December 5, 2016

Via First Class Mail and E-Filing

Honorable Norman C. Bay, Chairman
Federal Energy Regulatory Commission
888 First Street NE, Room 1A
Washington, DC 20426

Attn: Kimberly D. Bose, Secretary

Re: Comment on Atlantic Sunrise Project Draft General Conformity Determination, Transcontinental Gas Pipe Line Company, LLC, Docket CP15-138-000

Dear Chairman Bay,

Intervenors Clean Air Council, Sierra Club, Concerned Citizens of Lebanon County, Lebanon Pipeline Awareness, and Lancaster Against Pipelines (collectively, "Public Interest Groups") hereby submit the following comment to the Federal Energy Regulatory Commission ("FERC") in response to the draft General Conformity Determination ("Draft") FERC made available on November 3, 2016, for Transcontinental Gas Pipe Line Company, LLC's ("Williams" or "Transco") proposed Atlantic Sunrise natural gas pipeline project (the "Project").

The Draft appropriately accounted for some of the Project construction equipment emissions. It did not, however, account for fugitive dust emissions from construction. This appears to be because Williams did not submit to FERC calculations of fugitive dust emissions for the Project. However, this omission is significant, as fugitive dust emissions due to construction would total roughly 2,200 tons of PM10 and 330 tons of PM2.5. When totaling the PM2.5 and precursor emissions for Lebanon and Lancaster Counties, the General Conformity applicability thresholds are exceeded. As Lebanon and Lancaster Counties are currently PM2.5 maintenance / nonattainment areas, the General Conformity rules apply to Project activities emitting PM2.5 in those counties. We assert that EPA should review all air quality data along the route of the proposed pipeline to determine whether the areas are appropriately classified. We respectfully submit that the Draft should be revised to account for fugitive dust emissions due to Project construction.

The Draft also failed to make a determination on PM2.5 emissions in Lancaster and Lebanon Counties by ignoring the combined emissions of PM2.5 and NOx, a significant PM2.5 precursor. NOx is also an ozone precursor, and Lancaster County is in nonattainment for ozone. Because emissions of NOx in Lancaster County exceed 100 tons per year, the General Conformity Rule should also be applied to ozone in Lancaster County. We ask that FERC fix these errors by

applying the General Conformity Rule in those counties and surrounding counties in the final GCD.

In light of the serious nature of the defects in the Draft, we also urge FERC to issue a new draft prior to finalizing the GCD and to provide the public with an opportunity to comment on additions and changes. The purpose of the determination itself it to protect vital public health safeguards by preventing backsliding in nonattainment from new construction projects and meaningful public participation in the process is critical.

The General Conformity Rule Applies to the Project's PM2.5 and ozone emissions in Lancaster County because NOx is a precursor to PM2.5 and ozone and the Project's NOx emissions exceed the Applicability Threshold for NOx.

Lancaster County is currently a maintenance area for PM2.5 and a nonattainment area for ozone. For ozone, the General Conformity Rule expressly states that emissions of more than 100 tons per year (tpy) of NOx triggers ozone general conformity applicability. 40 CFR § 93.153(b). For PM2.5, "unless determined not to be significant precursors," emission of 100 or more tpy of NOx triggers General Conformity Rule applicability for PM2.5. *Id.* The Pennsylvania Department of Environmental Protection (PADEP) has *not* determined that NOx is not a significant PM2.5 precursor in Lancaster County. To the contrary, the applicable maintenance plan includes NOx as a PM2.5 precursor. *See* State Implementation Plan Revision: Maintenance Plan and Comprehensive Inventory Lancaster Nonattainment Area 1997 and 2006 Fine Particulate Matter National Ambient Air Quality Standards, May 2014, at pp. 22-24.[1] Therefore, NOx is a significant PM2.5 precursor for the purpose of FERC's General Conformity determination. And the purpose of the determination itself it to protect vital public health safeguards by preventing backsliding in nonattainment from new construction projects.

As the Draft acknowledges, Williams anticipates emitting 133.5 tpy of NOx in Lancaster County as part of its Project construction. Therefore, the General Conformity Rule applies for PM2.5 and ozone for Lancaster County, and a General Conformity Determination is required for it. As the Draft omits any such determination, FERC must fix it and provide for meaningful public participation on a new draft.

Since NOx is a PM2.5 Precursor, and NOx Emissions Added to PM2.5 Emissions in Lebanon County Would Exceed the Applicability Threshold, the General Conformity Rule Applies for PM2.5 in Lebanon County.

Lebanon County, in turn, is a nonattainment area for PM2.5. Above the 100 tpy applicability threshold for "direct emissions" of PM2.5, the General Conformity Rule applies to PM2.5 emissions in Lebanon County. 40 CFR § 93.153(b). "Direct emissions" includes "emissions of

[1] Bureau of Air Quality, PADEP. Available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-100598/01%20FINAL%20Lanc%20PM2%205%20Maint%20Plan.pdf, accessed November 4, 2016.

a criteria pollutant or its precursors." 40 CFR § 93.152. "[U]nless determined not to be significant precursors," emission of 100 or more tpy of NOx triggers General Conformity Rule applicability for PM2.5. 40 CFR § 93.153(b). PADEP has *not* determined that NOx is not a significant PM2.5 precursor in Lebanon County. To the contrary, the applicable state plan includes NOx as a PM2.5 precursor. *See* State Implementation Plan Revision: Maintenance Plan and Comprehensive Inventory Harrisburg-Lebanon-Carlisle Nonattainment Area 1997 Fine Particulate Matter National Ambient Air Quality Standards, April 2014, at pp. 26-27.[2] Therefore, NOx is a significant PM2.5 precursor for the purpose of FERC's General Conformity determination.

As the Draft acknowledges, Williams anticipates emitting 98.9 tpy of NOx in Lebanon County as part of its Project construction. Adding the anticipated 7.5 tpy of PM2.5 emissions in Lebanon County, the 100 tpy threshold for "direct emissions" of PM2.5 is exceeded.

Therefore, the General Conformity Rule applies for PM2.5 for Lebanon County, and a General Conformity Determination is required for it. As the draft GCD does not yet reflect this applicability, FERC must include it in the final GCD.

Fugitive Dust Emissions Should Be, But Were Not, Included in the General Conformity Determination.

The General Conformity Rule, 40 CFR Part 93, Subpart B, bars FERC from certificating a project which would not conform to applicable Clean Air Act implementation plans, § 93.150(a), and requires a pre-certification determination of conformity, § 93.150(b).

Pennsylvania regulates fugitive dust emissions. *See*, e.g., 25 Pa. Code § 123.1 ("Prohibition of certain fugitive emissions"); § 121.1 (defining "fugitive air contaminant" as "An air contaminant of the outdoor atmosphere not emitted through a flue, including, but not limited to, industrial process losses, stock pile losses, reentrained dust and construction/demolition activities."). Williams recognized fugitive dust emissions from construction as an air emission impact from the Project in its Draft Resource Report No. 9 dated October 2014. It wrote:

> Fugitive dust emission levels can vary in relation to moisture content, composition and volume of soils during construction. Fugitive dust will primarily be produced at sites involving land disturbance and earthwork, such as trenching and excavation of soil, stockpiling and transport of soil, and restoration. Transco will implement dust control measures as necessary during all appropriate construction activities such as transporting soil or rock, trenching, and use of access roads that will be specified in the fugitive dust control plan to be provided in a future submittal.

[2] Bureau of Air Quality, PADEP. Available at http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-101961/02_FINAL_HbgLebCar97_PM2%205%20Maint%20Plan.pdf, accessed December 1, 2016.

> Fugitive dust emissions associated with construction will not contribute to degradation of NAAQS.

Draft Resource Report No. 9, § 9.2.1, page 9-21. Williams also wrote that it would "submit construction emission calculations as part of Transco's application anticipated to be filed in March 2015." *Id.*

Williams' March 2015 submission did indeed contain construction emission calculations, but those calculations did not include fugitive dust. Instead, only equipment emissions were tallied. *See* Resource Report No. 9, Appendix 9A, dated March 2015. When Williams updated the construction emission calculations to account for schedule changes in its September 20, 2016, filing on the CP15-138 docket, those calculations still did not include fugitive dust. *See* Responses to FERC Data Requests dated September 7, 2016, Attachment 10.

Likely due to Williams's omission, the Draft also omitted fugitive dust from the determination.

Including Fugitive Dust, as Required, Also Makes the General Conformity Rules Apply to Lancaster and Lebanon Counties.

As explained above, there is a 100 tpy threshold for applicability of the General Conformity Rule with respect to PM2.5 in Lancaster and Lebanon Counties. That threshold can be met by PM2.5 emissions alone, or in combination with emissions of its significant precursor, NOx. While the Project exceeds that threshold in both counties even without counting emissions from construction-related fugitive dust, the latter provides an independent basis for finding that the General Conformity Rule applies here.

An engineer at Clean Air Council calculated the construction-related fugitive dust emissions from earthmoving and vehicular traffic using methods that have been employed for such calculations by pipeline companies in other FERC applications under the Natural Gas Act. His calculations are supplied in the attached spreadsheet. The spreadsheet contains the sources for factors he used and the formulae used to derive the results.

