

2023 Supplemental Environmental Assessment (EA) for DMW Airport



SEA for “Five Year Development Plan”

Carroll County Regional Airport (DMW)

Carroll County, MD
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Contents

1. INTRODUCTION	1
2. PROPOSED DEVELOPMENT PROGRAM.....	1
3. PURPOSE AND NEED FOR THE PROPOSED FEDERAL ACTION	9
4. PROJECT ALTERNATIVES	9
4.1 No Action Alternative	9
4.2 Build Alternative	10
5. AFFECTED ENVIRONMENT.....	10
5.1 Air Quality.....	10
5.2 Biological Resources	10
5.3 Climate	11
5.4 Coastal Resources.....	11
5.5 Department of Transportation (DOT) Act, Section 4(f).....	11
5.6 Farmlands.....	12
5.7 Hazardous Materials, Solid Waste, and Pollution Prevention	12
5.8 Historical, Architectural, Archaeological, and Cultural Resources	13
5.9 Land Use	13
5.10 Natural Resources and Energy Supply	13
5.11 Noise and Noise-Compatible Land Use	13
5.12 Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks 14	
5.13 Visual Effects	14
5.14 Water Resources	14
5.14.1 Wetlands	14
5.14.2 Floodplains	14
5.14.3 Surface Waters	15
5.14.4 Groundwater	15
5.14.5 Wild and Scenic Rivers.....	15
6. Environmental Consequences.....	18
6.1 Air Quality.....	18
6.2 Biological Resources	19
6.2.1 Indiana Bat	20
6.2.2 NLEB	20
6.2.3 Bog Turtle	20
6.2.4 Bald Eagle	20



6.2.5	Monarch Butterfly	21
6.2.6	Forest Conservation Act	21
6.3	Climate	21
6.4	Coastal Resources.....	22
6.5	Department of Transportation, Section 4(f) Resources.....	22
6.6	Farmlands.....	22
6.7	Hazardous Materials, Solid Waste, and Pollution Prevention	23
6.8	Historical, Architectural, Archaeological and Cultural Resources.....	25
6.9	Land Use	25
6.10	Natural Resources and Energy Supply	26
6.11	Noise and Noise-Compatible Land Use	26
6.12	Socioeconomics, Environmental Justice (EJ), and Children’s Health and Safety Risks.....	26
6.13	Visual Effects	27
6.14	Water Resources	28
6.14.1	Wetlands	28
6.14.2	Floodplains	29
6.14.3	Surface Waters	32
6.14.4	Groundwater	33
6.14.5	Wild and Scenic Rivers.....	33
7.	Mitigation.....	34
7.1	Cultural Resources.....	34
7.2	Human Remains	34
7.3	Wetlands and Streams	34
7.4	Biotic Resources	35
8.	Public Participation.....	35
9.	List of Preparers	35
10.	List of Agencies and Persons Consulted	35

List of Figures

Figure 1: 2009 Proposed Action	4
Figure 2: 2018 Proposed Action	5
Figure 3: 2020 Proposed Action	6
Figure 4: 2023 Proposed Action	7
Figure 5: Delineated Wetlands (2016).....	16
Figure 6: FEMA Floodplains in the Vicinity of DMW	17
Figure 7: LOD in Relation to RECs, Parcel 18	24



Figure 8: Estimated Wetland Impacts, Runway 16 End	30
Figure 9: Estimated Wetland Impacts, Runway 34 End	31

List of Tables

Table 1: Previously Prepared EAs	1
Table 2: Comparison of Items Reviewed During EA Efforts	3
Table 3: Emissions Analysis Results	19
Table 4: GHG Emissions Analysis	22
Table 5: Wetland Impacts Comparison	29
Table 6: Stream Impacts Comparison	33

List of Attachments

Attachment A:	Previous (2009, 2018, 2020) FONSI
Attachment B:	USFWS/Biotics Coordination
Attachment C:	Bog Turtle Survey Report and Agency Coordination
Attachment D:	NEPAssist Report for Hazardous Materials
Attachment E:	Section 106 and Tribal Coordination
Attachment F:	EPA “EJScreen” Demographic and Socioeconomic Data
Attachment G:	Air Emissions Analysis Report
Attachment H:	Excerpts from 2017 EDDAs
Attachment I:	Forest Stand Delineation/Forest Conservation Plan for Meadow Branch Road
Attachment J:	Farmlands Form 1006-AD
Attachment K:	2023 Preliminary Engineering exhibits
Attachment L:	Agency Scoping Memo
Attachment M:	MDE Email Coordination



1. INTRODUCTION

This document provides a Supplement to the 2020 Supplemental Environmental Assessment (SEA) for “Five-Year Capital Improvement Program” at the Carroll County Regional Airport (DMW). The 2020 SEA was a supplement to the 2018 SEA, which in turn supplemented a 2009 Environmental Assessment (EA). **Table 1** summarizes the previously prepared EA/SEAs for the “Five-Year Capital Improvement Program” at DMW. The previous FONSI are included in Attachment A.

Table 1: Previously Prepared EAs

DOCUMENT	DATE OF FONSI	PURPOSE
2009 EA	April 2009	Five-Year Development Program with 6,400' replacement runway
2018 SEA	May 2018	Revise 2009 EA to reflect a new critical aircraft and a shorter replacement runway length (5,500')
2020 SEA	June 2020	Revise 2018 SEA to include a grading easement on Parcel 19 and two additional areas of on-airport grading
2023 SEA	TBD	Revise 2020 SEA to include a larger LOD, refined project locations, and additional grading easement, fee simple, restrictive land-use easement and LOS easement acquisition. Revise document to include discussion of new environmental category since 2020 (Climate) and to reflect new environmental guidance related to Biological Resources

Source: Delta Airport Consultants, Inc.

FONSI = Finding of No Significant Impact

LOS = Line of Sight

LOD = Limits of Disturbance

2. PROPOSED DEVELOPMENT PROGRAM

The Proposed Development Program for DMW is based on the development recommendation of the 2015 Airport Master Plan Update (MPU) for DMW.

The development program which was reviewed under the 2018 SEA/FONSI includes a new (replacement) runway, 5,500' long by 100' wide, to be constructed 250' west of the existing Runway 16-34. A full parallel taxiway is to be constructed for the replacement runway, measuring 5,500' long by 35' wide. The purpose of shifting the runway 250' west is to allow for development on the east side of the airfield while maintaining adequate separation distances to meet FAA standards. The purpose of shifting the runway 600' north is to eliminate incompatible land uses to the south. A Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) is to be installed at the new Runway 16 end.



As a result of the westward runway shift, Meadow Branch Road would be located inside the Runway Object-Free Area (ROFA) which violates FAA design standards; therefore, Meadow Branch Road is to be realigned outside of the ROFA.

To accommodate the extension of Runway 16 to the north, Pinch Valley Road is to be terminated into two cul-de-sacs on the eastern and western sides of airport property.

The Proposed Development Program requires land acquisition in fee for the construction of the replacement runway, Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road. This involves the relocation of residences and businesses on these parcels. In addition, a swimming pool on an adjacent parcel is within the proposed Runway 16 RPZ and may need to be relocated or abandoned. A perimeter/security fence is to be installed around the newly acquired airport property.

Avigation easements are to be acquired for obstruction removal. The vegetative (tree) obstructions identified during the 2015 MPU effort which must be mitigated total approximately 105 acres. Grading easements are proposed to be acquired to accommodate grading. The purpose of grading in these areas is to reduce terrain where it has been identified as a penetration to the future airspace surfaces associated with the replacement runway. Grading would also occur on the airfield to accommodate the construction and to meet FAA design standards for various safety surfaces.

Two conventional hangars and associated automobile parking are to be constructed on the east side of the airfield to accommodate future demand.

A FONSI was issued by FAA in May 2018 for the airport development program described above. In 2020, a SEA was prepared for additional areas of on-airport grading and the acquisition of an additional grading easement to support the project. Since that time, as the preliminary engineering effort has progressed, the scope for the development program has been refined which necessitates the preparation of a 2023 SEA. In addition, this SEA includes renewed coordination with the United States Fish and Wildlife Service (USFWS) regarding potential impacts to the Northern long-eared bat, due to changes in its listed status since the 2020 SEA was prepared. This 2023 SEA effort also included a field survey for Bog Turtles within select wetland areas proposed to be impacted by the construction program.

The 2009, 2018, and 2020 Proposed Actions are depicted in **Figure 1**, **Figure 2**, and **Figure 3**. The 2023 Proposed Action is depicted in **Figure 4**.

The development items reviewed under the previous NEPA documents and what is included in this 2023 document are outlined in **Table 2**.



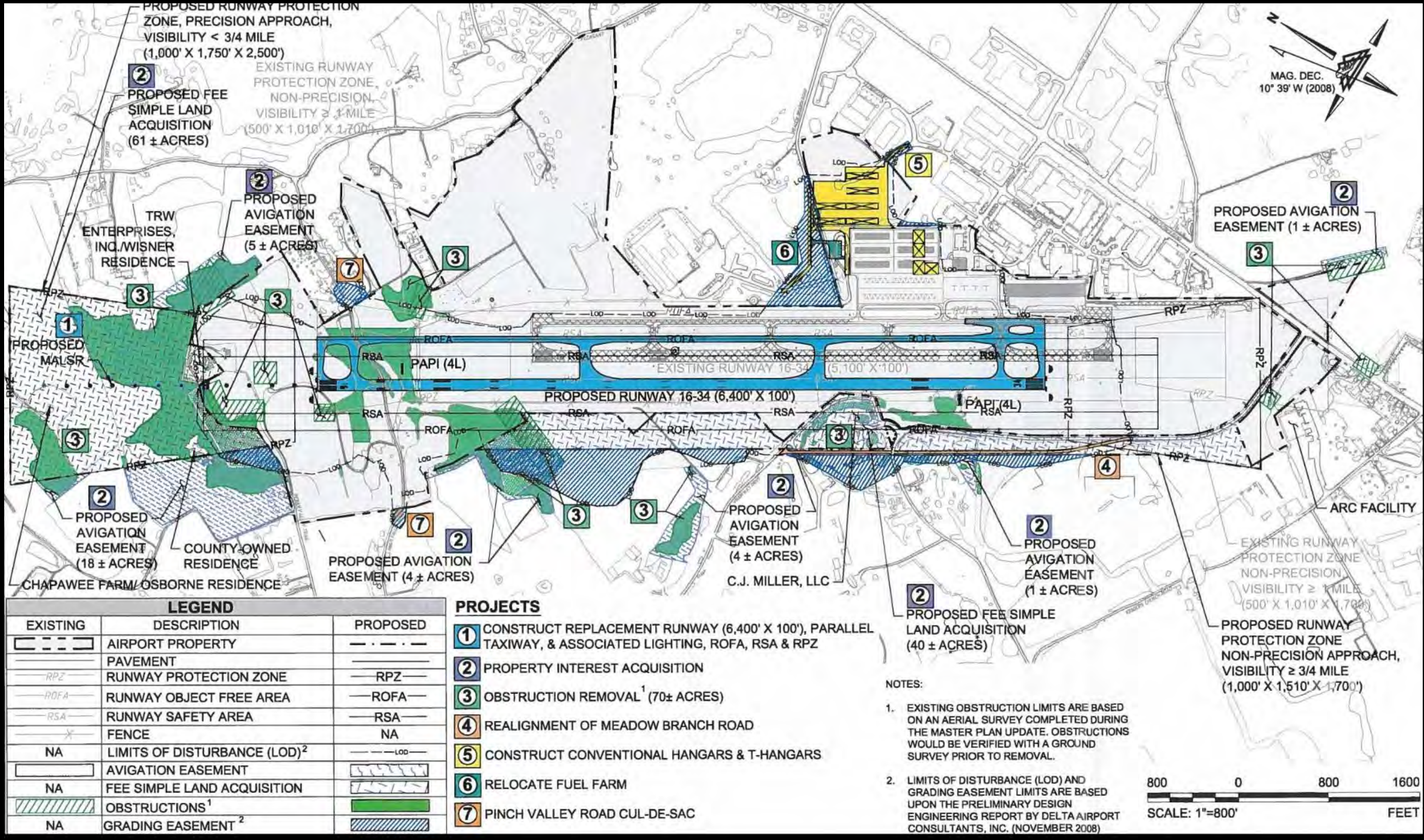
Table 2: Comparison of Items Reviewed During EA Efforts

2009 EA	2018 Supplement	2020 Supplement	2023 Supplement
Construct replacement RW, 6,400' x 100'	Construct replacement RW, 5,500' x 100'		
Construct full length TW, 6,400' x 50'	Construct full TW, 5,500' x 35'		
Install Cat. I ILS	See Note 1		
Acquire 101± acres of fee-simple land	Acquire 185± acres of fee-simple land		Acquire 47± additional acres of land; 0.1± acre RLU easement
Acquire 33± acres of aviation easements	Acquire 312± acres of aviation easements		
Acquire grading easement, amount unnamed	Acquire 19± acres of grading easements	Acquire an additional 0.14± acre of grading easement on Parcel 19	Acquire 15± additional acres of grading easements
Remove obstructions on 70± acres	Remove obstructions on 63± acres		Remove obstructions on 105± acres
Realign Meadow Branch Road	Realign Meadow Branch Road		Road alignment refined during preliminary design
Construct 4 conventional hangars and 7 T-hangars w/ auto parking	Construct 2 conventional hangars w/ auto parking, and no T-hangars		
Relocate fuel farm	See Note 1		
Remove 4,000-feet of Pinch Valley Road (Cul-de-sac Pinch Valley Road)			Eastern cul-de-sac moved onto airport; western cul-de-sac shifted west
Install perimeter/security fence			
Relocate three residences and three businesses	Relocate three residences and <u>two</u> businesses and possibly relocated/abandon a private swimming pool		
		Additional on-airport grading	
			Acquire LOS Easement for Meadow Branch Road (Parcel 45)

Source: Delta Airport Consultants, Inc.

NOTE: ¹ No longer included in Proposed Action; project delayed to later phase. RLU = Restrictive Land Use

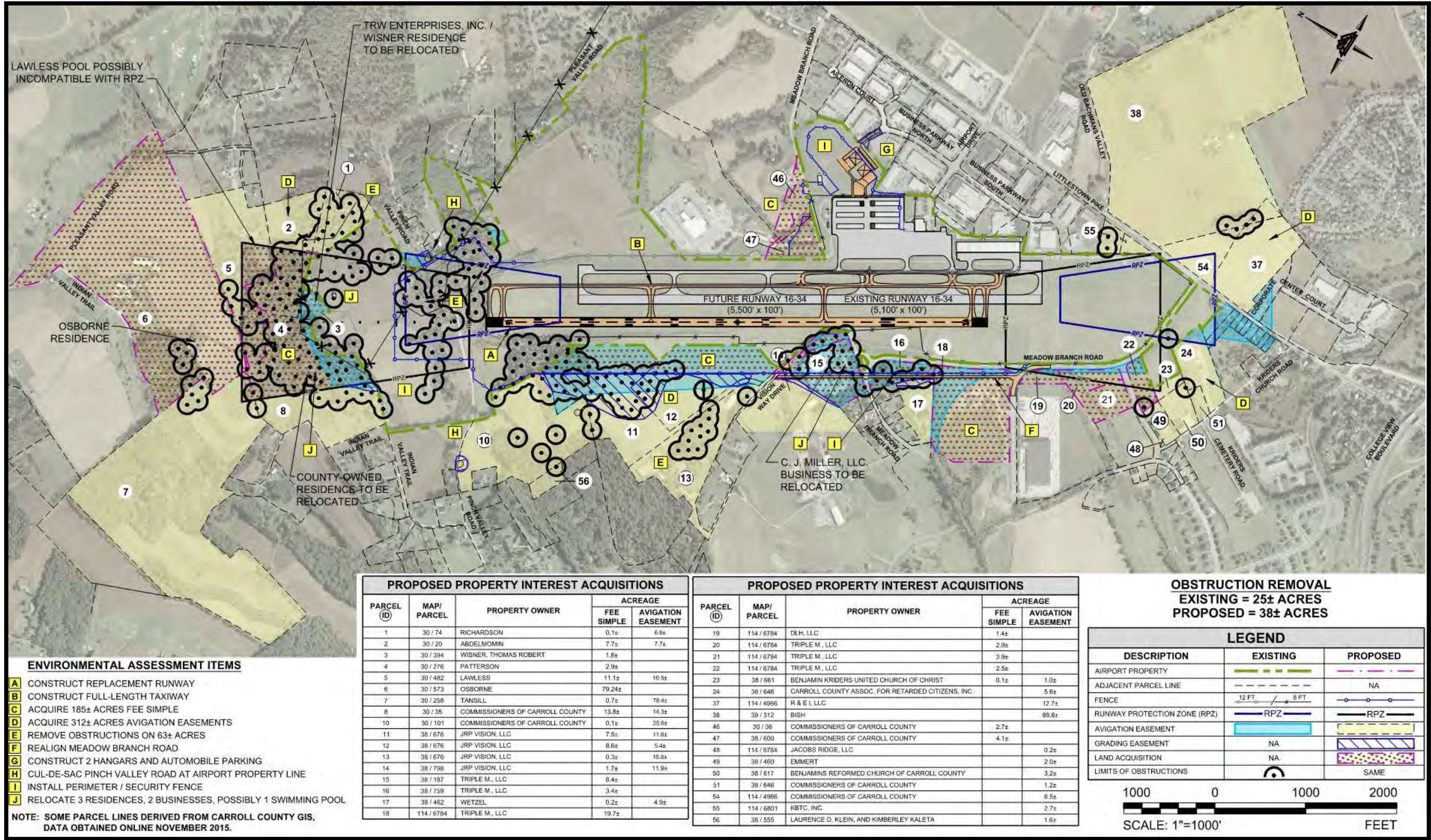
Figure 1: 2009 Proposed Action



Source: Delta Airport Consultants, Inc



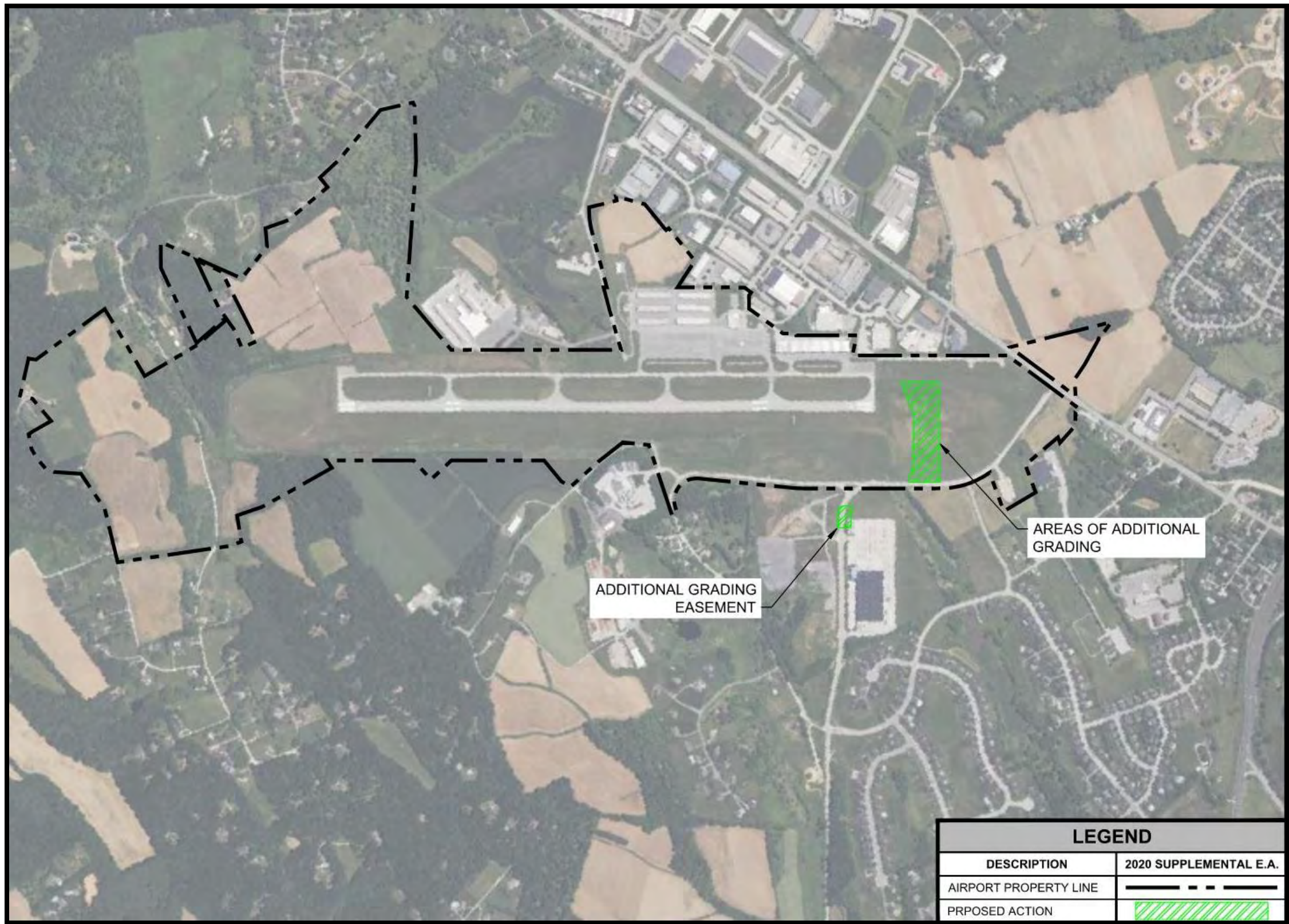
Figure 2: 2018 Proposed Action



Source: Delta Airport Consultants, Inc.

