	0.0	52	0	6.90E-04	9.38E-03	9.88E-03	5.20E-06	6.74E-05	6.20E-05	-	-	-	-	-	-						
	Chain saw		0.7652	0.8	0.0	52	0	9.73E-04	6.25E-05	7.19E-03	8.00E-07	1.13E-05	1.13E-05	-	-	-	-	-	-						
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-					
	Tractor/crawler/dozer	250 hp	0.3857	0.4	0.0	52	0	8.06E-04	9.38E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-						
	Brush chipper	250 hp	0.3857	0.4	0.0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-						
	Front end loader	540 hp	0.3857	0.4	0.0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-	-						
	Vibratory roller	85 hp	16	16.0	0.0	52	0	4.81E-03	1.22E-01	1.56E-01	3.01E-04	8.09E-03	7.44E-03	-	-	-	-	-	-						
	Tractor/crawler/dozer	310 hp	3.7481	3.7	0.0	52	0	4.30E-03	6.84E-02	4.45E-02	2.27E-04	4.20E-04	3.86E-04	-	-	-	-	-	-						
	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	1.33E-03	1.80E-02	1.37E-02	7.01E-05	1.30E-04	1.19E-04	-	-	-	-	-	-						
Guard Railing	Asphalt distributor	3000 gal	0.8196	0.8	0.0	52	0	5.32E-04	8.61E-03	9.56E-04	7.40E-06	1.90E-04	1.25E-04	-	-	-	-	-	-						
	Flatbed truck		8.75	8.8	0.0	52	0	6.85E-03	6.71E-03	9.70E-02	4.53E-05	3.70E-04	1.66E-04	-	-	-	-	-	-						
	Auger drill	10 hp	8.75	8.8	0.0	52	0	2.69E-02	1.99E-02	9.82E-01	4.74E-05	1.09E-02	1.39E-02	-	-	-	-	-	-						
	Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	1.52E-03	2.87E-02	3.43E-02	6.12E-05	2.31E-03	1.85E-03	-	-	-	-	-	-						
	Flatbed truck		4	4.0	0.0	52	0	3.19E-03	3.07E-03	4.43E-02	2.07E-05	1.69E-04	7.59E-05	-	-	-	-	-	-						
	1 ton pickup truck		0.3026	0.0	0.3	42	0	-	-	-	-	-	-	9.46E-05	1.01E-04	1.27E-03	1.95E-06	1.58E-05	7.10E-06						
	Excavator	84 hp	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	1.80E-04	3.28E-03	5.88E-03	9.74E-06	2.32E-04	2.13E-04						
	Front end loader	210 hp	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	3.95E-04	3.51E-03	3.63E-03	2.03E-05	2.75E-05	2.53E-05						
	Dump truck	10cy	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	2.22E-04	3.63E-03	4.05E-04	3.42E-06	7.63E-05	4.70E-05						
	Dump truck	10cy	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	2.22E-04	3.63E-03	4.05E-04	3.42E-06	7.63E-05	4.73E-05						
Brush chipper	275 hp	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	6.35E-04	4.61E-03	3.39E-03	1.91E-05	3.29E-05	3.02E-05							
Front end loader	210 hp	0.3026	0.0	0.3	42	0	-	-	-	-	-	-	1.82E-04	1.61E-03	1.67E-03	9.32E-06	1.27E-05	1.16E-05							
Cutting	1 ton pickup truck		8.625	0.0	8.6	42	0	-	-	-	-	-	2.70E-03	2.87E-03	3.62E-02	5.57E-05	4.50E-04	2.02E-04							
Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	42	0	-	-	-	-	-	-	3.45E-04	4.46E-03	4.73E-03	2.56E-05	3.20E-05	2.94E-05							
Tractor/crawler/dozer	250 hp	0.2875	0.0	0.3	42	0	-	-	-	-	-	-	4.45E-04	6.16E-02	2.56E-02	5.79E-05	1.29E-05	2.94E-05							
Chain saw		0.2875	0.0	0.3	42	0	-	-	-	-	-	-	4.79E-04	2.91E-05	3.34E-03	3.72E-07	5.26E-06	5.25E-06							
Brush Piling	Front end loader	540 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	4.78E-04	4.24E-03	4.83E-03	2.54E-05	3.33E-05	3.06E-05							
Tractor/crawler/dozer	310 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	2.21E-04	2.82E-03	2.16E-03	1.06E-05	2.05E-05	1.89E-05							
Brush chipper	250 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	4.38E-04	3.77E-03	2.81E-03	1.80E-05	2.69E-02	2.47E-05							
Chain saw		0.2875	0.0	0.3	42	0	-	-	-	-	-	-	4.78E-04	4.24E-03	4.83E-03	2.54E-05	3.33E-05	3.06E-05							
Brush Piling	Front end loader	540 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	1.60E-03	1.17E-03	2.15E-02	3.31E-05	2.68E-04	1.20E-04							
Tractor/crawler/dozer	310 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	3.92E-03	6.95E-02	3.96E-02	1.65E-04	3.92E-04	3.63E-04							
Brush chipper	250 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	6.70E-03	5.95E-02	6.15E-02	3.44E-04	4.66E-04	4.29E-04							
Chain saw		0.2875	0.0	0.3	42	0	-	-	-	-	-	-	3.76E-03	6.16E-02	6.68E-03	5.79E-05	1.29E-03	8.02E-04							
Front end loader	540 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	3.76E-03	6.16E-02	6.68E-03	5.79E-05	1.29E-03	8.02E-04							
Brush chipper	275 hp	0.1449	0.0	0.1	42	0	-	-	-	-	-	-	9.07E-03	7.82E-02	5.70E-02	3.25E-04	5.56E-04	5.12E-04							
Front end loader	210 hp	2.3595	0.0	2.4	42	0	-	-	-	-	-	-	3.08E-03	2.74E-02	2.83E-02	1.58E-04	2.14E-04	1.97E-04							
Cutting	1 ton pickup truck		2.925	0.0	2.9	42	0	-	-	-	-	-	9.14E-04	9.73E-04	1.23E-02	1.89E-05	1.53E-04	6.98E-05							
Tractor/crawler/dozer	250 hp	4.8751	0.0	4.9	42	0	-	-	-	-	-	-	6.85E-03	7.45E-02	8.02E-02	4.34E-04	5.40E-04	4.98E-04							
Tractor/crawler/dozer	250 hp	4.875	0.0	4.9	42	0	-	-	-	-	-	-	6.85E-03	7.45E-02	8.02E-02	4.34E-04	5.42E-04	4.98E-04							
Chain saw		4.8751	0.0	4.9	42	0	-	-	-	-	-	-	8.12E-03	4.93E-04	5.67E-02	6.31E-06	8.92E-05	8.90E-05							
Brush Piling	Front end loader	540 hp	2.457	0.0	2.5	42	0	-	-	-	-	-	6.10E-03	7.20E-02	6.18E-02	1.55E-04	5.05E-04	3.63E-04							
Tractor/crawler/dozer	310 hp	2.457	0.0	2.5	42	0	-	-	-	-	-	-	3.75E-03	4.78E-02	3.69E-02	1.84E-04	3.48E-04	3.20E-04							
Brush chipper	250 hp	2.457	0.0	2.5	42	0	-	-	-	-	-	-	7.43E-03	6.40E-02	4.76E-02	3.05E-04	4.56E-04	4.19E-04							
Front end loader	540 hp	2.457	0.0	2.5	42	0	-	-	-	-	-	-	6.10E-03	7.20E-02	6.18E-02	1.55E-04	5.05E-04	3.63E-04							
Tractor/crawler/dozer	180 hp	2	0.0	2.0	106	0	106	6.85E-04	8.72E-03	9.39E-03	5.07E-05	6.34E-05	5.83E-05	-	-	-	-	-	-						
Front end loader	49 hp	4	0.0	4.0	106	0	106	1.58E-03	1.74E-02	1.58E-02	2.44E-05	7.04E-04	6.47E-04	-	-	-	-	-	-						
Roller	47 hp	4	0.0	4.0	106	0	106	1.29E-03	1.65E-02	1.40E-02	2.38E-05	6.32E-04	5.62E-04	-	-	-	-	-	-						
Water truck	3000 gal	4	0.0	4.0	106	0	106	1.16E-03	1.99E-02	2.12E-02	1.79E-05	4.00E-04	2.67E-04	-	-	-	-	-	-						
Excavator	300 hp	4	0.0	4.0	106	0	106	2.19E-03	2.62E-02	2.12E-02	1.04E-04	1.93E-04	1.78E-04	-	-	-	-	-	-						
Front end loader	180 hp	4	0.0	4.0	106	0	106	1.77E-03	1.57E-02	1.63E-02	9.10E-05	1.23E-04	1.14E-04	-	-	-	-	-	-						
Tractor/crawler/dozer	180 hp	4	0.0	4.0	106	0	106	2.06E-03	2.62E-02	2.82E-02	1.52E-04	1.90E-04	1.75E-04	-	-	-	-	-	-						
36" Diversion Pipe - grade	Tractor/crawler/dozer		6	6.0	6.0	106	106	1.77E-03	1.57E-02	1.63E-02	9.10E-05	1.23E-04	1.14E-04	-	-	-	-	-	-						
36" Diversion Pipe - pipe & Welder		17 hp	16	0.0	16	106	106	2.88E-02	1.86E-02	1.06E+00	4.27E-05	1.41E-02	1.41E-02	-	-	-	-	-	-						
Crane 80"	130 hp	273	0.0	273.0	106	106	106	5.71E-02	1.00E+00	1.84E+00	3.46E-03	6.33E-02	5.82E-02	-	-	-	-	-	-						
Loader/backhoe	75 hp	0.0923	0.0	0.1	106	106	106	1.77E-05	3.12E-04	3.79E-04	6.60E-07	2.22E-05	2.05E-05	-	-	-	-	-	-						
Crane 94"	155 hp	155	0.0	155.0	21	21	21	1.95E-01	3.53E+00	6.28E+00	1.18E-02	2.16E-01	1.99E-01	-	-	-	-	-	-						
1 ton pickup truck		155	0.0	155.0	21	21	21	9.69E-02	1.03E-01	1.30E+00	2.00E-03	1.62E-02	7.27E-03	-											

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		48	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
Dust Control	Water truck	5000 gal	1696	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056		
	Cutting	1 ton pickup truck	1,0325	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056		
		Tractor/crawler/dozer	250 hp	1,7208	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
		Chain saw		1,7208	19	2.096	0.115	13.187	0.001	0.021	0.021	35.644	0.130	0.039	
		Brush Piling	Front end loader	540 hp	0.8673	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000
			Tractor/crawler/dozer	310 hp	0.8673	19	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000
		Chipping	Brush chipper	250 hp	0.8673	19	0.125	0.962	0.724	0.005	0.007	0.006	402.522	0.011	0.000
			Front end loader	540 hp	0.8673	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000
			Front end loader	49 hp	4	19	0.224	2.197	2.112	0.003	0.093	0.085	231.302	0.020	0.000
		Roller	47 hp	4	19	0.194	2.169	1.953	0.003	0.087	0.080	235.458	0.017	0.000	
		Water truck	3000 gal	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Excavator	300 hp	4	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
		Front end loader	180 hp	4	19	0.068	0.534	0.569	0.003	0.004	0.004	270.062	0.014	0.000	
			Tractor/crawler/dozer	180 hp	6	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000
		36" Diversion Pipe - grad	Loader/backhoe	75 hp	0.0923	19	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000
			Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000
			1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
			Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000
			1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000
		Dewatering	Concrete saw	13 hp	8	21	3.249	2.402	118.759	0.006	1.684	1.680	200.831	0.184	0.193
			Crane 80'	130 hp	16	21	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000
			Flatbed truck		8	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135
		Generator	80 hp	5856	244	0.110	1.476	1.708	0.003	0.100	0.092	294.378	0.010	0.000	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000
			Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000	
	Armoring	1 ton pickup truck		1,0667	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Excavator	430 hp	1,0667	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
		1 ton pickup truck		1,0667	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Maintenance	Grader	215 hp	144	209	0.060	0.562	0.664	0.004	0.004	0.004	311.990	0.017	0.000
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
			Excavator	430 hp	4.445	22	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.194	1.437	0.634	0.003	0.043	0.039	316.617	0.018	0.000	
Drilling		Rotary drill	475 hp	7.3333	128	0.052	0.685	0.532	0.003	0.005	0.005	281.905	0.012	0.000	
		3/4 ton Pickup truck		7.3333	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Cut with Diamond wire	3/4 ton Pickup truck	48	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
			Diamond cutting saw	50 hp	48	128	0.130	2.363	1.738	0.004	0.082	0.075	277.553	0.012	0.000
		Lift/Load blocks	Crane 260'	375 hp	60.0214	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
			3/4 ton Pickup truck		60.0214	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
			Water truck	3000 gal	507	128	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Landfill	Crane 260'	375 hp	30.0107	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
<b>Total</b>															

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	209	1.86E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01		
Dust Control	Water truck	5000 gal	1696	209	1.28E-02	1.80E-01	2.37E-02	2.00E-04	4.17E-03	2.48E-03	4.01E+01	9.53E-05	8.97E-05	4.01E+01	3.64E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	209	2.74E-03	2.37E-03	3.33E-02	4.75E-05	3.88E-04	1.74E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
	Cutting	1 ton pickup truck	10325	19	2.24E-06	2.87E-06	3.03E-05	6.94E-08	5.52E-07	2.42E-07	2.33E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02		
		Tractor/crawler/dozer	250 hp	17209	19	2.45E-05	2.80E-04	3.04E-04	1.61E-06	2.08E-06	1.91E-06	1.43E-01	7.90E-06	-	1.43E-01	1.30E-01	
		Chain saw	1.7209	19	3.34E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.08E-06	6.24E-07	8.05E-04	7.30E-04		
	Brush Piling	Front end loader	540 hp	0.8673	19	3.50E-05	2.73E-04	3.17E-04	1.60E-06	2.21E-06	2.03E-06	1.60E-01	8.50E-06	-	1.60E-01	1.45E-01	
		Tractor/crawler/dozer	310 hp	0.8673	19	1.56E-05	1.78E-04	1.39E-04	6.84E-07	1.32E-06	1.22E-06	6.96E-02	3.85E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	250 hp	0.8673	19	2.98E-05	2.30E-04	1.73E-04	1.08E-06	1.67E-06	1.54E-06	9.62E-02	2.69E-06	-	9.63E-02	8.73E-02	
		Front end loader	540 hp	0.8673	19	3.50E-05	2.73E-04	3.17E-04	1.60E-06	2.21E-06	2.03E-06	1.60E-01	8.50E-06	-	1.60E-01	1.45E-01	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
			Front end loader	49 hp	4	19	4.84E-05	4.75E-04	4.56E-04	6.46E-07	2.00E-05	1.84E-05	5.00E-02	4.37E-06	-	5.01E-02	4.54E-02
		Roller	47 hp	4	19	4.02E-05	4.50E-04	4.05E-04	6.31E-07	1.80E-05	1.66E-05	4.88E-02	3.63E-06	-	4.89E-02	4.43E-02	
		Water truck	3000 gal	4	19	3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	9.47E-02	8.59E-02	
		Excavator	300 hp	4	19	6.57E-05	7.06E-04	5.61E-04	2.75E-06	5.30E-06	4.88E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
		Front end loader	180 hp	4	19	5.42E-05	4.23E-04	4.52E-04	2.41E-06	3.43E-06	3.16E-06	2.14E-01	1.14E-05	-	2.15E-01	1.95E-01	
		Tractor/crawler/dozer	180 hp	6	19	6.16E-05	7.03E-04	7.64E-04	4.03E-06	5.21E-06	4.80E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01	
36" Diversion Pipe - grad		Loader/backhoe	75 hp	0.0923	19	5.28E-07	8.42E-06	1.05E-05	1.75E-08	6.15E-07	5.66E-07	1.49E-03	1.11E-07	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	19	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	19	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Dewatering	Concrete saw	13 hp	8	21	3.72E-04	2.75E-04	1.36E-02	6.56E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02
			Crane 80'	130 hp	16	21	9.96E-05	1.62E-03	2.99E-03	5.37E-06	1.03E-04	9.52E-05	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01
			Flatbed truck	8	21	4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	-	1.86E-01	1.69E-01
		Generator	80 hp	5856	244	5.66E-02	7.62E-01	8.82E-01	1.78E-03	5.15E-02	4.74E-02	1.52E+02	5.11E-03	-	1.52E+02	1.38E+02	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	2.75E-03	3.14E-02	3.12E-02	1.56E-04	2.33E-04	2.14E-04	1.56E+01	8.61E-04	-	1.56E+01	1.41E+01
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	2.75E-03	3.14E-02	3.12E-02	1.56E-04	2.33E-04	2.14E-04	1.56E+01	8.61E-04	-	1.56E+01	1.41E+01
			Tractor/crawler/dozer	600 hp	78.8462	19	2.75E-03	3.14E-02	3.12E-02	1.56E-04	2.33E-04	2.14E-04	1.56E+01	8.61E-04	-	1.56E+01	1.41E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	2.75E-03	3.14E-02	3.12E-02	1.56E-04	2.33E-04	2.14E-04	1.56E+01	8.61E-04	-	1.56E+01	1.41E+01	
	Armoring	1 ton pickup truck		1.0667	19	2.31E-06	2.97E-06	3.13E-05	7.17E-08	5.71E-07	2.50E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1.0667	19	2.51E-05	2.70E-04	2.15E-04	1.05E-06	2.03E-06	1.86E-06	1.07E-01	5.92E-06	-	1.07E-01	9.73E-02	
		1 ton pickup truck		1.0667	19	2.31E-06	2.97E-06	3.13E-05	7.17E-08	5.71E-07	2.50E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	209	2.04E-03	1.92E-02	2.27E-02	1.20E-04	1.48E-04	1.37E-04	1.06E+01	5.85E-04	-	1.07E+01	9.67E+00	
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	5.12E-05	7.21E-04	9.47E-05	1.67E-05	9.93E-06	1.60E-01	3.81E-07	3.59E-07	1.60E-01	1.46E-01		
		Excavator	430 hp	4.445	22	1.05E-04	1.12E-03	8.94E-04	4.38E-06	8.44E-06	7.77E-06	4.46E-01	2.47E-05	-	4.47E-01	4.05E-01	
	Tractor/crawler/dozer	850 hp	3.2327	22	5.88E-04	4.36E-03	1.92E-03	9.64E-06	1.29E-04	1.19E-04	9.59E-01	5.30E-05	-	9.60E-01	8.71E-01		
Drilling	Rotary drill	475 hp	7.3333	128	2.01E-04	2.63E-03	2.04E-03	1.06E-05	1.90E-05	1.75E-05	1.08E+00	4.63E-05	-	1.08E+00	9.83E-01		
	3/4 ton Pickup truck		7.3333	128	2.84E-05	2.45E-05	3.44E-04	4.92E-07	4.01E-06	1.80E-06	1.65E-01	1.64E-05	8.54E-06	-	1.68E-01	1.52E-01	
Cut with Diamond wire	3/4 ton Pickup truck		48	128	1.89E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	-	1.10E+00	9.95E-01	
	Diamond cutting saw	50 hp	48	128	3.45E-04	6.25E-03	4.60E-03	9.49E-06	2.16E-04	1.99E-04	7.34E-01	3.11E-05	-	7.35E-01	6.67E-01		
Lift/Load blocks	Crane 260'	375 hp	60.0214	128	7.71E-04	9.73E-03	8.11E-03	3.97E-05	7.09E-05	6.52E-05	4.05E+00	2.24E-04	-	4.05E+00	3.68E+00		
	3/4 ton Pickup truck		60.0214	128	2.32E-04	2.00E-04	2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00		
	Water truck	3000 gal	507	128	3.83E-03	5.39E-02	7.08E-03	5.98E-05	1.25E-03	7.43E-04	1.20E+01	2.85E-05	2.68E-05	1.20E+01	1.09E+01		
Landfill	Crane 260'	375 hp	30.0107	128	3.86E-04	4.87E-03	4.06E-03	1.99E-05	3.54E-05	3.26E-05	2.02E+00	1.12E-04	-	2.03E+00	1.84E+00		
					9.62E-02	1.22E+00	1.22E+00	3.12E-03	6.19E-02	5.49E-02	3.27E+02	1.35E-02	1.56E-03	3.28E+02	2.97E+02		

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 2

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	209	3.55E-03	3.07E-03	4.32E-02	6.16E-05	5.03E-04	2.26E-04		
Dust Control	Water truck	5000 gal	1696	209	2.45E-01	3.45E+00	4.53E-01	3.83E-03	7.97E-02	4.75E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	209	5.25E-02	4.53E-02	6.37E-01	9.10E-04	7.43E-03	3.33E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.30E-02	1.12E-02	1.59E-01	2.26E-04	1.84E-03	8.27E-04		
	Cutting	1 ton pickup truck	10325	19	4.71E-04	6.04E-04	6.39E-03	1.46E-05	1.16E-04	5.09E-05		
		Tractor/crawler/dozer	250 hp	17209	19	5.18E-03	5.89E-02	6.41E-02	3.38E-04	4.37E-04	4.02E-04	
		Chain saw		17209	19	7.03E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	540 hp	0.8673	19	7.36E-03	5.75E-02	6.67E-02	3.38E-04	4.65E-04	4.28E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	3.29E-03	3.75E-02	2.94E-02	1.44E-04	2.79E-04	2.56E-04	
		Chipping	Brush chipper	250 hp	0.8673	19	6.28E-03	4.84E-02	3.64E-02	2.28E-04	3.51E-04	3.23E-04
			Front end loader	540 hp	0.8673	19	7.36E-03	5.75E-02	6.67E-02	3.38E-04	4.65E-04	4.28E-04
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.32E-03	4.93E-02	5.36E-02	2.83E-04	3.66E-04	3.37E-04
			Front end loader	49 hp	4	19	1.02E-02	9.99E-02	9.61E-02	1.36E-04	4.22E-03	3.88E-03
		Roller	47 hp	4	19	8.46E-03	9.46E-02	8.52E-02	1.33E-04	3.80E-03	3.50E-03	
		Water truck	3000 gal	4	19	6.36E-03	8.95E-02	1.18E-02	9.93E-05	2.07E-03	1.23E-03	
		Excavator	300 hp	4	19	1.38E-02	1.49E-01	1.18E-01	5.79E-04	1.12E-03	1.03E-03	
		Front end loader	180 hp	4	19	1.14E-02	8.92E-02	9.51E-02	5.08E-04	7.22E-04	6.64E-04	
		Tractor/crawler/dozer	180 hp	6	19	1.30E-02	1.49E-01	1.61E-01	8.49E-04	1.10E-03	1.01E-03	
36" Diversion Pipe - grad		Loader/backhoe	75 hp	0.0923	19	1.11E-04	1.77E-03	2.21E-03	3.68E-06	1.29E-04	1.19E-04	
		Crane 94'	155 hp	155	19	2.42E-01	3.95E+00	7.26E+00	1.31E-02	2.52E-01	2.32E-01	
		1 ton pickup truck		155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
		Crane 94'	155 hp	155	19	2.42E-01	3.95E+00	7.26E+00	1.31E-02	2.52E-01	2.32E-01	
		1 ton pickup truck		155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.32E-03	4.93E-02	5.36E-02	2.83E-04	3.66E-04	3.37E-04
		Dewatering	Concrete saw	13 hp	8	21	7.09E-02	5.24E-02	2.59E+00	1.25E-04	3.68E-02	3.67E-02
			Crane 80'	130 hp	16	21	1.90E-02	3.09E-01	5.69E-01	1.02E-03	1.97E-02	1.81E-02
			Flatbed truck		8	21	9.27E-03	1.00E-02	1.29E-01	1.01E-04	8.04E-04	3.47E-04
		Generator	80 hp	5856	244	9.29E-01	1.25E+01	1.45E+01	2.92E-02	8.45E-01	7.77E-01	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	5.79E-01	6.60E+00	6.56E+00	3.29E-02	4.90E-02	4.51E-02
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	5.79E-01	6.60E+00	6.56E+00	3.29E-02	4.90E-02	4.51E-02
			Tractor/crawler/dozer	600 hp	78.8462	19	5.79E-01	6.60E+00	6.56E+00	3.29E-02	4.90E-02	4.51E-02
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	5.79E-01	6.60E+00	6.56E+00	3.29E-02	4.90E-02	4.51E-02	
	Armoring	1 ton pickup truck		1.0667	19	4.87E-04	6.24E-04	6.59E-03	1.51E-05	1.20E-04	5.26E-05	
		Excavator	430 hp	1.0667	19	5.29E-03	5.68E-02	4.52E-02	2.21E-04	4.27E-04	3.93E-04	
		1 ton pickup truck		1.0667	19	4.87E-04	6.24E-04	6.59E-03	1.51E-05	1.20E-04	5.26E-05	
	Maintenance	Grader	215 hp	1.44	209	3.91E-02	3.67E-01	4.33E-01	2.29E-03	2.84E-03	2.61E-03	
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	9.31E-03	1.31E-01	1.72E-02	1.45E-04	3.03E-03	1.81E-03
			Excavator	430 hp	4.445	22	1.90E-02	2.04E-01	1.63E-01	7.97E-04	1.54E-03	1.41E-03
		Tractor/crawler/dozer	850 hp	3.2327	22	1.07E-01	7.91E-01	3.49E-01	1.75E-03	2.35E-02	2.16E-02	
Drilling		Rotary drill	475 hp	7.3333	128	6.29E-03	8.22E-02	6.39E-02	3.32E-04	5.95E-04	5.47E-04	
		3/4 ton Pickup truck		7.3333	128	8.86E-04	7.65E-04	1.08E-02	1.54E-05	1.25E-04	5.63E-05	
Cut with Diamond wire		3/4 ton Pickup truck		48	128	5.80E-03	5.01E-03	7.05E-02	1.01E-04	8.21E-04	3.68E-04	
		Diamond cutting saw	50 hp	48	128	1.08E-02	1.95E-01	1.44E-01	2.97E-04	6.76E-03	6.22E-03	
Lift/Load blocks		Crane 260'		60.0214	128	2.41E-02	3.04E-01	2.53E-01	1.24E-03	2.21E-03	2.04E-03	
		3/4 ton Pickup truck		60.0214	128	7.25E-03	6.26E-03	8.81E-02	1.26E-04	1.03E-03	4.61E-04	
		Water truck	3000 gal	507	128	1.20E-01	1.68E+00	2.21E-01	1.87E-03	3.89E-02	2.32E-02	
Landfill		Crane 260'		30.0107	128	1.20E-02	1.52E-01	1.27E-01	6.21E-04	1.11E-03	1.02E-03	
						4.76E+00	5.59E+01	6.47E+01	2.12E-01	1.83E+00	1.62E+00	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2019
Birthdays of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019

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<http://beta.epm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2019>



Malibu Creek Ecosystem Restoration Feasibility Study  
 Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2021  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)									
					VOc	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	
	Chain saw		1,7209	19	2.303	0.115	13.188	0.001	0.021	0.021	35.645	0.143	0.039	
	Brush Piling	Front end loader	0.8673	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	
		Tractor/crawler/dozer	0.8673	19	0.058	0.607	0.471	0.002	0.005	0.004	234.947	0.013	0.000	
	Chipping	Brush chipper	0.8673	19	0.134	0.936	0.711	0.004	0.007	0.006	386.935	0.012	0.000	
		Front end loader	0.8673	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	
		Front end loader	49 hp	4	0.249	2.247	2.257	0.003	0.098	0.090	231.303	0.022	0.000	
		Roller	47 hp	4	0.222	2.225	2.115	0.003	0.093	0.086	235.529	0.020	0.000	
		Water truck	3000 gal	4	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	
		Excavator	300 hp	4	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000	
		Front end loader	180 hp	4	0.076	0.543	0.576	0.003	0.005	0.004	270.060	0.015	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	
		Loader/backhoe	75 hp	0.0923	0.076	1.118	1.383	0.002	0.083	0.077	195.356	0.015	0.000	
		Crane 94'	155 hp	155	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	
		1 ton pickup truck	155	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	
		1 ton pickup truck	155	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	
	Dewatering	Concrete saw	13 hp	8	3.253	2.405	118.912	0.006	1.686	1.682	201.089	0.184	0.193	
		Crane 80'	130 hp	16	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	
		Flatbed truck	8	23	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.120	1.489	1.736	0.003	0.102	0.094	294.380	0.011	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000
	Armoring	1 ton pickup truck	1.0667	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000
		1 ton pickup truck	1.0667	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.067	0.571	0.665	0.004	0.005	0.004	312.023	0.017	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
		Excavator	430 hp	4.445	22	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.177	1.311	0.579	0.003	0.039	0.036	289.013	0.016	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.058	0.607	0.471	0.002	0.005	0.004	234.947	0.013	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.058	0.607	0.471	0.002	0.005	0.004	234.947	0.013	0.000
		3/4 ton Pickup truck		20	20	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.054	0.684	0.537	0.003	0.005	0.005	282.173	0.013	0.000
		3/4 ton Pickup truck		34.0003	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.146	2.395	1.830	0.004	0.085	0.078	277.566	0.013	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.034	0.397	0.327	0.002	0.003	0.003	163.300	0.009	0.000
		3/4 ton Pickup truck		60.0214	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.076	0.542	0.430	0.002	0.004	0.004	214.819	0.012	0.000
		Water truck	3000 gal	507	126	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.034	0.397	0.327	0.002	0.003	0.003	163.300	0.009	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.034	0.397	0.327	0.002	0.003	0.003	163.300	0.009	0.000
		Horizontal boring drill	10 hp	55	126	0.098	2.489	1.168	0.004	0.091	0.083	283.780	0.031	0.000
		3/4 ton Pickup truck		60	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.034	0.397	0.327	0.002	0.003	0.003	163.300	0.009	0.000
		Air compressor	50 hp	40	126	0.666	0.763	61.867	0.004	0.024	0.023	306.998	0.038	0.060
		3/4 ton Pickup truck		20	126	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056
<b>Total</b>														

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2021 (tons per year)										Metric Tons CO2e/yr
					GWP										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		48	210	1.44E-04	1.37E-04	1.77E-03	3.22E-06	2.58E-05	1.14E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
Dust Control	Water truck	5000 gal	1696	210	1.31E-02	9.34E-02	2.48E-02	1.99E-04	3.45E-03	1.83E-03	3.98E+01	9.53E-05	8.97E-05	3.98E+01	3.61E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.13E-03	2.03E-03	2.62E-02	4.76E-05	3.81E-04	1.68E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01
	Fish relocation	3/4 ton pickup truck	16	19	4.82E-05	4.58E-05	5.91E-04	1.07E-06	8.60E-06	3.79E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	1.57E-06	2.36E-06	2.17E-05	6.96E-08	5.42E-07	2.33E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02
	Tractor/crawler/dozer	250 hp	1,7208	19	2.72E-05	2.83E-04	3.04E-04	1.61E-06	2.14E-06	1.97E-06	1.43E-01	7.90E-06	-	1.43E-01	1.30E-01
	Chain saw		1,7209	19	3.67E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.28E-06	6.24E-07	8.09E-04	7.34E-04
	Brush Piling	Front end loader	0.8673	19	3.89E-05	2.78E-04	3.23E-04	1.62E-06	2.31E-06	2.12E-06	1.61E-01	8.92E-06	-	1.62E-01	1.47E-01
		Tractor/crawler/dozer	0.8673	19	1.73E-05	1.80E-04	1.39E-04	6.83E-07	1.36E-06	1.25E-06	6.96E-02	3.85E-06	-	6.97E-02	6.32E-02
	Chipping	Brush chipper	0.8673	19	3.20E-05	2.24E-04	1.70E-04	1.04E-06	1.65E-06	1.52E-06	9.25E-02	2.89E-06	-	9.25E-02	8.40E-02
		Front end loader	0.8673	19	3.89E-05	2.78E-04	3.23E-04	1.62E-06	2.31E-06	2.12E-06	1.61E-01	8.92E-06	-	1.62E-01	1.47E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Front end loader	49 hp	4	5.39E-05	4.85E-04	4.88E-04	6.46E-07	2.12E-05	1.95E-05	5.00E-02	4.86E-06	-	5.01E-02	4.54E-02
		Roller	47 hp	4	4.60E-05	4.61E-04	4.38E-04	6.31E-07	1.93E-05	1.77E-05	4.88E-02	4.15E-06	-	4.89E-02	4.44E-02
		Water truck	3000 gal	4	3.08E-05	2.20E-04	5.86E-05	4.69E-07	8.14E-06	4.31E-06	9.39E-02	2.25E-07	2.12E-07	9.40E-02	8.53E-02
		Excavator	300 hp	4	19	7.17E-05	7.07E-04	5.61E-04	2.75E-06	5.41E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01
		Front end loader	180 hp	4	19	6.04E-05	4.31E-04	4.57E-04	2.41E-06	3.58E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	19	6.82E-05	7.11E-04	7.64E-04	4.03E-06	5.39E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01
		Loader/backhoe	75 hp	0.0923	19	5.78E-07	8.53E-06	1.05E-05	1.75E-08	6.36E-07	5.85E-07	1.14E-07	-	1.49E-03	1.35E-03
		Crane 94'	155 hp	155	19	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck	155	19	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Crane 94'	155 hp	155	20	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck	155	20	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	13 hp	8	23	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	2.31E-02	2.11E-05	2.21E-05	3.04E-02	2.75E-02
		Crane 80'	130 hp	16	23	1.10E-04	1.64E-03	2.99E-03	5.37E-06	1.08E-04	9.96E-05	4.77E-01	3.64E-05	-	4.78E-01
		Flatbed truck		8	23	3.47E-05	3.98E-05	4.78E-04	5.33E-07	4.15E-06	1.76E-06	1.80E-01	4.06E-05	1.88E-05	1.63E-01
		Generator	80 hp	5856	244	6.21E-02	7.69E-01	8.96E-01	1.78E-03	5.29E-02	4.86E-02	1.52E+02	5.60E-03	-	1.52E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.03E-03	3.16E-02	2.85E-02	1.43E-04	2.39E-04	2.20E-04	1.42E+01	7.85E-04	-	1.42E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.03E-03	3.16E-02	2.85E-02	1.43E-04	2.39E-04	2.20E-04	1.42E+01	7.85E-04	-	1.42E+01
		Tractor/crawler/dozer	600 hp	78,8462	19	3.03E-03	3.16E-02	2.85E-02	1.43E-04	2.39E-04	2.20E-04	1.42E+01	7.85E-04	-	1.42E+01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.03E-03	3.16E-02	2.85E-02	1.43E-04	2.39E-04	2.20E-04	1.42E+01	7.85E-04	-	1.42E+01
	Armoring	1 ton pickup truck	1,0667	19	1.62E-06	2.43E-06	2.25E-05	7.19E-08	5.60E-07	2.41E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
		Excavator	430 hp	1,0667	19	2.74E-05	2.70E-04	2.15E-04	1.05E-06	2.07E-06	1.07E-01	5.92E-06	-	1.07E-01	9.73E-02
		1 ton pickup truck	1,0667	19	1.62E-06	2.43E-06	2.25E-05	7.19E-08	5.60E-07	2.41E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
	Maintenance	Grader	215 hp	144	210	2.28E-03	1.95E-02	2.27E-02	1.20E-04	1.54E-04	1.42E-04	1.06E+01	5.89E-04	-	1.07E+01
Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6,7805	22	5.23E-05	3.73E-04	9.93E-05	7.94E-07	1.38E-05	7.31E-06	1.59E-01	3.81E-07	3.59E-07	1.45E-01
		Excavator	430 hp	4,445	22	1.14E-04	1.13E-03	8.94E-04	4.38E-06	8.62E-06	7.93E-06	4.46E-01	2.47E-05	-	4.47E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	5.37E-04	3.97E-03	1.75E-03	8.80E-06	1.18E-04	1.09E-04	8.75E-01	4.84E-05	-	8.76E-01
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.13E-03	1.18E-02	9.13E-03	4.47E-05	8.90E-05	8.19E-05	4.56E+00	2.52E-04	-	4.56E+00
		Tractor/crawler/dozer	440 hp	5	20	1.41E-04	1.47E-03	1.14E-03	5.59E-06	1.11E-05	1.02E-05	5.70E-01	3.15E-05	-	5.70E-01
		3/4 ton Pickup truck		20	20	6.02E-05	5.72E-05	7.39E-04	1.34E-06	1.08E-05	4.74E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01
	Drilling	Rotary drill	475 hp	34,0003	126	9.59E-04	1.22E-02	9.57E-03	4.93E-05	8.85E-05	5.02E+00	2.24E-04	-	5.03E+00	
		3/4 ton Pickup truck		34,0003	126	1.02E-04	9.73E-05	1.26E-03	2.28E-06	1.93E-05	8.06E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.44E-04	1.37E-04	1.77E-03	3.22E-06	2.58E-05	1.14E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00
		Diamond cutting saw	50 hp	48	126	3.87E-04	6.34E-03	4.84E-03	9.49E-06	2.25E-04	2.07E-04	7.34E-01	3.49E-05	-	7.35E-01
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	8.56E-04	9.86E-03	8.12E-03	3.98E-05	7.30E-05	6.72E-05	4.05E+00	2.24E-04	-	4.06E+00
		3/4 ton Pickup truck		60,0214	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00
		Front end loader	350 hp	4	126	1.17E-04	8.36E-04	6.64E-04	3.25E-06	6.94E-06	3.32E-01	1.83E-05	-	3.32E-01	
		Water truck	3000 gal	507	126	3.91E-03	2.79E-02	7.42E-03	5.94E-05	1.03E-03	5.47E-04	1.19E+01	2.85E-05	2.68E-05	1.19E+01
	Landfill	Crane 260'	375 hp	30,0107	126	4.28E-04	4.93E-03	4.06E-03	1.99E-05	3.65E-05	2.03E+00	1.12E-04	-	2.03E+00	
		Crane 260'	375 hp	49	126	6.99E-04	8.05E-03	6.63E-03	3.25E-05	5.96E-05	3.31E+00	1.83E-04	-	3.31E+00	
		Horizontal boring drill	10 hp	55	126	5.97E-05	1.51E-03	7.08E-04	2.18E-06	5.49E-05	5.05E-05	1.72E-01	1.87E-05	-	1.72E-01
		3/4 ton Pickup truck		60	126	1.81E-04	1.72E-04	2.22E-03	4.03E-06	3.23E-05	1.42E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00
	Demolish spillway	Crane 260'	375 hp	20	126	2.85E-04	3.28E-03	2.70E-03	1.33E-05	2.43E-05	2.24E-05	1.35E+00	7.47E-05	-	1.35E+00
		Air compressor	50 hp	40	126	1.47E-03	1.68E-03	1.36E-01	8.23E-06	5.18E-05	5.17E-05	6.77E-01	8.29E-05	1.32E-04	7.19E-01
		3/4 ton Pickup truck		20	126	6.02E-05	5.72E-05	7.39E-04	1.34E-06	1.08E-05	4.74E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01
						1.08E-01	1.15E+00	1.39E+00	3.22E-03	6.29E-02	5.58E-02	3.39E+02	1.48E-02	1.84E-03	3.40E+02

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Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	2.75E-03	2.62E-03	3.38E-02	6.14E-05	4.92E-04	2.17E-04		
Dust Control	Water truck	5000 gal	1696	210	2.49E-01	1.78E+00	4.73E-01	3.78E-03	6.58E-02	3.48E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	4.07E-02	3.86E-02	4.99E-01	9.07E-04	7.26E-03	3.20E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.01E-02	9.64E-03	1.24E-01	2.26E-04	1.81E-03	7.98E-04		
	Cutting	1 ton pickup truck	1,0325	19	3.30E-04	4.96E-04	4.58E-03	1.46E-05	1.14E-04	4.90E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	5.72E-03	5.96E-02	6.41E-02	3.38E-04	4.51E-04	4.15E-04	
		Chain saw	1,7209	19	7.72E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05		
	Brush Piling	Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	6.81E-02	3.42E-04	4.86E-04	4.47E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	3.63E-03	3.79E-02	2.94E-02	1.44E-04	2.86E-04	2.63E-04	
	Chipping	Brush chipper	250 hp	0.8673	19	6.74E-03	4.71E-02	3.58E-02	2.19E-04	3.48E-04	3.20E-04	
		Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	6.81E-02	3.42E-04	4.86E-04	4.47E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	4.79E-03	4.99E-02	5.36E-02	2.83E-04	3.77E-04	3.47E-04	
			Front end loader	49 hp	4	1.13E-02	1.02E-01	1.03E-01	1.36E-04	4.46E-03	4.10E-03	
		Roller	47 hp	4	9.69E-03	9.71E-02	9.23E-02	1.33E-04	4.06E-03	3.74E-03		
		Water truck	3000 gal	4	6.49E-03	4.64E-02	1.23E-02	9.87E-05	1.71E-03	9.08E-04		
		Excavator	300 hp	4	1.51E-02	1.49E-01	1.18E-01	5.79E-04	1.14E-03	1.05E-03		
		Front end loader	180 hp	4	1.27E-02	9.08E-02	9.62E-02	5.08E-04	7.54E-04	6.93E-04		
36" Diversion Pipe - grade		Tractor/crawler/dozer	180 hp	6	1.44E-02	1.50E-01	1.61E-01	8.49E-04	1.13E-03	1.04E-03		
		Loader/backhoe	75 hp	0.0923	19	1.22E-04	1.80E-03	2.22E-03	3.68E-06	1.34E-04	1.23E-04	
		Crane 94'	155 hp	155	19	2.67E-01	3.99E+00	7.26E+00	1.30E-02	2.63E-01	2.42E-01	
		1 ton pickup truck	155	155	19	4.96E-02	7.44E-02	6.87E-01	2.20E-03	1.71E-02	7.36E-03	
		Crane 94'	155 hp	155	20	2.54E-01	3.79E+00	6.90E+00	1.24E-02	2.50E-01	2.30E-01	
		1 ton pickup truck	155	155	20	4.71E-02	7.07E-02	6.53E-01	2.09E-03	1.63E-02	6.99E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	4.55E-03	4.74E-02	5.10E-02	2.69E-04	3.58E-04	3.30E-04	
		Concrete saw	13 hp	8	23	6.49E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02	
		Dewatering	Crane 80'	130 hp	16	23	1.91E-02	2.85E-01	5.19E-01	9.33E-04	1.88E-02	1.73E-02
			Flatbed truck	8	23	6.03E-03	6.93E-03	8.32E-02	9.26E-05	7.22E-04	3.06E-04	
			Generator	80 hp	5856	244	1.02E+00	1.26E+01	1.47E+01	2.92E-02	8.66E-01	7.97E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	6.38E-01	6.65E+00	5.99E+00	3.01E-02	5.03E-02	4.63E-02
		Push	Tractor/crawler/dozer	600 hp	78,8462	19	6.38E-01	6.65E+00	5.99E+00	3.01E-02	5.03E-02	4.63E-02
			Tractor/crawler/dozer	600 hp	78,8462	19	6.38E-01	6.65E+00	5.99E+00	3.01E-02	5.03E-02	4.63E-02
		Build road	Tractor/crawler/dozer	600 hp	78,8462	19	6.38E-01	6.65E+00	5.99E+00	3.01E-02	5.03E-02	4.63E-02
			1 ton pickup truck	1,0667	1,0667	19	3.41E-04	5.12E-04	4.73E-03	1.51E-05	1.18E-04	5.06E-05
		Armoring	Excavator	430 hp	1,0667	19	5.77E-03	5.69E-02	4.52E-02	2.21E-04	4.35E-04	4.01E-04
			1 ton pickup truck	1,0667	1,0667	19	3.41E-04	5.12E-04	4.73E-03	1.51E-05	1.18E-04	5.06E-05
	Maintenance	Grader	215 hp	144	210	4.33E-02	3.71E-01	4.32E-01	2.28E-03	2.94E-03	2.70E-03	
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	9.50E-03	6.79E-02	1.80E-02	1.44E-04	2.51E-03	1.33E-03
			Excavator	430 hp	4,445	22	2.08E-02	2.05E-01	1.63E-01	7.97E-04	1.57E-03	1.44E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	9.76E-02	7.22E-01	3.19E-01	1.60E-03	2.15E-02	1.98E-02	
Platform		Tractor/crawler/dozer	440 hp	40	20	2.26E-01	2.36E+00	1.83E+00	8.95E-03	1.78E-02	1.64E-02	
		Tractor/crawler/dozer	440 hp	5	20	2.82E-02	2.94E-01	2.28E-01	1.12E-03	2.23E-03	2.05E-03	
Drilling		3/4 ton Pickup truck	20	20	1.20E-02	1.14E-02	1.48E-01	2.69E-04	2.15E-03	9.48E-04		
		Rotary drill	475 hp	34,0003	126	3.04E-02	3.85E-01	3.04E-01	1.57E-03	2.51E-03	2.59E-03	
		3/4 ton Pickup truck	34,0003	126	3.25E-03	3.09E-03	3.99E-02	7.25E-05	5.80E-04	2.56E-04		
Cut with Diamond wire		3/4 ton Pickup truck	48	48	126	4.59E-03	4.36E-03	5.63E-02	1.02E-04	8.19E-04	3.61E-04	
		Diamond cutting saw	50 hp	48	126	1.23E-02	2.01E-01	1.54E-01	3.01E-04	7.15E-03	6.58E-03	
Lift/Load blocks		Crane 260'	375 hp	60,0214	126	2.72E-02	3.13E-01	2.58E-01	1.26E-03	2.32E-03	2.13E-03	
		3/4 ton Pickup truck	60,0214	126	5.74E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04		
Load/Haul		Front end loader	350 hp	4	126	3.72E-03	2.65E-02	2.11E-02	1.03E-04	2.20E-04	2.03E-04	
		Water truck	3000 gal	507	126	1.24E-01	8.86E-01	2.36E-01	1.89E-03	3.28E-02	1.74E-02	
Landfill		Crane 260'	375 hp	30,0107	126	1.36E-02	1.56E-01	1.29E-01	6.31E-04	1.16E-03	1.07E-03	
		Crane 260'	375 hp	49	126	2.22E-02	2.55E-01	2.10E-01	1.03E-03	1.89E-03	1.74E-03	
Micro-blast		Horizontal boring drill	10 hp	55	126	1.89E-03	4.79E-02	2.25E-02	6.93E-05	1.74E-03	1.60E-03	
		3/4 ton Pickup truck	60	60	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04	
Demolish spillway		Crane 260'	375 hp	20	126	9.05E-03	1.04E-01	8.59E-02	4.21E-04	7.72E-04	7.11E-04	
		Air compressor	50 hp	40	126	4.66E-02	5.34E-02	4.33E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	20	126	1.91E-03	1.82E-03	2.35E-02	4.27E-05	3.41E-04	1.50E-04	
					<b>5.46E+00</b>	<b>5.68E+01</b>	<b>6.85E+01</b>	<b>2.13E-01</b>	<b>1.87E+00</b>	<b>1.66E+00</b>		

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
 Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2023  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2023 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
Environmental protection measures	Biologist		709	210	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Fish relocation		16	19	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
Clear Vegetation	Cutting		1,0325	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	
	Chain saw		1,7209	19	2.509	0.115	13.187	0.001	0.021	0.021	35.644	0.156	0.039	
	Brush Piling		0.8673	19	0.075	0.538	0.548	0.003	0.004	0.004	273.357	0.015	0.000	
	Tractor/crawler/dozer	540 hp	0.8673	19	0.063	0.611	0.471	0.002	0.005	0.004	234.966	0.013	0.000	
	Brush chipper	250 hp	0.8673	19	0.157	1.006	0.773	0.005	0.008	0.007	411.577	0.014	0.000	
	Tractor/crawler/dozer	540 hp	0.8673	19	0.075	0.538	0.548	0.003	0.004	0.004	273.357	0.015	0.000	
Dewatering	Temporary Cofferdam		2	19	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	
	Front end loader		4	19	0.269	2.286	2.372	0.003	0.102	0.094	231.300	0.024	0.000	
	Roller		4	19	0.073	1.863	2.268	0.003	0.068	0.062	235.492	0.022	0.000	
	Water truck	3000 gal	4	19	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
	Excavator	300 hp	4	19	0.058	0.534	0.424	0.002	0.004	0.004	211.846	0.012	0.000	
	Front end loader	180 hp	4	19	0.076	0.543	0.576	0.003	0.005	0.004	270.058	0.015	0.000	
	Tractor/crawler/dozer	180 hp	6	19	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	
	36" Diversion Pipe - grad	Loader/backhoe	0.0923	19	0.081	1.131	1.383	0.002	0.086	0.079	195.357	0.015	0.000	
	Crane 94'	155 hp	155	19	0.052	0.722	1.302	0.002	0.049	0.045	208.013	0.016	0.000	
	1 ton pickup truck		155	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Crane 94'	155 hp	155	20	0.052	0.722	1.302	0.002	0.049	0.045	208.013	0.016	0.000	
	1 ton pickup truck		155	20	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	
	Dewatering	Concrete saw	13 hp	8	23	3.251	2.403	118.832	0.006	1.685	1.681	200.954	0.184	0.193
	Crane 80'	130 hp	16	23	0.052	0.722	1.302	0.002	0.049	0.045	208.013	0.016	0.000	
	Flatbed truck		8	23	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135	
	Generator	80 hp	5856	244	0.131	1.501	1.764	0.003	0.105	0.097	294.401	0.012	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	0.063	0.613	0.618	0.003	0.005	0.004	308.370	0.017	0.000
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	0.063	0.613	0.618	0.003	0.005	0.004	308.370	0.017	0.000
	Tractor/crawler/dozer	600 hp	78,8462	19	0.063	0.613	0.618	0.003	0.005	0.004	308.370	0.017	0.000	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	0.063	0.613	0.618	0.003	0.005	0.004	308.370	0.017	0.000
	Armoring	1 ton pickup truck	1,0667	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Excavator	430 hp	1,0667	19	0.058	0.534	0.424	0.002	0.004	0.004	211.846	0.012	0.000	
	1 ton pickup truck		1,0667	19	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.073	0.579	0.665	0.004	0.005	0.004	312.026	0.017	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048
	Excavator	430 hp	4,445	22	0.058	0.534	0.424	0.002	0.004	0.004	211.846	0.012	0.000	
	Tractor/crawler/dozer	850 hp	3,2327	22	0.201	1.485	0.655	0.003	0.044	0.041	327.216	0.018	0.000	
	Platform	Tractor/crawler/dozer	440 hp	40	0.063	0.611	0.471	0.002	0.005	0.004	234.966	0.013	0.000	
	Tractor/crawler/dozer	440 hp	5	20	0.063	0.611	0.471	0.002	0.005	0.004	234.966	0.013	0.000	
	3/4 ton Pickup truck		20	20	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Drilling	Rotary drill	475 hp	34,0003	126	0.053	0.668	0.544	0.003	0.005	0.004	283.890	0.013	0.000
	3/4 ton Pickup truck		34,0003	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Diamond cutting saw	50 hp	48	126	0.162	2.426	1.921	0.004	0.089	0.081	277.558	0.015	0.000	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000
	3/4 ton Pickup truck		60,0214	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Load/Haul	Front end loader	350 hp	4	126	0.076	0.539	0.430	0.002	0.004	0.004	214.835	0.012	0.000
	Water truck	3000 gal	507	126	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	
	Landfill	Crane 260'	375 hp	30,0107	126	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000
	Horizontal boring drill	10 hp	55	126	0.101	2.501	2.636	0.004	0.092	0.084	283.073	0.026	0.000	
	3/4 ton Pickup truck		60	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Demolish spillway	Crane 260'	375 hp	20	126	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000
	Air compressor	50 hp	40	126	0.731	0.811	70.044	0.004	0.024	0.023	307.049	0.041	0.062	
	3/4 ton Pickup truck		20	126	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	
											<b>Total</b>			

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2023 (tons per year)										Metric Tons CO2e/yr
					GWP 1 21 310										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		48	210	1.08E-04	1.17E-04	1.39E-03	3.22E-06	2.54E-05	1.10E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
Dust Control	Water truck	5000 gal	1696	210	1.19E-02	4.65E-02	2.26E-02	1.97E-04	3.37E-03	1.75E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E-01
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.60E-03	1.73E-03	2.05E-02	4.76E-05	3.76E-04	1.63E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	3.60E-05	3.90E-05	4.62E-04	1.07E-06	8.48E-06	3.67E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
	Cutting	1 ton pickup truck	1,0325	19	1.08E-06	1.94E-06	1.58E-05	6.96E-08	5.35E-07	2.26E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02
	Tractor/crawler/dozer	250 hp	1,7208	19	2.94E-05	2.85E-04	3.04E-04	1.61E-06	2.19E-06	2.01E-06	1.43E-01	7.90E-06	-	1.43E-01	1.30E-01
	Chain saw		1,7209	19	4.00E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.49E-06	6.24E-07	8.14E-04	7.38E-04
	Brush Piling	Front end loader	0.8673	19	3.89E-05	2.78E-04	2.83E-04	1.42E-06	2.31E-06	2.12E-06	1.41E-01	7.80E-06	-	1.41E-01	1.28E-01
		Tractor/crawler/dozer	0.8673	19	1.87E-05	1.81E-04	1.39E-04	6.83E-07	1.39E-06	1.28E-06	6.96E-02	3.85E-06	-	6.97E-02	6.32E-02
		Brush chipper	0.8673	19	3.76E-05	2.41E-04	1.85E-04	1.11E-06	1.81E-06	1.66E-06	9.84E-02	3.39E-06	-	9.84E-02	8.93E-02
		Front end loader	0.8673	19	3.89E-05	2.78E-04	2.83E-04	1.42E-06	2.31E-06	2.12E-06	1.41E-01	7.80E-06	-	1.41E-01	1.28E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.46E-05	2.38E-04	2.55E-04	1.34E-06	1.83E-06	1.68E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Front end loader	49 hp	4	5.82E-05	4.94E-04	5.12E-04	6.46E-07	2.21E-05	2.03E-05	5.00E-02	5.25E-06	-	5.01E-02	4.54E-02
		Roller	47 hp	4	1.52E-05	3.86E-04	4.70E-04	6.31E-07	1.40E-05	1.29E-05	4.88E-02	4.65E-06	-	4.89E-02	4.44E-02
		Water truck	3000 gal	4	2.80E-05	1.10E-04	5.33E-05	4.65E-07	7.94E-06	4.13E-06	9.33E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02
		Excavator	300 hp	4	7.67E-05	7.06E-04	5.61E-04	2.75E-06	5.49E-06	5.05E-06	2.80E-01	1.55E-05	-	2.81E-01	2.57E-01
		Front end loader	180 hp	4	6.03E-05	4.31E-04	4.57E-04	2.41E-06	3.57E-06	3.29E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01
		Tractor/crawler/dozer	180 hp	6	7.39E-05	7.15E-04	7.64E-04	4.03E-06	5.49E-06	5.05E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01
	36" Diversion Pipe - grade	Loader/backhoe	75 hp	0.0923	6.22E-07	8.83E-06	1.06E-05	1.75E-08	6.54E-07	6.02E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03
		Crane 94'	155 hp	155	1.39E-03	1.91E-02	3.45E-02	6.20E-05	1.31E-03	1.20E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck	155	19	1.63E-04	2.92E-04	2.37E-03	1.04E-05	8.03E-05	3.39E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
		Crane 94'	155 hp	155	1.39E-03	1.91E-02	3.45E-02	6.20E-05	1.31E-03	1.20E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
		1 ton pickup truck	155	20	1.63E-04	2.92E-04	2.37E-03	1.04E-05	8.03E-05	3.39E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.46E-05	2.38E-04	2.55E-04	1.34E-06	1.83E-06	1.68E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	13 hp	8	2.37E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02
		Crane 80'	130 hp	16	1.20E-04	1.66E-03	2.98E-03	5.37E-06	1.13E-04	1.04E-04	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01
		Flatbed truck	3.03E-05	8	2.44E-05	3.03E-05	3.45E-04	5.32E-07	4.11E-06	1.72E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
		Generator	80 hp	5856	244	6.75E-02	7.75E-01	9.11E-01	1.78E-03	5.42E-02	4.98E-02	1.52E+02	6.09E-03	-	1.52E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.31E-03	3.20E-02	3.22E-02	1.62E-04	2.46E-04	1.61E+01	8.89E-04	-	1.61E+01	1.46E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.31E-03	3.20E-02	3.22E-02	1.62E-04	2.46E-04	1.61E+01	8.89E-04	-	1.61E+01	1.46E+01
		Tractor/crawler/dozer	600 hp	78,8462	19	3.31E-03	3.20E-02	3.22E-02	1.62E-04	2.46E-04	1.61E+01	8.89E-04	-	1.61E+01	1.46E+01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.31E-03	3.20E-02	3.22E-02	1.62E-04	2.46E-04	1.61E+01	8.89E-04	-	1.61E+01	1.46E+01
	Armoring	1 ton pickup truck	1,0667	19	1.12E-06	2.01E-06	1.63E-05	7.19E-08	5.53E-07	2.34E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
		Excavator	430 hp	1,0667	19	2.93E-05	2.70E-04	2.15E-04	1.05E-06	2.10E-06	1.07E-01	5.92E-06	-	1.07E-01	9.73E-02
		1 ton pickup truck	1,0667	19	1.12E-06	2.01E-06	1.63E-05	7.19E-08	5.53E-07	2.34E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
	Maintenance	Grader	215 hp	144	2.49E-03	1.98E-02	2.27E-02	1.20E-04	1.69E-04	1.47E-04	1.06E+01	5.89E-04	-	1.07E+01	9.67E+00
Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6,7805	22	4.75E-05	1.86E-04	9.03E-05	7.89E-07	1.35E-05	6.99E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01
		Excavator	430 hp	4,445	22	1.22E-04	1.13E-03	8.94E-04	4.38E-06	8.75E-06	4.46E-01	2.47E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	6.07E-04	4.50E-03	1.99E-03	9.97E-06	1.34E-04	9.91E-01	5.48E-05	-	9.92E-01	9.00E-01
	Platform	Tractor/crawler/dozer	440 hp	40	1.23E-03	1.19E-02	9.13E-03	4.47E-05	9.11E-05	8.38E-05	4.66E+00	2.52E-04	-	4.66E+00	4.14E+00
		Tractor/crawler/dozer	440 hp	5	1.53E-04	1.48E-03	1.14E-03	5.59E-06	1.14E-05	1.05E-05	5.70E-01	3.15E-05	-	5.70E-01	5.18E-01
		3/4 ton Pickup truck	20	20	4.50E-05	4.88E-05	5.78E-04	1.34E-06	1.06E-05	4.59E-06	4.49E-01	4.46E-05	2.33E-05	4.47E-01	4.15E-01
	Drilling	Rotary drill	475 hp	34,0003	126	9.47E-04	1.19E-02	9.89E-03	4.96E-05	8.67E-05	7.98E-05	5.05E+00	2.32E-04	-	5.06E+00
		3/4 ton Pickup truck	34,0003	126	7.65E-05	8.30E-05	9.83E-04	2.28E-06	1.90E-05	7.81E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.08E-04	1.17E-04	1.39E-03	3.22E-06	2.54E-05	1.10E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00
		Diamond cutting saw	50 hp	48	4.29E-04	6.42E-03	5.08E-03	9.49E-06	2.34E-04	2.15E-04	7.34E-01	3.87E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	9.37E-04	9.97E-03	8.11E-03	3.97E-05	7.51E-05	6.91E-05	4.05E+00	2.24E-04	-	4.05E+00
		3/4 ton Pickup truck	60,0214	126	1.35E-04	1.46E-04	1.73E-03	4.03E-06	3.18E-05	1.38E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
		Front end loader	350 hp	4	1.17E-04	8.32E-04	6.64E-04	3.25E-06	6.91E-06	6.36E-06	3.32E-01	1.83E-05	-	3.32E-01	3.01E-01
		Water truck	3000 gal	507	126	3.55E-03	1.39E-02	6.75E-03	5.90E-05	1.01E-03	5.23E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01
		Crane 260'	375 hp	30,0107	126	4.69E-04	4.99E-03	4.06E-03	1.99E-05	3.75E-05	3.45E-05	2.02E+00	1.12E-04	-	2.03E+00
		Crane 260'	375 hp	49	126	7.65E-04	8.14E-03	6.62E-03	3.24E-05	6.13E-05	5.64E-05	3.31E+00	1.83E-04	-	3.31E+00
		Horizontal boring drill	10 hp	55	126	6.14E-05	1.52E-03	1.60E-03	2.22E-06	5.55E-05	5.11E-05	1.72E-01	1.55E-05	-	1.72E-01
		3/4 ton Pickup truck	60	126	1.35E-04	1.46E-04	1.73E-03	4.03E-06	3.18E-05	1.38E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	375 hp	20	126	3.12E-04	3.32E-03	2.70E-03	1.32E-05	2.50E-05	2.30E-05	1.35E+00	7.46E-05	-	1.35E+00
		Air compressor	50 hp	40	126	1.61E-03	1.79E-03	1.54E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	9.09E-05	1.36E-04	7.21E-01
		3/4 ton Pickup truck	20	126	4.50E-05	4.88E-05	5.78E-04	1.34E-06	1.06E-05	4.59E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01
					1.13E-01	1.10E+00	1.42E+00	3.29E-03	6.43E-02	5.71E-02	3.46E+02	1.57E-02	1.84E-03	3.47E+02	3.15E+02

