

APPENDIX N

Air Quality Analysis





Mercer County

Trenton Mercer Airport

Township of Ewing, New Jersey

Appendix N - Air Quality
Assessment for Obstruction
Mitigation

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Section 1 – Background

1.1 Introduction

Mercer County (County) is preparing an Environmental Assessment to support the removal of airspace obstructions and mitigate incompatible land uses at Trenton-Mercer County Airport (TTN). The purpose for this project is to enhance the safety and efficiency of aircraft operations conducted at the airport by addressing obstructions to navigable airspace and to enhance the protection of people and property on the ground by addressing incompatible land uses within the runway protection zones. Throughout the planning process, alternative plans were analyzed based on a multitude of environmental criteria. The evaluation of development alternatives culminated in the selection of a preferred alternative (Proposed Project) that will be further analyzed under this report to determine its potential impacts to air quality.

The purpose of this document is to quantify criteria pollutant and greenhouse gas emissions associated with the construction and operation of the Proposed Project and to assess and propose mitigation measures for potential impacts relating to air quality, as necessary. This document summarizes the results as well as describes the technical approach, methodology, and data sources developed in support of the criteria pollutant and green-house gas emissions inventory for TTN.

1.2 Project Description

The proposed project mitigates obstructions and incompatible land uses within the runway protection zones (RPZ) and includes the following:

On-airport obstruction mitigation includes the following:

- Removal of tree canopy areas (64.62 acres)
- Removal of individual trees (53 trees)
- Grading of 3.3 acres of terrain
- Lighting of three areas of fence and two antennas
- Removal of four utility poles

Off airport obstruction mitigation includes the following:

- Right of first refusal/avigation easement or fee simple acquisition of ten residences to remove residential structures that penetrate the FAR Part 77 or departure surfaces (ten houses, three sheds, one gazebo)
- Removal of tree canopy areas (16.8 acres)
- Removal of individual trees (111 trees)
- Avigation easement for 47 parcels
- Lighting of nine utility poles and one transmission tower

- Installing four obstruction lights to mark a railroad (Runway 34 end)
- Removal and/or lowering of two communication towers (if relocated impacts not assessed as part of this EA)

RPZ Mitigation:

- Right of first refusal/aviation easement or fee simple acquisition of six residences to remove buildings within the RPZ

It should be noted that this analysis does not include the following projects that are listed in the preferred alternative of the EA report:

- Acquire on airport/critical property aviation easement or one time right of entry (see Appendix F for off airport parcels affected)
- Acquire right of first refusal for the purchase of residences and/or residential structures
- Acquire off airport aviation easement or one time right of entry for 121 parcels (see Appendix F for off airport parcels affected)
- RPZ mitigation comprised of acquiring right of first refusal for the purchase of six residences to remove buildings
- Removal and relocation of two communication towers

Property acquisitions were not included in the analysis as there are no emissions associated with the transfer of ownership. At this time a plan for the removal and relocation of two communication towers has not been developed, therefore this portion of the work was not included in the analysis. Air quality impacts for the removal and relocation of the two communication towers will be included in future environmental review.

Due to the nature of the project, there would be a temporary increase in emissions during construction due to the use of various construction equipment and travel by contractors.

1.3 Regulatory Setting

In accordance with FAA requirements, air quality requires consideration under both the Clean Air Act (CAA) and the National Environmental Policy Act (NEPA).

1.3.1 Clean Air Act

Under the Federal Clean Air Act (CAA) (42 U.S.C. § 7401-7671q), the USEPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), ozone, and lead. Under the CAA, if a proposed action is subject to Federal funding

or approval, it must conform to the goals set forth for eliminating or reducing the number of violations of the NAAQS in the state or region in which the action is to take place. An area that violates a national primary or secondary NAAQS for one or more of the USEPA designated criteria pollutants is referred to as ‘nonattainment’. According to the CAA, the NAAQS are applicable to all areas of the United States and associated territories. Each nonattainment area is required to have an applicable State Implementation Plan (SIP) that prescribes mitigation measures and timelines necessary to bring ambient concentrations of criteria pollutants below the NAAQS. When a nonattainment area successfully reduces criteria pollutant concentrations below the NAAQS, EPA re-designates the area a ‘maintenance area’. For actions planned to occur in a nonattainment or maintenance area, the proposed impacts to air quality must conform to the conditions of the applicable SIP, also known as *General Conformity*.