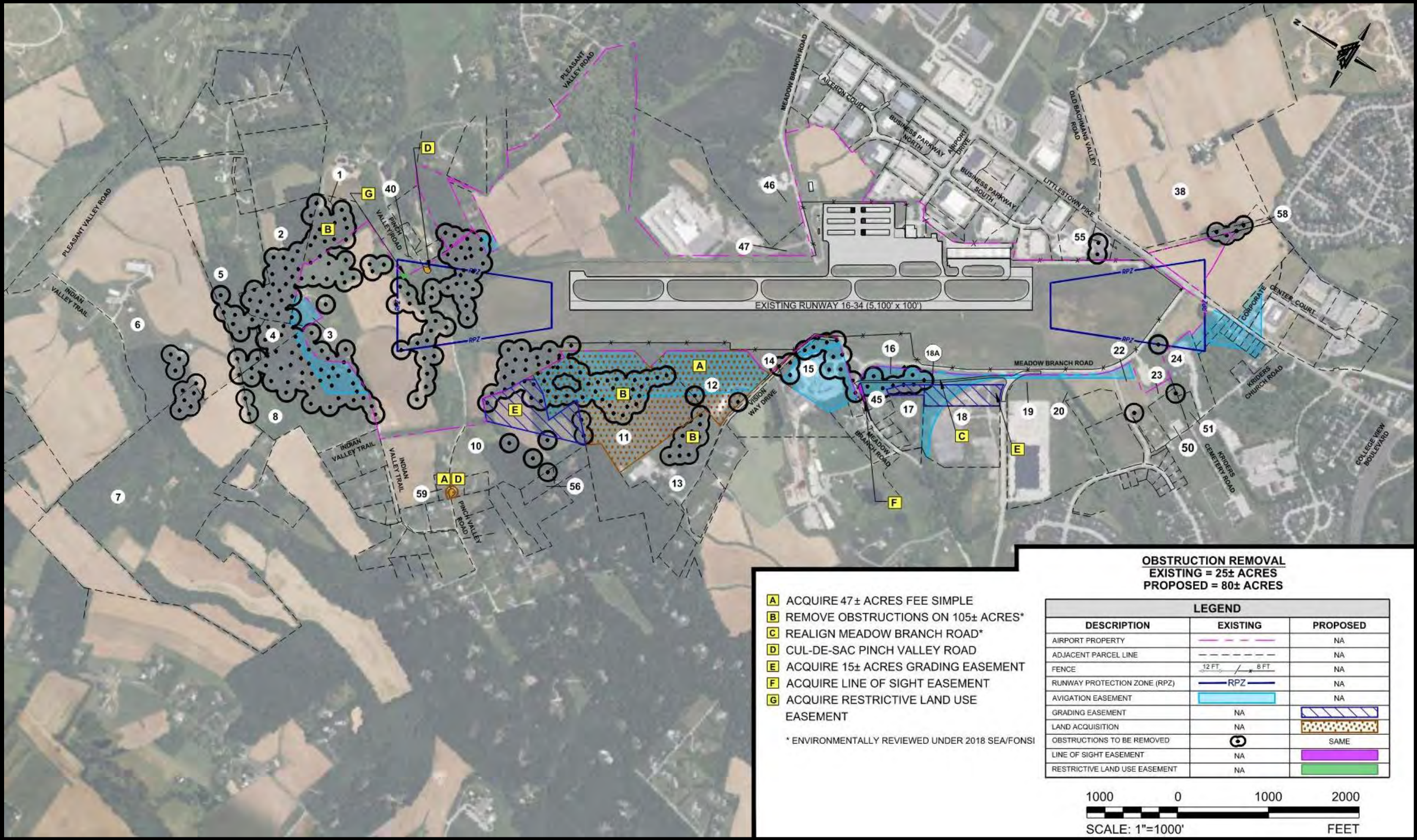


Figure 3: 2020 Proposed Action



Source: Delta Airport Consultants, Inc.

Figure 4: 2023 Proposed Action



Source: Delta Airport Consultants, Inc.



Greater detail is provided below for those projects listed in **Table 2** that are included in the 2023 Proposed Action:

- Acquire Land (Fee Simple): As depicted in **Figure 2** the County initially proposed to acquire only a portion of Parcels 11 and 12 in fee for airfield expansion, and proposed to acquire grading easements outside of the proposed airport fence to remove terrain obstructions to airspace. However, as the preliminary design effort progressed beginning in 2021, the amount of proposed grading on these parcels increased to ensure that the terrain can be taken below the 14 CFR Part 77 surface and to accommodate stormwater regulations. Parcels 11 and 12 are currently used for agricultural purposes. Due to the increased amount of grading proposed on these parcels, it is possible that the parcels will no longer be suitable for agricultural purposes and the County would be obligated to purchase the parcels. The 2023 SEA assumes the acquisition of Parcels 11 and 12 in fee as a “worst case” scenario (see **Figure 4**). This totals approximately 46 acres (33± acres for Parcel 11 and 13± acres for Parcel 12).

Also, when the 2018 SEA was prepared, it was assumed that easements would be sufficient to establish the western cul-de-sac to terminate Pinch Valley Road. Fee simple acquisition of a portion of Parcels 10 and 59 is now proposed, for the purposes of public right-of-way to the cul-de-sac and for the grading and drainage required to construct the cul-de-sacs (see **Figure 4**). Approximately 0.5 acres of each parcel is proposed to be acquired in fee.

- Remove Approximately 105 Acres of Tree Obstructions: Removal of existing and future tree obstructions to airspace was environmentally reviewed during the 2018 SEA (see **Figure 2**); however, that document included a typo that reported the amount of clearing to be approximately 63 total acres (25± acres for existing airspace and 38± acres for future airspace). The actual amount of clearing is approximately 105 acres (25± acres for existing airspace and 80± acres for future airspace). No additional tree obstructions have been identified since the 2018 SEA and the extent and location of proposed tree removal has not changed. The full 105 acres is to be evaluated in the 2023 Supplemental EA to correct the error.
- Realign Meadow Branch Road: The realignment of Meadow Branch Road was environmentally reviewed during the 2018 SEA. This project is listed here as an administrative measure to document that the conceptual alignment depicted in the 2018 SEA was refined during the recent preliminary engineering effort (see **Figure 2** and **Figure 4**). A LOS easement was identified to be necessary for the realignment during the preliminary design effort; that project is environmentally reviewed in this document.
- Cul-de-Sac Pinch Valley Road: In a change from what is depicted on the 2018 SEA, the eastern cul-de-sac of Pinch Valley Road is now proposed to be constructed on airport property (see **Figure 2** and **Figure 4**). This change was made to avoid impacts to the adjacent privately owned parcels. The location of the western cul-de-sac has been shifted to the westernmost border of Parcel 10 and now extends onto Parcel 59. As mentioned previously, the proposed land acquisition associated with the westernmost cul-de-sac has been revised from proposed grading easement to proposed fee simple acquisition in the 2023 SEA.
- Acquire Grading Easements: The 2023 SEA includes the need for approximately 15 additional acres of grading easements. The amount of proposed grading easement to be acquired has



increased since 2018 on Parcel 10 and has been refined on Parcel 17; and grading easement is now proposed on a portion of Parcel 18 in lieu of fee simple acquisition (see **Figure 2** and **Figure 4**).

- Acquire Line-of-Sight (LOS) Easement: During the preliminary design effort for Meadow Branch Road, which began in 2021, the need for a LOS easement over a small (less than 2,000 square foot) triangular strip of a residential parcel (Parcel 45) was identified (see **Figure 4**). Acquisition of the LOS easement is a new element to the Proposed Action.
- Acquire Restrictive Land Use Easement: A small (0.1± acre) portion of Parcel 40 is within the future RPZ associated with the replacement runway. To prevent incompatible land uses within the RPZ per FAA guidance, a restrictive land use easement is proposed to be acquired on this parcel.

3. PURPOSE AND NEED FOR THE PROPOSED FEDERAL ACTION

As stated in the previous 2009 EA and 2018 and 2020 Supplements, the projects included in the “Five-Year Capital Improvement Program” are necessary for DMW to ensure the safety of the flying public while at the same time meeting the performance requirements for the critical aircraft expected to utilize the facility. The 2009 EA established that the purpose of the project is to provide sufficient airfield infrastructure at DMW to support the current and projected demand for aviation activity in the greater Carroll County, Maryland region, and to continue to serve in its role as a general aviation reliever airport for Baltimore/Washington International Thurgood Marshall Airport (BWI). The purpose of the project remains valid for this supplemental effort.

The need for the project as stated in the 2009 EA and 2018 and 2020 Supplements is the inability of current conditions to support the current and projected demand at DMW.

The Purpose and Need carried forward from the previous NEPA documents remains valid for the project refinements included in this 2023 SEA. The proposed land and easement acquisition, expanded limits of disturbance, and refined locations of cul-de-sacs support the comprehensive development program and the Purpose and Need statements included in the 2009 EA and 2018 and 2020 Supplements.

4. PROJECT ALTERNATIVES

This section compares the No Action and the Build/Proposed Action alternatives.

4.1 No Action Alternative

The No Action alternative serves as a basis for comparing environmental consequences of other potential alternatives. Under the No Action alternative, the development described in **Section 2** would not occur and the airfield layout would remain in its current (2023) condition. Without the proposed land and easement acquisition, adjusted locations of cul-de-sacs, removal of tree obstructions to airspace, and expanded limits of disturbance, the County is unable to achieve its comprehensive airport development program, preventing the Airport from accommodating the current and projected demand at DMW and meeting FAA design standards. Because this alternative does not meet the stated Purpose



and Need, it was not considered further, although it has been carried forward in the analysis for comparison purposes to fulfil Council on Environmental Quality (CEQ) regulations.

4.2 Build Alternative

The 2023 Proposed Action is described in **Section 2** and is depicted conceptually in **Figure 4**. The proposed land and easement acquisition, refined locations of cul-de-sacs, obstruction removal, and expanded limits of grading support the comprehensive airport development program and the Purpose and Need statement; namely to meet FAA design standards and enable the airport to accommodate existing and projected aviation demands and accomplish the facility requirements recommended in the 2015 Airport Master Plan. Because the Build alternative enables the County to move forward with the development program, therefore supporting the stated Purpose and Need, it has been selected as the Preferred Alternative.

5. AFFECTED ENVIRONMENT

This section includes a description of each of the environmental impact categories as listed in FAA Order 1050.1F to establish a “baseline” from which to assess potential impacts.

DMW is an operating, general aviation airport which encompasses approximately 475 acres within Carroll County, Maryland. The airport property is largely built-out and disturbed. There is one runway at the airport, Runway 16/34, which is 5,100’ long and oriented in a northwest-southeast direction. The airport is located in Carroll County, Maryland and is immediately surrounded by the City of Westminster to the south and east.

5.1 Air Quality

Pursuant to the Clean Air Act (CAA), the Environmental Protection Agency (EPA) establishes, enforces, and periodically reviews the National Ambient Air Quality Standards (NAAQS). NAAQS have been established for six common air pollutants, referred to as criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate matter with a diameter of 10 micrometers or less (PM₁₀), particulate matter (PM) with a diameter of 2.5 micrometers or less (PM_{2.5}), and sulfur dioxide (SO₂). The EPA designates areas as either meeting (attainment) or not meeting (nonattainment) the NAAQS. Once the measured pollutant concentrations in a nonattainment area meet the NAAQS and the additional re-designation requirements in the CAA, the EPA will designate the area as a maintenance area.

The Airport is in Carroll County, Maryland. Carroll County is a Non-Attainment area for both 8-hour ozone (2008) and 8-hour ozone (2015).

5.2 Biological Resources

Biological resources include various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, etc.) as well as lakes, rivers, wetlands, forests, and upland habitats. The Airport property is bordered by commercial, institutional, industrial, residential, and agricultural properties. Vegetative communities within the site reflect these varied land uses and include mowed lawns, agricultural fields, forests, floodplains, and wetlands. The areas proposed for grading and development (cul-de-sacs) are previously disturbed (either graded, paved or being actively farmed).



A search of the USFWS Information for Planning and Conservation (IPaC) database identified two federally threatened species, the Indiana Bat and the Northern Long-eared Bat (NLEB), and one candidate species, the Monarch Butterfly, as having the potential to occur or be affected by activities in the project location. The search also identified seven migratory birds, including the Bald Eagle, which may be within the project area. No critical habitats, wildlife refuges, or fish hatcheries were identified within the project area by the IPaC database (see Attachment B).

During preparation of the 2018 SEA, the Maryland Department of Natural Resources (DNR) noted the potential presence of the Bog Turtle, a federally listed threatened species, during initial project scoping. The Bog Turtle was also identified by the state agency during the 2009 EA as having the potential to occur within the project area. A Phase I Bog Turtle Habitat Assessment was completed during the 2009 EA effort and a site visit with the Maryland DNR was conducted in January 2009. Phase II and Phase III surveys (trapping) within the defined habitat areas were completed in May 2008; no bog turtles were found during the surveys. During preparation of the 2018 SEA, a field survey to investigate the presence of rare, threatened, and endangered species was conducted within the 2018 SEA project area; no species, including the Bog Turtle, were identified during the field survey. Similarly, a Phase II Bog Turtle survey was conducted in spring 2023 as part of the 2023 SEA; no bog turtles were identified (see report in **Attachment C**).

The previous EA/SEAs note that in accordance with the Annotated Code of Maryland and the Code of Maryland Regulations, the Forest Conservation Act (FCA) of 1991 and the Carroll County Forest Conservation Ordinance, a Forest Stand Delineation (FSD) must be submitted prior to approval of any project with land disturbance equal to or greater than 40,000 square feet. Consistent with the approved scopes of work for the previous EA and SEAs, these are to be prepared and submitted during the design and permitting phases. The County's acceptance of this approach is included in Attachment I.

5.3 Climate

Greenhouse gas (GHG) is a category of pollutants for which there is global and national concern. The majority of GHG emissions from transportation are CO₂ emissions resulting from the combustion of petroleum-based products, like gasoline, in internal combustion engines. GHG emissions have not been regulated under the CAA as air pollutants. Currently, there are no federal standards for GHG emissions applicable to aviation.

5.4 Coastal Resources

Coastal resources can include islands, transitional, and intertidal areas, salt marshes, wetlands, floodplains, estuaries, beaches, dunes, barrier islands, and coral reefs, as well as fish and wildlife and their respective habitats within these areas. Federal activities involving or affecting coastal resources are governed by the Coastal Barrier Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Environmental Order (EO) 13089, *Coral Reef Protection*.

Carroll County is not located within the Maryland Coastal Zone.

5.5 Department of Transportation (DOT) Act, Section 4(f)

The previous environmental documents noted that there are no known Section 4(f) Resources on or near the project area. During preparation of the 2009 EA, a Phase I Cultural Resources survey was completed for a 233-acre project area, and a follow-up Phase II evaluation was conducted for three resources recommended as potentially eligible for listing on the National Register of Historic Places



(NRHP). None of these would have been impacted by the Proposed Development Program. There are no known Section 4(f) resources, including historic resources, within the areas included in the 2023 Proposed Action.

5.6 Farmlands

Farmlands are agricultural areas considered important and protected by federal, state, and local regulations. The Farmland Protection Policy Act (FPPA) regulates federal actions with the potential to convert farmland to non-agricultural uses. Specifically, the Act regulates farmland as prime, unique, or of statewide or local importance. The 2023 Proposed Action would occur on dedicated airport property and on adjacent parcels, some of which are currently used for agricultural purposes (including Parcels 11 and 12, proposed for full acquisition). According to FAA Order 1050.1F Desk Reference, direct impacts to farmlands typically involve the conversion of farmlands to non-agricultural use.

5.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Hazardous materials, solid waste, and pollution prevention are impact categories that include an evaluation of potential waste streams, potential hazardous materials either used during construction/operation or encountered at a contaminated site, and potential to interfere with ongoing remediation of a contaminated site.

The 2023 Proposed Action involves the fee simple acquisition of approximately 47 acres of property on Parcels 11 (approximately 33 acres), 12 (approximately 13 acres), 10 (approximately 0.5 acres), and 59 (approximately 0.5 acres). The 2018 SEA/FONSI notes that Environmental Due Diligence Audits (EDDA), also known as Environmental Site Assessments (ESA), are to be conducted for the properties slated for fee simple acquisition and on areas where grading easements may be required, before federal funds are expended on acquisitions.