Based on these calculations, fugitive PM2.5 emissions from earthmoving alone would exceed 90 tpy in Lancaster County. Combining this with the additional PM2.5 emissions already calculated in the Draft's Table 2, emissions of PM2.5 (even ignoring its precursors) in Lancaster County would exceed 100 tpy, crossing the applicability threshold for that county.

In Lebanon County, fugitive PM2.5 emissions from earthmoving alone would exceed 50 tpy. This combined with the additional PM2.5 emissions already calculated in the Draft's Table 2 would not exceed 100 tons per year. However, NOx is a significant PM2.5 precursor. Construction emissions in Lebanon County would already exceed 98 tpy of NOx. Combined with the additional PM2.5 emissions from the fugitive dust, the 100 tpy threshold is far surpassed.

Since the applicability threshold is crossed for PM2.5 emissions in each of Lebanon and Lancaster Counties, the General Conformity Rule applies in each. Accordingly, the final GCD

should explain how Williams will ensure that its Project will conform with the pertinent state Clean Air Act implementation plans.

Additional General Conformity Rule Implications

We also note that the Draft omits mitigation measures for the increased Lancaster County Project emissions within Lancaster County; instead, it appears Williams proposes to obtain NOx offsets for Lancaster County from York County and perhaps Maryland. Draft at 9. Project construction emissions of NOx also appear to be significant in Howard County, Maryland and Prince William County, Virginia, which are designated "nonattainment" and where a 50 tpy threshold applies. Draft at 7. Even if NOx offsets from Maryland are appropriate for Lancaster County, which is unclear, additional Project NOx emissions in Maryland and Northern Virginia should be taken into consideration for determining the sufficiency of Williams's compliance with General Conformity.

It is likely that the emissions from the Project can:

- cause or contribute to new violations of NAAQS along the Project route;
- increase the frequency or severity of any existing violation of NAAQS in the area; or
- delay timely attainment of NAAQS, interim emission reductions, or other milestones in the area.

Therefore, it is crucial that FERC ensure strict compliance with the General Conformity Rule. Finally, we have read the Pennsylvania Department of Environmental Protection's comments on the Draft and join in their concerns regarding the methodology used to allocate emissions across counties.

Conclusion

The Public Interest Groups ask that FERC correct these errors by applying the General Conformity Rule to Williams' Project emissions of PM2.5 and ozone in Lancaster County and PM2.5 in Lebanon County, as required. FERC should adhere to the stringent standard of the rule. The final General Conformity Determination should reflect these changes. In light of the serious nature of the defects in the Draft, we also urge FERC to issue a new draft prior to finalizing the General Conformity Determination and to provide the public with an opportunity to comment on additions and changes.

Sincerely,

/s/ Joseph Otis Minott
Joseph Otis Minott
Executive Director & Chief Counsel
Alexander G. Bomstein
Senior Litigation Attorney
Clean Air Council
135 South 19th Street, Suite 300
Philadelphia, PA 19103
215.567.4004
joe_minott@cleanair.org
abomstein@cleanair.org

/s/ Thomas Au
Thomas Au
Conservation Chair
Sierra Club Pennsylvania Chapter
P.O. Box 606
Harrisburg PA 17108
717.232.0101
thomxau@gmail.com

/s/ Malinda Harnish Clatterbuck
Malinda Harnish Clatterbuck
Lancaster Against Pipelines
717.284.4940
lancasteragainstpipelines@gmail.com

/s/ Ann Pinca
Ann Pinca, President
Lebanon Pipeline Awareness
1594 Cumberland St., Ste. 194
Lebanon, PA 17042-4532
717.274.0814
lebanonpipeline@gmail.com

/s/ Pamela Bishop
Pamela Bishop, Principal
Concerned Citizens of Lebanon County
P.O. Box 275
Mt. Gretna, PA 17064
717.574.6453
concernedcitizenslebco@gmail.com

cc PADEP via First Class Mail:

William R. Weaver
Regional Manager
Air Quality Program

Ann Roda
Director, Office of Program Integration

Krishnan Ramamurthy
Acting Director, Bureau of Air Quality

Document Content(s)

Row Labels	Sum of PM 2.5 Total (TPY)	Sum of PM 10 Total (TPY)
Clinton	1.944075163	13.21929193
Columbia	48.74825046	326.8111815
Lancaster	90.77706058	604.0537672
Lebanon	50.49493475	337.5420508
Luzerne	28.8959242	193.7518813
Lycoming	7.886858785	53.7429033
Northumberland	14.1820695	96.16992385
Schuylkill	34.38699051	231.626701
Susquehanna	12.08425904	81.22519217
Wyoming	44.57703891	299.6608585
(blank)		
Grand Total	**333.9774619**	**2237.803752**

Sum of Unpaved PM 2.5 Emission (TPY)	Sum of Paved PM 2.5 Emission (TPY)
0.100059765	0.028828942
0.679573301	0.173330526
0.08198984	0.539975338
0.366180749	0.120130717
0.416301122	0.106180882
0.44820608	0.12735342
0.654784129	0.215930548
0.960350055	0.316698137
0.252841115	0.069173403
0.945335768	0.258629189
4.905621923	**1.956231103**

Sum of Unpaved PM 10 Emission (TPY)	Sum of Paved PM 10 Emission (TPY)	Construction PM 2.5
1.000597647	0.117451246	1.815186456
6.795733006	0.713137653	47.89534663
0.819898405	2.199899526	90.1550954
3.661807488	0.48942144	50.00862329
4.16301122	0.432588779	28.3734422
4.482060796	0.518847267	7.311299285
6.547841286	0.879717047	13.31135483
9.603500552	1.29025167	33.10994232
2.528411149	0.281817569	11.76224452
9.453357684	1.053674472	43.37307396
		0
49.05621923	**7.97680667**	**327.1156089**

Construction PM10

12.10124304
319.3023109
601.0339693
333.3908219
189.1562813
48.74199523
88.74236552
220.7329488
78.41496345
289.1538264
0
2180.770726

PENNSYLVANIA

Central Penn Line (CPL) North

	Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Columbia	4,366,824	0.004796	0.002564394
Luzerne	4,366,824	0.266187	0.002564394
Wyoming	4,366,824	0.563549	0.002355056
Susquehanna	4,366,824	0.165468	0.002355056
Total	4,366,824	1	-

Central Penn Line (CPL) South

	Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Lancaster	-	0.335587	0.0046254
Lebanon	6,050,733	0.15477	0.003128166
Schuylkill	6,050,733	0.40424	0.003141029
Northumberland	6,050,733	0.275618	0.003141029
Columbia	6,050,733	0.165371	0.002564394
Total	9,106,881	1	-

Chapman Loop

	Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Clinton	380,815	1	0.002102013

Unity Loop

	Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Lycoming	1,245,216	1	0.002250386

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
New Compressor Station 605		Total VMT		
	Wyoming	614,016	1	0.002355056

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
New Compressor Station 610		Total VMT		
	Columbia	614,016	1	0.002564394

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Zick Meter Station with pig launcher and receiver		Total VMT		
	Susquehanna	136,320	1	0.002355056

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
Springville Meter Station		Total VMT		
	Wyoming	136,320	1	0.002355056

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
North Diamond Regulator Station		Total VMT		
	Luzerne	136,320	1	0.002564394

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
West Diamond Regulator Station with pig launcher and receiver		Total VMT		
	Columbia	136,320	1	0.002564394

			% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
River Road Regulator Station with pig receiver		Total VMT		
	Lancaster	136,320	1	0.0046254

Compressor Station 517		Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
	Columbia	348,132	1	0.002564394

Compressor Station 520		Total VMT	% of Project Roads in County	2.5 Unpaved Emission Factor (lb/VMT)
	Lycoming	348,132	1	0.002250386

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.025643938	0.000218023	0.001776483	5236	15708	13.42717	134.2717
0.025643938	0.000218023	0.000888242	290598	871794	745.2077	7452.077
0.023550555	0.000214769	0.000874984	615230	1845690	1448.901	14489.01
0.023550555	0.000214769	0.000874984	180642	541926	425.4219	4254.219
-	-	-	1091706	3275118	2632.958	26329.58
				TPY	**1.316479**	**13.16479**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.046254	0.00034208	0.001393658	1,372	3,054,776	6.346049	63.46049
0.031281663	0.00034208	0.001393658	234118.4677	702355	732.3615	7323.615
0.031410292	0.000345276	0.001406681	611487.5046	1834463	1920.7	19207
0.031410292	0.000345276	0.001406681	416923.2986	1250770	1309.568	13095.68
0.025643938	0.000218023	0.000888242	250153.9792	750462	641.4933	6414.933
-	-	-	1,514,055	7,592,826	4610.469	46104.69
				TPY	**2.305235**	**23.05235**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.021020131	0.000201875	0.000822455	95203.75	285611	200.1195	2001.195
				TPY	**0.10006**	**1.000598**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.022503864	0.000213142	0.000868356	311304	933912	700.5543	7005.543
				TPY	**0.350277**	**3.502771**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.023550555	0.000214769	0.000874984	153504	460512	361.5104	3615.104
				TPY	**0.180755**	**1.807552**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.025643938	0.000218023	0.000888242	153504	460512	393.6447	3936.447
				TPY	**0.196822**	**1.968224**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.023550555	0.000214769	0.000874984	34080	102240	80.26029	802.6029
				TPY	**0.04013**	**0.401301**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.023550555	0.000214769	0.000874984	34080	102240	80.26029	802.6029
				TPY	**0.04013**	**0.401301**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.025643938	0.000218023	0.000888242	34080	102240	87.39454	873.9454
				TPY	**0.043697**	**0.436973**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.025643938	0.000218023	0.000888242	34080	102240	87.39454	873.9454
				TPY	**0.043697**	**0.436973**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.046254	0.00034208	0.001393658	34080	102240	157.6336	1576.336