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2023  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2023 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	2.06E-03	2.23E-03	2.64E-02	6.14E-05	4.84E-04	2.10E-04		
Dust Control	Water truck	5000 gal	1696	210	2.26E-01	8.85E-01	4.30E-01	3.76E-03	6.41E-02	3.33E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.04E-02	3.29E-02	3.90E-01	9.07E-04	7.16E-03	3.10E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	7.58E-03	8.22E-03	9.74E-02	2.26E-04	1.78E-03	7.73E-04		
	Cutting	1 ton pickup truck	1,0325	19	2.28E-04	4.09E-04	3.33E-03	1.46E-05	1.13E-04	4.76E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	6.20E-03	5.99E-02	6.41E-02	3.38E-04	4.61E-04	4.24E-04	
		Chain saw		1,7209	19	8.42E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	5.95E-02	2.99E-04	4.86E-04	4.47E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	3.94E-03	3.81E-02	2.94E-02	1.44E-04	2.93E-04	2.70E-04	
		Brush chipper	250 hp	0.8673	19	7.92E-03	5.06E-02	3.89E-02	2.33E-04	3.81E-04	3.50E-04	
		Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	5.95E-02	2.99E-04	4.86E-04	4.47E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.19E-03	5.01E-02	5.36E-02	2.83E-04	3.85E-04	3.55E-04	
			Front end loader	49 hp	4	1.23E-02	1.04E-01	1.08E-01	1.36E-04	4.65E-03	4.28E-03	
		Roller	47 hp	4	3.20E-03	8.13E-02	9.89E-02	1.33E-04	2.95E-03	2.72E-03		
		Water truck	3000 gal	4	5.90E-03	2.31E-02	1.12E-02	9.80E-05	1.67E-03	8.69E-04		
		Excavator	300 hp	4	1.62E-02	1.49E-01	1.18E-01	5.79E-04	1.16E-03	1.06E-03		
		Front end loader	180 hp	4	1.27E-02	9.07E-02	9.62E-02	5.08E-04	7.53E-04	6.92E-04		
		Tractor/crawler/dozer	180 hp	6	1.56E-02	1.50E-01	1.61E-01	8.49E-04	1.16E-03	1.06E-03		
36" Diversion Pipe - grade		Loader/backhoe	75 hp	0.0923	19	1.31E-04	1.92E-03	2.22E-03	3.68E-06	1.38E-04	1.27E-04	
		Crane 94'	155 hp	155	19	2.92E-01	4.03E+00	7.26E+00	1.30E-02	2.75E-01	2.53E-01	
		1 ton pickup truck		155	19	3.42E-02	6.14E-02	4.99E-01	2.20E-03	1.69E-02	7.14E-03	
		Crane 94'	155 hp	155	20	2.77E-01	3.83E+00	6.90E+00	1.24E-02	2.61E-01	2.40E-01	
		1 ton pickup truck		155	20	3.25E-02	5.83E-02	4.74E-01	2.09E-03	1.61E-02	6.79E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	4.93E-03	4.76E-02	5.10E-02	2.69E-04	3.66E-04	3.37E-04	
		Dewatering	Concrete saw	13 hp	8	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02	
			Crane 80'	130 hp	16	2.09E-02	2.88E-01	5.19E-01	9.33E-04	1.97E-02	1.81E-02	
			Flatbed truck	8	23	4.25E-03	5.26E-03	6.00E-02	9.25E-05	7.15E-04	2.99E-04	
			Generator	80 hp	5856	244	1.11E+00	1.27E+01	1.49E+01	2.92E-02	8.88E-01	8.17E-01
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	6.96E-01	6.73E+00	6.78E+00	3.40E-02	5.18E-02	4.76E-02
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	6.96E-01	6.73E+00	6.78E+00	3.40E-02	5.18E-02	4.76E-02
			Tractor/crawler/dozer	600 hp	78.8462	19	6.96E-01	6.73E+00	6.78E+00	3.40E-02	5.18E-02	4.76E-02
			Tractor/crawler/dozer	600 hp	78.8462	19	6.96E-01	6.73E+00	6.78E+00	3.40E-02	5.18E-02	4.76E-02
		Build road	Tractor/crawler/dozer	600 hp	78.8462	19	6.96E-01	6.73E+00	6.78E+00	3.40E-02	5.18E-02	4.76E-02
		Armoring	1 ton pickup truck		1.0667	19	2.36E-04	4.23E-04	3.44E-03	1.51E-05	1.16E-04	4.92E-05
			Excavator	430 hp	1.0667	19	6.18E-03	5.68E-02	4.52E-02	2.21E-04	4.42E-04	4.07E-04
			1 ton pickup truck		1.0667	19	2.36E-04	4.23E-04	3.44E-03	1.51E-05	1.16E-04	4.92E-05
		Maintenance	Grader	215 hp	144	210	4.74E-02	3.76E-01	4.32E-01	2.28E-03	3.03E-03	2.79E-03
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	8.64E-03	3.38E-02	1.64E-02	1.43E-04	2.45E-03	1.27E-03
		Excavator	430 hp	4.445	22	2.22E-02	2.05E-01	1.63E-01	7.97E-04	1.59E-03	1.46E-03	
		Tractor/crawler/dozer	850 hp	3.2327	22	1.10E-01	8.18E-01	3.61E-01	1.81E-03	2.43E-02	2.24E-02	
Platform		Tractor/crawler/dozer	440 hp	40	20	2.45E-01	2.37E+00	1.83E+00	8.95E-03	1.82E-02	1.68E-02	
		Tractor/crawler/dozer	440 hp	5	20	3.06E-02	2.96E-01	2.28E-01	1.12E-03	2.28E-03	2.10E-03	
		3/4 ton Pickup truck		20	20	9.00E-03	9.76E-03	1.16E-01	2.69E-04	2.12E-03	9.18E-04	
Drilling		Rotary drill		34.0003	126	3.01E-02	3.78E-01	3.08E-01	1.57E-03	2.75E-03	2.53E-03	
		3/4 ton Pickup truck		34.0003	126	2.43E-03	2.63E-03	3.12E-02	7.25E-05	5.72E-04	2.48E-04	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	3.43E-03	3.72E-03	4.40E-02	1.02E-04	8.07E-04	3.50E-04	
		Diamond cutting saw	50 hp	48	126	1.36E-02	2.04E-01	1.61E-01	3.01E-04	7.43E-03	6.84E-03	
		Lift/Load blocks	Crane 260'	375 hp	60.0214	126	2.98E-02	3.17E-01	2.58E-01	1.26E-03	2.38E-03	2.19E-03
		3/4 ton Pickup truck		60.0214	126	4.29E-03	4.65E-03	5.51E-02	1.28E-04	1.01E-03	4.38E-04	
		Load/Haul	Front end loader	350 hp	4	126	3.70E-03	2.64E-02	2.11E-02	1.03E-04	2.19E-04	2.02E-04
			Water truck	3000 gal	507	126	1.13E-01	4.41E-01	2.14E-01	1.87E-03	3.20E-02	1.66E-02
		Landfill	Crane 260'	375 hp	30.0107	126	1.49E-02	1.58E-01	1.29E-01	6.31E-04	1.19E-03	1.10E-03
		Micro-blast	Crane 260'	375 hp	49	126	2.43E-02	2.58E-01	2.10E-01	1.03E-03	1.95E-03	1.79E-03
			Horizontal boring drill	10 hp	55	126	1.95E-03	4.81E-02	5.07E-02	7.04E-05	1.76E-03	1.62E-03
			3/4 ton Pickup truck	60	126	4.29E-03	4.65E-03	5.51E-02	1.28E-04	1.01E-03	4.37E-04	
		Demolish spillway	Crane 260'	375 hp	20	126	9.91E-03	1.05E-01	8.58E-02	4.20E-04	7.94E-04	7.31E-04
			Air compressor	50 hp	40	126	5.11E-02	5.67E-02	4.90E+00	2.61E-04	1.65E-03	1.64E-03
			3/4 ton Pickup truck		20	126	1.43E-03	1.55E-03	1.84E-02	4.26E-05	3.36E-04	1.46E-04
							<b>5.79E+00</b>	<b>5.60E+01</b>	<b>7.18E+01</b>	<b>2.29E-01</b>	<b>1.92E+00</b>	<b>1.70E+00</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2025 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.067	0.608	0.642	0.003	0.005	0.004	301.139	0.017	0.000	
	Chain saw		1,7209	19	2.716	0.115	13.187	0.001	0.021	0.021	35.643	0.169	0.039	
	Brush Piling	Front end loader	0.8673	19	0.075	0.538	0.549	0.003	0.004	0.004	274.182	0.015	0.000	
		Tractor/crawler/dozer	0.8673	19	0.069	0.627	0.471	0.002	0.005	0.004	234.953	0.013	0.000	
	Chipping	Brush chipper	0.8673	19	0.179	1.057	0.819	0.005	0.008	0.007	427.344	0.016	0.000	
		Front end loader	0.8673	19	0.075	0.538	0.549	0.003	0.004	0.004	274.182	0.015	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.067	0.608	0.642	0.003	0.005	0.004	301.139	0.017	0.000	
		Front end loader	49 hp	4	0.284	2.315	2.455	0.003	0.105	0.097	231.297	0.026	0.000	
		Roller	47 hp	4	0.079	1.869	2.412	0.003	0.069	0.064	235.465	0.025	0.000	
		Water truck	3000 gal	4	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048	
		Excavator	300 hp	4	0.062	0.543	0.424	0.002	0.004	0.004	211.851	0.012	0.000	
		Front end loader	180 hp	4	0.076	0.542	0.576	0.003	0.005	0.004	270.058	0.015	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.067	0.608	0.642	0.003	0.005	0.004	301.139	0.017	0.000	
		Loader/backhoe	75 hp	0.0923	0.086	1.137	1.383	0.002	0.087	0.080	195.355	0.015	0.000	
		Crane 94'	155 hp	155	0.057	0.730	1.302	0.002	0.051	0.047	208.005	0.016	0.000	
		1 ton pickup truck	155	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
		Crane 94'	155 hp	155	0.057	0.730	1.302	0.002	0.051	0.047	208.005	0.016	0.000	
		1 ton pickup truck	155	20	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.067	0.608	0.642	0.003	0.005	0.004	301.139	0.017	0.000	
	Dewatering	Concrete saw	13 hp	8	3.250	2.402	118.803	0.006	1.684	1.681	200.905	0.184	0.193	
		Crane 80'	130 hp	16	0.057	0.730	1.302	0.002	0.051	0.047	208.005	0.016	0.000	
		Flatbed truck	8	23	1.975	2.645	28.336	0.061	0.463	0.191	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.141	1.514	1.793	0.003	0.107	0.099	294.371	0.013	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.068	0.614	0.555	0.003	0.005	0.004	276.956	0.015	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.068	0.614	0.555	0.003	0.005	0.004	276.956	0.015	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.068	0.614	0.555	0.003	0.005	0.004	276.956	0.015	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.068	0.614	0.555	0.003	0.005	0.004	276.956	0.015	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.062	0.543	0.424	0.002	0.004	0.004	211.851	0.012	0.000
		1 ton pickup truck	1.0667	19	0.679	1.413	10.293	0.062	0.465	0.194	20,361.281	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.079	0.588	0.665	0.004	0.005	0.004	311.998	0.017	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048
		Excavator	430 hp	4,445	22	0.062	0.543	0.424	0.002	0.004	0.004	211.851	0.012	0.000
		Tractor/crawler/dozer	850 hp	3,2327	22	0.180	1.333	0.589	0.003	0.040	0.036	293.882	0.016	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.069	0.627	0.471	0.002	0.005	0.004	234.953	0.013	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.069	0.627	0.471	0.002	0.005	0.004	234.953	0.013	0.000
		3/4 ton Pickup truck		20	20	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.054	0.668	0.552	0.003	0.005	0.004	285.965	0.014	0.000
		3/4 ton Pickup truck		34.0003	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.178	2.457	2.012	0.004	0.092	0.085	277.545	0.016	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.041	0.405	0.327	0.002	0.003	0.003	163.231	0.009	0.000
		3/4 ton Pickup truck		60.0214	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.076	0.541	0.430	0.002	0.004	0.004	214.809	0.012	0.000
		Water truck	3000 gal	507	126	6.515	25.808	12.372	0.106	1.813	0.947	21,149.472	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.041	0.405	0.327	0.002	0.003	0.003	163.231	0.009	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.041	0.405	0.327	0.002	0.003	0.003	163.231	0.009	0.000
		Horizontal boring drill	10 hp	55	126	1.004	2.510	2.659	0.004	0.093	0.085	279.762	0.026	0.000
		3/4 ton Pickup truck		60	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.041	0.405	0.327	0.002	0.003	0.003	163.231	0.009	0.000
		Air compressor	50 hp	40	126	0.796	0.858	78.254	0.004	0.024	0.023	307.220	0.045	0.064
		3/4 ton Pickup truck		20	126	1.504	1.882	20.210	0.061	0.474	0.203	20,361.282	2.024	1.056
											<b>Total</b>			

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2025 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	7.96E-05	9.96E-05	1.07E-03	3.25E-06	2.51E-05	1.07E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.22E-02	4.82E-02	2.31E-02	1.98E-04	3.39E-03	1.77E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.18E-03	1.47E-03	1.58E-02	4.80E-05	3.71E-04	1.58E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	2.65E-05	3.32E-05	3.56E-04	1.08E-06	8.37E-06	3.57E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	7.72E-07	1.61E-06	1.17E-05	7.02E-08	5.29E-07	2.20E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	3.18E-05	2.88E-04	3.04E-04	1.61E-06	2.25E-06	2.07E-06	1.43E-01	7.90E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	4.33E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.69E-06	6.24E-07	8.18E-04	7.42E-04	
	Brush Piling	Front end loader	0.8673	19	3.89E-05	2.78E-04	2.84E-04	1.42E-06	2.31E-06	2.12E-06	1.42E-01	7.83E-06	-	1.42E-01	1.29E-01	
		Tractor/crawler/dozer	0.8673	19	2.05E-05	1.86E-04	1.39E-04	6.83E-07	1.45E-06	1.33E-06	6.96E-02	3.85E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	4.27E-05	2.53E-04	1.96E-04	1.15E-06	1.93E-06	1.78E-06	1.02E-01	3.85E-06	-	1.02E-01	9.27E-02	
		Front end loader	0.8673	19	3.89E-05	2.78E-04	2.84E-04	1.42E-06	2.31E-06	2.12E-06	1.42E-01	7.83E-06	-	1.42E-01	1.29E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.66E-05	2.41E-04	2.55E-04	1.34E-06	1.88E-06	1.73E-06	1.19E-01	6.61E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	6.13E-05	5.00E-04	5.30E-04	6.46E-07	2.28E-05	2.10E-05	5.00E-02	5.53E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	1.63E-05	3.87E-04	5.00E-04	6.31E-07	1.44E-05	1.32E-05	4.88E-02	5.12E-06	-	4.89E-02	4.44E-02	
		Water truck	3000 gal	4	2.87E-05	1.14E-04	5.45E-05	4.67E-07	7.99E-06	4.17E-06	9.33E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	300 hp	4	8.24E-05	7.18E-04	5.61E-04	2.75E-06	5.66E-06	5.20E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
		Front end loader	180 hp	4	6.03E-05	4.30E-04	4.57E-04	2.41E-06	3.57E-06	3.29E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	7.97E-05	7.24E-04	7.64E-04	4.03E-06	5.65E-06	5.19E-06	3.58E-01	1.98E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	6.55E-07	8.67E-06	1.05E-05	1.75E-08	6.66E-07	6.13E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	1.50E-03	1.93E-02	3.45E-02	6.20E-05	1.36E-03	1.25E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	19	1.18E-04	2.41E-04	1.76E-03	1.05E-05	7.94E-05	3.31E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	1.50E-03	1.93E-02	3.45E-02	6.20E-05	1.36E-03	1.25E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck	155	20	1.16E-04	2.41E-04	1.76E-03	1.05E-05	7.94E-05	3.31E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.66E-05	2.41E-04	2.55E-04	1.34E-06	1.88E-06	1.73E-06	1.19E-01	6.61E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	3.73E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02	
		Crane 80'	130 hp	16	2.30E-04	1.67E-03	2.98E-03	5.37E-06	1.18E-04	1.08E-04	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01	
		Flatbed truck	2.33E-05	8	1.74E-05	2.33E-05	2.50E-04	5.36E-07	4.08E-06	1.69E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	7.30E-02	7.82E-01	9.26E-01	1.78E-03	5.55E-02	5.11E-02	1.52E+02	6.58E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	3.53E-03	3.20E-02	2.89E-02	1.45E-04	2.50E-04	2.30E-04	1.44E+01	7.99E-04	-	1.45E+01	1.31E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	3.53E-03	3.20E-02	2.89E-02	1.45E-04	2.50E-04	2.30E-04	1.44E+01	7.99E-04	-	1.45E+01	1.31E+01
		Tractor/crawler/dozer	600 hp	78.8462	19	3.53E-03	3.20E-02	2.89E-02	1.45E-04	2.50E-04	2.30E-04	1.44E+01	7.99E-04	-	1.45E+01	1.31E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	3.53E-03	3.20E-02	2.89E-02	1.45E-04	2.50E-04	2.30E-04	1.44E+01	7.99E-04	-	1.45E+01	1.31E+01
	Armoring	1 ton pickup truck	1.0667	19	7.98E-07	1.66E-06	1.21E-05	7.25E-08	5.47E-07	2.28E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1.0667	19	3.15E-05	2.75E-04	2.15E-04	1.05E-06	2.16E-06	1.07E-01	5.92E-06	-	1.07E-01	9.73E-02	
		1 ton pickup truck	1.0667	19	7.98E-07	1.66E-06	1.21E-05	7.25E-08	5.47E-07	2.28E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	2.69E-03	2.01E-02	2.27E-02	1.20E-04	1.64E-04	1.51E-04	1.06E+01	5.89E-04	-	1.07E+01	9.67E+00	
Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6,7805	22	4.87E-05	1.93E-04	9.25E-05	7.91E-07	1.35E-05	7.08E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.44E-01
		Excavator	430 hp	4,445	22	1.31E-04	1.14E-03	8.94E-04	4.38E-06	9.01E-06	8.29E-06	4.46E-01	2.47E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	5.46E-04	4.04E-03	1.78E-03	8.95E-06	1.20E-04	1.10E-04	8.90E-01	4.92E-05	-	8.91E-01	8.08E-01
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.34E-03	1.22E-02	9.13E-03	4.47E-05	9.48E-05	8.72E-05	4.56E+00	2.52E-04	-	4.56E+00	4.14E+00
		Tractor/crawler/dozer	440 hp	5	20	1.67E-04	1.52E-03	1.14E-03	5.59E-06	1.18E-05	1.09E-05	5.70E-01	3.15E-05	-	5.70E-01	5.17E-01
		3/4 ton Pickup truck	20	20	3.32E-05	4.15E-05	4.46E-04	1.36E-06	1.05E-05	4.46E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	34,0003	126	9.86E-04	1.19E-02	9.82E-03	5.00E-05	8.69E-05	8.00E-05	5.09E+00	2.41E-04	-	5.10E+00	4.62E+00	
		3/4 ton Pickup truck	34,0003	126	5.64E-05	7.05E-05	7.57E-04	2.30E-06	1.78E-05	7.59E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	7.96E-05	9.96E-05	1.07E-03	3.25E-06	2.51E-05	1.07E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
		Diamond cutting saw	50 hp	48	126	4.71E-04	6.50E-03	5.32E-03	9.49E-06	2.43E-04	2.24E-04	7.34E-01	4.25E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.01E-03	1.00E-02	8.11E-03	3.98E-05	7.68E-05	7.06E-05	4.05E+00	2.24E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck	60,0214	126	9.95E-05	1.25E-04	1.34E-03	4.07E-06	3.14E-05	1.34E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	126	1.17E-04	8.34E-04	6.64E-04	3.25E-06	6.92E-06	6.37E-06	3.31E-01	1.83E-05	-	3.32E-01	3.01E-01
		Water truck	3000 gal	507	126	3.64E-03	1.44E-02	6.91E-03	5.92E-05	1.01E-03	5.29E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	375 hp	30,0107	126	5.06E-04	5.02E-03	4.06E-03	1.99E-05	3.84E-05	3.53E-05	2.02E+00	1.12E-04	-	2.03E+00	1.84E+00
	Micro-blast	Crane 260'	375 hp	49	126	8.26E-04	8.20E-03	6.62E-03	3.25E-05	6.27E-05	5.77E-05	3.31E+00	1.83E-04	-	3.31E+00	3.00E+00
		Horizontal boring drill	10 hp	55	126	6.31E-05	1.52E-03	1.61E-03	2.19E-06	5.61E-05	5.16E-05	1.70E-01	1.58E-05	-	1.70E-01	1.54E-01
		3/4 ton Pickup truck	60	126	9.95E-05	1.24E-04	1.34E-03	4.07E-06	3.14E-05	1.34E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	126	3.37E-04	3.35E-03	2.70E-03	1.32E-05	2.56E-05	2.35E-05	1.35E+00	7.46E-05	-	1.35E+00	1.23E+00
		Air compressor	50 hp	40	126	1.75E-03	1.89E-03	1.73E-01	8.23E-06	5.19E-05	5.18E-05	6.77E-01	9.90E-05	1.40E-04	7.23E-01	6.56E-01
		3/4 ton Pickup truck	20	126	3.32E-05	4.15E-05	4.46E-04	1.36E-06	1.05E-05	4.46E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
						1.20E-01	1.11E+00	1.44E+00	3.23E-03	6.58E-02	5.84E-02	3.40E+02	1.59E-02	1.84E-03	3.41E+02	3.09E+02

Data from Alt3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2025  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2025 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	1.52E-03	1.90E-03	2.04E-02	6.20E-05	4.78E-04	2.04E-04		
Dust Control	Water truck	5000 gal	1696	210	2.32E-01	9.19E-01	4.41E-01	3.77E-03	6.46E-02	3.37E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	2.24E-02	2.80E-02	3.01E-01	9.15E-04	7.06E-03	3.01E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	5.59E-03	6.99E-03	7.50E-02	2.28E-04	1.76E-03	7.52E-04		
	Cutting	1 ton pickup truck	1,0325	19	1.63E-04	3.39E-04	2.47E-03	1.48E-05	1.11E-04	4.64E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	6.69E-03	6.07E-02	6.41E-02	3.38E-04	4.73E-04	4.36E-04	
		Chain saw	1,7209	19	9.11E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05		
	Brush Piling	Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	5.97E-02	3.00E-04	4.86E-04	4.47E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	4.31E-03	3.91E-02	2.94E-02	1.44E-04	3.05E-04	2.80E-04	
	Chipping	Brush chipper	250 hp	0.8673	19	8.99E-03	5.32E-02	4.12E-02	2.42E-04	4.07E-04	3.74E-04	
		Front end loader	540 hp	0.8673	19	8.20E-03	5.85E-02	5.97E-02	3.00E-04	4.86E-04	4.47E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	5.60E-03	5.08E-02	5.36E-02	2.83E-04	3.96E-04	3.64E-04	
			Front end loader	49 hp	4	1.29E-02	1.05E-01	1.12E-01	1.36E-04	4.79E-03	4.41E-03	
		Roller	47 hp	4	3.43E-03	8.15E-02	1.05E-01	1.33E-04	3.02E-03	2.78E-03		
		Water truck	3000 gal	4	6.05E-03	2.40E-02	1.15E-02	9.82E-05	1.68E-03	8.79E-04		
		Excavator	300 hp	4	1.73E-02	1.51E-01	1.18E-01	5.79E-04	1.19E-03	1.10E-03		
		Front end loader	180 hp	4	1.27E-02	9.06E-02	9.62E-02	5.08E-04	7.52E-04	6.92E-04		
36" Diversion Pipe - grade		Tractor/crawler/dozer	180 hp	6	1.68E-02	1.52E-01	1.61E-01	8.49E-04	1.19E-03	1.09E-03		
		Loader/backhoe	75 hp	0.0923	19	1.38E-04	1.83E-03	2.22E-03	3.68E-06	1.40E-04	1.29E-04	
		Crane 94'	155 hp	155	19	3.15E-01	4.07E+00	7.26E+00	1.30E-02	2.86E-01	2.63E-01	
		1 ton pickup truck	155	155	19	2.44E-02	5.08E-02	3.70E-01	2.22E-03	1.67E-02	6.97E-03	
		Crane 94'	155 hp	155	20	3.00E-01	3.87E+00	6.90E+00	1.24E-02	2.72E-01	2.50E-01	
		1 ton pickup truck	155	155	20	2.32E-02	4.83E-02	3.52E-01	2.11E-03	1.59E-02	6.62E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	5.32E-03	4.83E-02	5.10E-02	2.69E-04	3.76E-04	3.46E-04	
Dewatering		Concrete saw	13 hp	8	23	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	23	2.26E-02	2.91E-01	5.19E-01	9.33E-04	2.05E-02	1.88E-02	
		Flatbed truck	8	8	23	3.03E-03	4.06E-03	4.35E-02	9.32E-05	7.09E-04	2.94E-04	
		Generator	80 hp	5856	244	1.20E+00	1.28E+01	1.52E+01	2.92E-02	9.10E-01	8.37E-01	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	7.42E-01	6.74E+00	6.09E+00	3.06E-02	5.25E-02	4.83E-02
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	7.42E-01	6.74E+00	6.09E+00	3.06E-02	5.25E-02	4.83E-02
			Tractor/crawler/dozer	600 hp	78.8462	19	7.42E-01	6.74E+00	6.09E+00	3.06E-02	5.25E-02	4.83E-02
		Build road	Tractor/crawler/dozer	600 hp	78.8462	19	7.42E-01	6.74E+00	6.09E+00	3.06E-02	5.25E-02	4.83E-02
			1 ton pickup truck	1,0667	1,0667	19	1.68E-04	3.50E-04	2.55E-03	1.53E-05	1.15E-04	4.79E-05
		Armoring	Excavator	430 hp	1,0667	19	6.63E-03	5.78E-02	4.52E-02	2.21E-04	4.55E-04	4.19E-04
			1 ton pickup truck	1,0667	1,0667	19	1.68E-04	3.50E-04	2.55E-03	1.53E-05	1.15E-04	4.79E-05
	Maintenance	Grader	215 hp	144	210	5.12E-02	3.82E-01	4.32E-01	2.28E-03	3.13E-03	2.88E-03	
	Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.85E-03	3.51E-02	1.68E-02	1.44E-04	2.46E-03	1.29E-03
			Excavator	430 hp	4,445	22	2.39E-02	2.08E-01	1.63E-01	7.97E-04	1.64E-03	1.51E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	9.92E-02	7.34E-01	3.24E-01	1.63E-03	2.18E-02	2.01E-02	
Platform		Tractor/crawler/dozer	440 hp	40	20	2.68E-01	2.43E+00	1.83E+00	8.95E-03	1.90E-02	1.74E-02	
		Tractor/crawler/dozer	440 hp	5	20	3.35E-02	3.04E-01	2.28E-01	1.12E-03	2.37E-03	2.18E-03	
		3/4 ton Pickup truck	20	20	6.63E-03	8.30E-03	8.91E-02	2.71E-04	2.09E-03	8.93E-04		
Drilling		Rotary drill	475 hp	34,0003	126	3.07E-02	3.77E-01	3.12E-01	1.59E-03	2.76E-03	2.54E-03	
		3/4 ton Pickup truck	34,0003	34,0003	126	1.79E-03	2.24E-03	2.40E-02	7.31E-05	5.65E-04	2.41E-04	
Cut with Diamond wire		3/4 ton Pickup truck	48	48	126	2.53E-03	3.16E-03	3.39E-02	1.03E-04	7.97E-04	3.40E-04	
		Diamond cutting saw	50 hp	48	126	1.49E-02	2.06E-01	1.69E-01	3.01E-04	7.72E-03	7.10E-03	
Lift/Load blocks		Crane 260'	375 hp	60,0214	126	3.21E-02	3.19E-01	2.58E-01	1.26E-03	2.44E-03	2.24E-03	
		3/4 ton Pickup truck	60,0214	60,0214	126	3.16E-03	3.95E-03	4.24E-02	1.29E-04	9.97E-04	4.25E-04	
Load/Haul		Front end loader	350 hp	4	126	3.71E-03	2.65E-02	2.11E-02	1.03E-04	2.20E-04	2.02E-04	
		Water truck	3000 gal	507	126	1.16E-01	4.58E-01	2.19E-01	1.88E-03	3.22E-02	1.68E-02	
Landfill		Crane 260'	375 hp	30,0107	126	1.61E-02	1.59E-01	1.29E-01	6.31E-04	1.22E-03	1.12E-03	
		Micro-blast	375 hp	49	126	2.62E-02	2.60E-01	2.10E-01	1.03E-03	1.99E-03	1.83E-03	
		Horizontal boring drill	10 hp	55	126	2.00E-03	4.83E-02	5.12E-02	6.96E-05	1.78E-03	1.64E-03	
Demolish spillway		3/4 ton Pickup truck	60	60	126	3.16E-03	3.95E-03	4.24E-02	1.29E-04	9.96E-04	4.25E-04	
		Crane 260'	375 hp	20	126	1.07E-02	1.06E-01	8.58E-02	4.20E-04	8.12E-04	7.47E-04	
		Air compressor	50 hp	40	126	5.57E-02	6.01E-02	5.48E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	20	126	1.05E-03	1.32E-03	1.41E-02	4.30E-05	3.32E-04	1.42E-04	
					<b>6.12E+00</b>	<b>5.63E+01</b>	<b>6.94E+01</b>	<b>2.15E-01</b>	<b>1.96E+00</b>	<b>1.75E+00</b>		

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2027 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.027	0.114	0.590	0.003	0.004	0.004	301.155	0.008	0.000	
	Chain saw		1,7209	19	1.683	0.115	13.187	0.001	0.021	0.021	35.644	0.105	0.039	
	Brush Piling	Front end loader	0.8673	19	0.032	0.099	0.534	0.003	0.004	0.003	290.653	0.007	0.000	
		Tractor/crawler/dozer	0.8673	19	0.027	0.115	0.440	0.002	0.004	0.004	234.957	0.006	0.000	
		Brush chipper	0.8673	19	0.066	0.187	0.691	0.005	0.007	0.006	402.162	0.006	0.000	
		Front end loader	0.8673	19	0.032	0.099	0.534	0.003	0.004	0.003	290.653	0.007	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.027	0.114	0.590	0.003	0.004	0.004	301.155	0.008	0.000	
		Front end loader	49 hp	4	0.159	1.249	1.738	0.003	0.006	0.005	231.301	0.014	0.000	
		Roller	47 hp	4	0.134	1.238	1.607	0.003	0.005	0.005	235.524	0.012	0.000	
		Water truck	3000 gal	4	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048	
		Excavator	300 hp	4	0.025	0.102	0.408	0.002	0.004	0.003	211.854	0.007	0.000	
		Front end loader	180 hp	4	0.032	0.099	0.516	0.003	0.004	0.003	270.057	0.007	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.027	0.114	0.590	0.003	0.004	0.004	301.155	0.008	0.000	
		Loader/backhoe	75 hp	0.0923	0.037	0.516	1.248	0.002	0.004	0.004	195.357	0.007	0.000	
		Crane 94'	155 hp	155	0.017	0.077	1.175	0.002	0.003	0.003	208.035	0.005	0.000	
		1 ton pickup truck	155	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.017	0.077	1.175	0.002	0.003	0.003	208.035	0.005	0.000	
		1 ton pickup truck	155	20	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.027	0.114	0.590	0.003	0.004	0.004	301.155	0.008	0.000	
	Dewatering	Concrete saw	13 hp	8	3.252	2.404	118.855	0.006	1.685	1.682	200.993	0.184	0.193	
		Crane 80'	130 hp	16	0.017	0.077	1.175	0.002	0.003	0.003	208.035	0.005	0.000	
		Flatbed truck	8	23	1.465	2.125	21.302	0.061	0.460	0.189	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.062	0.703	1.651	0.003	0.005	0.005	294.376	0.006	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.027	0.115	0.547	0.003	0.004	0.004	291.784	0.008	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.027	0.115	0.547	0.003	0.004	0.004	291.784	0.008	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.027	0.115	0.547	0.003	0.004	0.004	291.784	0.008	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.027	0.115	0.547	0.003	0.004	0.004	291.784	0.008	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.027	0.115	0.547	0.003	0.004	0.004	291.784	0.008	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.025	0.102	0.408	0.002	0.004	0.003	211.854	0.007	0.000
		1 ton pickup truck	1.0667	19	0.522	1.201	8.140	0.062	0.462	0.191	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.030	0.111	0.600	0.004	0.004	0.004	311.997	0.008	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048
		Excavator	430 hp	4.445	22	0.025	0.102	0.408	0.002	0.004	0.003	211.854	0.007	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.027	0.998	0.580	0.003	0.008	0.008	309.616	0.008	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.027	0.115	0.440	0.002	0.004	0.004	234.957	0.006	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.027	0.115	0.440	0.002	0.004	0.004	234.957	0.006	0.000
		3/4 ton Pickup truck		20	20	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.030	0.133	0.510	0.003	0.005	0.004	282.098	0.006	0.000
		3/4 ton Pickup truck		34.0003	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.098	1.390	1.556	0.004	0.005	0.005	277.581	0.009	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.016	0.076	0.302	0.002	0.003	0.002	163.266	0.004	0.000
		3/4 ton Pickup truck		60.0214	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.032	0.101	0.395	0.002	0.004	0.004	214.824	0.005	0.000
		Water truck	3000 gal	507	126	6.583	26.175	12.501	0.106	1.818	0.952	21,148.901	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.016	0.076	0.302	0.002	0.003	0.002	163.266	0.004	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.016	0.076	0.302	0.002	0.003	0.002	163.266	0.004	0.000
		Horizontal boring drill	10 hp	55	126	0.080	1.511	1.885	0.005	0.006	0.005	308.640	0.032	0.000
		3/4 ton Pickup truck		60	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.016	0.076	0.302	0.002	0.003	0.002	163.266	0.004	0.000
		Air compressor	50 hp	40	126	0.472	0.622	37.381	0.004	0.024	0.023	307.092	0.027	0.054
		3/4 ton Pickup truck		20	126	1.128	1.630	15.889	0.061	0.470	0.198	20,361.281	2.024	1.056
											<b>Total</b>			

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2027 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	5.97E-05	8.62E-05	8.41E-04	3.25E-06	2.49E-05	1.05E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.89E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	8.82E-04	1.27E-03	1.24E-02	4.80E-05	3.67E-04	1.55E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	1.99E-05	2.87E-05	2.80E-04	1.08E-06	8.29E-06	3.50E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	5.95E-07	1.37E-06	9.26E-06	7.02E-08	5.25E-07	2.17E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	1.27E-05	5.42E-05	2.80E-04	1.61E-06	1.93E-06	1.78E-06	1.43E-01	3.91E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	2.68E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	1.67E-06	6.24E-07	7.96E-04	7.22E-04	
	Brush Piling	Front end loader	0.8673	19	1.63E-05	5.13E-05	2.76E-04	1.51E-06	1.94E-06	1.78E-06	1.50E-01	3.72E-06	-	1.50E-01	1.36E-01	
		Tractor/crawler/dozer	0.8673	19	7.96E-06	3.40E-05	1.31E-04	6.83E-07	1.21E-06	1.12E-06	6.96E-02	1.91E-06	-	6.97E-02	6.32E-02	
		Brush chipper	0.8673	19	1.57E-05	4.47E-05	1.65E-04	1.08E-06	1.47E-06	1.44E-06	9.61E-02	1.42E-06	-	9.61E-02	8.72E-02	
		Front end loader	0.8673	19	1.63E-05	5.13E-05	2.76E-04	1.51E-06	1.94E-06	1.78E-06	1.50E-01	3.72E-06	-	1.50E-01	1.36E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.06E-05	4.54E-05	2.34E-04	1.34E-06	1.62E-06	1.49E-06	1.20E-01	3.27E-06	-	1.20E-01	1.08E-01	
		Front end loader	49 hp	4	3.43E-05	2.70E-04	3.75E-04	6.46E-07	1.25E-06	1.15E-06	5.00E-02	3.10E-06	-	5.00E-02	4.54E-02	
		Roller	47 hp	4	2.77E-05	2.57E-04	3.33E-04	6.31E-07	1.10E-06	1.01E-06	4.88E-02	2.50E-06	-	4.89E-02	4.43E-02	
		Water truck	3000 gal	4	2.90E-05	1.15E-04	5.51E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	300 hp	4	3.35E-05	1.35E-04	5.39E-04	2.75E-06	4.87E-06	4.48E-06	2.80E-01	8.65E-06	-	2.80E-01	2.54E-01	
		Front end loader	180 hp	4	2.53E-05	7.88E-05	4.09E-04	2.41E-06	3.01E-06	2.77E-06	2.14E-01	5.31E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	3.19E-05	1.36E-04	7.03E-04	4.03E-06	4.85E-06	4.47E-06	3.59E-01	9.81E-06	-	3.59E-01	3.25E-01	
		Loader/backhoe	75 hp	0.0923	2.80E-07	3.93E-06	9.53E-06	1.75E-08	3.37E-08	3.10E-08	1.49E-03	5.55E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	4.38E-04	2.03E-03	3.11E-02	6.20E-05	7.36E-05	6.77E-05	5.51E+00	1.40E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	19	8.93E-05	2.05E-04	1.39E-03	1.05E-05	7.89E-05	3.26E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	4.38E-04	2.03E-03	3.11E-02	6.20E-05	7.36E-05	6.77E-05	5.51E+00	1.40E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	20	8.93E-05	2.05E-04	1.39E-03	1.05E-05	7.89E-05	3.26E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.06E-05	4.54E-05	2.34E-04	1.34E-06	1.62E-06	1.49E-06	1.20E-01	3.27E-06	-	1.20E-01	1.08E-01	
	Dewatering	Concrete saw	13 hp	8	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02	
		Crane 80'	130 hp	16	3.79E-05	1.76E-04	2.69E-03	5.37E-06	6.37E-06	5.86E-06	4.77E-01	1.22E-05	-	4.77E-01	4.33E-01	
		Flatbed truck		8	1.29E-05	1.87E-05	1.88E-04	5.36E-07	4.06E-06	1.67E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	3.20E-02	3.63E-01	8.52E-01	1.78E-03	2.68E-03	2.47E-03	1.52E+02	2.89E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	1.40E-03	5.99E-03	2.85E-02	1.53E-04	2.14E-04	1.96E-04	1.52E+01	4.16E-04	-	1.52E+01	1.38E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	1.40E-03	5.99E-03	2.85E-02	1.53E-04	2.14E-04	1.96E-04	1.52E+01	4.16E-04	-	1.52E+01	1.38E+01
		Tractor/crawler/dozer	600 hp	78,8462	19	1.40E-03	5.99E-03	2.85E-02	1.53E-04	2.14E-04	1.96E-04	1.52E+01	4.16E-04	-	1.52E+01	1.38E+01
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	1.40E-03	5.99E-03	2.85E-02	1.53E-04	2.14E-04	1.96E-04	1.52E+01	4.16E-04	-	1.52E+01	1.38E+01
	Armoring	1 ton pickup truck	1,0667	19	6.14E-07	1.41E-06	9.57E-06	7.25E-08	5.43E-07	2.24E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1,0667	19	1.28E-05	5.17E-05	2.06E-04	1.05E-06	1.86E-06	1.07E-01	3.31E-06	-	1.07E-01	9.72E-02	
		1 ton pickup truck	1,0667	19	6.14E-07	1.41E-06	9.57E-06	7.25E-08	5.43E-07	2.24E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	1.04E-03	3.80E-03	2.05E-02	1.20E-04	1.39E-04	1.28E-04	1.06E+01	2.71E-04	-	1.07E+01	9.66E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.92E-05	1.96E-04	9.34E-05	7.91E-07	1.36E-05	7.11E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.44E-01
		Excavator	430 hp	4,445	22	5.33E-05	2.15E-04	8.59E-04	4.38E-06	7.75E-06	7.13E-06	4.46E-01	1.38E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3,2327	22	8.12E-05	3.02E-03	1.76E-03	9.43E-06	2.56E-05	2.36E-05	9.38E-01	2.57E-05	-	9.38E-01	8.51E-01
	Platform	Tractor/crawler/dozer	440 hp	40	5.21E-04	2.23E-03	8.54E-03	4.47E-05	7.94E-05	7.30E-05	4.56E+00	1.25E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	440 hp	5	6.51E-05	2.78E-04	1.07E-03	5.59E-06	9.92E-06	9.13E-06	5.70E-01	1.56E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck		20	2.49E-05	3.59E-05	3.50E-04	1.36E-06	1.04E-05	4.37E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	475 hp	34,0003	126	5.33E-04	2.37E-03	9.08E-03	4.93E-05	8.38E-05	7.71E-05	5.02E+00	1.14E-04	-	5.02E+00	4.56E+00
		3/4 ton Pickup truck		34,0003	126	4.23E-05	6.11E-05	5.95E-04	2.30E-06	1.76E-05	7.43E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01
		Cut with Diamond wire	Diamond cutting saw	48	126	5.97E-05	8.62E-05	8.41E-04	3.25E-06	2.49E-05	1.05E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
			50 hp	48	126	2.60E-04	3.68E-03	4.12E-03	9.49E-06	1.32E-05	1.22E-05	7.34E-01	2.35E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	4.09E-04	1.90E-03	7.48E-03	3.98E-05	6.67E-05	6.14E-05	4.05E+00	1.03E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck		60,0214	126	7.46E-05	1.08E-04	1.05E-03	4.07E-06	3.11E-05	1.31E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
		Front end loader	350 hp	4	126	4.93E-05	1.55E-04	6.09E-04	3.25E-06	5.87E-06	5.40E-06	3.32E-01	8.21E-06	-	3.32E-01	3.01E-01
		Water truck	3000 gal	507	126	3.68E-03	1.46E-02	6.99E-03	5.91E-05	1.02E-03	5.32E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	375 hp	30,0107	126	2.04E-04	9.48E-04	3.74E-03	1.99E-05	3.33E-05	3.07E-05	2.03E+00	5.16E-05	-	2.03E+00	1.84E+00
		Crane 260'	375 hp	49	126	3.34E-04	1.55E-03	6.11E-03	3.25E-05	5.45E-05	5.01E-05	3.31E+00	8.43E-05	-	3.31E+00	3.00E+00
		Horizontal boring drill	10 hp	55	126	4.84E-05	9.16E-04	1.14E-03	2.91E-06	3.60E-06	3.31E-06	1.87E-01	1.97E-05	-	1.88E-01	1.70E-01
		3/4 ton Pickup truck		60	126	7.46E-05	1.08E-04	1.05E-03	4.07E-06	3.11E-05	1.31E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
	Demolish spillway	Crane 260'	375 hp	20	126	1.36E-04	6.32E-04	2.49E-03	1.32E-05	2.22E-05	2.04E-05	1.35E+00	3.44E-05	-	1.35E+00	1.23E+00
		Air compressor	50 hp	40	126	1.04E-03	1.37E-03	8.24E-02	8.23E-06	5.19E-05	5.18E-05	6.77E-01	5.87E-05	1.18E-04	7.15E-01	6.48E-01
		3/4 ton Pickup truck		20	126	2.49E-05	3.59E-05	3.50E-04	1.36E-06	1.04E-05	4.37E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01
						6.15E-02	4.82E-01	1.25E+00	3.26E-03	9.63E-03	6.78E-03	3.43E+02	9.00E-03	1.82E-03	3.44E+02	3.12E+02

Data from Alt3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2027  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2027 (pounds per day)											
					VOC	NOx	CO	SO2	PM10	PM2.5						
Construction Survey	3/4 ton pickup truck		48	210	1.14E-03	1.64E-03	1.60E-02	6.19E-05	4.74E-04	2.00E-04						
Dust Control	Water truck	5000 gal	1696	210	2.34E-01	9.32E-01	4.45E-01	3.77E-03	6.47E-02	3.39E-02						
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.68E-02	2.43E-02	2.37E-01	9.15E-04	6.99E-03	2.95E-03						
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	4.19E-03	6.05E-03	5.90E-02	2.28E-04	1.74E-03	7.36E-04						
	Cutting	1 ton pickup truck	1,0325	19	1.25E-04	2.88E-04	1.95E-03	1.48E-05	1.11E-04	4.57E-05						
		Tractor/crawler/dozer	250 hp	1,7208	19	2.67E-03	1.14E-02	5.89E-02	3.38E-04	4.07E-04	3.75E-04					
		Chain saw		1,7209	19	5.64E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05					
		Brush Piling	Front end loader	540 hp	0.8673	19	3.43E-03	1.08E-02	5.80E-02	3.18E-04	4.08E-04	3.75E-04				
			Tractor/crawler/dozer	310 hp	0.8673	19	1.68E-03	7.16E-03	2.75E-02	1.44E-04	2.55E-04	2.35E-04				
			Brush chipper	250 hp	0.8673	19	3.31E-03	9.41E-03	3.48E-02	2.28E-04	3.30E-04	3.03E-04				
			Front end loader	540 hp	0.8673	19	3.43E-03	1.08E-02	5.80E-02	3.18E-04	4.08E-04	3.75E-04				
			Tractor/crawler/dozer	180 hp	2	19	2.24E-03	9.55E-03	4.93E-02	2.83E-04	3.41E-04	3.13E-04				
			Front end loader	49 hp	4	19	7.23E-03	5.68E-02	7.90E-02	1.36E-04	2.64E-04	2.43E-04				
Dewatering		Roller	47 hp	4	19	5.82E-03	5.40E-02	7.01E-02	1.33E-04	2.32E-04	2.13E-04					
		Water truck	3000 gal	4	19	6.11E-03	2.43E-02	1.16E-02	9.82E-05	1.69E-03	8.84E-04					
		Excavator	300 hp	4	19	7.05E-03	2.85E-02	1.14E-01	5.79E-04	1.02E-03	9.43E-04					
			Front end loader	180 hp	4	19	5.32E-03	1.66E-02	8.62E-02	5.08E-04	6.33E-04	5.92E-04				
			Tractor/crawler/dozer	180 hp	6	19	6.71E-03	2.87E-02	1.48E-01	8.49E-04	1.02E-03	9.40E-04				
		36" Diversion Pipe - grade	Loader/backhoe	75 hp	0.0923	19	5.89E-05	8.28E-04	2.01E-03	3.68E-06	7.10E-06	6.53E-06				
			Crane 94'	155 hp	155	19	9.23E-02	4.28E-01	6.55E+00	1.31E-02	1.55E-02	1.43E-02				
			1 ton pickup truck	155	19	1.88E-02	4.32E-02	2.93E-01	2.22E-03	1.68E-02	6.85E-03					
			Crane 94'	155 hp	155	20	8.77E-02	4.07E-01	6.22E+00	1.24E-02	1.47E-02	1.35E-02				
			1 ton pickup truck	155	20	1.79E-02	4.10E-02	2.78E-01	2.11E-03	1.58E-02	6.51E-03					
			Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	2.12E-03	9.08E-03	4.68E-02	2.69E-04	3.24E-04	2.98E-04			
			Dewatering	Concrete saw	13 hp	8	23	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02			
				Crane 80'	130 hp	16	23	6.60E-03	3.06E-02	4.68E-01	9.33E-04	1.11E-03	1.02E-03			
				Flatbed truck	8	23	2.25E-03	3.26E-03	3.27E-02	9.32E-05	7.06E-04	2.90E-04				
				Generator	80 hp	5856	244	5.24E-01	5.95E+00	1.40E+01	2.92E-02	4.39E-02	4.04E-02			
				Tractor/crawler/dozer	600 hp	78.8462	19	2.95E-01	1.26E+00	6.00E+00	3.22E-02	4.50E-02	4.14E-02			
				Push	Tractor/crawler/dozer	600 hp	78.8462	19	2.95E-01	1.26E+00	6.00E+00	3.22E-02	4.50E-02	4.14E-02		
					Tractor/crawler/dozer	600 hp	78.8462	19	2.95E-01	1.26E+00	6.00E+00	3.22E-02	4.50E-02	4.14E-02		
					Tractor/crawler/dozer	600 hp	78.8462	19	2.95E-01	1.26E+00	6.00E+00	3.22E-02	4.50E-02	4.14E-02		
					Build road	Tractor/crawler/dozer	600 hp	78.8462	19	2.95E-01	1.26E+00	6.00E+00	3.22E-02	4.50E-02	4.14E-02	
				Armoring	1 ton pickup truck	1,0667	19	1.29E-04	2.97E-04	2.01E-03	1.53E-05	1.14E-04	4.72E-05			
				Excavator	430 hp	1,0667	19	2.69E-03	1.09E-02	4.34E-02	2.21E-04	3.92E-04	3.60E-04			
				1 ton pickup truck	1,0667	19	1.29E-04	2.97E-04	2.01E-03	1.53E-05	1.14E-04	4.72E-05				
				Maintenance	Grader	215 hp	144	210	1.98E-02	7.24E-02	3.90E-01	2.28E-03	2.65E-03	2.44E-03		
Demolition				Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.95E-03	3.56E-02	1.70E-02	1.44E-04	2.47E-03	1.29E-03		
					Excavator	430 hp	4,445	22	9.70E-03	3.92E-02	1.56E-01	7.97E-04	1.41E-03	1.30E-03		
						Tractor/crawler/dozer	850 hp	3,2327	22	1.48E-02	5.49E-01	3.20E-01	1.71E-03	4.66E-03	4.29E-03	
					Platform	Tractor/crawler/dozer	440 hp	40	20	1.04E-01	4.45E-01	1.71E+00	8.95E-03	1.59E-02	1.46E-02	
						Tractor/crawler/dozer	440 hp	5	20	1.30E-02	5.56E-02	2.14E-01	1.12E-03	1.98E-03	1.83E-03	
						3/4 ton Pickup truck	20	20	4.97E-03	7.18E-03	7.01E-02	2.71E-04	2.07E-03	8.74E-04		
					Drilling	Rotary drill	475 hp	34,0003	126	1.69E-02	7.51E-02	2.88E-01	1.56E-03	2.66E-03	2.45E-03	
						3/4 ton Pickup truck	34,0003	126	1.34E-03	1.94E-03	1.89E-02	7.31E-05	5.59E-04	2.36E-04		
						Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.89E-03	2.74E-03	2.67E-02	1.03E-04	7.89E-04	3.33E-04	
						Diamond cutting saw	50 hp	48	126	8.27E-03	1.17E-01	1.31E-01	3.01E-04	4.20E-04	3.87E-04	
						Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.30E-02	6.02E-02	2.38E-01	1.26E-03	2.12E-03	1.95E-03
						3/4 ton Pickup truck	60,0214	126	2.37E-03	3.42E-03	3.34E-02	1.29E-04	9.87E-04	4.16E-04		
						Load/Haul	Front end loader	350 hp	4	126	1.57E-03	4.93E-03	1.93E-02	1.03E-04	1.86E-04	1.71E-04
							Water truck	3000 gal	507	126	1.17E-01	4.64E-01	2.22E-01	1.88E-03	3.23E-02	1.69E-02
						Landfill	Crane 260'	375 hp	30,0107	126	6.49E-03	3.01E-02	1.19E-01	6.31E-04	1.06E-03	9.74E-04
						Micro-blast	Crane 260'	375 hp	49	126	1.06E-02	4.91E-02	1.94E-01	1.03E-03	1.73E-03	1.59E-03
							Horizontal boring drill	10 hp	55	126	1.54E-03	2.91E-02	3.63E-02	9.24E-05	1.14E-04	1.05E-04
							3/4 ton Pickup truck	60	126	2.37E-03	3.42E-03	3.34E-02	1.29E-04	9.87E-04	4.16E-04	
						Demolish spillway	Crane 260'	375 hp	20	126	4.32E-03	2.01E-02	7.92E-02	4.21E-04	7.06E-04	6.49E-04
							Air compressor	50 hp	40	126	3.30E-02	4.35E-02	2.62E+00	2.61E-04	1.65E-03	1.64E-03
						3/4 ton Pickup truck	20	126	7.89E-04	1.14E-03	1.11E-02	4.30E-05	3.29E-04	1.39E-04		
									<b>2.71E+00</b>	<b>1.54E+01</b>	<b>6.28E+01</b>	<b>2.22E-01</b>	<b>4.82E-01</b>	<b>3.81E-01</b>		

Data from Alt3\_EnvrAirQualityReport.pdf

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2029 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.627	0.003	0.004	0.004	301.165	0.010	0.000	
	Chain saw		1,7209	19	1.889	0.115	13.187	0.001	0.021	0.021	35.643	0.117	0.039	
	Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.549	0.003	0.004	0.004	286.791	0.009	0.000	
		Tractor/crawler/dozer	0.8673	19	0.031	0.116	0.462	0.002	0.004	0.004	234.949	0.008	0.000	
	Chipping	Brush chipper	0.8673	19	0.073	0.184	0.685	0.004	0.007	0.006	389.821	0.007	0.000	
		Front end loader	0.8673	19	0.038	0.102	0.549	0.003	0.004	0.004	286.791	0.009	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.627	0.003	0.004	0.004	301.165	0.010	0.000	
		Front end loader	49 hp	4	0.194	1.290	1.939	0.003	0.007	0.006	231.303	0.018	0.000	
		Roller	47 hp	4	0.164	1.275	1.785	0.003	0.006	0.005	235.545	0.015	0.000	
		Water truck	3000 gal	4	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048	
		Excavator	300 hp	4	0.029	0.104	0.424	0.002	0.004	0.004	211.855	0.008	0.000	
		Front end loader	180 hp	4	0.038	0.102	0.544	0.003	0.004	0.004	270.066	0.008	0.000	
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	0.031	0.116	0.627	0.003	0.004	0.004	301.165	0.010	0.000	
		Loader/backhoe	75 hp	0.0923	0.043	0.523	1.315	0.002	0.005	0.004	195.357	0.009	0.000	
		Crane 94'	155 hp	155	0.019	0.078	1.245	0.002	0.003	0.003	208.071	0.007	0.000	
		1 ton pickup truck	155	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.019	0.078	1.245	0.002	0.003	0.003	208.071	0.007	0.000	
		1 ton pickup truck	155	20	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.627	0.003	0.004	0.004	301.165	0.010	0.000	
	Dewatering	Concrete saw	13 hp	8	3.250	2.403	118.808	0.006	1.684	1.681	200.914	0.184	0.193	
		Crane 80'	130 hp	16	0.019	0.078	1.245	0.002	0.003	0.003	208.071	0.007	0.000	
		Flatbed truck	8	23	1.131	1.787	16.593	0.061	0.459	0.188	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.069	0.709	1.679	0.003	0.005	0.005	294.391	0.006	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.530	0.003	0.004	0.004	269.731	0.009	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.530	0.003	0.004	0.004	269.731	0.009	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.530	0.003	0.004	0.004	269.731	0.009	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.530	0.003	0.004	0.004	269.731	0.009	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.855	0.008	0.000
		1 ton pickup truck	1.0667	19	0.413	1.030	6.565	0.062	0.459	0.188	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.633	0.004	0.004	0.004	311.988	0.010	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048
		Excavator	430 hp	4,445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.855	0.008	0.000
		Tractor/crawler/dozer	850 hp	3,2327	22	0.031	0.102	0.563	0.003	0.009	0.008	286.216	0.010	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.462	0.002	0.004	0.004	234.949	0.008	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.462	0.002	0.004	0.004	234.949	0.008	0.000
		3/4 ton Pickup truck		20	20	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34,0003	126	0.033	0.133	0.523	0.003	0.005	0.004	282.098	0.007	0.000
		3/4 ton Pickup truck		34,0003	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.114	1.408	1.647	0.004	0.005	0.005	277.553	0.010	0.000
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.019	0.077	0.316	0.002	0.003	0.003	163.216	0.005	0.000
		3/4 ton Pickup truck		60,0214	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.411	0.002	0.004	0.004	214.820	0.006	0.000
		Water truck	3000 gal	507	126	6.592	26.288	12.519	0.106	1.819	0.953	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30,0107	126	0.019	0.077	0.316	0.002	0.003	0.003	163.216	0.005	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.316	0.002	0.003	0.003	163.216	0.005	0.000
		Horizontal boring drill	10 hp	55	126	0.089	1.506	1.194	0.004	0.006	0.006	289.997	0.032	0.000
		3/4 ton Pickup truck		60	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.316	0.002	0.003	0.003	163.216	0.005	0.000
		Air compressor	50 hp	40	126	0.536	0.669	45.525	0.004	0.024	0.023	306.925	0.030	0.056
		3/4 ton Pickup truck		20	126	0.843	1.423	12.380	0.061	0.466	0.195	20,361.282	2.024	1.056
<b>Total</b>														

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2029 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	4.46E-05	7.53E-05	6.55E-04	3.25E-06	2.47E-05	1.03E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.91E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	6.59E-04	1.11E-03	9.68E-03	4.80E-05	3.64E-04	1.52E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	1.49E-05	2.51E-05	2.18E-04	1.08E-06	8.22E-06	3.44E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	4.70E-07	1.17E-06	7.47E-06	7.02E-08	5.23E-07	2.15E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	2.97E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	4.82E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	3.01E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	1.87E-06	6.24E-07	8.01E-04	7.26E-04	
	Brush Piling	Front end loader	0.8673	19	1.96E-05	5.24E-05	2.83E-04	1.49E-06	2.06E-06	1.89E-06	1.48E-01	4.46E-06	-	1.48E-01	1.34E-01	
		Tractor/crawler/dozer	0.8673	19	9.17E-06	3.45E-05	1.37E-04	6.83E-07	1.26E-06	1.16E-06	6.96E-02	2.35E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	1.74E-05	4.39E-05	1.64E-04	1.05E-06	1.57E-06	1.44E-06	9.32E-02	1.57E-06	-	9.32E-02	8.46E-02	
		Front end loader	0.8673	19	1.96E-05	5.24E-05	2.83E-04	1.49E-06	2.06E-06	1.89E-06	1.48E-01	4.46E-06	-	1.48E-01	1.34E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.49E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.04E-06	-	1.20E-01	1.08E-01	
		Front end loader	49 hp	4	4.19E-05	2.79E-04	4.19E-04	6.46E-07	1.42E-06	1.30E-06	5.00E-02	3.78E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	19	3.41E-05	2.64E-04	3.70E-04	6.31E-07	1.24E-06	1.14E-06	4.88E-02	3.08E-06	-	4.89E-02	4.43E-02
		Water truck	3000 gal	4	19	2.91E-05	1.16E-04	5.52E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	
		Excavator	300 hp	4	19	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01	
		Front end loader	180 hp	4	19	3.05E-05	8.10E-05	4.31E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	6.45E-06	-	2.14E-01	
		Tractor/crawler/dozer	180 hp	6	19	3.67E-05	1.38E-04	7.47E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.21E-05	-	3.59E-01	
	36" Diversion Pipe - grade	Loader/backhoe	0.0923	19	3.25E-07	3.99E-06	1.00E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	6.73E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	19	4.98E-04	2.05E-03	3.30E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	1.74E-04	-	5.51E+00	
		1 ton pickup truck	155	19	7.05E-05	1.76E-04	1.12E-03	1.05E-05	7.85E-05	3.22E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	20	4.98E-04	2.05E-03	3.30E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	1.74E-04	-	5.51E+00	
		1 ton pickup truck	155	20	7.05E-05	1.76E-04	1.12E-03	1.05E-05	7.85E-05	3.22E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.49E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.04E-06	-	1.20E-01	1.08E-01	
	Dewatering	Concrete saw	13 hp	8	23	3.73E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02	
		Crane 80'	130 hp	16	23	4.32E-05	1.78E-04	2.86E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.50E-05	-	4.77E-01	
		Flatbed truck	8	23	9.98E-06	1.58E-05	1.46E-04	5.35E-07	4.05E-06	1.66E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.63E-01	
		Generator	80 hp	5856	244	3.58E-02	3.66E-01	8.67E-01	1.78E-03	2.84E-03	2.61E-03	1.52E+02	3.23E-03	-	1.52E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.77E-02	1.41E-04	2.22E-04	2.04E-04	1.41E+01	4.75E-04	-	1.41E+01	
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.77E-02	1.41E-04	2.22E-04	2.04E-04	1.41E+01	4.75E-04	-	1.41E+01	
		Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.77E-02	1.41E-04	2.22E-04	2.04E-04	1.41E+01	4.75E-04	-	1.41E+01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.77E-02	1.41E-04	2.22E-04	2.04E-04	1.41E+01	4.75E-04	-	1.41E+01	
	Armoring	1 ton pickup truck	1,0667	19	4.85E-07	1.21E-06	7.72E-06	7.25E-08	5.40E-07	2.22E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1,0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02	
		1 ton pickup truck	1,0667	19	4.85E-07	1.21E-06	7.72E-06	7.25E-08	5.40E-07	2.22E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	210	1.23E-03	3.88E-03	2.16E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.30E-04	-	1.07E+01	
Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6,7805	22	4.93E-05	1.96E-04	9.36E-05	7.91E-07	1.36E-05	7.12E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	
		Excavator	430 hp	4,445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	7.43E-06	4.46E-01	1.62E-05	-	4.47E-01	
		Tractor/crawler/dozer	850 hp	3,2327	22	9.36E-05	3.06E-03	1.70E-03	8.72E-06	2.69E-05	2.47E-05	8.67E-01	2.93E-05	-	8.68E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	20	6.00E-04	2.26E-03	8.96E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.54E-04	-	4.56E+00	
		Tractor/crawler/dozer	440 hp	5	20	7.50E-05	2.82E-04	1.12E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	1.92E-05	-	5.70E-01	
		3/4 ton Pickup truck	20	20	1.86E-05	3.14E-05	2.73E-04	1.35E-06	1.03E-05	4.30E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	475 hp	34,0003	126	5.85E-04	2.38E-03	9.32E-03	4.93E-05	8.55E-05	7.86E-05	5.02E+00	1.31E-04	-	5.02E+00	
		3/4 ton Pickup truck	34,0003	126	3.16E-05	5.33E-05	4.64E-04	2.30E-06	1.75E-05	7.30E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	4.46E-05	7.53E-05	6.55E-04	3.25E-06	2.47E-05	1.03E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	
		Diamond cutting saw	50 hp	48	126	3.02E-04	3.73E-03	4.36E-03	9.49E-06	1.41E-05	1.30E-05	7.34E-01	2.73E-05	-	7.35E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	4.66E-04	1.92E-03	7.83E-03	3.97E-05	6.89E-05	6.34E-05	4.05E+00	1.28E-04	-	4.05E+00	
		3/4 ton Pickup truck	60,0214	126	5.58E-05	9.41E-05	8.19E-04	4.07E-06	3.08E-05	1.29E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
		Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.34E-04	3.25E-06	6.24E-06	5.74E-06	3.32E-01	9.98E-06	-	3.32E-01	
		Water truck	3000 gal	507	126	3.68E-03	1.47E-02	7.00E-03	5.91E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	2.33E-04	9.60E-04	3.91E-03	1.99E-05	3.44E-05	3.17E-05	2.02E+00	6.38E-05	-	2.03E+00	
	Micro-blast	Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.39E-03	3.24E-05	5.62E-05	5.17E-05	3.31E+00	1.04E-04	-	3.31E+00	
		Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	7.24E-04	2.23E-06	3.76E-06	3.46E-06	1.76E-01	1.91E-05	-	1.76E-01	
		3/4 ton Pickup truck	60	126	5.58E-05	9.41E-05	8.19E-04	4.06E-06	3.08E-05	1.29E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.61E-03	1.32E-05	2.30E-05	2.11E-05	1.35E+00	4.25E-05	-	1.35E+00	
		Air compressor	50 hp	40	126	1.18E-03	1.47E-03	1.00E-01	8.23E-06	5.18E-05	5.17E-05	6.77E-01	6.68E-05	1.23E-04	7.16E-01	
		3/4 ton Pickup truck	20	126	1.86E-05	3.14E-05	2.73E-04	1.35E-06	1.03E-05	4.30E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>6.66E-02</b>	<b>4.86E-01</b>	<b>1.28E+00</b>	<b>3.21E-03</b>	<b>9.85E-03</b>	<b>6.98E-03</b>	<b>3.38E+02</b>	<b>9.85E-03</b>	<b>1.83E-03</b>	<b>3.39E+02</b>	<b>3.07E+02</b>	

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2029  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2029 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		48	210	8.50E-04	1.43E-03	1.25E-02	6.19E-05	4.70E-04	1.96E-04
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.36E-01	4.46E-01	3.77E-03	6.48E-02	3.39E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	1.26E-02	2.12E-02	1.84E-01	9.15E-04	6.94E-03	2.90E-03
	Fish relocation	3/4 ton pickup truck	16	19	3.13E-03	5.28E-03	4.60E-02	2.28E-04	1.73E-03	7.24E-04
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	9.89E-05	2.47E-04	1.57E-03	1.48E-05	1.10E-04	4.52E-05
	Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.26E-02	3.38E-04	4.23E-04	3.89E-04
	Chain saw		1,7209	19	6.34E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05
	Brush Piling	Front end loader	0.8673	19	4.12E-03	1.10E-02	5.96E-02	3.13E-04	4.33E-04	3.98E-04
		Tractor/crawler/dozer	0.8673	19	1.93E-03	7.26E-03	2.88E-02	1.44E-04	2.65E-04	2.44E-04
	Chipping	Brush chipper	0.8673	19	3.66E-03	9.23E-03	3.45E-02	2.21E-04	3.30E-04	3.04E-04
		Front end loader	0.8673	19	4.12E-03	1.10E-02	5.96E-02	3.13E-04	4.33E-04	3.98E-04
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.24E-02	2.83E-04	3.54E-04	3.25E-04
		Front end loader	49 hp	4	8.83E-03	5.87E-02	8.82E-02	1.36E-04	2.98E-04	2.74E-04
		Roller	47 hp	4	7.18E-03	5.56E-02	7.79E-02	1.33E-04	2.60E-04	2.40E-04
		Water truck	3000 gal	4	6.12E-03	2.44E-02	1.16E-02	9.82E-05	1.69E-03	8.84E-04
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.08E-02	5.08E-04	6.75E-04	6.21E-04
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.37E-01	8.49E-04	1.06E-03	9.76E-04
		Loader/backhoe	75 hp	0.0923	6.83E-05	8.40E-04	2.11E-03	3.68E-06	7.76E-06	7.14E-06
		Crane 94'	155 hp	155	1.05E-01	4.33E-01	6.94E+00	1.31E-02	1.61E-02	1.48E-02
		1 ton pickup truck	155	155	1.48E-02	3.70E-02	2.36E-01	2.22E-03	1.65E-02	6.78E-03
		Crane 94'	155 hp	155	9.97E-02	4.11E-01	6.60E+00	1.24E-02	1.53E-02	1.41E-02
		1 ton pickup truck	155	20	1.41E-02	3.52E-02	2.24E-01	2.11E-03	1.57E-02	6.44E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	4.98E-02	2.69E-04	3.36E-04	3.09E-04
	Dewatering	Concrete saw	13 hp	8	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	4.97E-01	9.34E-04	1.15E-03
		Flatbed truck	8	23	1.73E-03	2.74E-03	2.54E-02	9.31E-05	7.04E-04	2.88E-04
		Generator	80 hp	5856	244	5.86E-01	6.01E+00	1.42E+01	2.92E-02	4.66E-02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.82E+00	2.98E-02	4.67E-02
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.82E+00	2.98E-02	4.67E-02
		Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.82E+00	2.98E-02	4.67E-02
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.82E+00	2.98E-02	4.67E-02
	Armoring	1 ton pickup truck	1,0667	19	1.02E-04	2.55E-04	1.63E-03	1.53E-05	1.14E-04	4.67E-05
		Excavator	430 hp	1,0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04
		1 ton pickup truck	1,0667	19	1.02E-04	2.55E-04	1.63E-03	1.53E-05	1.14E-04	4.67E-05
	Maintenance	Grader	215 hp	144	210	2.33E-02	7.39E-02	4.12E-01	2.28E-03	2.79E-03
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.96E-03	3.57E-02	1.70E-02	1.44E-04	2.47E-03
		Excavator	430 hp	4,445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	1.70E-02	5.57E-01	3.10E-01	1.58E-03	4.89E-03
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.20E-01	4.52E-01	1.79E+00	8.95E-03	1.65E-02
		Tractor/crawler/dozer	440 hp	5	20	1.50E-02	5.65E-02	2.24E-01	1.12E-03	2.06E-03
		3/4 ton Pickup truck	20	20	3.72E-03	6.27E-03	5.48E-02	2.71E-04	2.06E-03	8.59E-04
	Drilling	Rotary drill	475 hp	34,0003	126	1.86E-02	7.54E-02	2.96E-01	1.56E-03	2.71E-03
		3/4 ton Pickup truck	34,0003	126	1.00E-03	1.69E-03	1.47E-02	7.31E-05	5.55E-04	2.32E-04
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.42E-03	2.39E-03	2.08E-02	1.03E-04	7.83E-04
		Diamond cutting saw	50 hp	48	126	9.60E-03	1.18E-01	1.38E-01	3.01E-04	4.49E-04
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.48E-02	6.10E-02	2.49E-01	1.26E-03	2.19E-03
		3/4 ton Pickup truck	60,0214	126	1.77E-03	2.99E-03	2.60E-02	1.29E-04	9.79E-04	
	Load/Haul	Front end loader	350 hp	4	126	1.89E-03	5.06E-03	2.01E-02	1.03E-04	1.98E-04
		Water truck	3000 gal	507	126	1.17E-01	4.66E-01	2.22E-01	1.88E-03	3.23E-02
	Landfill	Crane 260'	375 hp	30,0107	126	7.39E-03	3.05E-02	1.24E-01	6.31E-04	1.09E-03
	Micro-blast	Crane 260'	375 hp	49	126	1.21E-02	4.98E-02	2.03E-01	1.03E-03	1.79E-03
		Horizontal boring drill	10 hp	55	126	1.72E-03	2.90E-02	2.30E-02	7.08E-05	1.19E-04
		3/4 ton Pickup truck	60	126	1.77E-03	2.99E-03	2.60E-02	1.29E-04	9.79E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	4.93E-03	2.03E-02	8.28E-02	4.20E-04	7.29E-04
		Air compressor	50 hp	40	126	3.75E-02	4.68E-02	3.19E+00	2.61E-04	1.65E-03
		3/4 ton Pickup truck	20	126	5.90E-04	9.96E-04	8.66E-03	4.30E-05	3.26E-04	
						<b>3.01E+00</b>	<b>1.55E+01</b>	<b>6.37E+01</b>	<b>2.12E-01</b>	<b>4.94E-01</b>
									<b>3.92E-01</b>	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2031  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2031 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.597	26.369	12.528	0.106	1.820	0.953	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.642	0.003	0.004	0.004	301.162	0.011	0.000	
	Chain saw		1,7209	19	2.096	0.115	13.187	0.001	0.021	0.021	35.644	0.130	0.039	
	Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.560	0.003	0.004	0.004	282.348	0.010	0.000	
		Tractor/crawler/dozer	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.955	0.009	0.000	
	Chipping	Brush chipper	0.8673	19	0.087	0.198	0.746	0.005	0.007	0.007	415.165	0.008	0.000	
		Front end loader	0.8673	19	0.038	0.102	0.560	0.003	0.004	0.004	282.348	0.010	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.162	0.011	0.000	
		Front end loader	49 hp	4	0.224	1.326	2.112	0.003	0.007	0.007	231.301	0.020	0.000	
		Roller	47 hp	4	0.194	1.310	1.954	0.003	0.007	0.006	235.486	0.017	0.000	
		Water truck	3000 gal	4	6.597	26.369	12.528	0.106	1.820	0.953	21,147.638	0.051	0.048	
		Excavator	300 hp	4	0.029	0.104	0.424	0.002	0.004	0.004	211.849	0.008	0.000	
		Front end loader	180 hp	4	0.038	0.102	0.569	0.003	0.004	0.004	270.067	0.009	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.031	0.116	0.642	0.003	0.004	0.004	301.162	0.011	0.000	
		Loader/backhoe	75 hp	0.0923	0.043	0.523	1.373	0.002	0.005	0.004	195.356	0.010	0.000	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.090	0.008	0.000	
		1 ton pickup truck	155	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.090	0.008	0.000	
		1 ton pickup truck	155	20	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.162	0.011	0.000	
	Dewatering	Concrete saw	13 hp	8	3.252	2.404	118.859	0.006	1.685	1.682	200.999	0.184	0.193	
		Crane 80'	130 hp	16	0.019	0.078	1.302	0.002	0.003	0.003	208.090	0.008	0.000	
		Flatbed truck	8	23	0.873	1.543	12.845	0.061	0.457	0.187	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.077	0.716	1.708	0.003	0.006	0.005	294.377	0.007	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.579	0.003	0.004	0.004	289.219	0.011	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.579	0.003	0.004	0.004	289.219	0.011	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.579	0.003	0.004	0.004	289.219	0.011	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.579	0.003	0.004	0.004	289.219	0.011	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.849	0.008	0.000
		1 ton pickup truck	1.0667	19	0.342	0.905	5.526	0.062	0.458	0.187	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.664	0.004	0.004	0.004	312.014	0.011	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	6.597	26.369	12.528	0.106	1.820	0.953	21,147.638	0.051	0.048
		Excavator	430 hp	4,445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.849	0.008	0.000
		Tractor/crawler/dozer	850 hp	3,2327	22	0.031	0.102	0.615	0.003	0.009	0.008	306.894	0.011	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	0.004	234.955	0.009	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.955	0.009	0.000
		3/4 ton Pickup truck		20	20	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34,0003	126	0.033	0.133	0.533	0.003	0.005	0.004	282.072	0.008	0.000
		3/4 ton Pickup truck		34,0003	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.130	1.427	1.739	0.004	0.006	0.005	277.576	0.012	0.000
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.019	0.077	0.327	0.002	0.003	0.003	163.275	0.006	0.000
		3/4 ton Pickup truck		60,0214	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.426	0.002	0.004	0.004	214.828	0.008	0.000
		Water truck	3000 gal	507	126	6.597	26.369	12.528	0.106	1.820	0.953	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30,0107	126	0.019	0.077	0.327	0.002	0.003	0.003	163.275	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	0.003	163.275	0.006	0.000
		Horizontal boring drill	10 hp	55	126	0.089	1.506	1.185	0.004	0.006	0.006	287.880	0.031	0.000
		3/4 ton Pickup truck		60	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	0.003	163.275	0.006	0.000
		Air compressor	50 hp	40	126	0.601	0.716	53.710	0.004	0.024	0.023	307.047	0.034	0.058
		3/4 ton Pickup truck		20	126	0.600	1.244	9.266	0.061	0.463	0.192	20,361.282	2.024	1.056
<b>Total</b>														