The EPA 'NEPAssist' database confirms that there are no Brownfields or Superfund sites within one mile of the airport property (see Attachment D). The airport is within one mile of a Toxic Release Inventory (TRI) company, Marada Industries, Inc., and various Resource Conservation and Recovery Act (RCRA) sites (listed below) which report to the EPA (see Attachment D); however, according to the Enforcement and Compliance History Online (ECHO) reports on the NEPAssist website, all of these are in compliance with EPA regulations. The areas included in the 2023 Proposed Action do not overlap with these identified sites.

- *Knorr Brake Corporation*
- *Advanced Thermal Batteries, Inc.*
- *Marada Industries, Inc. (TRI)*
- *Strouse*
- *Wes Pharma, Inc.*
- *Pinnacle Ct Labs*
- *Advanced Vacuum Company*
- *Western Industrial Machine*
- *Skytech, Inc. (on airport)*
- *Finch Services*
- *Laser Applications, Inc.*
- *General Aero Services*



- *Carroll County Maintenance Facility (on airport)*

5.8 Historical, Architectural, Archaeological, and Cultural Resources

Historical, architectural, archaeological, and cultural resources encompass a range of sites, properties, and physical resources relating to human activities, society, and cultural institutions.

Coordination with the MHT conducted during the 2009 EA, and 2018 and 2020 SEAs confirmed that the proposed development program would have no effect on historic or cultural resources. Renewed coordination was conducted with MHT during preparation of the 2023 SEA which also resulted in a “no affect” determination (see **Attachment E**).

Two Native American tribes have documented an interest in Carroll County: the Delaware Nation, Oklahoma and the Seneca-Cayuga Nation.

5.9 Land Use

DMW is an operating, general aviation airport which contains a runway, parallel taxiway, a full-service fixed base operator (FBO) which provides fueling services, and various on-airport buildings, including hangar storage buildings. The Airport property is bordered by commercial, institutional, industrial, residential, and agricultural properties.

The 2023 Proposed Action requires approximately 47-acres of fee simple land acquisition for the removal of terrain obstructions to airspace and the construction of the western cul-de-sac to Pinch Valley Road. Parcels 11 and 12, which total approximately 36 acres, are used for agricultural purposes. The proposed western cul-de-sac of Pinch Valley Road would require the fee simple acquisition of approximately 0.5 acres each of Parcels 10 and 59, which are residential parcels. The 2023 Proposed Action also requires the acquisition of approximately 15 acres of grading easements over agricultural and industrial parcels; a small (0.1± acre) RLU easement within the future RPZ to Runway 16 over Parcel 40, a residential parcel; and a small LOS easement associated with the realignment of Meadow Branch Road over Parcel 45, a residential parcel. The land acquisitions are to be conducted in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970 (the Uniform Act)¹.

5.10 Natural Resources and Energy Supply

Natural resources and energy supply provide an evaluation of a project’s consumption of natural resources (such as water, petroleum for asphalt, stone for aggregate, wood, etc.) and use of energy supplies (such as coal for electricity, natural gas for heating, and fuel for aircraft or other ground vehicles). There would be a demand for natural resources and energy during the grading activities and construction of the cul-de-sacs proposed during the 2023 Proposed Action, which could require construction vehicles likely powered by fuel, and water for weighing down construction dust.

5.11 Noise and Noise-Compatible Land Use

The 2023 Proposed Action would occur on dedicated airport property and on adjacent parcels with residential, agricultural, and industrial uses. The FAA’s Advisory Circular 150/5190-4B, *Airport Land Use Compatibility Planning*, does not identify noise sensitivity impacts on agricultural and industrial uses by

¹ The requirements of this Act include: that owners of real property are treated fairly and consistently; that persons displaced as a result of federally assisted projects do not suffer disproportionate injuries; and that Agencies implement these regulations in a manner that is efficient and cost-effective.



airport operations, and notes that residential uses do experience noise impacts from airport operations. The noise associated with the proposed action would come from grading activities and construction of the cul-de-sacs and would be temporary.

5.12 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

The 2023 Proposed Action requires the acquisition of private property in fee and the acquisition of grading easements, line-of-sight easement, and a RLU easement.

Construction impacts, such as a temporary increase in traffic, noise, and air emissions, can be expected as a result of the project, as is the case with any construction project.

According to the EPA EJSCREEN mapper, the population within one mile of airport property is reported to be 22% “people of color”, with 13% of the population defined as low-income (see Attachment F). This is significantly lower than the state averages for these demographics, which are 49% “people of color” and 22% “low-income”, and higher or equal to the percentages for Carroll County, which reports 12% “people of color” and 13% “low-income”. Twenty seven percent of the population within one mile of the airport property are under the age of 18.

5.13 Visual Effects

According to the FAA 1050.1F Desk Reference, visual effects include light impacts that create annoyance or interfere with activities, or contrast with or detract from the visual character of the existing environment. The 2023 Proposed Action includes the acquisition of grading easements and grading activities on adjacent land to remove terrain obstructions to airspace and to support the realignment of Meadow Branch Road, and the construction of a cul-de-sac adjacent to two residential parcels on the western side of the airfield. The 2023 Proposed Action does not involve lighting and night work is not anticipated to be necessary for the construction of the cul-de-sacs adjacent to residential parcels.

5.14 Water Resources

5.14.1 Wetlands

A wetlands delineation was conducted during the 2018 SEA effort which identified approximately 16.8 acres of wetlands (see **Figure 5**). Many of the wetlands are adjacent to streams and occur in the floodplains of these streams. The project LOD does encompass several areas of wetlands and streams.

Wetlands, ponds, and streams are regulated by the United States Army Corps of Engineers (USACE) and the Maryland Department of the Environment (MDE); any encroachments, fills, or crossings of these areas would require the appropriate state and federal permits.

5.14.2 Floodplains

According to FEMA flood maps 24013C0182D and 24013C0202D, both effective 10/02/2015, there are no floodplains on airport property or the vicinity, including the areas associated with the 2023 Proposed Action (see **Figure 6**).



5.14.3 Surface Waters

Surface waters include streams, rivers, lakes, ponds, estuaries, and oceans. A wetlands and stream delineation conducted during the 2018 SEA identified 25 streams (a total of 18,088 linear feet [LF]) within the study area for the 2018 SEA (see **Figure 5**). Wetlands, ponds and streams are regulated by the USACE and the MDE. Any encroachments, fills, or crossings of these areas will require the appropriate state and federal permits.

5.14.4 Groundwater

Groundwater is surface water that is stored between sand, clay, and rock formations, and includes aquifers, geologic layers which store and transmit groundwater to wells, springs, and other water sources. The EPA “Sole Source Aquifers” online mapper does not identify a sole source aquifer on or near airport property and there are no known aquifers in the areas of the 2023 Proposed Projects. The 2023 Proposed Action does include the addition of impervious surface (cul-de-sacs) and significant grading activities.

5.14.5 Wild and Scenic Rivers

There are no federally designated Wild and Scenic rivers in Maryland nor state-designated rivers in the vicinity of the airport and project area.



LEGEND

AIRPORT PROPERTY	
ADJACENT PARCEL LINE	
FENCE	
STUDY AREA	
DELINEATED STREAM	
DELINEATED WETLANDS	
BOG TURTLE HABITAT	
AREAS OF CURSORY INVESTIGATION (NO ACCESS GRANTED)	

1000 0 1000 2000
SCALE: 1"=1000' FEET



Figure 6: FEMA Floodplains in the Vicinity of DMW



Source: Maryland Environmental Resources and Land Information Network (MERLIN)



6. Environmental Consequences

This section examines the environmental categories listed in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*. The reasonably foreseeable environmental consequences of the 2023 Proposed Action and No Action alternatives are discussed.

6.1 Air Quality

The airport is located in Carroll County, Maryland, which is a Non-Attainment area for ozone.

- **No Action:** As it does not involve construction, the No Action alternative would not create adverse impacts to air quality.
- **Build/Proposed Action:** The 2018 SEA/FONSI stated that limited short-term effects resulting from construction operations may occur from the proposed projects, which would be mitigated by the Sponsor's adherence to the applicable Best Management Practices (BMPs) specified in FAA Advisory Circular (AC) 150/5470-10, *Standard Specifications for Construction of Airports*, Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control". These mitigation measures would also apply to the 2023 Proposed Action (although Item P-156 has since been renumbered to Item C-102).

An emissions analysis was conducted for the project during the 2009 EA which concluded that while the proposed airport development program would increase emissions, the emission increases during construction and after construction would not exceed *de minimis* levels or equal or exceed 10 percent of regional emissions totals, and therefore are not considered to be significant.

While this 2023 SEA is being prepared to environmentally review only those items depicted in **Figure 4** and described on pages 8 and 9, due to the amount of time that has lapsed since the 2009 emissions analysis, a new analysis was conducted for the full airport development program. Estimates of construction and demolition-related emissions were developed for the Proposed Action using standard industry methodologies and techniques including the FAA *Aviation Emissions and Air Quality Handbook* and associated US EPA guidance and the US EPA's Motor Vehicle Emission Simulator (MOVES) model for both on-road and nonroad source emission factors. The results, displayed in **Table 3**, show that annual emissions for the 2023 through 2031 construction years would be below established *de minimis* thresholds for all pollutants; therefore, a General Conformity determination is not required. (Note that Carroll County is designated as "in attainment" for all criteria pollutants except for the 2008 and 2015 8-hour ozone standard; however, the remaining pollutants are listed in the table with the associated maintenance area designation *de minimis* thresholds to determine significance under NEPA.) The full air emissions report is included as **Attachment G**.

No significant air quality impacts are anticipated from the 2023 Proposed Action.



Table 3: Emissions Analysis Results

Year	Relevant Criteria Pollutant Emissions (tons per year)					
	CO	VOC	NOx	SO ₂	PM ₁₀	PM _{2.5}
2023						
Total Emissions	1.93	0.17	0.64	0.004	0.14	0.03
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2024						
Total Emissions	3.15	0.67	3.38	0.007	0.24	0.11
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2027						
Total Emissions	0.59	0.45	1.29	0.001	0.15	0.06
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2028						
Total Emissions	1.39	0.14	0.27	0.004	0.14	0.01
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2029						
Total Emissions	1.32	0.13	0.25	0.004	0.14	0.01
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2030						
Total Emissions	1.26	0.13	0.24	0.004	0.14	0.01
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>
2031						
Total Emissions	1.18	0.13	0.22	0.004	0.14	0.01
US EPA De Minimis Threshold	100	50	100	100	100	100
<i>Emissions below de minimis thresholds?</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>	<i>Yes</i>

Source: Harris, Miller, Miller, and Hanson, Inc.

6.2 Biological Resources

The USFWS IPaC database identified two federally threatened species, the Indiana Bat and the NLEB, and one candidate species, the Monarch Butterfly, as having the potential to occur or be affected by activities in the project location. The search also identified seven migratory birds, including the Bald Eagle, which may be within the project area. No critical habitats, wildlife refuges, or fish hatcheries were identified within the project area. During previous NEPA efforts, the Maryland DNR noted that the Bog Turtle could be located within the project area.

Potential impacts to individual species are discussed in further detail in this section.



6.2.1 Indiana Bat

To avoid impacts to the Indiana bat, the 2018 SEA noted that it may be necessary during the design phase to identify individual potential roost trees or maternity habitat and avoid their removal, or to remove trees during winter months when they are not being used as seasonal roosts. Coordination has been periodically renewed with the USFWS as the preliminary and final design phases for the first stage of the development program, the relocation of Meadow Branch Road, have progressed, with the most recent email communication from USFWS revalidating the time of year restrictions occurring in April 2023 (see **Attachment B**) USFWS has requested to be consulted before each stage of the development program progresses, to ensure no impacts to bats.

6.2.2 NLEB

The proposed removal of tree obstructions to existing and future airspace surfaces was environmentally reviewed under the 2018 SEA/FONSI. However, in March 2023, during preparation of this SEA, the NLEB was elevated by the United States Fish and Wildlife Service from a 'Threatened' to an 'Endangered' species, which nullified much of the agency's previous guidance. Coordination with the agency conducted in spring 2023, including preparing the online Determination Key ("dKey"), concluded that the 2023 Proposed Action, including the proposed tree removal which was reviewed under the 2018 SEA, has a "May Affect, but Not Likely to Affect" impact on the NLEB and that no mitigation measures are required at this time (see **Attachment B**). However, the dKey results are valid only until April 2024; the obstruction clearing at DMW is proposed to occur in 2026. Additional coordination is to be conducted with USFWS in April 2024, at which time the agency is expected to provide additional guidance related to mitigating potential impacts to this species.

6.2.3 Bog Turtle

Phase II trapping surveys were conducted during spring 2023 in select wetland areas which are proposed to be impacted by the airport development program (grading for the replacement runway) and which Maryland DNR determined during the previous NEPA efforts to be potential habitat for the Bog Turtle. Trapping occurred once in April 2023, twice during May 2023, and once in June 2023, in accordance with DNR guidance. No turtles were found during the surveys. The Phase 2 Bog Turtle Survey Report was submitted to Maryland DNR in June 2023 and in July 2023 the agency concurred with the findings of the report and confirmed that no additional coordination or mitigation for this species is necessary (see **Attachment C**).

6.2.4 Bald Eagle

Bald eagles or their nests were not identified during previous NEPA efforts. The Cornell Lab of Ornithology "eBird" site lists several self-reported Bald Eagle sightings near a pond north of the airport property, outside of the study area, but no documented nests (see **Attachment B**). Similarly, the Maryland Bird Conservation Partnership database of bald eagle nests does not identify documented nests in the vicinity (see **Attachment B**).

During preparation of this SEA, the County was notified by an adjacent resident of a suspected bald eagle and nest in the vicinity of the airport. In April 2023, the County submitted the photos provided by the resident, and photographs taken by County employees at the location provided by the resident, to the USFWS Regional Eagle Coordinator, who advised that the nest is likely a hawk's nest but that the County should continue to monitor the nest and the area for signs of bald eagle presence or use (see **Attachment B**).



6.2.5 Monarch Butterfly

The Monarch Butterfly became a federally listed Candidate species in December 2020. The USFWS notes that this is a Candidate species and not yet listed or proposed for listing; consultation with the USFWS under Section 7 of the ESA is not required for candidate species. The USFWS notes that the habitat for the Monarch Butterfly is provided by milkweed and flowering plants; they can only lay eggs on milkweed plants. No milkweed plants were observed during the species field surveys conducted during the 2018 SEA, suggesting that suitable habitat for this species is not present within the study area. The areas proposed for grading are currently mowed or are developed as industrial uses. As milkweed requires full sun, it is unlikely that it would be present within the forested areas proposed for clearing.

6.2.6 Forest Conservation Act

The 2018 SEA notes that a Forest Stand Delineation (FSD) and Forest Conservation Plan (FCP) are to be prepared and submitted as appropriate to the County during the permitting phase before final design is initiated. The replacement runway program is being conducted in phases to accommodate funding and phasing. A FSD and FCP were prepared in 2021 for the first stage of the program, the relocation of Meadow Branch Road (see **Attachment I**). The plans detail the removal of four specimen trees due to site grading and the construction of the road and note that 2.66 acres of mitigation credits are to be purchased from an off-site forest bank prior to the grading permit being issued. According to a list of available forest bank credits provided by Carroll County in early 2022, there are over 40 credits available for purchase in the project vicinity. The Carroll County Department of Landscape/Forest Conservation approved the plans on June 23, 2022. As stated in the 2018 SEA, FSD and FCP are to be prepared for the remaining phases of the program as they move forward. The County's acceptance of this is included in Attachment I.

Based on the information provided above, the potential impacts to Biological Resources from the two alternatives considered are described below.

- **No Action:** As it does not involve construction, the No Action alternative would not create adverse impacts to biological resources.
- **Build/Proposed Action:** Based on the information outlined above and with the understanding that a time-of-year restriction on tree removal is to be implemented to avoid impacts to the Indiana Bat, the suspected hawk nest is to be monitored for signs of bald eagles, and coordination with USFWS is to be conducted in April 2024 for renewed guidance or mitigation measures related to the NLEB, *no significant impacts to biological resources are anticipated.*

6.3 Climate

The 2018 SEA/FONSI noted that as the Proposed Action is not associated with an increase in aircraft operations or aircraft operational changes, no measurable increase in greenhouse gases would occur and no climate impacts are anticipated. Although no federal standards have been set for GHG emissions, an emissions analysis was conducted for the Proposed Action during this 2023 SEA for disclosure purposes using the EPA's MOVES4 software. For this analysis, GHG emissions associated with the Proposed Action were prepared for carbon dioxide, methane, and nitrous oxide and presented as carbon dioxide equivalent (CO₂e) in metric tons per year relevant to their global warming potential. The results are depicted in Table 4 and the full air quality report is included as **Attachment G**. As stated in the attached report, while there are no significance thresholds established for climate impacts, given the low percentage of overall emissions from the project compared to GHG emissions on a statewide level,



the increase in construction emissions as a result of the project is not substantial on a national or global scale.

Table 4: GHG Emissions Analysis

Year	Greenhouse Gases (metric tons/year)			CO ₂ e (metric tons/year)
	CO ₂	CH ₄	N ₂ O	
2023	802.3	0.006	0.004	803
2024	1,929	0.03	0.17	1,974
2027	1,862	0.001	0.005	1,864
2028	720	0.003	0.004	721
2029	718	0.003	0.004	719
2030	717	0.003	0.004	718
2031	716	0.003	0.004	717

Source: Harris, Miller, Miller, and Hanson, Inc.

- **No Action:** As it does not involve construction, the No Action alternative would not create adverse climate impacts.
- **Build/Proposed Action:** Similar to what was noted in the 2018 and 2020 SEA/FONSI, the projects contained in the 2023 Proposed Action are not anticipated to cause a measurable increase in greenhouse gases and *no significant climate impacts are anticipated.*

6.4 Coastal Resources

As Carroll County is not located within the Maryland Coastal Zone, a consistency determination is not required and *no adverse impacts are anticipated to coastal resources by either the No Action alternative or the Build/Proposed Action.*

6.5 Department of Transportation, Section 4(f) Resources

The previous environmental documents noted that there are no known Section 4(f) Resources, including historic properties eligible for listing on the NRHP, on or near the project area.

- **No Action:** As it does not involve construction, the No Action alternative would not impact Section 4(f) resources.
- **Build/Proposed Action:** The MHT was contacted during this 2023 Supplemental effort and has confirmed that no impacts to historic properties are anticipated as a result of the Proposed Action (see Attachment E). *No impacts to Section 4(f) resources are anticipated as a result of the 2023 Proposed Action.*

6.6 Farmlands

After coordination with the Natural Resources Conservation Service (NRCS), the 2018 SEA/FONSI concluded that there would be no significant, adverse impacts to farmlands as a result of the Proposed Action. FAA Order 1050.1 Desk References notes that a significant impact would occur when the total combined score on Form AD-1006, "Farmland Conversion Impact Rating," ranges between 200 and 260 points. The Form AD-1006 prepared for the 2009 EA had a total of between 75 and 80 points.



According to the FAA Order 1050.1F Desk Reference, direct impacts to farmlands typically involve the conversion of farmlands to non-agricultural use. The Desk Reference notes that the study area for farmlands is typically limited to the construction footprint of the project. The 2023 Proposed Action includes expanded grading activities on Parcels 11 and 12, which are currently farmed.