				TPY	**0.078817**	**0.788168**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.025643938	0.000218023	0.000888242	87033	261099	223.1869	2231.869
				TPY	**0.111593**	**1.115934**

10 Unpaved Emission Factor (lb/VMT)	2.5 Paved Emission Factor (lb/VMT)	10 Paved Emission Factor (lb/VMT)	VMT Unpaved	VMT Paved	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)
0.022503864	0.000213142	0.000868356	87033	261099	195.8579	1958.579
				TPY	**0.097929**	**0.979289**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
3.424704	27.905
190.0711	774.3637
396.3968	1614.95
116.3888	474.1767
706.2814	2891.395
0.353141	**1.445698**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
1044.976	4257.312
240.2614	978.8429
633.3963	2580.503
431.8611	1759.434
163.6179	666.5915
2514.113	10242.68
1.257057	**5.121342**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
57.65788	234.9025
0.028829	**0.117451**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
199.0557	810.9677
0.099528	**0.405484**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
98.90364	402.9408
0.049452	**0.20147**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
100.4022	409.0459
0.050201	**0.204523**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
21.95797	89.4584
0.010979	**0.044729**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
21.95797	89.4584
0.010979	**0.044729**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
22.29067	90.81383
0.011145	**0.045407**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
22.29067	90.81383
0.011145	**0.045407**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
34.97422	142.4875

0.017487	**0.071244**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
56.92557	231.919
0.028463	**0.11596**

Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)
55.65112	226.7268
0.027826	**0.113363**

Using USEPA reference document "Estimating Particulate Matter Emissions frc

Base PM 10 Emissions Factor (tons/acre-month)	0.42
Ratio of PM2.5 to PM10	0.15
Construction Dust Plan Control Efficiency	50%

Project	County	Acres Used	Silt %
CPL North (Collocated)	Columbia	67	39.50%
CPL North (Collocated)	Luzerne	321	39.50%
CPL North (Collocated)	Wyoming	347.9	39.50%
CPL North (Collocated)	Susquehanna	101.8	39.50%
CPL North (Uncollocated)	Columbia	67	39.50%
CPL North (Uncollocated)	Luzerne	321	39.50%
CPL North (Uncollocated)	Wyoming	347.9	39.50%
CPL North (Uncollocated)	Susquehanna	101.8	39.50%
CPL South	Lancaster	684.2	61%
CPL South	Lebanon	586.8	39.50%
CPL South	Schuylkill	430.6	39.50%
CPL South	Northumberland	160.1	39.50%
CPL South	Columbia	587.3	39.50%
Chapman Loop	Clinton	97.1	39.50%
Unity Loop	Lycoming	164.9	39.50%
Mainline A&B Replace	Prince William	30.9	12%
Mainline A&B Replace	Fairfax	21.9	39.50%
New Compressor Station 605	Wyoming	50.1	39.50%
New Compressor Station 610	Columbia	33.5	39.50%
Zick Meter Station with pig launcher and receiver	Susquehanna	9.1	39.50%
Springville Meter Station	Wyoming	4.8	39.50%
North Diamond Regulator Station	Luzerne	2.3	39.50%
West Diamond Regulator Station with pig launcher and receiver	Columbia	4.8	39.50%
River Road Regulator Station with pig receiver	Lancaster	2.4	61%
Compressor Station 517	Columbia	32	39.50%
Compressor Station 520	Lycoming	36.1	39.50%

Compressor Station 190	Howard County, MD	30	
Compressor Station 185	Prince William	13.7	12%
Compressor Station 170	Appomattox	10.7	
Compressor Station 160	Rockingham County, NC	10.5	
Compressor Station 155	Davidson County, NC	17.7	
Compressor Station 150	Iredell County, NC	11.2	
Compressor Station 145	Cleveland County, NC	9	
Puddlefield Meter Station	Wyoming	0.8	39.50%
Grover Meter Station	Cleveland County, NC		
Shelby M&R Station	Cleveland County, NC		
Cleveland County Meter Station	Cleveland County, NC		
Asheville M&R Station	Cleveland County, NC		
Foote Mineral M&R Station	Cleveland County, NC		
Kings Mountain M&R Station	Cleveland County, NC		
Lithium Meter Station	Gaston County, NC		
Gastonia Meter Station	Gaston County, NC		
Bessemer City M&R Station	Gaston County, NC		
Stanley Meter Station	Gaston County, NC		
Hickory Meter Station	Gaston County, NC		
Duke Lincoln Meter Station	Lincoln County, NC		
Lowesville Meter Station	Lincoln County, NC		
Charlotte Meter Station	Iredell County, NC		
Davidson Meter Station	Iredell County, NC		
NC Natural Tidewater Meter Station	Iredell County, NC		
Iredell Meter Station	Iredell County, NC		
Hicks Crossroads Meter Station	Lincoln County, NC		
Mooresville Meter Station	Iredell County, NC		
Linwood Road Meter Station	Iredell County, NC		
Statesville Meter Station	Rowan County, NC		
Park Road Power Plant Meter Station	Rowan County, NC		
Salisbury M&R Station	Rowan County, NC		
Frontier Appalachian Meter Station	Rowan County, NC		
Spencer Buck Meter Station	Rowan County, NC		

West Lexington M&R Station	Davidson County, NC
Lexington M&R Station	Davidson County, NC
Winston Salem M&R Station	Davidson County, NC
Kernersville Meter Station	Forsyth County, NC
Greensboro M&R station	Guliford County, NC
Stokesdale Meter Station	Guliford County, NC
Bethany M&R Station	Rockingham County, NC
Rockingham Meter Station	Rockingham County, NC
Timken M&R Station	Cherokee County, SC
Gaffney M&R Station	Cherokee County, SC
Cherokee Co-Gen Meter Station	Cherokee County, SC
Skygen Co-Gen Meter Station	Cherokee County, SC
Deering Milliken M&R Station	Cherokee County, SC
Blacksburg M&R Station	Cherokee County, SC
Broad River Meter Station	Cherokee County, SC
York Road Meter Station	Cherokee County, SC
Mill Creek Meter Station	Cherokee County, SC

)m Construction Operations"

PM2.5 Emissions = Uncontrolled PM10 * (1-0.50) * (24/PE) * (s/0.09)* 0.15
Where s=% dry silt content, 0.5= 50% ctrl eff. From watering (this will be 0 assuming nc

PE Value	Time (months)	PM 2.5 Adjusted Emissions Factor	PM 10 Emissions Factor	**Total PM 2.5 Emissions (TPY)**	**Total PM 10 Emissions (TPY)**
123	2.095890411	0.02697561	0.1798374	3.7880408	25.2536051
151	2.095890411	0.02197351	0.1464901	14.783356	98.5557072
118	2.095890411	0.028118644	0.1874576	20.502998	136.686655
118	2.095890411	0.028118644	0.1874576	5.9994401	39.9962675
123	1.919178082	0.02697561	0.1798374	3.4686569	23.1243796
151	1.919178082	0.02197351	0.1464901	13.536916	90.2461083
118	1.919178082	0.028118644	0.1874576	18.774314	125.162094
118	1.919178082	0.028118644	0.1874576	5.493605	36.6240332
120	3.082191781	0.0427	0.2846667	90.047281	600.315205
120	3.082191781	0.02765	0.1843333	50.008623	333.390822
133	3.082191781	0.024947368	0.1663158	33.109942	220.732949
123	3.082191781	0.02697561	0.1798374	13.311355	88.7423655
123	2.27260274	0.02697561	0.1798374	36.004335	240.028902
124	0.698630137	0.026758065	0.1783871	1.8151865	12.101243
123	1.145205479	0.02697561	0.1798374	5.0941924	33.9612826
107	0.698630137	0.009656075	0.0643738	0.2084522	1.38968112
107	0.698630137	0.031009346	0.206729	0.474443	3.16295327
118	2.802739726	0.028118644	0.1874576	3.948343	26.3222864
123	2.802739726	0.02697561	0.1798374	2.532788	16.8852536
118	1.052054795	0.028118644	0.1874576	0.2691994	1.79466283
118	1.052054795	0.028118644	0.1874576	0.1419953	0.94663534
151	1.052054795	0.02197351	0.1464901	0.0531699	0.35446583
123	1.052054795	0.02697561	0.1798374	0.1362231	0.90815423
120	1.052054795	0.0427	0.2846667	0.1078146	0.71876384
123	2.276712329	0.02697561	0.1798374	1.9653025	13.1020167
123	2.276712329	0.02697561	0.1798374	2.2171069	14.7807126