Data from AR3\_EnvrAirQualityReport.pdf



Malibu Creek Ecosystem Restoration Feasibility Study  
 Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year: 2031  
 Speed of Onsite Trucks: 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2031 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	210	3.18E-05	6.58E-05	4.90E-04	3.25E-06	2.45E-05	1.02E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.93E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E-01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	4.69E-04	9.72E-04	7.24E-03	4.80E-05	3.62E-04	1.50E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	1.06E-05	2.19E-05	1.63E-04	1.08E-06	8.17E-06	3.39E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.89E-07	1.03E-06	6.29E-06	7.02E-08	5.21E-07	2.13E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	3.34E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.08E-06	6.24E-07	8.05E-04	7.30E-04	
	Brush Piling	Front end loader	0.8673	19	1.96E-05	5.24E-05	2.89E-04	1.47E-06	2.06E-06	1.89E-06	1.46E-01	5.11E-06	-	1.46E-01	1.32E-01	
		Tractor/crawler/dozer	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.83E-07	1.26E-06	1.16E-06	6.96E-02	2.53E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	0.8673	19	2.08E-05	4.73E-05	1.78E-04	1.12E-06	1.72E-06	1.58E-06	9.92E-02	1.88E-06	-	9.93E-02	9.01E-02	
		Front end loader	0.8673	19	1.96E-05	5.24E-05	2.89E-04	1.47E-06	2.06E-06	1.89E-06	1.46E-01	5.11E-06	-	1.46E-01	1.32E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	4.84E-05	2.87E-04	4.56E-04	6.46E-07	1.55E-06	1.43E-06	5.00E-02	4.37E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	4.02E-05	2.71E-04	4.05E-04	6.31E-07	1.37E-06	1.26E-06	4.88E-02	3.63E-06	-	4.89E-02	4.43E-02	
		Water truck	3000 gal	4	2.91E-05	1.16E-04	5.52E-05	4.67E-07	8.02E-06	4.20E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
		Excavator	300 hp	4	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.70E-06	2.80E-01	1.02E-05	-	2.80E-01	2.57E-01	
		Front end loader	180 hp	4	3.05E-05	8.10E-05	4.52E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	7.51E-06	-	2.14E-01	1.95E-01	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.30E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	3.25E-07	3.99E-06	1.05E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.77E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	19	5.84E-05	1.55E-04	9.44E-04	1.05E-05	7.82E-05	3.20E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck	155	20	5.84E-05	1.55E-04	9.44E-04	1.05E-05	7.82E-05	3.20E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.09E-01	
	Dewatering	Concrete saw	13 hp	8	2.37E-04	1.36E-02	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02	
		Crane 80'	130 hp	16	2.43E-05	1.78E-04	2.99E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01	4.33E-01	
		Flatbed truck	136E-05	8	7.70E-06	1.36E-05	1.13E-04	5.34E-07	4.03E-06	1.65E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
		Generator	80 hp	5856	244	3.96E-02	3.70E-01	8.82E-01	1.78E-03	3.00E-03	2.76E-03	1.52E+02	3.57E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.02E-02	1.52E-04	2.22E-04	2.04E-04	1.51E+01	5.48E-04	-	1.51E+01	1.37E+01
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.02E-02	1.52E-04	2.22E-04	2.04E-04	1.51E+01	5.48E-04	-	1.51E+01	1.37E+01
		Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.02E-02	1.52E-04	2.22E-04	2.04E-04	1.51E+01	5.48E-04	-	1.51E+01	1.37E+01
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.02E-02	1.52E-04	2.22E-04	2.04E-04	1.51E+01	5.48E-04	-	1.51E+01	1.37E+01
	Armoring	1 ton pickup truck	1.0667	19	4.02E-07	1.06E-06	6.50E-06	7.25E-08	5.38E-07	2.20E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
		Excavator	430 hp	1.0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02	
		1 ton pickup truck	1.0667	19	4.02E-07	1.06E-06	6.50E-06	7.25E-08	5.38E-07	2.20E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Maintenance	Grader	215 hp	144	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.85E-04	-	1.07E+01	9.47E+00	
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.93E-05	1.97E-04	9.36E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.63E-01
		Excavator	430 hp	4.445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	4.46E-01	1.62E-05	-	4.47E-01	4.05E-01	
		Tractor/crawler/dozer	850 hp	3.2327	22	9.36E-05	3.06E-03	1.86E-03	9.35E-06	2.69E-05	2.47E-05	9.30E-01	3.38E-05	-	9.30E-01	8.44E-01
	Platform	Tractor/crawler/dozer	440 hp	40	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.66E-04	-	4.56E+00	4.14E+00	
		Tractor/crawler/dozer	440 hp	5	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01	5.17E-01	
		3/4 ton Pickup truck		20	1.32E-05	2.74E-05	2.04E-04	1.35E-06	1.02E-05	4.23E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	475 hp	34.0003	126	5.85E-04	2.38E-03	9.48E-03	4.93E-05	8.55E-05	5.02E+00	1.42E-04	-	5.02E+00	4.56E+00	
		3/4 ton Pickup truck		34.0003	126	2.25E-05	4.66E-05	3.47E-04	2.30E-06	1.74E-05	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
		Cut with Diamond wire	Diamond cutting saw	48	126	3.18E-05	6.58E-05	4.90E-04	3.25E-06	2.45E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
			50 hp	48	126	3.45E-04	3.78E-03	4.60E-03	9.49E-06	1.50E-05	1.38E-05	7.34E-01	3.11E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	4.66E-04	1.92E-03	8.11E-03	3.98E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck		60.0214	126	3.97E-05	8.23E-05	6.13E-04	4.06E-06	3.06E-05	1.27E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
		Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.58E-04	3.25E-06	6.24E-06	3.32E-01	1.16E-05	-	3.32E-01	3.01E-01	
		Water truck	3000 gal	507	126	3.69E-03	1.47E-02	7.00E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01
	Landfill	Crane 260'	375 hp	30.0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	2.03E+00	7.36E-05	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.62E-03	3.25E-05	5.62E-05	3.31E+00	1.20E-04	-	3.31E+00	3.00E+00	
		Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	7.19E-04	2.21E-06	3.76E-06	1.75E-01	1.90E-05	-	1.75E-01	1.59E-01	
		3/4 ton Pickup truck		60	126	3.97E-05	8.23E-05	6.13E-04	4.06E-06	3.06E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.70E-03	1.32E-05	2.30E-05	1.35E+00	4.91E-05	-	1.35E+00	1.23E+00	
		Air compressor	50 hp	40	126	1.33E-03	1.58E-03	1.18E-01	8.23E-06	5.19E-05	6.77E-01	7.48E-05	1.27E-04	7.18E-01	6.51E-01	
		3/4 ton Pickup truck		20	126	1.32E-05	2.74E-05	2.04E-04	1.35E-06	1.02E-05	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>7.03E-02</b>	<b>4.89E-01</b>	<b>1.33E+00</b>	<b>3.25E-03</b>	<b>1.00E-02</b>	<b>7.12E-03</b>	<b>3.42E+02</b>	<b>1.07E-02</b>	<b>1.83E-03</b>	<b>3.43E+02</b>	<b>3.11E+02</b>	

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2031  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2031 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		48	210	6.05E-04	1.25E-03	9.34E-03	6.19E-05	4.67E-04	1.93E-04
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.39E-01	4.46E-01	3.77E-03	6.48E-02	3.39E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	8.94E-03	1.85E-02	1.38E-01	9.14E-04	6.89E-03	2.86E-03
	Fish relocation	3/4 ton pickup truck	16	19	2.23E-03	4.62E-03	3.44E-02	2.28E-04	1.72E-03	7.13E-04
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	8.19E-05	2.17E-04	1.32E-03	1.48E-05	1.10E-04	4.48E-05
	Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.41E-02	3.38E-04	4.23E-04	3.89E-04
	Chain saw		1,7209	19	7.03E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05
	Brush Piling	Front end loader	0.8673	19	4.12E-03	1.10E-02	6.09E-02	3.09E-04	4.33E-04	3.98E-04
		Tractor/crawler/dozer	0.8673	19	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04
	Chipping	Brush chipper	0.8673	19	4.38E-03	9.96E-03	3.76E-02	2.35E-04	3.62E-04	3.33E-04
		Front end loader	0.8673	19	4.12E-03	1.10E-02	6.09E-02	3.09E-04	4.33E-04	3.98E-04
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04
		Front end loader	49 hp	4	1.02E-02	6.03E-02	9.61E-02	1.36E-04	3.27E-04	3.01E-04
		Roller	47 hp	4	8.46E-03	5.71E-02	8.52E-02	1.33E-04	2.88E-04	2.65E-04
		Water truck	3000 gal	4	6.12E-03	2.45E-02	1.16E-02	9.83E-05	1.69E-03	8.85E-04
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.51E-02	5.08E-04	6.75E-04	6.21E-04
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.76E-04
		Loader/backhoe	75 hp	0.0923	6.83E-05	8.40E-04	2.21E-03	3.68E-06	7.76E-06	7.14E-06
		Crane 94'	155 hp	155	1.05E-01	4.33E-01	7.26E+00	1.31E-02	1.61E-02	1.48E-02
		1 ton pickup truck	155	19	1.23E-02	3.26E-02	1.99E-01	2.22E-03	1.65E-02	6.73E-03
		Crane 94'	155 hp	155	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02
		1 ton pickup truck	155	20	1.17E-02	3.09E-02	1.89E-01	2.11E-03	1.56E-02	6.39E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	5.10E-02	2.69E-04	3.36E-04	3.09E-04
	Dewatering	Concrete saw	13 hp	8	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	5.19E-01	9.34E-04	1.15E-03
		Flatbed truck	8	23	1.34E-03	2.37E-03	1.97E-02	9.29E-05	7.02E-04	2.86E-04
		Generator	80 hp	5856	244	6.48E-01	6.06E+00	1.45E+01	2.92E-02	4.92E-02
		Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.36E+00	3.19E-02	4.67E-02
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.36E+00	3.19E-02	4.67E-02
		Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.36E+00	3.19E-02	4.67E-02
		Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.36E+00	3.19E-02	4.67E-02
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.36E+00	3.19E-02	4.67E-02
	Armoring	1 ton pickup truck	1.0667	19	8.46E-05	2.24E-04	1.37E-03	1.53E-05	1.13E-04	4.63E-05
		Excavator	430 hp	1.0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04
		1 ton pickup truck	1.0667	19	8.46E-05	2.24E-04	1.37E-03	1.53E-05	1.13E-04	4.63E-05
	Maintenance	Grader	215 hp	144	210	2.33E-02	7.39E-02	4.31E-01	2.28E-03	2.79E-03
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	8.96E-03	3.58E-02	1.70E-02	1.44E-04	2.47E-03
		Excavator	430 hp	4.445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03
		Tractor/crawler/dozer	850 hp	3.2327	22	1.70E-02	5.57E-01	3.39E-01	1.70E-03	4.89E-03
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02
		Tractor/crawler/dozer	440 hp	5	20	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03
		3/4 ton Pickup truck	20	20	2.65E-03	5.49E-03	4.09E-02	2.71E-04	2.04E-03	8.46E-04
	Drilling	Rotary drill	475 hp	34.0003	126	1.88E-02	7.54E-02	3.01E-01	1.56E-03	2.71E-03
		3/4 ton Pickup truck	34.0003	126	7.14E-04	1.48E-03	1.10E-02	7.30E-05	5.51E-04	2.28E-04
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	1.01E-03	2.09E-03	1.56E-02	1.03E-04	7.78E-04
		Diamond cutting saw	50 hp	48	126	1.09E-02	1.20E-01	1.46E-01	3.01E-04	4.77E-04
		Crane 260'	375 hp	60.0214	126	1.48E-02	6.10E-02	2.58E-01	1.26E-03	2.19E-03
		3/4 ton Pickup truck	60.0214	126	1.26E-03	2.61E-03	1.95E-02	1.29E-04	9.73E-04	4.03E-04
		Front end loader	350 hp	4	126	1.89E-03	5.06E-03	2.09E-02	1.03E-04	1.98E-04
		Water truck	3000 gal	507	126	1.17E-01	4.68E-01	2.22E-01	1.88E-03	3.23E-02
		Crane 260'	375 hp	30.0107	126	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03
		Crane 260'	375 hp	49	126	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03
		Horizontal boring drill	10 hp	55	126	1.72E-03	2.90E-02	2.28E-02	7.03E-05	1.19E-04
		3/4 ton Pickup truck	60	126	1.26E-03	2.61E-03	1.95E-02	1.29E-04	9.72E-04	4.03E-04
		Crane 260'	375 hp	20	126	4.93E-03	2.03E-02	8.58E-02	4.21E-04	7.29E-04
		Air compressor	50 hp	40	126	4.21E-02	5.01E-02	3.76E+00	2.61E-04	1.65E-03
		3/4 ton Pickup truck	20	126	4.20E-04	8.71E-04	6.49E-03	4.30E-05	3.24E-04	1.34E-04
					<b>3.07E+00</b>	<b>1.56E+01</b>	<b>6.73E+01</b>	<b>2.21E-01</b>	<b>4.96E-01</b>	<b>3.95E-01</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

10

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2033 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.642	0.003	0.004	0.004	301.168	0.011	0.000	
	Chain saw		1,7209	19	2.303	0.115	13.187	0.001	0.021	0.021	35.644	0.143	0.039	
	Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.556	0.003	0.004	0.004	277.531	0.010	0.000	
		Tractor/crawler/dozer	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.976	0.009	0.000	
	Chipping	Brush chipper	0.8673	19	0.093	0.193	0.733	0.004	0.007	0.007	399.089	0.008	0.000	
		Front end loader	0.8673	19	0.038	0.102	0.556	0.003	0.004	0.004	277.531	0.010	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.168	0.011	0.000	
		Front end loader	49 hp	4	0.249	1.356	2.257	0.003	0.008	0.007	231.302	0.022	0.000	
		Roller	47 hp	4	0.222	1.343	2.115	0.003	0.007	0.007	235.530	0.020	0.000	
		Water truck	3000 gal	4	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Excavator	300 hp	4	0.029	0.104	0.424	0.002	0.004	0.004	211.857	0.008	0.000	
		Front end loader	180 hp	4	0.038	0.102	0.576	0.003	0.004	0.004	270.055	0.010	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.031	0.116	0.642	0.003	0.004	0.004	301.168	0.011	0.000	
		Loader/backhoe	75 hp	0.0923	0.043	0.523	1.383	0.002	0.005	0.004	195.355	0.010	0.000	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.020	0.008	0.000	
		1 ton pickup truck	155	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.020	0.008	0.000	
		1 ton pickup truck	155	20	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.168	0.011	0.000	
	Dewatering	Concrete saw	13 hp	8	3.255	2.406	118.960	0.006	1.686	1.683	201.170	0.184	0.193	
		Crane 80'	130 hp	16	0.019	0.078	1.302	0.002	0.003	0.003	208.020	0.008	0.000	
		Flatbed truck	8	23	0.723	1.394	10.684	0.061	0.457	0.186	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.084	0.722	1.736	0.003	0.006	0.006	294.397	0.008	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.529	0.003	0.004	0.004	264.004	0.010	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.529	0.003	0.004	0.004	264.004	0.010	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.529	0.003	0.004	0.004	264.004	0.010	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.529	0.003	0.004	0.004	264.004	0.010	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.857	0.008	0.000
		1 ton pickup truck	1.0667	19	0.305	0.834	4.998	0.062	0.457	0.186	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.665	0.004	0.004	0.004	311.989	0.011	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048
		Excavator	430 hp	4.445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.857	0.008	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.031	0.102	0.561	0.003	0.009	0.008	280.138	0.010	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	0.004	234.976	0.009	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.976	0.009	0.000
		3/4 ton Pickup truck		20	20	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.033	0.133	0.539	0.003	0.005	0.004	283.011	0.008	0.000
		3/4 ton Pickup truck		34.0003	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck		48	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.146	1.446	1.830	0.004	0.006	0.006	277.572	0.013	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.019	0.077	0.327	0.002	0.003	0.003	163.286	0.006	0.000
		3/4 ton Pickup truck		60.0214	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.430	0.002	0.004	0.004	214.835	0.008	0.000
		Water truck	3000 gal	507	126	6.605	26.445	12.543	0.106	1.821	0.954	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.019	0.077	0.327	0.002	0.003	0.003	163.286	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	0.003	163.286	0.006	0.000
		Horizontal boring drill	10 hp	55	126	0.089	1.506	1.215	0.004	0.006	0.006	295.190	0.032	0.000
		3/4 ton Pickup truck		60	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	0.003	163.286	0.006	0.000
		Air compressor	50 hp	40	126	0.666	0.764	61.875	0.004	0.024	0.023	307.040	0.038	0.060
		3/4 ton Pickup truck		20	126	0.468	1.130	7.490	0.061	0.461	0.190	20,361.282	2.024	1.056
<b>Total</b>														

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2033 (tons per year)										Metric Tons CO2e/yr		
					GWP												
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	210	2.48E-05	5.98E-05	3.96E-04	3.25E-06	2.44E-05	1.00E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01		
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.94E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.66E-04	8.83E-04	5.85E-03	4.80E-05	3.60E-04	1.48E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	8.25E-06	1.99E-05	1.32E-04	1.08E-06	8.13E-06	3.35E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
	Cutting	1 ton pickup truck	1,0325	19	3.48E-07	9.50E-07	5.69E-06	7.02E-08	5.20E-07	2.12E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02		
		Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01	1.30E-01	
		Chain saw		1,7209	19	3.67E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.28E-06	6.24E-07	8.09E-04	7.34E-04	
	Brush Piling	Front end loader	540 hp	0.8673	19	1.96E-05	5.24E-05	2.87E-04	1.44E-06	2.06E-06	1.89E-06	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01	
		Tractor/crawler/dozer	310 hp	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.84E-07	1.26E-06	1.16E-06	6.96E-02	2.53E-06	-	6.97E-02	6.32E-02	
	Chipping	Brush chipper	250 hp	0.8673	19	2.22E-05	4.60E-05	1.75E-04	1.07E-06	1.70E-06	1.57E-06	9.54E-02	2.00E-06	-	9.54E-02	8.66E-02	
		Front end loader	540 hp	0.8673	19	1.96E-05	5.24E-05	2.87E-04	1.44E-06	2.06E-06	1.89E-06	1.43E-01	5.21E-06	-	1.43E-01	1.30E-01	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.09E-01	
			Front end loader	49 hp	4	5.39E-05	2.93E-04	4.88E-04	6.46E-07	1.67E-06	1.54E-06	5.00E-02	4.86E-06	-	5.01E-02	4.54E-02	
			Roller	47 hp	4	19	4.60E-05	2.78E-04	4.38E-04	6.31E-07	1.49E-06	1.37E-06	4.88E-02	4.15E-06	-	4.89E-02	4.44E-02
			Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02
		Excavator	300 hp	4	19	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01	2.54E-01	
		Front end loader	180 hp	4	19	3.05E-05	8.10E-05	4.57E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	7.79E-06	-	2.14E-01	1.95E-01	
		Tractor/crawler/dozer	180 hp	6	19	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.30E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	19	3.25E-07	3.99E-06	1.05E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.94E-08	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	19	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck		155	19	5.22E-05	1.43E-04	8.54E-04	1.05E-05	7.80E-05	3.18E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	20	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
		1 ton pickup truck		155	20	5.22E-05	1.43E-04	8.54E-04	1.05E-05	7.80E-05	3.18E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.09E-01	
		Dewatering	Concrete saw	13 hp	8	23	3.73E-04	2.76E-04	1.36E-02	6.58E-07	1.93E-04	2.31E-02	2.11E-05	2.22E-05	3.04E-02	2.76E-02	
			Crane 80'	130 hp	16	23	4.32E-05	1.78E-04	2.99E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01	4.63E-01
			Flatbed truck		8	23	6.38E-06	1.23E-05	9.42E-05	5.34E-07	4.03E-06	1.64E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.39E-01
			Generator	80 hp	5856	244	4.33E-02	3.73E-01	8.96E-01	1.78E-03	3.16E-03	2.91E-03	1.52E+02	3.91E-03	-	1.52E+02	1.38E+02
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.76E-02	1.38E-04	2.22E-04	2.04E-04	1.38E+01	5.01E-04	-	1.38E+01	1.25E+01
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.76E-02	1.38E-04	2.22E-04	2.04E-04	1.38E+01	5.01E-04	-	1.38E+01	1.25E+01
			Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.76E-02	1.38E-04	2.22E-04	2.04E-04	1.38E+01	5.01E-04	-	1.38E+01	1.25E+01
		Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.76E-02	1.38E-04	2.22E-04	2.04E-04	1.38E+01	5.01E-04	-	1.38E+01	1.25E+01
		Armoring	1 ton pickup truck		1.0667	19	3.59E-07	9.81E-07	5.88E-06	7.25E-08	5.37E-07	2.19E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
			Excavator	430 hp	1.0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.78E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02
			1 ton pickup truck		1.0667	19	3.59E-07	9.81E-07	5.88E-06	7.25E-08	5.37E-07	2.19E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02
		Maintenance	Grader	215 hp	144	210	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.87E-04	-	1.07E+01	9.47E+00
		Excavation for Dam Demolition	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.38E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01
			Excavator	430 hp	4.445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	7.43E-06	4.46E-01	1.62E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3.2327	22	9.36E-05	3.06E-03	1.70E-03	8.53E-06	2.69E-05	2.47E-05	8.49E-01	3.09E-05	-	8.49E-01	7.70E-01	
Platform		Tractor/crawler/dozer	440 hp	40	20	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.66E-04	-	4.56E+00	4.14E+00	
	Tractor/crawler/dozer	440 hp	5	20	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01	5.17E-01		
3/4 ton Pickup truck			20	20	1.03E-05	2.49E-05	1.65E-04	1.35E-06	1.02E-05	4.18E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01		
	Rotary drill		34.0003	126	5.85E-04	2.38E-03	9.80E-03	4.95E-05	8.55E-05	7.86E-05	5.04E+00	1.49E-04	-	5.04E+00	4.57E+00		
3/4 ton Pickup truck			34.0003	126	1.75E-05	4.24E-05	2.81E-04	2.30E-06	1.73E-05	7.11E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01		
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.48E-05	5.98E-05	3.96E-04	3.25E-06	2.44E-05	1.00E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01		
	Diamond cutting saw	50 hp	48	126	3.87E-04	3.83E-03	4.84E-03	9.49E-06	1.59E-05	1.46E-05	7.34E-01	3.49E-05	-	7.35E-01	6.67E-01		
Lift/Load blocks	Crane 260'	375 hp	60.0214	126	4.66E-04	1.92E-03	8.12E-03	3.98E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	3.68E+00		
	3/4 ton Pickup truck		60.0214	126	3.10E-05	7.48E-05	4.96E-04	4.06E-06	3.05E-05	1.26E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00		
Load/Haul	Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.64E-04	3.25E-06	6.24E-06	5.74E-06	3.32E-01	1.21E-05	-	3.32E-01	3.01E-01		
	Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01		
Landfill	Crane 260'	375 hp	30.0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	3.17E-05	2.03E+00	7.36E-05	-	2.03E+00	1.84E+00		
	Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.63E-03	3.25E-05	5.62E-05	5.17E-05	3.31E+00	1.20E-04	-	3.31E+00	3.00E+00		
Micro-blast	Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	7.37E-04	2.27E-06	3.76E-06	3.46E-06	1.79E-01	1.95E-05	-	1.79E-01	1.63E-01		
	3/4 ton Pickup truck		60	126	3.09E-05	7.47E-05	4.95E-04	4.06E-06	3.05E-05	1.26E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00		
Demolish spillway	Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.70E-03	1.32E-05	2.30E-05	2.11E-05	1.35E+00	4.91E-05	-	1.35E+00	1.23E+00		
	Air compressor	50 hp	40	126	1.47E-03	1.68E-03	1.36E-01	8.23E-06	5.18E-05	5.17E-05	6.77E-01	8.29E-05	1.32E-04	7.19E-01	6.53E-01		
	3/4 ton Pickup truck		20	126	1.03E-05	2.49E-05	1.65E-04	1.35E-06	1.02E-05	4.18E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01		
					<b>7.42E-02</b>	<b>4.93E-01</b>	<b>1.35E+00</b>	<b>3.20E-03</b>	<b>1.02E-02</b>	<b>7.27E-03</b>	<b>3.37E+02</b>	<b>1.09E-02</b>	<b>1.84E-03</b>	<b>3.38E+02</b>	<b>3.06E+02</b>		

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2033  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2033 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	4.72E-04	1.14E-03	7.55E-03	6.19E-05	4.64E-04	1.91E-04		
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.42E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	6.97E-03	1.68E-02	1.11E-01	9.14E-04	6.86E-03	2.82E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.74E-03	4.20E-03	2.78E-02	2.28E-04	1.71E-03	7.05E-04		
	Cutting	1 ton pickup truck	1,0325	19	7.32E-05	2.00E-04	1.20E-03	1.48E-05	1.09E-04	4.46E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.41E-02	3.38E-04	4.23E-04	3.89E-04	
		Chain saw	1,7209	19	7.72E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05		
	Brush Piling	Front end loader	540 hp	0.8673	19	4.12E-03	1.10E-02	6.04E-02	3.03E-04	4.33E-04	3.98E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04	
	Chipping	Brush chipper	250 hp	0.8673	19	4.67E-03	9.69E-03	3.69E-02	2.26E-04	3.59E-04	3.30E-04	
		Front end loader	540 hp	0.8673	19	4.12E-03	1.10E-02	6.04E-02	3.03E-04	4.33E-04	3.98E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04	
			Front end loader	49 hp	4	1.13E-02	6.17E-02	1.03E-01	1.36E-04	3.51E-04	3.23E-04	
		Roller	47 hp	4	9.69E-03	5.86E-02	9.23E-02	1.33E-04	3.14E-04	2.89E-04		
		Water truck	3000 gal	4	6.13E-03	2.45E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04		
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04		
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.62E-02	5.08E-04	6.75E-04	6.21E-04		
36" Diversion Pipe - grade		Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.76E-04		
		Loader/backhoe	75 hp	0.0923	19	6.83E-05	8.40E-04	2.22E-03	3.68E-06	7.76E-06	7.14E-06	
		Crane 94'	155 hp	155	19	1.05E-01	4.33E-01	7.26E+00	1.30E-02	1.61E-02	1.48E-02	
		1 ton pickup truck	155	155	19	1.10E-02	3.00E-02	1.80E-01	2.22E-03	1.64E-02	6.69E-03	
		Crane 94'	155 hp	155	20	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02	
		1 ton pickup truck	155	155	20	1.04E-02	2.85E-02	1.71E-01	2.11E-03	1.56E-02	6.36E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	5.10E-02	2.69E-04	3.36E-04	3.09E-04	
Dewatering		Concrete saw	13 hp	8	23	6.49E-02	4.80E-02	2.37E+00	1.14E-04	3.36E-02	3.36E-02	
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	5.19E-01	9.33E-04	1.15E-03	1.06E-03	
		Flatbed truck	8	8	23	1.11E-03	2.14E-03	1.64E-02	9.29E-05	7.00E-04	2.85E-04	
		Generator	80 hp	5856	244	7.10E-01	6.11E+00	1.47E+01	2.92E-02	5.18E-02	4.77E-02	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.81E+00	2.91E-02	4.67E-02	4.29E-02
			Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.81E+00	2.91E-02	4.67E-02
		Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.81E+00	2.91E-02	4.67E-02	4.29E-02
			Armoring	1 ton pickup truck	1,0667	19	7.56E-05	2.07E-04	1.24E-03	1.53E-05	1.13E-04	4.61E-05
		Maintenance	Excavator	430 hp	1,0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04	3.75E-04
			1 ton pickup truck	1,0667	19	7.56E-05	2.07E-04	1.24E-03	1.53E-05	1.13E-04	4.61E-05	
			Grader	215 hp	144	210	2.33E-02	7.39E-02	4.32E-01	2.28E-03	2.79E-03	2.56E-03
		Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6,7805	22	8.98E-03	3.59E-02	1.70E-02	1.44E-04	2.47E-03
	Excavator			430 hp	4,445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03	1.35E-03
	Platform		Tractor/crawler/dozer	850 hp	3,2327	22	1.70E-02	5.57E-01	3.09E-01	1.55E-03	4.89E-03	4.49E-03
Tractor/crawler/dozer			440 hp	40	20	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02	1.52E-02	
Drilling	Tractor/crawler/dozer		440 hp	5	20	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03	1.89E-03	
	3/4 ton Pickup truck		20	20	2,06E-03	4.98E-03	3.30E-02	2.71E-04	2.03E-03	8.37E-04		
Cut with Diamond wire	Rotary drill		475 hp	34,0003	126	1.86E-02	7.54E-02	3.05E-01	1.57E-03	2.71E-03	2.50E-03	
	3/4 ton Pickup truck		34,0003	126	5.57E-04	1.34E-03	8.91E-03	7.31E-05	5.48E-04	2.26E-04		
Lift/Load blocks	Diamond cutting saw		50 hp	48	126	7.86E-04	1.90E-03	1.26E-02	1.03E-04	7.74E-04	3.19E-04	
	Crane 260'		375 hp	60,0214	126	1.23E-02	1.21E-01	1.54E-01	3.01E-04	5.05E-04	4.65E-04	
Load/Haul	3/4 ton Pickup truck		60,0214	126	9.83E-04	2.37E-03	1.57E-02	1.29E-04	9.68E-04	3.99E-04		
	Front end loader		350 hp	4	126	1.89E-03	5.06E-03	2.11E-02	1.03E-04	1.98E-04	1.82E-04	
Landfill	Water truck		3000 gal	507	126	1.17E-01	4.69E-01	2.23E-01	1.88E-03	3.23E-02	1.69E-02	
	Crane 260'		375 hp	30,0107	126	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03	1.01E-03	
Micro-blast	Crane 260'		375 hp	49	126	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03	1.64E-03	
	Horizontal boring drill		10 hp	55	126	1.72E-03	2.90E-02	2.34E-02	7.21E-05	1.19E-04	1.10E-04	
Demolish spillway	3/4 ton Pickup truck		60	60	126	9.82E-04	2.37E-03	1.57E-02	1.29E-04	9.67E-04	3.98E-04	
	Crane 260'		375 hp	20	126	4.93E-03	2.03E-02	8.58E-02	4.21E-04	7.29E-04	6.70E-04	
	Air compressor		50 hp	40	126	4.66E-02	5.34E-02	4.33E+00	2.61E-04	1.65E-03	1.64E-03	
	3/4 ton Pickup truck		20	20	126	3.27E-04	7.91E-04	5.24E-03	4.30E-05	3.22E-04	1.33E-04	
					<b>3.14E+00</b>	<b>1.56E+01</b>	<b>6.58E+01</b>	<b>2.09E-01</b>	<b>4.99E-01</b>	<b>3.97E-01</b>		

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

Malibu Creek Ecosystem Restoration Feasibility Study  
 Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2035  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2035 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
	Chain saw		1,7209	19	2.509	0.115	13.187	0.001	0.021	0.021	35.643	0.156	0.039	
	Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.625	0.003	0.004	0.004	312.041	0.011	0.000	
		Tractor/crawler/dozer	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000	
		Brush chipper	0.8673	19	0.108	0.207	0.797	0.005	0.008	0.007	424.504	0.010	0.000	
		Front end loader	0.8673	19	0.038	0.102	0.625	0.003	0.004	0.004	312.041	0.011	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Front end loader	49 hp	4	0.269	1.380	2.372	0.003	0.008	0.008	231.302	0.024	0.000	
		Roller	47 hp	4	0.054	1.087	2.268	0.003	0.004	0.004	235.535	0.022	0.000	
		Water truck	3000 gal	4	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Excavator	300 hp	4	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
		Front end loader	180 hp	4	0.038	0.102	0.576	0.003	0.004	0.004	270.067	0.010	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Loader/backhoe	75 hp	0.0923	0.043	0.523	1.383	0.002	0.005	0.004	195.357	0.010	0.000	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		1 ton pickup truck	155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		1 ton pickup truck	155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
	Dewatering	Concrete saw	13 hp	8	3.251	2.403	118.829	0.006	1.685	1.681	200.948	0.184	0.193	
		Crane 80'	130 hp	16	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		Flatbed truck	8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.091	0.728	1.764	0.003	0.006	0.006	294.375	0.008	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.575	0.003	0.004	0.004	286.944	0.010	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.575	0.003	0.004	0.004	286.944	0.010	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.575	0.003	0.004	0.004	286.944	0.010	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.575	0.003	0.004	0.004	286.944	0.010	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.575	0.003	0.004	0.004	286.944	0.010	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
		1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.665	0.004	0.004	0.004	311.993	0.011	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Excavator	430 hp	4.445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.031	0.102	0.610	0.003	0.009	0.008	304.481	0.011	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
		3/4 ton Pickup truck		20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.033	0.133	0.544	0.003	0.005	0.004	283.590	0.009	0.000
		3/4 ton Pickup truck		34.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.162	1.465	1.921	0.004	0.006	0.006	277.562	0.015	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		3/4 ton Pickup truck		60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.430	0.002	0.004	0.004	214.817	0.008	0.000
		Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Horizontal boring drill	10 hp	55	126	0.089	1.506	2.597	0.004	0.006	0.006	278.915	0.025	0.000
		3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Air compressor	50 hp	40	126	0.731	0.811	70.045	0.004	0.024	0.023	307.054	0.041	0.062
		3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
<b>Total</b>														

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2035  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2035 (tons per year)											Metric Tons CO2e/yr		
					GWP													
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e				
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01			
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01			
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01			
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01			
	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02			
		Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01	1.40E-01		
		Chain saw		1,7209	19	4.00E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.49E-06	6.24E-07	8.13E-04	7.38E-04		
		Brush Piling	Front end loader	540 hp	0.8673	19	1.96E-05	5.24E-05	3.23E-04	1.62E-06	2.06E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01		
			Tractor/crawler/dozer	310 hp	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.84E-07	1.26E-06	6.96E-02	2.53E-06	-	6.97E-02	6.32E-02		
			Brush chipper	250 hp	0.8673	19	2.59E-05	4.95E-05	1.90E-04	1.14E-06	1.87E-06	1.01E-01	2.34E-06	-	1.02E-01	9.21E-02		
			Front end loader	540 hp	0.8673	19	1.96E-05	5.24E-05	3.23E-04	1.62E-06	2.06E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01		
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01	
			Front end loader	49 hp	4	19	5.82E-05	2.98E-04	5.12E-04	6.46E-07	1.76E-06	1.62E-06	5.00E-02	5.25E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	19	1.12E-05	2.25E-04	4.70E-04	6.31E-07	8.61E-07	7.92E-07	4.88E-02	4.65E-06	-	4.89E-02	4.44E-02		
		Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02		
		Excavator	300 hp	4	19	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01	2.54E-01		
			Front end loader	180 hp	4	19	3.05E-05	8.10E-05	4.57E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	7.79E-06	-	2.15E-01	1.95E-01	
			Tractor/crawler/dozer	180 hp	6	19	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.30E-05	-	3.59E-01	3.25E-01	
		36" Diversion Pipe - grade	Loader/backhoe	75 hp	0.0923	19	3.25E-07	3.99E-06	1.06E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.94E-08	-	1.49E-03	1.35E-03	
			Crane 94'	155 hp	155	19	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
			1 ton pickup truck	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	3.17E-05	7.79E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
			Crane 94'	155 hp	155	20	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
			1 ton pickup truck	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	3.17E-05	7.79E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
			Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01
			Concrete saw	13 hp	8	23	3.73E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02	
			Dewatering	Crane 80'	130 hp	16	23	4.32E-05	1.78E-04	2.99E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01	4.33E-01
				Flatbed truck	8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
				Generator	80 hp	5856	244	4.71E-02	3.76E-01	9.11E-01	1.78E-03	3.32E-03	3.05E-03	1.52E+02	4.25E-03	-	1.52E+02	1.38E+02
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.00E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
			Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.00E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
			Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.00E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
			Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.00E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
			Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	3.00E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01
			Armoring	1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
				Excavator	430 hp	1.0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02	
			1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02		
		Maintenance	Grader	215 hp	144	210	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.87E-04	-	1.07E+01	9.47E+00	
	Demolition	Excavation for Dam Demolition	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01	
		Excavator	430 hp	4.445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	7.43E-06	4.46E-01	1.62E-05	-	4.47E-01	4.05E-01		
			Tractor/crawler/dozer	850 hp	3.2327	22	9.36E-05	3.06E-03	1.85E-03	9.27E-06	2.69E-05	2.47E-05	9.22E-01	3.35E-05	-	9.23E-01	8.37E-01	
			Tractor/crawler/dozer	440 hp	40	20	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.66E+00	1.66E-04	-	4.66E+00	4.14E+00	
			Tractor/crawler/dozer	440 hp	5	20	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01	5.17E-01	
			3/4 ton Pickup truck		20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
			Rotary drill	475 hp	34.0003	126	5.85E-04	2.38E-03	9.88E-03	4.96E-05	8.55E-05	7.86E-05	5.05E+00	1.53E-04	-	5.05E+00	4.58E+00	
			3/4 ton Pickup truck		34.0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
			Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
			Diamond cutting saw	50 hp	48	126	4.29E-04	3.88E-03	5.08E-03	9.49E-06	1.68E-05	1.55E-05	7.34E-01	3.87E-05	-	7.35E-01	6.67E-01	
			Lift/Load blocks	Crane 260'	375 hp	60.0214	126	4.66E-04	1.92E-03	8.11E-03	3.97E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	3.68E+00
				3/4 ton Pickup truck	60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
				Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.64E-04	3.25E-06	6.24E-06	3.32E-01	1.21E-05	-	3.32E-01	3.01E-01	
				Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+00	2.85E-05	2.68E-05	1.18E+00	1.07E+00
				Crane 260'	375 hp	30.0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	3.17E-05	2.02E+00	7.36E-05	-	2.03E+00	1.84E+00
				Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.62E-03	3.25E-05	5.62E-05	5.17E-05	3.31E+00	1.20E-04	-	3.31E+00	3.00E+00
				Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	1.57E-03	2.19E-06	3.76E-06	3.46E-06	1.69E-01	1.53E-05	-	1.69E-01	1.54E-01
				3/4 ton Pickup truck	60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
				Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.70E-03	1.32E-05	2.30E-05	2.11E-05	1.35E+00	4.91E-05	-	1.35E+00	1.23E+00
				Air compressor	50 hp	40	126	1.61E-03	1.79E-03	1.54E-01	8.23E-06	5.19E-05	5.17E-05	6.77E-01	9.09E-05	1.36E-04	7.21E-01	6.54E-01
				3/4 ton Pickup truck	20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
								<b>7.80E-02</b>	<b>4.96E-01</b>	<b>1.39E+00</b>	<b>3.25E-03</b>	<b>1.03E-02</b>	<b>7.42E-03</b>	<b>3.42E+02</b>	<b>1.14E-02</b>	<b>1.84E-03</b>	<b>3.43E+02</b>	<b>3.11E+02</b>



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2035  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2035 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03
	Fish relocation	3/4 ton pickup truck	16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05
	Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.41E-02	3.38E-04	4.23E-04	3.89E-04
	Chain saw		1,7209	19	8.42E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05
	Brush Piling	Front end loader	0.8673	19	4.12E-03	1.10E-02	6.79E-02	3.41E-04	4.33E-04	3.98E-04
		Tractor/crawler/dozer	0.8673	19	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04
	Chipping	Brush chipper	0.8673	19	5.46E-03	1.04E-02	4.01E-02	2.40E-04	3.93E-04	3.61E-04
		Front end loader	0.8673	19	4.12E-03	1.10E-02	6.79E-02	3.41E-04	4.33E-04	3.98E-04
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04
		Front end loader	49 hp	4	1.23E-02	6.27E-02	1.08E-01	1.36E-04	3.71E-04	3.41E-04
		Roller	47 hp	4	2.35E-03	4.74E-02	9.89E-02	1.33E-04	1.81E-04	1.67E-04
		Water truck	3000 gal	4	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.62E-02	5.08E-04	6.75E-04	6.21E-04
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.76E-04
		Loader/backhoe	75 hp	0.0923	6.83E-05	8.40E-04	2.22E-03	3.68E-06	7.76E-06	7.14E-06
		Crane 94'	155 hp	155	1.05E-01	4.33E-01	7.26E+00	1.31E-02	1.61E-02	1.48E-02
		1 ton pickup truck	155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03
		Crane 94'	155 hp	155	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02
		1 ton pickup truck	155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	5.10E-02	2.69E-04	3.36E-04	3.09E-04
	Dewatering	Concrete saw	13 hp	8	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	5.19E-01	9.33E-04	1.15E-03
		Flatbed truck	8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04
		Generator	80 hp	5856	244	7.72E-01	6.16E+00	1.49E+01	2.92E-02	5.44E-02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.31E+00	3.17E-02	4.67E-02
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.31E+00	3.17E-02	4.67E-02
		Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.31E+00	3.17E-02	4.67E-02
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.31E+00	3.17E-02	4.67E-02
	Armoring	1 ton pickup truck	1.0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05
		Excavator	430 hp	1.0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04
		1 ton pickup truck	1.0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05
	Maintenance	Grader	215 hp	144	210	2.33E-02	7.39E-02	4.32E-01	2.28E-03	2.79E-03
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03
		Excavator	430 hp	4.445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03
		Tractor/crawler/dozer	850 hp	3.2327	22	1.70E-02	5.57E-01	3.36E-01	1.69E-03	4.89E-03
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02
		Tractor/crawler/dozer	440 hp	5	20	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03
		3/4 ton Pickup truck	20	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	
	Drilling	Rotary drill	34.0003	126	1.86E-02	7.54E-02	3.07E-01	1.57E-03	2.71E-03	
		3/4 ton Pickup truck	34.0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04
		Diamond cutting saw	50 hp	48	126	1.36E-02	1.23E-01	1.61E-01	3.01E-04	5.34E-04
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	1.48E-02	6.10E-02	2.58E-01	1.26E-03	2.19E-03
		3/4 ton Pickup truck	60.0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	
	Load/Haul	Front end loader	350 hp	4	126	1.89E-03	5.06E-03	2.11E-02	1.03E-04	1.98E-04
		Water truck	3000 gal	507	126	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02
	Landfill	Crane 260'	375 hp	30.0107	126	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03
	Micro-blast	Crane 260'	375 hp	49	126	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03
		Horizontal boring drill	10 hp	55	126	1.72E-03	2.90E-02	5.00E-02	6.94E-05	1.19E-04
		3/4 ton Pickup truck	60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	4.93E-03	2.03E-02	8.58E-02	4.20E-04	7.29E-04
		Air compressor	50 hp	40	126	5.11E-02	5.67E-02	4.90E+00	2.61E-04	1.65E-03
		3/4 ton Pickup truck	20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	
					<b>3.20E+00</b>	<b>1.57E+01</b>	<b>6.86E+01</b>	<b>2.20E-01</b>	<b>5.01E-01</b>	<b>3.99E-01</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2037 (g/hp-hr or g/hr)									
					VOc	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
Environmental protection measures	Biologist		709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Fish relocation		16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
	Chain saw		1,7209	19	2.716	0.115	13.188	0.001	0.021	0.021	35.643	0.156	0.039	
	Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.627	0.003	0.004	0.004	312.041	0.011	0.000	
		Tractor/crawler/dozer	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000	
		Brush chipper	0.8673	19	0.107	0.191	0.739	0.004	0.007	0.007	424.504	0.010	0.000	
		Front end loader	0.8673	19	0.038	0.102	0.627	0.003	0.004	0.004	312.041	0.011	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Front end loader	49 hp	4	0.284	1.397	2.455	0.003	0.008	0.008	231.302	0.024	0.000	
		Roller	47 hp	4	0.054	1.087	2.412	0.003	0.004	0.004	235.510	0.025	0.000	
		Water truck	3000 gal	4	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Excavator	300 hp	4	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
		Front end loader	180 hp	4	0.038	0.102	0.576	0.003	0.004	0.004	270.067	0.010	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Loader/backhoe	75 hp	0.0923	0.043	0.523	1.383	0.002	0.005	0.004	195.357	0.010	0.000	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		1 ton pickup truck	155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Crane 94'	155 hp	155	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		1 ton pickup truck	155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
	Dewatering	Concrete saw	13 hp	8	3.251	2.403	118.834	0.006	1.685	1.681	200.957	0.184	0.193	
		Crane 80'	130 hp	16	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000	
		Flatbed truck	8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135	
		Generator	80 hp	5856	244	0.099	0.734	1.793	0.003	0.007	0.006	294.375	0.008	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.516	0.003	0.004	0.004	286.944	0.010	0.000
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.516	0.003	0.004	0.004	286.944	0.010	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.516	0.003	0.004	0.004	286.944	0.010	0.000
		Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.516	0.003	0.004	0.004	286.944	0.010	0.000
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.516	0.003	0.004	0.004	286.944	0.010	0.000
	Armoring	1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Excavator	430 hp	1.0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
		1 ton pickup truck	1.0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.665	0.004	0.004	0.004	311.993	0.011	0.000
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Excavator	430 hp	4.445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
		Tractor/crawler/dozer	850 hp	3.2327	22	0.031	0.102	0.548	0.003	0.009	0.008	304.481	0.011	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
		Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
		3/4 ton Pickup truck		20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34.0003	126	0.033	0.133	0.549	0.003	0.005	0.004	283.590	0.009	0.000
		3/4 ton Pickup truck		34.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	126	0.178	1.484	2.012	0.004	0.007	0.006	277.562	0.015	0.000
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		3/4 ton Pickup truck		60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.430	0.002	0.004	0.004	214.817	0.008	0.000
		Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30.0107	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Horizontal boring drill	10 hp	55	126	0.089	1.506	2.664	0.004	0.006	0.006	278.915	0.025	0.000
		3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Air compressor	50 hp	40	126	0.796	0.858	78.260	0.004	0.024	0.023	307.242	0.045	0.064
		3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
<b>Total</b>														

\* 5-ft dam demolition would occur after dewatering well pumps are tested and area dewatered; could occur anytime after dewatering completed and area excavated; would not take entire 6 months shown, but could happen within this time frame

Data from AR3\_EnvrAirQualityReport.pdf

- Haul trips
- Change from Alt 2
- On-highway vehicles

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2037 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01		
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	1.93E-05	8.97E-05	3.96E+01	3.59E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01		
	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02		
	Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01	1.30E-01		
	Chain saw		1,7209	19	4.33E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.49E-06	6.24E-07	8.13E-04	7.38E-04		
	Brush Piling	Front end loader	0.8673	19	1.96E-05	5.24E-05	3.24E-04	1.62E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01		
		Tractor/crawler/dozer	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.84E-07	1.26E-06	1.16E-06	6.96E-02	2.53E-06	-	6.97E-02	6.32E-02		
		Brush chipper	0.8673	19	2.57E-05	4.55E-05	1.77E-04	1.04E-06	1.74E-06	1.60E-06	1.01E-01	2.34E-06	-	1.02E-01	9.21E-02		
		Front end loader	0.8673	19	1.96E-05	5.24E-05	3.24E-04	1.62E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01		
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01		
		Front end loader	49 hp	4	6.13E-05	3.02E-04	5.30E-04	6.46E-07	1.83E-06	1.68E-06	5.00E-02	5.25E-06	-	5.01E-02	4.54E-02		
		Roller	47 hp	4	1.12E-05	2.25E-04	5.00E-04	6.31E-07	8.61E-07	7.92E-07	4.88E-02	5.12E-06	-	4.89E-02	4.44E-02		
		Water truck	3000 gal	4	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02		
		Excavator	300 hp	4	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01	2.54E-01		
		Front end loader	180 hp	4	3.05E-05	8.10E-05	4.57E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	7.79E-06	-	2.15E-01	1.95E-01		
		Tractor/crawler/dozer	180 hp	6	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.30E-05	-	3.59E-01	3.25E-01		
	36" Diversion Pipe - grad	Loader/backhoe	75 hp	0.0923	3.25E-07	3.99E-06	1.05E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.94E-08	-	1.49E-03	1.35E-03		
		Crane 94'	155 hp	155	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00		
		1 ton pickup truck	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
		Crane 94'	155 hp	155	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00		
		1 ton pickup truck	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01	
		Concrete saw	13 hp	8	2.37E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02		
	Dewatering	Crane 80'	130 hp	16	4.32E-05	1.78E-04	2.98E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01	4.33E-01		
		Flatbed truck		8	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01		
		Generator	80 hp	5856	244	5.09E-02	3.79E-01	9.26E-01	1.78E-03	3.48E-03	3.20E-03	1.52E+02	4.25E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.69E-02	1.35E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.69E-02	1.35E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
		Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.69E-02	1.35E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.69E-02	1.35E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
	Armoring	1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02		
		Excavator	430 hp	1.0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02		
		1 ton pickup truck	1.0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02		
	Maintenance	Grader	215 hp	144	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.87E-04	-	1.07E+01	9.47E+00		
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01	
		Excavator	430 hp	4.445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	4.46E-01	1.62E-05	-	4.47E-01	4.05E-01		
		Tractor/crawler/dozer	850 hp	3.2327	22	9.36E-05	3.06E-03	1.66E-03	8.33E-06	2.69E-05	2.47E-05	9.22E-01	3.35E-05	-	9.23E-01	8.37E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.66E-04	-	4.56E+00	4.14E+00		
		Tractor/crawler/dozer	440 hp	5	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01	5.17E-01		
		3/4 ton Pickup truck		20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01		
	Drilling	Rotary drill	475 hp	34.0003	126	5.85E-04	2.38E-03	9.77E-03	4.97E-05	8.55E-05	7.86E-05	5.05E+00	1.53E-04	-	5.05E+00	4.58E+00	
		3/4 ton Pickup truck		34.0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
		Cut with Diamond wire	Diamond cutting saw	50 hp	48	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
				48	126	4.71E-04	3.93E-03	5.32E-03	9.49E-06	1.77E-05	1.63E-05	7.34E-01	3.87E-05	-	7.35E-01	6.67E-01	
		Lift/Load blocks	Crane 260'	375 hp	60.0214	126	4.66E-04	1.92E-03	8.12E-03	3.98E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	3.68E+00
				60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
		Load/Haul	Front end loader	350 hp	4	5.94E-05	1.59E-04	6.64E-04	3.25E-06	6.24E-06	5.74E-06	3.32E-01	1.21E-05	-	3.32E-01	3.01E-01	
			Water truck	3000 gal	507	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
		Landfill	Crane 260'	375 hp	30.0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	2.02E+00	7.36E-05	-	2.03E+00	1.84E+00	
		Micro-blast	Crane 260'	375 hp	49	3.80E-04	1.57E-03	6.63E-03	3.25E-05	5.62E-05	5.17E-05	3.31E+00	1.20E-04	-	3.31E+00	3.00E+00	
			Horizontal boring drill	10 hp	55	5.41E-05	9.13E-04	1.61E-03	2.20E-06	3.76E-06	1.69E-01	1.53E-05	-	1.69E-01	1.54E-01		
			3/4 ton Pickup truck	60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
		Demolish spillway	Crane 260'	375 hp	20	1.55E-04	6.40E-04	2.70E-03	1.33E-05	2.30E-05	2.11E-05	1.35E+00	4.91E-05	-	1.35E+00	1.23E+00	
			Air compressor	50 hp	40	1.75E-03	1.89E-03	1.73E-01	8.24E-06	5.19E-05	5.18E-05	6.77E-01	9.91E-05	1.40E-04	7.23E-01	6.56E-01	
			3/4 ton Pickup truck	20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>8.20E-02</b>	<b>4.99E-01</b>	<b>1.41E+00</b>	<b>3.18E-03</b>	<b>1.05E-02</b>	<b>7.57E-03</b>	<b>3.42E+02</b>	<b>1.14E-02</b>	<b>1.84E-03</b>	<b>3.43E+02</b>	<b>3.11E+02</b>		

\* 5-ft dam demolition would occur after dewatering well pumps are tested and area dewatered; could occur anytime after dewatering comp

Data from AR3\_EnvrAirQualityReport.pdf

- Haul trips
- Change from Alt 2
- On-highway vehicles

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2037  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2037 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04		
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04		
	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05		
		Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.41E-02	3.38E-04	4.23E-04	3.89E-04	
		Chain saw	1,7209	19	9.11E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05		
	Brush Piling	Front end loader	540 hp	0.8673	19	4.12E-03	1.10E-02	6.81E-02	3.42E-04	4.33E-04	3.98E-04	
		Tractor/crawler/dozer	310 hp	0.8673	19	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04	
	Chipping	Brush chipper	250 hp	0.8673	19	5.41E-03	9.59E-03	3.72E-02	2.18E-04	3.67E-04	3.38E-04	
		Front end loader	540 hp	0.8673	19	4.12E-03	1.10E-02	6.81E-02	3.42E-04	4.33E-04	3.98E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04	
			Front end loader	49 hp	4	1.29E-02	6.35E-02	1.12E-01	1.36E-04	3.85E-04	3.54E-04	
		Roller	47 hp	4	2.35E-03	4.74E-02	1.05E-01	1.33E-04	1.81E-04	1.67E-04		
		Water truck	3000 gal	4	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04		
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04		
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.62E-02	5.08E-04	6.75E-04	6.21E-04		
36" Diversion Pipe - grade		Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.76E-04		
		Loader/backhoe	75 hp	0.0923	19	6.83E-05	8.40E-04	2.22E-03	3.68E-06	7.76E-06	7.14E-06	
		Crane 94'	155 hp	155	19	1.05E-01	4.33E-01	7.26E+00	1.30E-02	1.61E-02	1.48E-02	
		1 ton pickup truck	155	155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03	
		Crane 94'	155 hp	155	20	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02	
		1 ton pickup truck	155	155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	5.10E-02	2.69E-04	3.36E-04	3.09E-04	
Dewatering		Concrete saw	13 hp	8	23	6.48E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02	
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	5.19E-01	9.33E-04	1.15E-03	1.06E-03	
		Flatbed truck	8	8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04	
		Generator	80 hp	5856	244	8.35E-01	6.22E+00	1.52E+01	2.92E-02	5.71E-02	5.25E-02	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
			Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
		Push	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
			Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
		Build road	Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
			Tractor/crawler/dozer	600 hp	78,8462	19	3.40E-01	1.28E+00	5.67E+00	2.84E-02	4.67E-02	4.29E-02
		Armoring	1 ton pickup truck	1,0667	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05
			Excavator	430 hp	1,0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04	3.75E-04
		1 ton pickup truck	1,0667	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05	
		Maintenance	Grader	215 hp	144	210	2.33E-02	7.39E-02	4.32E-01	2.28E-03	2.79E-03	2.56E-03
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03	
		Excavator	430 hp	4,445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03	1.35E-03	
		Tractor/crawler/dozer	850 hp	3,2327	22	1.70E-02	5.57E-01	3.02E-01	1.51E-03	4.89E-03	4.49E-03	
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02	1.52E-02	
		Tractor/crawler/dozer	440 hp	5	20	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03	1.89E-03	
		3/4 ton Pickup truck	20	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	8.28E-04		
	Drilling	Rotary drill	475 hp	34,0003	126	1.86E-02	7.54E-02	3.10E-01	1.58E-03	2.71E-03	2.50E-03	
		3/4 ton Pickup truck	34,0003	34,0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	2.23E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	48	126	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04	3.15E-04	
		Diamond cutting saw	50 hp	48	126	1.49E-02	1.25E-01	1.69E-01	3.01E-04	5.62E-04	5.17E-04	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.48E-02	6.10E-02	2.58E-01	1.26E-03	2.19E-03	2.01E-03	
		3/4 ton Pickup truck	60,0214	60,0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Load/Haul	Front end loader	350 hp	4	126	1.89E-03	5.06E-03	2.11E-02	1.03E-04	1.98E-04	1.82E-04	
		Water truck	3000 gal	507	126	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30,0107	126	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03	1.01E-03	
		Micro-blast	375 hp	49	126	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03	1.64E-03	
		Horizontal boring drill	10 hp	55	126	1.72E-03	2.90E-02	5.13E-02	6.97E-05	1.19E-04	1.10E-04	
	Demolish spillway	3/4 ton Pickup truck	60	60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
		Crane 260'	375 hp	20	126	4.93E-03	2.03E-02	8.59E-02	4.21E-04	7.29E-04	6.70E-04	
		Air compressor	50 hp	40	126	5.57E-02	6.01E-02	5.48E+00	2.61E-04	1.65E-03	1.64E-03	
		3/4 ton Pickup truck	20	20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	1.31E-04	
						<b>3.27E+00</b>	<b>1.57E+01</b>	<b>6.69E+01</b>	<b>2.07E-01</b>	<b>5.04E-01</b>	<b>4.02E-01</b>	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

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\* 5-ft dam demolition would occur after dewatering well pumps are tested and area dewatered; could occur anytime after dewatering comp

Data from AR3\_EnvrAirQualityReport.pdf

Haul trips  
Change from Alt 2  
On-highway vehicles

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2039 (g/hp-hr or g/hr)								
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
Environmental protection measures	Biologist		709	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Fish relocation		16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
Clear Vegetation	Cutting		1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	1,7208	19	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000
	Chain saw		1,7209	19	2.923	0.115	13.188	0.001	0.021	0.021	35.643	0.156	0.039
	Brush Piling		0.8673	19	0.038	0.102	0.631	0.003	0.004	0.004	312.041	0.011	0.000
	Tractor/crawler/dozer	540 hp	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
	Brush chipper	250 hp	0.8673	19	0.124	0.205	0.804	0.005	0.008	0.007	424.504	0.010	0.000
	Tractor/crawler/dozer	540 hp	0.8673	19	0.038	0.102	0.631	0.003	0.004	0.004	312.041	0.011	0.000
Dewatering	Temporary Cofferdam			2	19	0.031	0.116	0.642	0.003	0.004	301.144	0.011	0.000
	Front end loader			4	19	0.284	1.397	2.455	0.003	0.008	231.302	0.024	0.000
	Roller			4	19	0.054	1.087	2.500	0.003	0.004	235.501	0.026	0.000
	Water truck	3000 gal	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Excavator	300 hp	4	19	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
	Front end loader	180 hp	4	19	0.038	0.102	0.576	0.003	0.004	0.004	270.067	0.010	0.000
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	0.031	0.116	0.642	0.003	0.004	301.144	0.011	0.000
	Loader/backhoe	75 hp	0.0923	19	0.043	0.523	1.383	0.002	0.005	0.004	195.357	0.010	0.000
	Crane 94'	155 hp	155	19	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
	1 ton pickup truck		155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Crane 94'	155 hp	155	20	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
	1 ton pickup truck		155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.031	0.116	0.642	0.003	0.004	301.144	0.011	0.000
	Dewatering	Concrete saw	13 hp	8	23	3.254	2.405	118.923	0.006	1.686	201.107	0.184	0.193
	Crane 80'	130 hp	16	23	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
	Flatbed truck		8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135
	Generator	80 hp	5856	244	0.106	0.741	1.821	0.003	0.007	0.006	294.375	0.008	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	0.031	0.117	0.574	0.003	0.004	286.944	0.010	0.000
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	0.031	0.117	0.574	0.003	0.004	286.944	0.010	0.000
	Tractor/crawler/dozer	600 hp	78,8462	19	0.031	0.117	0.574	0.003	0.004	0.004	286.944	0.010	0.000
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	0.031	0.117	0.574	0.003	0.004	286.944	0.010	0.000
	Armoring	1 ton pickup truck	1,0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Excavator	430 hp	1,0667	19	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
	1 ton pickup truck		1,0667	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056
	Maintenance	Grader	215 hp	144	210	0.036	0.114	0.665	0.004	0.004	311.993	0.011	0.000
Demolition	Excavation for Dam Demol	Asphalt distributor	3000 gal	6,7805	22	6.605	26.471	12.542	0.106	1.821	21,147.638	0.051	0.048
	Excavator	430 hp	4,445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
	Tractor/crawler/dozer	850 hp	3,2327	22	0.031	0.102	0.609	0.003	0.009	0.008	304.481	0.011	0.000
	Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	234.974	0.009	0.000
	Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
	3/4 ton Pickup truck		20	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Drilling	Rotary drill	475 hp	34,0003	126	0.033	0.133	0.556	0.003	0.005	283.590	0.009	0.000
	3/4 ton Pickup truck		34,0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Diamond cutting saw	50 hp	48	126	0.194	1.503	2.103	0.004	0.007	0.006	277.562	0.015	0.000
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	0.019	0.077	0.327	0.002	0.003	163.228	0.006	0.000
	3/4 ton Pickup truck		60,0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.430	0.002	0.004	214.817	0.008	0.000
	Water truck	3000 gal	507	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
	Landfill	Crane 260'	375 hp	30,0107	126	0.019	0.077	0.327	0.002	0.003	163.228	0.006	0.000
	Micro-blast	Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	163.228	0.006	0.000
	Horizontal boring drill	10 hp	55	126	0.089	1.506	2.754	0.004	0.006	0.006	278.915	0.025	0.000
	3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
	Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	163.228	0.006	0.000
	Air compressor	50 hp	40	126	0.860	0.905	86.414	0.004	0.024	0.023	307.177	0.049	0.065
	3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
<b>Total</b>													