The ground elevation of Parcels 11 and 12 is significantly higher than that of the runway and airfield. The parcels contain trees which penetrate protected airspace, and the terrain on these parcels also penetrates airspace from 10 to 40 feet. As a “worst case scenario” this SEA is being prepared with the assumption that the parcels will be unusable for agricultural activities when grading is complete and that these parcels may need to be acquired in fee by the County in lieu of grading easements.

An updated Form AD-1006 was prepared for the 2023 SEA and was coordinated with NRCS. The AD-1006 was prepared to consider the full airport development program to take into account any cumulative impacts. This effort resulted in an Impact Rating score of 114, which is below the threshold for significant impacts (see Attachment J).

- **No Action:** As it does not involve construction, the No Action alternative would not impact farmlands.
- **Build/Proposed Action:** The Farmland Conversation Impact Rating completed in conjunction with NRCS resulted in a score which is well below the threshold of significance; therefore *no significant adverse impacts to farmlands are anticipated.*

6.7 Hazardous Materials, Solid Waste, and Pollution Prevention

The 2023 Proposed Action involves the fee simple acquisition of approximately 47 acres of property and grading on Parcels 11 and 12, and the fee simple acquisition of small portions of Parcels 10 and 59. The 2023 Proposed Action also includes the construction of two cul-de-sacs to terminate Pinch Valley Road and grading activities on Parcels 10, 18, and 17.

The 2018 SEA/FONSI notes that Environmental Due Diligence Audits (EDDA), also known as Environmental Site Assessments (ESA), are to be conducted for the properties slated for fee simple acquisition and on areas where grading easements may be required, before federal funds are expended on acquisitions.

While EDDAs are not included in the scope of work for the 2018 SEA or for this 2023 SEA, the 2018 SEA included summaries of EDDAs for select parcels that the County conducted at the time during a separate effort, to support the environmental analysis. Summaries of EDDAs for Parcels 17 and 18 are included below and excerpts from both EDDAs are included in this 2023 document as **Attachment H**.

- **Parcel 17:** A small portion of Parcel 17 is proposed for grading easement acquisition in this 2023 SEA. The EDDA conducted by the County in 2017 did not identify Recognized Environmental Conditions (RECs), Historical RECs (HRECs), or Controlled RECs (CRECs) on this parcel and no further study was recommended.
- **Parcel 18:** The 2017 EDDA did not identify HRECs or CRECs on the parcel but did identify RECs in the form of soil and broken asphalt from local road projects. At the time the 2017 EDDA was conducted, the County had proposed to purchase the full 20± acre parcel; however, design refinements since that time have limited the limits of disturbance (LOD) to outside of the identified RECs (see).



EDDAs have not been conducted for Parcels 10, 11, 12, or 59 because they were not proposed for fee simple acquisition in previous environmental documents; however, consistent with the commitments in the 2018 SEA, they would be conducted as necessary before federal funds are expended on acquisitions. There are no known “red flag” issues related to hazardous materials or pollution on the parcels proposed for fee simple acquisition. For the purposes of this SEA, it is assumed that Parcels 11 and 12 would be acquired in full; these parcels are in agricultural use, with Parcel 11 being actively farmed. Parcels 59 and 10 are residential parcels with no structures or facilities present within the areas to be acquired.

The EPA ‘NEPAssist’ database confirms that there are no Brownfields or Superfund sites within one mile of the airport property (see Attachment D).

- **No Action:** As it does not involve construction or land acquisition, the No Action alternative would not involve hazards materials, solid waste, or pollution impacts.
- **Build/Proposed Action:** Other than the solid waste that can be expected from any construction project, which the contractor is responsible for disposing of at a permitted facility, and with the understanding that ESAs are to be performed on those parcels proposed for fee simple acquisition and grading before federal funds are expended on acquisitions, *no significant adverse impacts to this resource category are anticipated.*

Figure 7: LOD in Relation to RECs, Parcel 18



Source: RETTEW, Inc., Delta Airport Consultants, Inc.

6.8 Historical, Architectural, Archaeological and Cultural Resources

The MHT was contacted during preparation of this 2023 SEA and has confirmed that no additional impacts to historic properties are anticipated as a result of the refinements to the Proposed Action (see Attachment E).

Two Native American tribes, the Delaware Nation and the Seneca-Cayuga Nation, have documented an interest in Carroll County. Coordination letters were submitted to both tribes in May 2022. The Delaware Nation responded that the project should have no adverse effect on known cultural or religious sites of interest but requested that construction and ground disturbing activities be halted and that the appropriate state agencies and the Tribe be notified within 24 hours if resources are uncovered (see Attachment E). No response was received from the Seneca-Cayuga Nation; however, should a response be received after this document is finalized, every effort is to be made to accommodate their requests.

- **No Action:** As it does not involve construction, demolition, or land disturbance, the No Action alternative would not impact historical, architectural, archaeological and cultural resources.
- **Build/Proposed Action:** There are no resources eligible for listing on the NRHP in the project area and MHT has confirmed there are no impacts anticipated; there are also no impacts anticipated to tribal resources. *No impacts to this category are anticipated.*

6.9 Land Use

The 2023 Proposed Action requires approximately 47 acres of fee simple land acquisition, approximately 15 acres of grading easements, a small (less than 2,000 square foot) LOS easement associated with the realignment of Meadow Branch Road, and an approximately 0.1-acre RLU easement within the future RPZ to Runway 16. Parcels proposed for acquisition are zoned for Agricultural, Industrial, or Residential use, similar to the airport property, portions of which are zoned Agricultural and portions of which are zoned Industrial, and there are no plans to re-zone parcels after acquisition.

As stated in the previous documents and per federal requirement, the acquisitions and relocations in the 2023 Proposed Action are to be conducted in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970 (the Uniform Act).

The proposed grading on the privately held parcels surrounding the airport would make possible the removal of terrain obstructions to airspace on parcels surrounding the airport, improving land use compatibility with airport operations. The agricultural properties proposed for grading are assumed to be acquired in fee by the County, should the grading activities render the parcels unusable for agricultural use. Approximately 0.5 acres of land each would be acquired in fee for the construction of the western cul-de-sac of Pinch Valley Road on two residential parcels. However, these parcels are already located adjacent to Pinch Valley Road. Construction of the cul-de-sac would likely decrease the amount of traffic on this gravel road, as well as the associated noise and dust effects, post-construction.

- **No Action:** As it does not involve construction, the No Action alternative would not create incompatible land uses or cause land use incompatibility issues.
- **Build/Proposed Action:** The build alternative proposes airport development that is in line with the character of the facility today. The grading of terrain obstructions to airspace would increase compatibility between surrounding land uses and airport operations. Land acquisition is



to be conducted in accordance with the Uniform Act. *No significant adverse land use impacts are anticipated.*

6.10 Natural Resources and Energy Supply

The 2018 SEA/FONSI concluded that there would be no impacts to Natural Resources and Energy Supply as a result of the Proposed Action.

- **No Action:** As it does not involve construction or the operation of new facilities, the No Action alternative would not negatively impact the supply of natural resources or energy.
- **Build/Proposed Action:** The proposed development would require natural resources and energy during construction of the project, including for fuel, water, and electricity; however, the development is not anticipated to exceed available or future supplies of these resources. The effort would also require the removal of approximately 105 acres of trees; however, this action would not cause demand for tree resources to exceed available or future supplies of these resources, and therefore does not represent a significant impact to this resource category. *No adverse impacts to natural resources and energy supply are anticipated as a result of the 2023 Proposed Action.*

6.11 Noise and Noise-Compatible Land Use

The 2023 Proposed Action requires grading activities and the construction of a cul-de-sac adjacent to two residential parcels. The appropriate property interest is to be acquired from off-airport parcels before construction activities take place. The FAA's 1050.1F Desk Reference notes that the acquisition of land or land interests such as easements and development rights to ensure the use of property for purposes compatible with noise exposure, is a mitigation measure for noise impacts.

Approximately one acre of land would be acquired in fee for the construction of the western cul-de-sac of Pinch Valley Road on two residential parcels. However, these parcels are already located adjacent to Pinch Valley Road. Construction of the cul-de-sac would likely decrease the amount of traffic on this gravel road, as well as the associated noise or dust effects to these residential parcels.

- **No Action:** As it does not involve construction, demolition, or land disturbance, there would be no noise impacts from the No Action alternative.
- **Build/Proposed Action:** As with any construction project, temporary impacts to noise levels are to be expected. However, the nuisance would last only as long as construction occurs. The residences on Parcels 10 and 59 are already adjacent to the gravel Pinch Valley Road; the level of activity on the proposed cul-de-sacs, once constructed, is expected to be lower than that of the road as through-access would no longer be available. The appropriate property interest is to be acquired before construction activities take place. *No adverse, long-term noise impacts are anticipated as a result of the Proposed Action.*

6.12 Socioeconomics, Environmental Justice (EJ), and Children's Health and Safety Risks

The 2023 Proposed Action requires the acquisition of land and easements, the construction of cul-de-sacs on the western and eastern sides of the airport property, and significant grading on and around the airfield.



The population within one mile of airport property is reported to be 22% “people of color”, with 13% of the population defined as low-income and 27% under the age of 18 (see Attachment F). As the area where the project is proposed is not heavily populated with minority or low-income residents or children, it is reasonable to conclude that any potential environmental impacts resulting from the project would not be disproportionately borne by these groups. Property acquisitions would adhere to the requirements of the Uniform Act.

Temporary construction impacts, such as a temporary increase in traffic, noise, and air emissions, can be expected as a result of the project, as is the case with any construction project. Construction could provide temporary jobs and economic activity in the area.

- **No Action:** As it does not involve construction, there would be no adverse socioeconomic impacts from the No Action alternative. The No Action alternative would not create jobs and economic activity in the area associated with a construction project.
- **Build/Proposed Action:** In consideration of the above discussion, *no significant adverse socioeconomic impacts anticipated as a result of the 2023 Proposed Action, although positive impacts in the form of jobs and economic activity generated during construction can be expected.*

6.13 Visual Effects

The 2018 SEA noted that the majority of the Proposed Action would be located on an existing, operating airport and the proposed projects are in line with the existing use and character of the Airport. There are scattered, low-density residential uses located in the vicinity of the airport; however, these residences area already situated near an operating airport with existing lighting. There have been no known complaints of lighting or visual effects from property owners in the airport vicinity.

There are no proposed street lights associated with the construction of the cul-de-sacs. The areas proposed for grading would either be fully acquired by the County, in which case the property owner would be compensated at Fair Market Value, or would be graded after the purchase of grading easements, which would compensate the property owner for the grading impacts.

Similarly, the County would obtain the appropriate property interest permissions, typically avigation easements, before removing airspace obstructions (trees) from adjacent, privately owned parcels. The property owner would be compensated for the effects of the tree removal, which may include visual impacts. As stated in the Desk Reference to FAA Order 1050.1F, visual impacts can be difficult to define or assess because they involve subjectivity.

- **No Action:** As it does not involve development, there would be no visual impacts from the No Action alternative.
- **Build/Proposed Action:** The FAA has not established a significance threshold for visual effects. As projects included in the 2023 Proposed Action do not involve lighting and private property owners would be compensated for the effects of off-airport grading and tree removal activities, *no significant, adverse visual impacts are anticipated as a result of the proposed development.*



6.14 Water Resources

6.14.1 Wetlands

A wetlands delineation was conducted during the 2018 SEA effort which identified approximately 16.8 acres of wetlands within the 2018 SEA project area (see **Figure 5**). The 2018 SEA noted that the Proposed Action would impact an estimated 4.11 acres of wetlands due to grading for the replacement runway. This wetlands impact is unavoidable to construct the runway and to comply with FAA design standards. Grubbing and grading associated with the obstruction (tree) removal north of Runway 16 would take place outside of delineated wetlands and streams, including maintaining a 35-foot buffer from these resources; therefore, no wetland impacts are anticipated from tree removal.

The 2023 SEA includes additional areas of grading on airport property and on Parcel 11 which would increase the total wetlands impact to approximately five acres (see **Figure 8** and **Table 5**). These additional impacts include expanded grading of Wetland #9. This impact is also unavoidable to comply with FAA requirements regarding maintaining clear airspace. The wetland impacts for the airport development program are limited to the Runway 16 (northern) end and the project limits of disturbance (LOD), depicted in red on **Figure 8** and **Figure 9**, avoids wetlands on the Runway 34 (southern) end.

The previous environmental documents note that prior to land disturbing activities, permit applications would be submitted to USACE and MDE for coordination and approval; this applies also to the 2023 Proposed Action. Based on the amount of wetland impacts of the full runway program, it is anticipated that an individual permit will be required.

During the design and permit process, a wetlands re-delineation and coordination regarding jurisdiction is to occur; also during this phase, mitigation is to be coordinated with USACE and MDE as the Sponsor addresses 404(b) 1 guidelines- avoidance, minimization, and compensation. While specific mitigation requirements cannot be determined prior to the permitting and mitigation effort, MDE has indicated that their preferred method of mitigation would be either wetlands banking or Permittee-Responsible Mitigation (PRM). MDE also stated that mitigation would be required (per acre of impact) at a 2:1 ratio for conversion of forested wetlands and 1:1 for emergent wetlands. Should the wetlands be designated as Non-tidal Wetlands of Special State Concern, the mitigation ratios would be 2:1 for impacts to emergent wetlands and 3:1 for forested wetlands (see **Attachment M**).

Mitigation would take place during the design and permitting phases. The Meadow Branch Road relocation, which is the first phase of construction for the airport development program, does not impact wetlands or streams and no permits or mitigation are required for this stage of the program. The next phase of development (grading and site preparation for the replacement runway) is anticipated to begin in fall 2024, at which point the permitting and mitigation effort for wetland impacts with associated coordination with the permitting agencies is to begin.



Table 5: Wetland Impacts Comparison

Impact Area (PER)	Designation (2016 Delineation)	Wetland Type(s)	Estimated 2018 Impacts (Acres)	Estimated 2023 Impacts (Acres, Total)	Estimated Additional Impacts from 2023 Proposed Action
A	#9	PEM/PSS/PFO	3.54	4.12	0.58
	#9	PEM/PFO	0.00	0.08	0.08
B	#10	PEM/PSS/PFO	0.30	0.30	0.00
C	#11	PEM	0.27	0.27	0.00
	Total		4.11	5.00*	

Source: Delta Airport Consultants, Inc.

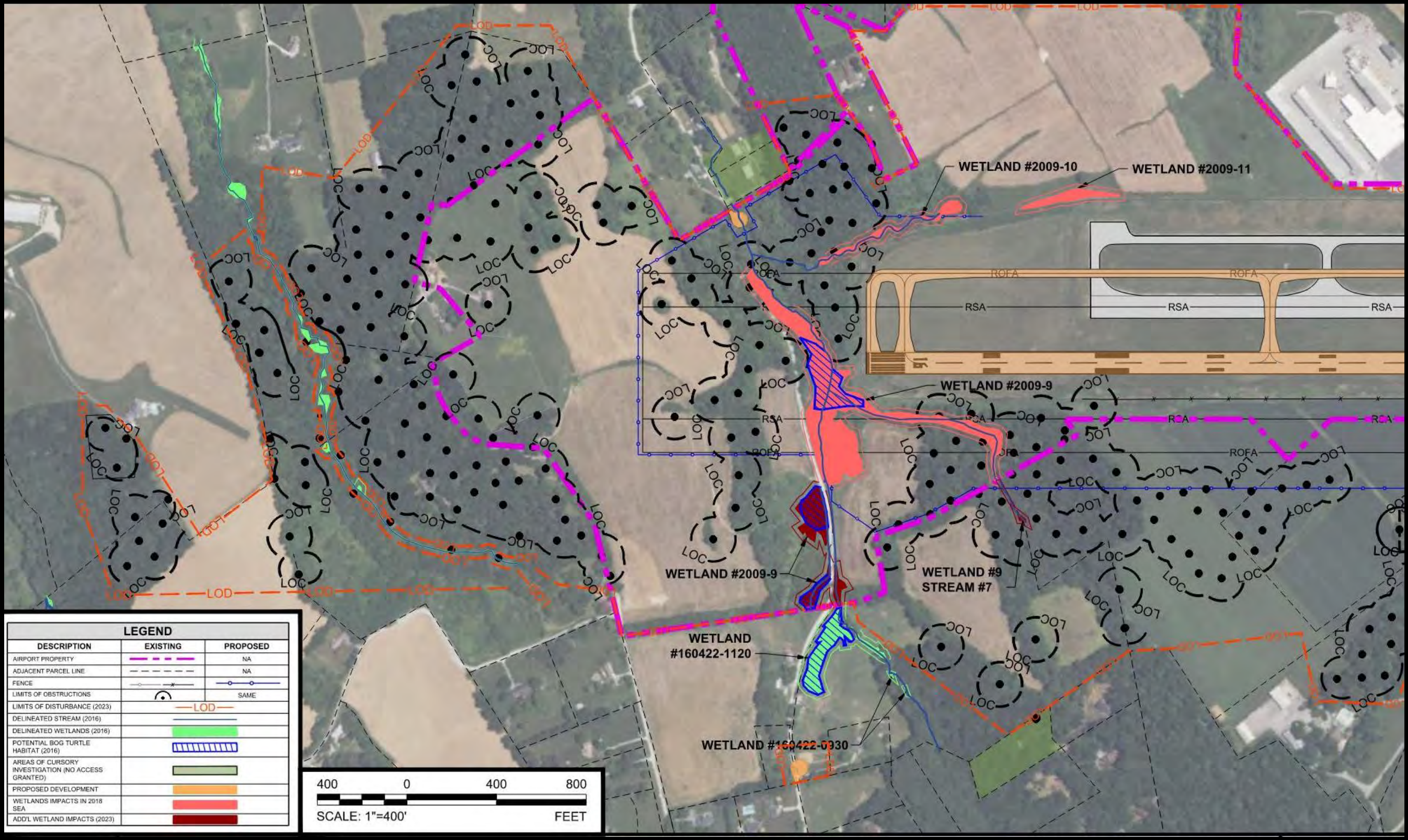
*Rounded

6.14.2 Floodplains

According to FEMA flood maps 24013C0182D and 24013C0202D, both effective 10/02/2015, there are no floodplains on airport property or within the project limits (see **Figure 6**). Therefore *there are no impacts to floodplains associated with the No Action or the Build/Proposed Action.*



Figure 8: Estimated Wetland Impacts, Runway 16 End



Source: RETTEW Associates, Inc., Delta Airport Consultants, Inc.