107	1.487671233	0.009656075	0.0643738	0.1968014	1.31200924
118	0.24109589	0.028118644	0.1874576	0.0054234	0.03615621
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Facility/County/ Workspace Type	Land Use Acreage Affected by Construction and Operation of the Atlantic Sunrise						
	Agricultural Land		Upland Forest		Industrial / Commercial Land		Transpo
	Cons.	Oper.	Cons.	Oper.	Cons.	Oper.	Cons.
PENNSYLVANIA							
Central Penn Line (CPL) North							
Columbia							
Pipeline	2.2	0.7	30.2	10.1	0	0	0.2
ATWS	0.5	0	4.5	0	0	0	0
Mainline valves and tie-in	0.3	0.3	0	0	0	0	0
Access roads	0	0	0.2	0	0	0	0
Contractor staging areas	5.3	0	0	0	0	0	0
Contractor and pipe yards	0	0	0	0	0	0	0
Luzerne							
Pipeline	26.7	10.7	147.5	59.1	0.4	0.1	2.4
ATWS	8.5	0	15.4	0	0.2	0	0.3
Mainline valves and tie-in	0	0	0.1	0.1	0	0	0
Access roads	1	0.1	4.1	0.1	0	0	2.9
Contractor staging areas	8.2	0	0.1	0	0	0	0
Contractor and pipe yards	0	0	0	0	0	0	0
Cathodic protection	0	0	0.1	0	0	0	0.1
Wyoming							
Pipeline	70	39.1	144	78.8	0.3	0.2	1.8
ATWS	23.1	0	9.7	0	0.3	0	0.3
Mainline valves and tie-in	0	0	0.1	0.1	0	0	0
Access roads	5	0.1	8.2	0	2.9	0	2.6
Contractor staging areas	4.5	0	0	0	0	0	0
Contractor and pipe yards	0	0	0	0	19.5	0	0
Cathodic protection	0.1	0	0	0	0	0	0
Susquehanna							
Pipeline	24.7	12.6	25.9	14.3	0	0	0.5
ATWS	8.1	0	2.9	0	0	0	0.1
Mainline valves and tie-in	0	0	0	0	0	0	0
Access roads	2	0.4	0.4	0	0	0	0.7
Contractor staging areas	8.8	0	0	0	0	0	0

Contractor and pipe yards	0	0	0	0	0	0	0
Cathodic protection	0.3	0.1	0	0	0	0	0
Subtotal CPL North	199.3	64.1	393.4	162.6	23.6	0.3	11.9
CPL South							
Lancaster							
Pipeline	346.9	174.7	60.7	29.9	0	0	6.6
ATWS	115.5	0	8.9	0	0	0	0.5
Mainline valves and tie-in	1.1	1.1	0	0	0	0	0
Access roads	11.5	1.3	1.2	0.1	1.5	0	3.2
Contractor staging areas	36.9	0	0.5	0	0	0	0
Contractor and pipe yards	35	0	0	0	16.8	0	0.6
Cathodic protection	0.3	0.1	0	0	0	0	0
Lebanon							
Pipeline	223.9	112.1	93	46.9	0	0	4.2
ATWS	74	0	11.8	0	0	0	1.4
Mainline valves and tie-in	0.7	0.7	0	0	0	0	0
Access roads	6.3	0.3	9.8	0.7	0.9	0	8
Contractor staging areas	21.9	0	0	0	0	0	0
Contractor and pipe yards	101.1	0	0	0	0	0	0
Cathodic protection	0.3	0.1	0	0	0	0	0
Schuylkill							
Pipeline	73.8	37.4	104.6	51.7	0.5	0.2	2
ATWS	23.2	0	16.1	0	0.1	0	0.3
Mainline valves and tie-in	0.7	0.7	0.1	0.1	0	0	0
Access roads	5.1	0.1	24.2	0.9	0.1	0	6.1
Contractor staging areas	25.6	0	0.1	0	0	0	0
Contractor and pipe yards	25.1	0	27.1	0	25.1	0	0
Cathodic protection	0.4	0.1	0	0	1	0.4	0
Northumberland							
Pipeline	7.1	3.6	88.8	44.5	0	0	1.4
ATWS	2.4	0	8.1	0	0	0	0.1
Mainline valves and tie-in	0.4	0.4	0	0	0	0	0
Access roads	0.1	0.1	22	0.8	0.9	0	9.6
Contractor staging areas	0	0	0	0	0	0	0
Contractor and pipe yards	0	0	0	0	0	0	0

Columbia							
Pipeline	241.2	121.7	107.6	53.7	1	0.5	2.7
ATWS	72.8	0	11.6	0	0	0	0.4
Mainline valves and tie-in	0.5	0.5	0	0	0	0	0
Access roads	10.1	0.1	6.5	0	0	0	2.1
Contractor staging areas	15.9	0	0.7	0	0.9	0	0.2
Contractor and pipe yards	42.5	0	0	0	0	0	0
Cathodic protection	0.6	0.2	0	0	0	0	0.1
Subtotal CPL South	1522.9	455.3	603.4	229.3	48.8	1.1	49.5
Chapman Loop							
Clinton							
Pipeline	0	0	13.9	2.7	0	0	0.1
ATWS	0	0	0.8	0	0	0	0
Mainline valves and tie-in	0	0	0.3	0.3	0	0	0
Access roads	0	0	10.3	3.3	0	0	0.4
Contractor staging areas	0	0	1.2	0	0	0	0
Contractor and pipe yards	0	0	0	0	31.1	0	4
Subtotal Chapman Loop	0	0	26.5	6.3	31.1	0	4.5
Unity Loop							
Lycoming							
Pipeline	35.3	9.5	40.4	11.7	0	0	1.5
ATWS	9.5	0	2.2	0	0	0	0.2
Mainline valves and tie-in	0.7	0.7	0	0	0	0	0
Access roads	1.4	0.1	2.2	0	0	0	1.4
Contractor staging areas	2.4	0	0	0	0	0	0
Contractor and pipe yards	30.9	0	0	0	0	0	0
Subtotal Unity Loop	80.2	10.3	44.8	11.7	0	0	3.1
VIRGINIA							
Mainline A & B Replacements							
Prince William							
Pipeline	0	0	1.5	0	1.4	0	1.6
ATWS	0	0	0.6	0	0.1	0	0.1
Mainline valves and tie-in	0	0	0	0	0	0	0
Access roads	0	0	0.1	0	0	0	0
Contractor staging areas	0	0	0	0	0	0	0

Contractor and pipe yards	0	0	0	0	0	0	0
Fairfax							
Pipeline	0	0	0	0	0	0	0
ATWS	0	0	0	0	0	0	0
Mainline valves and tie-in	0	0	0	0	0	0	0
Access roads	0	0	0	0	0	0	0
Contractor staging areas	0	0	0	0	21.9	0	0
Contractor and pipe yards	0	0	0	0	0	0	0
Subtotal Mainline A & B Replacements	0	0	2.2	0	23.4	0	1.7
PIPELINE FACILITIES TOTAL	**1802.4**	**529.7**	**1070.3**	**409.9**	**126.9**	**1.4**	**70.7**
NEW ABOVEGROUND FACILITIES							
New Compressor Station 605	45	36	5.1	3.2	0	0	0
New Compressor Station 610	32.8	32.8	0.7	0.7	0	0	0
Zick Meter Station with pig launcher and receiver	9.1	4.1	0	0	0	0	0
Springville Meter Station	0	0	4.8	3.1	0	0	0
North Diamond Regulator Station	0	0	1.6	1.5	0	0	0
West Diamond Regulator Station with pig launcher and receiver	0	0	3	3	0	0	0
River Road Regulator Station with pig receiver	0	0	2.1	2.1	0	0	0
Subtotal	86.9	72.9	17.3	13.6	0	0	0
MODIFIED COMPRESSOR STATIONS							
Compressor Station 517	0	0	6.3	0.8	19	0	0
Compressor Station 520	0	0	0	0	12.3	0	0
Compressor Station 190	0	0	0	0	24.3	0	0
Compressor Station 185	0	0	0	0	13.7	0	0
Compressor Station 170	0	0	0	0	10.7	0	0
Compressor Station 160	0	0	0	0	6	0	0