1.3.2 Conformity

The General Conformity Rule ensures that federal actions comply with the NAAQS. In order to meet the CAA requirement, a federal agency must demonstrate that every action that it undertakes, approves, permits or supports will conform to the appropriate state implementation plan (SIP). The USEPA promulgated the initial conformity regulations in 1993¹ to assist federal agencies in complying with the SIP by specifying rules for two categories of federal actions: transportation actions and general actions. The two rules have separate and distinct applicability and evaluation requirements. Transportation conformity applies to highway and transit projects, while general conformity regulations apply to other federal actions that are not transportation projects, such as federal funding for maintenance and repair and new construction projects at existing airports.

The General Conformity Rule, published under 40 CFR Part 93, applies only to an action that is federally-funded or federally-approved and only for pollutants causing the area to be designated as nonattainment or maintenance. The net increase in emissions of the applicable pollutants are compared against the threshold levels established in the Rule, known as the *de minimis* thresholds, published at 40 CFR 93.153(b)(1)-(b), Applicability Analysis. Under the General Conformity Rule, if the net increase in emissions due to a federal action equals or exceeds USEPA established *de minimis* thresholds, a General Conformity Determination would be required. As previously mentioned, the General Conformity Rule applies to a federal action that is located in an area designated nonattainment or maintenance by the USEPA.

The study area is located in Mercer County. According to the USEPA Green Book² (current as of February 13, 2017 Mercer County is classified as marginal nonattainment for 8-hour

¹ 40 CFR Part 51 and Part 93

² USEPA Green Book. Accessed February 13, 2017. Available at: https://www3.epa.gov/airquality/green-book/anayo_nj.html

ozone due to having a design value of 0.076 ppm to 0.086 ppm. The county also has designation of maintenance for carbon monoxide and PM_{2.5}. Therefore, General Conformity applies to this project.

1.3.3 NEPA

In 1970, the National Environmental Policy Act (NEPA) and its amendments, established a broad national policy to protect the quality of the human environment and provide for the establishment of a Council on Environmental Quality (CEQ). The act provides policies and goals to ensure that environmental considerations are given careful attention and appropriate weight in all decisions of the Federal Government. The NEPA environmental review process discloses these impacts on the human environment. As part of the NEPA process, the proposed action's impact on air quality is assessed by evaluating the impact of the proposed action on the NAAQS.

1.3.4 Climate Change

There are no federal or state standards for aviation-related greenhouse gas (GHG) emissions. The CEQ has indicated that climate should be considered in NEPA analyses. As noted by CEQ, "federal agencies, to remain consistent with NEPA, should consider the extent to which a proposed action and its reasonable alternatives contribute to climate change through GHG emissions and take into account the ways in which a changing climate over the life of the proposed project may alter the overall environmental implications of such actions" (CEQ December 18, 2014).

1.4 Significant Impact Threshold

1.4.1 Criteria Pollutants

Potentially significant air quality impacts would occur if a proposed project would cause pollutant concentrations to exceed one or more of the NAAQS for any of the time periods analyzed or to increase the frequency or severity of any such existing violations. **Table 1-1** presents the applicable *de minimis* thresholds for pollutants based on their nonattainment status under the General Conformity Rule.

Table 1-1: Clean Air Act *De Minimis* Thresholds

Pollutant	Nonattainment Area Threshold (tons per year)	Maintenance Area Threshold (tons per year)
Carbon Monoxide (CO)	100	100
Particulate Matter (PM₁₀)		100
Moderate Nonattainment Area	100	
Serious Nonattainment Area	70	
Particulate Matter (PM_{2.5})		
Direct Emissions	100	100
SO ₂	100	100
NO _x	100	100
VOC or Ammonia	100	100
Sulfur Dioxide (SO₂)	100	
Nitrogen Dioxide (NO₂)	100	
Lead (Pb)	25	25
Ozone (O₃)	<i>VOC/NO_x</i>	<i>VOC/NO_x</i>
Serious Nonattainment Area	50/50	
Severe Nonattainment Area	25/25	
Extreme Nonattainment Area	10/10	
Inside an ozone transport region:	50/100	50/100
Outside an ozone transport region:	100/100	100/100

Source: 40 CFR 93.153(b)(1) & (2)

As previously mentioned, the General Conformity Rule applies only to a federal action that is located in an area designated nonattainment or maintenance by the USEPA. Since the Proposed Project is located in a nonattainment area, General Conformity Applicability applies to this project.

1.4.2 Greenhouse Gas Pollutants

Since there are no federal or state standards for aviation-related GHG emissions, there is no significant impact threshold for GHGs.