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2039 (tons per year)										Metric Tons CO2e/yr	
					GWP											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01	3.59E+01	
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	3.05E-04	8.20E-04	4.96E-03	4.80E-05	3.58E-04	1.47E-04	1.59E+01	1.58E-03	8.25E-04	1.62E+01	1.47E+01	
	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.36E-02	2.14E-02	
	Tractor/crawler/dozer	250 hp	1,7208	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01	1.30E-01	
	Chain saw		1,7209	19	4.66E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.49E-06	6.24E-07	8.13E-04	7.38E-04	
	Brush Piling	Front end loader	0.8673	19	1.96E-05	5.24E-05	3.25E-04	1.63E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01	
	Tractor/crawler/dozer	310 hp	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.83E-07	1.26E-06	1.16E-06	6.96E-02	2.53E-06	-	6.97E-02	6.32E-02	
	Brush chipper	250 hp	0.8673	19	2.96E-05	4.91E-05	1.92E-04	1.10E-06	1.91E-06	1.76E-06	1.01E-01	2.34E-06	-	1.02E-01	9.21E-02	
	Chipping	Front end loader	0.8673	19	1.96E-05	5.24E-05	3.25E-04	1.63E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01	1.46E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01	
	Front end loader	49 hp	4	19	6.13E-05	3.02E-04	5.30E-04	6.46E-07	1.83E-06	1.68E-06	5.00E-02	5.25E-06	-	5.01E-02	4.54E-02	
	Roller	47 hp	4	19	1.12E-05	2.25E-04	5.18E-04	6.31E-07	7.92E-07	7.92E-07	4.88E-02	5.41E-06	-	4.89E-02	4.44E-02	
	Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02	8.47E-02	
	Excavator	300 hp	4	19	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01	2.54E-01	
	Front end loader	180 hp	4	19	3.05E-05	8.10E-05	4.57E-04	2.41E-06	3.21E-06	2.95E-06	2.14E-01	7.79E-06	-	2.15E-01	1.95E-01	
	Tractor/crawler/dozer	180 hp	6	19	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	4.64E-06	3.59E-01	1.30E-05	-	3.59E-01	3.25E-01	
	36" Diversion Pipe - grad	Loader/backhoe	0.0923	19	3.25E-07	3.99E-06	1.06E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.94E-08	-	1.49E-03	1.35E-03	
	Crane 94'	155 hp	155	19	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Crane 94'	155 hp	155	20	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00	5.00E+00	
	1 ton pickup truck	155 hp	155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01	1.08E-01	
	Dewatering	Concrete saw	13 hp	8	23	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.22E-05	3.04E-02	2.75E-02
	Crane 80'	130 hp	16	23	4.32E-05	1.78E-04	2.98E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01	4.33E-01	
	Flatbed truck	1.15E-05	8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01	
	Generator	80 hp	5856	244	5.47E-02	3.82E-01	9.40E-01	1.78E-03	3.64E-03	3.35E-03	1.52E+02	4.25E-03	-	1.52E+02	1.38E+02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.99E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01
	Push	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.99E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01
	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.99E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01	
	Build road	Tractor/crawler/dozer	600 hp	78,8462	19	1.62E-03	6.08E-03	2.99E-02	1.50E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	1.36E+01
	Armoring	1 ton pickup truck	1,0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02	
	Excavator	430 hp	1,0667	19	1.48E-05	5.26E-05	2.15E-04	1.05E-06	1.94E-06	1.78E-06	1.07E-01	3.89E-06	-	1.07E-01	9.72E-02	
	1 ton pickup truck	1,0667	19	3.38E-07	9.30E-07	5.54E-06	7.25E-08	5.36E-07	2.18E-07	2.39E-02	2.38E-06	1.24E-06	2.44E-02	2.21E-02		
	Maintenance	Grader	215 hp	144	210	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.87E-04	-	1.07E+01	9.47E+00
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	1.43E-01
	Excavator	430 hp	4,445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	7.43E-06	4.46E-01	1.62E-05	-	4.47E-01	4.05E-01	
	Tractor/crawler/dozer	850 hp	3,2327	22	9.36E-05	3.06E-03	1.84E-03	9.26E-06	2.69E-05	2.47E-05	9.22E-01	3.35E-05	-	9.23E-01	8.37E-01	
	Platform	Tractor/crawler/dozer	440 hp	40	20	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.66E-04	-	4.56E+00	4.14E+00
	Tractor/crawler/dozer	440 hp	5	20	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01	5.17E-01	
	3/4 ton Pickup truck		20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
	Drilling	Rotary drill	34,0003	126	5.85E-04	2.38E-03	9.90E-03	5.00E-05	8.55E-05	7.86E-05	5.05E+00	1.53E-04	-	5.05E+00	4.58E+00	
	3/4 ton Pickup truck		34,0003	126	1.46E-05	3.93E-05	2.38E-04	2.30E-06	1.72E-05	7.04E-06	7.63E-01	7.59E-05	3.96E-05	7.77E-01	7.05E-01	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
	Diamond cutting saw	50 hp	48	126	5.13E-04	3.97E-03	5.56E-03	9.49E-06	1.86E-05	1.71E-05	7.34E-01	3.87E-05	-	7.35E-01	6.67E-01	
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	4.66E-04	1.92E-03	8.11E-03	3.97E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	3.68E+00
	3/4 ton Pickup truck		60,0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
	Load/Haul	Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.64E-04	3.25E-06	6.24E-06	3.32E-01	1.21E-05	-	3.32E-01	3.01E-01	
	Water truck	3000 gal	507	126	3.69E-03	1.48E-02	7.01E-03	5.92E-05	1.02E-03	5.33E-04	1.18E+01	2.85E-05	2.68E-05	1.18E+01	1.07E+01	
	Landfill	Crane 260'	375 hp	30,0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	2.02E+00	7.36E-05	-	2.03E+00	1.84E+00	
	Micro-blast	Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.62E-03	3.24E-05	5.62E-05	3.31E+00	1.20E-04	-	3.31E+00	3.00E+00	
	Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	1.67E-03	2.23E-06	3.76E-06	3.46E-06	1.69E-01	1.53E-05	-	1.69E-01	1.54E-01	
	3/4 ton Pickup truck		60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
	Demolish spillway	Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.70E-03	1.32E-05	2.30E-05	1.35E+00	4.91E-05	-	1.35E+00	1.23E+00	
	Air compressor	50 hp	40	126	1.90E-03	2.00E-03	1.91E-01	8.23E-06	5.19E-05	5.18E-05	6.77E-01	1.07E-04	1.44E-04	7.24E-01	6.57E-01	
	3/4 ton Pickup truck		20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01	4.15E-01	
					<b>8.60E-02</b>	<b>5.03E-01</b>	<b>1.46E+00</b>	<b>3.25E-03</b>	<b>1.07E-02</b>	<b>7.71E-03</b>	<b>3.42E+02</b>	<b>1.14E-02</b>	<b>1.85E-03</b>	<b>3.43E+02</b>	<b>3.11E+02</b>	

Data from AR3\_EnvrAirQualityReport.pdf

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episodes 3 through 21

Construction Start Year 2039  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2039 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Construction Survey	3/4 ton pickup truck		48	210	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04
Dust Control	Water truck	5000 gal	1696	210	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02
Environmental protection measures	Biologist	3/4 ton pickup truck	709	210	5.80E-03	1.56E-02	9.44E-02	9.14E-04	6.83E-03	2.80E-03
	Fish relocation	3/4 ton pickup truck	16	19	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04
Clear Vegetation	Cutting	1 ton pickup truck	1,0325	19	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05
	Tractor/crawler/dozer	250 hp	1,7208	19	3.08E-03	1.16E-02	6.41E-02	3.38E-04	4.23E-04	3.89E-04
	Chain saw		1,7209	19	9.80E-03	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05
	Brush Piling	Front end loader	0.8673	19	4.12E-03	1.10E-02	6.85E-02	3.44E-04	4.33E-04	3.98E-04
		Tractor/crawler/dozer	0.8673	19	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04
	Chipping	Brush chipper	0.8673	19	6.23E-03	1.03E-02	4.04E-02	2.33E-04	4.02E-04	3.69E-04
		Front end loader	0.8673	19	4.12E-03	1.10E-02	6.85E-02	3.44E-04	4.33E-04	3.98E-04
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04
		Front end loader	49 hp	4	1.29E-02	6.35E-02	1.12E-01	1.36E-04	3.85E-04	3.54E-04
		Roller	47 hp	4	2.35E-03	4.74E-02	1.09E-01	1.33E-04	1.81E-04	1.67E-04
		Water truck	3000 gal	4	6.13E-03	2.46E-02	1.16E-02	9.83E-05	1.69E-03	8.86E-04
		Excavator	300 hp	4	8.16E-03	2.90E-02	1.18E-01	5.79E-04	1.07E-03	9.82E-04
		Front end loader	180 hp	4	6.42E-03	1.71E-02	9.62E-02	5.08E-04	6.75E-04	6.21E-04
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.76E-04
		Loader/backhoe	75 hp	0.0923	6.83E-05	8.40E-04	2.22E-03	3.68E-06	7.76E-06	7.14E-06
		Crane 94'	155 hp	155	1.05E-01	4.33E-01	7.26E+00	1.30E-02	1.61E-02	1.48E-02
		1 ton pickup truck	155	19	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03
		Crane 94'	155 hp	155	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02
		1 ton pickup truck	155	20	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.45E-03	9.21E-03	5.10E-02	2.69E-04	3.36E-04	3.09E-04
	Dewatering	Concrete saw	13 hp	8	6.49E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02
		Crane 80'	130 hp	16	23	7.51E-03	3.09E-02	5.19E-01	9.33E-04	1.15E-03
		Flatbed truck	8	23	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04
		Generator	80 hp	5856	244	8.97E-01	6.27E+00	1.54E+01	2.92E-02	5.97E-02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.30E+00	3.16E-02	4.67E-02
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.30E+00	3.16E-02	4.67E-02
		Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.30E+00	3.16E-02	4.67E-02
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	3.40E-01	1.28E+00	6.30E+00	3.16E-02	4.67E-02
	Armoring	1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05
		Excavator	430 hp	1,0667	19	3.12E-03	1.11E-02	4.52E-02	2.21E-04	4.08E-04
		1 ton pickup truck	1,0667	19	7.12E-05	1.96E-04	1.17E-03	1.53E-05	1.13E-04	4.59E-05
	Maintenance	Grader	215 hp	144	210	2.33E-02	7.39E-02	4.32E-01	2.28E-03	2.79E-03
Demolition	Excavation for Dam Demo	Asphalt distributor	3000 gal	6,7805	22	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03
		Excavator	430 hp	4,445	22	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03
		Tractor/crawler/dozer	850 hp	3,2327	22	1.70E-02	5.57E-01	3.35E-01	1.68E-03	4.89E-03
	Platform	Tractor/crawler/dozer	440 hp	40	20	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02
		Tractor/crawler/dozer	440 hp	5	20	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03
		3/4 ton Pickup truck	20	20	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	
	Drilling	Rotary drill	475 hp	34,0003	126	1.86E-02	7.54E-02	3.14E-01	1.59E-03	2.71E-03
		3/4 ton Pickup truck	34,0003	126	4.64E-04	1.25E-03	7.54E-03	7.31E-05	5.46E-04	
		Cut with Diamond wire	3/4 ton Pickup truck	48	126	6.65E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04
		Diamond cutting saw	50 hp	48	126	1.63E-02	1.28E-01	1.77E-01	3.01E-04	5.91E-04
	Lift/Load blocks	Crane 260'	375 hp	60,0214	126	1.48E-02	6.10E-02	2.58E-01	1.26E-03	2.19E-03
		3/4 ton Pickup truck	60,0214	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	
	Load/Haul	Front end loader	350 hp	4	126	1.89E-03	5.06E-03	2.11E-02	1.03E-04	1.98E-04
		Water truck	3000 gal	507	126	1.17E-01	4.70E-01	2.23E-01	1.88E-03	3.23E-02
	Landfill	Crane 260'	375 hp	30,0107	126	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03
	Micro-blast	Crane 260'	375 hp	49	126	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03
		Horizontal boring drill	10 hp	55	126	1.72E-03	2.90E-02	5.30E-02	7.07E-05	1.19E-04
		3/4 ton Pickup truck	60	126	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	
	Demolish spillway	Crane 260'	375 hp	20	126	4.93E-03	2.03E-02	8.58E-02	4.20E-04	7.29E-04
		Air compressor	50 hp	40	126	6.02E-02	6.34E-02	6.05E+00	2.61E-04	1.65E-03
		3/4 ton Pickup truck	20	126	2.73E-04	7.34E-04	4.44E-03	4.30E-05	3.21E-04	
					<b>3.34E+00</b>	<b>1.58E+01</b>	<b>7.03E+01</b>	<b>2.19E-01</b>	<b>5.07E-01</b>	<b>4.04E-01</b>

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2021
Birthday of Martin Luther King, Jr.	1/18/2021
Washington's Birthday	2/15/2021
Memorial Day	5/31/2021
Independence Day	7/5/2021
Labor Day	9/6/2021
Columbus Day	10/11/2021
Veterans Day	11/11/2021
Thanksgiving Day	11/25/2021
Christmas Day	12/24/2021

10

Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2066 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Construction Survey	3/4 ton pickup truck		48	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
Dust Control	Water truck	5000 gal	1696	210	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056		
	Cutting	1 ton pickup truck	1,0325	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
		Tractor/crawler/dozer	250 hp	1,7209	19	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Chain saw		1,7209	19	3.026	0.115	13.188	0.001	0.021	0.021	35.643	0.156	0.039	
		Brush Piling	Front end loader	0.8673	19	0.038	0.102	0.566	0.003	0.004	0.004	312.041	0.011	0.000	
			Tractor/crawler/dozer	310 hp	0.8673	19	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
		Chipping	Brush chipper	0.8673	19	0.116	0.187	0.735	0.004	0.007	0.007	424.504	0.010	0.000	
			Front end loader	0.8673	19	0.038	0.102	0.566	0.003	0.004	0.004	312.041	0.011	0.000	
	Landscaping	Fish Passage	Excavator	454 hp	24	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
			Loader/backhoe	75 hp	24	0.043	0.523	1.383	0.002	0.005	0.004	195.357	0.010	0.000	
Dewatering		Tractor/crawler/dozer	440 hp	24	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000		
	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000		
		Front end loader	49 hp	4	0.284	1.397	2.455	0.003	0.008	0.008	231.302	0.024	0.000		
		Roller	47 hp	4	0.054	1.087	2.500	0.003	0.004	0.004	235.521	0.026	0.000		
		Water truck	3000 gal	4	19	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Excavator	300 hp	4	19	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
		Front end loader	180 hp	4	19	0.038	0.102	0.566	0.003	0.004	0.004	270.067	0.009	0.000	
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	0.031	0.116	0.642	0.003	0.004	301.144	0.011	0.000	
			Loader/backhoe	75 hp	0.0923	19	0.043	0.523	1.383	0.002	0.005	0.004	195.357	0.010	0.000
			Crane 94'	155 hp	155	19	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
			1 ton pickup truck	155	19	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
			Crane 94'	155 hp	155	20	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
			1 ton pickup truck	155	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	20	0.031	0.116	0.642	0.003	0.004	0.004	301.144	0.011	0.000	
		Dewatering	Concrete saw	13 hp	8	23	3.253	2.405	118.916	0.006	1.686	1.682	201.097	0.184	0.193
			Crane 80'	130 hp	16	23	0.019	0.078	1.302	0.002	0.003	0.003	208.063	0.008	0.000
			Flatbed truck	8	23	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135	
			Generator	80 hp	244	0.110	0.744	1.835	0.003	0.007	0.007	294.375	0.008	0.000	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.539	0.003	0.004	0.004	286.944	0.010	0.000
		Push	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.539	0.003	0.004	0.004	286.944	0.010	0.000
			Tractor/crawler/dozer	600 hp	78.8462	20	0.029	0.104	0.424	0.002	0.004	0.004	286.944	0.010	0.000
		Build road	Tractor/crawler/dozer	600 hp	78.8462	19	0.031	0.117	0.539	0.003	0.004	0.004	286.944	0.010	0.000
		Maintenance	Grader	215 hp	144	210	0.036	0.114	0.665	0.004	0.004	0.004	311.993	0.011	0.000
Dismantling		Tractor/crawler/dozer	600 hp	157.6923	20	0.031	0.117	0.539	0.003	0.004	0.004	286.944	0.010	0.000	
		Tractor/crawler/dozer	600 hp	157.6923	20	0.031	0.117	0.539	0.003	0.004	0.004	286.944	0.010	0.000	
		1 ton pickup truck		0.9333	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056	
		Excavator	430 hp	0.9333	20	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
		Excavator	300 hp	341.8667	20	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
Rindge Dam & Spillway Demolition*		1 ton pickup truck	0.9333	20	0.288	0.791	4.714	0.062	0.456	0.185	20,361.282	2.024	1.056		
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048	
		Excavator	430 hp	4.445	22	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000	
		Tractor/crawler/dozer	850 hp	3.2327	22	0.031	1.012	0.572	0.003	0.009	0.008	304.481	0.011	0.000	
		Platform	Tractor/crawler/dozer	440 hp	40	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
			Tractor/crawler/dozer	440 hp	5	20	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
			3/4 ton Pickup truck		20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
		Drilling	Rotary drill	475 hp	34.0003	126	0.033	0.133	0.535	0.003	0.005	0.004	283.590	0.009	0.000
			3/4 ton Pickup truck		30.0003	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
			Cut with Diamond wire	3/4 ton Pickup truck	48	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
			Diamond cutting saw	50 hp	48	126	0.202	1.512	2.149	0.004	0.007	0.007	277.562	0.015	0.000
		Load/Haul	Crane 260'	375 hp	60.0214	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
			3/4 ton Pickup truck		60.0214	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Load/Haul	Front end loader	350 hp	4	126	0.039	0.103	0.430	0.002	0.004	0.004	214.817	0.008	0.000
			Water truck	3000 gal	907	126	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Landfill	Crane 260'	375 hp	30.0107	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
			Crane 260'	375 hp	49	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Micro-blast	Horizontal boring drill	10 hp	55	126	0.089	1.506	2.687	0.004	0.006	0.006	278.915	0.025	0.000
			3/4 ton Pickup truck		60	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056
		Demolish spillway	Crane 260'	375 hp	20	126	0.019	0.077	0.327	0.002	0.003	0.003	163.228	0.006	0.000
		Air compressor	50 hp	40	126	0.892	0.929	90.470	0.004	0.024	0.023	307.077	0.050	0.066	
		3/4 ton Pickup truck		20	126	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	40	0.033	0.133	0.535	0.003	0.005	0.004	283.590	0.009	0.000	
		3/4 ton Pickup truck		128.7333	40	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
		Load/Haul	Front end loader	350 hp	34	40	0.039	0.103	0.430	0.002	0.004	0.004	214.817	0.008	0.000
			Water truck	3000 gal	15	40	6.605	26.471	12.542	0.106	1.821	0.954	21,147.638	0.051	0.048
		Fracture	Excavator	400 hp	540	40	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
			Excavator	300 hp	540	40	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
			Excavator	300 hp	270	40	0.029	0.104	0.424	0.002	0.004	0.004	211.859	0.008	0.000
			Tractor/crawler/dozer	440 hp	270	40	0.031	0.116	0.471	0.002	0.004	0.004	234.974	0.009	0.000
Road Improvement Plan		3/4 ton Pickup truck		540	40	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282	2.024	1.056	
	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	0.050	0.113	0.494	0.002	0.005	0.004	246.860	0.009	0.000	
		Line Striper	23 hp	92.576	20	0.188	0.447	8.453	0.002	0.018	0.018	230.360	0.011	0.024	
		Roller	70 hp	442.5143	20	0.031	0.515	1.577	0.003	0.004	0.004	222.771	0.010	0.000	
		Vibratory roller	33 hp	442.5143	20	0.089	1.506	2.687	0.004	0.006	0.006	274.411	0.027	0.000	
		Flatbed truck		92.576	20	0.630	1.299	9.351	0.061	0.456	0.185	20,361.282	4.604	2.135	
		3/4 ton Pickup truck		92.576	20	0.390	1.049	6.341	0.061	0.459	0.188	20,361.282			



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	GWP											
					Annual Emissions - 2066 (tons per year)											
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Construction Survey	3/4 ton pickup truck		48	210	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-06	1.10E+00		
Dust Control	Water truck	5000 gal	1696	210	1.23E-02	4.95E-02	2.34E-02	1.98E-04	3.40E-03	1.78E-03	3.95E+01	9.53E-05	8.97E-05	3.96E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	5.28E-04	1.42E-03	8.59E-03	8.32E-05	6.21E-04	2.54E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	6.88E-06	1.85E-05	1.12E-04	1.08E-06	8.09E-06	3.31E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01		
	1 ton pickup truck		1.0325	19	3.28E-07	9.00E-07	5.37E-06	7.02E-08	5.19E-07	2.11E-07	2.32E-02	2.30E-06	1.20E-06	2.35E-02		
	Tractor/crawler/dozer	250 hp	1.7209	19	1.46E-05	5.51E-05	3.04E-04	1.61E-06	2.01E-06	1.85E-06	1.43E-01	5.19E-06	-	1.43E-01		
	Chain saw		1.7209	19	4.82E-05	1.83E-06	2.10E-04	2.34E-08	3.31E-07	3.30E-07	5.68E-04	2.49E-06	6.24E-07	8.13E-04		
	Brush Piling	540 hp	0.8673	19	1.96E-05	5.24E-05	2.92E-04	1.47E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01		
	Tractor/crawler/dozer	310 hp	0.8673	19	9.17E-06	3.45E-05	1.39E-04	6.84E-07	1.26E-06	1.16E-06	6.96E-02	2.53E-06	-	6.97E-02		
	Brush chipper	250 hp	0.8673	19	2.78E-05	4.47E-05	1.76E-04	9.99E-07	1.75E-06	1.61E-06	1.01E-01	2.34E-06	-	1.02E-01		
	Front end loader	540 hp	0.8673	19	1.96E-05	5.24E-05	2.92E-04	1.47E-06	2.06E-06	1.89E-06	1.61E-01	5.86E-06	-	1.61E-01		
Landscaping	Fish Passage	Excavator	454 hp	24	3.52E-04	1.25E-03	5.10E-03	2.50E-05	4.60E-05	4.24E-05	2.54E+00	9.25E-05	-	2.55E+00		
	Loader/backhoe	75 hp	24	20	8.44E-05	1.04E-03	2.74E-03	4.55E-06	9.59E-06	8.92E-06	3.88E-01	2.06E-05	-	3.88E-01		
	Tractor/crawler/dozer	440 hp	24	20	3.60E-04	1.36E-03	5.48E-03	2.68E-05	4.94E-05	4.55E-05	2.74E+00	9.94E-05	-	2.74E+00		
	Tractor/crawler/dozer	180 hp	2	19	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01		
	Front end loader	49 hp	4	19	6.13E-05	3.02E-04	5.30E-04	6.46E-07	1.83E-06	1.68E-06	5.00E-02	5.25E-06	-	5.01E-02		
	Roller	47 hp	4	19	1.12E-05	2.25E-04	5.18E-04	6.31E-07	8.61E-07	7.92E-07	4.88E-02	5.41E-06	-	4.89E-02		
	Water truck	3000 gal	4	19	2.91E-05	1.17E-04	5.53E-05	4.67E-07	8.03E-06	4.21E-06	9.32E-02	2.25E-07	2.12E-07	9.33E-02		
	Excavator	300 hp	4	19	3.88E-05	1.38E-04	5.61E-04	2.75E-06	5.07E-06	4.67E-06	2.80E-01	1.02E-05	-	2.80E-01		
	Front end loader	180 hp	2	19	3.05E-05	8.10E-05	4.57E-04	2.41E-06	3.21E-06	2.14E-06	7.79E-06	-	-	2.15E-01		
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	3.67E-05	1.38E-04	7.64E-04	4.03E-06	5.04E-06	3.59E-01	1.30E-05	-	3.59E-01		
	Loader/backhoe	75 hp	0.0923	19	3.25E-07	3.99E-06	1.05E-05	1.75E-08	3.69E-08	3.39E-08	1.49E-03	7.94E-08	-	1.49E-03		
	Crane 94'	155 hp	155	19	4.98E-04	2.05E-03	8.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00		
	1 ton pickup truck		155	19	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	1.80E-04	-	3.54E+00		
	Crane 94'	155 hp	155	20	4.98E-04	2.05E-03	3.45E-02	6.20E-05	7.65E-05	7.04E-05	5.51E+00	2.00E-04	-	5.51E+00		
	1 ton pickup truck		155	20	4.92E-05	1.35E-04	8.05E-04	1.05E-05	7.79E-05	3.17E-05	3.48E+00	1.80E-04	-	3.54E+00		
	Tractor/crawler/dozer	180 hp	2	19	1.22E-05	4.61E-05	2.55E-04	1.34E-06	1.68E-06	1.55E-06	1.20E-01	4.35E-06	-	1.20E-01		
	Concrete saw	13 hp	8	23	3.75E-04	2.78E-04	1.38E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.22E-05	3.04E-02		
	Crane 80'	130 hp	16	23	4.32E-05	1.78E-04	2.98E-03	5.37E-06	6.63E-06	6.10E-06	4.77E-01	1.73E-05	-	4.77E-01		
	Flatbed truck		8	23	5.56E-06	1.15E-05	8.25E-05	5.35E-07	4.02E-06	1.63E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01		
	Generator	80 hp	5856	244	5.66E-02	3.84E-01	9.48E-01	1.78E-03	3.72E-03	3.42E-03	1.52E+02	4.25E-03	-	1.52E+02		
Temporary Access Road	Excavator	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.81E-02	1.41E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.81E-02	1.41E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	
	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.81E-02	1.41E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01		
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.62E-03	6.08E-03	2.81E-02	1.41E-04	2.22E-04	2.04E-04	1.50E+01	5.44E-04	-	1.50E+01	
	Maintenance	Grader	215 hp	144	210	1.23E-03	3.88E-03	2.27E-02	1.20E-04	1.46E-04	1.35E-04	1.06E+01	3.87E-04	-	1.07E+01	
	Dismantling	Tractor/crawler/dozer	600 hp	157.6923	20	3.23E-03	1.22E-02	5.62E-02	2.82E-04	4.43E-04	4.08E-04	2.99E+01	1.09E-03	-	2.99E+01	
	Tractor/crawler/dozer	600 hp	157.6923	20	3.23E-03	1.22E-02	5.62E-02	2.82E-04	4.43E-04	4.08E-04	2.99E+01	1.09E-03	-	2.99E+01		
	1 ton pickup truck		0.9333	20	2.96E-07	8.14E-07	4.85E-06	6.34E-08	4.69E-07	1.91E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02		
	Excavator	430 hp	0.9333	20	1.30E-05	4.60E-05	1.88E-04	9.20E-07	1.70E-06	1.56E-06	9.37E-02	3.41E-06	-	9.38E-02		
	Excavator	300 hp	341.6667	20	3.31E-03	8.17E-02	4.79E-02	2.33E-04	3.89E-04	4.33E-04	2.39E+01	8.70E-04	-	2.40E+01		
	1 ton pickup truck		0.9333	20	2.96E-07	8.14E-07	4.85E-06	6.34E-08	4.69E-07	1.91E-07	2.09E-02	2.08E-06	1.09E-06	2.13E-02		
Rindge Dam & Spillway Demolition*	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	4.94E-05	1.98E-04	9.37E-05	7.92E-07	1.36E-05	7.13E-06	1.58E-01	3.81E-07	3.59E-07	1.58E-01	
	Excavator	430 hp	4.445	22	6.18E-05	2.19E-04	8.94E-04	4.38E-06	8.08E-06	7.43E-06	4.46E-01	1.62E-05	-	4.47E-01		
	Tractor/crawler/dozer	850 hp	3.2327	22	9.36E-05	3.06E-03	1.73E-03	8.69E-06	2.69E-05	2.47E-05	9.22E-01	3.35E-05	-	9.23E-01		
	Platform	Tractor/crawler/dozer	440 hp	40	20	6.00E-04	2.26E-03	9.13E-03	4.47E-05	8.24E-05	7.58E-05	4.56E+00	1.66E-04	-	4.56E+00	
	Tractor/crawler/dozer	440 hp	5	20	7.50E-05	2.82E-04	1.14E-03	5.59E-06	1.03E-05	9.47E-06	5.70E-01	2.07E-05	-	5.70E-01		
	3/4 ton Pickup truck		20	20	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	2.33E-05	4.57E-01		
	Rotary drill	475 hp	34.0003	126	5.85E-04	2.38E-03	9.52E-03	4.79E-05	8.55E-05	7.89E-05	5.05E+00	1.53E-04	-	5.05E+00		
	3/4 ton Pickup truck		30.0003	126	1.29E-05	3.47E-05	2.10E-04	2.03E-06	1.52E-05	6.21E-06	6.73E-01	6.69E-05	3.49E-05	6.68E-01		
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	2.06E-05	5.55E-05	3.36E-04	3.25E-06	2.43E-05	9.93E-06	1.08E+00	1.07E-04	5.59E-05	1.10E+00		
	Diamond cutting saw	50 hp	48	126	5.34E-04	4.00E-03	5.68E-03	9.49E-06	1.90E-05	1.75E-05	7.34E-01	3.87E-05	-	7.35E-01		
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	4.66E-04	1.92E-03	8.11E-03	3.97E-05	6.89E-05	6.34E-05	4.05E+00	1.47E-04	-	4.05E+00	
	3/4 ton Pickup truck		60.0214	126	2.58E-05	6.94E-05	4.20E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00		
	Load/Haul	Front end loader	350 hp	4	126	5.94E-05	1.59E-04	6.64E-04	3.25E-06	6.24E-06	5.74E-06	3.32E-01	1.21E-05	-	3.32E-01	
	Water truck	3000 gal	907	126	3.89E-03	1.48E-02	7.01E-03	1.02E-03	5.33E-04	5.33E-04	1.18E+01	2.85E-05	-	1.18E+01		
	Landfill	Crane 260'	375 hp	30.0107	126	2.33E-04	9.60E-04	4.06E-03	1.99E-05	3.44E-05	2.02E+00	7.36E-05	-	2.03E+00		
	Micro-blast	Crane 260'	375 hp	49	126	3.80E-04	1.57E-03	6.62E-03	3.24E-05	5.62E-05	5.17E-05	3.31E+00	1.20E-04	-	3.31E+00	
	Horizontal boring drill	10 hp	55	126	5.41E-05	9.13E-04	1.63E-03	2.15E-06	3.76E-06	3.46E-06	1.69E-01	1.53E-05	-	1.69E-01		
	3/4 ton Pickup truck		60	126	2.58E-05	6.94E-05	4.19E-04	4.06E-06	3.03E-05	1.24E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00		
	Demolish spillway	Crane 260'	375 hp	20	126	1.55E-04	6.40E-04	2.70E-03	1.32E-05	2.30E-05	2.11E-05	1.35E+00	4.91E-05	-	1.35E+00	
	Air compressor	50 hp	40	126	1.97E-03	2.05E-03	1.99E-01	8.23E-06	5.19E-05	5.18E-05	6.77E-01	1.11E-04	1.46E-04	7.25E-01		
	3/4 ton Pickup truck		20	126	8.60E-06	2.31E-05	1.40E-04	1.35E-06	1.01E-05	4.14E-06	4.49E-01	4.46E-05	-	4.57E-01		
	Rotary drill	475 hp	120.7333	40	2.08E-03	8.44E-03	3.38E-02	1.70E-04	3.03E-04	2.79E-04	1.79E+01	5.44E-04	-	1.79E+01		
	3/4 ton Pickup truck		128.7333	40	5.53E-05	1.49E-04	9.00E-04	8.72E-06								



Malibu Creek Ecosystem Restoration Feasibility Study  
Construction Equipment - Alternative 3 - Episode 22

Construction Start Year 2066  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Metric Tons CO2/yr	Peak Daily Emissions - 2066 (pounds per day)						
						VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		48	210	9.95E-01	3.93E-04	1.06E-03	6.39E-03	6.19E-05	4.62E-04	1.89E-04	
Dust Control	Water truck	5000 gal	1696	210	3.59E+01	2.35E-01	9.43E-01	4.47E-01	3.77E-03	6.48E-02	3.40E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	2.55E+01	1.01E-02	2.71E-02	1.64E-01	1.59E-03	1.18E-02	4.85E-03	
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	3.32E-01	1.45E-03	3.90E-03	2.35E-02	2.28E-04	1.70E-03	6.97E-04	
	1 ton pickup truck		1,0325	19	2.14E-02	6.90E-05	1.90E-04	1.13E-03	1.48E-05	1.09E-04	4.44E-05	
	Tractor/crawler/dozer	250 hp	1,7209	19	1.30E-01	3.08E-03	1.16E-02	6.41E-02	3.39E-04	4.23E-04	3.89E-04	
	Chain saw		1,7209	19	7.38E-04	1.02E-02	3.85E-04	4.42E-02	4.92E-06	6.96E-05	6.95E-05	
	Brush Piling	Front end loader	540 hp	0.8673	19	1.46E-01	4.12E-03	1.10E-02	6.15E-02	3.09E-04	4.33E-04	3.98E-04
	Tractor/crawler/dozer	310 hp	0.8673	19	6.32E-02	1.93E-03	7.26E-03	2.94E-02	1.44E-04	2.65E-04	2.44E-04	
	Chipping	Brush chipper	250 hp	0.8673	19	9.21E-02	5.85E-03	9.40E-03	3.70E-02	2.10E-04	3.68E-04	3.39E-04
	Front end loader	540 hp	0.8673	19	1.46E-01	4.12E-03	1.10E-02	6.15E-02	3.09E-04	4.33E-04	3.98E-04	
Landscaping	Fish Passage	Excavator	454 hp	24	2.31E+00	7.04E-02	2.50E-01	1.02E+00	4.99E-03	9.21E-03	8.47E-03	
	Loader/backhoe	75 hp	24	20	3.52E-01	1.69E-02	2.09E-01	5.49E-01	3.09E-04	1.92E-03	1.70E-03	
	Tractor/crawler/dozer	440 hp	24	20	2.48E+00	7.20E-02	2.71E-01	1.10E+00	5.37E-03	9.88E-03	9.09E-03	
	Tractor/crawler/dozer	180 hp	2	19	1.08E-01	2.58E-03	9.70E-03	5.36E-02	2.83E-04	3.54E-04	3.25E-04	
Dewatering	Front end loader	49 hp	4	19	4.54E-02	1.29E-02	6.35E-02	1.12E-01	1.36E-04	3.85E-04	3.54E-04	
	Roller	47 hp	4	19	4.44E-02	2.35E-03	4.74E-02	1.09E-01	1.33E-04	1.81E-04	1.67E-04	
	Water truck	3000 gal	4	19	8.47E-02	6.13E-03	2.46E-02	1.16E-02	5.93E-05	1.69E-03	8.86E-04	
	Excavator	390 hp	4	19	2.54E-01	8.18E-03	2.90E-02	1.18E-01	7.87E-04	1.07E-03	9.82E-04	
	Front end loader	180 hp	6	19	1.95E-01	6.42E-03	1.71E-02	9.82E-02	3.36E-04	6.21E-04	5.75E-06	
	36" Diversion Pipe - gradit	Tractor/crawler/dozer	180 hp	6	19	3.25E-01	7.73E-03	2.91E-02	1.61E-01	8.49E-04	1.06E-03	9.78E-04
	Loader/backhoe	75 hp	0.0923	19	1.35E-03	6.83E-05	8.40E-04	2.22E-03	3.68E-06	7.76E-06	7.14E-06	
	Crane 94'	155 hp	155	19	5.00E+00	1.05E-01	4.33E-01	7.26E+00	1.30E-02	1.61E-02	1.48E-02	
	1 ton pickup truck	155	155	19	3.21E+00	1.04E-02	2.84E-02	1.70E-01	2.22E-03	1.64E-02	6.67E-03	
	Crane 94'	155 hp	155	20	5.00E+00	9.97E-02	4.11E-01	6.90E+00	1.24E-02	1.53E-02	1.41E-02	
	1 ton pickup truck	155	155	20	3.21E+00	9.83E-03	2.70E-02	1.61E-01	2.11E-03	1.56E-02	6.33E-03	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	8	23	1.08E-01	3.90E-03	9.21E-03	6.19E-02	2.66E-04	3.09E-04	
	Dewatering	Concrete saw	13 hp	8	23	2.75E-02	6.49E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02
	Crane 80'	130 hp	16	23	4.33E-01	7.51E-03	3.09E-02	5.19E-01	9.33E-04	1.15E-03	1.06E-03	
	Flatbed truck	8	23	1.69E-01	9.67E-04	1.99E-03	1.43E-02	9.30E-05	6.99E-04	2.84E-04	2.84E-04	
Generator	80 hp	5856	244	19	1.38E+02	9.28E-01	6.30E+00	1.55E+01	2.92E-02	6.10E-02	5.61E-02	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	78.8462	19	1.36E+01	3.40E-01	1.28E+00	5.92E+00	2.97E-02	4.67E-02	4.29E-02
	Push	Tractor/crawler/dozer	600 hp	78.8462	19	1.36E+01	3.40E-01	1.28E+00	5.92E+00	2.97E-02	4.67E-02	4.29E-02
	Tractor/crawler/dozer	600 hp	78.8462	19	1.36E+01	3.40E-01	1.28E+00	5.92E+00	2.97E-02	4.67E-02	4.29E-02	
	Build road	Tractor/crawler/dozer	600 hp	78.8462	19	1.36E+01	3.40E-01	1.28E+00	5.92E+00	2.97E-02	4.67E-02	4.29E-02
	Maintenance	Grader	215 hp	144	210	9.67E+00	2.33E-02	7.39E-02	4.32E-01	2.28E-03	2.79E-03	2.56E-03
	Dismantling	Tractor/crawler/dozer	600 hp	157.6923	20	2.72E+01	6.46E-01	2.43E+00	1.12E+01	5.64E-02	8.87E-02	8.16E-02
	Tractor/crawler/dozer	600 hp	157.6923	20	2.72E+01	6.46E-01	2.43E+00	1.12E+01	5.64E-02	8.87E-02	8.16E-02	
	1 ton pickup truck	0.9333	20	1.93E-02	5.92E-05	1.63E-04	9.70E-04	1.27E-05	9.38E-05	3.81E-05	3.81E-05	
	Excavator	430 hp	0.9333	20	8.51E-02	2.69E-03	9.20E-03	3.75E-02	1.84E-04	3.39E-04	3.12E-04	
	Excavator	390 hp	341.6667	20	2.17E+01	6.63E-01	2.35E+00	9.95E+00	4.70E-02	8.66E-02	7.97E-02	
Rindge Dam & Spillway Demolition*	1 ton pickup truck	0.9333	20	1.93E-02	5.92E-05	1.63E-04	9.70E-04	1.27E-05	9.38E-05	3.81E-05	3.81E-05	
	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	22	1.43E-01	8.98E-03	3.60E-02	1.70E-02	1.44E-04	2.47E-03	1.30E-03
	Excavator	430 hp	4.445	22	4.05E-01	1.12E-02	3.98E-02	1.63E-01	7.97E-04	1.47E-03	1.35E-03	
	Tractor/crawler/dozer	850 hp	3.2327	22	8.37E-01	1.70E-02	5.57E-01	3.15E-01	1.58E-03	4.89E-03	4.49E-03	
	Platform	Tractor/crawler/dozer	440 hp	40	20	4.14E+00	1.20E-01	4.52E-01	1.83E+00	8.95E-03	1.65E-02	1.52E-02
	Tractor/crawler/dozer	440 hp	5	20	5.17E-01	1.50E-02	5.65E-02	2.28E-01	1.12E-03	2.06E-03	1.89E-03	
	3/4 ton Pickup truck		20	20	4.15E-01	1.72E-03	4.63E-03	2.80E-02	2.71E-04	2.02E-03	8.28E-04	
	Rotary drill	475 hp	34.0003	126	4.58E+00	1.86E-02	7.54E-02	3.02E-01	1.52E-03	2.71E-03	2.50E-03	
	3/4 ton Pickup truck		30.0003	126	6.22E-01	4.09E-04	1.10E-03	6.66E-03	6.45E-05	4.81E-04	1.97E-04	
	Cut with Diamond wire	3/4 ton Pickup truck	48	126	9.95E-01	6.55E-04	1.76E-03	1.07E-02	1.03E-04	7.70E-04	3.15E-04	
	Diamond cutting saw	50 hp	48	126	6.67E-01	1.69E-02	1.27E-01	1.80E-01	3.01E-04	6.05E-04	5.56E-04	
	Lift/Load blocks	Crane 260'	375 hp	60.0214	126	3.68E+00	1.48E-02	6.10E-02	2.57E-01	1.26E-03	2.19E-03	2.01E-03
	3/4 ton Pickup truck		60.0214	126	1.24E+00	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04	
	Load/Haul	Front end loader	350 hp	4	126	3.01E-01	1.89E-03	5.06E-03	2.11E-02	1.03E-04	1.98E-04	1.82E-04
	Water truck	3000 gal	907	126	1.07E+01	1.17E-01	4.70E-01	2.29E-01	1.89E-03	3.23E-02	1.69E-02	
	Landfill	Crane 260'	375 hp	30.0107	126	1.84E+00	7.39E-03	3.05E-02	1.29E-01	6.31E-04	1.09E-03	1.01E-03
	Micro-blast	Crane 260'	375 hp	49	126	3.00E+00	1.21E-02	4.98E-02	2.10E-01	1.03E-03	1.79E-03	1.64E-03
	Horizontal boring drill	10 hp	55	126	1.54E-01	1.72E-03	2.90E-02	5.17E-02	6.83E-05	1.19E-04	1.10E-04	
3/4 ton Pickup truck		60	126	1.24E+00	8.19E-04	2.20E-03	1.33E-02	1.29E-04	9.63E-04	3.94E-04		
Demolish spillway	Crane 260'	375 hp	20	126	1.23E+00	4.93E-03	2.03E-02	8.58E-02	4.20E-04	7.29E-04	6.70E-04	
Air compressor	50 hp	40	126	6.57E-01	6.25E-02	6.50E-02	6.33E+00	2.61E-04	1.65E-03	1.64E-03		
3/4 ton Pickup truck		20	126	4.15E-01	2.73E-04	7.85E-04	4.44E-03	4.30E-05	3.21E-04	1.31E-04		
Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	40	1.63E+01	2.08E-01	8.44E-01	3.38E+00	1.70E-02	3.03E-02	2.79E-02
3/4 ton Pickup truck		128.7333	40	2.67E+00	5.53E-03	1.49E-02	9.00E-02	8.72E-04	6.51E-03	2.66E-03		
Load/Haul	Front end loader	350 hp	34	40	2.56E+00	5.05E-02	1.35E-01	5.64E-01	2.77E-03	5.31E-03	4.88E-03	
Water truck	3000 gal	15	40	3.17E-01	1.09E-02	4.38E-02	2.07E-02	1.75E-04	3.01E-03	1.58E-03		
Fracture	Excavator	400 hp	540	40	4.58E+01	6.98E-01	2.48E+00	1.01E+01	4.95E-02	9.13E-02	8.40E-02	
Excavator	390 hp	540	40	3.43E+01	5.24E-01	1.86E+00	7.58E+00	3.71E-02	6.85E-02	6.30E-02		
Excavator	390 hp	270	40	2.29E+00	1.29E-02	2.85E-02	3.29E-01	3.42E-02	3.30E-02	3.95E-02		
Tractor/crawler/dozer	440 hp	270	40	2.79E+01	4.05E-01	1.52E+00	6.16E+00	3.02E-02	5.56E-02	5.11E-02		
3/4 ton Pickup truck		540	40	1.12E+01	2.32E-02	6.25E-02	3.77E-01	3.66E-03	2.73E-02	1.12E-02		
Road Improvement Plan	Asphalt Road	Asphalt hopper	300 hp	442.5143	20	3.28E+01	1.46E+00	3.32E+00	1.45E+01	7.09E-02	1.36E-01	1.25E-01
Line Striper	23 hp	92.576	20	5.07E-01	8.82E-02	2.10E-01	3.97E+00	1.07E-03	8.61E-03	8.60E-03		
Roller	70 hp	442.5143	20	6.91E+00	2.08E-01	3.51E+00	1.08E+01	1.78E-02	2.74E-02	2.52E-02		
Vibratory roller	33 hp	442.5143	20	4.02E+00	2.87E-01	4.85E+00	8.65E+00	1.14E-02	2.00E-02	1.84E-02		
Flatbed truck	92.576	20	1.96E+00	1.29E-02	2.85E-02	1.91E-01	1.24E-03	1.24E-03	3.76E-03	3.76E-03		
3/4 ton Pickup truck	92.576	20	1.92E+00	7.86E-03	2.14E-02	1.29E-01	1.25E-03	9.36E-03	9.36E-03	9.35E-03		
					6.09E+02	9.74E+00	4.36E+01	1.74E+02	6.47E-01	1.33E+00	1.13E+00	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwitten

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Emission Factors - 2016 (g/hp-hr or g/hr)								Emission Factors - 2017 (g/hp-hr or g/hr)									
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Construction Survey	3/4 ton pickup truck		96	22.2	73.8	52	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
Dust Control	Water truck	5000 gal	2320	535.4	1,784.6	52	210	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80	0.0	80.0	0	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
Clear & Grub - Sheriff's Overlook (Staging Area)	Biologist	3/4 ton pickup truck	1213	0.0	1,213.0	0	210	5.037	3.900	60.209	0.061	0.513	0.238	20,361.282	2.024	1.056	4.535	3.606	54.402	0.061	0.507	0.233	20,361.281	2.024	1.056
	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	0	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
	Tractor/crawler/dozer	250 hp	0.7652	0.8	0.0	52	0	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000
	Chain saw		0.7652	0.8	0.0	52	0	1.786	0.115	13.187	0.001	0.021	0.021	35.645	0.111	0.039	1.889	0.115	13.187	0.001	0.021	0.021	35.643	0.117	0.039
	Brush Piling	Front end loader	0.3857	0.4	0.0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000
	Chipping	Brush chipper	0.3857	0.4	0.0	52	0	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000
	Front end loader	540 hp	0.3857	0.4	0.0	52	0	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000
	Gravel	Grader	11.1111	11.1	0.0	52	0	0.068	0.996	1.863	0.004	0.066	0.061	320.918	0.019	0.000	0.073	1.005	1.912	0.004	0.069	0.063	320.926	0.021	0.000
	Vibratory roller	85 hp	16	16.0	0.0	52	0	0.042	1.062	1.354	0.003	0.070	0.065	222.773	0.010	0.000	0.044	1.069	1.378	0.003	0.071	0.066	222.772	0.010	0.000
	Tractor/crawler/dozer	310 hp	3.2593	3.3	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000
	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000
	Asphalt distributor	3000 gal	0.8106	0.8	0.0	52	0	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Guard Railing	Flatbed truck	8.75	8.8	0.0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135
	Auger drill	10 hp	8.75	8.8	0.0	52	0	3.623	2.678	132.418	0.006	1.877	1.873	223.929	0.205	0.204	3.633	2.686	132.805	0.006	1.883	1.879	224.584	0.205	0.204
	Demo Existing Gate	Loader/backhoe	4.2	4.2	0.0	52	0	0.057	1.075	1.282	0.002	0.075	0.069	195.357	0.012	0.000	0.061	1.085	1.315	0.002	0.077	0.071	195.356	0.013	0.000
	Flatbed truck		4	4.0	0.0	52	0	9.236	9.041	130.746	0.061	0.499	0.224	20,361.283	4.604	2.135	7.793	7.877	109.254	0.061	0.491	0.217	20,361.282	4.604	2.135
Clear & Grub - Sediment Removal Area	Clear Brush	1 ton pickup truck	15.1316	0.0	15.1	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
	Excavator	94 hp	15.1316	0.0	15.1	0	42	0.057	1.099	1.937	0.003	0.077	0.070	278.042	0.020	0.000	0.060	1.098	1.968	0.003	0.078	0.071	278.041	0.021	0.000
	Front end loader	210 hp	15.1316	0.0	15.1	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000
	Dump truck	10cy	15.1316	0.0	15.1	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Dump truck	10cy	15.1316	0.0	15.1	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Brush chipper	275 hp	15.1316	0.0	15.1	0	42	0.058	0.528	0.384	0.002	0.004	0.003	224.564	0.005	0.000	0.061	0.528	0.385	0.002	0.004	0.003	223.246	0.006	0.000
	Front end loader	210 hp	6.9575	0.0	7.0	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000
	Cutting	1 ton pickup truck	8.625	0.0	8.6	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
	Tractor/crawler/dozer	250 hp	14.375	0.0	14.4	0	42	0.043	0.578	0.609	0.003	0.004	0.004	301.151	0.014	0.000	0.046	0.583	0.627	0.003	0.004	0.004	301.152	0.015	0.000
	Chain saw		14.3753	0.0	14.4	0	42	1.786	0.115	13.187	0.001	0.021	0.021	35.645	0.111	0.039	1.889	0.115	13.187	0.001	0.021	0.021	35.643	0.117	0.039
	Brush Piling	Front end loader	7.245	0.0	7.2	0	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000
	Tractor/crawler/dozer	310 hp	7.245	0.0	7.2	0	42	0.044	0.593	0.451	0.002	0.004	0.004	234.973	0.011	0.000	0.047	0.598	0.462	0.002	0.004	0.004	234.945	0.012	0.000
	Chipping	Brush chipper	7.245	0.0	7.2	0	42	0.099	0.904	0.668	0.004	0.006	0.006	384.551	0.009	0.000	0.115	0.993	0.738	0.005	0.007	0.006	419.944	0.010	0.000
	Front end loader	540 hp	7.245	0.0	7.2	0	42	0.053	0.510	0.546	0.003	0.004	0.004	290.880	0.012	0.000	0.058	0.517	0.588	0.003	0.004	0.004	307.067	0.014	0.000
Clear & Grub - Access Rd & Cofferdam	Clear Brush	1 ton pickup truck	8.0263	0.0	8.0	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169	39.989	0.062	0.497	0.223	20,361.280	2.024	1.056
	Excavator	94 hp	8.0263	0.0	8.0	0	42	0.057	1.099	1.937	0.003	0.077	0.070	278.042	0.020	0.000	0.060	1.098	1.968	0.003	0.078	0.071	278.041	0.021	0.000
	Front end loader	210 hp	8.0263	0.0	8.0	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000
	Dump truck	10cy	8.0263	0.0	8.0	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Dump truck	10cy	8.0263	0.0	8.0	0	42	7.746	125.318	13.903	0.108	2.768	1.826	21,547.038	0.051	0.048	6.977	114.417	12.738	0.108	2.402	1.489	21,520.018	0.051	0.048
	Brush chipper	275 hp	8.0263	0.0	8.0	0	42	0.058	0.528	0.384	0.002	0.004	0.003	224.564	0.005	0.000	0.061	0.528	0.385	0.002	0.004	0.003	223.246	0.006	0.000
	Front end loader	210 hp	3.6905	0.0	3.7	0	42	0.054	0.522	0.530	0.003	0.004	0.004	270.065	0.011	0.000	0.059	0.526	0.543	0.003	0.004	0.004	270.056	0.012	0.000
	Cutting	1 ton pickup truck	4.575	0.0	4.6	0	42	3.579	3.535	47.996	0.062	0.504	0.230	20,361.283	2.024	1.056	2.978	3.169							



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Annual Emissions - 2016 (tons per year)								Metric Tons CO2e/yr	Annual Emissions - 2017 (tons per year)								Metric Tons CO2e/yr				
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4		N2O	CO2e	VOC	NOx	CO	SO2	PM10	PM2.5		CO2	CH4	N2O	CO2e
				2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017		2016	2017	2016	2017	2016	2017	2016	2017		2016	2017	2016	2017
Construction Survey	3/4 ton pickup truck		96	22.2	73.8	52	210	1.23E-04	9.52E-05	1.47E-03	1.50E-06	1.25E-05	5.81E-06	4.97E-01	4.94E-05	2.58E-05	5.06E-01	4.59E-01	3.69E-04	2.94E-04	4.43E-03	4.99E-06	4.13E-05	1.89E-05	1.66E+00	1.65E-04	8.60E-05	1.69E+00	1.53E+00
Dust Control	Water truck	5000 gal	2320	535.4	1,784.6	52	210	4.57E-03	7.40E-02	8.21E-03	6.36E-05	1.63E-03	1.08E-03	1.27E+01	3.01E-05	2.83E-05	1.27E+01	1.15E+01	1.37E-02	2.25E-01	2.12E-02	4.72E-03	2.93E-03	4.23E+01	1.00E-04	9.44E-05	4.24E+01	3.84E+01	
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80	0.0	80.0	0	210	-	-	-	-	-	-	-	-	-	-	-	4.00E-04	3.18E-04	4.80E-03	5.40E-06	4.47E-05	2.05E-05	1.80E+00	1.78E-04	9.31E-05	1.83E+00	
	Biologist	3/4 ton pickup truck	1213	0.0	1,213.0	0	210	-	-	-	-	-	-	-	-	-	-	-	6.06E-03	4.82E-03	7.27E-02	8.19E-05	6.78E-04	3.11E-04	2.72E+01	2.71E-03	1.41E-03	2.77E+01	
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	0	1.81E-06	1.79E-06	2.43E-05	3.11E-08	2.55E-07	1.16E-07	1.03E-02	1.02E-06	5.34E-07	1.05E-02	9.52E-03	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	0.7652	0.8	0.0	52	0	8.98E-06	1.22E-04	1.28E-04	7.15E-07	8.76E-07	8.06E-07	6.35E-02	2.94E-06	-	6.36E-02	5.77E-02	-	-	-	-	-	-	-	-	-	-	-
	Chain saw		0.7652	0.8	0.0	52	0	1.27E-05	8.13E-07	9.34E-05	1.04E-08	1.47E-07	1.47E-07	2.53E-04	7.87E-07	2.77E-07	3.55E-04	3.22E-04	-	-	-	-	-	-	-	-	-	-	-
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.06E-02	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	5.76E-06	7.82E-05	5.95E-05	3.04E-07	5.62E-07	5.17E-07	3.10E-02	1.43E-06	-	3.10E-02	2.81E-02	-	-	-	-	-	-	-	-	-	-	-
	Brush chipper	250 hp	0.3857	0.4	0.0	52	0	1.05E-05	9.61E-05	7.10E-05	4.60E-07	6.77E-07	6.23E-07	4.09E-02	9.45E-07	-	4.09E-02	3.71E-02	-	-	-	-	-	-	-	-	-	-	-
	Front end loader	540 hp	0.3857	0.4	0.0	52	0	1.22E-05	1.17E-04	1.25E-04	6.71E-07	9.02E-07	8.30E-07	6.68E-02	2.77E-06	-	6.68E-02	6.06E-02	-	-	-	-	-	-	-	-	-	-	-
	Gravel	Grader	135 hp	11.1111	11.1	0.0	52	0	1.12E-04	1.65E-03	3.08E-03	5.97E-06	1.09E-04	1.01E-04	5.31E-01	3.14E-05	-	5.31E-01	4.82E-01	-	-	-	-	-	-	-	-	-	-
	Vibratory roller	85 hp	16	16.0	0.0	52	0	6.25E-05	1.59E-03	2.03E-03	3.92E-06	1.05E-04	9.68E-05	3.34E-01	1.43E-05	-	3.34E-01	3.03E-01	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp	3.2593	3.3	0.0	52	0	4.87E-05	6.61E-04	5.03E-04	2.57E-06	4.75E-06	4.37E-06	1.93E-02	4.56E-08	4.29E-08	1.93E-02	1.75E-02	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	1.73E-05	2.34E-04	1.78E-04	9.11E-07	1.68E-06	1.55E-06	9.29E-02	4.30E-06	-	9.29E-02	8.43E-02	-	-	-	-	-	-	-	-	-	-	-
	Asphalt distributor	3000 gal	0.8106	0.8	0.0	52	0	6.92E-06	1.12E-04	1.24E-05	9.62E-08	2.47E-06	1.63E-06	1.93E-02	4.56E-08	4.29E-08	1.93E-02	1.75E-02	-	-	-	-	-	-	-	-	-	-	-
	Guard Railing	Flatbed truck	8.75	8.8	0.0	52	0	8.91E-05	8.72E-05	1.26E-03	5.89E-07	4.81E-06	2.16E-06	1.96E-01	4.44E-05	2.06E-05	2.04E-01	1.85E-01	-	-	-	-	-	-	-	-	-	-	-
	Auger drill	10 hp	8.75	8.8	0.0	52	0	3.49E-04	2.58E-04	1.28E-02	6.16E-07	1.81E-04	1.81E-04	2.16E-02	1.98E-05	1.96E-05	2.81E-02	2.55E-02	-	-	-	-	-	-	-	-	-	-	-
	Demo Existing Gate	Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	1.98E-05	3.73E-04	4.45E-04	7.96E-07	2.62E-05	2.41E-05	6.78E-02	4.02E-06	-	6.79E-02	6.16E-02	-	-	-	-	-	-	-	-	-	-
	Flatbed truck		4	4.0	0.0	52	0	4.07E-05	3.99E-05	5.76E-04	2.69E-07	2.62E-06	9.87E-07	8.98E-02	2.03E-05	9.41E-06	9.31E-02	8.45E-02	-	-	-	-	-	-	-	-	-	-	-
Clear & Grub - Sediment Removal Area	Clear Brush	1 ton pickup truck	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	4.97E-05	5.29E-05	6.67E-04	1.03E-06	8.30E-06	3.73E-06	3.40E-01	3.38E-05	1.76E-05	3.46E-01	3.14E-01
	Excavator	94 hp	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	9.43E-05	1.72E-03	3.09E-03	5.11E-06	1.22E-04	1.12E-04	4.36E-01	3.33E-05	-	4.37E-01	3.96E-01
	Front end loader	210 hp	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	2.07E-04	1.84E-03	1.90E-03	1.06E-05	1.44E-05	1.33E-05	9.46E-01	4.31E-05	-	9.47E-01	8.59E-01
	Dump truck	10cy	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	1.16E-04	1.91E-03	2.12E-04	1.79E-06	4.01E-05	2.48E-05	3.59E-01	8.51E-07	8.01E-07	3.59E-01	3.26E-01
	Dump truck	10cy	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	1.16E-04	1.91E-03	2.12E-04	1.79E-06	4.01E-05	2.48E-05	3.59E-01	8.51E-07	8.01E-07	3.59E-01	3.26E-01
	Brush chipper	275 hp	15,1316	0.0	15.1	0	42	-	-	-	-	-	-	-	-	-	-	-	2.81E-04	2.42E-03	1.76E-03	1.01E-05	1.72E-05	1.58E-05	1.02E+00	2.53E-05	-	1.02E+00	9.29E-01
	Front end loader	210 hp	6.9575	0.0	7.0	0	42	-	-	-	-	-	-	-	-	-	-	-	9.54E-05	8.47E-04	8.75E-04	4.89E-06	6.64E-06	6.11E-06	4.35E-01	1.98E-05	-	4.35E-01	3.95E-01
	Cutting	1 ton pickup truck	8.625	0.0	8.6	0	42	-	-	-	-	-	-	-	-	-	-	-	2.83E-05	3.01E-05	3.80E-04	5.85E-07	4.73E-06	2.12E-06	1.94E-01	1.92E-05	1.00E-05	1.97E-01	1.79E-01
	Tractor/crawler/dozer	250 hp	14.375	0.0	14.4	0	42	-	-	-	-	-	-	-	-	-	-	-	1.81E-04	2.31E-03	2.48E-03	1.34E-05	1.68E-05	1.54E-05	1.19E+00	6.11E-05	-	1.19E+00	1.08E+00
	Chain saw		14.3753	0.0	14.4	0	42	-	-	-	-	-	-	-	-	-	-	-	2.51E-04	1.53E-05	1.76E-03	1.95E-07	2.76E-06	2.76E-06	4.74E-03	1.56E-05	5.21E-06	6.69E-03	6.07E-03
	Brush Piling	Front end loader	540 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	-	-	-	-	2.51E-04	2.23E-03	2.53E-03	1.33E-05	1.75E-05	1.61E-05	1.32E+00	6.03E-05	-	1.33E+00	1.20E+00
	Tractor/crawler/dozer	310 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	-	-	-	-	-	1.16E-04	1.48E-03	1.14E-03	5.71E-06	1.08E-05	9.90E-06	5.82E-01	2.98E-05	-	5.82E-01	5.28E-01
	Chipping	Brush chipper	250 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	-	-	-	-	2.30E-04	1.98E-03	1.47E-03	9.43E-06	1.41E-05	1.30E-05	8.38E-01	2.07E-05	-	8.39E-01	7.61E-01
	Front end loader	540 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	-	-	-	-	-	2.51E-04	2.23E-03	2.53E-03	1.33E-05	1.75E-05	1.61E-05	1.32E+00	6.03E-05	-	1.33E+00	1.20E+00
Clear & Grub - Access Rd & Cofferdam	Clear Brush	1 ton pickup truck	8,0263	0.0	8.0	0	42	-	-	-	-	-	-	-	-	-	-	-	2.63E-05	2.80E-05	3.54E-04	5.44E-07	4.40E-06	1.98E-06	1.80E-01	1.79E-05	9.34E-06	1.83E-01	1.66E-01
	Excavator	94 hp	8,0263	0.0	8.0	0	42	-	-	-	-	-	-	-	-	-	-	-	5.00E-05	9.13E-04	1.64E-03	2.71E-06	6.45E-05	5.94E-05	2.31E-01	1.77E-05	-	2.32E-01	2.10E-01
	Front end loader	210 hp	8,0263	0.0	8.0	0	42	-	-	-	-	-	-	-	-	-	-	-	1.10E-04	9.77E-04	1.01E-03	5.65E-06	7.66E-06	7.05E-06	5.02E-01	2.28E-05	-	5.02E-01	4.56E-01
	Dump truck	10cy	8,0263	0.0	8.0	0	42	-	-	-	-	-	-	-	-	-	-	-	6.17E-05	1.01E-03	1.13E-04	9.52E-07	2.12E-05	1.32E-05	1.90E-01	4.51E-07	4.25E-07	1.91E-01	1.73E-01
	Dump truck	10cy	8,0263	0.0	8.0	0	42	-	-	-	-	-	-	-	-	-	-	-	6.17E-05	1.01E-03	1.13E-04	9.52E-07	2.12E-05	1.32E-05	1.90E-01	4.51E-07	4.25E-07	1.91E-01	1.73E-01
	Brush chipper	275 hp</																											