Compressor Station 155	0	0	0	0	17.7	0	0
Compressor Station 150	0	0	0	0	11.2	0	0
Compressor Station 145	0	0	0	0	9	0	0
Subtotal	0	0	6.3	0.8	123.9	0	0
MODIFIED M&R							
Puddlefield Meter Station	0	0	0	0	0.8	0	0
Grover Meter Station	0	0	0	0	0	0	0
Shelby M&R Station	0	0	0	0	0.1	0	0
Cleveland County Meter Station	0	0	0	0	0.6	0	0
Asheville M&R Station	0	0	0	0	0.1	0	0
Foote Mineral M&R Station	0	0	0	0	0.1	0	0
Kings Mountain M&R Station	0	0	0	0	0.1	0	0
Lithium Meter Station	0	0	0	0	0.1	0	0
Gastonia Meter Station	0	0	0	0	0.2	0	0
Bessemer City M&R Station	0	0	0	0	0	0	0
Stanley Meter Station	0	0	0.1	0	0.3	0	0
Hickory Meter Station	0	0	0	0	0	0	0
Duke Lincoln Meter Station	0	0	0	0	0.7	0	0
Lowesville Meter Station	0	0	0	0	0.1	0	0
Charlotte Meter Station	0	0	0	0	1	0	0
Davidson Meter Station	0	0	0	0	0	0	0
NC Natural Tidewater Meter Station	0	0	0	0	0	0	0
Iredell Meter Station	0	0	0	0	0	0	0
Hicks Crossroads Meter Station	0	0	0	0	0.8	0	0
Mooresville Meter Station	0	0	0	0	0.1	0	0
Linwood Road Meter Station	0	0	0	0	0.2	0	0
Statesville Meter Station	0	0	0	0	0.1	0	0
Park Road Power Plant Meter Station	0	0	0	0	0.3	0	0
Salisbury M&R Station	0	0	0	0	0.4	0	0
Frontier Appalachian Meter Station	0	0	0	0	0	0	0
Spencer Buck Meter Station	0	0	0	0	0.3	0	0

West Lexington M&R Station	0	0	0	0	0.1	0	0
Lexington M&R Station	0	0	0	0	0.1	0	0
Winston Salem M&R Station	0	0	0	0	0.3	0	0
Kernersville Meter Station	0	0	0	0	0.3	0	0
Greensboro M&R station	0	0	0	0	0.1	0	0
Stokesdale Meter Station	0.1	0.1	0	0	0.1	0	0
Bethany M&R Station	0	0	0.1	0.1	0.1	0	0
Rockingham Meter Station	0	0	0	0	0.3	0	0
Timken M&R Station	0	0	0	0	0.1	0	0
Gaffney M&R Station	0	0	0	0	0.1	0	0
Cherokee Co-Gen Meter Station	0	0	0.1	0	0.1	0	0
Skygen Co-Gen Meter Station	0	0	0	0	0.4	0	0
Deering Milliken M&R Station	0	0	0	0	0.2	0	0
Blacksburg M&R Station	0	0	0.1	0.1	0.2	0	0
Broad River Meter Station	0	0	0	0	0.1	0	0
York Road Meter Station	0	0	0	0	0.6	0	0
Mill Creek Meter Station	0	0	0	0	0.7	0	0
Subtotal	0.1	0.1	0.4	0.2	10.3	0	0
EXISTING MLVs							
MLV 145-10	0	0	0	0	0.6	0	0
MLV N545	0	0	0	0	0.3	0	0
MLV 145-20	0	0	0	0	0.5	0	0
MLV 145-21	0	0	0	0	0.7	0	0
MLV 150-D5	0	0	0	0	0.4	0	0
MLV 150-10	0	0	0	0	0.3	0	0
MLV 150-D15	0	0	0	0	0.1	0	0
MLV 150-20	0	0	0	0	0.5	0	0
MLV 155-D2	0	0	0	0	0.4	0	0
MLV 155-B2	0	0	0	0	0.2	0	0
MLV 155-B5	0	0	0	0	0.1	0	0
MLV 155-10	0	0	0	0	0.3	0	0
MLV 155-20	0	0	0	0	0.4	0	0
MLV 140-D15	0	0	0	0	0.1	0	0
MLV 140-20	0	0	0	0	0.8	0	0

Subtotal	0	0	0	0	5.7	0	0
ABOVEGROUND FACILITIES TOTAL	87	73	24	14.6	139.9	0	0
Project Total	1889.4	602.7	1094.3	424.5	266.8	1.4	70.7

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ortation		Residential Land		Open Land		Wetlands		Open Water	
Oper.	Cons.	Oper.	Cons.	Oper.	Cons.	Oper.	Cons.	Oper.	
0.1	1.6	0.5	16.3	4.5	3.3	1.1	0.4	0.1	
0	0.5	0	0.6	0	0	0	0	0	
0	0	0	0.1	0.1	0	0	0	0	
0	0	0	0	0	0	0	0	0	
0	0.5	0	0.7	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	
1	6.8	2.2	41	8.8	11	3.8	0.9	0.3	
0	1.1	0	3.6	0	0.9	0	0.1	0	
0	0	0	0.1	0.1	0	0	0	0	
0.2	1.5	0	1.6	0.4	0	0	0	0	
0	0	0	0	0	0	0	0	0	
0	0	0	34.5	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	
1	3.8	2.1	20.8	12.5	6.9	4.6	1.2	0.8	
0	1.1	0	6	0	0.4	0	0	0	
0	0	0	0	0	0	0	0	0	
0	1.5	0.1	3.2	0.4	0	0	0	0	
0	0	0	0	0	0	0	0	0	
0	0	0	10.9	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	
0.3	3.8	2.2	13.8	8.9	3.3	2.1	0.2	0.1	
0	1.1	0	1.4	0	0	0	0	0	
0	0	0	0	0	0	0	0	0	
0	0.7	0	3	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
2.6	24	7.1	157.6	35.7	25.8	11.6	2.8	1.3
3.1	11.2	5.6	8.9	4.8	2.4	1.5	1.8	1
0	2.8	0	3.5	0	0.3	0	0.1	0
0	0	0	0	0	0	0	0	0
0.3	2.4	0.4	1.8	0	0	0	0	0
0	0.4	0	1.4	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
2.1	3.8	1.6	11.8	5.9	3.4	2.2	1.3	0.7
0	1.6	0	3.4	0	0.3	0	0	0
0	0	0	0	0	0	0	0	0
1.4	0.9	0.1	2.5	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0.3	0.1	0	0	0	0	0	0
1	3.5	1.7	29.4	15.2	6.3	4.2	0.7	0.4
0	1.1	0	5.4	0	1.2	0	0.1	0
0	0	0	0	0	0	0	0	0
0.5	1.1	0	20	0.9	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
0.7	2.7	1.3	6.7	3.3	0.3	0.1	0.4	0.2
0	0.9	0	1.7	0	0.1	0	0.1	0
0	0	0	0	0	0	0	0	0
3.2	0.5	0	5.9	0.1	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0

2.3	4.5	2.2	31.7	15.4	4.7	3	1.5	0.9
0	1.7	0	7.4	0	0.4	0	0	0
0	0	0	0	0	0	0	0	0
0	2.6	0	1.9	0	0.3	0	0	0
0	4.1	0	7	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.1	0	0	0.2	0.1	0	0	0	0
14.7	46.1	13	150.6	45.7	19.7	11	6	3.2
0	0	0	16.4	5.2	0.2	0.1	0.1	0
0	0	0	0.9	0	0	0	0	0
0	0	0	0.8	0.8	0	0	0	0
0	0.2	0.1	3.9	0.4	0	0	0	0
0	0	0	2.6	0	0	0	0	0
0	0	0	9.6	0	0	0	0	0
0	0.2	0.1	34.2	6.4	0.2	0.1	0.1	0
0.4	1.3	0.4	22.2	3.6	2.1	0.4	0.3	0.1
0	0.3	0	2.7	0	0.2	0	0	0
0	0	0	0	0	0	0	0	0
0	1.3	0	1.7	0	0	0	0	0
0	0	0	4.4	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0.4	2.9	0.4	31	3.6	2.3	0.4	0.3	0.1
0	0.2	0	20.2	0	2	0	0.2	0
0	0.5	0	0.7	0	0.2	0	0	0
0	0	0	0.3	0.2	0	0	0	0
0	0	0	1.4	0.3	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	0
0	0	0	0	0	0	0	0	0
0	0.7	0	22.6	0.5	2.2	0	0.2	0
17.7	**73.9**	**20.6**	**396**	**91.9**	**50.2**	**23.1**	**9.4**	**4.6**
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	0.1	0	0	0	0
0	0	0	0.7	0.3	0	0	0	0
0	0	0	1.8	1.4	0	0	0	0
0	0	0	0.3	0.3	0	0	0	0
0	0	0	2.9	2.1	0	0	0	0
0	0	0	6.7	0.6	0	0	0	0
0	0	0	23.8	15.5	0	0	0	0
0	0	0	5.7	3.5	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	4.5	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	40.7	19.6	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0.1	0	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.1	0	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.1	0.1	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	0.2	0.1	0	0	0	0
0	0	0	0.7	0.1	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	0.6	0	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	0.2	0.1	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	0.5	0.1	0	0	0	0
0	0	0	0.3	0.1	0	0	0	0
0	0	0	0.1	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0.2	0.1	0	0	0	0

0	0	0	0.4	0.1	0	0	0	0
0	0	0	0.2	0.1	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.3	0.1	0	0	0	0
0	0	0	0.1	0	0	0	0	0
0	0	0	0	0.1	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0.2	0.1	0	0	0	0
0	0	0	0.1	0.1	0	0	0	0
0	0	0	0.2	0.1	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	0	0	0	0
0	0	0	0.2	0.1	0	0	0	0
0	0	0	0.2	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	6.3	2.3	0	0	0	0
0	0	0	0.4	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0
0	0	0	0.4	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0
0	0	0	0.4	0	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	1	0	0	0	0	0
0	0	0	0.4	0	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	0.2	0	0	0	0	0
0	0	0	0.3	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0.5	0	0	0	0	0