Section 2—Construction Emission Inventory

2.1 Methodology

In accordance with the FAA *Air Quality Handbook*, a construction emissions inventory was conducted to determine the expected emissions associated with heavy equipment, deliveries, and worker mobilization. At this time a definitive schedule for construction has not been developed. In order to provide a conservative, “worst-case” estimate, emissions were assumed to occur within the shortest realistic time frame. The soonest construction could occur is in 2018. Therefore all of the on airport and critical obstruction mitigation was assumed to occur during 2018. In addition, all of the remaining off airport obstruction mitigation would occur in 2021 due to the time needed to acquire the necessary easements, establish land access agreements, and complete potential impact studies that may be required for other environmental resources. The following is a list of activities modeled per year:

- 2018
 - On airport terrain obstruction removal
 - On airport tree obstruction removal
 - On airport utility pole removal and replace/light fence
- 2021
 - Off airport tree obstruction removal
 - Off airport railroad obstruction lighting

The construction vehicle fleet properties were not known at the time of this analysis; therefore the software contained in the *ACRP Report 102: Guidance for Estimating Airport Construction Emissions* was utilized to generate default equipment lists for each construction project. ACRP Report 102 provides guidance and an interactive modeling tool, called Airport Construction Emissions Inventory Tool (ACEIT), to assist airports and other stakeholders in developing airport construction emission inventories. It should be noted that representatives from USEPA participated on the ACRP panel for the ACEIT modeling tool. ACEIT has the capabilities of calculating emissions from off-road sources (such as heavy duty construction equipment), on-road sources (such as passenger vehicles or tractor trailers for material deliveries), and fugitive sources. Fugitive sources include dust (particulate matter) produced from material movement, soil handling, and unstabilized land and wind erosion as well as evaporative emissions (PM₁₀, CO, NO_x, SO_x, and VOC) from asphalt paving, storage, and batching.

ACEIT can model projects based on known equipment use information or based on known project types. For this analysis, project types (i.e., tree clearing, site work, etc.) that match the scope of the work were selected and the model automatically selected a standard mix of activities for the project type. For example, if the “hangar building” project type is selected, typical construction activities such as concrete foundations, roofing, and masonry work are

automatically selected. The user is later prompted to enter overall size information, such as the dimensions of a building or parking lot, as well as the overall cost of the project. These inputs are used to calculate an assumed off-road construction equipment usage (in hours), on-road vehicle usage (in miles), and inputs for fugitive emission calculations.

ACEIT has emission factors for fugitive and mobile sources incorporated into the software in order to calculate emissions, however the emission factors for mobile sources have been updated and rereleased in other models. Therefore, fugitive source emissions were calculated through ACEIT while emission factors for each of the equipment types specified in ACEIT were generated through the latest version of USEPA's MOTO Vehicle Emission Simulator (MOVES2014a). MOVES2014a is the latest version of emissions modeling software for mobile sources that was developed as a combination of two legacy models – NONROAD (which was previously only for off-road vehicles) and MOVES2012 (which was previously only for on-road vehicles).

In order to be conservative, it was assumed that all equipment would be operating on diesel, with the exception of chain saws and on-road passenger vehicles for construction employees, which are assumed to operate on gasoline.

2.2 Results

Based on the results for the ACEIT and MOVES2014a modeling programs, **Table 2** presents the expected annual construction emissions by year of nonattainment or maintenance pollutants as a result of the proposed project. ACEIT modeling results are included within **Appendix A**.

Table 2: De Minimis Thresholds and Construction Emissions by Year

Year	Source	CO	PM _{2.5}	VOC	NO _x
<i>De Minimis Threshold</i>		100	100	50	100
2018	Non-road	44.591	5.167	10.216	44.092
2018	On-road	1.380	0.061	0.115	0.071
2018	Fugitive	0	--	0	0
<i>2018 Total Emissions</i>		<i>45.971</i>	<i>5.228</i>	<i>10.331</i>	<i>44.163</i>
2021	Non-road	25.236	2.605	6.130	23.308
2021	On-road	0.493	0.015	0.028	0.420
2021	Fugitive	0	--	0	0
<i>2021 Total Emissions</i>		<i>25.729</i>	<i>2.62</i>	<i>6.158</i>	<i>23.728</i>

Source: ACEIT and MOVES2014a Modeling Programs, C&S Analysis 2017

As shown in Table 2, none of the annual emissions for nonattainment and maintenance parameters exceeded the respective *de minimis* thresholds.

2.3 Impact Analysis

2.3.1 CAA – Conformity Analysis

Since the project does not include the modification of existing airport operations or the construction of new facilities, there would not be an increase in airport related or stationary emissions as a result of this project. Therefore, as provided in Section 2.2, the project will not result in an increase in emissions above applicable *de minimis* thresholds in any future calendar year. No further analysis is required under the General Conformity Rule and the proposed project would be presumed to conform to the state implementation plan.