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 1

Construction Start Year 2016  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Hours per Year		Days per Year		Peak Daily Emissions - 2016 (pounds per day)					Peak Daily Emissions - 2017 (pounds per day)								
				2016	2017	2016	2017	VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	22.2	73.8	52	210	9.46E-03	7.33E-03	1.13E-01	1.15E-04	9.64E-04	4.47E-04	7.03E-03	5.59E-03	8.43E-02	9.50E-05	7.87E-04	3.61E-04		
Dust Control	Water truck	5000 gal	2320	535.4	1,784.6	52	210	3.52E-01	5.69E+00	6.31E-01	4.89E-03	1.26E-01	8.29E-02	2.61E-01	4.29E+00	4.77E-01	4.03E-03	9.00E-02	5.58E-02		
Environmental protection measures	WQ Testing	3/4 ton pickup truck	80	0.0	80.0	0	210	-	-	-	-	-	-	7.62E-03	6.06E-03	9.14E-02	1.03E-04	8.52E-04	3.91E-04		
	Biologist	3/4 ton pickup truck	1213	0.0	1,213.0	0	210	-	-	-	-	-	-	1.16E-01	9.18E-02	1.39E+00	1.56E-03	1.29E-02	5.93E-03		
Clear & Grub - Sheriff's Overlook (Staging Area)	Cutting	1 ton pickup truck	0.4591	0.5	0.0	52	0	1.39E-04	1.38E-04	1.87E-03	2.40E-06	1.96E-05	8.94E-06	-	-	-	-	-	-		
		Tractor/crawler/dozer	250 hp	0.7652	0.8	0.0	52	0	6.90E-04	9.38E-03	9.88E-03	5.50E-05	6.74E-05	6.20E-05	-	-	-	-	-		
		Chain saw		0.7652	0.8	0.0	52	0	9.73E-04	6.25E-05	7.19E-03	8.00E-07	1.13E-05	1.13E-05	-	-	-	-	-		
	Brush Piling	Front end loader	540 hp	0.3857	0.4	0.0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-		
		Tractor/crawler/dozer	310 hp	0.3857	0.4	0.0	52	0	4.43E-04	6.01E-03	4.58E-03	2.34E-05	4.32E-05	3.98E-05	-	-	-	-	-		
		Brush chipper	250 hp	0.3857	0.4	0.0	52	0	8.06E-04	7.39E-03	5.46E-03	3.54E-05	5.21E-05	4.79E-05	-	-	-	-	-		
		Front end loader	540 hp	0.3857	0.4	0.0	52	0	9.38E-04	9.01E-03	9.64E-03	5.17E-05	6.94E-05	6.38E-05	-	-	-	-	-		
	Gravel	Grader	135 hp	11.1111	11.1	0.0	52	0	8.59E-03	1.27E-01	2.37E-01	4.59E-04	8.41E-03	7.74E-03	-	-	-	-	-		
		Vibratory roller	85 hp	16	16.0	0.0	52	0	4.81E-03	1.22E-01	1.56E-01	3.01E-04	8.09E-03	7.44E-03	-	-	-	-	-		
		Tractor/crawler/dozer	310 hp	3.2593	3.3	0.0	52	0	3.74E-03	5.08E-02	3.87E-02	1.98E-04	3.65E-04	3.36E-04	-	-	-	-	-		
		Tractor/crawler/dozer	440 hp	0.8148	0.8	0.0	52	0	1.33E-03	1.80E-02	1.37E-02	7.01E-05	1.30E-04	1.19E-04	-	-	-	-	-		
		Asphalt distributor	3000 gal	0.8106	0.8	0.0	52	0	5.32E-04	8.61E-03	9.56E-04	7.40E-06	1.90E-04	1.25E-04	-	-	-	-	-		
		Flatbed truck		8.75	8.8	0.0	52	0	6.85E-03	6.71E-03	9.70E-02	4.53E-05	3.70E-04	1.66E-04	-	-	-	-	-		
		Auger drill	10 hp	8.75	8.8	0.0	52	0	2.69E-02	1.99E-02	9.82E-01	4.74E-05	1.39E-02	1.39E-02	-	-	-	-	-		
		Demo Existing Gate	Loader/backhoe	75 hp	4.2	4.2	0.0	52	0	1.52E-03	2.87E-02	3.43E-02	6.12E-05	2.01E-03	1.85E-03	-	-	-	-		
		Flatbed truck		4	4.0	0.0	52	0	3.13E-03	3.07E-03	4.43E-02	2.07E-05	1.69E-04	7.59E-05	-	-	-	-	-		
	Clear & Grub - Sediment Removal Area	Clear Brush	1 ton pickup truck	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	4.73E-03	5.03E-03	6.35E-02	9.77E-05	7.90E-04	3.55E-04	
			Excavator	94 hp	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	8.98E-03	1.64E-01	2.94E-01	4.87E-04	1.16E-02	1.07E-02
			Front end loader	210 hp	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	1.98E-02	1.75E-01	1.81E-01	1.01E-03	1.38E-03	1.27E-03
			Dump truck	10cy	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	1.11E-02	1.82E-01	2.02E-02	1.71E-04	3.82E-03	2.36E-03
		Dump truck	10cy	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	1.11E-02	1.82E-01	2.02E-02	1.71E-04	3.82E-03	2.36E-03	
		Brush chipper	275 hp	15,131.6	0.0	15.1	0	42	-	-	-	-	-	-	2.67E-02	2.31E-01	1.68E-01	9.57E-04	1.64E-03	1.51E-03	
		Front end loader	210 hp	6.9575	0.0	7.0	0	42	-	-	-	-	-	-	9.08E-03	8.07E-02	8.34E-02	4.66E-04	6.32E-04	5.82E-04	
		Cutting	1 ton pickup truck	8,625	0.0	8.6	0	42	-	-	-	-	-	-	2.70E-03	2.87E-03	3.62E-02	5.57E-05	4.50E-04	2.02E-04	
		Tractor/crawler/dozer	250 hp	14.375	0.0	14.4	0	42	-	-	-	-	-	-	1.73E-02	2.20E-01	2.37E-01	1.28E-03	1.60E-03	1.47E-03	
		Chain saw		14.3753	0.0	14.4	0	42	-	-	-	-	-	-	2.40E-02	1.45E-03	1.67E-01	1.86E-05	2.63E-04	2.63E-04	
		Brush Piling	Front end loader	540 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	2.39E-02	2.12E-01	2.41E-01	1.27E-03	1.66E-03	1.53E-03	
		Tractor/crawler/dozer	310 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	1.11E-02	1.41E-01	1.09E-01	5.44E-04	1.02E-03	9.43E-04	
		Chipping	Brush chipper	250 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	2.19E-02	1.89E-01	1.40E-01	8.98E-04	1.34E-03	1.24E-03	
		Front end loader	540 hp	7.245	0.0	7.2	0	42	-	-	-	-	-	-	2.39E-02	2.12E-01	2.41E-01	1.27E-03	1.66E-03	1.53E-03	
Clear & Grub - Access Rd & Cofferdam		Clear Brush	1 ton pickup truck	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	2.51E-03	2.67E-03	3.37E-02	5.18E-05	4.19E-04	1.88E-04	
			Excavator	94 hp	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	4.77E-03	8.70E-02	1.56E-01	2.58E-04	6.15E-03	5.65E-03
			Front end loader	210 hp	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	1.05E-02	9.30E-02	9.62E-02	5.38E-04	7.29E-04	6.71E-04
			Dump truck	10cy	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	5.88E-03	9.64E-02	1.07E-02	9.06E-05	2.02E-03	1.25E-03
			Dump truck	10cy	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	5.88E-03	9.64E-02	1.07E-02	9.06E-05	2.02E-03	1.25E-03
			Brush chipper	275 hp	8,026.3	0.0	8.0	0	42	-	-	-	-	-	-	1.42E-02	1.22E-01	8.91E-02	5.08E-04	8.70E-04	8.01E-04
		Front end loader	210 hp	3,690.5	0.0	3.7	0	42	-	-	-	-	-	-	4.82E-03	4.28E-02	4.42E-02	2.47E-04	3.35E-04	3.09E-04	
		Cutting	1 ton pickup truck	4,575	0.0	4.6	0	42	-	-	-	-	-	-	1.43E-03	1.52E-03	1.92E-02	2.95E-05	2.39E-04	1.07E-04	
		Tractor/crawler/dozer	250 hp	7.625	0.0	7.6	0	42	-	-	-	-	-	-	9.16E-03	1.17E-01	1.25E-01	6.78E-04	8.47E-04	7.80E-04	
		Chain saw		7.6252	0.0	7.6	0	42	-	-	-	-	-	-	1.27E-02	7.71E-04	8.87E-02	9.87E-06	1.40E-04	1.39E-04	
		Brush Piling	Front end loader	540 hp	3.843	0.0	3.8	0	42	-	-	-	-	-	1.27E-02	1.13E-01	1.28E-01	6.73E-04	8.83E-04	8.12E-04	
		Tractor/crawler/dozer	310 hp	3.843	0.0	3.8	0	42	-	-	-	-	-	-	5.87E-03	7.48E-02	5.78E-02	2.88E-04	5.44E-04	5.00E-04	
		Chipping	Brush chipper	250 hp	3.843	0.0	3.8	0	42	-	-	-	-	-	1.16E-02	1.00E-01	7.45E-02	4.77E-04	7.13E-04	6.56E-04	
		Front end loader	540 hp	3.843	0.0	3.8	0	42	-	-	-	-	-	-	1.27E-02	1.13E-01	1.28E-01	6.73E-04	8.83E-04	8.12E-04	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	2.0	0	190	-	-	-	-	-	-	3.82E-04	4.87E-03	5.24E-03	2.83E-05	3.54E-05	3.25E-05	
			Front end loader	49 hp	4	4.0	0	190	-	-	-	-	-	-	8.83E-04	9.72E-03	8.82E-03	1.36E-05	3.93E-04	3.61E-04	
			Roller	47 hp	4	4.0	0	190	-	-	-	-	-	-	7.17E-04	9.21E-03	7.79E-03	1.33E-05	3.53E-04	3.24E-04	
			Water truck	3000 gal	4	4.0	0	190	-	-	-	-	-	-	6.48E-04	1.06E-02	1.18E-03	9.99E-06	2.23E-04	1.38E-04	
			Excavator	300 hp	4	4.0	0	190	-	-	-	-	-	-	1.22E-03	1.46E-02	1.18E-02	5.79E-05	1.08E-04	9.90E-05	
			Front end loader	180 hp	4	4.0	0	190	-	-	-	-	-	-	9.89E-04	8.79E-03	9.08E-03	5.08E-05	6.89E-05	6.34E-05	
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	6.0	0	190	-	-	-	-	-	-	1.15E-03	1.46E-02	1.57E-02	8.49E-05	1.06E-04	9.76E-05	
		36" Diversion Pipe - pipe	Welder	17 hp	16	16.0	0	190	-	-	-	-	-	-	1.61E-02	1.04E-02	5.90E-01	2.38E-05	7.88E-03	7.86E-03	
		36" Diversion Pipe	Crane 80"	130 hp	273	0.0	273.0	0	190	-	-	-	-	-	3.19E-02	5.76E-01	1.03E+00	1.93E-03	3.53E-02	3.25E-02	
		Loader/backhoe	75 hp	0.0923	0.0	0.1	0	190	-	-	-	-	-	-	9.85E-06	1.74E-04	2.11E-04	3.68E-07	1.24E-05	1.14E-05	
		Crane 94"	155 hp	155	0.0	155.0	0	20	-	-	-	-	-	-	2.05E-01	3.71E+00	6.60E+00	1.24E-02	2.27E-01	2.09E-01	
		1 ton pickup truck		155	0.0	155.0	0	20	-	-	-	-	-	-	1.02E-01	1.08E-01	1.37E+00	2.10E-03	1.70E-02	7.64E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	2.0	0	20	-	-	-	-	-	-	3.63E-03	4.62E-02	4.98E-02	2.69E-04	3.3		



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		96	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
Dust Control	Water truck	5000 gal	2320	210	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		Tractor/crawler/dozer	250 hp	7.3333	19	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
		Chain saw		7.3335	19	1.993	0.115	13.187	0.001	0.021	0.021	35.644	0.124	0.039
	Brush Piling	Front end loader	540 hp	3.696	19	0.063	0.523	0.567	0.003	0.004	0.004	290.956	0.014	0.000
		Tractor/crawler/dozer	310 hp	3.696	19	0.050	0.602	0.471	0.002	0.004	0.004	234.968	0.013	0.000
	Chipping	Brush chipper	250 hp	3.696	19	0.120	0.977	0.730	0.005	0.007	0.006	410.775	0.011	0.000
		Front end loader	540 hp	3.696	19	0.063	0.523	0.567	0.003	0.004	0.004	290.956	0.014	0.000
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
		Front end loader	49 hp	4	19	0.210	2.169	2.030	0.003	0.090	0.082	231.301	0.019	0.000
		Roller	47 hp	4	19	0.179	2.141	1.871	0.003	0.084	0.077	235.555	0.016	0.000
		Water truck	3000 gal	4	19	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Excavator	300 hp	4	19	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Front end loader	180 hp	4	19	0.064	0.528	0.556	0.003	0.004	0.004	270.067	0.013	0.000
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
		Loader/backhoe	75 hp	0.0923	19	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
		Crane 94'	155 hp	155	19	0.041	0.704	1.280	0.002	0.044	0.041	208.102	0.015	0.000
		1 ton pickup truck		155	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
		Crane 94'	155 hp	155	20	0.041	0.704	1.280	0.002	0.044	0.041	208.102	0.015	0.000
		1 ton pickup truck		155	20	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Dewatering	Concrete saw	13 hp	8	22	3.250	2.402	118.784	0.006	1.684	1.681	200.873	0.184	0.193
		Crane 80'	130 hp	16	22	0.041	0.704	1.280	0.002	0.044	0.041	208.102	0.015	0.000
		Flatbed truck		8	22	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
		Generator	80 hp	5856	244	0.104	1.470	1.693	0.003	0.099	0.091	294.397	0.009	0.000
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
		Tractor/crawler/dozer	600 hp	184.6154	19	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
	Armoring	1 ton pickup truck		2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
		Excavator	430 hp	2	19	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		1 ton pickup truck		2	19	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	Maintenance	Grader	215 hp	340	210	0.056	0.558	0.649	0.004	0.004	0.004	312.011	0.016	0.000
	Material Excavation	1 ton pickup truck	663.5	78	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		Front end loader	350 hp	663.5	78	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	663.5	78	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	663.5	78	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	663.5	78	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Water truck	3000 gal	663.5	78	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Excavator	400 hp	663.5	78	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Excavator	400 hp	663.5	78	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Excavator	400 hp	663.5	78	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
		Front end loader	350 hp	102	11	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	102	11	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	102	11	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Front end loader	350 hp	102	11	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Water truck	3000 gal	102	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
		Excavator	400 hp	102	11	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Excavator	400 hp	102	11	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Excavator	400 hp	102	11	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
		Excavator	400 hp	102	11	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
	Beach Crew	1 ton pickup truck		102	11	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
		Tractor/crawler/dozer	600 hp	102	11	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
		Tractor/crawler/dozer	600 hp	102	11	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
		Tractor/crawler/dozer	600 hp	102	11	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
		Tractor/crawler/dozer	600 hp	102	11	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
	Water truck	3000 gal	25	11	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2018 (g/hp-hr or g/hr)										
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056		
		Front end loader	350 hp	382.5	48	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000	
		Front end loader	350 hp	382.5	48	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000	
		Front end loader	350 hp	382.5	48	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000	
		Front end loader	350 hp	382.5	48	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000	
		Water truck	3000 gal	382.5	48	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
		Excavator	400 hp	382.5	48	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000	
		Excavator	400 hp	382.5	48	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000	
		Excavator	400 hp	382.5	48	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000	
		Excavator	400 hp	382.5	48	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000	
		Beach Crew	1 ton pickup truck	382.5	48	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056	
			Tractor/crawler/dozer	600 hp	382.5	48	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
			Tractor/crawler/dozer	600 hp	382.5	48	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
			Tractor/crawler/dozer	600 hp	382.5	48	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
			Tractor/crawler/dozer	600 hp	382.5	48	0.049	0.593	0.520	0.003	0.004	0.004	259.569	0.014	0.000
		Water truck	3000 gal	382.5	30	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
Demolition - Concrete Arc & Spillway	Platform	Tractor/crawler/dozer	440 hp	720	22	0.050	0.602	0.471	0.002	0.004	0.004	234.968	0.013	0.000	
		Tractor/crawler/dozer	440 hp	90	22	0.050	0.602	0.471	0.002	0.004	0.004	234.968	0.013	0.000	
		3/4 ton pickup truck		360	22	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
	Drilling	Rotary drill	475 hp	88.1333	128	0.051	0.680	0.529	0.003	0.005	0.005	282.235	0.012	0.000	
		3/4 ton pickup truck		84.1333	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Cut with Diamond wire	3/4 ton pickup truck		376	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	376	128	0.122	2.347	1.693	0.004	0.080	0.074	277.541	0.011	0.000	
	Lift/Load blocks	Crane 260'	375 hp	454.8767	128	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000	
		3/4 ton pickup truck		454.8767	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Load/Haul	Front end loader	350 hp	32	128	0.064	0.528	0.419	0.002	0.004	0.004	214.813	0.011	0.000
		Landfill	Crane 260'	375 hp	227.4384	128	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
		Micro-blast	Crane 260'	375 hp	60	128	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
			Horizontal boring drill	10 hp	55	128	0.092	2.462	1.184	0.004	0.088	0.081	287.564	0.031	0.000
			3/4 ton pickup truck		60	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		Demolish spillway	Crane 260'	375 hp	100	128	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
		Air compressor	50 hp	200	128	0.569	0.693	49.653	0.004	0.024	0.023	307.213	0.032	0.057	
		3/4 ton pickup truck		100	128	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
Demolition - Notch 5'	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	20	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
		Excavator	430 hp	4.445	20	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000	
		Tractor/crawler/dozer	850 hp	3.2327	20	0.169	1.250	0.552	0.003	0.037	0.034	275.433	0.015	0.000	
	Drilling	Rotary drill	475 hp	7.3333	20	0.051	0.680	0.529	0.003	0.005	0.005	282.235	0.012	0.000	
		3/4 ton Pickup truck		7.3333	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Cut with Diamond wire	3/4 ton Pickup truck		48	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
		Diamond cutting saw	50 hp	48	20	0.122	2.347	1.693	0.004	0.080	0.074	277.541	0.011	0.000	
	Lift/Load blocks	Crane 260'	375 hp	60.0214	20	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000	
		3/4 ton Pickup truck		60.0214	20	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
		Landfill	Crane 260'	375 hp	30.0107	20	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
<b>Total</b>															

Data from Alt4\_EnvrAirQualityReport.pdf

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2018 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Construction Survey	3/4 ton pickup truck		96	210	4.30E-04	3.53E-04	5.18E-03	6.48E-06	5.31E-05	2.41E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00		
Dust Control	Water truck	5000 gal	2320	210	1.78E-02	2.69E-01	3.27E-02	2.75E-04	5.91E-03	3.60E-03	5.50E+01	1.30E-04	1.23E-04	5.50E+01	4.99E+01		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	5.51E-03	4.52E-03	6.64E-02	8.30E-05	6.80E-04	3.09E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01		
	Fish relocation	3/4 ton pickup truck	16	19	7.17E-05	5.88E-05	8.64E-04	1.08E-06	8.86E-06	4.02E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.17E-05	1.38E-05	1.57E-04	2.98E-07	2.38E-06	1.05E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02		
		Tractor/crawler/dozer	250 hp	7.3333	19	9.86E-05	1.19E-03	1.30E-03	6.85E-06	8.71E-06	8.01E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01	
		Chain saw		7.3335	19	1.35E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	8.41E-06	2.66E-06	3.42E-03	3.10E-03	
	Brush Piling	Front end loader	540 hp	3.696	19	1.39E-04	1.15E-03	1.25E-03	6.44E-06	9.17E-06	8.44E-06	6.40E-01	3.17E-05	-	6.41E-01	5.81E-01	
		Tractor/crawler/dozer	310 hp	3.696	19	6.33E-05	7.60E-04	5.94E-04	2.91E-06	5.59E-06	5.14E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01	
	Chipping	Brush chipper	250 hp	3.696	19	1.22E-04	9.95E-04	7.44E-04	4.71E-06	7.15E-06	6.58E-06	4.18E-01	1.10E-05	-	4.19E-01	3.80E-01	
		Front end loader	540 hp	3.696	19	1.39E-04	1.15E-03	1.25E-03	6.44E-06	9.17E-06	8.44E-06	6.40E-01	3.17E-05	-	6.41E-01	5.81E-01	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	1.94E-05	2.33E-04	2.55E-04	1.34E-06	1.71E-06	1.57E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	19	4.53E-05	4.69E-04	4.38E-04	6.46E-07	1.94E-05	1.78E-05	5.00E-02	4.09E-06	-	5.01E-02	4.54E-02	
		Roller	47 hp	4	19	3.72E-05	4.44E-04	3.88E-04	6.31E-07	1.74E-05	1.60E-05	4.88E-02	3.35E-06	-	4.89E-02	4.43E-02	
		Water truck	3000 gal	4	19	3.07E-05	4.64E-04	5.64E-05	4.74E-07	1.02E-05	6.20E-06	9.47E-02	2.25E-07	2.12E-07	-	9.48E-02	8.60E-02
		Excavator	300 hp	4	19	6.20E-05	7.00E-04	5.61E-04	2.75E-06	5.21E-06	4.79E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
		Front end loader	180 hp	4	19	5.05E-05	4.19E-04	4.42E-04	2.41E-06	3.34E-06	3.07E-06	2.14E-01	1.06E-05	-	2.15E-01	1.95E-01	
	36" Diversion Pipe - gradi	Tractor/crawler/dozer	180 hp	6	19	5.81E-05	6.98E-04	7.64E-04	4.03E-06	5.13E-06	4.72E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01	
		Loader/backhoe	75 hp	0.0923	19	4.98E-07	8.34E-06	1.03E-05	1.75E-08	6.02E-07	5.54E-07	1.49E-03	1.04E-07	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	19	1.09E-03	1.87E-02	3.39E-02	6.20E-05	1.17E-03	1.07E-03	5.51E+00	3.98E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	19	4.13E-04	4.85E-04	5.51E-03	1.05E-05	8.38E-05	3.71E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	20	1.09E-03	1.87E-02	3.39E-02	6.20E-05	1.17E-03	1.07E-03	5.51E+00	3.98E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	20	4.13E-04	4.85E-04	5.51E-03	1.05E-05	8.38E-05	3.71E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	1.94E-05	2.33E-04	2.55E-04	1.34E-06	1.71E-06	1.57E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
		Dewatering	Concrete saw	13 hp	8	22	3.73E-04	2.75E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02
			Crane 80'	130 hp	16	22	9.42E-05	1.61E-03	2.93E-03	5.37E-06	1.01E-04	9.29E-05	4.77E-01	3.45E-05	-	4.78E-01	4.34E-01
			Flatbed truck		8	22	5.78E-05	6.04E-05	8.03E-04	5.37E-07	4.27E-06	1.86E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
			Generator	80 hp	5856	244	5.39E-02	7.59E-01	8.75E-01	1.78E-03	5.09E-02	4.68E-02	1.52E+02	4.87E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	6.02E-03	7.24E-02	6.35E-02	3.19E-04	5.32E-04	4.89E-04	3.17E+01	1.75E-03	-	3.17E+01	2.88E+01	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	6.02E-03	7.24E-02	6.35E-02	3.19E-04	5.32E-04	4.89E-04	3.17E+01	1.75E-03	-	3.17E+01	2.88E+01	
		Tractor/crawler/dozer	600 hp	184.6154	19	6.02E-03	7.24E-02	6.35E-02	3.19E-04	5.32E-04	4.89E-04	3.17E+01	1.75E-03	-	3.17E+01	2.88E+01	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	6.02E-03	7.24E-02	6.35E-02	3.19E-04	5.32E-04	4.89E-04	3.17E+01	1.75E-03	-	3.17E+01	2.88E+01	
	Armoring	1 ton pickup truck		2	19	5.33E-06	6.26E-06	7.12E-05	1.35E-07	1.08E-06	4.79E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
		Excavator	430 hp	2	19	4.45E-05	5.02E-04	4.02E-04	1.97E-06	3.73E-06	3.43E-06	2.01E-01	1.11E-05	-	2.01E-01	1.82E-01	
		1 ton pickup truck		2	19	5.33E-06	6.26E-06	7.12E-05	1.35E-07	1.08E-06	4.79E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
	Maintenance	Grader	215 hp	340	210	4.52E-03	4.49E-02	5.23E-02	2.83E-04	3.43E-04	3.16E-04	2.51E+01	1.28E-03	-	2.52E+01	2.28E+01	
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	1.77E-03	2.08E-03	2.36E-02	4.49E-05	3.59E-04	1.59E-04	1.49E+01	1.48E-03	7.72E-04	1.52E+01	1.38E+01		
		Front end loader	350 hp	663.5	78	1.63E-02	1.35E-01	1.07E-01	5.40E-04	1.08E-03	9.91E-04	5.50E+01	2.72E-03	-	5.50E+01	4.99E+01	
		Front end loader	350 hp	663.5	78	1.63E-02	1.35E-01	1.07E-01	5.40E-04	1.08E-03	9.91E-04	5.50E+01	2.72E-03	-	5.50E+01	4.99E+01	
		Front end loader	350 hp	663.5	78	1.63E-02	1.35E-01	1.07E-01	5.40E-04	1.08E-03	9.91E-04	5.50E+01	2.72E-03	-	5.50E+01	4.99E+01	
		Front end loader	350 hp	663.5	78	1.63E-02	1.35E-01	1.07E-01	5.40E-04	1.08E-03	9.91E-04	5.50E+01	2.72E-03	-	5.50E+01	4.99E+01	
		Water truck	3000 gal	663.5	78	5.09E-03	7.70E-02	9.36E-03	7.86E-05	1.69E-03	1.03E-03	1.57E+01	3.73E-05	3.51E-05	1.57E+01	1.43E+01	
		Excavator	400 hp	663.5	78	1.37E-02	1.55E-01	1.24E-01	6.08E-04	1.15E-03	1.06E-03	6.20E+01	3.43E-03	-	6.21E+01	5.63E+01	
		Excavator	400 hp	663.5	78	1.37E-02	1.55E-01	1.24E-01	6.08E-04	1.15E-03	1.06E-03	6.20E+01	3.43E-03	-	6.21E+01	5.63E+01	
		Excavator	400 hp	663.5	78	1.37E-02	1.55E-01	1.24E-01	6.08E-04	1.15E-03	1.06E-03	6.20E+01	3.43E-03	-	6.21E+01	5.63E+01	
		Excavator	400 hp	663.5	78	1.37E-02	1.55E-01	1.24E-01	6.08E-04	1.15E-03	1.06E-03	6.20E+01	3.43E-03	-	6.21E+01	5.63E+01	
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	2.72E-04	3.19E-04	3.63E-03	6.91E-06	5.52E-05	2.44E-05	2.29E+00	2.28E-04	1.19E-04	2.33E+00	2.11E+00		
		Front end loader	350 hp	102	11	2.50E-03	2.08E-02	1.65E-02	8.30E-05	1.66E-04	1.52E-04	8.45E+00	4.18E-04	-	8.46E+00	7.68E+00	
		Front end loader	350 hp	102	11	2.50E-03	2.08E-02	1.65E-02	8.30E-05	1.66E-04	1.52E-04	8.45E+00	4.18E-04	-	8.46E+00	7.68E+00	
		Front end loader	350 hp	102	11	2.50E-03	2.08E-02	1.65E-02	8.30E-05	1.66E-04	1.52E-04	8.45E+00	4.18E-04	-	8.46E+00	7.68E+00	
		Front end loader	350 hp	102	11	2.50E-03	2.08E-02	1.65E-02	8.30E-05	1.66E-04	1.52E-04	8.45E+00	4.18E-04	-	8.46E+00	7.68E+00	
		Water truck	3000 gal	102	11	7.83E-04	1.18E-02	1.44E-03	1.21E-05	2.60E-04	1.58E-04	2.42E+00	5.73E-06	5.40E-06	2.42E+00	2.19E+00	
		Excavator	400 hp	102	11	2.11E-03	2.38E-02	1.91E-02	9.35E-05	1.77E-04	1.63E-04	9.53E+00	5.27E-04	-	9.54E+00	8.65E+00	
		Excavator	400 hp	102	11	2.11E-03	2.38E-02	1.91E-02	9.35E-05	1.77E-04	1.63E-04	9.53E+00	5.27E-04	-	9.54E+00	8.65E+00	
		Excavator	400 hp	102	11	2.11E-03	2.38E-02	1.91E-02	9.35E-05	1.77E-04	1.63E-04	9.53E+00	5.27E-04	-	9.54E+00	8.65E+00	
		Excavator	400 hp	102	11	2.11E-03	2.38E-02	1.91E-02	9.35E-05	1.77E-04	1.63E-04	9.53E+00	5.27E-04	-	9.54E+00	8.65E+00	
		Excavator	400 hp	102	11	2.11E-03	2.38E-02	1.91E-02	9.35E-05	1.77E-04	1.63E-04	9.53E+00	5.27E-04	-	9.54E+00	8.65E+00	
	Beach Crew	1 ton pickup truck		102	11	2.72E-04	3.19E-04	3.63E-03	6.91E-06	5.52E-05	2.44E-05	2.29E+00	2.28E-04	1.19E-04	2.33E+00	2.11E+00	
		Tractor/crawler/dozer	600 hp	102	11	3.33E-03	4.00E-02	3.51E-02	1.76E-04	2.94E-04	2.70E-04	1.75E+01	9.68E-04	-	1.75E+01	1.59E+01	
		Tractor/crawler/dozer	600 hp	102	11	3.33E-03	4.00E-02	3.51E-02	1.76E-04	2.94E-04	2.70E-04	1.75E+01	9.68E-04	-	1.75		



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2018 (tons per year)										Metric Tons CO2e/yr	
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		Front end loader	350 hp	382.5	48	9.39E-03	7.79E-02	6.18E-02	3.11E-04	6.21E-04	5.71E-04	3.17E+01	1.57E-03	-	3.17E+01	2.88E+01
	Front end loader	350 hp	382.5	48	9.39E-03	7.79E-02	6.18E-02	3.11E-04	6.21E-04	5.71E-04	3.17E+01	1.57E-03	-	3.17E+01	2.88E+01	
		350 hp	382.5	48	9.39E-03	7.79E-02	6.18E-02	3.11E-04	6.21E-04	5.71E-04	3.17E+01	1.57E-03	-	3.17E+01	2.88E+01	
	Front end loader	350 hp	382.5	48	9.39E-03	7.79E-02	6.18E-02	3.11E-04	6.21E-04	5.71E-04	3.17E+01	1.57E-03	-	3.17E+01	2.88E+01	
		350 hp	382.5	48	9.39E-03	7.79E-02	6.18E-02	3.11E-04	6.21E-04	5.71E-04	3.17E+01	1.57E-03	-	3.17E+01	2.88E+01	
	Water truck	3000 gal	382.5	48	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00	
		3000 gal	382.5	48	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00	
	Excavator	400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
		400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
	Excavator	400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
		400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
	Excavator	400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
		400 hp	382.5	48	7.91E-03	8.93E-02	7.16E-02	3.51E-04	6.64E-04	6.11E-04	3.57E+01	1.98E-03	-	3.58E+01	3.25E+01	
	Beach Crew	1 ton pickup truck	382.5	48	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
		1 ton pickup truck	382.5	48	1.02E-03	1.20E-03	1.36E-02	2.59E-05	2.07E-04	9.17E-05	8.58E+00	8.53E-04	4.45E-04	8.74E+00	7.93E+00	
Tractor/crawler/dozer	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
Tractor/crawler/dozer	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
Tractor/crawler/dozer	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
	600 hp	382.5	48	1.25E-02	1.50E-01	1.32E-01	6.60E-04	1.10E-03	1.01E-03	6.57E+01	3.63E-03	-	6.57E+01	5.96E+01		
Water truck	3000 gal	382.5	30	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00		
	3000 gal	382.5	30	2.94E-03	4.44E-02	5.40E-03	4.53E-05	9.75E-04	5.93E-04	9.06E+00	2.15E-05	2.02E-05	9.07E+00	8.23E+00		
Demolition - Concrete Arc & Spillway	Platform	Tractor/crawler/dozer	440 hp	720	22	1.75E-02	2.10E-01	1.64E-01	8.05E-04	1.54E-03	1.42E-03	8.21E+01	4.54E-03	-	8.21E+01	7.45E+01
		Tractor/crawler/dozer	440 hp	90	22	2.19E-03	2.63E-02	2.05E-02	1.01E-04	1.93E-04	1.78E-04	1.03E+01	5.67E-04	-	1.03E+01	9.32E+00
	3/4 ton pickup truck			360	22	1.61E-03	1.32E-03	1.94E-02	2.43E-05	1.99E-04	9.05E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00
				84.1333	128	3.77E-04	3.09E-04	4.54E-03	5.68E-06	4.66E-05	2.11E-05	1.89E+00	1.88E-04	9.79E-05	1.92E+00	1.74E+00
	Cut with Diamond wire	3/4 ton pickup truck		376	128	1.69E-03	1.38E-03	2.03E-02	2.54E-05	2.08E-04	9.45E-05	8.44E+00	8.39E-04	4.38E-04	8.59E+00	7.79E+00
		Diamond cutting saw	50 hp	376	128	2.53E-03	4.86E-02	3.51E-02	7.44E-05	1.66E-03	1.53E-03	5.75E+00	2.29E-04	-	5.76E+00	5.22E+00
	Lift/Load blocks	Crane 260'	375 hp	454.8767	128	5.52E-03	7.33E-02	6.06E-02	3.01E-04	5.29E-04	4.87E-04	3.07E+01	1.60E-03	-	3.07E+01	2.79E+01
		3/4 ton pickup truck		454.8767	128	2.04E-03	1.67E-03	2.46E-02	3.07E-05	2.52E-04	1.14E-04	1.02E+01	1.01E-03	5.29E-04	1.04E+01	9.43E+00
	Load/Haul	Front end loader	350 hp	32	128	7.86E-04	6.51E-03	5.17E-03	2.60E-05	5.19E-05	4.78E-05	2.65E+00	1.31E-04	-	2.65E+00	2.41E+00
		Crane 260'	375 hp	227.4384	128	2.76E-03	3.66E-02	3.03E-02	1.51E-04	2.64E-04	2.43E-04	1.53E+01	8.02E-04	-	1.54E+01	1.39E+01
	Micro-blast	Crane 260'	375 hp	60	128	7.28E-04	9.67E-03	8.00E-03	3.97E-05	6.98E-05	6.42E-05	4.05E+00	2.12E-04	-	4.05E+00	3.68E+00
		Horizontal boring drill	10 hp	55	128	5.55E-05	1.49E-03	7.18E-04	2.21E-06	5.33E-05	4.91E-05	1.74E-01	1.90E-05	-	1.75E-01	1.59E-01
	3/4 ton pickup truck			60	128	2.69E-04	2.20E-04	3.24E-03	4.05E-06	3.32E-05	1.51E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00
				100	128	1.21E-03	1.61E-02	1.33E-02	6.62E-05	1.16E-04	1.07E-04	6.75E+00	3.53E-04	-	6.75E+00	6.13E+00
	Demolish spillway	Crane 260'	375 hp	100	128	1.21E-03	1.61E-02	1.33E-02	6.62E-05	1.16E-04	1.07E-04	6.75E+00	3.53E-04	-	6.75E+00	6.13E+00
		Air compressor	50 hp	200	128	6.27E-03	7.64E-03	5.47E-01	4.12E-05	2.59E-04	2.59E-04	3.39E+00	3.54E-04	6.25E-04	3.59E+00	3.25E+00
3/4 ton pickup truck			100	128	4.48E-04	3.67E-04	5.40E-03	6.75E-06	5.53E-05	2.51E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
			100	128	4.48E-04	3.67E-04	5.40E-03	6.75E-06	5.53E-05	2.51E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
Demolition - Notch 5'	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	20	5.21E-05	7.87E-04	9.57E-05	8.03E-07	1.73E-05	1.05E-05	1.61E-01	3.81E-07	3.59E-07	1.61E-01	1.46E-01
		Excavator	430 hp	4.445	20	9.88E-05	1.12E-03	8.94E-04	4.38E-06	8.30E-06	7.63E-06	4.46E-01	2.47E-05	-	4.47E-01	4.05E-01
	Tractor/crawler/dozer	850 hp	3.2327	20	5.11E-04	3.79E-03	1.67E-03	8.39E-06	1.13E-04	1.04E-04	8.34E-01	4.61E-05	-	8.35E-01	7.58E-01	
		850 hp	3.2327	20	5.11E-04	3.79E-03	1.67E-03	8.39E-06	1.13E-04	1.04E-04	8.34E-01	4.61E-05	-	8.35E-01	7.58E-01	
	Drilling	Rotary drill	475 hp	7.3333	20	1.95E-04	2.61E-03	2.03E-03	1.06E-05	1.88E-05	1.73E-05	1.08E+00	4.46E-05	-	1.08E+00	9.84E-01
		3/4 ton Pickup truck		7.3333	20	3.29E-05	2.69E-05	3.96E-04	4.95E-07	4.06E-06	1.84E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01
	Cut with Diamond wire	3/4 ton Pickup truck		48	20	2.15E-04	1.76E-04	2.59E-03	3.24E-06	2.66E-05	1.21E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01
		Diamond cutting saw	50 hp	48	20	3.23E-04	6.21E-03	4.48E-03	9.49E-06	2.12E-04	1.95E-04	7.34E-01	2.92E-05	-	7.35E-01	6.67E-01
	Lift/Load blocks	Crane 260'	375 hp	60.0214	20	7.28E-04	9.67E-03	8.00E-03	3.98E-05	6.98E-05	6.42E-05	4.05E+00	2.12E-04	-	4.05E+00	3.68E+00
		3/4 ton Pickup truck		60.0214	20	2.69E-04	2.20E-04	3.24E-03	4.05E-06	3.32E-05	1.51E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00
	Landfill	Crane 260'	375 hp	30.0107	20	3.64E-04	4.84E-03	4.00E-03	1.99E-05	3.49E-05	3.21E-05	2.02E+00	1.06E-04	-	2.03E+00	1.84E+00
		Crane 260'	375 hp	30.0107	20	3.64E-04	4.84E-03	4.00E-03	1.99E-05	3.49E-05	3.21E-05	2.02E+00	1.06E-04	-	2.03E+00	1.84E+00
					<b>4.49E-01</b>	<b>4.87E+00</b>	<b>4.75E+00</b>	<b>1.74E-02</b>	<b>9.51E-02</b>	<b>8.32E-02</b>	<b>1.85E+03</b>	<b>9.60E-02</b>	<b>6.51E-03</b>	<b>1.85E+03</b>	<b>1.68E+03</b>	

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)						
					VOC	NOx	CO	SO2	PM10	PM2.5	
Construction Survey	3/4 ton pickup truck		96	210	8.20E-03	6.72E-03	9.88E-02	1.23E-04	1.01E-03	4.60E-04	
Dust Control	Water truck	5000 gal	2320	210	3.39E-01	5.13E+00	6.23E-01	5.23E-03	1.13E-01	6.85E-02	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	210	1.05E-01	8.60E-02	1.26E+00	1.58E-03	1.30E-02	5.88E-03	
	Fish relocation	3/4 ton pickup truck	16	19	1.51E-02	1.24E-02	1.82E-01	2.27E-04	1.86E-03	8.46E-04	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.47E-03	2.90E-03	3.30E-02	6.27E-05	5.01E-04	2.22E-04	
		Tractor/crawler/dozer	250 hp	7.3333	19	2.08E-02	2.49E-01	2.73E-01	1.44E-03	1.83E-03	
		Chain saw		7.3335	19	2.85E-02	1.64E-03	1.89E-01	2.10E-05	2.97E-04	
	Brush Piling	Front end loader	540 hp	3.696	19	2.92E-02	2.42E-01	2.63E-01	1.35E-03	1.93E-03	
		Tractor/crawler/dozer	310 hp	3.696	19	1.33E-02	1.60E-01	1.25E-01	6.13E-04	1.18E-03	
		Chipping	Brush chipper	250 hp	3.696	19	2.57E-02	2.09E-01	1.57E-01	9.91E-04	1.50E-03
			Front end loader	540 hp	3.696	19	2.92E-02	2.42E-01	2.63E-01	1.35E-03	1.93E-03
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.08E-03	4.90E-02	5.36E-02	2.83E-04	3.60E-04	
		Front end loader	49 hp	4	19	9.54E-03	9.86E-02	9.23E-02	1.36E-04	4.08E-03	
		Roller	47 hp	4	19	7.83E-03	9.34E-02	8.16E-02	1.33E-04	3.67E-03	
		Water truck	3000 gal	4	19	6.46E-03	9.77E-02	1.19E-02	9.97E-05	2.15E-03	
		Excavator	300 hp	4	19	1.31E-02	1.47E-01	1.18E-01	5.79E-04	1.10E-03	
		Front end loader	180 hp	4	19	1.06E-02	8.82E-02	9.30E-02	5.08E-04	7.03E-04	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	1.22E-02	1.47E-01	1.61E-01	8.49E-04	1.08E-03	
		Loader/backhoe	75 hp	0.0923	19	1.05E-04	1.76E-03	2.16E-03	3.68E-06	1.27E-04	
		Crane 94'	155 hp	155	19	2.29E-01	3.93E+00	7.14E+00	1.31E-02	2.45E-01	
		1 ton pickup truck		155	19	8.69E-02	1.02E-01	1.16E+00	2.21E-03	1.76E-02	
		Crane 94'	155 hp	155	20	2.18E-01	3.73E+00	6.78E+00	1.24E-02	2.33E-01	
		1 ton pickup truck		155	20	8.26E-02	9.70E-02	1.10E+00	2.10E-03	1.68E-02	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	3.87E-03	4.65E-02	5.10E-02	2.69E-04	3.42E-04	
	Dewatering	Concrete saw	13 hp	8	22	6.77E-02	5.01E-02	2.48E+00	1.19E-04	3.51E-02	
		Crane 80'	130 hp	16	22	1.71E-02	2.94E-01	5.34E-01	9.76E-04	1.84E-02	
		Flatbed truck		8	22	1.05E-02	1.10E-02	1.46E-01	9.76E-05	7.76E-04	
		Generator	80 hp	5856	244	8.84E-01	1.24E+01	1.43E+01	2.92E-02	8.34E-01	
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.27E+00	1.52E+01	1.34E+01	6.71E-02	1.12E-01
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.27E+00	1.52E+01	1.34E+01	6.71E-02	1.12E-01
			Tractor/crawler/dozer	600 hp	184.6154	19	1.27E+00	1.52E+01	1.34E+01	6.71E-02	1.12E-01
Build road		Tractor/crawler/dozer	600 hp	184.6154	19	1.27E+00	1.52E+01	1.34E+01	6.71E-02	1.12E-01	
Armoring		1 ton pickup truck		2	19	1.12E-03	1.32E-03	1.50E-02	2.85E-05	2.28E-04	
		Excavator	430 hp	2	19	9.36E-03	1.06E-01	8.47E-02	4.15E-04	7.86E-04	
		1 ton pickup truck		2	19	1.12E-03	1.32E-03	1.50E-02	2.85E-05	2.28E-04	
Maintenance		Grader	215 hp	340	210	8.61E-02	8.56E-01	9.96E-01	5.39E-03	6.54E-03	
Coarse Material (Gravel & Larger) - 167,000 cy after ramp building (4/1-7/21)	Material Excavation	1 ton pickup truck	663.5	78	9.07E-02	1.06E-01	1.21E+00	2.30E-03	1.84E-02	8.15E-03	
		Front end loader	350 hp	663.5	78	8.35E-01	6.93E+00	5.50E+00	2.77E-02	5.52E-02	
		Front end loader	350 hp	663.5	78	8.35E-01	6.93E+00	5.50E+00	2.77E-02	5.52E-02	
		Front end loader	350 hp	663.5	78	8.35E-01	6.93E+00	5.50E+00	2.77E-02	5.52E-02	
		Front end loader	350 hp	663.5	78	8.35E-01	6.93E+00	5.50E+00	2.77E-02	5.52E-02	
		Water truck	3000 gal	663.5	78	2.61E-01	3.95E+00	4.80E-01	4.03E-03	8.67E-02	
		Excavator	400 hp	663.5	78	7.04E-01	7.94E+00	6.37E+00	3.12E-02	5.91E-02	
		Excavator	400 hp	663.5	78	7.04E-01	7.94E+00	6.37E+00	3.12E-02	5.91E-02	
		Excavator	400 hp	663.5	78	7.04E-01	7.94E+00	6.37E+00	3.12E-02	5.91E-02	
		Excavator	400 hp	663.5	78	7.04E-01	7.94E+00	6.37E+00	3.12E-02	5.91E-02	
Sand to Surfrider Beach (32,400 cy) (9/3-18)	Material Excavation	1 ton pickup truck	102	11	9.88E-02	1.16E-01	1.32E+00	2.51E-03	2.01E-02	8.89E-03	
		Front end loader	350 hp	102	11	9.10E-01	7.55E+00	5.99E+00	3.02E-02	6.02E-02	
		Front end loader	350 hp	102	11	9.10E-01	7.55E+00	5.99E+00	3.02E-02	6.02E-02	
		Front end loader	350 hp	102	11	9.10E-01	7.55E+00	5.99E+00	3.02E-02	6.02E-02	
		Front end loader	350 hp	102	11	9.10E-01	7.55E+00	5.99E+00	3.02E-02	6.02E-02	
		Water truck	3000 gal	102	11	2.85E-01	4.30E+00	5.23E-01	4.39E-03	9.46E-02	
		Excavator	400 hp	102	11	7.67E-01	8.66E+00	6.94E+00	3.40E-02	6.44E-02	
		Excavator	400 hp	102	11	7.67E-01	8.66E+00	6.94E+00	3.40E-02	6.44E-02	
		Excavator	400 hp	102	11	7.67E-01	8.66E+00	6.94E+00	3.40E-02	6.44E-02	
		Excavator	400 hp	102	11	7.67E-01	8.66E+00	6.94E+00	3.40E-02	6.44E-02	
		Excavator	400 hp	102	11	7.67E-01	8.66E+00	6.94E+00	3.40E-02	6.44E-02	
	Beach Crew	1 ton pickup truck		102	11	9.88E-02	1.16E-01	1.32E+00	2.51E-03	2.01E-02	
		Tractor/crawler/dozer	600 hp	102	11	1.21E+00	1.45E+01	1.28E+01	6.40E-02	1.07E-01	
		Tractor/crawler/dozer	600 hp	102	11	1.21E+00	1.45E+01	1.28E+01	6.40E-02	1.07E-01	
		Tractor/crawler/dozer	600 hp	102	11	1.21E+00	1.45E+01	1.28E+01	6.40E-02	1.07E-01	
		Tractor/crawler/dozer	600 hp	102	11	1.21E+00	1.45E+01	1.28E+01	6.40E-02	1.07E-01	
		Water truck	3000 gal	25	11	6.98E-02	1.05E+00	1.28E-01	1.08E-03	2.32E-02	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2018
Birthday of Martin Luther King, Jr.	1/15/2018
Washington's Birthday	2/19/2018
Memorial Day	5/28/2018
Independence Day	7/4/2018
Labor Day	9/3/2018
Columbus Day	10/8/2018
Veterans Day	11/12/2018
Thanksgiving Day	11/22/2018
Christmas Day	12/25/2018

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<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 2

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2018 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Sand to Topanga Beach (93,200 cy) (7/22-Labor Day; 9/19-10/15)	Material Excavation	1 ton pickup truck	382.5	48	8.49E-02	9.97E-02	1.13E+00	2.16E-03	1.72E-02	7.64E-03		
		Front end loader	350 hp	382.5	48	7.82E-01	6.49E+00	5.15E+00	2.59E-02	5.17E-02	4.76E-02	
		Front end loader	350 hp	382.5	48	7.82E-01	6.49E+00	5.15E+00	2.59E-02	5.17E-02	4.76E-02	
	Beach Crew	Front end loader	350 hp	382.5	48	7.82E-01	6.49E+00	5.15E+00	2.59E-02	5.17E-02	4.76E-02	
		Water truck	3000 gal	382.5	48	2.45E-01	3.70E+00	4.50E-01	3.77E-03	8.13E-02	4.94E-02	
		Excavator	400 hp	382.5	48	6.59E-01	7.44E+00	5.96E+00	2.92E-02	5.53E-02	5.09E-02	
		Excavator	400 hp	382.5	48	6.59E-01	7.44E+00	5.96E+00	2.92E-02	5.53E-02	5.09E-02	
		Excavator	400 hp	382.5	48	6.59E-01	7.44E+00	5.96E+00	2.92E-02	5.53E-02	5.09E-02	
		Excavator	400 hp	382.5	48	6.59E-01	7.44E+00	5.96E+00	2.92E-02	5.53E-02	5.09E-02	
	Beach Crew	1 ton pickup truck	382.5	48	8.49E-02	9.97E-02	1.13E+00	2.16E-03	1.72E-02	7.64E-03		
		Tractor/crawler/dozer	600 hp	382.5	48	1.04E+00	1.25E+01	1.10E+01	5.50E-02	9.19E-02	8.45E-02	
		Tractor/crawler/dozer	600 hp	382.5	48	1.04E+00	1.25E+01	1.10E+01	5.50E-02	9.19E-02	8.45E-02	
		Tractor/crawler/dozer	600 hp	382.5	48	1.04E+00	1.25E+01	1.10E+01	5.50E-02	9.19E-02	8.45E-02	
		Tractor/crawler/dozer	600 hp	382.5	48	1.04E+00	1.25E+01	1.10E+01	5.50E-02	9.19E-02	8.45E-02	
		Water truck	3000 gal	382.5	30	3.91E-01	5.92E+00	7.19E-01	6.04E-03	1.30E-01	7.91E-02	
Demolition - Concrete Arc & Spillway	Platform	Tractor/crawler/dozer	440 hp	720	22	3.18E+00	3.82E+01	2.99E+01	1.46E-01	2.81E-01	2.58E-01	
		Tractor/crawler/dozer	440 hp	90	22	3.98E-01	4.78E+00	3.74E+00	1.83E-02	3.51E-02	3.23E-02	
	3/4 ton pickup truck			360	22	2.93E-01	2.40E-01	3.53E+00	4.42E-03	3.62E-02	1.64E-02	
		Drilling	Rotary drill	475 hp	88.1333	128	7.32E-02	9.80E-01	7.63E-01	3.99E-03	7.06E-03	6.50E-03
	3/4 ton pickup truck			84.1333	128	1.18E-02	9.66E-03	1.42E-01	1.77E-04	1.46E-03	6.61E-04	
		Cut with Diamond wire	3/4 ton pickup truck		376	128	5.27E-02	4.32E-02	6.35E-01	7.93E-04	6.50E-03	2.95E-03
	Diamond cutting saw			376	128	7.92E-02	1.52E+00	1.10E+00	2.32E-03	5.19E-02	4.77E-02	
		Lift/Load blocks	Crane 260'	375 hp	454.8767	128	1.72E-01	2.29E+00	1.89E+00	9.41E-03	1.65E-02	1.52E-02
	3/4 ton pickup truck			454.8767	128	6.37E-02	5.22E-02	7.68E-01	9.60E-04	7.87E-03	3.57E-03	
		Load/Haul	Front end loader	350 hp	32	128	2.45E-02	2.04E-01	1.62E-01	8.13E-04	1.62E-03	1.49E-03
	Landfill	Crane 260'	375 hp	227.4384	128	8.62E-02	1.15E+00	9.47E-01	4.71E-03	8.26E-03	7.60E-03	
		Micro-blast	Crane 260'	375 hp	60	128	2.27E-02	3.02E-01	2.50E-01	1.24E-03	2.18E-03	2.01E-03
	Horizontal boring drill			55	128	1.73E-03	4.67E-02	2.24E-02	6.91E-05	1.67E-03	1.53E-03	
		3/4 ton pickup truck		60	128	8.41E-03	6.89E-03	1.01E-01	1.27E-04	1.04E-03	4.71E-04	
	Demolish spillway	Crane 260'	375 hp	100	128	3.79E-02	5.04E-01	4.17E-01	2.07E-03	3.63E-03	3.34E-03	
Air compressor		50 hp	200	128	1.96E-01	2.39E-01	1.71E+01	1.29E-03	8.11E-03	8.09E-03		
3/4 ton pickup truck		100	128	1.40E-02	1.15E-02	1.69E-01	2.11E-04	1.73E-03	7.85E-04			
Demolition - Notch 5'	Excavation for Dam Demo	Asphalt distributor	3000 gal	6.7805	20	1.04E-02	1.57E-01	1.91E-02	1.61E-04	3.46E-03	2.10E-03	
		Excavator	430 hp	4.445	20	1.98E-02	2.23E-01	1.79E-01	8.76E-04	1.66E-03	1.53E-03	
	Tractor/crawler/dozer			850 hp	3.2327	20	1.02E-01	7.57E-01	3.34E-01	1.68E-03	2.25E-02	2.07E-02
		Drilling	Rotary drill	475 hp	7.3333	20	3.90E-02	5.22E-01	4.06E-01	2.13E-03	3.76E-03	3.46E-03
	3/4 ton Pickup truck			7.3333	20	6.58E-03	5.39E-03	7.92E-02	9.90E-05	8.12E-04	3.69E-04	
		Cut with Diamond wire	3/4 ton Pickup truck		48	20	4.30E-02	3.53E-02	5.18E-01	6.48E-04	5.31E-03	2.41E-03
	Diamond cutting saw			48	20	6.47E-02	1.24E+00	8.96E-01	1.90E-03	4.24E-02	3.90E-02	
		Lift/Load blocks	Crane 260'	375 hp	60.0214	20	1.46E-01	1.93E+00	1.60E+00	7.95E-03	1.40E-02	1.28E-02
	3/4 ton Pickup truck			60.0214	20	5.38E-02	4.41E-02	6.48E-01	8.10E-04	6.64E-03	3.02E-03	
		Landfill	Crane 260'	375 hp	30.0107	20	7.28E-02	9.67E-01	8.00E-01	3.98E-03	6.98E-03	6.42E-03
					<b>4.21E+01</b>	<b>4.54E+02</b>	<b>4.06E+02</b>	<b>1.79E+00</b>	<b>5.28E+00</b>	<b>4.59E+00</b>		

Conversions  
2000 pounds per ton

Data from Alt4\_EnvrAirQualityReport.pdf

Emissions (lb/day)						
32	336	307	1	4	4	
5	59	52	0	0	0	
5	56	46	0	1	0	
0	0	0	0	0	0	
0	2	2	0	0	0	

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Construction Survey	3/4 ton pickup truck		96	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Dust Control	Water truck	5000 gal	2320	209	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Fish relocation	3/4 ton pickup truck	16	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Chain saw		7.3335	19	2.096	0.115	13.187	0.001	0.021	0.021	35.644	0.130	0.039	
	Brush Piling	Front end loader	3.696	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000	
	Tractor/crawler/dozer	310 hp	3.696	19	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000	
	Chipping	Brush chipper	3.696	19	0.125	0.962	0.724	0.005	0.007	0.006	402.522	0.011	0.000	
	Front end loader	540 hp	3.696	19	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000	
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	301.172	0.017	0.000	
	Front end loader	49 hp	4	19	0.224	2.197	2.112	0.003	0.093	0.085	231.302	0.020	0.000	
	Roller	47 hp	4	19	0.194	2.169	1.953	0.003	0.087	0.080	235.458	0.017	0.000	
	Water truck	3000 gal	4	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Excavator	300 hp	4	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
	Front end loader	180 hp	4	19	0.068	0.534	0.569	0.003	0.004	0.004	270.062	0.014	0.000	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	0.052	0.590	0.642	0.003	0.004	301.172	0.017	0.000	
	36" Diversion Pipe - pipe	Welder	17 hp	4	19	2.544	1.646	93.480	0.004	1.249	1.246	148.933	0.144	0.124
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000
	Loader/backhoe	75 hp	0.0923	19	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	
	Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	
	1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Crane 94'	155 hp	155	19	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	
	1 ton pickup truck		155	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.052	0.590	0.642	0.003	0.004	301.172	0.017	0.000	
	Dewatering	Concrete saw	13 hp	8	21	3.249	2.402	118.759	0.006	1.684	1.680	200.831	0.184	0.193
	Crane 80'	130 hp	16	21	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000	
	Flatbed truck		8	21	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
	Generator	80 hp	5856	244	0.110	1.476	1.708	0.003	0.100	0.092	294.378	0.010	0.000	
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.053	0.602	0.598	0.003	0.004	298.381	0.017	0.000	
	Armoring	1 ton pickup truck	2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Excavator	430 hp	2	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
	1 ton pickup truck		2	19	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Maintenance	Grader	215 hp	340	209	0.060	0.562	0.664	0.004	0.004	311.990	0.017	0.000	
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Front end loader	350 hp	59.5	7	0.068	0.534	0.426	0.002	0.004	0.004	214.831	0.011	0.000	
	Front end loader	350 hp	59.5	7	0.068	0.534	0.426	0.002	0.004	0.004	214.831	0.011	0.000	
	Water truck	3000 gal	59.5	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Excavator	400 hp	59.5	7	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
	Beach Crew	1 ton pickup truck	59.5	7	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Tractor/crawler/dozer	600 hp	59.5	7	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000	
	Tractor/crawler/dozer	600 hp	59.5	7	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000	
	Water truck	3000 gal	14.875	7	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2019 (g/hp-hr or g/hr)									
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
		Front end loader	1028.5	131	0.068	0.534	0.426	0.002	0.004	0.004	214.831	0.011	0.000	
		Front end loader	1028.5	131	0.068	0.534	0.426	0.002	0.004	0.004	214.831	0.011	0.000	
		Water truck	1028.5	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Excavator	1028.5	131	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
		Beach Crew	1 ton pickup truck	1028.5	131	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056
			Tractor/crawler/dozer	1028.5	131	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000
			Tractor/crawler/dozer	1028.5	131	0.053	0.602	0.598	0.003	0.004	0.004	298.381	0.017	0.000
			Water truck	257.125	131	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
	Demolition	Platform	Tractor/crawler/dozer	720	22	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000
		Tractor/crawler/dozer	90	22	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000	
		3/4 ton pickup truck	360	22	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Drilling		Rotary drill	54.4	128	0.052	0.685	0.532	0.003	0.005	0.005	281.905	0.012	0.000	
		3/4 ton pickup truck	50.4	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Cut with Diamond wire	3/4 ton pickup truck	148	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
			Diamond cutting saw	148	128	0.130	2.363	1.738	0.004	0.082	0.075	277.553	0.012	0.000
		Lift/Load blocks	Crane 260'	179.6356	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
			3/4 ton pickup truck	179.6356	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
		Load/Haul	Front end loader	32	128	0.068	0.534	0.426	0.002	0.004	0.004	214.831	0.011	0.000
			Water truck	521	128	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
		Landfill	Crane 260'	89.8178	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
		Micro-blast	Crane 260'	60	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
			Horizontal boring drill	55	128	0.095	2.473	1.183	0.004	0.089	0.082	287.212	0.031	0.000
			3/4 ton pickup truck	60	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
		Demolish spillway	Crane 260'	100	128	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
			Air compressor	200	128	0.601	0.717	53.729	0.004	0.024	0.023	307.156	0.034	0.058
		3/4 ton pickup truck	100	128	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
Demolition - Notch 5'	Excavation for Dam Demolition	Asphalt Distributor	6.7805	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
		Excavator	4.445	19	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
		Tractor/crawler/dozer	3.2327	19	0.194	1.437	0.634	0.003	0.043	0.039	316.617	0.018	0.000	
	Drilling	Rotary drill	7.3333	19	0.052	0.685	0.532	0.003	0.005	0.005	281.905	0.012	0.000	
		3/4 ton Pickup truck	7.3333	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	
		Cut with Diamond wire	3/4 ton Pickup truck	48	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
			Diamond cutting saw	48	19	0.130	2.363	1.738	0.004	0.082	0.075	277.553	0.012	0.000
		Lift/Load blocks	Crane 260'	60.0214	19	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
			3/4 ton Pickup truck	60.0214	19	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056
			Water truck	507	19	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
	Landfill	Crane 260'	30.0107	19	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000	
<b>Total</b>														

Data from Alt4\_EnvrAirQualityReport.pdf

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	209	3.71E-04	3.21E-04	4.51E-03	6.44E-06	5.25E-05	2.36E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00
Dust Control	Water truck	5000 gal	2320	209	1.75E-02	2.47E-01	3.24E-02	2.73E-04	5.70E-03	3.40E-03	5.49E+01	1.30E-04	1.23E-04	5.49E+01	4.98E+01
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	4.75E-03	4.11E-03	5.77E-02	8.24E-05	6.73E-04	3.02E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01
	Fish relocation	3/4 ton pickup truck	16	19	6.19E-05	5.34E-05	7.52E-04	1.07E-06	8.76E-06	3.93E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	9.54E-06	1.22E-05	1.29E-04	2.96E-07	2.35E-06	1.03E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02
	Tractor/crawler/dozer	250 hp	7.3333	19	1.05E-04	1.19E-03	1.30E-03	6.85E-06	8.85E-06	8.14E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01
	Chain saw		7.3335	19	1.42E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	8.85E-06	2.66E-06	3.43E-03	3.11E-03
	Brush Piling	Front end loader	3.696	19	1.49E-04	1.16E-03	1.35E-03	6.84E-06	9.42E-06	8.67E-06	6.80E-01	3.62E-05	-	6.81E-01	6.18E-01
	Tractor/crawler/dozer	310 hp	3.696	19	6.66E-05	7.60E-04	5.94E-04	2.91E-06	5.64E-06	5.19E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01
	Chipping	Brush chipper	3.696	19	1.27E-04	9.80E-04	7.37E-04	4.61E-06	7.11E-06	6.54E-06	4.10E-01	1.15E-05	-	4.10E-01	3.72E-01
	Front end loader	540 hp	3.696	19	1.49E-04	1.16E-03	1.35E-03	6.84E-06	9.42E-06	8.67E-06	6.80E-01	3.62E-05	-	6.81E-01	6.18E-01
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	2	19	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
	Front end loader	49 hp	4	19	4.84E-05	4.75E-04	4.56E-04	6.46E-07	2.00E-05	1.84E-05	5.00E-02	4.37E-06	-	5.01E-02	4.54E-02
	Roller	47 hp	4	19	4.02E-05	4.50E-04	4.05E-04	6.31E-07	1.80E-05	1.66E-05	4.88E-02	3.63E-06	-	4.89E-02	4.43E-02
	Water truck	3000 gal	4	19	3.02E-05	4.25E-04	5.58E-05	4.72E-07	9.82E-06	5.86E-06	9.46E-02	2.25E-07	2.12E-07	9.47E-02	8.59E-02
	Excavator	300 hp	4	19	6.57E-05	7.06E-04	5.61E-04	2.75E-06	5.30E-06	4.88E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01
	Front end loader	180 hp	4	19	5.42E-05	4.23E-04	4.52E-04	2.41E-06	3.43E-06	3.16E-06	2.14E-01	1.14E-05	-	2.15E-01	1.95E-01
	36" Diversion Pipe - grad	Tractor/crawler/dozer	6	19	6.16E-05	7.03E-04	7.64E-04	4.03E-06	5.21E-06	4.80E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01
	36" Diversion Pipe - pipe	Welder	4	19	1.91E-04	1.23E-04	7.01E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02
	36" Diversion Pipe	Crane 80'	27.3333	19	1.70E-04	2.77E-03	5.10E-03	9.17E-06	1.77E-04	1.63E-04	8.15E-01	6.22E-05	-	8.16E-01	7.40E-01
	Loader/backhoe	75 hp	0.0923	19	5.28E-07	8.42E-06	1.05E-05	1.75E-08	6.15E-07	5.66E-07	1.49E-03	1.11E-07	-	1.49E-03	1.35E-03
	Crane 94'	155 hp	155	19	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Crane 94'	155 hp	155	19	1.15E-03	1.88E-02	3.45E-02	6.20E-05	1.20E-03	1.10E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00
	1 ton pickup truck		155	19	3.36E-04	4.31E-04	4.55E-03	1.04E-05	8.29E-05	3.63E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00
	Demolish cofferdam	Tractor/crawler/dozer	2	19	2.05E-05	2.34E-04	2.55E-04	1.34E-06	1.74E-06	1.60E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01
	Dewatering	Concrete saw	8	21	3.72E-04	2.75E-04	1.36E-02	6.56E-07	1.93E-04	1.93E-04	2.30E-02	2.11E-05	2.21E-05	3.03E-02	2.75E-02
	Crane 80'	130 hp	16	21	9.96E-05	1.62E-03	2.99E-03	5.37E-06	1.03E-04	9.52E-05	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01
	Flatbed truck		8	21	4.87E-05	5.25E-05	6.75E-04	5.33E-07	4.22E-06	1.82E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01
	Generator	80 hp	5856	244	5.66E-02	7.62E-01	8.82E-01	1.78E-03	5.15E-02	4.74E-02	1.52E+02	5.11E-03	-	1.52E+02	1.38E+02
Temporary Access Road	Excavate	Tractor/crawler/dozer	184.6154	19	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01
	Push	Tractor/crawler/dozer	184.6154	19	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01
	Push	Tractor/crawler/dozer	184.6154	19	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01
	Build road	Tractor/crawler/dozer	184.6154	19	6.44E-03	7.35E-02	7.30E-02	3.66E-04	5.45E-04	5.02E-04	3.64E+01	2.01E-03	-	3.65E+01	3.31E+01
	Armoring	1 ton pickup truck	2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
	Excavator	430 hp	2	19	4.71E-05	5.06E-04	4.02E-04	1.97E-06	3.80E-06	3.50E-06	2.01E-01	1.11E-05	-	2.01E-01	1.82E-01
	1 ton pickup truck		2	19	4.34E-06	5.56E-06	5.87E-05	1.34E-07	1.07E-06	4.68E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02
	Maintenance	Grader	340	209	4.82E-03	4.53E-02	5.35E-02	2.83E-04	3.50E-04	3.22E-04	2.51E+01	1.38E-03	-	2.52E+01	2.28E+01
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00
	Front end loader	350 hp	59.5	7	1.57E-03	1.23E-02	9.78E-03	4.84E-05	9.92E-05	9.13E-05	4.93E+00	2.62E-04	-	4.94E+00	4.48E+00
	Front end loader	350 hp	59.5	7	1.57E-03	1.23E-02	9.78E-03	4.84E-05	9.92E-05	9.13E-05	4.93E+00	2.62E-04	-	4.94E+00	4.48E+00
	Water truck	3000 gal	59.5	7	4.49E-04	6.32E-03	8.31E-04	7.01E-06	1.46E-04	8.71E-05	1.41E+00	3.34E-06	3.15E-06	1.41E+00	1.28E+00
	Excavator	400 hp	59.5	7	1.30E-03	1.40E-02	1.11E-02	5.46E-05	1.05E-04	9.67E-05	5.56E+00	3.07E-04	-	5.56E+00	5.05E+00
	Beach Crew	1 ton pickup truck	59.5	7	1.29E-04	1.65E-04	1.75E-03	4.00E-06	3.18E-05	1.39E-05	1.34E+00	1.33E-04	6.93E-05	1.36E+00	1.23E+00
	Tractor/crawler/dozer	600 hp	59.5	7	2.08E-03	2.37E-02	2.35E-02	1.18E-04	1.76E-04	1.62E-04	1.17E+01	6.49E-04	-	1.18E+01	1.07E+01
	Tractor/crawler/dozer	600 hp	59.5	7	2.08E-03	2.37E-02	2.35E-02	1.18E-04	1.76E-04	1.62E-04	1.17E+01	6.49E-04	-	1.18E+01	1.07E+01
	Water truck	3000 gal	14.875	7	1.12E-04	1.58E-03	2.08E-04	1.75E-06	3.65E-05	2.18E-05	3.52E-01	8.36E-07	7.87E-07	3.52E-01	3.19E-01