0	0	0	6	0	0	0	0	0
0	0	0	55.9	24	0	0	0	0
17.7	73.9	20.6	451.9	115.9	50.2	23.1	9.4	4.6

Total	
Cons.	Oper.
54.2	17
6.2	0
0.4	0.4
0.2	0
6	0
0	0
236.7	85.9
30.1	0
0.2	0.2
11.1	0.7
8.3	0
34.5	0
0.1	0
248.7	139
40.8	0
0.1	0.1
23.5	0.6
4.5	0
30.3	0
0	0
72.3	40.5
13.5	0
0	0
6.9	0.4
8.8	0

0	0
0.3	0.1
837.7	284.9
438.1	220.4
131.3	0
1.1	1.1
21.6	2.1
39.3	0
52.5	0
0.3	0.1
341.9	171.8
92.4	0
0.7	0.7
28.2	2.5
21.9	0
101.1	0
0.6	0.2
220.9	111.8
47.4	0
0.8	0.8
57.2	2.5
25.6	0
77.3	0
1.4	0.5
107.4	53.7
13.3	0
0.4	0.4
39	4.2
0	0
0	0

396.9	199.7
94.3	0
0.5	0.5
23.4	0.1
28.8	0
42.5	0
0.9	0.3
2449	773.4
30.7	8
1.7	0
1.1	1.1
14.8	3.7
4.1	0
44.7	0
97.1	12.8
103.2	26
15.1	0
0.9	0.9
8.1	0.2
6.7	0
30.9	0
164.9	27.1
27.1	0
2	0
0.3	0.2
1.5	0.4
0	0

0	0
0	0
0	0
0	0
0	0
21.9	0
0	0
52.8	0.6
3601.5	**1098.8**
50.1	39.2
33.5	33.5
9.1	4.1
4.8	3.1
2.3	1.8
4.8	4.4
2.4	2.4
107	88.5
32	1.4
36.1	15.5
30	3.5
13.7	0
10.7	0
10.5	0

17.7	0
11.2	0
9	0
170.9	20.4
0.8	0
0.1	0
0.2	0.1
0.7	0
0.2	0.1
0.2	0.1
0.2	0.1
0.2	0
0.3	0.1
0	0
0.4	0
0	0
0.7	0
0.3	0.1
1.7	0.1
0	0
0	0
0.6	0
1.1	0.1
0.3	0.1
0.5	0
0.6	0.1
0.6	0.1
0.5	0
0	0
0.5	0.1

0.5	0.1
0.3	0.1
0.3	0.1
0.4	0.1
0.4	0.1
0.2	0.1
0.3	0.1
0.3	0
0.3	0.1
0.2	0.1
0.3	0.1
0.4	0
0.2	0
0.2	0.1
0.3	0.1
0.8	0
0.7	0
16.8	2.4
1	0
0.8	0
0.9	0
1.2	0
0.8	0
0.6	0
1	0
0.9	0
0.7	0
0.5	0
0.3	0
0.6	0
0.9	0
0.1	0
1.3	0

11.6	0
306.3	111.3
3907.8	1210.1

USEPA AP-42 (Paved Roads)	E=(k * (sL)^.91 * (W)^1.02) * (1 - P/4N)			
USEPA AP-42 (Unpaved Roads)	E = (k * (s/12)^a * (W/3)^b * ((365-P)/365)			
	Columbia			
	Unpaved		Paved	
	PM 2.5	PM 10	PM 2.5	PM 10
k (lb/VMT)	0.15	1.5	0.00054	0.0022
sL (silt loading)	-	-	0.2	0.2
s (silt content - %)	39.50%	39.50%	-	-
W (mean vehicle weight - tons)	3.707386	3.707386	3.707386	3.707386
P (number of days/yr with at least .01 inches precipitation)	120	120	120	120
a (const)	0.9	0.9	-	-
b (const)	0.45	0.45	-	-
N (days in averaging period)	365	365	365	365
Uncontrolled Emissions Factor (lb/VMT)	0.005129	0.051288	0.000436	0.001776
Control Efficiency (%)	50%	50%	50%	50%
Controlled Emissions Factor (lb/VMT)	0.002564	0.025644	0.000218	0.000888
Primary Soil Type	Inceptisols			
Silt % (0-10cm)	39.50%			

Luzerne				Wyoming				
Unpaved		Paved		Unpaved		Paved		Unpa
PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5
0.15	1.5	0.00054	0.0022	0.15	1.5	0.00054	0.0022	0.15
-	-	0.2	0.2	-	-	0.2	0.2	-
39.50%	39.50%	-	-	39.50%	39.50%	-	-	39.50%
3.707386	3.707386	3.707386	3.707386	3.707386	3.707386	3.707386	3.707386	3.707386
120	120	120	120	140	140	140	140	140
0.9	0.9	-	-	0.9	0.9	-	-	0.9
0.45	0.45	-	-	0.45	0.45	-	-	0.45
365	365	365	365	365	365	365	365	365
0.005129	0.051288	0.000436	0.001776	0.00471	0.047101	0.00043	0.00175	0.00471
50%	50%	50%	50%	50%	50%	50%	50%	50%
0.002564	0.025644	0.000218	0.000888	0.002355	0.023551	0.000215	0.000875	0.002355

Inceptisols	Inceptisols
39.50%	39.50%

Susquehanna				Lancaster				Leba
aved	Paved		Unpaved		Paved		Unpaved	
PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10
1.5	0.00054	0.0022	0.15	1.5	0.00054	0.0022	0.15	1.5
-	0.2	0.2	-	-	0.2	0.2	-	-
39.50%	-	-	61%	61%	-	-	39.50%	39.50%
3.707386	3.707386	3.707386	5.765766	5.765766	5.765766	5.765766	5.765766	5.765766
140	140	140	120	120	120	120	120	120
0.9	-	-	0.9	0.9	-	-	0.9	0.9
0.45	-	-	0.45	0.45	-	-	0.45	0.45
365	365	365	365	365	365	365	365	365
0.047101	0.00043	0.00175	0.009251	0.092508	0.000684	0.002787	0.006256	0.062563
50%	50%	50%	50%	50%	50%	50%	50%	50%
0.023551	0.000215	0.000875	0.004625	0.046254	0.000342	0.001394	0.003128	0.031282

Inceptisols	Mollisols	Incep
39.50%	61%	39.5

anon				Schuylkill				Northumberland	
Paved		Unpaved		Paved		Unpaved		Pav	
PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	
0.00054	0.0022	0.15	1.5	0.00054	0.0022	0.15	1.5	0.00054	
0.2	0.2	-	-	0.2	0.2	-	-	0.2	
-	-	39.50%	39.50%	-	-	39.50%	39.50%	-	
5.765766	5.765766	5.818584	5.818584	5.818584	5.818584	5.818584	5.818584	5.818584	
120	120	120	120	120	120	120	120	120	
-	-	0.9	0.9	-	-	0.9	0.9	-	
-	-	0.45	0.45	-	-	0.45	0.45	-	
365	365	365	365	365	365	365	365	365	
0.000684	0.002787	0.006282	0.062821	0.000691	0.002813	0.006282	0.062821	0.000691	
50%	50%	50%	50%	50%	50%	50%	50%	50%	
0.000342	0.001394	0.003141	0.03141	0.000345	0.001407	0.003141	0.03141	0.000345	

tisols	Inceptisols	Inceptisols
50%	39.50%	39.50%

	Columbia				Clinton				
ved	Unpaved		Paved		Unpaved		Paved		
PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	
0.0022	0.15	1.5	0.00054	0.0022	0.15	1.5	0.00054	0.0022	
0.2	-	-	0.2	0.2	-	-	0.2	0.2	
-	39.50%	39.50%	-	-	39.50%	39.50%	-	-	
5.818584	3.707386	3.707386	3.707386	3.707386	3.541667	3.541667	3.541667	3.541667	
120	120	120	120	120	160	160	160	160	
-	0.9	0.9	-	-	0.9	0.9	-	-	
-	0.45	0.45	-	-	0.45	0.45	-	-	
365	365	365	365	365	365	365	365	365	
0.002813	0.005129	0.051288	0.000436	0.001776	0.004204	0.04204	0.000404	0.001645	
50%	50%	50%	50%	50%	50%	50%	50%	50%	
0.001407	0.002564	0.025644	0.000218	0.000888	0.002102	0.02102	0.000202	0.000822	