2.3.2 NEPA

Under NEPA, Federal agencies are required to assess the impacts federal actions may have on air quality and the human environment. As part of the NEPA process, the proposed action's impact on air quality is assessed by evaluating the impact of the proposed action on the NAAQS. The methodology for evaluating the need to conduct an air quality analysis is provided in the FAA document, *Aviation Emissions and Air Quality Handbook Version 3, Update 1* dated January 2015 (*Air Quality Handbook*). In accordance with procedures outlined in that document, the airport and the proposed projects impacts to air quality were evaluated based on the following:

Indirect Source Review

At this time, indirect source review requirements have not been established for the State of New Jersey.

General Conformity with SIP

As demonstrated in the previous section, the increase in emissions is below applicable *de minimis* thresholds and the proposed project would be presumed to conform to the state implementation plan.

NAAQS Assessment

Since the proposed project would cause an increase in emissions, the FAA *Air Quality Handbook* requires completion of an emissions inventory. Based on the results of the ACEIT modeling software (see **Appendix A**), **Table 3** presents the expected emissions of all criteria pollutants.

Table 3: De Minimis Thresholds and Total Emissions by Year

Year	Source	VOC	NO _x	PM2.5	PM10	CO	SO ₂
<i>De Minimis Threshold</i>		50	100	100	100	100	100
2018	Non-road	10.216	44.092	5.167	5.350	44.591	0.054
2018	On-road	0.115	1.683	0.061	0.066	1.380	0.003
2018	Fugitive	0	0	--	0.100	0	0
<i>2018 Total Emissions</i>		<i>10.331</i>	<i>45.775</i>	<i>5.228</i>	<i>5.516</i>	<i>45.971</i>	<i>0.057</i>
2021	Non-road	6.130	23.308	2.605	2.702	25.236	0.035
2021	On-road	0.028	0.420	0.015	0.017	0.493	0.001
2021	Fugitive	0	0	--	0.029	0	0
<i>2021 Total Emissions</i>		<i>6.158</i>	<i>23.728</i>	<i>2.62</i>	<i>2.748</i>	<i>25.729</i>	<i>0.036</i>

*Total also includes emissions from fugitive sources.

Source: ACEIT Modeling Software, C&S Analysis 2017

2.3.3 Climate Change

GHG emissions were estimated using the ACEIT output for construction. Based on the results of the ACEIT modeling software, **Table 4** presents the expected increase in emissions of greenhouse gases by year.

Table 4: Greenhouse Gas Emissions by Year

Year	Source	CO ₂	CO ₂ e
2018	Non-road	8,517.886	8,529.867
2018	On-road	325.645	325.783
<i>2018 Total Emissions</i>		<i>8,843.531</i>	<i>8,855.650</i>
2021	Non-road	5,748.600	5,756.1584
2021	On-road	118.142	118.196
<i>2021 Total Emissions</i>		<i>5,866.742</i>	<i>5,874.354</i>

Source: MOVES2014a Modeling Software, C&S Analysis 2017

Section 3—Summary

The obstruction mitigation project at TTN will increase emissions during throughout the 2018 and 2021 calendar years based on the assumed construction schedule.

3.1 CAA – Conformity Analysis

As illustrated in **Table 2**, the total increase in annual emissions from the proposed project for non-attainment and maintenance parameters (CO, PM_{2.5}, NO_x, and VOCs) are below the *de minimis* thresholds of 100 tons per year for CO, 100 tons per year for PM_{2.5}, 50 tons per year for VOCs, and 100 tons per year for NO_x. Therefore, a General Conformity Determination is not required.

3.2 NEPA

As illustrated in **Table 3**, the increase in emissions resulting from the Proposed Action were below the *de minimis* thresholds levels, even for attainment parameters. Therefore, given the expected emissions and the short time-frame of construction, it is unlikely that the pollutant concentration levels would exceed a NAAQS standard.

3.3 Climate Change

Greenhouse gas emissions associated with the project were also calculated for carbon dioxide, methane, and nitrous oxide. The proposed project would temporarily increase carbon dioxide emissions due to increased vehicle movements associated with construction equipment and travel by contractors. As presented in **Table 4**, the increase in carbon dioxide equivalent emissions is 8,866 metric tons in 2018 and 5,875 metric tons in 2021. There are currently no federal requirements for reporting greenhouse gases from aviation sources and no significance thresholds.

3.4 Conclusion

Given the information detailed above, as well as the fact that the proposed action would not have an effect on enplanements or aircraft operations at the airport, the proposed project would not significantly impact air quality.