WETLAND #160428-1600

WETLAND #160428-1105

ROFA

RSA

LEGEND

DESCRIPTION	EXISTING	PROPOSED
AIRPORT PROPERTY	—	NA
ADJACENT PARCEL LINE	---	---
FENCE	—	—
LIMITS OF OBSTRUCTIONS	—	—
LIMITS OF DISTURBANCE (2023)	—	—
DELINEATED STREAM (2016)	—	—
DELINEATED WETLANDS (2016)	—	—
POTENTIAL BOG TURTLE HABITAT (2016)	—	—
AREAS OF CURSORY INVESTIGATION (NO ACCESS GRANTED)	—	—
PROPOSED DEVELOPMENT	—	—
WETLANDS IMPACTS IN 2018 SEA	—	—
ADD'L WETLAND IMPACTS (2023)	—	—

SCALE: 1"=400'

FEET



6.14.3 Surface Waters

The Proposed Action would result in an increase of impervious surface in the project area from the proposed cul-de-sacs and would include additional on- and off-airport grading. The preliminary engineering effort conducted for the airport development program during 2021 through 2023 (see **Attachment K** for exhibits) used current Maryland Stormwater and Erosion Control standards in the analysis and intends that Environmental Site Design (ESD) practices are to be implemented to the maximum extent practical during final design, in accordance with MDE's Maryland Stormwater Handbook. These practices include minimizing impervious ground cover, reducing existing impervious cover, disconnecting impervious cover from channels and storm sewer systems, and implementing several best management practices (BMP). Specific to the proposed grading west of the Runway 16 end (including Parcels 11 and 12), the graded slopes would either be covered with grass or riprap or other stabilizing materials to reduce stormwater runoff.

In addition, impacts to water quality from construction are to be mitigated by the Sponsor's proposed adherence to applicable BMPs specified in FAA AC 150/5470-10, *Standard Specifications for Construction of Airports*.

In general, the goals for the final design of the total project site include routing stormwater runoff from the airfield and roadway surfaces, reducing volume and peak runoff to protect property and environmental resources, and minimizing pollutants, such as metals and sediment. During final design, a Stormwater Management Concept Plan is to be prepared to meet County standards.

The 2018 SEA noted that the Proposed Action would impact an estimated 3,660 linear feet (LF) of streams due to grading for the replacement runway. The 2023 SEA includes additional areas of grading on airport property and on Parcel 11 which would increase the stream impact to approximately 4,825 LF, which has been rounded to 5,000 LF as a conservative measure for this SEA (see **Table 6**).

Grubbing and grading associated with the proposed obstruction (tree) removal north of Runway 16 would take place outside of delineated wetlands and streams, including maintaining a 35-foot buffer from these resources; therefore no stream impacts are anticipated as a result of tree removal.

The previous environmental documents note that prior to land disturbing activities, permit applications would be submitted to USACE and MDE for coordination and approval and list stream restoration or paying into a bank as possible mitigation measures for stream impacts, which remains the case. Mitigation for the grading associated with the replacement runway would take place during the design and permitting phase, which is anticipated to begin in fall 2024.



Table 6: Stream Impacts Comparison

Stream Impact Area (PER)	Stream Designation (2016 Delineation)	Description	Estimated 2018 Impacts (LF)	Estimated 2023 Impacts (LF)	2023-specific impacts
1	Stream #5	Unnamed Tributary to Bear Branch	1,530	1,972	442
	Stream #10	Unnamed Tributary to Bear Branch	0	628	628
2	Stream #6	Unnamed Tributary to Bear Branch	1,000	1,000	0
3	Stream #7	Unnamed Tributary to Bear Branch	1,130	1,225	95
	Total		3,660	4,825 (5,000)*	

Source: Delta Airport Consultants, Inc.

*rounded

- **No Action:** As it does not involve construction, demolition, or land disturbance, there would be no impacts to surface waters from the No Action alternative.
- **Build/Proposed Action:** With the proper adherence to BMPs and mitigation for impacts to streams, *no significant, long-term impacts to Surface Waters are anticipated as a result of the Proposed Action.*

6.14.4 Groundwater

The EPA “Sole Source Aquifers” online mapper does not identify a sole source aquifer on or near airport property. The areas on Parcels 11 and 12 to be graded are at a significantly higher elevation than the surrounding parcels and there is no anticipation of impacting groundwater during grading activities.

- **No Action:** As it does not involve construction, demolition, or land disturbance, there would be no impacts to ground waters from the No Action alternative.
- **Build/Proposed Action:** There is no expectation of reaching the groundwater table during grading or construction activities and there are *no adverse, long-term impacts to ground waters anticipated as a result of the 2023 Proposed Action.*

6.14.5 Wild and Scenic Rivers

There are no federally designated Wild and Scenic rivers in Maryland. The Monocacy River is designated as a State Scenic and Wild River and follows the western border of Carroll County, well outside the project area. Therefore *there are no anticipated impacts to Wild and Scenic Rivers from either the No Action or the Build/Proposed Action.*



7. Mitigation

Mitigation measures are listed below which are in addition to the mitigation measures noted in the previous FONSI's included in **Attachment A** (the previous mitigation measures from the 2018 EA and 2020 SEA also apply to the 2023 SEA):

7.1 Cultural Resources

The FAA shall follow the procedures in 47 CFR 800.13 for post-review discoveries if potential historic properties are discovered or if unanticipated effects on known historic properties are found after the agency has completed Section 106 consultation for the undertaking.

If a post review discovery is made during implementation of an undertaking conducted under this Agreement, all activities within a 100- foot-radius of the discovery will cease, and the airport Sponsor shall take steps to protect the discovery, and promptly report the discovery to the FAA, SHPO/THPO, and Tribes that have expressed an interest in this area.

If the FAA has approved the undertaking and construction has commenced, determine actions that the agency official can take to resolve adverse effects, and notify the SHPO/THPO, any Indian Tribe that might attach religious and cultural significance to the affected property, and the Council within 48 hours of the discovery. The notification shall describe the agency official's assessment of National Register eligibility of the property and proposed actions to resolve the adverse effects. The SHPO/THPO, the Indian tribe and the Council shall respond within 48 hours of the notification. The agency official shall take into account their recommendations regarding National Register eligibility and proposed actions, and then carry out appropriate actions. The agency official shall provide the SHPO/THPO, the Indian Tribe and the Council a report of the actions when they are completed.

7.2 Human Remains

If human remains and associated cultural items, as defined by the NAGPRA, are encountered, the airport Sponsor will immediately notify the FAA and follow the regulations at 43 CFR § 10. A NAGPRA plan of action will be implemented.

If human remains, funerary objects, sacred ceremonial objects or objects of national or tribal patrimony are discovered on state, county, municipal, or private lands, either through archaeological excavation or during construction, and no Burial Agreement is in place the Airport Sponsor shall require the person in charge to immediately cease within a 100- foot radius of the discovery, take steps to protect the discovery, and immediately notify the FAA, SHPO/THPO and the Tribes that have expressed an interest in this area.

7.3 Wetlands and Streams

A wetland and stream re-delineation and agency coordination regarding jurisdiction and mitigation for the wetland and stream impacts associated with the replacement runway is to be coordinated and accomplished during the design and permitting phase for the runway grading and site preparation project (anticipated to begin in fall 2024). Under the USACE's "Mitigation Rule", purchasing credits at an approved mitigation bank site is preferred by the permitting agencies over permittee responsible mitigation (PRM), in which a sponsor creates new wetlands. According to the USACE Regulatory In-lieu Fee and Bank Information and Tracking System (RIBITS), one pending bank occurs in the Carroll County



service area. If wetland credits are not available at the time of mitigation, then PRM would likely become the mitigation method. See **Attachment M** for email communication with MDE regarding potential mitigation methods.

7.4 Biotic Resources

While there are no mitigation measures proposed for the NLEB under USFWS's current guidance, renewed coordination with the agency is to take place in April 2024, at which time the agency is anticipated to issue additional guidance and mitigation methods for this species. The County should coordinate with USFWS regarding impacts to the Indiana Bat as the phases of development move forward, per the agency's request. Adherence to a time-of-year restriction on tree clearing is proposed to mitigate potential impacts to the Indiana Bat. The County should monitor the nest identified by a resident in spring 2023 for signs of Bald Eagle activity; should the nest indicate bald eagle activity, additional coordination with USFWS would occur.

8. Public Participation

Agency scoping letters were issued to various federal, state, and local agencies in May 2022 with a request for comments by June 27, 2022 (see Attachment L). The Maryland DNR responded in August 2022 that they do not anticipate impacts to protected species from the proposed project. Tribal coordination is described on Page 25 and Attachment E.

Upon concurrence by FAA, the draft Supplemental EA is to be made available for a 30-day public review and comment period. The FAA's environmental finding and final document is also to be made available for a 30-day public review period.

9. List of Preparers

Mark Myers, Airport Manager (Carroll County)
Mary Ashburn Pearson, Project Manager (Delta Airport Consultants, Inc.)
Delta Airport Consultants, Inc. – Technical Support and Quality Control

10. List of Agencies and Persons Consulted

Federal Aviation Administration (FAA)	Genevieve J. Walker, Environmental Specialist
Maryland Aviation Administration (MAA)	Gerry Stover, Airport Services Manager
U.S. Environmental Protection Agency (EPA)	Virginia Vassalotti, Source Water Protection
U.S. Fish and Wildlife Service (USFWS)	Genevieve LaRouche, Ecological Services
U.S. Army Corps of Engineers (USACE)	Dave Morrow, Dep. District Mgr.
U.S. Dept of Agriculture, NRCS	Dr. Terron L. Hillsman, Ph.D.
Delaware Nation, Oklahoma	Katelyn Lucas, Tribal Historic Preservation Assistant
Seneca-Cayuga Nation	William Tarrant, Tribal Historic Preservation Officer
Maryland Department of Planning, State Clearinghouse	Linda C. Janey, Assistant Secretary
Maryland Dept. of Natural Resources	Lori Byrne, Wildlife and Heritage Service
Maryland Dept. of the Environment	Josh Tirella, Wetlands and Waterways
Maryland Historic Trust	Beth Cole, Administrator
City of Westminster Dept. of Community	



Planning and Development
City of Westminster Recreation and Parks
City of Westminster Office of Housing Svcs
City of Westminster Dept. of Public Works

Mark Depo, Director
Abby Gruber, Director
Eric C. Brown, Administrator
Jeffrey D. Glass, Director



Attachment A

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT**

Carroll County Regional Airport
Westminster, Carroll County, Maryland

Airport's Five Year Capital Improvement Program

- 1. Introduction.** This document is a Finding of No Significant Impact on the environment as a result of a development proposal by Carroll County, owner and operator of Carroll County Regional Airport (DMW). Carroll County's proposed actions are to construct a new 6,400 foot runway 250 feet west of the existing runway, construct a parallel taxiway, install an Instrument Landing System (ILS) on Runway 16 end, remove obstructions, acquire land and complete associated projects as listed in Section 3 below.

The Federal Aviation Administration (FAA) must comply with the National Environmental Policy Act of 1969 (NEPA) before being able to take the federal action of further processing of an application for Federal assistance in funding various airport development and for approval of the Airport Layout Plan (ALP) that depicts the proposed airport development projects. Approval of the ALP is authorized by the Airport and Airway Improvement Act of 1982, as amended (Public Laws 97-248 and 100-223).

- 2. Project Purpose and Need.** The purpose of the proposed improvements is to accommodate the existing and projected aviation demand of the Carroll County Regional Airport. The existing Airport Reference Code (ARC) is C-II and future ARC is C-III based on the critical aircraft identified in the 2007 Master Plan Update. The existing Runway 16/34 is 100 feet wide and 5,100 feet long with a pavement strength of 22,000 pounds Single Wheel Loading (SWL). The installation of the Category I ILS will provide more precise lateral guidance to aircraft during the approach to the runway and allow aircraft to more accurately determine their position along the final approach course during Instrument Meteorological Conditions. This project is part of the National Plan of Integrated Airport Systems (NPIAS), which is planned to provide public airport facilities conforming to minimum design standards.

Obstruction removal includes removal of existing trees and brush within the protected airspace for Runway 16/34 and the elimination of obstructions to the Federal Aviation Regulation (FAR) Part 77, *Objects Affecting Navigable Airspace* surfaces. Property interest acquisition is necessary to gain controlling interest of the RPZs and aid in the removal of obstructions.

- 3. Proposed Project.** The following is a listing of the various components of the proposed project:
- Construct new Runway 6,400 feet by 100 feet with a pavement strength of 91,000 Dual Wheel Gear.
 - Construct full length taxiway 6,400 feet by 50 feet.
 - Install a Category I ILS on Runway 16 end.
 - Acquire approximately 101 acres of fee-simple land for construction of the replacement runway, Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road.
 - Acquire approximately three acres of aviation easements for obstruction removal.
 - Remove obstructions on approximately 70 acres.
 - Realign Meadow Branch Road.
 - Construct four conventional hangars and seven t-hangars and auto parking.
 - Relocate fuel farm.
 - Remove 4,000 feet of Pinch Valley Road.
 - Install perimeter/security fence.
 - Relocate three residences and three businesses.

4. **Reasonable Alternatives Considered.** As described in Chapter 2 of the Final Environmental Assessment (EA), the alternative courses of action evaluated include: (1) No Action, (2) Extend existing Runway 16 by 1,300 feet, (3) Construct new 6,400 foot runway 375 feet west of the existing runway and (4) Proposed Project – construct new 6,400 foot runway 250 feet west of existing runway, shifted 600 feet to the north. These four alternatives were retained for further analysis the EA.
5. **Assessment.** The attached EA addresses the effect of the proposed project on the quality of the human and natural environment and is made a part of this finding. The following impact analysis highlights the more thorough analysis presented in the Final EA prepared in April 2009.

Compatible Land Use: The proposed project will require the acquisition of approximately 101 acres of fee-simple land and 33 acres of avigation easement. The fee-simple acquisition would include the partial acquisition of 10 residential properties and 11 commercial properties to construct replacement Runway 16/34, protect Runway Protection Zones (RPZ), allow for the MALSR installation and relocate Meadow Branch Road. The relocation of three residences and three businesses would also be required. All acquisitions would be accomplished in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970.

Farmland: The proposed project will result in impacts to 39 acres of farmlands, 4 acres are considered prime and unique farmland and 39 acres are considered of statewide and local importance. Under the *Farmland Protection Policy Act*, Form AD-1006, "Farmland Conversion Impact Rating" was completed. The total score on Form AD-1006 was 80; therefore, the proposed project would result in no significant impacts to farmlands. According to the *Farmland Protection Policy Act*, a total score below 160 requires no further analysis.

Wetlands: The proposed project will result in the loss of approximately five acres of wetlands due to the grading and construction of the replacement runway, grading associated with the Runway Object Free Area and Runway Safety Area and obstruction removal. A Joint Permit Application has been filed with the Maryland Department of the Environment (MDE) and U.S. Army Corps of Engineers for approval.

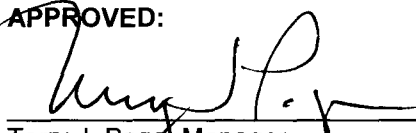
6. **Public Participation.** Efforts were made to encourage public participation through the public meeting process as is documented in the Final EA (Appendix L). Carroll County, as owner and operator of DMW held three public open houses, three property owners meetings and a public hearing. The meetings were held on April 21, 2008, June 9, 2008 and November 18, 2008 and the public hearing was held on March 9, 2009. Notices announcing these public meetings and public hearing were published in the local newspapers. The sign-in sheets, project summaries and comments received are included in the EA (Appendix L). The Draft EA was made available to the public from February 9, 2009 to March 20, 2009. Responses to comments received on the EA are included in Appendices L and M.
7. **Mitigation Measures.** The FAA will require that Carroll County implement the following conservation measures, if they decide to pursue the proposed project:
 1. Obstruction (tree) removal to achieve compliance with Federal Aviation Regulation Part 77, *Objects Affecting Navigable Airspace* is exempt from the Forest Conservation Act per Section 5-1602(b)(11). Due to this exemption, federal funding for tree removal mitigation may be limited.
 2. All acquisitions would be accomplished in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970.
 3. Approximately five acres of wetlands would be impacted by obstruction removal and grading limits for the replacement runway and safety areas. A Joint Permit Application has been filed with the MDE and U.S. Army Corps of Engineers for review and approval.

4. Carroll County shall prepare an erosion and sedimentation control plan to meet Maryland's Erosion and Sediment Control Guidelines for State and Federal Projects, pursuant to the Environmental Article, Title 4, Subtitle 1, Annotated Code of Maryland and COMAR 26.17.01.
5. Construction contract provisions shall contain the provisions of FAA AC 150/5370-10A, *Standards for Specifying Construction of Airports* item P-156, temporary air, water pollution, soil erosion and siltation control and FAA AC 150/5320-5B, *Airport Drainage*.
6. The implementation of Best Management Practices will minimize construction impacts associated with the proposed project.
7. Environmental Due Diligence Audit reports will be completed on properties proposed for fee simple acquisition or where grading easements may be required.
8. All necessary permits for construction of the proposed project shall be obtained prior to construction.

8. Finding of No Significant Impact

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information I find that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in section 101(a) of the National Environmental Policy Act of 1969 (NEPA). I also find the proposed Federal Action, with the required mitigation referenced above will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to section 102 (2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

APPROVED:


 Terry J. Page, Manager
 Washington Airports District Office

4/30/09
 Date

DISAPPROVED:

 Terry J. Page, Manager
 Washington Airports District Office

 Date

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION**

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Location

Carroll County Regional Airport (DMW)
Westminster, MD

Proposed Federal Action

The proposed federal action consists of approval for the Airport's proposed five-year Capital Improvement Program. The Federal Aviation Administration (FAA) must comply with the National Environmental Policy Act of 1969 (NEPA) prior to processing applications for federal assistance in funding various airport development projects and approval of the Airport Layout Plan (ALP) that depicts the proposed development projects. Issuing a FONSI does not constitute a commitment by the FAA to provide federal financial assistance for these development actions.

Summary

An Environmental Assessment (EA) was completed in 2009, and a FONSI was issued on April 30, 2009, for the following twelve (12) proposed improvement projects at Carroll County Regional Airport.

- Construct new (replacement) Runway 6,400-feet by 100-feet with a pavement strength of 91,000 Dual Wheel Gear
- Construct full length taxiway 6,400-feet by 50-feet
- Install Category I Instrument Landing System (ILS) on Runway 16 end
- Acquire approximately 101 acres of fee-simple land for construction of the replacement runway, Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road
- Acquire approximately 33 acres of aviation easements for obstruction removal
- Remove obstructions on approximately 70 acres
- Realign Meadow Branch Road
- Construct four conventional hangars and seven t-hangars and auto parking
- Relocate fuel farm
- Remove 4,000-feet of Pinch Valley Road (Cul-de-sac Pinch Valley Road)
- Install perimeter/security fence
- Relocate three residences and three businesses

Following the 2009 EA, the Gulfstream V did not locate at the Airport as anticipated by the 2007 Master Plan Update (MPU). After input from the public, and a review of the 2007 MPU, the County made the decision to proceed with a new MPU, which was completed in 2015. A Supplemental Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code (U.S.C.) §§ 4321–4347), Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations (CFR) §§ 1500–1508), and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, based on the change in anticipated operational fleet.

Purpose and Need

The purpose of the Proposed Action as stated in the 2009 EA, to provide sufficient airfield infrastructure at DMW to support the current and projected demand for aviation activity in the greater Carroll County, Maryland region, and to continue to serve in its role as a general aviation (GA) reliever airport for Baltimore/Washington International Thurgood Marshall Airport (BWI), remains valid for this Supplemental EA. The need for the Proposed Action is the inability of current conditions to support the current and projected demand at DMW.