Inceptisols	Inceptisols
39.50%	39.50%

Lycoming				Prince William			
Unpaved		Paved		Unpaved		Paved	
PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10	PM 2.5	PM 10
0.15	1.5	0.00054	0.0022	0.15	1.5	0.00054	0.0022
-	-	0.2	0.2	-	-	0.2	0.2
39.50%	39.50%	-	-	12%	12%	-	-
3.707386	3.707386	3.707386	3.707386	3.541667	3.541667	3.541667	3.541667
150	150	150	150	120	120	120	120
0.9	0.9	-	-	0.9	0.9	-	-
0.45	0.45	-	-	0.45	0.45	-	-
365	365	365	365	365	365	365	365
0.004501	0.045008	0.000426	0.001737	0.001758	0.017581	0.000416	0.001696
50%	50%	50%	50%	50%	50%	50%	50%
0.00225	0.022504	0.000213	0.000868	0.000879	0.008791	0.000208	0.000848

Inceptisols	Alfisols
39.50%	12%

Fairfax			
Unpaved		Paved	
PM 2.5	PM 10	PM 2.5	PM 10
0.15	1.5	0.00054	0.0022
-	-	0.2	0.2
39.50%	39.50%	-	-
3.541667	3.541667	3.541667	3.541667
120	120	120	120
0.9	0.9	-	-
0.45	0.45	-	-
365	365	365	365
0.005024	0.050243	0.000416	0.001696
50%	50%	50%	50%
0.002512	0.025122	0.000208	0.000848

Inceptisols
39.50%

Pipeline Segment - Un-Collocated CPL North (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
July	24	192	33%
August	24	192	33%
September	24	192	33%
October	24	192	33%
November	24	192	33%
December	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	95	40
Company trucks	Light Commercial Truck	20	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	60	100
All Traveling Vehicles		176	340

Project Emissions

Equipment	Avg Qty	HP	Weekly Work Hours
Worker	95	NA	NA
Company Trucks	20	NA	NA
Delivery	1	NA	NA
Contractor	60	NA	NA
Water	8	8	27
Generator	5	13	24
Air	6	140	36
Sandblasting	5	NA	NA
Gators	6	12	24
Excavator	18	89	54
Crane	1	175	48
Welding	24	33	40.5
Welding	24	345	13.5

RT	6	124	36
Dozer	10	410	54
Front	2	180	54
Side	15	347	54
Motor	1	183	54
HDD	1	800	72

Pipeline Segment - Collocated CPL North (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
July	24	192	100%
August	24	192	33%
September	24	192	33%
October	24	192	33%
November	24	192	33%
December	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	95	40
Company trucks	Light Commercial Truck	20	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	60	100
All Traveling Vehicles		176	340

Project Emissions

Equipment	Avg Qty	HP		Weekly Work Hours
Worker	95	NA	NA	
Company	20	NA	NA	
Delivery	1	NA	NA	
Contractor	60	NA	NA	
Water	8	8		27
Generator	5	13		24

Air	6	140	36
Sandblasting	5	NA	NA
Gators	6	12	24
Excavator	18	89	54
Crane	1	175	48
Welding	24	33	41
Welding	24	345	13.5
RT	6	124	36
Dozer	10	410	54
Front	2	180	54
Side	15	347	54
Motor	1	183	54

Summary - CPL North (2017)

Equipment Type	MOVES Equip Typ	Total Avg Qty	Total VMT
Worker commute vehicles	Passenger Car	190	1,394,448
Company trucks	Light Commercial Truck	40	733,920
Delivery Trucks	Combination Short-haul Truck	2	36,696
Contractor trucks	Light Commercial Truck	120	2,201,760
All Traveling Vehicles		352	4,366,824

Pipeline Segment - CPLS Spread 6/7 (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	0	0	100%
February	0	0	100%
March	24	240	100%
April	24	240	100%
May	25	250	100%
June	24	240	100%
July	25	250	100%
August	25	250	100%
September	24	240	100%
October	24	240	100%
November	24	240	100%
December	6	60	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	112	46

Company trucks	Light Commercial Truck	64	91
Delivery Trucks	Combination Short-haul Truck	45	91
Contractor trucks	Light Commercial Truck	1	91
All Traveling Vehicles		222	319

Pipeline Segment - CPLS Spread 5/6 (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	0	0	100%
February	0	0	100%
March	24	240	100%
April	24	240	100%
May	25	250	100%
June	24	240	100%
July	25	250	100%
August	25	250	100%
September	24	240	100%
October	24	240	100%
November	24	240	100%
December	6	60	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	110	46
Company trucks	Light Commercial Truck	0	0
Delivery Trucks	Combination Short-haul Truck	46	91
Contractor trucks	Light Commercial Truck	70	91
All Traveling Vehicles		226	228

Pipeline Segment - CPLS Spread 4 (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%

July	24	192	100%
August	24	192	100%
September	24	192	33%
October	24	192	33%
November	24	192	33%
December	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	95	40
Company trucks	Light Commercial Truck	20	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	60	100
All Traveling Vehicles		176	340

Summary - CPL South (2017)

Equipment Type	MOVES Equip Typ	Total Avg Qty	Total VMT
Worker commute vehicles	Passenger Car	317	2,975,491
Company trucks	Light Commercial Truck	84	1,673,760
Delivery Trucks	Combination Short-haul Truck	92	1,813,387
Contractor trucks	Light Commercial Truck	131	2,644,243
All Traveling Vehicles		624	9,106,881

Pipeline Segment - Chapman Loop (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
March	24	192	33%
April	24	192	100%
May	24	192	100%
June	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	53	70
Company trucks	Light Commercial Truck	10	100
Delivery Trucks	Combination Short-haul Truck	1	100

Contractor trucks	Light Commercial Truck	20	100
All Traveling Vehicles		84	370

Pipeline Segment - Unity (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
March	24	192	33%
April	24	192	70%
May	24	192	100%
June	24	192	100%
July	24	192	100%
August	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	95	40
Company trucks	Light Commercial Truck	20	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	60	100
All Traveling Vehicles		176	340

Pipeline Segment - Mainline A & B Replacements (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	53	70
Company trucks	Light Commercial Truck	10	100
Delivery Trucks	Combination Short-haul Truck	1	100

Contractor trucks	Light Commercial Truck	20	100
All Traveling Vehicles		84	370

Compressor Stations 610 & 605 - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
July	24	192	100%
August	24	192	100%
September	24	192	100%
October	24	192	100%
November	24	192	100%
December	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	30	50
Company trucks	Light Commercial Truck	6	50
Delivery Trucks	Combination Short-haul Truck	2	50
Contractor trucks	Light Commercial Truck	10	50
All Traveling Vehicles		48	200

Zick Meter Station - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	100%
February	24	192	100%
March	24	192	100%
April	24	192	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	8	40
Company trucks	Light Commercial Truck	5	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	5	100
All Traveling Vehicles		19	340

Springville Meter Station - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	8	40
Company trucks	Light Commercial Truck	5	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	5	100
All Traveling Vehicles		19	340

North Diamond Regulator Stations - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	8	40
Company trucks	Light Commercial Truck	5	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	5	100
All Traveling Vehicles		19	340

West Diamond Regulator Station - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	100%
February	24	192	100%
March	24	192	100%
April	24	192	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	8	40
Company trucks	Light Commercial Truck	5	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	5	100
All Traveling Vehicles		19	340

River Road Regulator Station - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	100%
February	24	192	100%
March	24	192	100%
April	24	192	100%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	8	40
Company trucks	Light Commercial Truck	5	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	5	100
All Traveling Vehicles		19	340

Modified Compressor Stations 517, 520, 190- Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%
March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
July	24	192	100%
August	24	192	100%
September	24	192	100%
October	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	18	50
Company trucks	Light Commercial Truck	5	50
Delivery Trucks	Combination Short-haul Truck	1	50
Contractor trucks	Light Commercial Truck	10	50
All Traveling Vehicles		34	200

Compressor Stations 185, 170, 160, 150, 145 - Atlantic Sunrise (2017)

Construction Duration

Month	Total Work Days	Total Work Hours	% of Actual Work Hours
January	24	192	33%
February	24	192	100%

March	24	192	100%
April	24	192	100%
May	24	192	100%
June	24	192	100%
July	24	192	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	18	50
Company trucks	Light Commercial Truck	5	50
Delivery Trucks	Combination Short-haul Truck	1	50
Contractor trucks	Light Commercial Truck	10	50
All Traveling Vehicles		34	200

Meter Stations (42) - Atlantic Sunrise (2017)

Construction Duration

Month Example	Total Work Days	Total Work Hours	% of Actual Work Hours
Wk 1	6	48	33%
Wk 2-4	18	144	100%
Wk 5	6	48	33%
Total			

OnRoad Emission Factors

Equipment Type	MOVES Equip Typ	Avg Qty	Daily Avg Round Trip (mi)
Worker commute vehicles	Passenger Car	1	40
Company trucks	Light Commercial Truck	1	100
Delivery Trucks	Combination Short-haul Truck	1	100
Contractor trucks	Light Commercial Truck	1	100
All Traveling Vehicles		4	340

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
1401	175.44	29.1	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
666,672	2.5	5000
350,880	5	10000
17,544	15	30000
1,052,640	5	10000
2,087,736	3.707386	7414.773

Total Work Hours
NA
NA
NA
NA
6,316
3,509
6,316
NA
4,211
28,421
1,404
28,421
9,474