Attachment A: Construction Emissions - Onroad Sources

Year	Season	Vehicle Type	Fuel Type	Total Project VMT*	CO (g/mi)	VOC (g/mi)	SO2 (g/mi)	NOx (g/mi)	PM10 - Total (g/mi)	PM2.5 Total (g/mi)	CO2 (g/mi)	CH4 (g/mi)	CO2e (g/mi)	CO (ST)	VOC (ST)	SO2 (ST)	NOx (ST)	PM10 - Total (ST)	PM2.5 Total (ST)	CO2 (MT)	CH4 (MT)	CO2e (MT)			
2018	Summer	Passenger Car	Gasoline	205,110.000	2.722	0.037	0.002	0.200	0.004	0.004	334.550	0.003	334.621	0.615	0.008	0.001	0.045	0.001	0.001	68.620	0.001	68.634			
		Passenger Truck	Gasoline	111.544	4.434	0.096	0.003	0.382	0.005	0.005	438.527	0.005	438.644	0.001	0.000	0.000	0.000	0.000	0.000	0.049	0.000	0.049			
		Single Unit Short Haul	Diesel	21,342.518	2.027	0.634	0.010	4.701	0.233	0.214	1,127.482	0.036	1,128.386	0.048	0.015	0.000	0.111	0.005	0.005	24.063	0.001	24.083			
2018	Winter	Combination Short-Haul Truck	Diesel	37,985.024	6.517	1.208	0.030	28.022	1.083	0.997	3,406.098	0.052	3,407.396	0.273	0.051	0.001	1.173	0.045	0.042	129.381	0.002	129.430			
		Passenger Car	Gasoline	82,884.000	3.614	0.063	0.004	0.428	0.015	0.013	610.874	0.005	610.990	0.330	0.006	0.000	0.039	0.001	0.001	50.632	0.000	50.641			
		Single Unit Short Haul	Diesel	26,023.016	3.962	1.235	0.018	10.973	0.450	0.414	2,032.839	0.070	2,034.590	0.114	0.035	0.001	0.315	0.013	0.012	52.901	0.002	52.946			
2018 TOTAL														1.380	0.115	0.003	1.683	0.066	0.061	325.645	0.006	325.783			
2021	Summer	Passenger Car	Gasoline	116,100.000	2.235	0.020	0.002	0.109	0.004	0.003	309.035	0.002	309.092	0.286	0.003	0.000	0.014	0.000	0.000	35.879	0.000	35.886			
		Passenger Truck	Gasoline	49.860	3.480	0.054	0.003	0.234	0.005	0.004	404.080	0.004	404.171	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.000	0.020			
		Single Unit Short Haul	Diesel	1,211.180	1.512	0.456	0.009	3.317	0.156	0.144	1,107.706	0.043	1,108.773	0.002	0.001	0.000	0.004	0.000	0.000	1.342	0.000	1.343			
2021	Winter	Combination Short-Haul Truck	Diesel	26,721.588	2.602	0.473	0.015	10.467	0.412	0.379	1,686.255	0.034	1,687.115	0.077	0.014	0.000	0.308	0.012	0.011	45.059	0.001	45.082			
		Passenger Car	Gasoline	58,050.000	1.493	0.017	0.002	0.121	0.005	0.005	282.034	0.002	282.080	0.096	0.001	0.000	0.008	0.000	0.000	16.372	0.000	16.375			
		Passenger Truck	Gasoline	156.000	2.370	0.047	0.002	0.261	0.007	0.006	370.042	0.003	370.117	0.000	0.000	0.000	0.000	0.000	0.000	0.058	0.000	0.058			
		Single Unit Short Haul	Diesel	19,457.392	1.512	0.456	0.009	3.976	0.156	0.144	997.647	0.043	998.715	0.032	0.010	0.000	0.085	0.003	0.003	19.412	0.001	19.432			
2021 TOTAL														0.493	0.028	0.001	0.420	0.017	0.015	118.142	0.002	118.196			