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Annual Emissions - 2019 (tons per year)										Metric Tons CO2e/yr		
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	CO2e			
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	Material Excavation	1 ton pickup truck	1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01		
		Front end loader	1028.5	131	2.71E-02	2.12E-01	1.69E-01	8.37E-04	1.72E-03	1.58E-03	8.52E+01	4.54E-03	-	8.53E+01	7.74E+01		
		Front end loader	350 hp	1028.5	131	2.71E-02	2.12E-01	1.69E-01	8.37E-04	1.72E-03	1.58E-03	8.52E+01	4.54E-03	-	8.53E+01	7.74E+01	
		Water truck	3000 gal	1028.5	131	7.77E-03	1.09E-01	1.44E-02	1.21E-04	2.53E-03	1.51E-03	2.43E+01	5.78E-05	5.44E-05	2.43E+01	2.21E+01	
	Beach Crew	Excavator	400 hp	1028.5	131	2.25E-02	2.42E-01	1.92E-01	9.43E-04	1.82E-03	1.67E-03	9.61E+01	5.31E-03	-	9.62E+01	8.73E+01	
		1 ton pickup truck		1028.5	131	2.23E-03	2.86E-03	3.02E-02	6.92E-05	5.50E-04	2.41E-04	2.31E+01	2.29E-03	1.20E-03	2.35E+01	2.13E+01	
		Tractor/crawler/dozer	600 hp	1028.5	131	3.59E-02	4.09E-01	4.07E-01	2.04E-03	3.04E-03	2.79E-03	2.03E+02	1.12E-02	-	2.03E+02	1.84E+02	
		Tractor/crawler/dozer	600 hp	1028.5	131	3.59E-02	4.09E-01	4.07E-01	2.04E-03	3.04E-03	2.79E-03	2.03E+02	1.12E-02	-	2.03E+02	1.84E+02	
		Water truck	3000 gal	257.125	131	1.94E-03	2.73E-02	3.59E-03	3.03E-05	6.31E-04	3.77E-04	6.08E+00	1.45E-05	1.36E-05	6.08E+00	5.52E+00	
		Tractor/crawler/dozer	440 hp	720	22	1.84E-02	2.10E-01	1.64E-01	8.05E-04	1.56E-03	1.43E-03	8.21E+01	4.54E-03	-	8.21E+01	7.45E+01	
Demolition	Platform	Tractor/crawler/dozer	440 hp	90	2.30E-03	2.63E-02	2.05E-02	1.01E-04	1.95E-04	1.79E-04	1.03E+01	5.67E-04	-	1.03E+01	9.32E+00		
		Tractor/crawler/dozer	440 hp	90	2.30E-03	2.63E-02	2.05E-02	1.01E-04	1.95E-04	1.79E-04	1.03E+01	5.67E-04	-	1.03E+01	9.32E+00		
	3/4 ton pickup truck		360	22	1.39E-03	1.20E-03	1.69E-02	2.41E-05	1.97E-04	8.84E-05	8.08E+00	8.03E-04	4.19E-04	8.23E+00	7.46E+00		
		Rotary drill	475 hp	54.4	128	1.49E-03	1.95E-02	1.52E-02	7.88E-05	1.41E-04	1.30E-04	8.03E+00	3.43E-04	-	8.04E+00	7.29E+00	
	Cut with Diamond wire	3/4 ton pickup truck		50.4	128	1.95E-04	1.68E-04	2.37E-03	3.38E-06	2.76E-05	1.24E-05	1.13E+00	1.12E-04	5.87E-05	1.15E+00	1.04E+00	
		Diamond cutting saw	50 hp	148	128	5.72E-04	4.94E-04	6.95E-03	9.92E-06	8.10E-05	3.64E-05	3.32E+00	3.30E-04	1.72E-04	3.38E+00	3.07E+00	
	Lift/Load blocks	Crane 260'	375 hp	179.6356	128	1.06E-03	1.93E-02	1.42E-02	2.93E-05	6.67E-04	6.14E-04	2.26E+00	9.58E-05	-	2.27E+00	2.06E+00	
		3/4 ton pickup truck		179.6356	128	2.31E-03	2.91E-02	2.43E-02	1.19E-04	2.12E-04	1.95E-04	1.21E+01	6.70E-04	-	1.21E+01	1.10E+01	
	Load/Haul	Front end loader	350 hp	32	128	6.95E-04	6.00E-04	8.44E-03	1.20E-05	9.83E-05	4.41E-05	4.03E+00	4.01E-04	2.09E-04	4.10E+00	3.72E+00	
		Water truck	3000 gal	521	128	8.44E-04	6.59E-03	5.26E-03	2.60E-05	5.34E-05	4.91E-05	2.65E+00	1.41E-04	-	2.66E+00	2.41E+00	
	Landfill	Crane 260'	375 hp	89.8178	128	3.93E-03	5.54E-02	7.27E-03	6.14E-05	1.28E-03	7.63E-04	1.23E+01	2.93E-05	2.76E-05	1.23E+01	1.12E+01	
		Crane 260'	375 hp	60	128	1.15E-03	1.46E-02	1.21E-02	5.95E-05	1.06E-04	9.76E-05	6.06E+00	3.35E-04	-	6.07E+00	5.50E+00	
	Micro-blast	Crane 260'	375 hp	60	128	7.71E-04	9.73E-03	8.11E-03	3.97E-05	7.08E-05	6.52E-05	4.05E+00	2.24E-04	-	4.05E+00	3.68E+00	
		Horizontal boring drill	10 hp	55	128	5.74E-05	1.50E-03	7.17E-04	2.21E-06	5.40E-05	4.97E-05	1.74E-01	1.90E-05	-	1.75E-01	1.58E-01	
	Demolish spillway	3/4 ton pickup truck		60	128	2.32E-04	2.00E-04	2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.98E-05	1.37E+00	1.24E+00	
		Crane 260'	375 hp	100	128	1.28E-03	1.62E-02	1.35E-02	6.62E-05	1.18E-04	1.09E-04	6.75E+00	3.73E-04	-	6.75E+00	6.13E+00	
		Air compressor	50 hp	200	128	6.63E-03	7.90E-03	5.92E-01	4.12E-05	2.59E-04	2.59E-04	3.39E+00	3.74E-04	6.36E-04	3.59E+00	3.26E+00	
		3/4 ton pickup truck		100	128	3.87E-04	3.34E-04	4.70E-03	6.70E-06	5.47E-05	2.46E-05	2.24E+00	2.23E-04	1.16E-04	2.29E+00	2.07E+00	
	Demolition - Notch 5'	Excavation for Dam Demolition	Asphalt Distributor	3000 gal	6.7805	19	5.12E-05	7.21E-04	9.47E-05	7.99E-07	1.67E-05	9.93E-06	1.60E-01	3.81E-07	3.59E-07	1.60E-01	1.46E-01
			Excavator	430 hp	4.445	19	1.05E-04	1.12E-03	8.94E-04	4.38E-06	8.44E-06	7.77E-06	4.46E-01	2.47E-05	-	4.47E-01	4.05E-01
		Tractor/crawler/dozer	850 hp	3.2327	19	5.88E-04	4.35E-03	1.92E-03	9.64E-06	1.29E-04	1.19E-04	9.59E-01	5.30E-05	-	9.60E-01	8.71E-01	
		Rotary drill	475 hp	7.3333	19	2.01E-04	2.63E-03	2.04E-03	1.06E-05	1.90E-05	1.75E-05	1.08E+00	4.63E-05	-	1.08E+00	9.83E-01	
Cut with Diamond wire		3/4 ton Pickup truck		7.3333	19	2.84E-05	2.45E-05	3.44E-04	4.92E-07	4.01E-06	1.80E-06	1.65E-01	1.64E-05	8.54E-06	1.68E-01	1.52E-01	
		Diamond cutting saw	50 hp	48	19	1.86E-04	1.60E-04	2.25E-03	3.22E-06	2.63E-05	1.18E-05	1.08E+00	1.07E-04	5.59E-05	1.10E+00	9.95E-01	
Lift/Load blocks		Crane 260'	375 hp	60.0214	19	3.45E-04	6.25E-03	4.60E-03	9.49E-06	2.16E-04	1.99E-04	7.34E-01	3.11E-05	-	7.35E-01	6.67E-01	
		3/4 ton Pickup truck		60.0214	19	7.71E-04	9.73E-03	8.11E-03	3.97E-05	7.09E-05	6.52E-05	4.05E+00	2.24E-04	-	4.05E+00	3.68E+00	
Landfill		Water truck	3000 gal	507	19	2.32E-04	2.00E-04	2.82E-03	4.02E-06	3.28E-05	1.47E-05	1.35E+00	1.34E-04	6.99E-05	1.37E+00	1.24E+00	
		Crane 260'	375 hp	30.0107	19	3.83E-03	5.39E-02	7.08E-03	5.98E-05	1.25E-03	7.43E-04	1.20E+01	2.85E-05	2.68E-05	1.20E+01	1.09E+01	
					3.37E-01	3.63E+00	3.90E+00	1.31E-02	8.72E-02	7.53E-02	1.42E+03	7.40E-02	6.58E-03	1.42E+03	1.29E+03		

Data from Alt4\_EnvrAirQualityReport.pdf

Daily Onsite Emissions  
Rindge  
Surfrider  
Topanga  
Zuma  
Landfill

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 3

Construction Start Year 2019  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	209	7.11E-03	6.14E-03	8.63E-02	1.23E-04	1.01E-03	4.51E-04		
Dust Control	Water truck	5000 gal	2320	209	3.35E-01	4.72E+00	6.20E-01	5.23E-03	1.09E-01	6.50E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	9.10E-02	7.86E-02	1.11E+00	1.58E-03	1.29E-02	5.78E-03		
	Fish relocation	3/4 ton pickup truck	16	19	1.30E-02	1.12E-02	1.58E-01	2.26E-04	1.84E-03	8.27E-04		
Clear Vegetation	Cutting	1 ton pickup truck	4.4	19	2.01E-03	2.57E-03	2.72E-02	6.23E-05	4.95E-04	2.17E-04		
		Tractor/crawler/dozer	250 hp	7.3333	19	2.20E-02	2.51E-01	2.73E-01	1.44E-03	1.86E-03	1.71E-03	
		Chain saw		7.3335	19	3.00E-02	1.64E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04	
	Brush Piling	Front end loader	540 hp	3.696	19	3.14E-02	2.45E-01	2.84E-01	1.44E-03	1.98E-03	1.82E-03	
		Tractor/crawler/dozer	310 hp	3.696	19	1.40E-02	1.60E-01	1.25E-01	6.13E-04	1.19E-03	1.09E-03	
		Chipping	Brush chipper	250 hp	3.696	19	2.68E-02	2.06E-01	1.55E-01	9.71E-04	1.50E-03	1.38E-03
			Front end loader	540 hp	3.696	19	3.14E-02	2.45E-01	2.84E-01	1.44E-03	1.98E-03	1.82E-03
Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.32E-03	4.93E-02	5.36E-02	2.83E-04	3.66E-04	3.37E-04	
		Front end loader	49 hp	4	19	1.02E-02	9.99E-02	9.61E-02	1.36E-04	4.22E-03	3.88E-03	
		Roller	47 hp	4	19	8.46E-03	9.46E-02	8.52E-02	1.33E-04	3.80E-03	3.50E-03	
		Water truck	3000 gal	4	19	6.36E-03	8.95E-02	1.18E-02	9.93E-05	2.07E-03	1.23E-03	
		Excavator	300 hp	4	19	1.38E-02	1.49E-01	1.18E-01	5.79E-04	1.12E-03	1.03E-03	
		Front end loader	180 hp	4	19	1.14E-02	8.92E-02	9.51E-02	5.08E-04	7.22E-04	6.64E-04	
	36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	1.30E-02	1.48E-01	1.61E-01	8.49E-04	1.10E-03	1.01E-03	
	36" Diversion Pipe - pipe	Welder	17 hp	4	19	4.02E-02	2.60E-02	1.48E+00	5.96E-05	1.97E-02	1.97E-02	
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	3.58E-02	5.84E-01	1.07E+00	1.93E-03	3.72E-02	3.42E-02	
		Loader/backhoe	75 hp	0.0923	19	1.11E-04	1.77E-03	2.21E-03	3.68E-06	1.29E-04	1.19E-04	
		Crane 94'	155 hp	155	19	2.42E-01	3.95E+00	7.26E+00	1.31E-02	2.52E-01	2.32E-01	
		1 ton pickup truck		155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
		Crane 94'	155 hp	155	19	2.42E-01	3.95E+00	7.26E+00	1.31E-02	2.52E-01	2.32E-01	
		1 ton pickup truck		155	19	7.08E-02	9.07E-02	9.58E-01	2.19E-03	1.75E-02	7.64E-03	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.32E-03	4.93E-02	5.36E-02	2.83E-04	3.66E-04	3.37E-04
		Dewatering	Concrete saw	13 hp	8	21	7.09E-02	5.24E-02	2.59E+00	1.25E-04	3.68E-02	3.67E-02
			Crane 80'	130 hp	16	21	1.90E-02	3.09E-01	5.69E-01	1.02E-03	1.97E-02	1.81E-02
			Flatbed truck		8	21	9.27E-03	1.00E-02	1.29E-01	1.01E-04	8.04E-04	3.47E-04
			Generator	80 hp	5856	244	9.29E-01	1.25E+01	1.45E+01	2.92E-02	8.45E-01	7.77E-01
	Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.36E+00	1.55E+01	1.54E+01	7.71E-02	1.15E-01	1.06E-01
Push		Tractor/crawler/dozer	600 hp	184.6154	19	1.36E+00	1.55E+01	1.54E+01	7.71E-02	1.15E-01	1.06E-01	
Push		Tractor/crawler/dozer	600 hp	184.6154	19	1.36E+00	1.55E+01	1.54E+01	7.71E-02	1.15E-01	1.06E-01	
Build road		Tractor/crawler/dozer	600 hp	184.6154	19	1.36E+00	1.55E+01	1.54E+01	7.71E-02	1.15E-01	1.06E-01	
Armoring		1 ton pickup truck		2	19	9.13E-04	1.17E-03	1.24E-02	2.83E-05	2.25E-04	9.86E-05	
		Excavator	430 hp	2	19	9.92E-03	1.06E-01	8.47E-02	4.15E-04	8.00E-04	7.36E-04	
		1 ton pickup truck		2	19	9.13E-04	1.17E-03	1.24E-02	2.83E-05	2.25E-04	9.86E-05	
	Maintenance	Grader	215 hp	340	209	9.22E-02	8.67E-01	1.02E+00	5.41E-03	6.71E-03	6.17E-03	
Sand to Topanga Beach (7,200 cy) (4/1-9)	Material Excavation	1 ton pickup truck	59.5	7	7.37E-02	9.45E-02	9.98E-01	2.29E-03	1.82E-02	7.96E-03		
		Front end loader	350 hp	59.5	7	8.97E-01	7.00E+00	5.59E+00	2.77E-02	5.67E-02	5.22E-02	
		Front end loader	350 hp	59.5	7	8.97E-01	7.00E+00	5.59E+00	2.77E-02	5.67E-02	5.22E-02	
		Water truck	3000 gal	59.5	7	2.57E-01	3.61E+00	4.75E-01	4.01E-03	8.35E-02	4.98E-02	
		Excavator	400 hp	59.5	7	7.45E-01	8.00E+00	6.36E+00	3.12E-02	6.01E-02	5.53E-02	
	Beach Crew	1 ton pickup truck	59.5	7	7.37E-02	9.45E-02	9.98E-01	2.29E-03	1.82E-02	7.96E-03		
		Tractor/crawler/dozer	600 hp	59.5	7	1.19E+00	1.35E+01	1.34E+01	6.75E-02	1.00E-01	9.24E-02	
		Tractor/crawler/dozer	600 hp	59.5	7	1.19E+00	1.35E+01	1.34E+01	6.75E-02	1.00E-01	9.24E-02	
		Water truck	3000 gal	14.875	7	6.42E-02	9.03E-01	1.19E-01	1.00E-03	2.09E-02	1.24E-02	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019
10	

<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2019>



**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Alternative 4 - Year 3**

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2019 (pounds per day)					
					VOC	NOx	CO	SO2	PM10	PM2.5
Sand to Zuma Beach (124,200 cy) (4/10-10/15)	<i>Material Excavation</i>	1 ton pickup truck	1028.5	131	6.81E-02	8.73E-02	9.22E-01	2.11E-03	1.68E-02	7.35E-03
		Front end loader	1028.5	131	8.28E-01	6.47E+00	5.16E+00	2.55E-02	5.24E-02	4.82E-02
		Front end loader	1028.5	131	8.28E-01	6.47E+00	5.16E+00	2.55E-02	5.24E-02	4.82E-02
		Water truck	1028.5	131	2.37E-01	3.34E+00	4.38E-01	3.70E-03	7.71E-02	4.60E-02
		Excavator	1028.5	131	6.88E-01	7.39E+00	5.88E+00	2.88E-02	5.55E-02	5.11E-02
	<i>Beach Crew</i>	1 ton pickup truck	1028.5	131	6.81E-02	8.73E-02	9.22E-01	2.11E-03	1.68E-02	7.35E-03
		Tractor/crawler/dozer	1028.5	131	1.10E+00	1.25E+01	1.24E+01	6.23E-02	9.27E-02	8.53E-02
		Tractor/crawler/dozer	1028.5	131	1.10E+00	1.25E+01	1.24E+01	6.23E-02	9.27E-02	8.53E-02
		Water truck	257.125	131	5.93E-02	8.34E-01	1.10E-01	9.25E-04	1.93E-02	1.15E-02
	Demolition	<i>Platform</i>	Tractor/crawler/dozer	720	22	3.35E+00	3.82E+01	2.99E+01	1.46E-01	2.84E-01
		Tractor/crawler/dozer	90	22	4.19E-01	4.77E+00	3.74E+00	1.83E-02	3.54E-02	3.26E-02
		3/4 ton pickup truck	360	22	2.53E-01	2.19E-01	3.07E+00	4.39E-03	3.58E-02	1.61E-02
<i>Drilling</i>		Rotary drill	54.4	128	4.67E-02	6.10E-01	4.74E-01	2.46E-03	4.41E-03	4.06E-03
		3/4 ton pickup truck	50.4	128	6.09E-03	5.26E-03	7.40E-02	1.06E-04	8.62E-04	3.87E-04
<i>Cut with Diamond wire</i>		3/4 ton pickup truck	148	128	1.79E-02	1.54E-02	2.17E-01	3.10E-04	2.53E-03	1.14E-03
		Diamond cutting saw	148	128	3.32E-02	6.02E-01	4.43E-01	9.15E-04	2.08E-02	1.92E-02
<i>Lift/Load blocks</i>		Crane 260'	179.6356	128	7.21E-02	9.10E-01	7.59E-01	3.72E-03	6.63E-03	6.10E-03
		3/4 ton pickup truck	179.6356	128	2.17E-02	1.87E-02	2.64E-01	3.76E-04	3.07E-03	1.38E-03
<i>Load/Haul</i>		Front end loader	32	128	2.64E-02	2.06E-01	1.64E-01	8.14E-04	1.67E-03	1.53E-03
		Water truck	521	128	1.23E-01	1.73E+00	2.27E-01	1.92E-03	4.00E-02	2.38E-02
<i>Landfill</i>		Crane 260'	89.8178	128	3.61E-02	4.55E-01	3.79E-01	1.86E-03	3.31E-03	3.05E-03
<i>Micro-blast</i>		Crane 260'	60	128	2.41E-02	3.04E-01	2.53E-01	1.24E-03	2.21E-03	2.04E-03
		Horizontal boring drill	55	128	1.79E-03	4.69E-02	2.24E-02	6.90E-05	1.69E-03	1.55E-03
		3/4 ton pickup truck	60	128	7.25E-03	6.26E-03	8.81E-02	1.26E-04	1.03E-03	4.61E-04
<i>Demolish spillway</i>		Crane 260'	100	128	4.02E-02	5.07E-01	4.22E-01	2.07E-03	3.69E-03	3.39E-03
		Air compressor	200	128	2.07E-01	2.47E-01	1.85E+01	1.29E-03	8.10E-03	8.09E-03
		3/4 ton pickup truck	100	128	1.21E-02	1.04E-02	1.47E-01	2.10E-04	1.71E-03	7.68E-04
Demolition - Notch 5'	<i>Excavation for Dam Demolition</i>	Asphalt Distributor	6.7805	19	1.08E-02	1.52E-01	1.99E-02	1.68E-04	3.51E-03	2.09E-03
		Excavator	4.445	19	2.20E-02	2.37E-01	1.88E-01	9.22E-04	1.78E-03	1.64E-03
		Tractor/crawler/dozer	3.2327	19	1.24E-01	9.16E-01	4.04E-01	2.03E-03	2.72E-02	2.51E-02
	<i>Drilling</i>	Rotary drill	7.3333	19	4.24E-02	5.54E-01	4.30E-01	2.24E-03	4.01E-03	3.69E-03
		3/4 ton Pickup truck	7.3333	19	5.97E-03	5.16E-03	7.25E-02	1.04E-04	8.45E-04	3.79E-04
	<i>Cut with Diamond wire</i>	3/4 ton Pickup truck	48	19	3.91E-02	3.37E-02	4.75E-01	6.77E-04	5.53E-03	2.48E-03
		Diamond cutting saw	48	19	7.25E-02	1.32E+00	9.68E-01	2.00E-03	4.55E-02	4.19E-02
	<i>Lift/Load blocks</i>	Crane 260'	60.0214	19	1.62E-01	2.05E+00	1.71E+00	8.37E-03	1.49E-02	1.37E-02
		3/4 ton Pickup truck	60.0214	19	4.89E-02	4.22E-02	5.94E-01	8.47E-04	6.92E-03	3.10E-03
		Water truck	507	19	8.06E-01	1.13E+01	1.49E+00	1.26E-02	2.62E-01	1.56E-01
	<i>Landfill</i>	Crane 260'	30.0107	19	8.12E-02	1.02E+00	8.54E-01	4.18E-03	7.46E-03	6.86E-03
						<b>2.44E+01</b>	<b>2.61E+02</b>	<b>2.60E+02</b>	<b>1.06E+00</b>	<b>3.94E+00</b>

**Conversions**  
 2000 pounds per ton

Data from Alt4\_EnvrAirQualityReport.pdf

Emissions (lb/day)						
19	206	205	1	3	3	
0	0	0	0	0	0	
3	28	28	0	0	0	
2	26	26	0	0	0	
0	1	1	0	0	0	

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2020 (g/HP-hr or g/hr)								Annual Emissions - 2020 (tons per year)								Metric Tons CO2e/yr					
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2		CH4	N2O	CO2e		
					GWP 1 21 310																					
Construction Survey	3/4 ton pickup truck		96	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	3.29E-04	2.97E-04	4.01E-03	6.43E-06	5.21E-05	2.31E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00		
Dust Control	Water truck	5000 gal	2320	209	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	1.70E-02	1.99E-01	3.17E-02	2.73E-04	5.18E-03	2.93E-03	5.47E+01	1.30E-04	1.23E-04	5.48E+01	4.97E+01		
Environmental protection measures	Biologist		1229.3333	209	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	4.22E-03	3.80E-03	5.14E-02	8.24E-05	6.67E-04	2.96E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	5.49E-05	4.95E-05	6.69E-04	1.07E-06	8.68E-06	3.86E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01		
	Cutting	1 ton pickup truck	4.4	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	8.02E-06	1.11E-05	1.10E-04	2.96E-07	2.33E-06	1.01E-06	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02		
		Tractor/crawler/dozer	250 hp	7.3333	19	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	1.10E-04	1.20E-03	1.30E-03	6.85E-06	8.97E-06	8.25E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01	
		Chain saw		7.3333	19	2.199	0.115	13.188	0.001	0.021	0.021	35.645	0.137	0.039	1.49E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	9.28E-06	2.66E-06	3.44E-03	3.12E-03	
		Front end loader	540 hp	3.696	19	0.072	0.534	0.583	0.003	0.004	0.004	291.179	0.016	0.000	1.59E-04	1.18E-03	1.28E-03	6.44E-06	9.66E-06	8.89E-06	6.41E-01	3.54E-05	-	6.41E-01	5.82E-01	
		Tractor/crawler/dozer	310 hp	3.696	19	0.055	0.604	0.471	0.002	0.005	0.004	234.954	0.013	0.000	7.00E-05	7.62E-04	5.94E-04	2.91E-06	5.71E-06	5.25E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01	
		Brush chopper	250 hp	3.696	19	0.130	0.950	0.718	0.004	0.007	0.006	395.187	0.012	0.000	1.32E-04	9.68E-04	7.32E-04	4.53E-06	7.09E-06	6.52E-06	4.03E-01	1.19E-05	-	4.03E-01	3.65E-01	
		Front end loader	540 hp	3.696	19	0.072	0.534	0.583	0.003	0.004	0.004	291.179	0.016	0.000	1.59E-04	1.18E-03	1.28E-03	6.44E-06	9.66E-06	8.89E-06	6.41E-01	3.54E-05	-	6.41E-01	5.82E-01	
		Tractor/crawler/dozer	180 hp	2	19	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	2.16E-05	2.35E-04	2.55E-04	1.34E-06	1.76E-06	1.62E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
		Front end loader	49 hp	4	19	0.237	2.223	2.188	0.003	0.096	0.088	231.302	0.021	0.000	5.13E-05	4.80E-04	4.73E-04	6.46E-07	2.06E-05	1.90E-05	5.00E-02	4.63E-06	-	5.01E-02	4.54E-02	
Dewatering		Roller	47 hp	4	19	0.208	2.198	2.035	0.003	0.090	0.083	235.495	0.019	0.000	4.31E-05	4.55E-04	4.22E-04	6.31E-07	1.87E-05	1.72E-05	4.88E-02	3.89E-06	-	4.89E-02	4.43E-02	
		Water truck	3000 gal	4	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	2.92E-05	3.43E-04	5.47E-05	4.70E-07	8.94E-06	5.04E-06	9.43E-02	2.25E-07	2.12E-07	9.44E-02	8.56E-02	
		Excavator	300 hp	4	19	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	6.86E-05	7.04E-04	5.61E-04	2.75E-06	5.34E-06	4.91E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
		Front end loader	180 hp	4	19	0.073	0.539	0.576	0.003	0.004	0.004	270.055	0.015	0.000	5.78E-05	4.28E-04	4.57E-04	2.41E-06	3.52E-06	3.24E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01	
		36" Diversion Pipe - grad	Tractor/crawler/dozer	180 hp	6	19	0.054	0.593	0.642	0.003	0.004	301.149	0.017	0.000	6.48E-05	7.05E-04	7.64E-04	4.03E-06	5.29E-06	4.86E-06	3.59E-01	1.98E-05	-	3.59E-01	3.26E-01	
		36" Diversion Pipe - pipe	Welder	17 hp	4	19	2.544	1.646	93.478	0.004	1.248	1.246	148.930	0.144	0.124	1.91E-04	1.23E-03	7.01E-03	2.83E-07	9.36E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02
		36" Diversion Pipe	Crane 80'	130 hp	4	19	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.79E-04	2.79E-03	5.10E-03	9.17E-06	1.81E-04	1.67E-04	1.15E-01	6.23E-05	-	1.15E-01	7.41E-01
		Loader/backhoe	75 hp	0.0923	19	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	5.53E-07	8.47E-06	1.05E-05	1.75E-08	6.25E-07	5.75E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03	
		Crane 94'	155 hp	155	19	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.21E-03	1.89E-02	3.45E-02	6.20E-05	1.22E-03	1.13E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Crane 94'	155 hp	155	19	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.21E-03	1.89E-02	3.45E-02	6.20E-05	1.22E-03	1.13E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00	
		1 ton pickup truck		155	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	2.82E-04	3.90E-04	3.86E-03	1.04E-05	8.21E-05	3.56E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00	
		Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	19	0.054	0.593	0.642	0.003	0.004	301.149	0.017	0.000	2.16E-05	2.35E-04	2.55E-04	1.34E-06	1.76E-06	1.62E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
		Dewatering	Concrete saw	13 hp	8	22	3.254	2.405	118.948	0.006	1.686	1.683	201.151	0.184	0.193	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.22E-05	3.04E-02	2.76E-02
		Crane 80'	130 hp	16	22	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	1.05E-04	1.63E-03	2.99E-03	5.37E-06	1.06E-04	9.75E-05	4.77E-01	3.64E-05	-	4.78E-01	4.34E-01	
	Flatbed truck		8	22	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	4.12E-05	4.58E-05	5.67E-04	5.32E-07	4.18E-06	1.78E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01		
	Generator	80 hp	5856	244	0.115	1.482	1.722	0.003	0.101	0.093	294.370	0.010	0.000	5.94E-02	7.65E-01	8.89E-01	1.78E-03	5.22E-02	4.80E-02	1.52E+02	5.36E-03	-	1.52E+02	1.38E+02		
Temporary Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01	
	Push	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.056	0.604	0.572	0.003	0.005	0.004	285.342	0.016	0.000	6.78E-03	7.38E-02	6.98E-02	3.50E-04	5.53E-04	5.08E-04	3.48E+01	1.93E-03	-	3.49E+01	3.16E+01	
	Armoring	1 ton pickup truck		2	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	3.64E-06	5.03E-06	4.98E-05	1.34E-07	1.06E-06	4.59E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
		Excavator	430 hp	2	19	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	4.92E-05	5.04E-04	4.02E-04	1.97E-06	3.83E-06	3.52E-06	2.01E-01	1.11E-05	-	2.01E-01	1.82E-01	
		1 ton pickup truck		2	19	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	3.64E-06	5.03E-06	4.98E-05	1.34E-07	1.06E-06	4.59E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
		Compaction	Vibratory roller	50 hp	7.38	19	0.208	2.198	2.035	0.003	0.090	0.083	235.495	0.019	0.000	8.47E-05	8.94E-04	8.28E-04	1.24E-06	3.67E-05	3.37E-05	9.58E-02	7.64E-06	-	9.59E-02	8.70E-02
		Tractor/crawler/dozer	250 hp	7.38	19	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	1.11E-04	1.21E-03	1.31E-03	6.89E-06	9.03E-06	8.31E-06	6.12E-01	3.39E-05	-	6.13E-01	5.56E-01	
		Water truck	5000 gal	9.225	19	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.													



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 4

Construction Start Year 2020  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2020 (pounds per day)							
					VOG	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	209	6.30E-03	5.69E-03	7.68E-02	1.23E-04	9.96E-04	4.43E-04		
Dust Control	Water truck	5000 gal	2320	209	3.25E-01	3.80E+00	6.08E-01	5.22E-03	9.92E-02	5.60E-02		
Environmental protection measures	Biologist	3/4 ton pickup truck	1229.3333	209	8.07E-02	7.28E-02	9.83E-01	1.58E-03	1.28E-02	5.67E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.16E-02	1.04E-02	1.41E-01	2.26E-04	1.83E-03	8.12E-04		
	Cutting	1 ton pickup truck	4.4	19	1.69E-03	2.33E-03	2.31E-02	6.23E-05	4.91E-04	2.13E-04		
	Brush Piling	Tractor/crawler/dozer	250 hp	7.3333	19	2.32E-02	2.52E-01	2.73E-01	1.44E-03	1.89E-03	1.74E-03	
		Chain saw		7.3335	19	3.14E-02	1.64E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04	
		Front end loader	540 hp	3.696	19	3.34E-02	2.48E-01	2.70E-01	1.36E-03	2.03E-03	1.87E-03	
	Chipping	Tractor/crawler/dozer	310 hp	3.696	19	1.47E-02	1.60E-01	1.25E-01	6.13E-04	1.20E-03	1.11E-03	
		Brush chipper	250 hp	3.696	19	2.78E-02	2.04E-01	1.54E-01	9.53E-04	1.49E-03	1.37E-03	
		Front end loader	540 hp	3.696	19	3.34E-02	2.48E-01	2.70E-01	1.36E-03	2.03E-03	1.87E-03	
	Dewatering	Temporary Cofferdam	Tractor/crawler/dozer	180 hp	2	19	4.55E-03	4.95E-02	5.36E-02	2.83E-04	3.71E-04	3.41E-04
		Front end loader	49 hp	4	19	1.08E-02	1.01E-01	9.95E-02	1.36E-04	4.34E-03	4.00E-03	
Roller		47 hp	4	19	9.08E-03	9.59E-02	8.88E-02	1.33E-04	3.93E-03	3.62E-03		
Water truck		3000 gal	4	19	6.16E-03	7.22E-02	1.15E-02	9.90E-05	1.88E-03	1.06E-03		
Excavator		300 hp	4	19	1.44E-02	1.48E-01	1.18E-01	5.79E-04	1.12E-03	1.03E-03		
Front end loader		180 hp	4	19	1.22E-02	9.01E-02	9.62E-02	5.08E-04	7.40E-04	6.81E-04		
36" Diversion Pipe - grad		Tractor/crawler/dozer	180 hp	6	19	1.36E-02	1.49E-01	1.61E-01	8.49E-04	1.11E-03	1.02E-03	
36" Diversion Pipe - pipe		Welder	17 hp	4	19	4.02E-02	2.60E-02	1.48E+00	5.96E-05	1.97E-02	1.97E-02	
36" Diversion Pipe		Crane 80'	130 hp	27.3333	19	3.77E-02	5.87E-01	1.07E+00	1.93E-03	3.81E-02	3.51E-02	
		Loader/backhoe	75 hp	0.0923	19	1.17E-04	1.78E-03	2.22E-03	3.68E-06	1.32E-04	1.21E-04	
		Crane 94'	155 hp	155	19	2.55E-01	3.97E+00	7.26E+00	1.31E-02	2.58E-01	2.37E-01	
		1 ton pickup truck	155	155	19	5.95E-02	8.21E-02	8.12E-01	2.19E-03	1.73E-02	7.49E-03	
		Crane 94'	155 hp	155	19	2.55E-01	3.97E+00	7.26E+00	1.31E-02	2.58E-01	2.37E-01	
		1 ton pickup truck	155	155	19	5.95E-02	8.21E-02	8.12E-01	2.19E-03	1.73E-02	7.49E-03	
Demolish cofferdam		Tractor/crawler/dozer	180 hp	2	19	4.55E-03	4.95E-02	5.36E-02	2.83E-04	3.71E-04	3.41E-04	
Dewatering		Concrete saw	13 hp	8	22	6.78E-02	5.01E-02	2.48E+00	1.20E-04	3.51E-02	3.51E-02	
		Crane 80'	130 hp	16	22	1.91E-02	2.97E-01	5.43E-01	9.76E-04	1.93E-02	1.77E-02	
		Flatbed truck	8	22	27	7.49E-03	8.32E-03	1.03E-01	9.67E-05	7.61E-04	3.25E-04	
		Generator	80 hp	5856	244	9.73E-01	1.25E+01	1.46E+01	2.92E-02	8.56E-01	7.87E-01	
Temporary Access Road		Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.43E+00	1.55E+01	1.47E+01	7.37E-02	1.16E-01	1.07E-01
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.43E+00	1.55E+01	1.47E+01	7.37E-02	1.16E-01	1.07E-01
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.43E+00	1.55E+01	1.47E+01	7.37E-02	1.16E-01	1.07E-01
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.43E+00	1.55E+01	1.47E+01	7.37E-02	1.16E-01	1.07E-01
		Armoring	1 ton pickup truck	2	19	7.67E-04	1.06E-03	1.05E-02	2.83E-05	2.23E-04	9.66E-05	
	Excavator	430 hp	2	19	1.04E-02	1.06E-01	8.47E-02	4.15E-04	8.06E-04	7.41E-04		
	1 ton pickup truck	2	19	7.67E-04	1.06E-03	1.05E-02	2.83E-05	2.23E-04	9.66E-05			
	Compaction	Vibratory roller	50 hp	7.38	19	1.78E-02	1.88E-01	1.74E-01	2.61E-04	7.72E-03	7.10E-03	
		Tractor/crawler/dozer	250 hp	7.38	19	2.33E-02	2.54E-01	2.75E-01	1.45E-03	1.90E-03	1.75E-03	
		Water truck	5000 gal	9.225	19	1.42E-02	1.66E-01	2.66E-02	2.28E-04	4.34E-03	2.45E-03	
		Grader	215 hp	340	209	9.76E-02	8.74E-01	1.03E+00	5.41E-03	6.84E-03	6.29E-03	
		Material Excavation	1 ton pickup truck	161.5	18	6.54E-02	9.03E-02	8.94E-01	2.41E-03	1.90E-02	8.24E-03	
	Sand to Zuma Beach (19,500 cy) (4/1-26)	Front end loader	350 hp	161.5	18	1.01E+00	7.48E+00	5.96E+00	2.92E-02	6.14E-02	5.65E-02	
Front end loader		350 hp	161.5	18	1.01E+00	7.48E+00	5.96E+00	2.92E-02	6.14E-02	5.65E-02		
Water truck		3000 gal	161.5	18	2.62E-01	3.08E+00	4.91E-01	4.22E-03	8.02E-02	4.53E-02		
Excavator		400 hp	161.5	18	8.21E-01	8.42E+00	6.72E+00	3.29E-02	6.39E-02	5.88E-02		
Beach Crew		1 ton pickup truck	161.5	18	6.54E-02	9.03E-02	8.94E-01	2.41E-03	1.90E-02	8.24E-03		
Tractor/crawler/dozer		600 hp	161.5	18	1.32E+00	1.43E+01	1.36E+01	6.81E-02	1.07E-01	9.88E-02		
Tractor/crawler/dozer		600 hp	161.5	18	1.32E+00	1.43E+01	1.36E+01	6.81E-02	1.07E-01	9.88E-02		
Tractor/crawler/dozer		600 hp	161.5	18	1.32E+00	1.43E+01	1.36E+01	6.81E-02	1.07E-01	9.88E-02		
Tractor/crawler/dozer		600 hp	161.5	18	1.32E+00	1.43E+01	1.36E+01	6.81E-02	1.07E-01	9.88E-02		
Tractor/crawler/dozer		600 hp	161.5	18	1.32E+00	1.43E+01	1.36E+01	6.81E-02	1.07E-01	9.88E-02		
Water truck		3000 gal	161.5	18	2.62E-01	3.08E+00	4.91E-01	4.22E-03	8.02E-02	4.53E-02		
		Material Excavation	1 ton pickup truck	1066	120	6.47E-02	8.94E-02	8.85E-01	2.39E-03	1.88E-02	8.16E-03	
Fines to landfill (147,700 cy) (4/27-10/15)		Front end loader	350 hp	1066	120	1.00E+00	7.40E+00	5.90E+00	2.89E-02	6.08E-02	5.60E-02	
	Front end loader	350 hp	1066	120	1.00E+00	7.40E+00	5.90E+00	2.89E-02	6.08E-02	5.60E-02		
	Water truck	3000 gal	1066	120	2.60E-01	3.04E+00	4.86E-01	4.18E-03	7.94E-02	4.48E-02		
	Excavator	400 hp	1066	120	8.13E-01	8.34E+00	6.65E+00	3.26E-02	6.32E-02	5.82E-02		
		Platform	Tractor/crawler/dozer	440 hp	720	20	3.87E+00	4.22E+01	3.29E+01	1.61E-01	3.16E-01	2.91E-01
		Tractor/crawler/dozer	440 hp	90	20	4.84E-01	5.27E+00	4.11E+00	2.01E-02	3.95E-02	3.63E-02	
Demolition	3/4 ton pickup truck		360	20	2.47E-01	2.23E-01	3.01E+00	4.82E-03	3.90E-02	1.74E-02		
	Drilling	Rotary drill	475 hp	61.7333	127	5.42E-02	6.95E-01	5.45E-01	2.82E-03	5.05E-03	4.64E-03	
	3/4 ton pickup truck		57.7333	127	6.24E-03	5.63E-03	7.60E-02	1.22E-04	9.86E-04	4.38E-04		
	Cut with Diamond wire	3/4 ton pickup truck	196	127	2.12E-02	1.91E-02	2.58E-01	4.14E-04	3.35E-03	1.49E-03		
	Diamond cutting saw	50 hp	196	127	4.70E-02	8.09E-01	6.07E-01	1.22E-03	2.84E-02	2.61E-02		
	Lift/Load blocks	Crane 260'	375 hp	239.2283	127	1.02E-01	1.23E+00	1.02E+00	4.99E-03	9.03E-03	8.31E-03	
	3/4 ton pickup truck		239.2283	127	2.59E-02	2.33E-02	3.15E-01	5.05E-04	4.09E-03	1.82E-03		
	Load/Haul	Front end loader	350 hp	32	127	2.84E-02	2.10E-01	1.67E-01	8.20E-04	1.73E-03	1.59E-03	
	Water truck	3000 gal	521	127	1.20E-01	1.41E+00	2.25E-01	1.93E-03	3.67E-02	2.07E-02		
	Landfill	Crane 260'	375 hp	119.6141	127	5.11E-02	6.15E-01	5.09E-01	2.49E-03	4.52E-03	4.15E-03	
	Micro-blast	Crane 260'	375 hp	60	127	2.56E-02	3.08E-01	2.55E-01	1.25E-03	2.27E-03	2.08E-03	
	Horizontal boring drill	10 hp	55	127	1.85E-03	4.74E-02	2.24E-02	6.91E-05	1.72E-03	1.58E-03		
	3/4 ton pickup truck		60	127	6.48E-03	5.85E-03	7.90E-02	1.27E-04	1.02E-03	4.56E-04		
	Demolish spillway	Crane 260'	375 hp	100	127	4.27E-02	5.14E-01	4.26E-01	2.09E-03	3.78E-03	3.47E-03	
	Air compressor	50 hp	200	127	2.20E-01	2.67E-01	2.01E+01	1.30E-03	8.17E-03	8.15E-03		
	3/4 ton pickup truck		100	127	1.08E-02	9.75E-03	1.32E-01	2.11E-04	1.71E-03	7.59E-04		
	Demolition - Notch 5'	Excavation for Dam Dem	Asphalt Distributor	3000 gal	6.7805	19	1.04E-02	1.22E-01	1.95E-02	1.68E-04	3.19E-03	1.80E-03
		Excavator	430 hp	4.445	19	2.30E-02	2.36E-01	1.88E-01	9.22E-04	1.79E-03	1.65E-03	
		Tractor/crawler/dozer	850 hp	3.2327	19	1.18E-01	8.76E-01	3.87E-01	1.94E-03	2.61E-02	2.40E-02	
Drilling		Rotary drill	475 hp	7.3333	19	4.30E-02	5.52E-01	4.33E-01	2.24E-03	4.01E-03	3.69E-03	
3/4 ton Pickup truck			7.3333	19	5.30E-03	4.78E-03	6.45E-02	1.03E-04	8.37E-04	3.72E-04		
Cut with Diamond wire		3/4 ton Pickup truck	48	19	3.47E-02	3.13E-02	4.22E-01	6.77E-04	5.48E-03	2.44E-03		
Diamond cutting saw		50 hp	48	19	7.70E-02	1.32E+00	9.94E-01	2.00E-03	4.65E-02	4.28E-02		
Crane 260'		375 hp	60.0214	19	1.71E-01	2.06E+00	1.71E+00	8.37E-03	1.51E-02	1.39E-02		
3/4 ton Pickup truck			60.0214	19	4.34E-02	3.91E-02	5.28E-01	8.47E-04	6.85E-03	3.05E-03		
Water truck		3000 gal	507	19	7.80E-01	9.15E+00	1.46E+00	1.25E-02	2.39E-01	1.35E-01		
Landfill		Crane 260'	375 hp	30.0107	19	8.57E-02	1.03E+00	8.54E-01	4.18E-03	7.57E-03	6.97E-03	
						2.70E+01	2.74E+02	2.68E+02	1.10E+00	4.11E+00	3.48E+00	

Conversions

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
Formula overwritten

Speciation Profiles

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Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5

Construction Start Year: 2021  
Speed of Onsite Trucks: 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Emission Factors - 2021 (g/hp-hr or g/hr)										Annual Emissions - 2021 (tons per year)							Metric Tons CO2e/yr			
					VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4		N2O	CO2e	
Construction Survey	3/4 ton pickup truck		96	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	2.89E-04	2.75E-04	3.55E-03	6.45E-06	5.16E-05	2.27E-05	2.15E+00	2.14E-04	1.12E-04	2.19E+00	1.99E+00	
	Water truck	5000 gal	2320	210	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	1.79E-02	1.28E-01	3.40E-02	2.72E-04	4.72E-03	2.50E-03	5.45E+01	1.30E-04	1.23E-04	5.45E+01	4.94E+01	
Environmental protection measures	Biologist		1229.3333	210	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	3.70E-03	2.82E-01	4.54E-02	8.26E-05	6.61E-04	2.91E-04	2.76E+01	2.74E-03	1.43E-03	2.81E+01	2.55E+01	
	Fish relocation	3/4 ton pickup truck	16	19	2.731	2.596	33.529	0.061	0.488	0.215	20,361.282	2.024	1.056	4.82E-05	4.58E-05	5.91E-04	1.07E-06	8.60E-06	3.79E-06	3.59E-01	3.57E-05	1.86E-05	3.66E-01	3.32E-01	
Clear Vegetation	1 ton pickup truck		4.4	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	6.69E-06	1.00E-05	9.27E-05	2.97E-07	2.31E-06	9.92E-07	9.88E-02	9.82E-06	5.12E-06	1.01E-01	9.12E-02	
	Tractor/crawler/dozer	250 hp	7.3333	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	1.16E-04	1.21E-03	1.30E-03	6.85E-06	9.13E-06	8.40E-06	6.09E-01	3.37E-05	-	6.09E-01	5.53E-01	
	Chain saw		7.3333	19	2.303	0.115	13.188	0.001	0.021	0.004	35.645	0.143	0.039	1.56E-04	7.79E-06	8.95E-04	9.97E-08	1.41E-06	1.41E-06	2.42E-03	9.92E-06	2.66E-06	3.45E-03	3.13E-03	
	Brush Piling	Front end loader	540 hp	3.696	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	1.66E-04	1.18E-03	1.38E-03	6.91E-06	9.83E-06	9.05E-06	6.88E-01	3.80E-05	-	6.88E-01	6.25E-01
	Tractor/crawler/dozer	310 hp	3.696	19	0.058	0.607	0.471	0.002	0.005	0.004	234.947	0.013	0.000	7.35E-05	7.67E-04	5.94E-04	2.91E-06	5.80E-06	5.33E-06	2.97E-01	1.64E-05	-	2.97E-01	2.70E-01	
	Brush chipper	250 hp	3.696	19	0.134	0.936	0.711	0.004	0.007	0.006	386.935	0.012	0.000	1.36E-04	9.53E-04	7.24E-04	4.43E-06	7.04E-06	6.49E-06	3.94E-01	1.23E-05	-	3.94E-01	3.58E-01	
	Front end loader	540 hp	3.696	19	0.075	0.538	0.626	0.003	0.004	0.004	312.589	0.017	0.000	1.66E-04	1.18E-03	1.38E-03	6.91E-06	9.83E-06	9.05E-06	6.88E-01	3.80E-05	-	6.88E-01	6.25E-01	
	Loader/backhoe	75 hp	24	20	0.076	1.118	1.383	0.002	0.083	0.077	195.356	0.015	0.000	1.50E-04	2.22E-03	2.74E-03	4.55E-06	1.65E-04	1.52E-04	3.88E-01	2.96E-05	-	3.88E-01	3.52E-01	
	Front end loader	350 hp	20	20	0.076	0.542	0.430	0.002	0.004	0.004	214.819	0.012	0.000	5.86E-04	4.18E-03	3.32E-03	1.63E-05	3.47E-05	3.19E-05	1.66E+00	9.17E-05	-	1.66E+00	1.51E+00	
	Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01	
Dump truck	20cy/24 ton	20	20	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	1.54E-04	1.10E-03	2.93E-04	2.34E-06	4.07E-05	2.16E-05	4.70E-01	1.12E-06	1.06E-06	4.70E-01	4.26E-01		
Dewatering	Tractor/crawler/dozer	180 hp	2	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
	Front end loader	49 hp	4	19	0.249	2.247	2.257	0.003	0.098	0.090	231.303	0.022	0.000	5.39E-05	4.85E-04	4.88E-04	6.46E-07	2.12E-05	1.95E-05	5.00E-02	4.86E-06	-	5.01E-02	4.54E-02	
	Roller	47 hp	4	19	0.222	2.225	2.115	0.003	0.093	0.086	235.529	0.020	0.000	4.60E-05	4.61E-04	4.38E-04	6.31E-07	1.93E-05	1.77E-05	4.88E-02	4.15E-06	-	4.88E-02	4.44E-02	
	Water truck	3000 gal	4	19	6.993	49.941	13.281	0.106	1.847	0.978	21,297.572	0.051	0.048	3.08E-05	2.20E-04	5.86E-05	4.69E-07	8.14E-06	4.31E-06	9.39E-02	2.25E-07	2.12E-07	9.40E-02	8.53E-02	
	Excavator	300 hp	4	19	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000	7.17E-05	7.07E-04	5.61E-04	2.75E-06	5.41E-06	4.98E-06	2.80E-01	1.55E-05	-	2.81E-01	2.55E-01	
	Front end loader	180 hp	4	19	0.076	0.543	0.576	0.003	0.005	0.004	270.060	0.015	0.000	6.04E-05	4.31E-04	4.57E-04	2.41E-06	3.58E-06	3.29E-06	2.14E-01	1.19E-05	-	2.15E-01	1.95E-01	
	Tractor/crawler/dozer	180 hp	6	19	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	6.82E-05	7.11E-04	7.64E-04	4.03E-06	5.39E-06	4.95E-06	3.59E-01	1.99E-05	-	3.59E-01	3.25E-01	
	36" Diversion Pipe - grade	Welder	17 hp	4	19	2.545	1.647	93.482	0.004	1.249	1.246	148.937	0.144	0.124	1.91E-04	1.23E-04	7.01E-03	2.83E-07	9.38E-05	9.34E-05	1.12E-02	1.08E-05	9.32E-06	1.43E-02	1.30E-02
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.88E-04	2.80E-03	5.10E-03	9.17E-06	1.85E-04	1.70E-04	8.15E-01	6.22E-05	-	8.15E-01	7.40E-01
	Loader/backhoe	75 hp	0.0923	19	0.076	1.118	1.383	0.002	0.083	0.077	195.356	0.015	0.000	5.78E-07	8.53E-06	1.05E-05	1.75E-08	6.36E-07	5.85E-07	1.49E-03	1.14E-07	-	1.49E-03	1.35E-03	
Crane 94'	155 hp	155	19	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	1.15E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00		
1 ton pickup truck	155 hp	155	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
Crane 94'	155 hp	155	20	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.27E-03	1.89E-02	3.45E-02	6.20E-05	1.25E-03	1.15E-03	5.51E+00	4.21E-04	-	5.52E+00	5.01E+00		
1 ton pickup truck	155 hp	155	20	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	2.36E-04	3.54E-04	3.26E-03	1.04E-05	8.14E-05	3.49E-05	3.48E+00	3.46E-04	1.80E-04	3.54E+00	3.21E+00		
Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	0.057	0.597	0.642	0.003	0.005	0.004	301.159	0.017	0.000	2.27E-05	2.37E-04	2.55E-04	1.34E-06	1.79E-06	1.65E-06	1.20E-01	6.61E-06	-	1.20E-01	1.09E-01	
Concrete saw	13 hp	8	23	3.253	2.405	118.912	0.006	1.686	1.682	201.089	0.184	0.193	3.73E-04	2.76E-04	1.36E-02	6.57E-07	1.93E-04	1.93E-04	2.31E-02	2.11E-05	2.21E-05	3.04E-02	2.75E-02		
Crane 80'	130 hp	16	23	0.048	0.715	1.302	0.002	0.047	0.043	208.020	0.016	0.000	1.10E-04	1.64E-03	2.99E-03	5.37E-06	1.08E-04	9.96E-05	4.77E-01	3.64E-05	-	4.78E-01	4.33E-01		
Front end loader	180 hp	16	23	3.935	4.518	54.221	0.060	0.471	0.199	20,361.282	4.604	2.135	3.47E-05	3.98E-05	4.78E-04	5.33E-07	4.15E-06	1.79E-06	1.80E-01	4.06E-05	1.88E-05	1.86E-01	1.69E-01		
Flarepot	80 hp	5856	70	0.120	1.489	1.736	0.003	0.102	0.094	294.390	0.011	0.000	6.21E-02	7.69E-01	8.96E-01	1.79E-03	6.20E-02	4.89E-02	1.63E+02	5.60E-03	-	1.63E+02	1.38E+02		
Access Road	Tractor/crawler/dozer	600 hp	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01	
	Tractor/crawler/dozer	600 hp	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01	
	Tractor/crawler/dozer	600 hp	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01	
	Build road	Tractor/crawler/dozer	600 hp	184.6154	19	0.058	0.606	0.546	0.003	0.005	0.004	272.368	0.015	0.000	7.10E-03	7.40E-02	6.66E-02	3.34E-04	5.59E-04	5.15E-04	3.33E+01	1.84E-03	-	3.33E+01	3.02E+01
	Armoring	1 ton pickup truck	2	19	1.379	2.069	19.104	0.061	0.477	0.205	20,361.282	2.024	1.056	3.04E-06	4.56E-06	4.21E-05	1.35E-07	1.05E-06	4.51E-07	4.49E-02	4.46E-06	2.33E-06	4.57E-02	4.15E-02	
	Excavator	430 hp	2	19	0.054	0.534	0.424	0.002	0.004	0.004	211.856	0.012	0.000	5.14E-05	5.07E-04	4.02E-04	1.97E-06	3.88E-06	3.57E-06	2.01E-01	1.11E-05	-	2.01E-01	1.82E-01	
	1 ton pickup																								



Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Alternative 4 - Year 5

Construction Start Year 2021  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Total Hours	Days per Year	Peak Daily Emissions - 2021 (pounds per day)							
					VOC	NOx	CO	SO2	PM10	PM2.5		
Construction Survey	3/4 ton pickup truck		96	210	5.50E-03	5.23E-03	6.76E-02	1.23E-04	9.83E-04	4.33E-04		
Dust Control	Water truck	5000 gal	2320	210	3.41E-01	2.43E+00	6.47E-01	5.18E-03	9.00E-02	4.76E-02		
Environmental protection measures	Biologist		1229.3333	210	7.05E-02	6.70E-02	8.65E-01	1.57E-03	1.26E-02	5.55E-03		
Clear Vegetation	Fish relocation	3/4 ton pickup truck	16	19	1.01E-02	9.64E-03	1.24E-01	2.26E-04	1.81E-03	7.98E-04		
	Cutting	1 ton pickup truck	4	19	1.41E-03	2.11E-03	1.95E-02	6.24E-05	4.87E-04	2.09E-04		
		Tractor/crawler/dozer	250 hp	7.3333	19	2.44E-02	2.54E-01	2.73E-01	1.44E-03	1.92E-03	1.77E-03	
		Chain saw		7.3335	19	3.29E-02	1.64E-03	1.89E-01	2.10E-05	2.97E-04	2.96E-04	
	Brush Piling	Front end loader	540 hp	3.696	19	3.49E-02	2.49E-01	2.90E-01	1.46E-03	2.07E-03	1.90E-03	
		Tractor/crawler/dozer	310 hp	3.696	19	1.55E-02	1.61E-01	1.25E-01	6.13E-04	1.22E-03	1.12E-03	
		Brush chipper	250 hp	3.696	19	2.87E-02	2.01E-01	1.52E-01	9.34E-04	1.48E-03	1.36E-03	
		Chipping	Front end loader	540 hp	3.696	19	3.49E-02	2.49E-01	2.90E-01	1.46E-03	2.07E-03	1.90E-03
		Loader/backhoe	75 hp	24	20	3.01E-02	4.44E-01	5.49E-01	9.09E-04	3.31E-02	3.04E-02	
		Front end loader	350 hp	20	20	1.17E-01	8.36E-01	6.64E-01	3.25E-03	6.94E-03	6.38E-03	
Landscaping	Dump truck	20cy/24 ton	20	20	3.08E-02	2.20E-01	5.86E-02	4.69E-04	8.14E-03	4.31E-03		
	Dump truck	20cy/24 ton	20	20	3.08E-02	2.20E-01	5.86E-02	4.69E-04	8.14E-03	4.31E-03		
Dewatering	Temporary Cofferdam			19	4.79E-03	4.99E-02	5.36E-02	2.83E-04	3.77E-04	3.47E-04		
		Tractor/crawler/dozer	180 hp	2	19	1.13E-02	1.02E-01	1.03E-01	1.36E-04	4.46E-03	4.10E-03	
		Front end loader	49 hp	4	19	9.69E-03	9.71E-02	9.23E-02	1.33E-04	4.06E-03	3.74E-03	
		Roller	47 hp	4	19	6.49E-03	4.64E-02	1.23E-02	9.87E-05	1.71E-03	9.08E-04	
		Water truck	3000 gal	4	19	1.51E-02	1.49E-01	1.18E-01	5.79E-04	1.14E-03	1.05E-03	
		Excavator	300 hp	4	19	1.27E-02	9.08E-02	9.62E-02	5.08E-04	7.54E-04	6.93E-04	
		Front end loader	180 hp	4	19	1.44E-02	1.50E-01	1.61E-01	8.49E-04	1.13E-03	1.04E-03	
	36" Diversion Pipe - grade	Tractor/crawler/dozer	180 hp	6	19	4.02E-02	2.60E-02	1.48E+00	5.96E-05	1.97E-02	1.97E-02	
	36" Diversion Pipe - pipe	Welder	17 hp	4	19	3.95E-02	5.90E-01	1.07E+00	1.93E-03	3.89E-02	3.58E-02	
	36" Diversion Pipe	Crane 80'	130 hp	27.3333	19	1.22E-04	1.80E-03	2.22E-03	3.68E-06	1.34E-04	1.23E-04	
		Loader/backhoe	75 hp	0.0923	19	2.67E-01	3.99E+00	7.26E+00	1.30E-02	2.63E-01	2.42E-01	
		Crane 94'	155 hp	155	19	4.96E-02	7.44E-02	6.87E-01	2.20E-03	1.71E-02	7.36E-03	
		1 ton pickup truck	155	155	19	2.54E-01	3.79E+00	6.90E+00	1.24E-02	2.50E-01	2.30E-01	
		Crane 94'	155 hp	155	20	4.71E-02	7.07E-02	6.53E-01	2.09E-03	1.63E-02	6.99E-03	
		1 ton pickup truck	155	155	20	4.56E-03	4.74E-02	5.10E-02	2.69E-04	3.58E-04	3.30E-04	
	Demolish cofferdam	Tractor/crawler/dozer	180 hp	2	20	6.49E-02	4.79E-02	2.37E+00	1.14E-04	3.36E-02	3.35E-02	
	Dewatering	Concrete saw	13 hp	8	23	1.91E-02	2.85E-01	5.19E-01	9.33E-04	1.88E-02	1.73E-02	
		Crane 80'	130 hp	16	23	1.03E-03	6.93E-03	6.32E-02	9.26E-05	7.22E-04	3.06E-04	
		Flatbed truck		8	23	1.02E+00	1.26E+01	1.47E+01	2.92E-02	8.66E-01	7.87E-01	
		Generator	80 hp	5858	24	1.49E+00	1.56E+01	1.40E+01	7.04E-02	1.18E-01	1.08E-01	
	Access Road	Excavate	Tractor/crawler/dozer	600 hp	184.6154	19	1.49E+00	1.56E+01	1.40E+01	7.04E-02	1.18E-01	1.08E-01
		Push	Tractor/crawler/dozer	600 hp	184.6154	19	1.49E+00	1.56E+01	1.40E+01	7.04E-02	1.18E-01	1.08E-01
			Tractor/crawler/dozer	600 hp	184.6154	19	1.49E+00	1.56E+01	1.40E+01	7.04E-02	1.18E-01	1.08E-01
		Build road	Tractor/crawler/dozer	600 hp	184.6154	19	1.49E+00	1.56E+01	1.40E+01	7.04E-02	1.18E-01	1.08E-01
		Armoring				19	6.40E-04	9.61E-04	8.87E-03	2.84E-05	2.21E-04	9.49E-05
			Excavator	430 hp	2	19	1.08E-02	1.07E-01	8.47E-02	4.15E-04	8.16E-04	7.51E-04
			1 ton pickup truck	2	19	6.40E-04	9.61E-04	8.87E-03	2.84E-05	2.21E-04	9.49E-05	
		Compaction				19	4.45E-02	4.46E-01	4.24E-01	6.10E-04	1.87E-02	1.72E-02
		Vibratory roller	50 hp	17.28	19	5.74E-02	5.98E-01	6.44E-01	3.40E-03	4.53E-03	4.17E-03	
		Tractor/crawler/dozer	250 hp	17.28	19	3.51E-02	2.50E-01	6.66E-02	5.33E-04	9.26E-03	4.90E-03	
		Water truck	5000 gal	21.6	19	1.02E-01	8.76E-01	1.02E+00	5.39E-03	6.93E-03	6.38E-03	
		Grader	215 hp	340	210	5.19E-02	7.79E-02	7.19E-01	2.30E-03	1.79E-02	7.69E-03	
Fines to landfill (82,300 cy) (4/1-7/10)		Maintenance			70	9.99E-01	7.13E+00	5.66E+00	2.78E-02	5.92E-02	5.44E-02	
		Material Excavation			70	9.99E-01	7.13E+00	5.66E+00	2.78E-02	5.92E-02	5.44E-02	
			1 ton pickup truck	597	70	2.63E-01	1.88E+00	4.99E-01	4.00E-03	6.94E-02	3.68E-02	
			Front end loader	350 hp	597	70	8.16E-01	8.04E+00	6.38E+00	3.13E-02	6.15E-02	5.66E-02
			Water truck	3000 gal	597	70	2.63E-01	1.88E+00	4.99E-01	4.00E-03	6.94E-02	3.68E-02
			Excavator	400 hp	597	70	5.94E-02	8.92E-02	8.23E-01	2.64E-03	2.05E-02	8.82E-03
		1 ton pickup truck	195.5	20	1.14E+00	8.17E+00	6.49E+00	3.18E-02	6.78E-02	6.24E-02		
		Front end loader	350 hp	195.5	20	1.14E+00	8.17E+00	6.49E+00	3.18E-02	6.78E-02	6.24E-02	
		Front end loader	350 hp	195.5	20	1.14E+00	8.17E+00	6.49E+00	3.18E-02	6.78E-02	6.24E-02	
Material from South Ramp (to landfill) (60,500 cy) (7/11-8/6)	Material Excavation			20	3.01E-01	2.19E+00	5.72E-01	4.58E-03	7.96E-02	4.22E-02		
		1 ton pickup truck	195.5	20	9.35E-01	9.21E+00	7.32E+00	3.58E-02	7.05E-02	6.49E-02		
		Excavator	400 hp	195.5	20	9.35E-01	9.21E+00	7.32E+00	3.58E-02	7.05E-02	6.49E-02	
		Excavator	400 hp	195.5	20	9.35E-01	9.21E+00	7.32E+00	3.58E-02	7.05E-02	6.49E-02	
		Excavator	400 hp	195.5	20	9.35E-01	9.21E+00	7.32E+00	3.58E-02	7.05E-02	6.49E-02	
		Excavator	400 hp	195.5	20	9.35E-01	9.21E+00	7.32E+00	3.58E-02	7.05E-02	6.49E-02	
		Excavator	400 hp	195.5	20	4.94E-02	7.41E-02	6.84E-01	2.19E-03	1.71E-02	7.33E-03	
		Front end loader	350 hp	585	72	9.52E-01	6.79E+00	5.40E+00	2.64E-02	5.64E-02	5.19E-02	
		Front end loader	350 hp	585	72	9.52E-01	6.79E+00	5.40E+00	2.64E-02	5.64E-02	5.19E-02	
		Water truck	3000 gal	585	72	2.51E-01	1.79E+00	4.76E-01	3.81E-03	6.62E-02	3.50E-02	
		Excavator	400 hp	585	72	7.77E-01	7.66E+00	6.08E+00	2.98E-02	5.86E-02	5.39E-02	
		Tractor/crawler/dozer	440 hp	720	20	4.07E+00	4.24E+01	3.29E+01	1.61E-01	3.21E-01	2.95E-01	
		Tractor/crawler/dozer	440 hp	90	20	5.08E-01	5.30E+00	4.11E+00	2.01E-02	4.01E-02	3.69E-02	
	Rindge Dam & Spillway Demolition	3/4 ton pickup truck		360	20	2.17E-01	2.06E-01	2.66E+00	4.84E-03	3.87E-02	1.71E-02	
Drilling		Rotary drill	475 hp	61.733	126	5.53E-02	7.02E-01	5.51E-01	2.84E-03	5.10E-03	4.69E-03	
		3/4 ton pickup truck		57.733	126	5.52E-03	5.25E-03	6.77E-02	1.23E-04	9.86E-04	4.34E-04	
Cut with Diamond wire		3/4 ton pickup truck	204	126	1.95E-02	1.85E-02	2.39E-01	4.35E-04	3.48E-03	1.53E-03		
		Diamond cutting saw	50 hp	204	126	5.22E-02	8.55E-01	6.53E-01	1.28E-03	3.04E-02	2.80E-02	
		Crane 260'	375 hp	239.2283	126	1.08E-01	1.25E+00	1.03E+00	5.03E-03	9.24E-03	8.50E-03	
		3/4 ton pickup truck		239.2283	126	2.29E-02	2.17E-02	2.81E-01	5.10E-04	4.08E-03	1.80E-03	
		Front end loader	350 hp	32	126	2.97E-02	2.12E-01	1.69E-01	8.26E-04	1.76E-03	1.62E-03	
		Water truck	3000 gal	14	126	3.43E-03	2.45E-02	6.51E-03	5.21E-05	9.05E-04	4.79E-04	
		Crane 260'	375 hp	119.6141	126	5.41E-02	6.24E-01	5.13E-01	2.52E-03	4.62E-03	4.25E-03	
		Micro-blast	Crane 260'	375 hp	60	2.72E-02	3.13E-01	2.58E-01	1.26E-03	2.32E-03	2.13E-03	
		Horizontal boring drill	10 hp	55	126	1.89E-03	4.79E-02	2.25E-02	6.93E-05	1.74E-03	1.60E-03	
		3/4 ton pickup truck		60	126	5.73E-03	5.45E-03	7.04E-02	1.28E-04	1.02E-03	4.51E-04	
		Crane 260'	375 hp	100	126	4.53E-02	5.21E-01	4.29E-01	2.10E-03	3.86E-03	3.55E-03	
		Air compressor	50 hp	200	126	2.33E-01	2.67E-01	2.16E+01	1.31E-03	8.23E-03	8.21E-03	
Rindge Dam Concrete Arc Foundation Demolition	Drilling	Rotary drill	475 hp	120.7333	20	9.56E-03	9.08E-03	1.17E-01	2.13E-04	1.71E-03	7.52E-04	
		Rotary drill	475 hp	120.7333	20	6.81E-01	8.65E+00	6.79E+00	3.50E-02	6.29E-02	5.78E-02	
		3/4 ton Pickup truck		128.7333	20	7.75E-02	7.37E-02	9.52E-01	1.73E-03	1.38E-02	6.10E-03	
		Front end loader	350 hp	34	20	1.99E-01	1.42E+00	1.13E+00	5.53E-03	1.18E-02	1.09E-02	
		Excavator	400 hp	540	20	2.58E+00	2.54E+01	2.02E+01	9.90E-02	1.95E-01	1.79E-01	
		Excavator	300 hp	540	20	1.94E+00	1.91E+01	1.52E+01	7.43E-02	1.46E-01	1.34E-01	
		Excavator</										

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 1  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

15 15 15 days per construction period (5 days per week)  
 CC1 & CC4 CC1 & CC5 LV2

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Emission Factors - 2018 (g/hp-hr or g/hr)								
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Water Control - Installation	Flatbed Truck	80 hp	4	12		16	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3,555.4	0.041	0.827	1.317	0.002	0.057	0.053	189.421	0.014	0.000
	Loader/Backhoe	75 hp	2.624	3.3513		5,975.3	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12,478.8	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Truck		0.3077		2.7692	3,076.9	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
Water Control - Removal	Water pump	3.5 hp		4		4	4.754	2.132	56.300	0.006	0.058	0.058	177.786	0.269	0.302
	Flatbed Truck	80 hp	4	12		16	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3,555.4	0.041	0.827	1.317	0.002	0.057	0.053	189.421	0.014	0.000
	Loader/Backhoe	75 hp				0	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10,666.6	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
Clear & Grub	Truck		0.3077		0.1482	0.3077	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66,178.8	0.139	1.462	1.780	0.004	0.091	0.083	341.058	0.013	0.000
	Crane 50'	200 hp	9.4118	18.8236		28,235.4	0.029	0.391	0.426	0.002	0.003	0.003	203.313	0.011	0.000
	Man lift	210 hp				0	0.052	0.455	0.331	0.002	0.003	0.003	192.958	0.005	0.000
	Loader	190 hp	28.2353	37.6471		65,882.4	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Chainsaw		56.7647	75.2941	0.2941	132,352.9	1.993	0.115	13.187	0.001	0.021	0.021	35.644	0.124	0.039
	1 ton pickup		0.1765			0.353	2.417	2.837	32.274	0.061	0.491	0.217	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Front end loader	540 hp	0.2964		0.2964	0.5928	0.063	0.523	0.567	0.003	0.004	0.004	290.956	0.014	0.000
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	0.050	0.602	0.471	0.002	0.004	0.004	234.968	0.013	0.000
	Dump truck	20cy/24 ton			1.4866	1.4866	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Demolition	Air Compressor	250 hp	44.4571	44.4571		88,914.2	0.095	0.585	0.451	0.003	0.004	0.004	237.902	0.009
Air Compressor		50 hp		32		32	0.569	0.693	49.653	0.004	0.024	0.023	307.213	0.032	0.057
Crane 126'		350 hp	5.1111	5.1111		10,222.2	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
Crane 50'		263 hp	44.4571	44.4571		88,914.2	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
Crane 210'		230 hp	16	16		32	0.029	0.391	0.426	0.002	0.003	0.003	203.313	0.011	0.000
Excavator		115 hp	32	16	24	72	0.063	1.095	1.968	0.003	0.078	0.072	278.045	0.021	0.000
Excavator		430 hp	8	8	12	28	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
Loader		190 hp	72	64	12	148	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
Front end loader		180 hp	4.6667	4.6667		9,333.4	0.064	0.528	0.556	0.003	0.004	0.004	270.067	0.013	0.000
Loader/Backhoe		75 hp	11.1	11.1		22.2	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
Tractor/crawler/dozer		250 hp	4	4		8	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
3/4 ton pickup			72	80	12	164	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
Chainsaw			44.4571	44.4571		88,914.2	1.993	0.115	13.187	0.001	0.021	0.021	35.644	0.124	0.039
Road Realignment		Vibratory roller	145 hp				0.046	0.902	1.559	0.003	0.054	0.049	280.080	0.014	0.000
		Vibrating compactor	5.5 hp	4	4		8	2.038	1.506	74.492	0.004	1.056	1.054	125.971	0.115
	Vibratory compactor	7.5 hp				0.057	1.817	0.996	0.003	0.062	0.057	241.998	0.026	0.000	
	Truck		16	16		32	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Asphalt distributor	3000 gal	4	4		8	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Suburban	3/4 ton	4	4		8	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
Disposal	Truck	35 ton	40	40		80	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
	Truck	75 ton	11.2	11.2		22.4	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Suburban	3/4 ton	12	12		24	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	Crane 210'	230 hp	24	24		48	0.029	0.391	0.426	0.002	0.003	0.003	203.313	0.011	0.000
Bridge Installation	Crane 270'	430 hp	24	24		48	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
	3/4 ton pickup		24	24		48	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	Tractor/crawler/dozer	250 hp		8		16	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Excavator	430 hp	0.6137	0.6137		1,227.4	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
	Truck		2,960.9	2,960.9		5,921.8	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Generator	7.5 hp	15,886.5	15,886.5		31,773.0	2.020	1.438	103.611	0.005	0.098	0.098	175.213	0.114	0.147
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	2.038	1.506	74.492	0.004	1.056	1.054	125.971	0.115	0.151
	Tractor/crawler/dozer	250 hp	2.0218		2.0218	4,043.6	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Truck		4,367.8	4,367.8		8,735.6	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Asphalt distributor	3000 gal	4,947.4		4,947.4	9,894.8	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
	Asphalt paver	120 hp	0.208	0.208		0.416	0.053	1.154	1.712	0.003	0.078	0.072	261.293	0.015	0.000
Vibrating roller/compactor	33 hp	0.848	0.848		1.696	0.179	2.141	1.871	0.003	0.084	0.077	235.555	0.016	0.000	
Chip spreader truck		0.64	0.64		1.28	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048	
Line striper	23 hp	0.0713	0.0713		0.1426	0.162	0.420	9.087	0.003	0.021	0.021	260.534	0.009	0.024	
Abutments	Flatbed Truck		0.0713	0.0713		0.1426	6.554	6.847	91.006	0.061	0.484	0.211	20,361.282	4.604	2.135
	3/4 ton pickup		0.0713	0.0713		0.1426	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056
	Roto trowel concrete finisher	9 hp				0	0.162	0.420	9.087	0.003	0.021	0.021	260.534	0.009	0.024
	Crane 80'	130 hp				0	0.041	0.704	1.280	0.002	0.044	0.041	208.102	0.015	0.000
	Crane 114'	430 hp				0	0.029	0.390	0.322	0.002	0.003	0.003	163.235	0.009	0.000
Landscaping	Auger drill	100 hp				0	0.074	1.505	1.894	0.003	0.104	0.096	291.325	0.017	0.000
	Water pump	80 hp				0	0.113	1.479	1.715	0.003	0.100	0.092	294.389	0.010	0.000
	Excavator	430 hp	9.4118	9.4118		18,823.6	0.047	0.529	0.424	0.002	0.004	0.004	211.860	0.012	0.000
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47,059.9	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
	Loader/Backhoe	92 hp	4.7059	9.4118		23,529.5	0.065	1.094	1.345	0.002	0.079	0.073	195.356	0.014	0.000
	Vibratory roller	44 hp				0	0.179	2.141	1.871	0.003	0.084	0.077	235.555	0.016	0.000
	Tractor/crawler/dozer	250 hp				0	0.049	0.586	0.642	0.003	0.004	0.004	301.159	0.017	0.000
	Dump truck	12 cy	18.8236	18.8236	9.4118	47,059.9	6.964	105.274	12.798	0.107	2.313	1.407	21,487.863	0.051	0.048
3/4 ton pickup					0	4.067	3.333	48.994	0.061	0.502	0.228	20,361.282	2.024	1.056	
3/4 ton pickup		4	4	2	10	4.									

Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Upstream Barriers - Year 1  
Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2018  
Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Annual Emissions - 2018 (tons per year)							Metric Tons CO2e/yr			
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	CO2		CH4	N2O	CO2e
Water Control - Installation	Flatbed Truck			12		16	1.16E-04	1.21E-04	1.61E-03	1.07E-06	8.53E-06	3.72E-06	3.59E-01	8.12E-05	3.77E-05	3.72E-01	3.38E-01
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	1.28E-05	2.59E-04	4.13E-04	6.97E-07	1.79E-05	1.65E-05	5.94E-02	4.29E-06	-	5.95E-02	5.40E-02
	Loader/Backhoe	75 hp		3.3513		5.9753	3.23E-05	5.40E-04	6.64E-04	1.13E-06	3.90E-05	3.59E-05	9.65E-02	6.75E-06	-	9.66E-02	8.77E-02
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	1.68E-04	2.02E-03	2.21E-03	1.17E-05	1.48E-05	1.36E-05	1.04E+00	5.73E-05	-	1.04E+00	9.41E-01
	Tractor/crawler/dozer	250 hp	0.3077			3.0769	2.36E-05	3.57E-04	4.34E-05	3.64E-07	7.84E-06	4.77E-06	7.29E-02	1.73E-07	1.63E-07	7.29E-02	6.62E-02
	Water pump	3.5 hp			4	4	7.34E-05	3.29E-05	8.69E-04	9.47E-08	8.94E-07	8.93E-07	2.74E-03	4.15E-06	4.67E-06	4.28E-03	3.88E-03
Water Control - Removal	Flatbed Truck			12		16	1.16E-04	1.21E-04	1.61E-03	1.07E-06	8.53E-06	3.72E-06	3.59E-01	8.12E-05	3.77E-05	3.72E-01	3.38E-01
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	1.28E-05	2.59E-04	4.13E-04	6.97E-07	1.79E-05	1.65E-05	5.94E-02	4.29E-06	-	5.95E-02	5.40E-02
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	1.43E-04	1.72E-03	1.89E-03	9.96E-06	1.27E-05	1.17E-05	8.85E-01	4.90E-05	-	8.86E-01	8.04E-01
	Tractor/crawler/dozer	250 hp	0.3077			3.077	2.36E-05	3.57E-05	4.34E-06	3.64E-08	7.84E-07	4.77E-07	7.29E-03	1.73E-08	1.63E-08	7.29E-03	6.62E-03
	Tractor/crawler/dozer	250 hp	28.3835		0.1482	66.1788	1.73E-03	1.81E-02	2.21E-02	4.76E-05	1.12E-03	1.03E-03	4.23E+00	1.56E-04	-	4.23E+00	3.84E+00
Clear & Grub	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	1.73E-03	1.81E-02	2.21E-02	4.76E-05	1.12E-03	1.03E-03	4.23E+00	1.56E-04	-	4.23E+00	3.84E+00
	Crane 50'	200 hp	9.4118	18.8236		28.2354	1.83E-04	2.44E-03	2.65E-03	1.42E-05	1.76E-05	1.62E-05	1.27E+00	6.62E-05	-	1.27E+00	1.15E+00
	Man lift	210 hp				0	-	-	-	-	-	-	-	-	-	-	-
	Loader	190 hp	28.2353	37.6471		65.8824	6.73E-04	8.09E-03	8.86E-03	4.68E-05	5.94E-05	5.47E-05	4.16E+00	2.30E-04	-	4.16E+00	3.77E+00
	Chainsaw	75.2941	75.2941	0.2941	132.3529	2.44E-03	1.41E-04	1.62E-02	1.80E-06	2.54E-05	2.54E-05	4.37E-02	1.52E-04	4.80E-05	6.17E-02	5.60E-02	5.60E-02
	1 ton pickup	0.1765			0.353	9.40E-07	1.10E-06	1.26E-05	2.39E-08	1.91E-07	8.46E-08	7.92E-03	7.88E-07	4.11E-07	8.07E-03	7.32E-03	7.32E-03
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	7.91E-06	9.51E-05	1.04E-04	5.49E-07	6.98E-07	6.43E-07	4.88E-02	2.70E-06	-	4.89E-02	4.43E-02
	Front end loader	540 hp	0.2964		0.2964	0.5928	2.23E-05	1.85E-04	2.00E-04	1.03E-06	1.47E-06	1.35E-06	1.03E-01	5.08E-06	-	1.03E-01	9.32E-02
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	5.07E-06	6.10E-05	4.77E-05	2.34E-07	4.42E-07	4.28E-02	1.32E-06	-	-	2.38E-02	2.16E-02
	Dump truck	20cy/24 ton			1.4866	1.4866	1.14E-05	1.73E-04	2.10E-05	1.76E-07	3.79E-06	2.31E-06	3.52E-02	8.36E-08	7.87E-08	3.52E-02	3.20E-02
	Air Compressor	250 hp	44.4571	44.4571		88.9142	2.34E-03	1.43E-02	1.11E-02	6.58E-05	1.09E-04	1.00E-04	5.83E+00	2.11E-04	-	5.83E+00	5.29E+00
	Demolition	Air Compressor	50 hp		32		32	1.00E-03	1.22E-03	8.76E-02	6.59E-06	4.15E-05	4.14E-05	5.42E-01	5.67E-05	1.00E-04	5.74E-01
Crane 126'		350 hp	5.1111	5.1111		10.2222	1.16E-04	1.54E-03	1.27E-03	6.32E-06	1.11E-05	1.02E-05	6.44E-01	3.37E-05	-	6.44E-01	5.85E-01
Crane 50'		263 hp	44.4571	44.4571		88.9142	7.56E-04	1.00E-02	8.31E-03	4.13E-05	7.25E-05	6.67E-05	4.21E+00	2.20E-04	-	4.21E+00	3.82E+00
Crane 210'		230 hp	16	16		32	2.39E-04	3.17E-03	3.46E-03	1.86E-05	2.29E-05	2.11E-05	1.65E+00	8.62E-05	-	1.65E+00	1.50E+00
Excavator		115 hp	32	16	24	72	5.79E-04	9.99E-03	1.80E-02	2.98E-05	7.15E-04	6.58E-04	2.54E+00	1.94E-04	-	2.54E+00	2.31E+00
Excavator		430 hp	8	8	12	28	6.22E-04	7.03E-03	5.63E-03	2.76E-05	5.23E-05	4.81E-05	2.81E+00	1.55E-04	-	2.81E+00	2.55E+00
Loader		190 hp	72	64	12	148	1.51E-03	1.82E-02	1.99E-02	1.05E-04	1.34E-04	1.23E-04	9.33E+00	5.16E-04	-	9.35E+00	8.48E+00
Front end loader		180 hp	4.6667	4.6667		9.3334	1.18E-04	9.77E-04	1.03E-03	5.63E-06	7.79E-06	7.17E-06	5.00E-01	2.47E-05	-	5.01E-01	4.54E-01
Loader/Backhoe		75 hp	11.1	11.1		22.2	1.20E-04	2.01E-03	2.47E-03	4.21E-06	1.45E-04	1.33E-04	3.59E-01	2.51E-05	-	3.59E-01	3.26E-01
Tractor/crawler/dozer		250 hp	4	4		8	1.08E-04	1.29E-03	1.42E-03	7.47E-06	9.50E-06	8.74E-06	6.64E-01	3.67E-05	-	6.65E-01	6.03E-01
3/4 ton pickup		72	80	12	164	7.35E-04	6.02E-04	8.86E-03	1.11E-05	9.08E-05	4.12E-05	3.68E+00	3.66E-04	1.91E-04	3.75E+00	3.40E+00	3.40E+00
Chainsaw		44.4571	44.4571		88.9142	1.64E-03	9.44E-05	1.09E-02	1.21E-06	1.71E-05	1.70E-05	2.93E-02	1.02E-04	3.22E-05	4.15E-02	-	3.76E-02
Road Realignment	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	4	4		8	9.88E-05	7.31E-05	3.61E-03	1.74E-07	5.12E-05	5.11E-05	6.11E-03	5.59E-06	7.30E-06	8.49E-03	7.70E-03
	Vibrating compactor	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-
	Truck	16	16		32	2.46E-04	3.71E-03	4.51E-04	3.79E-06	8.16E-05	4.96E-05	7.58E-01	1.80E-06	1.69E-06	7.59E-01	6.88E-01	
	Asphalt distributor	3000 gal	4	4		8	6.14E-05	9.28E-04	1.13E-04	9.47E-07	2.04E-05	1.24E-05	1.89E-01	4.50E-07	4.23E-07	1.90E-01	1.72E-01
	Suburban	3/4 ton	4	4		8	3.59E-05	2.94E-05	4.32E-04	5.40E-07	4.43E-06	2.01E-06	1.80E-01	1.78E-05	9.31E-06	1.83E-01	1.66E-01
	Truck	35 ton	40	40		80	5.78E-04	6.04E-04	8.03E-03	5.37E-06	4.27E-05	1.86E-05	1.80E+00	4.06E-04	1.88E-04	1.86E+00	1.69E+00
	Truck	75 ton	11.2	11.2		22.4	1.72E-04	2.60E-03	3.16E-04	2.65E-06	5.71E-05	3.47E-05	5.31E-01	1.26E-06	1.19E-06	5.31E-01	4.82E-01
Bridge Installation	Suburban	3/4 ton	12	12		24	1.08E-04	8.82E-05	1.30E-03	1.62E-06	1.33E-05	6.03E-06	5.39E-01	5.35E-05	2.79E-05	5.48E-01	4.98E-01
	Crane 210'	230 hp	24	24		48	3.59E-04	4.76E-03	5.18E-03	2.78E-05	3.44E-05	3.16E-05	2.47E+00	1.29E-04	-	2.48E+00	2.25E+00
	Crane 270'	430 hp	24	24		48	6.68E-04	8.87E-03	7.34E-03	3.65E-05	6.40E-05	5.89E-05	3.71E+00	1.94E-04	-	3.72E+00	3.37E+00
	3/4 ton pickup	24	24		48	2.15E-04	1.76E-04	2.59E-03	3.24E-06	2.66E-05	1.21E-05	1.08E+00	1.07E-04	5.59E-05	-	1.10E+00	9.95E-01
	Tractor/crawler/dozer	250 hp	8	8		16	2.15E-04	2.59E-03	2.83E-03	1.49E-05	1.90E-05	1.75E-05	1.33E+00	7.34E-05	-	1.33E+00	1.21E+00
	Excavator	430 hp	0.6137	0.6137		1.2274	2.73E-05	3.08E-04	2.47E-04	1.21E-06	2.29E-06	2.11E-06	1.23E-01	6.82E-06	-	1.23E-01	1.12E-01
	Truck	2.9609	2.9609		5.9218	4.55E-05	6.87E-04	8.35E-05	7.01E-07	1.51E-05	9.18E-06	1.40E-01	3.33E-07	3.19E-07	1.40E-01	1.27E-01	
	Generator	7.5 hp	15.8865	15.8865		31.773	5.31E-04	3.78E-04	2.72E-02	1.31E-06	2.57E-05	2.57E-05	4.60E-02	3.00E-05	3.86E-05	5.86E-02	5.32E-02
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	9.01E-05	6.66E-05	3.29E-03	1.59E-07	4.67E-05	4.66E-05	5.57E-03	5.10E-06	6.66E-06	7.74E-03	7.02E-03
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	5.44E-05	6.53E-04	7.15E-04	3.78E-06	4.80E-06	4.42E-06	3.36E-01	1.86E-05	-	3.36E-01	3.05E-01
	Truck	4.3678	4.3678		8.7356	6.71E-05	1.01E-03	1.23E-04	1.03E-06	2.23E-05	1.35E-05	2.07E-01	4.91E-07	4.62E-07	2.07E-01	1.88E-01	
	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	7.60E-05	1.15E-03	1.40E-04	1.17E-06	2.52E-05	1.53E-05	2.34E-01	5.56E-07	5.24E-07	2.35E-01	2.13E-01
Asphalt paver	120 hp	0.208	0.208		0.416	2.91E-06	6.35E-05	9.42E-05	1.69E-07	4.32E-06	3.97E-06	1.44E-02	8.45E-07	-	1.44E-02	1.31E-02	
Vibrating roller/compactor	33 hp	0.848	0.848		1.696	1.11E-05	1.32E-04	1.15E-04	1.88E-07	5.18E-06	4.77E-06	1.45E-02	9.99E-07	-	1.46E-02	1.32E-02	
Chip spreader truck	0.64	0.64		1.28	9.83E-06	1.49E-04	1.81E-05	1.52E-07	3.26E-06	1.98E-06	3.03E-02	7.20E-08	6.77E-08				



Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 1  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2018  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC1 & CC4) - 2018 (pounds per day)						Peak Daily Emissions (CC1 & CC5) - 2018 (pounds per day)						
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
																			LV2
Water Control - Installation	Flatbed Truck	80 hp	4	12		16	7.71E-03	8.05E-03	1.07E-01	7.16E-05	5.69E-04	2.48E-04	2.31E-02	2.42E-02	3.21E-01	2.15E-04	1.71E-03	7.43E-04	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	1.71E-03	3.46E-02	5.51E-02	9.29E-05	2.39E-03	2.20E-03	1.28E-03	2.59E-02	4.13E-02	6.97E-05	1.79E-03	1.65E-03	
	Loader/Backhoe	75 hp		3.3513		5.9753	3.78E-03	6.33E-02	7.78E-02	1.33E-04	4.56E-03	4.20E-03	4.82E-03	8.08E-02	9.94E-02	1.69E-04	5.83E-03	5.36E-03	
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	1.98E-02	2.38E-01	2.60E+01	1.37E-03	1.75E-03	1.61E-03	-	-	-	-	-	-	
	Truck		0.3077			3.0769	6.30E-04	9.52E-03	1.16E-03	9.71E-06	2.09E-04	1.27E-04	-	-	-	-	-	-	
Water Control - Removal	Water pump	3.5 hp			4	4	-	-	-	-	-	-	1.96E-02	8.77E-03	2.32E-01	2.53E-05	2.39E-04	2.38E-04	
	Flatbed Truck	80 hp	4	12		16	7.71E-03	8.05E-03	1.07E-01	7.16E-05	5.69E-04	2.48E-04	2.31E-02	2.42E-02	3.21E-01	2.15E-04	1.71E-03	7.43E-04	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	1.71E-03	3.46E-02	5.51E-02	9.29E-05	2.39E-03	2.20E-03	1.28E-03	2.59E-02	4.13E-02	6.97E-05	1.79E-03	1.65E-03	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	1.91E-02	2.30E-01	2.52E-01	1.33E-03	1.69E-03	1.55E-03	-	-	-	-	-	-	
Clear & Grub	Truck		0.3077			0.3077	6.30E-04	9.52E-03	1.16E-03	9.71E-06	2.09E-04	1.27E-04	-	-	-	-	-	-	
	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	1.98E-01	2.07E+00	2.52E+00	5.44E-03	1.29E-01	1.18E-01	2.62E-01	2.75E+00	3.35E+00	7.22E-03	1.70E-01	1.57E-01	
	Crane 50'	200 hp	9.4118	18.8236		28.2354	1.63E-02	2.17E-01	2.36E-01	1.27E-03	1.56E-03	1.44E-03	3.26E-02	4.33E-01	4.71E-01	2.53E-03	3.12E-03	2.87E-03	
	Man lift	210 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Loader	190 hp	28.2353	37.6471		65.8824	7.69E-02	9.25E-01	1.01E+00	5.34E-03	6.79E-03	6.25E-03	1.03E-01	1.23E+00	1.35E+00	7.12E-03	9.06E-03	8.33E-03	
	Chainsaw		56.7647	75.2941	0.2941	132.3529	2.79E-01	1.61E-02	1.85E+00	2.06E-04	2.91E-03	2.90E-03	3.70E-01	2.13E-02	2.45E+00	2.73E-04	3.86E-03	3.85E-03	
	1 ton pickup		0.1765			0.353	1.25E-04	1.47E-04	1.67E-03	3.19E-06	2.55E-05	1.13E-05	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	1.05E-03	1.27E-02	1.39E-02	7.32E-05	9.31E-05	8.57E-05	-	-	-	-	-	-	
	Front end loader	540 hp	0.2964		0.2964	0.5928	2.97E-03	2.46E-02	2.67E-02	1.38E-04	1.96E-04	1.80E-04	-	-	-	-	-	-	
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	6.71E-04	8.13E-03	6.36E-03	3.11E-05	5.97E-05	5.50E-05	-	-	-	-	-	-	
	Dump truck	20cy/24 ton			1.4866	1.4866	-	-	-	-	-	-	-	-	-	-	-	-	
	Demolition	Air Compressor	250 hp	44.4571	44.4571		88.9142	3.11E-01	1.91E+00	1.47E+00	8.75E-03	1.45E-02	1.33E-02	3.11E-01	1.91E+00	1.47E+00	8.75E-03	1.45E-02	1.33E-02
Air Compressor		50 hp		32		32	-	-	-	-	-	-	2.68E-01	3.26E-01	2.34E+01	1.76E-03	1.11E-02	1.10E-02	
Crane 126'		350 hp	5.1111	5.1111		10.2222	1.54E-02	2.05E-01	1.70E-01	8.42E-04	1.48E-03	1.36E-03	1.54E-02	2.05E-01	1.70E-01	8.42E-04	1.48E-03	1.36E-03	
Crane 50'		263 hp	44.4571	44.4571		88.9142	1.01E-01	1.34E+00	1.11E+00	5.51E-03	9.67E-03	8.89E-03	1.01E-01	1.34E+00	1.11E+00	5.51E-03	9.67E-03	8.89E-03	
Crane 210'		230 hp	16	16		32	3.19E-02	4.23E-01	4.61E-01	2.47E-03	3.05E-03	2.81E-03	3.19E-02	4.23E-01	4.61E-01	2.47E-03	3.05E-03	2.81E-03	
Excavator		115 hp	32	16	24	72	6.86E-02	1.18E+00	2.13E+00	3.53E-03	8.48E-02	7.80E-02	3.43E-02	5.92E-01	1.06E+00	1.76E-03	4.24E-02	3.90E-02	
Excavator		430 hp	8	8	12	28	4.74E-02	5.35E-01	4.29E-01	2.10E-03	3.98E-03	3.66E-03	4.74E-02	5.35E-01	4.29E-01	2.10E-03	3.98E-03	3.66E-03	
Loader		190 hp	72	64	12	148	1.96E-01	2.36E+00	2.58E+00	1.36E-02	1.73E-02	1.59E-02	1.74E-01	2.10E+00	2.29E+00	1.21E-02	1.54E-02	1.42E-02	
Front end loader		180 hp	4.6667	4.6667		9.3334	1.57E-02	1.30E-01	1.37E-01	7.50E-04	1.04E-03	9.56E-04	1.57E-02	1.30E-01	1.37E-01	7.50E-04	1.04E-03	9.56E-04	
Loader/Backhoe		75 hp	11.1	11.1		22.2	1.60E-02	2.68E-01	3.29E-01	5.61E-04	1.93E-02	1.78E-02	1.60E-02	2.68E-01	3.29E-01	5.61E-04	1.93E-02	1.78E-02	
Tractor/crawler/dozer		250 hp	4	4		8	1.43E-02	1.72E-01	1.89E-01	9.96E-04	1.27E-03	1.17E-03	1.43E-02	1.72E-01	1.89E-01	9.96E-04	1.27E-03	1.17E-03	
3/4 ton pickup			72	80	12	164	8.61E-02	7.05E-02	1.04E+00	1.30E-03	1.06E-02	4.82E-03	9.56E-02	7.84E-02	1.15E+00	1.44E-03	1.18E-02	5.36E-03	
Chainsaw			44.4571	44.4571		88.9142	2.19E-01	1.26E-02	1.45E+00	1.61E-04	2.28E-03	2.27E-03	2.19E-01	1.26E-02	1.45E+00	1.61E-04	2.28E-03	2.27E-03	
Road Realignment		Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-	
		Vibrating compactor	5.5 hp	4	4		8	1.32E-02	9.74E-03	4.82E-01	2.32E-05	6.83E-03	6.82E-03	1.32E-02	9.74E-03	4.82E-01	2.32E-05	6.83E-03	6.82E-03
		Vibratory compactor	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	
		Truck		16	16		32	3.28E-02	4.95E-01	6.02E-02	5.05E-04	1.09E-02	6.62E-03	3.28E-02	4.95E-01	6.02E-02	5.05E-04	1.09E-02	6.62E-03
	Asphalt distributor	3000 gal	4	4		8	8.19E-03	1.24E-01	1.50E-02	1.26E-04	2.72E-03	1.65E-03	8.19E-03	1.24E-01	1.50E-02	1.26E-04	2.72E-03	1.65E-03	
Disposal	Suburban	3/4 ton	4	4		8	4.78E-03	3.92E-03	5.76E-02	7.20E-05	5.90E-04	2.68E-04	4.78E-03	3.92E-03	5.76E-02	7.20E-05	5.90E-04	2.68E-04	
	Truck	35 ton	40	40		80	7.71E-02	8.05E-02	1.07E+00	7.16E-04	5.69E-03	2.48E-03	7.71E-02	8.05E-02	1.07E+00	7.16E-04	5.69E-03	2.48E-03	
	Truck	75 ton	11.2	11.2		22.4	2.29E-02	3.47E-01	4.21E-02	3.54E-04	7.61E-03	4.63E-03	2.29E-02	3.47E-01	4.21E-02	3.54E-04	7.61E-03	4.63E-03	
	Suburban	3/4 ton	12	12		24	1.43E-02	1.18E-02	1.73E-01	2.16E-04	1.77E-03	8.04E-04	1.43E-02	1.18E-02	1.73E-01	2.16E-04	1.77E-03	8.04E-04	
Bridge Installation	Crane 210'	230 hp	24	24		48	4.78E-02	6.35E-01	6.91E-01	3.71E-03	4.58E-03	4.21E-03	4.78E-02	6.35E-01	6.91E-01	3.71E-03	4.58E-03	4.21E-03	
	Crane 270'	430 hp	24	24		48	8.90E-02	1.18E+00	9.78E-01	4.86E-03	8.53E-03	7.85E-03	8.90E-02	1.18E+00	9.78E-01	4.86E-03	8.53E-03	7.85E-03	
	3/4 ton pickup		24	24		48	2.87E-02	2.35E-02	3.46E-01	4.32E-04	3.54E-03	1.61E-03	2.87E-02	2.35E-02	3.46E-01	4.32E-04	3.54E-03	1.61E-03	
	Tractor/crawler/dozer	250 hp	8	8		16	2.87E-02	3.45E-01	3.77E-01	1.99E-03	2.83E-03	2.33E-03	2.87E-02	3.45E-01	3.77E-01	1.99E-03	2.83E-03	2.33E-03	
	Excavator	430 hp	0.6137	0.6137		1.2274	3.64E-03	4.11E-02	3.29E-02	1.61E-04	3.05E-04	2.81E-04	3.64E-03	4.11E-02	3.29E-02	1.61E-04	3.05E-04	2.81E-04	
	Truck		2.9609	2.9609		5.9218	6.06E-03	9.16E-02	1.11E-02	9.35E-05	2.01E-03	1.22E-03	6.06E-03	9.16E-02	1.11E-02	9.35E-05	2.01E-03	1.22E-03	
	Generator	7.5 hp	15.8865	15.8865		31.773	7.07E-02	5.03E-02	3.63E+00	1.75E-04	3.43E-03	3.42E-03	7.07E-02	5.03E-02	3.63E+00	1.75E-04	3.43E-03	3.42E-03	
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	1.20E-02	8.88E-03	4.39E-01	2.12E-05	6.23E-03	6.22E-03	1.20E-02	8.88E-03	4.39E-01	2.12E-05	6.23E-03	6.22E-03	
	Tractor/crawler/dozer	250 hp	2.0218	2.0218		4.0436	7.25E-03	8.71E-02	9.54E-02	5.03E-04	6.40E-04	5.89E-04	7.25E-03	8.71E-02	9.54E-02	5.03E-04	6.40E-04	5.89E-04	
	Truck		4.3678	4.3678		8.7356	8.94E-03	1.35E-01	1.64E-02	1.38E-04	2.97E-03	1.81E-03	8.94E-03	1.35E-01	1.64E-02	1.38E-04	2.97E-03	1.81E-03	
Highway Replacement	Asphalt distributor	3000 gal	4.9474	4.9474		9.8948	1.01E-02	1.53E-01	1.86E-02	1.56E-04	3.36E-03	2.05E-03	1.01E-02	1.53E-01	1.86E-02	1.56E-04	3.36E-03	2.05E-03	
	Asphalt paver	120 hp	0.208	0.208		0.416	3.88E-04	8.47E-03	1.26E-02	2.25E-05	5.76E-04	5.30E-04	3.88E-04	8.47E-03	1.26E-02	2.25E-05	5.76E-04	5.30E-04	
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	1.48E-03	1.76E-02	1.54E-02	2.50E-05	6.91E-04	6.36E-04							

**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Upstream Barriers - Year 1  
Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2018**  
Speed of Onsite Trucks **10 mph**

15 15 15 days per cost  
CC1 & CC4 CC1 & CC5 LV2

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (LV2) - 2018 (pounds per day)								
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5			
<b>Water Control - Installation</b>	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	4.27E-04	8.64E-03	1.38E-02	2.32E-05	5.97E-04	5.49E-04	-	-	
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	2.49E-02	3.00E-01	3.28E-01	1.73E-03	2.20E-03	2.03E-03	-	-	
	Truck		0.3077		2.7692	3.0769	5.67E-03	8.57E-02	1.04E-02	8.74E-05	1.88E-03	1.15E-03	-	-	
<b>Water Control - Removal</b>	Water pump	3.5 hp		4		4	-	-	-	-	-	-	-	-	
	Flatbed Truck		4	12		16	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	4.27E-04	8.64E-03	1.38E-02	2.32E-05	5.97E-04	5.49E-04	-	-	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	1.91E-02	2.30E-01	2.52E-01	1.33E-03	1.69E-03	1.55E-03	-	-	
<b>Clear &amp; Grub</b>	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	1.03E-03	1.08E-02	1.32E-02	2.84E-05	6.71E-04	6.17E-04	-	-	
	Crane 50'	200 hp	9.4118	18.8236		28.2354	-	-	-	-	-	-	-	-	
	Man lift	210 hp				0	-	-	-	-	-	-	-	-	
	Loader	190 hp	28.2353	37.6471		65.8824	-	-	-	-	-	-	-	-	
	Chainsaw		56.7647	75.2941	0.2941	132.3529	1.45E-03	8.33E-05	9.58E-03	1.07E-06	1.51E-05	1.50E-05	-	-	
	1 ton pickup		0.1765		0.1765	0.353	1.25E-04	1.47E-04	1.67E-03	3.19E-06	2.55E-05	1.13E-05	-	-	
	Tractor/crawler/dozer	250 hp	0.2941		0.2941	0.5882	1.05E-03	1.27E-02	1.39E-02	7.32E-05	9.31E-05	8.57E-05	-	-	
	Front end loader	540 hp	0.2964		0.2964	0.5928	2.97E-03	2.46E-02	2.67E-02	1.38E-04	1.96E-04	1.80E-04	-	-	
	Tractor/crawler/dozer	310 hp	0.1482		0.1482	0.2964	6.77E-04	8.13E-03	6.36E-03	3.11E-05	5.97E-05	5.50E-05	-	-	
	Dump truck	20cy/24 ton			1.4866	1.4866	3.04E-03	4.60E-02	5.59E-03	4.69E-05	1.01E-03	6.15E-04	-	-	
	Air Compressor	250 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-	
	Air Compressor	50 hp			32	32	-	-	-	-	-	-	-	-	
	<b>Demolition</b>	Crane 126'	350 hp	5.1111	5.1111		10.2222	-	-	-	-	-	-	-	-
Crane 50'		263 hp	44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-	
Crane 210'		230 hp	16	16		32	-	-	-	-	-	-	-	-	
Excavator		115 hp	32	16	24	72	5.15E-02	8.88E-01	1.60E+00	2.65E-03	6.36E-02	5.85E-02	-	-	
Excavator		430 hp	8	8	12	28	7.11E-02	8.03E-01	6.44E-01	3.15E-03	5.97E-03	5.49E-03	-	-	
Loader		190 hp	72	64	12	148	3.27E-02	3.93E-01	4.30E-01	2.27E-03	2.89E-03	2.66E-03	-	-	
Front end loader		180 hp	4.6667	4.6667		9.3334	-	-	-	-	-	-	-	-	
Loader/Backhoe		75 hp	11.1	11.1		22.2	-	-	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	4	4		8	-	-	-	-	-	-	-	-	
3/4 ton pickup			72	80	12	164	1.43E-02	1.18E-02	1.73E-01	2.16E-04	1.77E-03	8.04E-04	-	-	
Chainsaw			44.4571	44.4571		88.9142	-	-	-	-	-	-	-	-	
<b>Road Realignment</b>		Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-
		Vibrating compactor	5.5 hp	4	4		8	-	-	-	-	-	-	-	-
	Vibratory compactor	7.5 hp				0	-	-	-	-	-	-	-	-	
	Truck		16	16		32	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	4	4		8	-	-	-	-	-	-	-	-	
<b>Disposal</b>	Suburban	3/4 ton	4	4		8	-	-	-	-	-	-	-	-	
	Truck	35 ton	40	40		80	-	-	-	-	-	-	-	-	
<b>Bridge Installation</b>	Truck	75 ton	11.2	11.2		22.4	-	-	-	-	-	-	-	-	
	Suburban	3/4 ton	12	12		24	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp	24	24		48	-	-	-	-	-	-	-	-	
	Crane 270'	430 hp	24	24		48	-	-	-	-	-	-	-	-	
	3/4 ton pickup		24	24		48	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	8	8		16	-	-	-	-	-	-	-	-	
	Excavator	430 hp	0.6137	0.6137		1.2274	-	-	-	-	-	-	-	-	
	Truck		2.9609	2.9609		5.9218	-	-	-	-	-	-	-	-	
	Generator	7.5 hp	15.8865	15.8865		31.773	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp	3.648	3.648		7.296	-	-	-	-	-	-	-	-	
<b>Highway Replacement</b>	Tractor/crawler/dozer	250 hp	2.0218			4.0436	-	-	-	-	-	-	-	-	
	Truck		4.3678			8.7356	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	4.9474			9.8948	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp	0.208	0.208		0.416	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp	0.848	0.848		1.696	-	-	-	-	-	-	-	-	
	Chip spreader truck		0.64	0.64		1.28	-	-	-	-	-	-	-	-	
	Line striper	23 hp	0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	Flatbed Truck		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	3/4 ton pickup		0.0713	0.0713		0.1426	-	-	-	-	-	-	-	-	
	Roto trowel concrete finisher	9 hp				0	-	-	-	-	-	-	-	-	
	Crane 80'	130 hp				0	-	-	-	-	-	-	-	-	
	Crane 114'	430 hp				0	-	-	-	-	-	-	-	-	
	Auger drill	100 hp				0	-	-	-	-	-	-	-	-	
Water pump	80 hp				0	-	-	-	-	-	-	-	-		
<b>Landscaping</b>	Excavator	430 hp	9.4118	9.4118		18.8236	-	-	-	-	-	-	-	-	
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	1.35E-02	2.27E-01	2.79E-01	4.75E-04	1.64E-02	1.51E-02	-	-	
	Loader/Backhoe	92 hp	4.7059	9.4118	9.4118	23.5295	1.66E-02	2.78E-01	3.42E-01	5.83E-04	2.01E-02	1.85E-02	-	-	
	Vibratory roller	44 hp				0	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.93E-02	2.91E-01	3.54E-02	2.97E-04	6.40E-03	3.89E-03	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	
	3/4 ton pickup		4	4	2	10	2.39E-03	1.96E-03	2.88E-02	3.60E-05	2.95E-04	1.34E-04	-	-	
							<b>2.82E-01</b>	<b>3.63E+00</b>	<b>4.22E+00</b>	<b>1.32E-02</b>	<b>1.26E-01</b>	<b>1.12E-01</b>			

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/2/2017
Birthday of Martin Luther King, Jr.	1/16/2017
Washington's Birthday	2/20/2017
Memorial Day	5/29/2017
Independence Day	7/4/2017
Labor Day	9/4/2017
Columbus Day	10/9/2017
Veterans Day	11/11/2017
Thanksgiving Day	11/23/2017
Christmas Day	12/25/2017
	10

<http://beta.epm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**Source:**

CC1 Equipment Report.pdf  
CC4 Equipment Report.pdf  
CC5 Equipment Report.pdf  
LV2 Equipment Report.pdf

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 2  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

15 15 15 days per construction period (5 days per week)  
 CC2 & LV1 CC2 & LV2 CC3

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Emission Factors - 2019 (g/hp-hr or g/hr)									
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	
Water Control - Installation	Flatbed Truck	80 hp	4	4	4	12	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
	Crane 44'	80 hp	2,222	1,777	1,333	5,333	0.043	0.834	1.340	0.002	0.058	0.054	189.378	0.014	0.000	
	Loader/Backhoe	75 hp	5,248	2,624	2,624	10,496	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	
	Tractor/crawler/dozer	250 hp	10,958	5,625	5,625	16,583	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Truck	3.5 hp	2,769	2,769		5,538	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
Water Control - Removal	Water pump	3.5 hp	0	4,754	2,132	56,301	0.006	0.058	0.058	0.058	0.058	177.788	0.269	0.302		
	Flatbed Truck	80 hp	4	4	4	12	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
	Crane 44'	80 hp	2,222	1,777	1,333	5,333	0.043	0.834	1.340	0.002	0.058	0.054	189.378	0.014	0.000	
	Loader/Backhoe	75 hp	5,248	2,624	2,624	10,496	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	
	Tractor/crawler/dozer	250 hp	4	4	4	8	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
Clear & Grub	Truck	3.5 hp	2,769	2,769		5,538	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Brush chipper	170 hp	28,235	14,132	14,117	56,482	0.149	1.478	1.810	0.004	0.094	0.086	343.002	0.013	0.000	
	Crane 50'	200 hp	9,411			9,411	0.031	0.393	0.433	0.002	0.003	0.003	203.332	0.011	0.000	
	Man lift	210 hp	9,411	9,411	9,411	28,235	0.054	0.457	0.333	0.002	0.003	0.003	192.823	0.005	0.000	
	Loader	190 hp	28,235	14,266		42,500	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Chainsaw	56.4706	0.0176	28,235	112,941	2,096	0.115	13.187	0.001	0.021	0.021	0.021	35.644	0.130	0.039	
	1 ton pickup	250 hp	0	0	0	0	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	
	Tractor/crawler/dozer	540 hp	0	0	0	0	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Front end loader	310 hp	0	0	0	0	0.048	0.068	0.529	0.613	0.003	0.004	309.181	0.016	0.000	
	Tractor/crawler/dozer	310 hp	0	0	0	0	0.048	0.053	0.602	0.471	0.002	0.004	234.975	0.013	0.000	
	Dump truck	20cy/24 ton	0	0	0	0	1.487	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048
	Air Compressor	250 hp	3,302	3,302		6,605	0.103	0.590	0.460	0.003	0.005	0.004	237.822	0.009	0.000	
	Air Compressor	350 hp	0	0	0	0	0.601	0.717	53.729	0.004	0.024	0.023	307.156	0.034	0.058	
	Crane 126'	263 hp	3,302	3,302		6,605	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000	
	Crane 50'	230 hp	0	0	0	0	0.031	0.393	0.433	0.002	0.003	0.003	203.332	0.011	0.000	
Excavator	115 hp	128	32	48	208	0.066	1.092	1.968	0.003	0.079	0.073	278.045	0.021	0.000		
Excavator	430 hp	80	32	48	160	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000		
Loader	190 hp	112	64	48	224	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000		
Front end loader	180 hp	0	0	0	0	0.068	0.534	0.569	0.003	0.004	0.004	270.062	0.014	0.000		
Loader/Backhoe	75 hp	0	0	0	0	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000		
Tractor/crawler/dozer	250 hp	20,745	5,413	5,413	31,574	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000		
3/4 ton pickup	112	64	48	224	3,509	3,029	42,612	0.061	0.496	0.223	0.223	20,361.281	2.024	1.056		
Chainsaw	3,302	3,302		6,605	2,096	0.115	13.187	0.001	0.021	0.021	0.021	35.644	0.130	0.039		
Road Realignment	Vibratory roller	145 hp	0	0	0	0	0.048	0.908	1.585	0.003	0.055	0.050	280.051	0.015	0.000	
	Vibrating compactor	5.5 hp	0	0	0	0	2.038	1.506	74.477	0.004	1.056	1.054	125.946	0.115	0.150	
	Vibratory compactor	7.5 hp	14.31	3,735	3,735	21,78	0.061	1.825	0.996	0.003	0.063	0.058	241.833	0.026	0.000	
	Truck	39,657	6,174	6,174	52,073	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048		
	Asphalt distributor	3000 gal	4,085	1,067	1,067	6,222	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Suburban	3/4 ton	0	0	0	0	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Truck	35 ton	4	4	4	12	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
Bridge Installation	Truck	75 ton	0	0	0	0	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Suburban	3/4 ton	18,823	9,411	9,411	37,647	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Crane 210'	230 hp	18,823			18,823	0.031	0.393	0.433	0.002	0.003	0.003	203.332	0.011	0.000	
	Crane 270'	430 hp	18,823	18,823	18,823	56,470	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000	
	3/4 ton pickup	37,647	18,823	18,823	75,294	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056		
	Tractor/crawler/dozer	250 hp	0	0	0	0	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Excavator	430 hp	0	0	0	0	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
	Truck	7.5 hp	0	0	0	0	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Generator	7.5 hp	0	0	0	0	2.020	1.438	103.611	0.005	0.098	0.098	175.213	0.114	0.147	
	Vibrating compactor	5.5 hp	0	0	0	0	2.038	1.506	74.477	0.004	1.056	1.054	125.946	0.115	0.150	
Highway Replacement	Tractor/crawler/dozer	250 hp	0	0	0	0	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Truck	3000 gal	0	0	0	0	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Asphalt distributor	3000 gal	0	0	0	0	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Asphalt paver	120 hp	0	0	0	0	0.056	1.162	1.747	0.003	0.080	0.073	261.288	0.017	0.000	
	Vibrating roller/compactor	33 hp	0	0	0	0	0.194	2.169	1.953	0.003	0.087	0.080	235.458	0.017	0.000	
	Chip spreader truck	0	0	0	0	0	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	Line striper	23 hp	0	0	0	0	0.172	0.435	9.082	0.003	0.020	0.020	257.050	0.010	0.025	
	Flatbed Truck	80 hp	0	0	0	0	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	
	3/4 ton pickup	0	0	0	0	0	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	Abutments	Roto trowel concrete finisher	9 hp	35,294	11,764	11,764	58,823	0.172	0.435	9.082	0.003	0.020	0.020	257.050	0.010	0.025
		Crane 80'	130 hp	11,764	5,882		23,529	0.043	0.708	1.302	0.002	0.045	0.042	208.054	0.016	0.000
		Crane 114'	430 hp	35,294	11,764	11,764	58,823	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000
		Auger drill	100 hp	11,764	5,882		23,529	0.075	1.502	1.911	0.003	0.104	0.096	291.139	0.017	0.000
Water pump		80 hp	11,764	5,882		23,529	0.119	1.487	1.732	0.003	0.102	0.094	294.396	0.011	0.000	
Excavator		430 hp	18,823	9,411	9,411	37,647	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	
Loader/Backhoe		75 hp	18,823	9,411	9,411	47,059	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	
Landscaping	Loader/Backhoe	92 hp	0	0	0	0	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	
	Vibratory roller	44 hp	0	0	0	0	0.194	2.169	1.953	0.003	0.087	0.080	235.458	0.017	0.000	
	Tractor/crawler/dozer	250 hp	0	0	0	0	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	
	Dump truck	12 cy	18,823	18,823	9,411	47,059	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	
	3/4 ton pickup	0	0	0	0	0	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	3/4 ton pickup	0	0	0	0	0	3.509	3,029	42,612	0.061	0.496	0.223	20,361.281	2.024	1.056	
	3/4 ton pickup	0	0													

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 2  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	15 days per cost			Annual Hours	Annual Emissions - 2019 (tons per year)								Metric Tons CO2e/yr			
			4/1-21	Hours of Operation			CC2 & LV1	CC3	GWP									
				4/22-5/12	5/13-6/2				SO2	PM10	PM2.5	CO2	CH4	N2O		CO2e		
Water Control - Installation	Flatbed Truck		4	4	4	12	7.30E-05	7.88E-05	1.01E-03	7.99E-07	6.33E-06	2.73E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.04E-05	3.92E-04	6.30E-04	1.04E-06	2.74E-05	2.52E-05	8.91E-02	6.80E-06	-	8.92E-02	8.09E-02	
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	6.00E-05	9.58E-04	1.19E-03	1.99E-06	6.99E-05	6.43E-05	1.70E-01	1.27E-05	-	1.70E-01	1.54E-01	
	Tractor/crawler/dozer	250 hp	10.9583	5.625	5.625	16.5833	2.36E-04	2.70E-03	2.93E-03	1.55E-05	2.00E-05	1.84E-05	1.38E+00	7.61E-05	-	1.38E+00	1.25E+00	
	Truck		2.7692	2.7692		5.5384	4.18E-05	5.89E-04	7.73E-05	6.53E-07	1.36E-05	8.11E-06	1.31E-01	3.11E-07	2.93E-07	1.31E-01	1.19E-01	
	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-
Water Control - Removal	Flatbed Truck		4	4	4	12	7.30E-05	7.88E-05	1.01E-03	7.99E-07	6.33E-06	2.73E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.04E-05	3.92E-04	6.30E-04	1.04E-06	2.74E-05	2.52E-05	8.91E-02	6.80E-06	-	8.92E-02	8.09E-02	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	4	4		8	1.14E-04	1.30E-03	1.42E-03	7.47E-06	9.66E-06	8.88E-06	6.64E-01	3.67E-05	-	6.65E-01	6.03E-01	
	Truck		2.7692			2.7692	2.09E-05	2.94E-04	3.87E-05	3.26E-07	6.80E-06	4.06E-06	6.55E-02	1.56E-07	1.47E-07	6.55E-02	5.94E-02	
	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	1.57E-03	1.56E-02	1.92E-02	4.09E-05	9.90E-04	9.11E-04	3.63E+00	1.42E-04	-	3.63E+00	3.30E+00	
Clear & Grub	Crane 50'	200 hp	9.4118			9.4118	6.47E-05	8.16E-04	8.99E-04	4.75E-06	5.94E-06	5.47E-06	4.22E-01	2.33E-05	-	4.22E-01	3.83E-01	
	Man lift	210 hp	9.4118	9.4118	9.4118	28.2354	3.55E-04	2.99E-03	2.18E-03	1.24E-05	2.13E-05	1.96E-05	1.26E+00	3.21E-05	-	1.26E+00	1.14E+00	
	Loader	190 hp	28.2352	14.2656		42.5008	4.60E-04	5.25E-03	5.72E-03	3.02E-05	3.90E-05	3.59E-05	2.68E+00	1.48E-04	-	2.68E+00	2.43E+00	
	Chainsaw		56.4706	28.2353	28.2353	112.9412	2.19E-03	1.20E-04	1.38E-02	1.54E-06	2.17E-05	2.17E-05	3.73E-02	1.36E-04	4.09E-05	5.28E-02	4.79E-02	
	1 ton pickup			0.0176		0.0176	3.82E-08	4.89E-08	5.17E-07	1.18E-09	9.41E-09	4.12E-09	3.95E-04	3.93E-08	2.05E-08	4.02E-04	3.65E-04	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Front end loader	540 hp		0.0148		0.0148	5.97E-07	4.66E-06	5.40E-06	2.74E-08	3.77E-08	3.47E-08	2.72E-03	1.45E-07	-	2.73E-03	2.47E-03	
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	2.67E-07	3.04E-06	2.38E-06	1.17E-08	2.26E-08	2.08E-08	1.19E-03	6.57E-08	-	1.19E-03	1.08E-03	
	Dump truck	20cy/24 ton		0.1487		0.1487	1.12E-06	1.58E-05	2.08E-06	1.75E-08	3.65E-07	2.18E-07	3.52E-03	8.36E-09	7.87E-09	3.52E-03	3.19E-03	
	Air Compressor	250 hp	3.3028	3.3028		6.6056	1.87E-04	1.07E-03	8.37E-04	4.87E-06	8.28E-06	7.61E-06	4.33E-01	1.69E-05	-	4.33E-01	3.93E-01	
	Air Compressor	50 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 128'	350 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 50'	263 hp	3.3028	3.3028		6.6056	5.95E-05	7.51E-04	6.26E-04	3.07E-06	5.47E-06	5.03E-06	3.13E-01	1.73E-05	-	3.13E-01	2.84E-01	
	Crane 210'	230 hp				0	-	-	-	-	-	-	-	-	-	-	-	
Excavator	115 hp	128	32	48	208	1.75E-03	2.88E-02	5.19E-02	8.60E-05	2.09E-03	1.92E-03	7.33E+00	5.60E-04	-	7.34E+00	6.66E+00		
Excavator	430 hp	80	32	48	160	3.77E-03	4.05E-02	3.22E-02	1.58E-04	3.04E-04	2.80E-04	1.61E+01	8.89E-04	-	1.61E+01	1.46E+01		
Loader	190 hp	112	64	48	224	2.43E-03	2.77E-02	3.01E-02	1.59E-04	2.05E-04	1.89E-04	1.41E+01	7.81E-04	-	1.41E+01	1.28E+01		
Front end loader	180 hp				0	-	-	-	-	-	-	-	-	-	-	-		
Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-		
Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	4.50E-04	5.13E-03	5.59E-03	2.95E-05	3.81E-05	3.51E-05	2.62E+00	1.45E-04	-	2.62E+00	2.38E+00		
3/4 ton pickup		112	64	48	224	8.66E-04	7.48E-04	1.05E-02	1.50E-05	1.23E-04	5.50E-05	5.03E+00	5.00E-04	2.61E-04	5.12E+00	4.64E+00		
Chainsaw		3.3028	3.3028		6.6056	1.28E-04	7.02E-06	8.07E-04	8.98E-08	1.27E-06	1.27E-06	2.18E-03	7.97E-06	2.39E-06	3.09E-03	2.80E-03		
Road Realignment	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Vibratory compactor	7.5 hp	14.31	3.735	3.735	21.78	1.09E-05	3.29E-04	1.79E-04	5.52E-07	1.14E-05	1.05E-05	4.35E-02	4.74E-06	-	4.36E-02	3.96E-02	
	Truck		39.6577	6.1748	6.1748	52.0073	3.93E-04	5.53E-03	7.26E-04	6.13E-06	1.28E-04	7.62E-05	1.23E+00	2.92E-06	2.75E-06	1.23E+00	1.12E+00	
	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	4.70E-05	6.61E-04	8.69E-05	7.34E-07	1.53E-05	9.11E-06	1.47E-01	3.50E-07	3.29E-07	1.47E-01	1.34E-01	
	Suburban	3/4 ton				0	-	-	-	-	-	-	-	-	-	-	-	
	Truck	35 ton	4	4	4	12	7.30E-05	7.88E-05	1.01E-03	7.99E-07	6.33E-06	2.73E-06	2.69E-01	6.09E-05	2.82E-05	2.79E-01	2.53E-01	
	Truck	75 ton				0	-	-	-	-	-	-	-	-	-	-	-	
Bridge Installation	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	1.46E-04	1.26E-04	1.77E-03	2.52E-06	2.06E-05	9.25E-06	8.45E-01	8.40E-05	4.38E-05	8.60E-01	7.80E-01	
	Crane 210'	230 hp	18.8235			18.8235	1.49E-04	1.88E-03	2.07E-03	1.09E-05	1.37E-05	1.26E-05	9.70E-01	5.37E-05	-	9.71E-01	8.81E-01	
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	8.32E-04	1.05E-02	8.75E-03	4.29E-05	7.64E-05	7.03E-05	4.37E+00	2.42E-04	-	4.37E+00	3.97E+00	
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	2.91E-04	2.51E-04	3.54E-03	5.05E-06	4.12E-05	1.85E-05	1.69E+00	1.68E-04	8.76E-05	1.72E+00	1.56E+00	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	430 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	-	-	-	-	-	
	Generator	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	
Highway Replacement	Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal			0	-	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	
	Chip spreader truck				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Line striper	23 hp			0	-	-	-	-	-	-	-	-	-	-	-	-	
	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Abutments	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	1.01E-04	2.54E-04	5.30E-03	1.49E-06	1.19E-05	1.19E-05	1.50E-01	5.69E-06	1.43E-05	1.55E-01	1.40E-01
		Crane 80'	130 hp	11.7648	5.8824	5.8824	23.5296	1.46E-04	2.39E-03	4.39E-03	7.89E-06	1.52E-04	1.40E-04	7.02E-01	5.36E-05	-	7.03E-01	6.37E-01
Crane 114'		430 hp	35.2941	11.7647	11.7647	58.8235	8.67E-04	1.09E-02	9.11E-03	4.47E-05	7.96E-05	7.33E-05	4.55E+00	2.52E-04	-	4.56E+00	4.13E+00	
Auger drill		100 hp	11.7648	5.8824	5.8824	23.5296	1.96E-04	3.90E-03	4.96E-03	8.86E-06	2.70E-04	2.48E-04	7.55E-01	4.47E-05	-	7.56E-01	6.86E-01	
Water pump		80 hp	11.7648	5.8824	5.8824	23.5296	2.47E-04	3.09E-03	3.59E-03	7.17E-06	2.12E-04	1.95E-04	6.11E-01	2.22E-05	-	6.11E-01	5.55E-01	
Excavator		430 hp	18.8236	9.4118	9.4118	37.6472	8.87E-04	9.52E-03	7.57E-03	3.71E-05	7.15E-05	6.58E-05	3.78E+00	2.09E-04	-	3.78E+00	3.43E+00	
Landscaping	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	2.69E-04	4.29E-03	5.34E-03	8.92E-06	3.14E-04	2.88E-04	7.60E-01	5.68E-05	-	7.61E-01		

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 2  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC2 & LV1) - 2019 (pounds per day)					Peak Daily Emissions (CC2 & LV2) - 2019 (pounds per day)							
			4/1-21	4/22-5/12	5/13-6/2		CC2 & LV1					CC3							
			15	15	15		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5	
Water Control - Installation	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.27E-03	4.36E-02	7.00E-02	1.16E-04	3.04E-03	2.80E-03	1.81E-03	3.49E-02	5.60E-02	9.29E-05	2.44E-03	2.24E-03	
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	8.00E-03	1.28E-01	1.59E-01	2.65E-04	9.32E-03	8.58E-03	4.00E-03	6.39E-02	7.94E-02	1.33E-04	4.66E-03	4.29E-03	
	Tractor/crawler/dozer	250 hp	10.9583	5.625	5.625	16.5833	4.17E-02	4.75E-01	5.17E-01	2.73E-03	3.53E-03	3.24E-03	2.14E-02	2.44E-01	2.65E-01	1.40E-03	1.81E-03	1.67E-03	
	Truck		2.7692	2.7692		5.5384	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03	
	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Water Control - Removal	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	2.27E-03	4.36E-02	7.00E-02	1.16E-04	3.04E-03	2.80E-03	1.81E-03	3.49E-02	5.60E-02	9.29E-05	2.44E-03	2.24E-03	
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	4	4		8	1.52E-02	1.73E-01	1.89E-01	9.96E-04	1.29E-03	1.18E-03	1.52E-02	1.73E-01	1.89E-01	9.96E-04	1.29E-03	1.18E-03	
	Truck		2.7692			2.7692	5.58E-03	7.85E-02	1.03E-02	8.70E-05	1.81E-03	1.08E-03							
	Water pump	3.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Clear & Grub	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	2.10E-01	2.09E+00	2.55E+00	5.45E-03	1.32E-01	1.21E-01	1.05E-01	1.04E+00	1.28E+00	2.73E-03	6.60E-02	6.08E-02	
	Crane 50'	200 hp	9.4118			9.4118	1.72E-02	2.18E-01	2.40E-01	1.27E-03	1.58E-03	1.46E-03							
	Man lift	210 hp	9.4118	9.4118	9.4118	28.2354	3.16E-02	2.65E-01	1.94E-01	1.10E-03	1.90E-03	1.75E-03	3.16E-02	2.65E-01	1.94E-01	1.10E-03	1.90E-03	1.75E-03	
	Loader	190 hp	28.2352	14.2656		42.5008	8.16E-02	9.31E-01	1.01E+00	5.34E-03	6.91E-03	6.35E-03	4.12E-02	4.70E-01	5.12E-01	2.70E-03	3.49E-03	3.21E-03	
	Chainsaw		56.4706	28.2353	28.2353	112.9412	2.92E-01	1.60E-02	1.84E+00	2.05E-04	2.89E-03	2.89E-03	1.46E-01	8.00E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03	
	1 ton pickup			0.0176		0.0176	-	-	-	-	-	-	1.02E-05	1.30E-05	1.38E-04	3.16E-07	2.51E-06	1.10E-06	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Front end loader	540 hp			0.0148	0.0148	-	-	-	-	-	-	1.59E-04	1.24E-03	1.44E-03	7.30E-06	1.01E-05	9.26E-06	
	Tractor/crawler/dozer	310 hp			0.0148	0.0148	-	-	-	-	-	-	7.11E-05	8.11E-04	6.35E-04	3.11E-06	6.02E-06	5.54E-06	
	Dump truck	20cy/24 ton			0.1487	0.1487	-	-	-	-	-	-	2.99E-04	4.21E-03	5.54E-04	4.67E-06	9.74E-05	5.81E-05	
	Air Compressor	250 hp	3.3028	3.3028		6.6056	2.49E-02	1.43E-01	1.12E-01	6.49E-04	1.10E-03	1.02E-03	2.49E-02	1.43E-01	1.12E-01	6.49E-04	1.10E-03	1.02E-03	
	Air Compressor	50 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Crane 128'	350 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Crane 50'	263 hp	3.3028	3.3028		6.6056	7.94E-03	1.00E-01	8.35E-02	4.09E-04	7.29E-04	6.71E-04	7.94E-03	1.00E-01	8.35E-02	4.09E-04	7.29E-04	6.71E-04	
Crane 210'	230 hp				0	-	-	-	-	-	-	-	-	-	-	-	-		
Excavator	115 hp	128	32	48	208	2.88E-01	4.72E+00	8.51E+00	1.41E-02	3.42E-01	3.15E-01	7.19E-02	1.18E+00	2.13E+00	3.53E-03	8.56E-02	7.87E-02		
Excavator	430 hp	80	32	48	160	5.03E-01	5.39E+00	4.29E+00	2.10E-02	4.05E-02	3.73E-02	2.01E-01	2.16E+00	1.72E+00	8.41E-03	1.62E-02	1.49E-02		
Loader	190 hp	112	64	48	224	3.24E-01	3.69E+00	4.02E+00	2.12E-02	2.74E-02	2.52E-02	1.85E-01	2.11E+00	2.30E+00	1.21E-02	1.57E-02	1.44E-02		
Front end loader	180 hp				0	-	-	-	-	-	-	-	-	-	-	-	-		
Loader/Backhoe	75 hp				0	-	-	-	-	-	-	-	-	-	-	-	-		
Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	7.89E-02	9.00E-01	9.79E-01	5.17E-03	6.68E-03	6.14E-03	2.06E-02	2.35E-01	2.55E-01	1.35E-03	1.74E-03	1.60E-03		
3/4 ton pickup		112	64	48	224	1.16E-01	9.97E-02	1.40E+00	2.00E-03	1.63E-02	7.34E-03	6.60E-02	5.70E-02	8.02E-01	1.14E-03	9.34E-03	4.19E-03		
Chainsaw		3.3028	3.3028		6.6056	1.71E-02	9.35E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04	1.71E-02	9.35E-04	1.08E-01	1.20E-05	1.69E-04	1.69E-04		
Road Realignment	Vibratory roller	145 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Vibratory compactor	7.5 hp	14.31	3.735	3.735	21.78	1.92E-03	5.76E-02	3.14E-02	9.68E-05	2.00E-03	1.84E-03	5.01E-04	1.50E-02	8.20E-03	2.53E-05	5.21E-04	4.80E-04	
	Truck		39.6577	6.1748	6.1748	52.0073	7.98E-02	1.12E+00	1.48E-01	1.25E-03	2.60E-02	1.55E-02	1.24E-02	1.75E-01	2.30E-02	1.94E-04	4.04E-03	2.41E-03	
	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	8.23E-03	1.16E-01	1.52E-02	1.29E-04	2.68E-03	1.60E-03	2.15E-03	3.02E-02	3.97E-03	3.35E-05	6.99E-04	4.17E-04	
	Suburban	3/4 ton				0	-	-	-	-	-	-	-	-	-	-	-	-	
Disposal	Truck	35 ton	4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04	
	Truck	75 ton				0	-	-	-	-	-	-	-	-	-	-	-	-	
Bridge Installation	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	1.94E-02	1.68E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03	9.71E-03	8.38E-03	1.18E-01	1.68E-04	1.37E-03	6.16E-04	
	Crane 210'	230 hp	18.8235			18.8235	3.97E-02	5.00E-01	5.52E-01	2.91E-03	3.64E-03	3.35E-03							
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	7.40E-02	9.33E-01	7.78E-01	3.81E-03	6.79E-03	6.25E-03	7.40E-02	9.33E-01	7.78E-01	3.81E-03	6.79E-03	6.25E-03	
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	3.88E-02	3.35E-02	4.72E-01	6.73E-04	5.49E-03	2.47E-03	1.94E-02	1.68E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	430 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Truck					0	-	-	-	-	-	-	-	-	-	-	-	-	
	Generator	7.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
Highway Replacement	Truck					0	-	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Chip spreader truck					0	-	-	-	-	-	-	-	-	-	-	-	-	
	Line striper	23 hp				0	-	-	-	-	-	-	-	-	-	-	-	-	
	Flatbed Truck					0	-	-	-	-	-	-	-	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	-	-	-	-	-	-	-	
	Abutments	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	1.61E-02	4.06E-02	8.48E-01	2.38E-04	1.91E-03	1.91E-03	5.37E-03	1.35E-02	2.83E-01	7.95E-05	6.37E-04	6.36E-04
		Crane 80'	130 hp	11.7648			23.5296	1.95E-02	3.18E-01	5.85E-01	1.05E-03	2.03E-02	1.87E-02	9.76E-03	1.59E-01	2.93E-01	5.26E-04	1.01E-02	9.33E-03
Crane 114'		430 hp	35.2941	11.7647	11.7647	58.8235	1.39E-01	1.75E+00	1.46E+00	7.15E-03	1.27E-02	1.17E-02	4.62E-02	5.83E-01	4.86E-01	2.38E-03	4.25E-03	3.91E-03	
Auger drill		100 hp	11.7648			23.5296	2.61E-02	5.19E-01	6.61E-01	1.18E-03	3.60E-02	3.31E-02	1.31E-02	2.60E-01	3.30E-01	5.91E-04	1.80E-02	1.66	

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 2  
 Upstream Barrier Removal (Alternatives 2 and 4)