Proposed Action

The twelve (12) improvement projects comprising the 2009 Proposed Action have been modified as follows:

- Construct new (replacement) Runway 5,500-feet by 100-feet with a pavement strength of 91,000 Dual Wheel Gear
- Construct full length taxiway 5,500-feet by 35-feet
- Install Category I ILS on Runway 16 end (*No longer included in the Proposed Action*)
- Acquire approximately 185-acres of fee-simple land for construction of the replacement runway,
- Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road
- Acquire approximately 312-acres of aviation easements for obstruction removal
- Remove obstructions on approximately 63 acres
- Realign Meadow Branch Road
- Construct two conventional hangars (two less than in 2009) and auto parking, and no T-hangars
- Relocate fuel farm (*No longer included in the Proposed Action*)
- Remove 4,000-feet of Pinch Valley Road (Cul-de-sac Pinch Valley Road)
- Install perimeter/security fence
- Relocate three residences and two businesses (one less of each than in 2009), and possibly a private swimming pool

Alternatives

The 2009 EA examined four runway and facility alternatives, and three roadway options, as listed below.

Runway and Facility Alternatives Analyzed in 2009 EA

1. Alternative One- No Action
2. Alternative Two- Extend Runway 16 by 1,300'
3. Alternative Three- Construct new 6,400' runway 375' west of existing runway
4. Alternative Four (Proposed Action) - Construct new 6,400' runway 250' west of existing runway, shifted 600' north

Roadway Alternatives Analyzed in 2009 EA

1. Remove 4,000' of Pinch Valley Road by adding cul-de-sacs at two points (Proposed Action)
2. Relocate Pinch Valley Road and construct 4,500'± of new roadway outside of the proposed Runway Object-Free Area (ROFA)
3. Construct 3,300'± of new roadway to connect Indian Valley Trail and Pleasant Valley Road. Add cul-de-sacs similar to Roadway Alternative 1.

The Preferred Alternative in the 2009 EA consists of Runway and Facility Alternative Four (4), and Roadway Alternative One (1).

The updated Preferred Alternative in the Supplemental EA recommends a new (replacement) runway, 5,500' long by 100' wide, to be constructed 250' west of the existing Runway 16-34. A full parallel taxiway is to be constructed for the replacement runway, measuring 5,500' long by 35' wide. The purpose of shifting the runway 250' west is to allow for development on the east side of the airfield while maintaining adequate separation distances to meet FAA standards. The purpose of shifting the runway 600' north is to eliminate incompatible land uses to the south. As a result of the westward runway shift, Meadow Branch Road will be located inside the Runway Object-Free Area (ROFA) which violates FAA design standards. Meadow Branch Road is to be realigned outside of the ROFA. To accommodate the extension of Runway 16 to the north, Pinch Valley Road is to be terminated into two cul-de-sacs on both the eastern and western sides of airport property.

Environmental Impacts

A substantial change to the Proposed Action resulting in environmental concerns is an increase to the overall study area, and the amount of proposed fee simple and avigation easement acquisition, which is greater than the 2009 EA and what is shown in the 2015 MPU and associated Airport Property Map (APM). This increase is due to the preference during this supplemental environmental effort to study entire parcels, instead of partial parcels as shown on the APM. In addition, during this assessment, a previously unidentified agricultural preservation easement was identified within the future and ultimate Runway Protection Zone (RPZ) and proposed future approach lighting system (MALSR).

The agricultural preservation easement places restrictions on subdivision on property currently owned by the Osbornes. Coordination with the Maryland Agricultural Land Preservation Foundation (MALPF) of the Maryland Department of Agriculture, the state agency which holds the agricultural preservation easement, confirmed that 0.3 acres currently required for the future RPZ cannot be subdivided from the parcel unless it is condemned. Further, MALPF recommended in a letter dated October 3, 2017, that the County should address both its current and ultimate property acquisition needs in the short term. The Ultimate development plan would require 28 acres within the preservation easement.

MALPF recommended two options for acquiring the land needed for the Ultimate development plan. The County may either 1) conduct a land exchange of immediately adjacent farmland of equal or greater acres that could provide better soils than the property that would be taken out of the preservation easement, or 2) condemn the 28 acres. The County has expressed its intention to condemn the acreage.

The condemnation of the 28± acres recommended by MALPF to achieve the County's Ultimate development plan would displace the current owner from their residence. The owner has stated to the County during the assessment, that displacement is unsuitable to continue to manage their on-site leases. Due to the existing and future impacts of the development plan, and the substantial impact to the resident landlord, it is proposed to acquire the entire 80± farm property. The residence would be relocated and the County would assume the business leases. While the agricultural easement would no longer apply to the Osborne parcel after acquisition/condemnation, the use of the parcel would not change.

Based on the analysis provided in the Supplemental EA, no significant environmental impacts, as defined by FAA Order 1050.1F, would result from the Proposed Action. Refer to Section V of the Supplemental EA for a full discussion of potential environmental impacts.

Mitigation/Conditions of Approval

The FAA is conditioning approval of the Proposed Action upon implementation of the measures outlined below. The FAA may also take appropriate steps through contract plans, specifications, grant assurances, and special grant conditions to ensure these measures are undertaken.

Temporary impacts from construction and demolition will be mitigated by the Sponsor's proposed adherence to applicable Best Management Practices (BMPs) specified in FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*, Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control" and FAA AC 150-5320-5, *Airport Drainage Design*.

The Proposed Action must comply with Maryland's Stormwater Management and Erosion and Sediment Control Guidelines for State and Federal Projects pursuant to the Annotated Code of Maryland, Environmental Article, Title 4, Subtitle 1 and Subtitle 2, the Erosion and Sediment Control Regulations, Code of Maryland Regulations (COMAR) 26.17.01, and the Stormwater Management Regulations, COMAR 26.17.02.

BMPs or additional controls, potentially above those minimally required, should be utilized to protect the North Branch Patapsco River, which is located in the vicinity of the project area and is designated as a Tier II stream.

Register for coverage, and adhere to, the National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activity.

Conduct Bog Turtle trapping on the entirety of Wetland #9 during the May 1-June 15 trapping window. If bog turtles are identified and documented in the project area, further studies may be required to characterize the population, identify nesting and hibernating areas, and/or identify and assess adverse impacts to the species and its habitat.

Coordinate with the U.S. Fish and Wildlife Service during the design and permitting phase to identify individual potential Indiana Bat roosting trees or maternity habitat and avoid their removal, or place time restrictions on when such trees can be removed (November 15 through March 31).

Prepare and submit a Forest Stand Delineation (FSD) and a new Forest Conservation Plan (FCP), specific to the Proposed Action, during the design and permitting phase for review and approval by the County in accordance with the Annotated Code of Maryland and the Code of Maryland Regulations, the Forest Conservation Act of 1991 and the Carroll County Forest Conservation Ordinance.

Complete Environmental Due Diligence Audits on properties proposed for fee simple acquisition or where grading easements may be required.

Construction through contaminated areas will be subject to regulatory requirements for appropriate management and disposal of contaminated materials and will require a permit from MDE.

Any solid waste including construction, demolition and land clearing debris, generated from the subject project, must be properly disposed of at a permitted solid waste acceptance facility, or recycled if possible.

Any above ground or underground petroleum storage tanks must be handled in accordance with applicable State and federal laws and regulations.

Construction, renovation and/or demolition of buildings and roadways must be performed in conformance with State regulations pertaining to "Particulate Matter from Materials Handling and Construction".

Conduct all acquisitions and relocations in accordance with the Uniform Relocation Assistance Real Property Acquisition Policies Act of 1970 (the Uniform Act).

Finalize and submit a Joint Permit Application (JPA), with a Phase I mitigation plan for 4.11± acres of wetland impacts, to the U.S. Army Corps of Engineers (USACE) and Maryland Department of the Environment (MDE) for review and approval during the Proposed Action's design and permitting phase.

Coordinate 3,660± linear of stream impacts and proposed mitigation with the USACE for review and approval during the Proposed Action's design and permitting phase.

All required permits and approvals for the Proposed Action must be obtained prior to construction.

Construction activities must be conducted in accordance with the provisions set forth in applicable permits.

Public Involvement

A public notice was published in The Carroll County Times beginning March 18th, 2018. Copies of the draft Supplemental EA were made available for the public to review at the Carroll County Regional Airport Terminal Building, 200 Airport Drive, Westminster, MD 21157; Westminster Library Circulation Desk, 50 East Main Street, Westminster, MD 21157; and online at the Carroll County Regional Airport website <http://www.carrollcountyairport.com>. In addition, one invite-only property owner briefing was held on April 18th, 2018 for affected property owners to inform them of the project and directly answer questions. The thirty (30) day review period ended on April 20th, 2018.

Comments were not received from the general public. Comments were received from the Maryland Department of Planning State Clearinghouse Review Process and MALPF. The Maryland Department of Planning, including the Maryland Historical Trust stated that the Proposed Action is consistent with their plans, programs, and objectives. The Maryland Department of the Environment determined that the project is generally consistent with their plans, programs, and objectives but also provided qualifying comments regarding compliance with applicable federal, state and local laws and regulations for construction activities. MALPF comments were limited to minor edits and clarifications associated

with the preservation easement. Comments provided by the State Clearinghouse and MALPF have been included in Appendix F of the final Supplemental EA.

Conclusion and Approval

The environmental analyses included in this Supplemental EA conclude that no adverse environmental impacts are anticipated as a result of the additional proposed property interest acquisition and obstruction removal. The findings of the 2009 EA/FONSI remain valid, and no significant impacts are anticipated as a result of the additional property interest acquisition and obstruction removal.


I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information, I find the proposed Federal action is consistent with existing national environmental policies and objectives of Section 101(a) of the National Environmental Policy Act of 1969 (NEPA) and other applicable environmental requirements. I also find the proposed Federal action will not significantly affect the quality of the human environment or include any condition requiring any consultation pursuant to section 102(2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

Recommended:


Susan Stafford
Environmental Specialist, Beckley AFO

5/04/18
Date

Approved:


Matthew DiGiulian
Manager, Beckley AFO

5/4/18
Date

Disapproved:

Matthew DiGiulian
Manager, Beckley AFO

Date

**U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT**

**Carroll County Regional Airport
Westminster, MD**

**Supplemental Environmental Assessment for Additional Grading Associated with 2018
Five- Year Capital Improvement Program Environmental Assessment/FONSI**

1. Introduction

This document provides the Finding of No Significant Impact (FONSI) on the environment as a result of the ***Supplemental Grading Associated to the 2018 Five-Year Capital Improvement Program Environmental Assessment/FONSI***. The analysis that forms the basis for this determination is found in the attached 2020 Supplemental Environmental Assessment (2020 Supplemental EA) which includes as attachments, the previous 2018 Capital Improvement Supplemental Environmental Assessment (2018 Supplemental EA) and FONSI.

The Federal Aviation Administration (FAA) must comply with the National Environmental Policy Act of 1969 (NEPA) before being able to take the federal action of further processing of an application for Federal assistance in funding various airport development and for approval of the Airport Layout Plan (ALP) that depicts the proposed airport development projects. Approval of the ALP is authorized by the Airport and Airway Improvement Act of 1982, as amended (Public Laws 97-248 and 100-223). The issuing of this FONSI does not constitute a commitment by the FAA to provide federal financial assistance for these actions.

2. Background Information

The Carroll County Regional Airport (DMW) is a general aviation airport in Westminster, Maryland which is now owned and operated by the Commissioners of Carroll County. There is one runway at the Airport, Runway 16-34, which is 5,100 feet long and 100 feet wide.

Several EAs were prepared from 2009 to 2018 that addressed capital Improvement programs (including a replacement runway), and as a result of updated Master Plans. Prior to this 2020 Supplemental EA, the most recent EA (a 2018 Supplemental EA -supplementing a 2009 EA, is attached to this 2020 Supplemental EA as **Attachment 1**). In the process of designing the project elements evaluated in the 2018 Supplemental EA (see **Figure 1** on the 2020 Supplemental EA), it was determined that additional grading would need to be evaluated to extend the Runway Safety Area (RSA) of the replacement runway (approximately five acres) and increase the turn radius (approximately 0.14 acres) of the realigned Meadow Branch Road.

3. Proposed Action

The Proposed Action is the acquisition of an approximately 0.14- acre grading easement on privately owned land (identified as Parcel 19) to maintain adequate turning radii at a new intersection after the road realignment on Meadow Branch Road is complete; and, approximately five acres of grading within the extended RSA associated with the replacement of Runway 16-34. The grading is depicted in **Figure 3** of the 2020 Supplemental EA.

4. Project Purpose and Need

The grading on Parcel 19 is associated with the realignment of Meadow Branch Road and the associated, perpendicular intersection of Meadow Branch Road and the road bordering Parcel 19. The proposed, on-airport grading is associated with the extended RSA to the replacement Runway 32 end. Both the road realignment and the replacement runway were evaluated in the 2018 Supplemental EA but the necessary grading was not evaluated.

5. Reasonable Alternatives Considered

Only one action (build) alternative was considered as the Road Realignment and the replacement Runway were previously evaluated in the 2018 Supplemental EA/FONSI.

The No Action Alternative (also referred in the document as the “No Build Alternative”), was also evaluated per CEQ requirements. This Alternative would not fulfill the Purpose and Need of the project but was evaluated in each resource area to act as a comparison with the Proposed Action.

6. Assessment

The attached EA (2020 Supplemental Environmental Assessment) addresses the effect of the proposed project on the quality of the human and natural environmental, and is made a part of this finding. The impact analysis highlights information presented in the 2018 Supplemental EA as well as the new analysis contained in this 2020 Supplemental EA.

7. Resource Areas evaluated and potential consequences

Air Quality

Mitigation measures identified in the 2018 Supplemental EA would extend to the proposed, additional grading. These include BMPs identified in FAA Advisory Circular (AC) 150/5370-10 Standards for Specifying Construction of Airports, Item P-156, “Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

No significant air quality impacts are anticipated from acquisition of the 0.14± acre grading easement or the associated, proposed grading; or from the proposed, additional five acres needed for the RSA grading.

Biological Resources

Two listed species were identified through the US Fish and Wildlife Service's Information for Planning and Consultation on-line tool, the Northern long-eared bat (NLEB) and the Indiana bat. The NLEB was not evaluated in the 2018 Supplemental EA although the Indiana Bat was, and their habitat is very similar. They both roost in hollow (alive and dead) trees, behind shutters (on buildings), and in mines and caves.

Additionally the Center for Conservation Biology mapping tool (accessed by the FAA on another project), did not find any active bald eagle nests within approximately 10 miles of the airport.

While wetlands were identified as being located near the site, the grading is not anticipated to impact the wetlands or associated wildlife habitat.

As there are minimal trees proposed to be removed (four or five in Parcel 19, none in the RSA grading area), and there are no mines, caves, or buildings in the study area, it is unlikely either of the listed bats would be affected by the proposed project. Similarly, any migratory birds (including the protected Bald Eagle) would likely only be encountered as migrants passing through the area and would likely disperse once construction commenced.

Climate

The proposed additional grading is not associated with an increase in aircraft operations or aircraft operational changes.

There would be no significant increase in greenhouse gases from the proposed grading and no significant impacts to the climate are anticipated.

Coastal Resources

Carroll County is not located within the Maryland Coastal Zone.

There will be no Impacts to the Maryland Coastal Zone.

Section 4 (f) Resources

No religious institutions, libraries, senior centers, schools, colleges, public landings, Fire Stations, police, courthouses, or town halls are located within the vicinity of the Airport. MHT concurred that the proposed projects will have no effect on any historic properties.

There are no anticipated impacts to Section 4 (f) resources.

Farmlands

The project is located solely on airport property and on private land used for commercial purposes.

There are no impacts to Farmlands anticipated from the proposed project.

Hazardous Materials, Solid Waste, and Pollution Prevention

Although construction activities will likely generate solid wastes, they will be handled in accordance with the area *Solid Waste Management Plan*. Wastes that could not be diverted or recycled would be handled in accordance with applicable regulations.

There are no anticipated impacts from hazardous materials or excessive generation of solid wastes as a result of the proposed project.

Historic, Architectural, Archeological, and Cultural Resources

The Maryland Historic Trust confirmed there will be no effect on historic properties from the proposed grading. Two Native American tribes were contacted as they had previously expressed an interest in projects in Carroll County. Letters offering consultation were sent by the FAA in February 2020 to the Delaware Nation and the Seneca-Cayuga Nation. As of mid-June 2020, no response has been received. However, should human remains or artifacts be discovered during the grading, all work would halt until the State, FAA, and tribes were notified.

There are no anticipated impacts to Historic, Archeological, or Cultural Resources as a result of this proposed project.

Land Use

The current land use for the two areas where grading will occur are a commercial site and an on-airport open area located at the end of Runway 16-34.

The proposed project (grading) is consistent with current land use therefore there are no anticipated impacts to land use from the proposed project.

Natural Resources and Energy Supply

Although fuel will be expended by construction equipment, the amount will not be significant. It is not anticipated that other natural resources would be used as the project is solely to grade the proposed project areas.

The potential impacts to Natural Resources and Energy Supply are negligible.

Noise and Noise Compatible Land Use

As the project does not involve increasing or modifying airfield activities, increases in ambient noise associated with the project would primarily occur as a result of construction activities.

As construction is expected to be temporary, and given it will occur next to an airport, it is anticipated that the increased noise would cause only minor impacts.

Socioeconomics, Environmental Justice, and Children's Health and Safety Risks

The Proposed Action would not involve any construction or development activity in residential areas, and there would be no significant shifts in population movement or increase significantly in the demands for public services. Induced impacts would likely include a short-term increase in employment, and income benefits associated with site development activities. These impacts would be temporary and minor in context of the construction-related job industry.

The Census Tract nearest to the airport and therefore most likely to be impacted by the project is not considered to be a low-income or high minority area. Therefore, there are no Environmental Justice concerns associated with the project.

As the project involves on-airport grading and a small amount of grading on a privately held lot currently used for an industrial facility located adjacent to the Airport, it is highly unlikely to impact Children's Health.

The potential socioeconomic impacts, impacts to Environmental Justice, and children's health and safety are not anticipated to be significant.

Visual Effects Including Light Emissions

The proposed project is consistent with surrounding land uses (airport, commercial, and industrial development) and would not conflict with the existing environment.

It is not anticipated that impacts to visual resources will be significant.

Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Wetlands

There are no wetlands located in the project area, although a small patch of PEM wetlands is located nearby. BMPs will be initiated to ensure no inadvertent impacts occur to the nearby wetlands.

There are no impacts to wetlands anticipated from the proposed project.

Floodplains

The proposed project is not located in, or adjacent to, a floodplain.

There are no impacts to floodplains anticipated from the proposed project.

Surface Waters

There are no surface waters in the study area of the proposed project.

There are no impacts to surface waters anticipated from the proposed project

Groundwater

There is no extraction needed to complete the project and no buildings are proposed which might require dewatering.

It is not anticipated that groundwater will be impacted by this project and no permit for groundwater extraction is required.

Wild and Scenic Rivers

There are no Federally-listed Wild and Scenic Rivers located in Maryland. Additionally, there are no rivers or other water resources located on or in the vicinity of the project site.