*Total project VMT generated by ACEIT

Attachment A: Construction Emissions - Nonroad Sources

Scenario ID	Year	Season	Project	Construction Activity*	Equipment*	Hours*	MOVES Emission Rates (g/hour)								CALCULATED EMISSIONS							
							Atmos. CO2	CH4	CO	NOx	PM10	PM2.5	SO2	VOCs	Atmos. CO2 (MT)	CH4 (MT)	CO (ST)	NOx (ST)	PM10 (ST)	PM2.5 (ST)	SO2 (ST)	VOCs (ST)
1	2018	Summer	Parking Lot	Excavation (Cut to Fill)	Dozer	66.79	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	9.3600	0.0003	0.0130	0.0309	0.0019	0.0018	0.0001	0.0035
1	2018	Summer	Parking Lot	Excavation (Topsoil Stripping)	Dozer	25.14	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	3.5231	0.0001	0.0049	0.0116	0.0007	0.0007	0.0000	0.0013
1	2018	Summer	Parking Lot	Grading	Dozer	16.88	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	2.3656	0.0001	0.0033	0.0078	0.0005	0.0005	0.0000	0.0009
1	2018	Summer	Parking Lot	Excavation (Cut to Fill)	Excavator	53.43	92,677.9730	2.4217	72.0673	191.8894	11.2723	10.9342	0.4780	29.1113	4.9518	0.0001	0.0042	0.0113	0.0007	0.0006	0.0000	0.0017
1	2018	Summer	Parking Lot	Grading	Grader	16.88	109,820.6577	2.9166	84.1023	227.7269	14.6604	14.2206	0.5739	35.1344	1.8538	0.0000	0.0016	0.0042	0.0003	0.0003	0.0000	0.0007
1	2018	Summer	Parking Lot	Hydroseeding	Hydroseeder	15.21	27,922.3446	0.8773	36.7623	116.8348	5.8545	5.6789	0.1522	10.4758	0.4247	0.0000	0.0006	0.0020	0.0001	0.0001	0.0000	0.0002
1	2018	Summer	Parking Lot	Hydroseeding	Off-Road Truck	15.21	419,702.7686	13.1396	428.0747	1,449.9219	43.4563	42.1526	2.0968	159.0165	6.3837	0.0002	0.0072	0.0243	0.0007	0.0007	0.0000	0.0027
1	2018	Summer	Parking Lot	Soil Erosion/Sediment Control	Other General Equipment	14	176,499.0357	4.4948	374.6535	848.2046	51.9871	50.4274	1.0315	72.2656	2.4710	0.0001	0.0058	0.0131	0.0008	0.0008	0.0000	0.0011
1	2018	Summer	Parking Lot	Soil Erosion/Sediment Control	Pumps	14	29,941.7509	0.9208	93.5408	205.7826	15.7345	15.2623	0.1839	21.9469	0.4192	0.0000	0.0014	0.0032	0.0002	0.0002	0.0000	0.0003
1	2018	Summer	Parking Lot	Excavation (Cut to Fill)	Roller	53.43	51,595.0928	1.4839	88.6159	174.9283	13.6956	13.2848	0.2849	18.6568	2.7567	0.0001	0.0052	0.0103	0.0008	0.0008	0.0000	0.0011
1	2018	Summer	Parking Lot	Grading	Roller	16.88	51,595.0928	1.4839	88.6159	174.9283	13.6956	13.2848	0.2849	18.6568	0.8709	0.0000	0.0016	0.0033	0.0003	0.0002	0.0000	0.0003
1	2018	Summer	Parking Lot	Excavation (Cut to Fill)	Scraper	66.79	219,577.1261	5.7393	303.7229	648.8664	39.2259	38.0492	1.2080	71.3658	14.6656	0.0004	0.0224	0.0478	0.0029	0.0028	0.0001	0.0053
1	2018	Summer	Parking Lot	Soil Erosion/Sediment Control	Tractors/Loader/Backhoe	14	62,064.4689	2.8179	312.6735	334.8312	48.7393	47.2771	0.3725	63.5373	0.8689	0.0000	0.0048	0.0052	0.0008	0.0007	0.0000	0.0010
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Bulldozer	12395.01	140,140.4428	3.8124	176.2924	419.3336	25.1630	24.4081	0.7574	47.9415	1,737.0419	0.0473	2.4087	5.7294	0.3438	0.3335	0.0103	0.6550
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Chain Saws	12395.01	2,577.8046	4.7092	919.7923	5.7724	33.4481	30.7722	0.0156	257.2579	31.9519	0.0584	12.5673	0.0789	0.4570	0.4204	0.0002	3.5150
2	2018	Winter	Site Work - 10000 sqft	Site Restoration - Landscaping (Rough Grading)	Compacting Equipment	7437.005	4,433.0080	0.3654	28.4118	34.0778	2.9145	2.8271	0.0299	4.6442	32.9683	0.0027	0.2329	0.2794	0.0239	0.0232	0.0002	0.0381
2	2018	Winter	Site Work - 10000 sqft	Site Restoration - Landscaping (Top Soil Seed and Plantings)	Forktruck (Hoist)	24790.02	55,088.8824	1.5897	130.9681	199.4557	19.2856	18.7070	0.3109	21.5664	1,365.6543	0.0394	3.5789	5.4504	0.5270	0.5112	0.0085	0.5893
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Front Loader	12395.01	62,064.4046	2.8179	312.6738	334.8306	48.7393	47.2771	0.3725	63.5371	769.2888	0.0349	4.2721	4.5748	0.6659	0.6660	0.0051	0.8681
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Grub the site down 2'-0	12395.01	37,953.1677	1.5648	252.3797	251.6440	37.6630	36.5331	0.2333	51.6400	470.4298	0.0194	3.4483	3.4383	0.5146	0.4992	0.0032	0.7056
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Log Chipper	12395.01	79,279.6173	2.0185	183.5107	486.3502	31.4150	30.4726	0.4764	47.0182	982.6715	0.0250	2.5073	6.6451	0.4292	0.4164	0.0065	0.6424
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Mulcher	12395.01	37,953.1677	1.5648	252.3797	251.6440	37.6630	36.5331	0.2333	51.6400	470.4298	0.0194	3.4483	3.4383	0.5146	0.4992	0.0032	0.7056