Construction Start Year 2019  
 Speed of Onsite Trucks 10 mph

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Peak Daily Emissions (CC3) - 2019 (pounds per day)					
			4/1-21	4/22-5/12	5/13-6/2		CC3					
			15	15	15		CC2 & LV1	CC2 & LV2	CC3	VOC	NOx	CO
Water Control - Installation	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	1.36E-03	2.62E-02	4.20E-02	6.97E-05	1.83E-03	1.68E-03
	Loader/Backhoe	75 hp	5.248	2.624	2.624	10.496	4.00E-03	6.39E-02	7.94E-02	1.33E-04	4.66E-03	4.29E-03
	Tractor/crawler/dozer	250 hp	10.9583	5.625		16.5833	-	-	-	-	-	-
	Truck		2.7692	2.7692		5.5384	-	-	-	-	-	-
Water Control - Removal	Water pump	3.5 hp				0	-	-	-	-	-	-
	Flatbed Truck		4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04
	Crane 44'	80 hp	2.2222	1.7777	1.3333	5.3332	1.36E-03	2.62E-02	4.20E-02	6.97E-05	1.83E-03	1.68E-03
	Loader/Backhoe	75 hp				0	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	4	4		8	-	-	-	-	-	-
Clear & Grub	Truck		2.7692			2.7692	-	-	-	-	-	-
	Brush chipper	170 hp	28.2352	14.1324	14.1176	56.4852	1.05E-01	1.04E+00	1.28E+00	2.72E-03	6.60E-02	6.07E-02
	Crane 50'	200 hp	9.4118			9.4118	-	-	-	-	-	-
	Man lift	210 hp	9.4118	9.4118	9.4118	28.2354	3.16E-02	2.65E-01	1.94E-01	1.10E-03	1.90E-03	1.75E-03
	Loader	190 hp	28.2352	14.2656		42.5008	-	-	-	-	-	-
	Chainsaw		56.4706		28.2353	112.9412	1.46E-01	8.00E-03	9.19E-01	1.02E-04	1.45E-03	1.44E-03
	1 ton pickup			0.0176		0.0176	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Front end loader	540 hp		0.0148		0.0148	-	-	-	-	-	-
	Tractor/crawler/dozer	310 hp		0.0148		0.0148	-	-	-	-	-	-
	Dump truck	20cy/24 ton		0.1487		0.1487	-	-	-	-	-	-
	Air Compressor	250 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
	Air Compressor	50 hp				0	-	-	-	-	-	-
	Crane 126'	350 hp				0	-	-	-	-	-	-
	Crane 50'	263 hp	3.3028	3.3028		6.6056	-	-	-	-	-	-
Crane 210'	230 hp				0	-	-	-	-	-	-	
Excavator	115 hp	128	32	48	208	1.08E-01	1.77E+00	3.19E+00	5.29E-03	1.28E-01	1.18E-01	
Excavator	430 hp	80	32	48	160	3.02E-01	3.24E+00	2.57E+00	1.26E-02	2.43E-02	2.24E-02	
Loader	190 hp	112	64	48	224	1.39E-01	1.58E+00	1.72E+00	9.08E-03	1.17E-02	1.08E-02	
Front end loader	180 hp				0	-	-	-	-	-	-	
Loader/Backhoe	75 hp				0	-	-	-	-	-	-	
Tractor/crawler/dozer	250 hp	20.7454	5.413	5.413	31.5714	2.06E-02	2.35E-01	2.55E-01	1.35E-03	1.74E-03	1.60E-03	
3/4 ton pickup		112	64	48	224	4.95E-02	4.27E-02	6.01E-01	8.58E-04	7.01E-03	3.14E-03	
Chainsaw		3.3028	3.3028		6.6056	-	-	-	-	-	-	
Road Realignment	Vibratory roller	145 hp				0	-	-	-	-	-	
	Vibrating compactor	5.5 hp				0	-	-	-	-	-	
	Vibratory compactor	7.5 hp	14.31	3.735	3.735	21.78	5.01E-04	1.50E-02	8.20E-03	2.53E-05	5.21E-04	4.80E-04
	Truck		39.6577	6.1748	6.1748	52.0073	1.24E-02	1.75E-01	2.30E-02	1.94E-04	4.04E-03	2.41E-03
	Asphalt distributor	3000 gal	4.0885	1.0671	1.0671	6.2227	2.15E-03	3.02E-02	3.97E-03	3.35E-05	6.99E-04	4.17E-04
	Suburban	3/4 ton				0	-	-	-	-	-	-
Disposal	Truck	35 ton	4	4	4	12	6.49E-03	7.00E-03	9.00E-02	7.10E-05	5.63E-04	2.43E-04
	Truck	75 ton				0	-	-	-	-	-	-
Bridge Installation	Suburban	3/4 ton	18.8236	9.4118	9.4118	37.6472	9.71E-03	8.38E-03	1.18E-01	1.68E-04	1.37E-03	6.16E-04
	Crane 210'	230 hp	18.8235			18.8235	-	-	-	-	-	-
	Crane 270'	430 hp	18.8235	18.8235	18.8235	56.4705	7.40E-02	9.33E-01	7.78E-01	3.81E-03	6.79E-03	6.25E-03
	3/4 ton pickup		37.647	18.8235	18.8235	75.294	1.94E-02	1.68E-02	2.36E-01	3.37E-04	2.75E-03	1.23E-03
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	-
	Excavator	430 hp				0	-	-	-	-	-	-
	Truck					0	-	-	-	-	-	-
	Generator	7.5 hp				0	-	-	-	-	-	-
Highway Replacement	Vibrating compactor	5.5 hp				0	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	
	Truck					0	-	-	-	-	-	
	Asphalt distributor	3000 gal				0	-	-	-	-	-	
	Asphalt paver	120 hp				0	-	-	-	-	-	
	Vibrating roller/compactor	33 hp				0	-	-	-	-	-	
	Chip spreader truck					0	-	-	-	-	-	
	Line striper	23 hp				0	-	-	-	-	-	
	Flatbed Truck					0	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	
Abutments	Roto trowel concrete finisher	9 hp	35.2941	11.7647	11.7647	58.8235	5.37E-03	1.35E-02	2.83E-01	7.95E-05	6.37E-04	6.36E-04
	Crane 80'	130 hp	11.7648	5.8824	5.8824	23.5296	9.76E-03	1.59E-01	2.93E-01	5.26E-04	1.01E-02	9.33E-03
	Crane 114'	430 hp	35.2941	11.7647	11.7647	58.8235	4.62E-02	5.83E-01	4.86E-01	2.38E-03	4.25E-03	3.91E-03
	Auger drill	100 hp	11.7648	5.8824	5.8824	23.5296	1.31E-02	2.60E-01	3.30E-01	5.91E-04	1.80E-02	1.66E-02
	Water pump	80 hp	11.7648	5.8824	5.8824	23.5296	1.64E-02	2.06E-01	2.40E-01	4.78E-04	1.41E-02	1.30E-02
Landscaping	Excavator	430 hp	18.8236	9.4118	9.4118	37.6472	5.91E-02	6.35E-01	5.05E-01	2.47E-03	4.77E-03	4.39E-03
	Loader/Backhoe	75 hp	18.8236	18.8236	9.4118	47.059	1.43E-02	2.29E-01	2.85E-01	4.75E-04	1.67E-02	1.54E-02
	Loader/Backhoe	92 hp			9.4118	9.4118	-	-	-	-	-	-
	Vibratory roller	44 hp				0	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp				0	-	-	-	-	-	
	Dump truck	12 cy	18.8236	18.8236	9.4118	47.059	1.89E-02	2.67E-01	3.50E-02	2.96E-04	6.16E-03	3.68E-03
	3/4 ton pickup					0	-	-	-	-	-	
	3/4 ton pickup			2		2	-	-	-	-	-	
	3/4 ton pickup					0	-	-	-	-	-	
							1.23E+00	1.19E+01	1.48E+01	4.55E-02	3.43E-01	3.07E-01

Conversions

2000 pounds per ton  
 453.6 grams per pound  
 2 peak day scaling factor  
 0.9072 metric tons per short ton

Legend

Data from EMFAC2011 (g/hr)  
 Formula overwritten

Speciation Profiles

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

Federal Holidays

New Year's Day	1/1/2018
Birthdays of Martin Luther King, Jr.	1/15/2018
Washington's Birthday	2/19/2018
Memorial Day	5/29/2018
Independence Day	7/4/2018
Labor Day	9/3/2018
Columbus Day	10/8/2018
Veterans Day	11/12/2018
Thanksgiving Day	11/22/2018
Christmas Day	12/25/2018
	10

<http://beta.epm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

Source:

- CC1 Equipment Report.pdf
- CC2 Equipment Report.pdf
- CC3 Equipment Report.pdf
- CC4 Equipment Report.pdf
- CC5 Equipment Report.pdf
- LV1 Equipment Report.pdf
- LV2 Equipment Report.pdf

**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Upstream Barriers - Year 3**  
**Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2020**  
 Speed of Onsite Trucks **10** mph

50 15  
 LV3 & LV4 LV2 days per construction period (5 days per week)

Activity	Equipment Type	Equipment Size	Hours of Operation		Annual Hours	Emission Factors - 2020 (g/hp-hr or g/hr)										
			4/1-6/9	6/10-6/30		VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O		
<b>Water Control - Installation</b>	Flatbed Truck	80 hp	49.6732		0.4444	0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	
	Crane 44'	80 hp	50.1176		0.4444	0	0.046	0.839	1.341	0.002	0.059	0.054	189.413	0.014	0.000	
	Loader/Backhoe	75 hp	34.624			0	34.624	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000
	Tractor/crawler/dozer	250 hp	127.6318	4		131.6318	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Truck	34.1719	2.7692			36.9411	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
<b>Water Control - Removal</b>	Water pump	3.5 hp				0	4.754	2.132	56.303	0.006	0.058	0.058	177.795	0.269	0.303	
	Flatbed Truck	80 hp			0.4444	0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	
	Crane 44'	80 hp			0.4444	0	0.046	0.839	1.341	0.002	0.059	0.054	189.413	0.014	0.000	
	Loader/Backhoe	75 hp	32			32	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	
	Tractor/crawler/dozer	250 hp	8.7059	4		12.7059	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
<b>Clear &amp; Grub</b>	Truck	34.1719				34.1719	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Brush chipper	170 hp	5.9294	0.0074		5.9368	0.158	1.499	1.845	0.004	0.097	0.089	345.852	0.014	0.000	
	Crane 50'	200 hp				0	0.033	0.395	0.433	0.002	0.003	0.003	203.330	0.011	0.000	
	Man lift	210 hp				0	0.057	0.459	0.336	0.002	0.003	0.003	192.831	0.005	0.000	
	Loader	190 hp	5.9294	0.0074		5.9368	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Chainsaw	5.8824	0.0147			5.8971	2.199	0.115	13.188	0.001	0.021	0.021	35.645	0.137	0.039	
	1 ton pickup		0.0088			0.0088	1.653	2.282	22.588	0.061	0.481	0.208	20,361.281	2.024	1.056	
	Tractor/crawler/dozer	250 hp	5.8824	0.0147		5.8971	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Front end loader	540 hp	5.9294	0.0074		5.9368	0.072	0.534	0.583	0.003	0.004	0.004	291.179	0.016	0.000	
	Tractor/crawler/dozer	310 hp	5.9294	0.0074		5.9368	0.055	0.604	0.471	0.002	0.005	0.004	234.954	0.013	0.000	
	Dump truck	20cy/24 ton	59.4635	0.0743		59.5378	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
<b>Demolition</b>	Air Compressor	250 hp				0	0.110	0.596	0.468	0.003	0.005	0.004	237.866	0.010	0.000	
	Air Compressor	50 hp				0	0.634	0.740	57.796	0.004	0.024	0.023	307.061	0.036	0.059	
	Crane 126'	350 hp				0	0.033	0.395	0.327	0.002	0.003	0.003	163.221	0.009	0.000	
	Crane 50'	263 hp				0	0.033	0.395	0.327	0.002	0.003	0.003	163.221	0.009	0.000	
	Crane 210'	230 hp				0	0.033	0.395	0.433	0.002	0.003	0.003	203.330	0.011	0.000	
	Excavator	115 hp		40		40	0.070	1.104	1.968	0.003	0.081	0.074	278.042	0.021	0.000	
	Excavator	430 hp	80	20		100	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	
	Loader	190 hp		20		20	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Front end loader	180 hp				0	0.073	0.539	0.576	0.003	0.004	0.004	270.055	0.015	0.000	
	Loader/Backhoe	75 hp	350			350	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	
	Tractor/crawler/dozer	250 hp	50.068			50.068	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	3/4 ton pickup	72	20			92	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	Chainsaw					0	2.199	0.115	13.188	0.001	0.021	0.021	35.645	0.137	0.039	
	Vibratory roller	145 hp	19.0893			19.0893	0.050	0.911	1.610	0.003	0.056	0.051	280.061	0.016	0.000	
<b>Road Realignment</b>	Vibrating compactor	5.5 hp	5.1724			5.1724	2.038	1.507	74.509	0.004	1.056	1.054	126.001	0.115	0.151	
	Vibratory compactor	7.5 hp				0	0.064	1.830	0.997	0.003	0.064	0.059	242.190	0.026	0.000	
	Truck	372.9363			372.9363	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048		
	Asphalt distributor	3000 gal	22.9363			22.9363	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Suburban	3/4 ton				0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
<b>Disposal</b>	Truck	35 ton				0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	
	Truck	75 ton				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Suburban	3/4 ton				0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
<b>Bridge Installation</b>	Suburban	3/4 ton				0	0.033	0.395	0.433	0.002	0.003	0.003	203.330	0.011	0.000	
	Crane 210'	230 hp				0	0.033	0.395	0.327	0.002	0.003	0.003	163.221	0.009	0.000	
	Crane 270'	430 hp				0	0.033	0.395	0.433	0.002	0.003	0.003	203.330	0.011	0.000	
	3/4 ton pickup					0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	Tractor/crawler/dozer	250 hp				0	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Excavator	430 hp				0	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	
	Truck					0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Generator	7.5 hp				0	2.020	1.438	103.611	0.005	0.098	0.098	175.214	0.114	0.147	
	Vibrating compactor	5.5 hp				0	2.038	1.507	74.509	0.004	1.056	1.054	126.001	0.115	0.151	
	Tractor/crawler/dozer	250 hp				0	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
<b>Highway Replacement</b>	Truck	35 ton				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Asphalt distributor	3000 gal				0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Asphalt paver	120 hp				0	0.059	1.174	1.781	0.003	0.081	0.075	261.349	0.018	0.000	
	Vibrating roller/compactor	33 hp				0	0.208	2.198	2.035	0.003	0.090	0.083	235.495	0.019	0.000	
	Chip spreader truck					0	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	Line striper	23 hp				0	0.184	0.455	9.176	0.003	0.020	0.020	256.420	0.010	0.025	
	Flatbed Truck	80 hp				0	4.669	5.192	64.306	0.060	0.474	0.202	20,361.283	4.604	2.135	
	3/4 ton pickup					0	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	Roto trowel concrete finisher	9 hp				0	0.184	0.455	9.176	0.003	0.020	0.020	256.420	0.010	0.025	
	Crane 80'	130 hp				0	0.046	0.712	1.302	0.002	0.046	0.043	208.093	0.016	0.000	
	Crane 114'	430 hp				0	0.033	0.395	0.327	0.002	0.003	0.003	163.221	0.009	0.000	
	Auger drill	100 hp				0	0.076	1.495	1.924	0.003	0.104	0.096	291.131	0.018	0.000	
	Water pump	80 hp				0	0.125	1.494	1.749	0.003	0.104	0.095	294.362	0.011	0.000	
<b>Landscaping</b>	Excavator	430 hp	144.7059			144.7059	0.052	0.532	0.424	0.002	0.004	0.004	211.853	0.012	0.000	
	Loader/Backhoe	75 hp	8		9.4118	17.4118	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	
	Loader/Backhoe	92 hp			9.4118	17.4118	0.073	1.110	1.383	0.002	0.082	0.075	195.356	0.015	0.000	
	Vibratory roller	44 hp	144.7059			144.7059	0.208	2.198	2.035	0.003	0.090	0.083	235.495	0.019	0.000	
	Tractor/crawler/dozer	250 hp	144.7059			144.7059	0.054	0.593	0.642	0.003	0.004	0.004	301.149	0.017	0.000	
	Dump truck	12 cy	8		9.4118	17.4118	6.632	77.738	12.413	0.107	2.027	1.144	21,394.036	0.051	0.048	
	3/4 ton pickup		181.1765			181.1765	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	3/4 ton pickup		8		2	10	3.113	2.807	37.915	0.061	0.492	0.219	20,361.282	2.024	1.056	
	<b>Total</b>															





**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Upstream Barriers - Year 3  
Upstream Barrier Removal (Alternatives 2 and 4)**

Construction Start Year **2020**  
Speed of Onsite Trucks **10** mph

50 15  
LV3 & LV4 LV2 days per const

Activity	Equipment Type	Equipment Size	Hours of Operation		Annual Hours	Peak Daily Emissions (LV2) - 2020 (pounds per day)							
			4/1-6/9	6/10-6/30		VOC	Nox	CO	SO2	PM10	PM2.5		
<b>Water Control - Installation</b>	Flatbed Truck				0	-	-	-	-	-	-	-	
	Crane 44'	80 hp	49.6732	0.4444	50.1176	4.77E-04	8.77E-03	1.40E-02	2.32E-05	6.19E-04	5.69E-04	-	
	Loader/Backhoe	75 hp	34.624		34.624	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	1.60E-02	1.74E-01	1.89E-01	9.96E-04	1.31E-03	1.20E-03	-	
	Truck		34.1719	2.7692	36.9411	5.40E-03	6.33E-02	1.01E-02	8.68E-05	1.65E-03	9.31E-04	-	
<b>Water Control - Removal</b>	Water pump	3.5 hp			0	-	-	-	-	-	-	-	
	Flatbed Truck				0	-	-	-	-	-	-	-	
	Crane 44'	80 hp		0.4444	0.4444	4.77E-04	8.77E-03	1.40E-02	2.32E-05	6.19E-04	5.69E-04	-	
	Loader/Backhoe	75 hp	32		32	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	1.60E-02	1.74E-01	1.89E-01	9.96E-04	1.31E-03	1.20E-03	-	
<b>Clean &amp; Grub</b>	Truck		34.1719		34.1719	-	-	-	-	-	-	-	
	Brush chipper	170 hp	5.9294	0.0074	5.9368	5.85E-05	5.54E-04	6.82E-04	1.44E-06	3.58E-05	3.29E-05	-	
	Crane 50'	200 hp			0	-	-	-	-	-	-	-	
	Man lift	210 hp			0	-	-	-	-	-	-	-	
	Loader	190 hp	5.9294	0.0074	5.9368	2.25E-05	2.45E-04	2.65E-04	1.40E-06	1.83E-06	1.69E-06	-	
	Chainsaw		5.8824	0.0147	5.8971	7.98E-05	4.16E-06	4.79E-04	5.33E-08	7.53E-07	7.52E-07	-	
	1 ton pickup			0.0088	0.0088	4.28E-06	5.90E-06	5.84E-05	1.58E-07	1.24E-06	5.39E-07	-	
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	5.88E-05	6.40E-04	6.94E-04	3.66E-06	4.80E-06	4.41E-06	-	
	Front end loader	540 hp	5.9294	0.0074	5.9368	8.48E-05	6.28E-04	6.85E-04	3.44E-06	5.16E-06	4.75E-06	-	
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	3.74E-05	4.07E-04	3.17E-04	1.56E-06	3.05E-06	2.81E-06	-	
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	1.45E-04	1.70E-03	2.71E-04	2.33E-06	4.43E-05	2.50E-05	-	
	<b>Demolition</b>	Air Compressor	250 hp			0	-	-	-	-	-	-	-
		Air Compressor	50 hp			0	-	-	-	-	-	-	-
Crane 126'		350 hp			0	-	-	-	-	-	-	-	
Crane 50'		263 hp			0	-	-	-	-	-	-	-	
Crane 210'		230 hp			0	-	-	-	-	-	-	-	
Excavator		115 hp		40	40	9.50E-02	1.49E+00	2.66E+00	4.41E-03	1.09E-01	1.01E-01	-	
Excavator		430 hp		80	100	1.31E-01	1.34E+00	1.07E+00	5.26E-03	1.02E-02	9.39E-03	-	
Loader		190 hp		20	20	6.08E-02	6.62E-01	7.17E-01	3.78E-03	4.96E-03	4.56E-03	-	
Front end loader		180 hp			0	-	-	-	-	-	-	-	
Loader/Backhoe		75 hp		350	350	-	-	-	-	-	-	-	
Tractor/crawler/dozer		250 hp	50.068		50.068	-	-	-	-	-	-	-	
3/4 ton pickup			72	20	92	1.83E-02	1.65E-02	2.23E-01	3.57E-04	2.89E-03	1.29E-03	-	
<b>Road Realignment</b>		Chainsaw				0	-	-	-	-	-	-	-
	Vibratory roller	145 hp	19.0893		19.0893	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp	5.1724		5.1724	-	-	-	-	-	-	-	
	Vibratory compactor	7.5 hp			0	-	-	-	-	-	-	-	
	Truck		372.9363		372.9363	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal	22.9363		22.9363	-	-	-	-	-	-	-	
<b>Disposal</b>	Suburban	3/4 ton			0	-	-	-	-	-	-	-	
	Truck	35 ton			0	-	-	-	-	-	-	-	
<b>Bridge Installation</b>	Truck	75 ton			0	-	-	-	-	-	-	-	
	Suburban	3/4 ton			0	-	-	-	-	-	-	-	
	Crane 210'	230 hp			0	-	-	-	-	-	-	-	
	Crane 270'	430 hp			0	-	-	-	-	-	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	
	Excavator	430 hp			0	-	-	-	-	-	-	-	
	Truck				0	-	-	-	-	-	-	-	
	Generator	7.5 hp			0	-	-	-	-	-	-	-	
	Vibrating compactor	5.5 hp			0	-	-	-	-	-	-	-	
<b>Highway Replacement</b>	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	
	Truck				0	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal			0	-	-	-	-	-	-	-	
	Asphalt paver	120 hp			0	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp			0	-	-	-	-	-	-	-	
	Chip spreader truck				0	-	-	-	-	-	-	-	
	Line striper	23 hp			0	-	-	-	-	-	-	-	
	Flatbed Truck				0	-	-	-	-	-	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	
	Rototrowel concrete finisher	9 hp			0	-	-	-	-	-	-	-	
	Crane 80'	130 hp			0	-	-	-	-	-	-	-	
	Crane 114'	430 hp			0	-	-	-	-	-	-	-	
<b>Landscaping</b>	Auger drill	100 hp			0	-	-	-	-	-	-	-	
	Water pump	80 hp			0	-	-	-	-	-	-	-	
	Excavator	430 hp	144.7059		144.7059	-	-	-	-	-	-	-	
	Loader/Backhoe	75 hp	8	9.4118	17.4118	1.50E-02	2.30E-01	2.87E-01	4.75E-04	1.70E-02	1.56E-02	-	
	Loader/Backhoe	92 hp		9.4118	9.4118	1.85E-02	2.82E-01	3.52E-01	5.83E-04	2.09E-02	1.92E-02	-	
	Vibratory roller	44 hp	144.7059		144.7059	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp	144.7059		144.7059	-	-	-	-	-	-	-	
	Dump truck	12 cy	8	9.4118	17.4118	1.83E-02	2.15E-01	3.43E-02	2.95E-04	5.61E-03	3.17E-03	-	
	3/4 ton pickup		181.1765		181.1765	-	-	-	-	-	-	-	
	3/4 ton pickup		8	2	10	1.83E-03	1.65E-03	2.23E-02	3.57E-05	2.89E-04	1.29E-04	-	
					<b>3.98E-01</b>	<b>4.68E+00</b>	<b>5.79E+00</b>	<b>1.73E-02</b>	<b>1.77E-01</b>	<b>1.59E-01</b>	-		

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's 1/1/2019  
Birthday of I 1/21/2019  
Washington 2/18/2019  
Memorial D 5/27/2019  
Independen 7/4/2019  
Labor Day 9/2/2019  
Columbus D 10/14/2019  
Veterans D 11/11/2019  
Thanksgivn 11/28/2019  
Christmas E 12/25/2019  
10

<http://beta.epa.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**Source:**

CC1 Equipment Report.pdf  
CC2 Equipment Report.pdf  
CC3 Equipment Report.pdf  
CC4 Equipment Report.pdf  
CC5 Equipment Report.pdf  
LV1 Equipment Report.pdf  
LV2 Equipment Report.pdf  
LV3 and LV4 Equipment Report.pdf

Malibu Creek Environmental Restoration Project EIS/EIR  
 Construction Equipment - Upstream Barriers - Year 1  
 Alternative 3

Construction Start Year: 2019  
 Speed of Onsite Truck: 10 mph

15 days per construction period (5 days per week)  
 CC1 & CC4 CC1 & CC5 LV2

Activity	Equipment Type	Equipment Size	Hours of Operation			Annual Hours	Emission Factors - 2019 (g/hp-hr or g/hr)						Annual Emissions - 2019 (tons per year)							Metric Tons CO2e/yr							
			4/1-21	4/22-5/12	5/13-6/2		VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	GWP											
																1	21	310	VOC		NOx	CO	SO2	PM10	PM2.5	CO2	CH4
Water Control - Installation	Flatbed Truck		4	12		16	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	9.74E-05	1.05E-04	1.35E-03	1.07E-06	8.45E-06	3.64E-06	3.59E-01	8.12E-05	3.77E-05	3.72E-01	3.38E-01	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	0.043	0.834	1.340	0.002	0.058	0.054	189.378	0.014	0.000	1.36E-05	2.62E-04	4.20E-04	6.97E-07	1.83E-05	1.68E-05	5.94E-02	4.54E-06	-	5.95E-02	5.40E-02	
	Loader/Backhoe	75 hp	2.624	3.3513		5.9753	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	3.42E-05	5.45E-04	6.78E-04	1.13E-06	3.98E-05	3.66E-05	9.65E-02	7.21E-06	-	9.67E-02	8.77E-02	
	Tractor/crawler/dozer	250 hp	5.5208		6.958	12.4788	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	1.78E-04	2.03E-03	2.21E-03	1.17E-05	1.51E-05	1.39E-05	1.04E+00	5.73E-05	-	1.04E+00	9.41E-01	
	Truck		0.3077		2.7692	3.0769	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	2.32E-05	3.27E-04	4.30E-05	3.63E-07	7.56E-06	4.51E-06	7.28E-02	1.73E-07	1.63E-07	7.28E-02	6.61E-02	
Water Control - Removal	Water pump	3.5 hp		4		4	4.754	2.132	56.301	0.006	0.058	0.058	177.788	0.269	0.302	7.34E-05	3.29E-05	8.69E-04	9.47E-08	8.94E-07	8.93E-07	2.74E-03	4.15E-06	4.67E-06	4.28E-03	3.88E-03	
Clear & Grub	Flatbed Truck		4	12		16	5.520	5.957	76.523	0.060	0.479	0.206	20,361.280	4.604	2.135	9.74E-05	1.05E-04	1.35E-03	1.07E-06	8.45E-06	3.64E-06	3.59E-01	8.12E-05	3.77E-05	3.72E-01	3.38E-01	
	Crane 44'	80 hp	1.7777	1.3333	0.4444	3.5554	0.043	0.834	1.340	0.002	0.058	0.054	189.378	0.014	0.000	1.36E-05	2.62E-04	4.20E-04	6.97E-07	1.83E-05	1.68E-05	5.94E-02	4.54E-06	-	5.95E-02	5.40E-02	
	Loader/Backhoe	75 hp				0	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	3.42E-05	5.45E-04	6.78E-04	1.13E-06	3.98E-05	3.66E-05	9.65E-02	7.21E-06	-	9.67E-02	8.77E-02	
	Tractor/crawler/dozer	250 hp	5.3333		5.3333	10.6666	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	1.78E-04	2.03E-03	2.21E-03	1.17E-05	1.51E-05	1.39E-05	1.04E+00	5.73E-05	-	1.04E+00	9.41E-01	
	Truck		0.3077			3.077	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	2.32E-05	3.27E-04	4.30E-05	3.63E-07	7.56E-06	4.51E-06	7.28E-02	1.73E-07	1.63E-07	7.28E-02	6.61E-02	
Demolition	Brush chipper	170 hp	28.3835	37.6471	0.1482	66.1788	0.149	1.478	1.810	0.004	0.094	0.086	343.002	0.013	0.000	1.84E-03	1.83E-02	2.24E-02	4.79E-05	1.16E-03	1.07E-03	4.25E+00	1.66E-04	-	4.26E+00	3.86E+00	
	Crane 50'	200 hp	9.4118	18.8236		28.2354	0.031	0.393	0.433	0.002	0.003	0.003	203.332	0.011	0.000	1.94E-04	2.45E-03	2.70E-03	1.42E-05	1.78E-05	1.64E-05	1.27E+00	7.00E-05	-	1.27E+00	1.15E+00	
	Man lift	210 hp				0	0.054	0.457	0.333	0.002	0.003	0.003	192.823	0.005	0.000	-	-	-	-	-	-	-	-	-	-	-	-
	Loader	190 hp	28.2353	37.6471		65.8824	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	7.14E-04	8.14E-03	8.86E-03	4.68E-05	6.04E-05	5.56E-05	4.16E+00	2.30E-04	-	4.16E+00	3.77E+00	
	Chainsaw		56.7647	75.2941	0.2941	132.3529	2.096	0.115	13.187	0.001	0.021	0.021	35.644	0.130	0.039	2.57E-03	1.41E-04	1.62E-02	1.80E-06	2.54E-05	2.54E-05	4.37E-02	1.60E-04	4.80E-05	6.19E-02	5.62E-02	
	1 ton pickup		0.1765			0.353	1.967	2.522	26.628	0.061	0.485	0.212	20,361.283	2.024	1.056	7.65E-07	9.81E-07	1.04E-05	2.37E-08	1.89E-07	7.28E-08	7.92E-03	7.88E-07	4.11E-07	8.07E-03	7.32E-03	
	Tractor/crawler/dozer	250 hp	0.2941			0.5882	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	8.38E-06	9.57E-05	1.04E-04	5.49E-07	7.10E-07	6.53E-07	4.88E-02	2.70E-06	-	4.89E-02	4.43E-02	
	Front end loader	540 hp	0.2964			0.5928	0.068	0.529	0.613	0.003	0.004	0.004	309.181	0.016	0.000	2.39E-05	1.87E-04	2.16E-04	1.51E-06	1.39E-06	1.09E-06	1.09E-01	5.81E-06	-	1.09E-01	9.91E-02	
	Tractor/crawler/dozer	310 hp	0.1482			0.2964	0.053	0.602	0.471	0.002	0.004	0.004	234.975	0.013	0.000	5.34E-06	6.09E-05	4.77E-05	2.34E-07	4.52E-07	4.16E-07	2.38E-02	1.32E-06	-	2.38E-02	2.16E-02	
	Dump truck	20cy/24 ton		1.4866		1.4866	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	1.12E-05	1.58E-04	2.08E-05	1.75E-07	3.65E-06	2.18E-06	3.52E-02	8.36E-08	7.87E-08	3.52E-02	3.19E-02	
	Air Compressor	250 hp	44.4571	44.4571		88.9142	0.103	0.590	0.460	0.003	0.005	0.004	237.822	0.009	0.000	2.52E-03	1.45E-02	1.13E-02	6.56E-05	1.11E-04	1.02E-04	5.83E+00	2.27E-04	-	5.83E+00	5.29E+00	
	Air Compressor	50 hp		32		32	0.601	0.717	53.729	0.004	0.024	0.023	307.156	0.034	0.058	1.06E-03	1.26E-03	9.48E-06	6.59E-06	4.15E-05	4.14E-05	5.42E-01	5.99E-05	1.02E-04	5.75E-01	5.21E-01	
	Crane 126'	350 hp	5.1111	5.1111		10.2222	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000	1.23E-04	1.55E-03	1.29E-03	6.32E-06	1.13E-05	1.04E-05	6.44E-01	3.56E-05	-	6.44E-01	5.85E-01	
	Crane 50'	263 hp	44.4571	44.4571		88.9142	0.031	0.392	0.327	0.002	0.003	0.003	163.194	0.009	0.000	8.01E-04	1.01E-02	8.43E-03	4.13E-05	7.36E-05	6.77E-05	4.21E+00	2.33E-04	-	4.21E+00	3.82E+00	
	Crane 210'	230 hp	16	16		32	0.031	0.393	0.433	0.003	0.003	0.003	203.332	0.011	0.000	2.53E-04	3.19E-03	3.52E-03	1.86E-05	2.32E-05	2.14E-05	1.65E+00	9.12E-05	-	1.65E+00	1.50E+00	
Excavator	115 hp	32	16	24	72	0.066	1.092	1.968	0.003	0.079	0.073	278.045	0.021	0.000	6.07E-04	9.96E-03	1.80E-02	2.98E-05	7.22E-04	6.64E-04	2.54E+00	1.94E-04	-	2.54E+00	2.31E+00		
Excavator	430 hp	8	8	12	28	0.050	0.533	0.424	0.002	0.004	0.004	211.858	0.012	0.000	6.60E-04	7.08E-03	5.63E-03	2.76E-05	5.32E-05	4.89E-05	2.81E+00	1.55E-04	-	2.81E+00	2.55E+00		
Loader	190 hp	72	64	12	148	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	1.60E-03	1.83E-02	1.99E-02	1.05E-04	1.36E-04	1.25E-04	9.34E+00	5.16E-04	-	9.35E+00	8.48E+00		
Front end loader	180 hp	4.6667	4.6667		9.3334	0.068	0.534	0.569	0.003	0.004	0.004	270.062	0.014	0.000	1.27E-04	9.88E-04	1.05E-03	5.63E-06	8.00E-06	7.36E-06	5.00E-01	2.66E-05	-	5.01E-01	4.54E-01		
Loader/Backhoe	75 hp	11.1	11.1		22.2	0.069	1.104	1.373	0.002	0.081	0.074	195.357	0.015	0.000	1.27E-04	2.03E-03	2.52E-03	4.21E-06	1.48E-04	1.36E-04	3.59E-01	2.68E-05	-	3.59E-01	3.26E-01		
Tractor/crawler/dozer	250 hp	4	4		8	0.052	0.590	0.642	0.003	0.004	0.004	301.172	0.017	0.000	1.14E-04	1.30E-03	1.42E-03	7.47E-06	9.66E-06	8.88E-06	6.64E-01	3.67E-05	-	6.65E-01	6.03E-01		
3/4 ton pickup		72	80	12	164	3.509	3.029	42.612	0.061	0.496	0.223	20,361.281	2.024	1.056	6.34E-04	5.48E-04	7.70E-03	1.10E-05	8.98E-05	4.03E-05	3.68E+00	3.66E-04	1.91E-04	3.75E+00	3.40E+00		
Chainsaw		44.4571	44.4571		88.9142	2.096	0.115	13.187	0.001	0.021	0.021	35.644	0.130	0.039	1.73E-03	9.44E-05	1.09E-02	1.21E-06	1.71E-05	1.70E-05	2.93E+00	1.07E-04	3.22E-05	4.16E-02	3.77E-02		
Road Realignment	Vibratory roller	145 hp				0	0.048	0.908	1.585	0.003	0.055	0.050	280.051	0.015	0.000	-	-	-	-	-	-	-	-	-	-	-	-
	Vibrating compactor	5.5 hp	4	4		8	2.038	1.506	74.477	0.004	1.056	1.054	125.946	0.115	0.150	9.88E-05	7.30E-05	3.61E-03	1.74E-07	5.12E-05	5.11E-05	6.11E-03	5.59E-06	7.30E-06	8.49E-03	7.70E-03	
	Vibratory compactor	7.5 hp				0	0.061	1.825	0.996	0.003	0.063	0.058	241.833	0.026	0.000	-	-	-	-	-	-	-	-	-	-	-	-
	Truck		16	16		32	6.850	96.426	12.666	0.107	2.228	1.329	21,451.850	0.051	0.048	2.42E-04	3.40E-03	4.47E-04	3.77E-06	7.86E-05	4.69E-05	7.57E-01	1.80E-06	1.69E-06	7.57E-01	6.87E-01	
	Asphalt distributor	3000 gal	4	4		8	6.850																				











**Malibu Creek Environmental Restoration Project EIS/EIR**  
**Construction Equipment - Upstream Barriers - Year 3**  
**Alternative 3**

Construction Start Year: 2023  
 Speed of Onsite Truck: 10 mph

50 days per construction period (5 days per week)  
 15 days per construction period (5 days per week)  
 LV3 & LV4 LV2

GWP 1 21 310

Activity	Equipment Type	Equipment Size	Hours of Operation		Annual Hours	Emission Factors - 2023 (g/hp-hr or g/hr)							Annual Emissions - 2023 (tons per year)							Metric Tons CO2e/yr						
			4/1-6/9	6/10-6/30		VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10		PM2.5	CO2	CH4	N2O	CO2e	
Water Control - Installation	Flatbed Truck				0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135	-	-	-	-	-	-	-	-	-	-		
	Crane 44'	80 hp	49.6732	0.4444	50.1176	0.053	0.856	1.340	0.002	0.062	0.057	189.341	0.014	0.000	2.32E-04	3.78E-03	5.92E-03	9.82E-06	2.75E-04	2.53E-04	8.37E-01	6.39E-05	-	8.38E-01	7.60E-01	
	Loader/Backhoe	75 hp	34.624		34.624	0.081	1.131	1.383	0.002	0.086	0.079	195.357	0.015	0.000	2.33E-04	3.24E-03	3.96E-03	6.56E-06	2.45E-04	2.26E-04	5.59E-01	4.27E-05	-	5.60E-01	5.08E-01	
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	2.25E-03	2.18E-02	2.33E-02	1.23E-04	1.67E-04	1.54E-04	1.09E+01	6.04E-04	-	1.09E+01	9.92E+00	
	Truck		34.1719	2.7692	36.9411	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	2.59E-04	1.01E-03	4.92E-04	4.30E-06	7.33E-05	3.81E-05	8.61E-01	2.08E-06	1.95E-06	8.62E-01	7.82E-01	
Water Control - Removal	Flatbed Truck				0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135	-	-	-	-	-	-	-	-	-	-		
	Crane 44'	80 hp		0.4444	0.4444	0.053	0.856	1.340	0.002	0.062	0.057	189.341	0.014	0.000	2.06E-06	3.35E-05	5.25E-05	8.70E-08	2.44E-06	2.24E-06	7.42E-03	5.67E-07	-	7.43E-03	6.74E-03	
	Loader/Backhoe	75 hp		32	32	0.081	1.131	1.383	0.002	0.086	0.079	195.357	0.015	0.000	2.16E-04	2.99E-03	3.66E-03	6.06E-06	2.27E-04	2.09E-04	5.17E-01	3.95E-05	-	5.18E-01	4.70E-01	
	Tractor/crawler/dozer	250 hp		4	12.7059	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	2.17E-04	2.10E-03	2.25E-03	1.19E-05	1.62E-05	1.49E-05	1.05E+00	5.83E-05	-	1.06E+00	9.58E-01	
	Truck		34.1719		34.1719	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	2.40E-04	9.36E-04	4.55E-04	3.98E-06	6.78E-05	3.53E-05	7.97E-01	1.92E-06	1.81E-06	7.97E-01	7.23E-01	
Clear & Grub	Brush chipper	170 hp	5.9294	0.0074	5.9368	0.180	1.493	1.865	0.004	0.102	0.094	338.470	0.016	0.000	2.00E-04	1.66E-03	2.07E-03	4.24E-06	1.13E-04	1.04E-04	3.77E-01	1.81E-05	-	3.77E-01	3.42E-01	
	Crane 50'	200 hp			0	0.038	0.400	0.434	0.002	0.003	0.003	203.339	0.011	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Man lift	210 hp			0	0.066	0.466	0.343	0.002	0.003	0.003	192.867	0.006	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Loader	190 hp	5.9294	0.0074	5.9368	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	7.72E-05	7.46E-04	7.98E-04	4.21E-06	5.74E-06	5.28E-06	3.74E-01	2.07E-05	-	3.75E-01	3.40E-01	
	Chainsaw		5.8824	0.0147	5.8971	2.509	0.115	13.187	0.001	0.021	0.021	35.644	0.156	0.039	1.37E-04	6.26E-06	7.20E-04	8.02E-08	1.13E-06	1.13E-06	1.95E-03	8.52E-06	2.14E-06	2.79E-03	2.53E-03	
	1 ton pickup			0.0088	0.0088	0.952	1.707	13.882	0.061	0.470	0.199	20,361.282	2.024	1.056	9.23E-09	1.66E-08	1.35E-07	5.93E-10	4.56E-09	1.93E-09	1.98E-04	1.96E-08	1.02E-08	2.01E-04	1.82E-04	
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	1.01E-04	9.75E-04	1.04E-03	5.51E-06	7.50E-06	6.90E-06	4.89E-01	2.71E-05	-	4.90E-01	4.45E-01	
	Front end loader	540 hp	5.9294	0.0074	5.9368	0.075	0.538	0.548	0.003	0.004	0.004	273.357	0.015	0.000	2.67E-04	1.90E-03	1.94E-03	9.71E-06	1.58E-05	1.45E-05	9.66E-01	5.34E-05	-	9.67E-01	8.77E-01	
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	0.063	0.611	0.471	0.002	0.005	0.004	234.966	0.013	0.000	1.28E-04	1.24E-03	9.55E-04	4.68E-06	9.53E-06	8.76E-06	4.77E-01	2.64E-05	-	4.77E-01	4.33E-01	
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	4.17E-04	1.63E-03	7.93E-04	6.93E-06	1.18E-04	6.14E-05	1.39E+00	3.35E-06	3.15E-06	1.39E+00	1.26E+00	
Demolition	Air Compressor	250 hp			0	0.133	0.613	0.493	0.003	0.005	0.005	237.830	0.012	0.000	-	-	-	-	-	-	-	-	-	-		
	Air Compressor	50 hp			0	0.731	0.811	70.044	0.004	0.024	0.023	307.049	0.041	0.062	-	-	-	-	-	-	-	-	-	-	-	
	Crane 126'	350 hp			0	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Crane 50'	263 hp			0	0.038	0.402	0.327	0.002	0.003	0.003	163.219	0.009	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp			0	0.038	0.400	0.434	0.002	0.003	0.003	203.339	0.011	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	115 hp		40	40	0.079	1.120	1.968	0.003	0.084	0.078	278.047	0.021	0.000	4.02E-04	5.68E-03	9.98E-03	1.65E-05	4.28E-04	3.94E-04	1.41E+00	1.08E-04	-	1.41E+00	1.28E+00	
	Excavator	430 hp		80	100	0.058	0.534	0.424	0.002	0.004	0.004	211.846	0.012	0.000	2.75E-03	2.53E-02	2.01E-02	9.86E-05	1.97E-04	1.81E-04	1.00E+01	5.55E-04	-	1.01E+01	9.12E+00	
	Loader	190 hp		20	20	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	2.60E-04	2.51E-03	2.69E-03	1.42E-05	1.93E-05	1.78E-05	1.26E+00	6.98E-05	-	1.26E+00	1.15E+00	
	Front end loader	180 hp			0	0.076	0.543	0.576	0.003	0.005	0.004	270.058	0.015	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Loader/Backhoe	75 hp		350	350	0.081	1.131	1.383	0.002	0.086	0.079	195.357	0.015	0.000	2.36E-03	3.27E-02	4.00E-02	6.63E-05	2.48E-03	2.28E-03	5.65E+00	4.32E-04	-	5.66E+00	5.14E+00	
Road Realignment	Tractor/crawler/dozer	250 hp	50.068		50.068	0.062	0.600	0.642	0.003	0.005	0.004	301.160	0.017	0.000	8.57E-04	8.28E-03	8.86E-03	4.68E-05	6.37E-05	5.86E-05	4.16E+00	2.30E-04	-	4.16E+00	3.77E+00	
	3/4 ton pickup		72	20	92	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	2.07E-04	2.24E-04	2.66E-03	6.18E-06	4.87E-05	2.11E-05	2.06E+00	2.05E-04	1.07E-04	2.10E+00	1.91E+00	
	Chainsaw				0	2.509	0.115	13.187	0.001	0.021	0.021	35.644	0.156	0.039	-	-	-	-	-	-	-	-	-	-	-	
	Vibratory roller	145 hp	19.0893		19.0893	0.056	0.922	1.681	0.003	0.059	0.054	280.032	0.019	0.000	1.71E-04	2.81E-03	5.13E-03	9.61E-06	1.79E-04	1.64E-04	8.54E-01	5.70E-05	-	8.56E-01	7.76E-01	
	Vibrating compactor	5.5 hp	5.1724		5.1724	2.035	1.504	74.398	0.004	1.055	1.053	125.812	0.115	0.150	6.38E-05	4.72E-05	2.33E-03	1.12E-07	3.31E-05	3.30E-05	3.95E-03	3.61E-06	4.71E-06	5.48E-03	4.97E-03	
	Vibrating compactor	7.5 hp			0	0.073	1.863	2.268	0.003	0.068	0.062	235.492	0.022	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Truck		372.9363		372.9363	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	2.61E-03	1.02E-02	4.97E-03	4.34E-05	7.40E-04	3.85E-04	8.69E+00	2.10E-05	1.97E-05	8.70E+00	7.89E+00	
	Asphalt distributor	3000 gal	22.9363		22.9363	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	1.61E-04	6.28E-04	3.05E-04	2.67E-06	4.55E-05	2.37E-05	5.35E-01	1.29E-06	1.21E-06	5.35E-01	4.85E-01	
	Suburban	3/4 ton			0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	-	-	-	-	-	-	-	-	-	-	-	-
	Disposal	Truck	35 ton			0	2.768	3.433	39.111	0.060	0.466	0.195	20,361.281	4.604	2.135	-	-	-	-	-	-	-	-	-	-	-
Truck		75 ton			0	6.360	24.855	12.079	0.106	1.801	0.936	21,149.122	0.051	0.048	-	-	-	-	-	-	-	-	-	-	-	
Bridge Installation	Suburban	3/4 ton			0	2.041	2.213	26.223	0.061	0.481	0.208	20,361.281	2.024	1.056	-	-	-	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp			0	0.038	0.400	0.434	0.002	0.003	0.003	203.339	0.011	0.000	-	-	-	-	-	-	-	-	-	-	-	
	Crane 270'	430 hp			0	0.038	0.402	0.327	0.002	0.003	0.003															



**Malibu Creek Environmental Restoration Project EIS/EIR  
Construction Equipment - Upstream Barriers - Year 3  
Alternative 3**

Construction Start Year: 2023  
Speed of Onsite Truck: 10 mph

50 days per const  
15 days per const  
LV3 & LV4 LV2

Activity	Equipment Type	Equipment Size	Hours of Operation		Annual Hours	Peak Daily Emissions (LV3 & LV4) - 2023 (pounds per day)						Peak Daily Emissions (LV2) - 2023 (pounds per day)					
			4/1-6/9	6/10-6/30		VOC	NOx	CO	SO2	PM10	PM2.5	VOC	NOx	CO	SO2	PM10	PM2.5
Water Control - Installation	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp	49.6732	0.4444	50.1176	1.84E-02	3.00E-01	4.70E-01	7.78E-04	2.18E-02	2.00E-02	5.49E-04	8.95E-03	1.40E-02	2.32E-05	6.50E-04	5.98E-04
	Loader/Backhoe	75 hp	34.624		34.624	1.87E-02	2.59E-01	3.17E-01	5.25E-04	1.96E-02	1.81E-02	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	127.6318	4	131.6318	1.75E-01	1.69E+00	1.81E+00	9.53E-03	1.30E-02	1.19E-02	1.82E-02	1.76E-01	1.89E-01	9.96E-04	1.36E-03	1.25E-03
	Truck		34.1719	2.7692	36.9411	1.92E-02	7.49E-02	3.64E-02	3.18E-04	5.43E-03	2.82E-03	5.18E-03	2.02E-02	9.83E-03	8.59E-05	1.47E-03	7.62E-04
	Water pump	3.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-
Water Control - Removal	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 44'	80 hp		0.4444	0.4444	-	-	-	-	-	-	5.49E-04	8.95E-03	1.40E-02	2.32E-05	6.50E-04	5.98E-04
	Loader/Backhoe	75 hp	32		32	1.72E-02	2.39E-01	2.93E-01	4.85E-04	1.81E-02	1.67E-02	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	8.7059	4	12.7059	1.19E-02	1.15E-01	1.23E-01	6.50E-04	8.86E-04	8.15E-04	1.82E-02	1.76E-01	1.89E-01	9.96E-04	1.36E-03	1.25E-03
	Truck		34.1719		34.1719	1.92E-02	7.49E-02	3.64E-02	3.18E-04	5.43E-03	2.82E-03	-	-	-	-	-	-
Clear & Grub	Brush chipper	170 hp	5.9294	0.0074	5.9368	1.60E-02	1.33E-01	1.66E-01	3.39E-04	9.04E-03	8.32E-03	6.65E-05	5.52E-04	6.90E-04	1.41E-06	3.76E-05	3.46E-05
	Crane 50'	200 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Man lift	210 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Loader	190 hp	5.9294	0.0074	5.9368	6.17E-03	5.96E-02	6.38E-02	3.37E-04	4.58E-04	4.22E-04	2.57E-05	2.48E-04	2.68E-04	1.40E-06	1.91E-06	1.75E-06
	Chainsaw		5.8824	0.0147	5.8971	1.09E-02	5.00E-04	5.75E-02	6.40E-06	9.04E-05	9.02E-05	9.11E-05	4.16E-06	4.79E-04	5.33E-08	7.53E-07	7.52E-07
	1 ton pickup			0.0088	0.0088	-	-	-	-	-	-	2.46E-06	4.42E-06	3.59E-05	1.58E-07	1.22E-06	5.14E-07
	Tractor/crawler/dozer	250 hp	5.8824	0.0147	5.8971	8.05E-03	7.78E-02	8.33E-02	4.39E-04	5.98E-04	5.50E-04	6.71E-05	6.48E-04	6.94E-04	3.66E-06	4.98E-06	4.59E-06
	Front end loader	540 hp	5.9294	0.0074	5.9368	2.13E-02	1.52E-01	1.55E-01	7.76E-04	1.26E-03	1.16E-03	8.86E-05	6.33E-04	6.43E-04	3.23E-06	5.25E-06	4.83E-06
	Tractor/crawler/dozer	310 hp	5.9294	0.0074	5.9368	1.02E-02	9.90E-02	7.63E-02	3.74E-04	7.61E-04	7.00E-04	4.26E-05	4.12E-04	3.17E-04	1.56E-06	3.17E-06	2.91E-06
	Dump truck	20cy/24 ton	59.4635	0.0743	59.5378	3.34E-02	1.30E-01	6.33E-02	5.53E-04	9.44E-03	4.91E-03	1.39E-04	5.43E-04	2.64E-04	2.31E-06	3.93E-05	2.04E-05
Demolition	Air Compressor	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Air Compressor	50 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 126'	350 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 50'	263 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	115 hp		40	40	-	-	-	-	-	-	1.07E-01	1.51E+00	2.66E+00	4.41E-03	1.14E-01	1.05E-01
	Excavator	430 hp		80	100	1.76E-01	1.62E+00	1.29E+00	6.31E-03	1.26E-02	1.16E-02	1.47E-01	1.35E+00	1.07E+00	5.26E-03	1.05E-02	9.65E-03
	Loader	190 hp			20	-	-	-	-	-	-	6.93E-02	6.71E-01	7.17E-01	3.78E-03	5.15E-03	4.74E-03
	Front end loader	180 hp			0	-	-	-	-	-	-	-	-	-	-	-	-
	Loader/Backhoe	75 hp	350		350	1.89E-01	2.62E+00	3.20E+00	5.30E-03	1.98E-01	1.83E-01	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	50.068		50.068	6.85E-02	6.63E-01	7.09E-01	3.74E-03	5.09E-03	4.69E-03	-	-	-	-	-	-
	3/4 ton pickup		72	20	92	1.30E-02	1.41E-02	1.66E-01	3.87E-04	3.05E-03	1.32E-03	1.20E-02	1.30E-02	1.54E-01	3.58E-04	2.83E-03	1.22E-03
	Chainsaw				0	-	-	-	-	-	-	-	-	-	-	-	-
	Road Realignment	Vibratory roller	145 hp	19.0893		19.0893	1.37E-02	2.25E-01	4.10E-01	7.69E-04	1.43E-02	1.32E-02	-	-	-	-	-
Vibrating compactor		5.5 hp	5.1724		5.1724	5.11E-03	3.77E-03	1.87E-01	9.00E-06	2.65E-03	2.64E-03	-	-	-	-	-	-
Vibratory compactor		7.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	-
Truck			372.9363		372.9363	2.09E-01	8.17E-01	3.97E-01	3.47E-03	5.92E-02	3.08E-02	-	-	-	-	-	-
Asphalt distributor		3000 gal	22.9363		22.9363	1.29E-02	5.03E-02	2.44E-02	2.13E-04	3.64E-03	1.89E-03	-	-	-	-	-	-
Suburban		3/4 ton			0	-	-	-	-	-	-	-	-	-	-	-	-
Disposal	Truck	35 ton			0	-	-	-	-	-	-	-	-	-	-	-	
	Truck	75 ton			0	-	-	-	-	-	-	-	-	-	-	-	
Bridge Installation	Suburban	3/4 ton			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 210'	230 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 270'	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Excavator	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Truck				0	-	-	-	-	-	-	-	-	-	-	-	
	Generator	7.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	
Highway Replacement	Vibrating compactor	5.5 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Tractor/crawler/dozer	250 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Truck				0	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt distributor	3000 gal			0	-	-	-	-	-	-	-	-	-	-	-	
	Asphalt paver	120 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Vibrating roller/compactor	33 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Chip spreader truck				0	-	-	-	-	-	-	-	-	-	-	-	
	Line striper	23 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Flatbed Truck				0	-	-	-	-	-	-	-	-	-	-	-	
	3/4 ton pickup				0	-	-	-	-	-	-	-	-	-	-	-	
Abutments	Roto trowel concrete finisher	9 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 80'	130 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Crane 114'	430 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Auger drill	100 hp			0	-	-	-	-	-	-	-	-	-	-	-	
	Water pump	80 hp			0	-	-	-	-	-	-	-	-	-	-	-	
Landscaping	Excavator	430 hp	144.7059		144.7059	3.18E-01	2.93E+00	2.33E+00	1.14E-02	2.28E-02	2.10E-02	-	-	-	-	-	-
	Loader/Backhoe	75 hp		8	17.4118	4.31E-03	5.98E-02	7.32E-02	1.21E-04	4.54E-03	4.17E-03	1.69E-02	2.35E-01	2.87E-01	4.75E-04	1.78E-02	1.64E-02
	Loader/Backhoe	92 hp			9.4118	-	-	-	-	-	-	2.07E-02	2.88E-01	3.52E-01	5.83E-04	2.18E-02	2.01E-02
	Vibratory roller	44 hp	144.7059		144.7059	4.12E-02	1.05E+00	1.27E+00	1.71E-03	3.80E-02	3.50E-02	-	-	-	-	-	-
	Tractor/crawler/dozer	250 hp	144.7059		144.7059	1.98E-01	1.91E+00	2.05E+00	1.08E-02	1.47E-02	1.35E-02	-	-	-	-	-	-
	Dump truck	12 cy		8	17.4118	4.49E-03	1.75E-02	8.52E-03	7.45E-05	1.27E-03	6.60E-04	1.76E-02	6.88E-02	3.34E-02	2.92E-04	4.98E-03	2.59E-03
	3/4 ton pickup		181.1765		181.1765	3.26E-02	3.54E-02	4.19E-01	9.73E-04	7.68E-03	3.33E-03	-	-	-	-	-	-
	3/4 ton pickup			8	10	1.44E-03	1.56E-03	1.85E-02	4.30E-05	3.39E-04	1.47E-04	1.20E-03	1.30E-03	1.54E-02	3.58E-05	2.83E-04	1.22E-04
					<b>1.67E+00</b>	<b>1.54E+01</b>	<b>1.63E+01</b>	<b>6.08E-02</b>	<b>4.94E-01</b>	<b>4.16E-01</b>	<b>4.35E-01</b>	<b>4.53E+00</b>	<b>5.71E+00</b>	<b>1.73E-02</b>	<b>1.83E-01</b>	<b>1.64E-01</b>	

**Conversions**

2000 pounds per ton  
453.6 grams per pound  
2 peak day scaling factor  
0.9072 metric tons per short ton

**Legend**

Data from EMFAC2011 (g/hr)  
Formula overwritten

**Speciation Profiles**

	PM10	PM2.5	Ratio	NO.
Diesel	1	0.92	0.92	425 (DIESEL VEHICLE EXHAUST)
Gasoline	0.994	0.992	0.998	117 (VEHICULAR SOURCES-GASOLINE)

**Federal Holidays**

New Year's Day	1/1/2019
Birthday of Martin Luther King, Jr.	1/21/2019
Washington's Birthday	2/18/2019
Memorial Day	5/27/2019
Independence Day	7/4/2019
Labor Day	9/2/2019
Columbus Day	10/14/2019
Veterans Day	11/11/2019
Thanksgiving Day	11/28/2019
Christmas Day	12/25/2019

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<http://beta.opm.gov/policy-data-oversight/snow-dismissal-procedures/federal-holidays/#url=2018>

**Source:**

CC1 Equipment Report.pdf  
CC2 Equipment Report.pdf  
CC3 Equipment Report.pdf  
CC4 Equipment Report.pdf  
CC5 Equipment Report.pdf  
LV1 Equipment Report.pdf  
LV2 Equipment Report.pdf  
LV3 and LV4 Equipment Report.pdf

# **Supplemental Air Quality Analyses**

**October 2016**

**Alternative 2: Ventura Harbor Haul Route**

2018 Haul Emissions					
		trips	mileage / trip	total miles	Daily Trips
Surfrider	ORIGINAL	1632	8	13056	136
Topanga	ORIGINAL	4725	20	94500	105
Ventura Increase	UPDATED	2467	80	197360	70
	<del> </del>			89804	

2018 Daily Emission Multiplier	
1088	1.67
2100	
5600	
3500	

2019 Haul Emissions					
		trips	mileage / trip	total miles	Daily Trips
Topanga	ORIGINAL	371	20	7420	53
Zuma	ORIGINAL	6413	20	128260	53
Ventura Increase	UPDATED	4864	80	389120	35
	<del> </del>			253440	

2019 Daily Emission Multiplier	
1060	1.64
1060	
2800	
1740	

2020 Haul Emissions					
		trips	mileage / trip	total miles	Daily Trips
Zuma	ORIGINAL	1007	20	20140	53
Ventura Increase	UPDATED	4864	80	389120	35
	<del> </del>			368980	

2020 Daily Emission Multiplier	
1060	1.64
2800	
1740	

	Annual Mileage Increase	Peak Daily Mile Increase
<b>2018</b>	89804	3500
<b>2019</b>	253440	1740
<b>2020</b>	368980	2767

	Emissions Factors (grams per mile)					
year	VOC	CO	NOX	PM10	PM2.5	SO2
<b>2018</b>	0.14	0.69	6.86	0.16	0.10	0.02
<b>2019</b>	0.14	0.71	6.18	0.16	0.10	0.02
<b>2020</b>	0.14	0.74	4.65	0.16	0.10	0.02

		Annual Emissions (tons per year)					
Year	Miles	VOC	CO	NOX	PM10	PM2.5	SO2
2018	89804	0.01	0.06	0.63	0.02	0.01	0.00
2019	253440	0.04	0.18	1.60	0.04	0.03	0.00
2020	368980	0.05	0.28	1.75	0.06	0.04	0.01

convert gm to tons      1.0231E-06

The numbers in the table above were used to update the MAX annual emissions tables from the EIS.

		Daily Emissions (lbs/day)					
Year	Miles	VOC	CO	NOX	PM10	PM2.5	SO2
2018	3500	1.06	5.31	52.91	1.26	0.74	0.13
2019	1740	0.53	2.72	23.72	0.63	0.37	0.06
2020	2767	0.87	4.51	28.35	1.00	0.58	0.10

convert grams to pounds      453.592

The numbers in the table above were used to update the MAX daily emissions tables from the EIS.

**Alternative 4: Ventura Harbor Haul Route**

**2018 Haul Emissions**

		trips	mileage / trip	total miles	Daily Trips
<b>Surfrider</b>	<b>ORIGINAL</b>	1632	8	13056	136
	<b>ORIGINAL</b>	3465	20	69300	105
<hr/>					
<b>Ventura Increase</b>	<b>UPDATED</b>	2467	80	197360	70
	<del>ORIGINAL</del>			115004	

**2019 Haul Emissions**

		trips	mileage / trip	total miles	Daily Trips
<b>Topanga</b>	<b>ORIGINAL</b>	371	20	7420	53
	<b>ORIGINAL</b>	5517	20	110340	53
<hr/>					
<b>Ventura Increase</b>	<b>UPDATED</b>	4864	80	389120	35
	<del>ORIGINAL</del>			271360	

**2020 Haul Emissions**

		trips	mileage / trip	total miles	Daily Trips
<b>Zuma</b>	<b>ORIGINAL</b>	1007	20	20140	53
<hr/>					
<b>Ventura Increase</b>	<b>UPDATED</b>	698	80	55840	35
	<del>ORIGINAL</del>			35700	

	Annual Mileage Increase	Peak Daily Mile Increase
2018	115004	3500
2019	271360	1740
2020	35700	1740

Emissions Factors (grams per mile)						
year	VOC	CO	NOX	PM10	PM2.5	SO2
2018	0.14	0.69	6.86	0.16	0.10	0.02
2019	0.14	0.71	6.18	0.16	0.10	0.02
2020	0.14	0.74	4.65	0.16	0.10	0.02

Annual Emissions (tons per year)							
Year	Miles	VOC	CO	NOX	PM10	PM2.5	SO2
2018	115004	0.02	0.08	0.81	0.02	0.01	0.00
2019	271360	0.04	0.20	1.72	0.05	0.03	0.00
2020	35700	0.01	0.03	0.17	0.01	0.00	0.00

convert gm to tons	1.0231E-06
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The numbers in the table above were used to update the MAX annual emissions tables from the EIS.

Daily Emissions (lbs/day)							
Year	Miles	VOC	CO	NOX	PM10	PM2.5	SO2
2018	3500	1.06	5.31	52.91	1.26	0.74	0.13
2019	1740	0.53	2.72	23.72	0.63	0.37	0.06
2020	1740	0.55	2.84	17.83	0.63	0.37	0.06

convert grams to pounds	453.592
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The numbers in this table were used to update the MAX daily emissions tables from the EIS.



**Alternative 2A**

<b>Table 5.12-6b Alternative 2a Maximum Daily Emissions (pounds per day)</b>					
Pollutant	Original		Updated		SCAQMD Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	109.4	96.2	114.7	100.9	550
Reactive Organic Gas, ROG	20.3	18.7	21.4	19.7	75
Nitrogen Oxides, NO <sub>x</sub>	223.5	125.7	276.4	154.8	100
Sulfur Dioxide, SO <sub>2</sub>	0.4	0.4	0.5	0.5	150
Inhalable Particulate Matter, PM <sub>10</sub>	16.9	13.3	18.2	14.3	150
Fine Particulate Matter, PM <sub>2.5</sub>	8.5	3.6	9.2	3.9	55
<b>Table 5.12-9b Alternative 2a Maximum Annual Emissions (tons per year)</b>					
Pollutant	Original		Updated		NEPA Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	5.8	5.1	6.1	5.4	100
Volatile Organic Compounds	0.8	0.5	1.3	0.8	10
Nitrogen Oxides, NO <sub>x</sub>	11.9	6.8	13.7	7.8	10
Lead, Pb	0.0	0.0	0.0	0.0	25
Inhalable Particulate Matter, PM <sub>10</sub>	1.1	0.9	1.7	1.4	100
Fine Particulate Matter, PM <sub>2.5</sub>	0.5	0.2	0.9	0.4	100

Alternative 2B	<b>Table 5.12-10b Alternative 2b Maximum Daily Emissions (pounds per day)</b>					
	Pollutant	Original		Updated		SCAQMD Significance Threshold
		Unmitigated	Mitigated	Unmitigated	Mitigated	
	Carbon Monoxide, CO	147.4	133.0	152.7	137.4	550
	Reactive Organic Gas, ROG	21.1	18.7	22.2	19.7	75
	Nitrogen Oxides, NO <sub>x</sub>	284.6	153.6	337.5	182.3	100
	Sulfur Dioxide, SO <sub>2</sub>	0.5	0.5	0.6	0.6	150
	Inhalable Particulate Matter, PM <sub>10</sub>	20.0	13.3	21.3	14.2	150
	Fine Particulate Matter, PM <sub>2.5</sub>	11.0	4.2	11.7	4.5	55
	<b>Table 5.12-17b Alternative 2b Maximum Annual Emissions (tons per year)</b>					
	Pollutant	Original		Updated		Significance Threshold
		Unmitigated	Mitigated	Unmitigated	Mitigated	
	Carbon Monoxide, CO	6.1	5.4	6.4	5.7	100
	Volatile Organic Compounds	0.9	0.5	1.4	0.8	10
Nitrogen Oxides, NO <sub>x</sub>	12.4	7.0	14.2	8.0	10	
Lead, Pb	0.0	0.0	0.0	0.0	25	
Inhalable Particulate Matter, PM <sub>10</sub>	1.1	0.9	1.7	1.4	100	
Fine Particulate Matter, PM <sub>2.5</sub>	0.5	0.2	0.9	0.4	100	

**Alternative 4A**

<b>Table 5.12-6b Alternative 4a Maximum Daily Emissions (pounds per day)</b>					
Pollutant	Original		Updated		SCAQMD Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	510.2	412.4	515.5	416.7	550
Volatile Organic Compounds	75.3	52.7	76.4	53.4	75
Nitrogen Oxides, NO <sub>x</sub>	1095.5	486.1	1148.4	509.6	100
Sulfur Dioxide, SO <sub>2</sub>	1.9	1.9	2.0	2.0	150
Inhalable Particulate Matter, PM <sub>10</sub>	49.1	17.2	50.4	17.6	150
Fine Particulate Matter, PM <sub>2.5</sub>	38.0	7.0	38.7	7.1	55

  

<b>Table 5.12-34b Alternative 4a Maximum Annual Emissions (tons per year)</b>					
Pollutant	Original		Updated		Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	5.8	5.1	6.0	5.3	100
Reactive Organic Gas, ROG	0.8	0.5	0.8	0.5	10
Nitrogen Oxides, NO <sub>x</sub>	11.7	6.6	13.4	7.6	10
Lead, Pb	0.0	0.0	0.0	0.0	25
Inhalable Particulate Matter, PM <sub>10</sub>	1.1	0.9	1.2	0.9	100
Fine Particulate Matter, PM <sub>2.5</sub>	0.5	0.2	0.5	0.2	100

**Alternative 4B**

<b>Table 5.12-35b Alternative 4b Maximum Daily Emissions (pounds per day)</b>					
Pollutant	Original		Updated		SCAQMD Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	548.3	449.2	553.6	453.6	550
Volatile Organic Compounds	81.0	52.9	82.1	53.6	75
Nitrogen Oxides, NO <sub>x</sub>	1156.6	514.1	1209.5	537.6	100
Sulfur Dioxide, SO <sub>2</sub>	2.1	2.0	2.1	2.0	150
Inhalable Particulate Matter, PM <sub>10</sub>	52.3	17.7	53.6	18.1	150
Fine Particulate Matter, PM <sub>2.5</sub>	40.5	7.2	41.2	7.3	55
<b>Table 5.12-36b Alternative 4b Maximum Annual Emissions (tons per year)</b>					
Pollutant	Original		Updated		Significance Threshold
	Unmitigated	Mitigated	Unmitigated	Mitigated	
Carbon Monoxide, CO	6.1	5.4	6.3	5.6	100
Reactive Organic Gas, ROG	0.9	0.5	0.9	0.5	10
Nitrogen Oxides, NO <sub>x</sub>	12.2	6.8	13.9	7.8	10
Lead, Pb	0.0	0.0	0.0	0.0	25
Inhalable Particulate Matter, PM <sub>10</sub>	1.1	0.9	1.2	0.9	100
Fine Particulate Matter, PM <sub>2.5</sub>	0.5	0.2	0.5	0.2	100