There are no impacts to Wild and Scenic Rivers anticipated from the proposed project

8. Cumulative Impacts

The potential cumulative impacts of the proposed projects in conjunction with other past, present, and future planned projects in the analysis study area cannot be fully assessed quantitatively, as specific impact data for all non-Airport related projects is either not available

or are not yet developed. Development plans for any non-Airport actions will need to be reviewed, and all required environmental permits will need to be issued by applicable local, State, and Federal agencies, as appropriate, before they can be constructed.

9. Permits

No permits are required to complete the project.

10. Required Mitigation

The grading areas will have to be depicted in an approved ALP and Exhibit A before grading can commence.

Finding of No Significant Impact

I have carefully and thoroughly considered the facts contained in the attached EA. Based on that information I find that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in section 101(a) of the National Environmental Policy Act of 1969 (NEPA). I also find the proposed Federal Action, with the required mitigation referenced above, will not significantly affect the quality of the human environment or otherwise include any condition requiring consultation pursuant to section 102 (2)(C) of NEPA. As a result, FAA will not prepare an EIS for this action.

APPROVED:

Genevieve Walker
Genevieve Walker, Environmental Protection Specialist
Washington Airports District Office

June 22, 2020
Date

CONCURRENCE:

Matthew J. Thys, Manager
Washington Airports District Office

Date

Letter

—

Attachment B



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127



In Reply Refer To:

Project code: 2022-0029035

Project Name: DMW Five Year Development Plan

August 25, 2023

Federal Nexus: yes

Federal Action Agency (if applicable): Federal Aviation Administration

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'DMW Five Year Development Plan'

Dear Genevieve Walker:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on August 25, 2023, for 'DMW Five Year Development Plan' (here forward, Project). This project has been assigned Project Code 2022-0029035 and all future correspondence should clearly reference this number.

Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project.

Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (DKey), invalidates this letter. ***Answers to certain questions in the DKey commit the project proponent to implementation of conservation measures that must be followed for the ESA determination to remain valid.***

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the determination of "May Affect, Not Likely to Adversely Affect" the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your

IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat that was not considered when completing the determination key.

15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat DKey.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Indiana Bat *Myotis sodalis* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Chesapeake Bay Ecological Services Field Office and reference Project Code 2022-0029035 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

DMW Five Year Development Plan

2. Description

The following description was provided for the project 'DMW Five Year Development Plan':

Replacement runway, land acquisition, obstruction removal, and other airport development projects

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.61203354368093,-77.00927559327499,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

3. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

Yes

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

9. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the [effects of any activities](#) that would not occur but for the proposed action.

If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of [Effects of the Action](#) can be found here: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

10. [Semantic] Is the action area located within 0.5 miles of a known northern long-eared bat hibernaculum?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

Automatically answered

No

11. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

No

12. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
(If unsure, answer "Yes.")

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥ 3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

13. Will the action cause effects to a bridge?

No

14. Will the action result in effects to a culvert or tunnel?

No

15. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

No

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats**?

No

17. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

Yes

18. Will any new road go through any area of contiguous forest that is greater than or equal to 10 acres in total extent?

Note: "Contiguous forest" of 10 acres or more may include areas where multiple forest patches are separated by less than 1,000 feet of non-forest if the forested patches, added together, comprise at least 10 acres.

No

19. Will any new road pass between two patches of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

Note: "Contiguous forest" of 10 acres or more may include areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

No

20. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

21. Will the action include or cause any construction or other activity that is reasonably certain to increase the number of travel lanes on an existing thoroughfare?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

22. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

No

23. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

24. Will the action include drilling or blasting?

No

25. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

No

26. Will the proposed action involve the use of herbicides or pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

No

27. Will the action include or cause activities that are reasonably certain to cause chronic nighttime noise in suitable summer habitat for the northern long-eared bat? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time.

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at:

<https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

28. Will the proposed action result in the cutting or other means of knocking down, bringing down, or trimming of any trees suitable for northern long-eared bat roosting?

Note: Suitable northern long-eared bat roost trees are live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities.

Yes

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

100

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the inactive (hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

100

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the active (non-hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

0

Will all potential northern long-eared bat (NLEB) roost trees (trees ≥ 3 inches diameter at breast height, dbh) be cut, knocked, or brought down from any portion of the action area greater than or equal to 0.1 acre? If all NLEB roost trees will be removed from multiple areas, select 'Yes' if the cumulative extent of those areas meets or exceeds 0.1 acre.

Yes

Enter the extent of the action area (in acres) from which all potential NLEB roost trees will be removed. If all NLEB roost trees will be removed from multiple areas, entire the total extent of those areas. Round up to the nearest tenth of an acre.

100

For the area from which all potential northern long-eared bat (NLEB) roost trees will be removed, on how many acres (round to the nearest tenth of an acre) will trees be allowed to regrow? Enter '0' if the entire area from which all potential NLEB roost trees are removed will be developed or otherwise converted to non-forest for the foreseeable future.

0

Will any snags (standing dead trees) ≥ 3 inches dbh be left standing in the area(s) in which all northern long-eared bat roost trees will be cut, knocked down, or otherwise brought down?

No

Will all project activities be completed by April 1, 2024?

No

IPAC USER CONTACT INFORMATION

Agency: Federal Aviation Administration
Name: Genevieve Walker
Address: 13783 Park Center Road, Suite 490S
City: Herndon
State: VA
Zip: 20171
Email: genevieve.j.walker@faa.gov
Phone: 7034873979



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127



In Reply Refer To:

Project Code: 2022-0029035

Project Name: DMW Five Year Development Plan

July 08, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see <https://www.fws.gov/birds/policies-and-regulations.php>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see <https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office

177 Admiral Cochrane Drive

Annapolis, MD 21401-7307

(410) 573-4599

PROJECT SUMMARY

Project Code: 2022-0029035
Project Name: DMW Five Year Development Plan
Project Type: Airport - New Construction
Project Description: Replacement runway, land acquisition, obstruction removal, and other airport development projects

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.61203354368093,-77.00927559327499,14z>



Counties: Carroll County, Maryland

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> There is final critical habitat for this species. Your location does not overlap the critical habitat. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ Consultation in this area is only required for wind power projects. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. This species only needs to be considered under the following conditions: <ul style="list-style-type: none"> ▪ The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html). Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Delta Airport Consultants, Inc
Name: Mary Pearson
Address: 2700 Polo Parkway
Address Line 2: Delta Airport Consultants, Inc.
City: Richmond
State: VA
Zip: 23113
Email: mapearson@deltaairport.com
Phone: 8049554556

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Aviation Administration



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, Maryland 21401
<http://www.fws.gov/chesapeakebay>

August 5, 2021

Mary Ashburn Pearson
Delta Airport Consultants, Inc.
9711 Farrar Court, Suite 100
Richmond, VA 23236

Re: "Not Likely to Adversely Affect" determination for northern long-eared bat and Indiana bat for Meadow Branch Road relocation, Carroll County, Maryland

Dear Ms. Pearson:

The U.S. Fish and Wildlife Service (Service) has reviewed your project information from the Service's Information for Planning and Consultation (IPaC) online system and your emails dated June 29, 2020, July 6, 2020, and July 29, 2021. The comments provided below are in accordance with Section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

The purpose of the proposed project is to remove and relocate portions of Meadow Branch Road. This project is phase one of a long-term development plan for the Carroll County Regional Airport which involves various actions, including runway replacement, land acquisition, and removal of obstructions. The estimated tree clearing for the entire project is 63 acres, however the tree clearing for phase one is estimated to be 15 acres.

This project is within the range of the federally threatened northern long-eared bat (*Myotis septentrionalis*) and the federally endangered Indiana bat (*Myotis sodalis*). Both species are temperate, insectivorous migratory bats that hibernate in mines and caves during the winter and spend summers in wooded areas. There are no known northern long-eared bat maternity roosts or hibernacula within the vicinity of this site, so under the 4(d) rule this phase of project requires no further consultation regarding the northern long-eared bat.

You have indicated that tree clearing will adhere to a time of year restriction between May 1 and July 31 that will avoid the time of year when any Indiana bat maternity roosts are active with pups. Based on these conditions, this project is "not likely to adversely affect" Indiana bat. Additional phases of the project will require consultation with the Service to determine if any mitigation measures are needed to protect Indiana bats.



Except for occasional transient individuals, no other federally proposed or listed threatened or endangered species are known to exist within the project area. Should project plans change or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

We appreciate the opportunity to provide information relative to fish and wildlife issues. Thank you for your interest in these resources. If you have any questions or need further assistance, please contact Kathleen Cullen of my staff at 410/573-4579 or kathleen_cullen@fws.gov.

Sincerely,

Genevieve LaRouche
Field Supervisor

Mary Ashburn Pearson

From: Mary Ashburn Pearson
Sent: Monday, May 16, 2022 2:44 PM
To: Mary Ashburn Pearson
Subject: FW: [EXTERNAL] RE: FWS Review of development at DMW airport
Attachments: DMW Airport phase one NLAA letter.pdf

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Thursday, August 5, 2021 10:46 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>; Roy G. Lewis <RLewis@deltaairport.com>; Savannah K. Neal <SNeal@deltaairport.com>
Subject: Re: [EXTERNAL] RE: FWS Review of development at DMW airport

Hi Mary-

Thank you for your continued coordination on this project. Please see the attached "not likely to adversely affect" for phase 1. Please let me know if there is anything else you need at this time.

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Thursday, July 29, 2021 10:43 AM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>; Roy G. Lewis <RLewis@deltaairport.com>; Savannah K. Neal <SNeal@deltaairport.com>
Subject: RE: [EXTERNAL] RE: FWS Review of development at DMW airport

Kathleen,

Thank you for the response! The desired mitigation method for Phase 1 (relocate Meadow Branch Road) is to adhere to a time of year restriction for tree clearing of between May 1 and July 31 (meaning, trees can be cleared between August 1 and April 31).

We will continue to coordinate with your office as the subsequent design and construction phases move forward.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Thursday, July 29, 2021 9:51 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>; Roy G. Lewis <RLewis@deltaairport.com>
Subject: Re: [EXTERNAL] RE: FWS Review of development at DMW airport

Hi Mary-

Thank you for reaching out and checking in about this project. The mitigation measures you listed in your email are still accurate, with the exception that the summer bat survey window is from May 15 to August 15. Guidance for 2021 surveys is the same as the 2020 guidance, which can be found here:
<https://www.fws.gov/midwest/endangered/mammals/inba/surveys/pdf/FINAL%20Range-wide%20Bat%20Survey%20Guidelines%203.23.20.pdf>.

Whenever you determine the scheduling or mitigation measures being used for this project, let me know and I can provide a "not likely to adversely affect" letter for phase 1. Additional consultation will be needed for future phases. Please let me know if you have any other questions!

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Tuesday, July 27, 2021 10:57 AM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>; Roy G. Lewis <RLewis@deltaairport.com>
Subject: RE: [EXTERNAL] RE: FWS Review of development at DMW airport

Good morning Kathleen,

This is our yearly check-in with USFWS regarding the proposed construction at the Carroll County Regional Airport (DMW) in Carroll County, Maryland. We have coordinated with your office since at least 2016 as this project has gone through the environmental (NEPA), land acquisition, and preliminary design stages.

The first phase of this construction project, which involves the relocation of Meadowbranch Road, is now moving forward. This phase would require the clearing of approximately 15 acres of trees (see attached, marked in yellow).

When we last communicated with your office in July 2020 (see email chain, below), the two recommended mitigation options for potential impacts to the Northern long-eared and Indiana Bats were a time-of-year restriction or a bat survey.

Since that time, has the recommended mitigation for these species been revised? Our understanding from last year is:

- TOY restriction between May 1 and July 31 (meaning, trees can be cleared between August 1 and April 31)
- Only acoustic surveys, no nets/trapping due to COVID
- Bat survey window is between 7/15 to 8/15

Any other changes we need to be aware of, as we move forward with design and scheduling of the project? We tried to pull an updated species list from the IPaC website but unfortunately the processor was down.

Thank you!

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAAIRPORT.COM

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Tuesday, July 7, 2020 2:55 PM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>; Roy G. Lewis <RLewis@deltaairport.com>
Subject: RE: [EXTERNAL] RE: FWS Review of development at DMW airport

Kathleen,

Thank you for your time on the phone today discussing mitigation options for the Indiana Bat, for the proposed Meadowbranch Road relocation project at DMW.

We understand that the County has two options to mitigate: either refrain from clearing trees between May 1 and July 31, when maternity roosts/pups could be present; or, hire a surveyor to confirm the presence or absence of bats in the area to be cleared. Due to Covid-19, Maryland does not currently permit the handling of bats, so the survey would be an acoustic one, not one involving nets/trapping. If the survey identifies bats, the project must adhere to the May 1 to July 31 clearing restrictions. If no bats are found, no additional mitigation measures are necessary. Bat survey guidelines are spelled out in the USFWS [Rangewide survey guidelines](#), linked here.

I have copied our design team on this email so they are also aware of the options.

Once an option is selected, we will inform USFWS and you will provide a "not likely to adversely affect" letter which will conclude the required Section 7 coordination.

We understand that USFWS would like to be consulted before each phase of the greater runway replacement project, to ensure no impacts to bats.

Thank you,

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAairport.COM

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Tuesday, July 7, 2020 9:49 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>
Subject: Re: [EXTERNAL] RE: FWS Review of development at DMW airport

Hi Mary-

Thank you for this information, and for providing all of the previous correspondence with Trevor. Would you be able to send me a copy of the EA that you developed for this project?

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Monday, July 6, 2020 8:50 AM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Cc: Adam D. Switzer <aswitzer@deltaairport.com>; Thomas A. Bergbauer <tbergbauer@deltaairport.com>
Subject: [EXTERNAL] RE: FWS Review of development at DMW airport

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good morning Kathleen,

We appreciate the update! The projects in the proposed action (all projects, including the construction of the replacement runway) are intended to be completed by 2027, according to the Airport's latest Capital Improvement Plan. This schedule of course is dependent on funding availability and other factors.

The Meadowbranch Road relocation project (the current project) is in the design phase and intended to move to construction in 2022.

As we noted in our email to Trevor, the project has been reviewed by USFWS several times previously during the Environmental Assessment stage; we are currently wondering what is the best (if any) mitigation measure for the 15 acres or less of tree clearing for this particular road relocation phase. If you need additional information or have questions, my direct line is below.

Thank you for your time!

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAIRPORT.COM

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Monday, July 6, 2020 8:43 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: FWS Review of development at DMW airport

Hi Mary-

Trevor forwarded me your email requesting review of phase one of the ongoing development project at Carroll County Regional Airport. I wanted to let you know that this project is currently being reviewed, and we will have a determination for you soon. I also wanted to see if you had an estimated timeline for when the other phases of the project might occur. Thanks for your assistance, please let me know if you have any questions!

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

Mary Ashburn Pearson

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Monday, May 22, 2023 8:02 AM
To: Mary Ashburn Pearson; Midwest RO ES Consultation, FW3
Cc: Cheryl A. Rodriguez
Subject: Re: [EXTERNAL] FW: 2022-0029035

Hi Mary-

Yes, that is correct no mitigation will be needed for NLEB for this project, but additional coordination may be needed after April 2024.

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Friday, May 19, 2023 4:22 PM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>; Midwest RO ES Consultation, FW3 <consultationr3es@fws.gov>
Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>
Subject: RE: [EXTERNAL] FW: 2022-0029035

Kathleen,

We re-ran the key and actually got a No Affect determination- see attached. We have deleted the previous evaluation.

We will assume that no mitigation is required for the NLEB based on this determination. The project is not proposed to occur until 2026 so we understand there may be additional coordination required with United States Fish and Wildlife Service after April 2024.

Thanks as always for your guidance!

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAAIRPORT.COM

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Thursday, May 18, 2023 2:50 PM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>; Midwest RO ES Consultation, FW3 <consultationr3es@fws.gov>

Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>

Subject: Re: [EXTERNAL] FW: 2022-0029035

Hi Mary-

Since you got a "may affect" in an area where we don't have a record of NLEB, it is likely that you ran the key before the mapping was updated. I recommend running the key again, which should get you to "not likely to adversely affect". If you do re-run the key, please delete the previous evaluation and start over to ensure that you are using the newest version of the key. Let me know if you have any questions.

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401
410-573-4579 - kathleen_cullen@fws.gov

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Thursday, May 18, 2023 10:55 AM
To: Midwest RO ES Consultation, FW3 <consultationr3es@fws.gov>
Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>; Cullen, Kathleen M <kathleen_cullen@fws.gov>
Subject: RE: [EXTERNAL] FW: 2022-0029035

Thanks Phil and Kathleen!

Kathleen- see the attached email with original attachments. I believe we pulled the Reasonable Certainty Map from one of your recent webinars in Virginia and Maryland.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAAIRPORT.COM

From: Delphey, Phil <Phil_Delphey@fws.gov> **On Behalf Of** Midwest RO ES Consultation, FW3
Sent: Thursday, May 18, 2023 10:53 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>; Cullen, Kathleen M <kathleen_cullen@fws.gov>
Subject: Re: [EXTERNAL] FW: 2022-0029035

Hi Mary -

I'm copying Kathleen Cullen in the Ches Bay Field Office for coordination on this.

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Monday, May 15, 2023 1:33 PM

To: Midwest RO ES Consultation, FW3 <consultationr3es@fws.gov>

Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>

Subject: [EXTERNAL] FW: 2022-0029035

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good morning,

It appears we used the incorrect email address on our April 26 submittal to your office. Please see below and attached and please feel free to reach out with questions. If there is a way to prioritize this review, please do so. This project is dependent on federal and state funding schedules.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAairport.com

From: Mary Ashburn Pearson <mapearson@deltaairport.com>

Sent: Wednesday, April 26, 2023 3:23 PM

To: consultationr3es@fws.gov

Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>

Subject: 2022-0029035

Good afternoon,

My firm is assisting Carroll County, Maryland to design and construct a runway replacement project for the Carroll County Regional Airport (DMW) in Westminster, Maryland. The project includes the removal of approximately 105 acres of trees to support the runway construction and to remove tree obstructions to airspace. Removal of the trees which obstruct airspace is required by FAA for all federally-obligated airports, including DMW.

We have coordinated with United States Fish and Wildlife Service over the past several years for potential impacts to both the Indiana Bat and Northern long-eared bat associated with this project. The NEPA document (Environmental Assessment) that was prepared and approved by FAA in 2018 relied on the 4(d) rule for impacts to the NLEB and proposed a time of year restriction for tree clearing of between May 1 to July 31 to mitigate potential impacts to the Indiana Bat. Subsequent "check-ins" with USFWS through January 2023 confirmed that a TOY restriction remained appropriate for both bat species (see first attachment).

Most recently, we ran the Dkey on the IPaC website and obtained a 'May Affect' determination (second attachment), and were referred to the Interim Consultation Framework. It appears that the Interim Consultation Framework does apply to this project because it previously relied on the 4(d) rule.

Therefore, we have been instructed to email this address to determine if NLEB are reasonably certain to occur in the action area (DMW airport and immediate environs).

Based on the “Reasonable Certainty Map” provided during a recent USFWS presentation on the Dkey, it does not appear that there are known NLEB in the Westminster, MD area (see third attachment).

Thank you!

Mary Ashburn

Mary Ashburn Pearson, AICP

Project Manager

DELTA AIRPORT CONSULTANTS, INC.