6,316
15,790
3,158
23,684
1,579
2,105

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
1530	191.52	31.8	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
727,776	2.5	5000
383,040	5	10000
19,152	15	30000
1,149,120	5	10000
2,279,088	3.707386	7414.773

Total Work Hours
NA
NA
NA
NA
6,895
3,830

6,895
NA
4,596
31,026
1,532
31,026
10,342
6,895
17,237
3,447
25,855
1,724

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
0	0	0	10-hour work days and 6-day work weeks
0	0	0	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
60	6	1	10-hour work days and 6-day work weeks
2250	225	37.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
1,103,155	2.5	5000

1,258,560	5	10000
886,464	15	30000
19,699	5	10000
3,267,878	5.765766	11531.53

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
0	0	0	10-hour work days and 6-day work weeks
0	0	0	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
250	25	4.2	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
240	24	4	10-hour work days and 6-day work weeks
60	6	1	10-hour work days and 6-day work weeks
2250	225	37.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
1,083,456	2.5	5000
0	5	10000
906,163	15	30000
1,378,944	5	10000
3,368,563	5.818584	11637.17

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks

192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
1659	207.6	34.5	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
788,880	2.5	5000
415,200	5	10000
20,760	15	30000
1,245,600	5	10000
2,470,440	3.707386	7414.773

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
510	63.84	10.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
207,463	2.5	5000
55,920	5	10000
5,592	15	30000

111,840	5	10000
380,815	3.541667	7083.333

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
134	16.8	2.8	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
836	104.64	17.4	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
397,632	2.5	5000
209,280	5	10000
10,464	15	30000
627,840	5	10000
1,245,216	3.707386	7414.773

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
510	63.84	10.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
236,846	2.5	5000
63,840	5	10000
6,384	15	30000

127,680	5	10000
434,750	3.541667	7083.333

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
2046	255.84	42.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
383,760	2.5	5000
76,752	5	10000
25,584	15	30000
127,920	5	10000
614,016	3.854167	7708.333

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
768	96	16	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
30,720	2.5	5000
48,000	5	10000
9,600	15	30000
48,000	5	10000
136,320	4.473684	8947.368

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
768	96	16	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
30,720	2.5	5000
48,000	5	10000
9,600	15	30000
48,000	5	10000
136,320	4.473684	8947.368

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
768	96	16	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
30,720	2.5	5000
48,000	5	10000
9,600	15	30000
48,000	5	10000
136,320	4.473684	8947.368

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
768	96	16	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
30,720	2.5	5000
48,000	5	10000
9,600	15	30000
48,000	5	10000
136,320	4.473684	8947.368

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
768	96	16	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
30,720	2.5	5000
48,000	5	10000
9,600	15	30000
48,000	5	10000
136,320	4.473684	8947.368

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
1662	207.84	34.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
181,860	2.5	5000
51,960	5	10000
10,392	15	30000
103,920	5	10000
348,132	3.970588	7941.176

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
63	7.92	1.3	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks

192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
192	24	4	8-hour work days and 6-day work weeks
63	7.92	1.3	8-hour work days and 6-day work weeks
1086	135.84	22.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
118,860	2.5	5000
33,960	5	10000
6,792	15	30000
67,920	5	10000
227,532	3.970588	7941.176

Actual Work Hours	Actual Work Days	Actual Work Weeks	Notes
16	1.98	0.3	8-hour work days and 6-day work weeks
144	18	3	8-hour work days and 6-day work weeks
16	1.98	0.3	8-hour work days and 6-day work weeks
176	21.96	3.6	

Total VMT	Avg Weight (tons)	Avg Weight (lbs)
878	2.5	5000
2,196	5	10000
2,196	15	30000
2,196	5	10000
7,466	6.875	13750

0	0
0	0
0	0

0	0
0	0
0	0

0	0
0	0
0	0

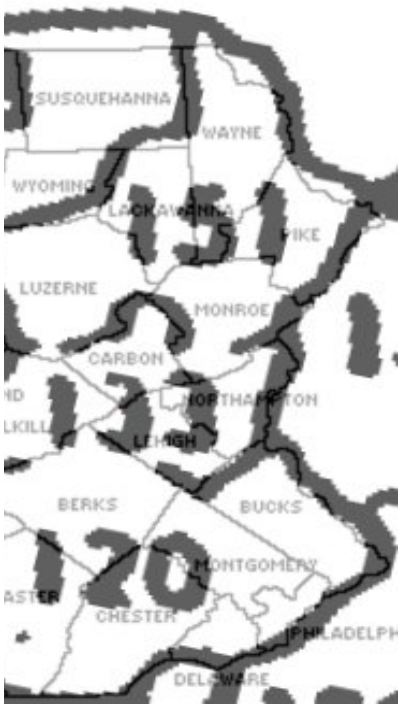
0	0
0	0
0	0

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				



County	Unpaved PM 2.5 Emission (lbs/yr)	Unpaved PM 10 Emission (lbs/yr)	Paved PM 2.5 Emission (lbs/yr)	Paved PM 10 Emission (lbs/yr)	Unpaved PM 2.5 Emission (TPY)	Unpaved PM 10 Emission (TPY)
Columbia	13.42717	134.2717	3.424704469	27.90499938	0.006714	0.067136
Luzerne	745.2077	7452.077	190.0710981	774.3637328	0.372604	3.726039
Wyoming	1448.901	14489.01	396.3967636	1614.949778	0.72445	7.244504
Susquehanna	425.4219	4254.219	116.388837	474.1767432	0.212711	2.12711
Lancaster	6.346049	63.46049	1044.976461	4257.311509	0.003173	0.03173
Lebanon	732.3615	7323.615	240.2614344	978.8428809	0.366181	3.661807
Schuylkill	1920.7	19207	633.3962741	2580.503339	0.96035	9.603501
Northumberlan	1309.568	13095.68	431.861096	1759.434095	0.654784	6.547841
Columbia	641.4933	6414.933	163.6179241	666.5915425	0.320747	3.207467
Clinton	200.1195	2001.195	57.65788457	234.9024927	0.10006	1.000598
Lycoming	700.5543	7005.543	199.0557196	810.9677466	0.350277	3.502771
Wyoming	361.5104	3615.104	98.90364384	402.9407712	0.180755	1.807552
Columbia	393.6447	3936.447	100.4021839	409.0459344	0.196822	1.968224
Susquehanna	80.26029	802.6029	21.95796971	89.45839511	0.04013	0.401301
Wyoming	80.26029	802.6029	21.95796971	89.45839511	0.04013	0.401301
Luzerne	87.39454	873.9454	22.29066622	90.81382533	0.043697	0.436973
Columbia	87.39454	873.9454	22.29066622	90.81382533	0.043697	0.436973
Lancaster	157.6336	1576.336	34.97421526	142.4875436	0.078817	0.788168
Columbia	223.1869	2231.869	56.92557374	231.9190041	0.111593	1.115934
Lycoming	195.8579	1958.579	55.65112059	226.7267876	0.097929	0.979289
Columbia						
Luzerne						
Wyoming						
Susquehanna						
Columbia						
Luzerne						
Wyoming						
Susquehanna						
Lancaster						
Lebanon						
Schuylkill						
Northumberland						
Columbia						
Clinton						
Lycoming						
Wyoming						
Columbia						
Susquehanna						
Wyoming						

Luzerne
Columbia
Lancaster
Columbia
Lycoming

Wyoming

Paved PM 2.5 Emission (TPY)	Paved PM 10 Emission (TPY)	PM 2.5 Total (TPY)	PM 10 Total (TPY)
0.001712	0.013952	0.008426	0.081088
0.095036	0.387182	0.467639	4.11322
0.198198	0.807475	0.922649	8.051979
0.058194	0.237088	0.270905	2.364198
0.522488	2.128656	0.525661	2.160386
0.120131	0.489421	0.486311	4.151229
0.316698	1.290252	1.277048	10.89375
0.215931	0.879717	0.870715	7.427558
0.081809	0.333296	0.402556	3.540762
0.028829	0.117451	0.128889	1.118049
0.099528	0.405484	0.449805	3.908255
0.049452	0.20147	0.230207	2.009023
0.050201	0.204523	0.247023	2.172746
0.010979	0.044729	0.051109	0.446031
0.010979	0.044729	0.051109	0.446031
0.011145	0.045407	0.054843	0.48238
0.011145	0.045407	0.054843	0.48238
0.017487	0.071244	0.096304	0.859412
0.028463	0.11596	0.140056	1.231894
0.027826	0.113363	0.125754	1.092653
		3.788041	25.25361
		14.78336	98.55571
		20.503	136.6867
		5.99944	39.99627
		3.468657	23.12438
		13.53692	90.24611
		18.77431	125.1621
		5.493605	36.62403
		90.04728	600.3152
		50.00862	333.3908
		33.10994	220.7329
		13.31135	88.74237
		36.00434	240.0289
		1.815186	12.10124
		5.094192	33.96128
		3.948343	26.32229
		2.532788	16.88525
		0.269199	1.794663
		0.141995	0.946635

0.05317	0.354466
0.136223	0.908154
0.107815	0.718764
1.965303	13.10202
2.217107	14.78071

0.005423	0.036156

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