2	2018	Winter	Site Work - 10000 sqft	Site Restoration - Landscaping (Top Soil Seed and Plantings)	Roller	12395.01	51,595.2476	1.4839	88.6157	174.9284	13.6956	13.2847	0.2849	18.6568	639.5235	0.0184	1.2108	2.3901	0.1871	0.1815	0.0039	0.2549
2	2018	Winter	Site Work - 10000 sqft	Site Restoration - Landscaping (Top Soil Seed and Plantings)	Seed Truck Spreader	4958.003	27,922.3116	0.8773	36.7624	116.8345	5.8545	5.6789	0.1522	10.4758	138.4389	0.0043	0.2009	0.6385	0.0320	0.0310	0.0008	0.0573
2	2018	Winter	Site Work - 10000 sqft	Site Restoration - Landscaping (Rough Grading)	Small Dozer	7437.005	37,953.1677	1.5648	252.3797	251.6440	37.6630	36.5331	0.2333	51.6400	282.2579	0.0116	2.0690	2.0630	0.3088	0.2995	0.0019	0.4233
2	2018	Winter	Site Work - 10000 sqft	Site Clearing - Remove Trees & Shrubs	Tractor	24790.02	62,064.4046	2.8179	312.6738	334.8306	48.7393	47.2771	0.3725	63.5371	1,538.5776	0.0699	8.5442	9.1497	1.3319	1.2919	0.0102	1.7362
3	2018	Summer	Airfield Lighting	Lighting	Air Compressor	0.667	47,527.9446	1.3935	94.5529	215.3439	13.5890	13.1813	0.2723	19.9703	0.0317	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Clearing and Grubbing	Chain Saw	1.2	79,279.4155	2.0185	183.5107	486.3498	31.4150	30.4726	0.4763	47.0181	0.0951	0.0000	0.0002	0.0006	0.0000	0.0000	0.0000	0.0001
3	2018	Summer	Fencing	Clearing and Grubbing	Chipper/Stump Grinder	1.2	79,279.4155	2.0185	183.5107	486.3498	31.4150	30.4726	0.4763	47.0181	0.0951	0.0000	0.0002	0.0006	0.0000	0.0000	0.0000	0.0001
3	2018	Summer	Fencing	Excavation (Cut to Fill)	Dozer	0.925	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	0.1296	0.0000	0.0002	0.0004	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Grading	Dozer	0.283	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	0.0397	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Topsoil Placement	Dozer	2.9	140,140.2330	3.8124	176.2923	419.3355	25.1630	24.4080	0.7574	47.9416	0.4064	0.0000	0.0006	0.0013	0.0001	0.0001	0.0000	0.0002
3	2018	Summer	Fencing	Excavation (Cut to Fill)	Excavator	0.925	92,677.9730	2.4217	72.0673	191.8894	11.2723	10.9342	0.4780	29.1113	0.0857	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Demolition - Concrete	Concrete Demolition	Excavator with Bucket	0.5	92,677.9730	2.4217	72.0673	191.8894	11.2723	10.9342	0.4780	29.1113	0.0463	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Demolition - Concrete	Concrete Demolition	Excavator with Hoe Ram	0.5	92,677.9730	2.4217	72.0673	191.8894	11.2723	10.9342	0.4780	29.1113	0.0463	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Grading	Grader	0.283	109,820.6577	2.9166	84.1023	227.7269	14.6604	14.2206	0.5739	35.1344	0.0311	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Hydroseeding	Hydroseeder	0.255	27,922.3446	0.8773	36.7623	116.8348	5.8545	5.6789	0.1522	10.4758	0.0071	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Airfield Lighting	Lighting	Loader	0.667	130,848.0387	3.5719	195.0248	484.1352	29.9504	29.0518	0.7321	48.4046	0.0873	0.0000	0.0001	0.0004	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Hydroseeding	Off-Road Truck	0.255	419,702.7686	13.1396	428.0747	1,449.9219	43.4563	42.1526	2.0968	159.0165	0.1070	0.0000	0.0001	0.0004	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Airfield Lighting	Lighting	Other General Equipment	0.667	176,499.0357	4.4948	374.6535	848.2046	51.9871	50.4274	1.0315	72.2656	0.1177	0.0000	0.0003	0.0006	0.0000	0.0000	0.0000	0.0001
3	2018	Summer	Fencing	Fencing	Other General Equipment	22.222	176,499.0357	4.4948	374.6535	848.2046	51.9871	50.4274	1.0315	72.2656	3.9222	0.0001	0.0092	0.0208	0.0013	0.0012	0.0000	0.0018
3	2018	Summer	Fencing	Soil Erosion/Sediment Control	Other General Equipment	0.4	176,499.0357	4.4948	374.6535	848.2046	51.9871	50.4274	1.0315	72.2656	0.0706	0.0000	0.0002	0.0004	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Soil Erosion/Sediment Control	Pumps	0.4	29,941.7509	0.9208	93.5408	205.7826	15.7345	15.2623	0.1839	21.9469	0.0120	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0000
3	2018	Summer	Fencing	Excavation (Cut to Fill)	Roller	0.925	51,595.0928	1.4839	88.6159	174.9283	13.6956	13.2848	0.2849	18.6568	0.0477	0.0000	0.0001	0.0002	0.0000	0.0000	0.0000	0.0000
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Attachment A: Construction Emissions - Fugitive Sources

Scenario ID	Year	Project	Fugitive Source Type	Number of Months	CO	NOx	SO2	PM10	VOC
1	2018	Parking Lot	Material Movement (Paved Roads)	6	-	-	-	0.0060	-
1	2018	Parking Lot	Material Movement (Unpaved Roads)	6	-	-	-	0.0204	-
1	2018	Parking Lot	Soil Handling	6	-	-	-	0.0409	-
1	2018	Parking Lot	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
2	2018	Site Work - 10000 sqft	Soil Handling	6	-	-	-	0.0028	-
2	2018	Site Work - 10000 sqft	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
3	2018	Airfield Lighting	Material Movement (Paved Roads)	6	-	-	-	0.0030	-
3	2018	Demolition - Concrete	Material Movement (Paved Roads)	6	-	-	-	0.0030	-
3	2018	Demolition - Concrete	Material Movement (Unpaved Roads)	6	-	-	-	0.0089	-
3	2018	Demolition - Concrete	Soil Handling	6	-	-	-	0.0001	-
3	2018	Demolition - Concrete	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
3	2018	Fencing	Material Movement (Paved Roads)	6	-	-	-	0.0030	-
3	2018	Fencing	Material Movement (Unpaved Roads)	6	-	-	-	0.0089	-
3	2018	Fencing	Soil Handling	6	-	-	-	0.0026	-
3	2018	Fencing	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
4	2021	Landscaping	Material Movement (Paved Roads)	6	-	-	-	-	-
4	2021	Landscaping	Material Movement (Unpaved Roads)	6	-	-	-	-	-
4	2021	Site Work - 10000 sqft	Material Movement (Paved Roads)	6	-	-	-	0.0030	-
4	2021	Site Work - 10000 sqft	Material Movement (Unpaved Roads)	6	-	-	-	0.0092	-
4	2021	Site Work - 10000 sqft	Soil Handling	6	-	-	-	0.0028	-
4	2021	Site Work - 10000 sqft	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
5	2021	Fencing	Material Movement (Paved Roads)	6	-	-	-	0.0030	-
5	2021	Fencing	Material Movement (Unpaved Roads)	6	-	-	-	0.0089	-
5	2021	Fencing	Soil Handling	6	-	-	-	0.0014	-
5	2021	Fencing	Unstabilized Land and Wind Erosion	6	-	-	-	0.0000	-
5	2021	Runway Drains	Material Movement (Paved Roads)	6	-	-	-	-	-
5	2021	Runway Drains	Material Movement (Unpaved Roads)	6	-	-	-	0.0008	-
TOTAL					-	-	-	0.1286	-

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