P. 804.955.4556 | WWW.DELTAIRPORT.COM



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127



In Reply Refer To:
Project code: 2022-0029035
Project Name: DMW Five Year Development Plan

May 19, 2023

Federal Nexus: yes
Federal Action Agency (if applicable): Federal Aviation Administration

Subject: Record of project representative's **no effect** determination for 'DMW Five Year Development Plan'

Dear Mary Pearson:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on May 19, 2023, for 'DMW Five Year Development Plan' (here forward, Project). This project has been assigned Project Code 2022-0029035 and all future correspondence should clearly reference this number. **Please carefully review this letter.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (Dkey), invalidates this letter.

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis, your project has reached the determination of "No Effect" on the northern long-eared bat. To make a no effect determination, the full scope of the proposed project implementation (action) should not have any effects (either positive or negative), to a federally listed species or designated critical habitat. Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may

include consequences occurring outside the immediate area involved in the action. (See § 402.17).

Under Section 7 of the ESA, if a federal action agency makes a no effect determination, no consultation with the Service is required (ESA §7). If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required except when the Service concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat [50 CFR §402.02, 50 CFR§402.13].

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Indiana Bat *Myotis sodalis* Endangered
- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may affect the animal species listed above and, if so, how they may be affected.

Next Steps

Based upon your IPaC submission, your project has reached the determination of "No Effect" on the northern long-eared bat. If there are no updates on listed species, no further consultation/coordination for this project is required with respect to the northern long-eared bat. However, the Service recommends that project proponents re-evaluate the Project in IPaC if: 1) the scope, timing, duration, or location of the Project changes (includes any project changes or amendments); 2) new information reveals the Project may impact (positively or negatively) federally listed species or designated critical habitat; or 3) a new species is listed, or critical habitat designated. If any of the above conditions occurs, additional coordination with the Service should take place to ensure compliance with the Act.

If you have any questions regarding this letter or need further assistance, please contact the Chesapeake Bay Ecological Services Field Office and reference Project Code 2022-0029035 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

DMW Five Year Development Plan

2. Description

The following description was provided for the project 'DMW Five Year Development Plan':

Replacement runway, land acquisition, obstruction removal, and other airport development projects

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.60479480000066,-77.00778218550498,14z>



DETERMINATION KEY RESULT

Based on the information you provided, you have determined that the Proposed Action will have no effect on the Endangered northern long-eared bat (*Myotis septentrionalis*). Therefore, no consultation with the U.S. Fish and Wildlife Service pursuant to Section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended 16 U.S.C. 1531 *et seq.*) is required for those species.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) are likely to be present in the action area?

Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

No

3. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer 'yes' if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

No

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

8. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

No

9. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the [effects of any activities](#) that would not occur but for the proposed action.

If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer “No” below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project’s action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a “no effect” determination for the northern long-eared bat.

Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer “No” and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of [Effects of the Action](#) can be found here: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

10. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

No

11. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?

(If unsure, answer "Yes.")

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥ 3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

PROJECT QUESTIONNAIRE

Will all project activities be completed by April 1, 2024?

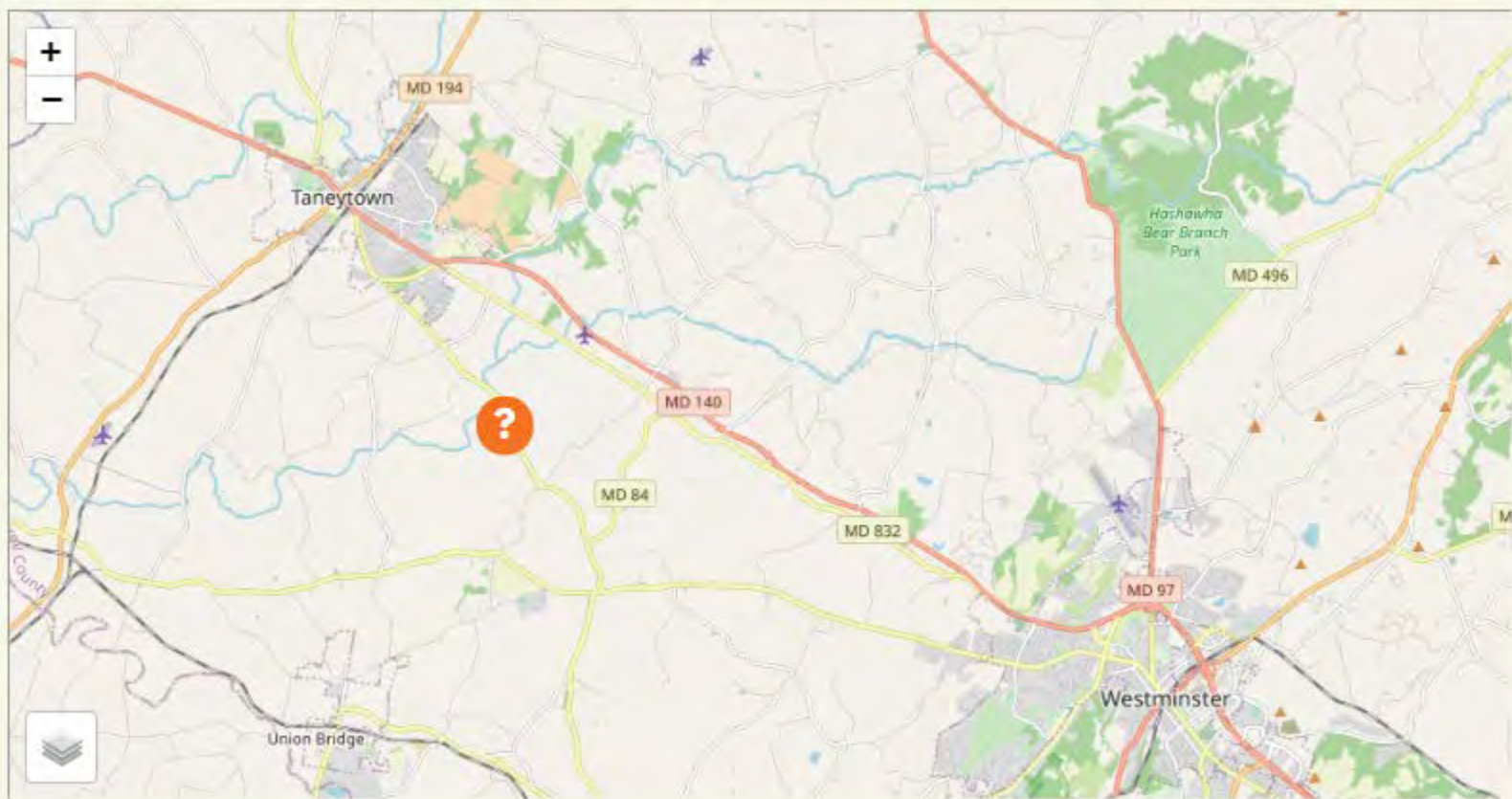
No

IPAC USER CONTACT INFORMATION

Agency: Delta Airport Consultants, Inc
Name: Mary Pearson
Address: 2700 Polo Parkway
Address Line 2: Delta Airport Consultants, Inc.
City: Richmond
State: VA
Zip: 23113
Email: mapearson@deltaairport.com
Phone: 8049554556

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Aviation Administration



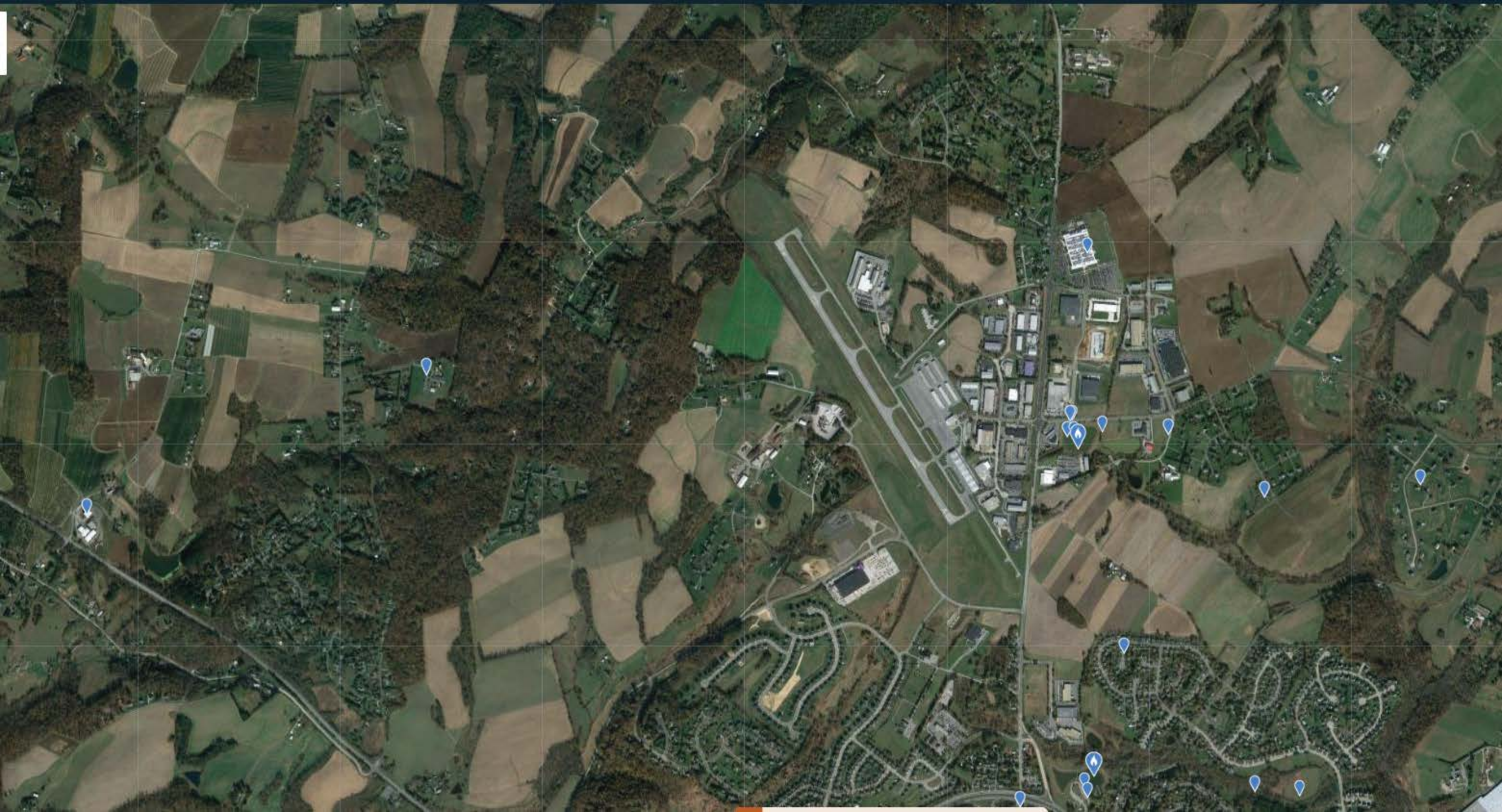
Species:

✕

DATE: [Year-round](#), [All years](#) ▾

LOCATION:

✕



Mary Ashburn Pearson

From: Wittig, Thomas W <thomas_wittig@fws.gov>
Sent: Tuesday, April 11, 2023 10:17 AM
To: Mary Ashburn Pearson
Cc: Roy G. Lewis
Subject: Re: [EXTERNAL] Carroll County Airport (DMW) - potential bald eagle

Hello Mary Ashburn,

Thanks for reaching out again.

I think the photos may have been compressed when zipped or emailed, so it is a bit hard to tell, but my first impression is that this nest is much more likely a hawk nest. The sticks in it look closer to twigs than branches, which is more typical of hawks. The location of the nest supports this conclusion too; bald eagles tend to nest in lone trees or trees on the edge of woodlots where they can easily navigate in and out with their six-foot wingspan. This nest is in the center of a forest block, which would be challenging for an eagle to access, but not so much for a hawk.

At the same time, that is undoubtedly an eagle in the resident's photos. Do you know whether the photos of the eagle were taken at the nest site or elsewhere?

If we're unable to make confident conclusions about the origin of the nest now, I'd suggest keeping an eye on it over the next couple years to see which, if any, birds use it. Waiting will also make the most sense from regulatory and administrative perspectives as well. Our agency is currently [revising its regulations](#) for authorizing removal and disturbance of bald eagle nests, with the general goal of making our system more effective and efficient. These changes will likely be made final by the end of the year.

Best,
Tom

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Thursday, April 6, 2023 3:57 PM
To: Wittig, Thomas W <thomas_wittig@fws.gov>
Cc: Roy G. Lewis <RLewis@deltaairport.com>
Subject: [EXTERNAL] Carroll County Airport (DMW) - potential bald eagle

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Tom,

As a follow up to my voicemail, my firm is assisting Carroll County Regional Airport (DMW) in Westminster, Maryland to design and construct a replacement runway. An adjacent resident reported seeing what she believes is a bald eagle's nest in the area where trees are proposed to be removed; a County employee provided the attached photos and the lat/long location of the tree in question (see attached). The resident provided the photos in the second attachment.

When you have the chance and once you have had a chance to review the photos, we would like to discuss some next steps with you for this project. Design of the replacement runway is proposed to occur in 2023 with construction (including tree clearing) planned for 2026.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP

Project Manager

DELTA AIRPORT CONSULTANTS, INC.

P. 804.955.4556 | WWW.DELTAIRPORT.COM

Figure 1: General Location of Suspected Bald Eagle Nest

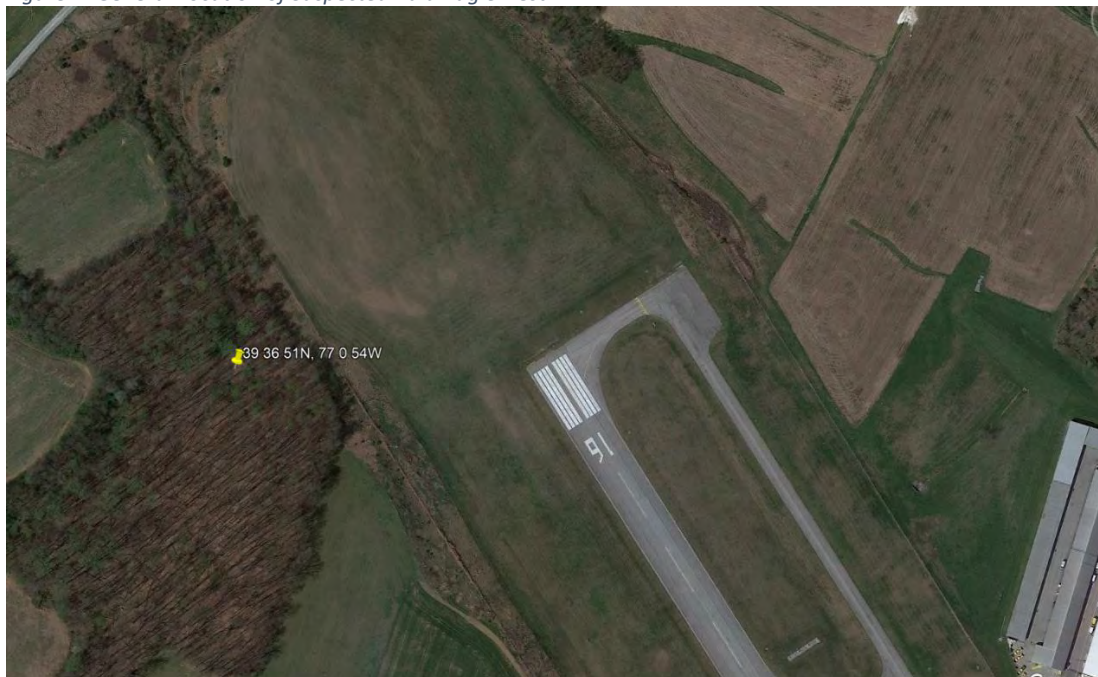


Figure 2: County photos



Figure 3: Resident-provided photos



Mary Ashburn Pearson

From: Beth Schlimm -DNR- <beth.schlimm1@maryland.gov>
Sent: Friday, July 7, 2023 3:53 PM
To: Sean Sipple
Cc: David Smith; Scott A. Smith -DNR-; Emma Beck; Mary Ashburn Pearson; Cheryl A. Rodriguez; Adam D. Switzer; Roy G. Lewis; Lori Byrne -DNR-
Subject: Re: Carroll County Regional Airport Bog Turtle Phase 2

Thank you, Sean. I have reviewed the phase II report and concur with your findings. DNR has no further bog turtle concerns with this project.

Best,

Beth

Beth Schlimm
Conservation Specialist
Natural Heritage Program
Wildlife and Heritage Service
Maryland Department of Natural Resources
580 Taylor Ave., E-1
Annapolis, Maryland 21401
443-775-9191 (cell)
410-260-8557 (office)
beth.schlimm1@maryland.gov



[Website](#) | [Facebook](#) | [Twitter](#)

Click [here](#) to complete a three question customer experience survey.

On Thu, Jun 29, 2023 at 10:52 AM Sean Sipple <seans@cri.biz> wrote:

Hi Beth – please find attached our Phase 2 bog turtle survey report for your review and concurrence. The County is requesting an expedited review (if possible) since they are on a tight schedule with the project. Let me know if that's not possible or if you have any questions.

Best,

Sean Sipple, PWS, PWD | *Department Head/Sr. Env. Scientist*

Mary Ashburn Pearson

From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Friday, June 23, 2023 7:45 AM
To: Mary Ashburn Pearson
Subject: FW: [EXTERNAL] Hopefully you can clear up something for me!

Categories: Filed by Newforma

Please include this communication in the Carroll County Supplemental EA. I was confirming that the State is the correct entity to coordinate with on the Bog Turtle and that FWS did not need to get the results of the surveys.

Genevieve

Genevieve Walker (she/her)
Environmental Protection Specialist
Washington ADO
13783 Park Center Road, Suite 490S
Herndon, VA 20171
(703) 487-3979

!_____
---o--()---o---

From: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Sent: Wednesday, June 21, 2023 11:06 AM
To: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Subject: Re: [EXTERNAL] Hopefully you can clear up something for me!

Hi Genevieve-

Thanks for reaching out with this question. The area where your project is located is not in our bog turtle screening layer, which is why it isn't showing up in IPaC. It is not on the State Sensitive Species Screening Layer either, so I am surprised they thought it might be in the area. The State does have more accurate data for bog turtle and potential habitat, so we generally defer to them for that species.

In general, you can coordinate with both us and the State on bog turtle. If you get bog turtle on your Species List, it is always best to reach out to the State to see what their recommendations are, and FWS will generally follow those. In a case like this where you didn't have bog turtle on the Species List but did get a hit through the State, you can let us know and include bog turtle in your consultation, and we will likely follow the State guidance. In this case, since there were no turtles found during Phase 3 surveys, there is no need to coordinate with us on bog turtles at this point. Hopefully this helps, let me know if you have any other questions!

Thank you,
Kathleen

Kathleen Cullen
U.S. Fish & Wildlife Service - Chesapeake Bay Field Office
177 Admiral Cochrane Dr., Annapolis MD, 21401

From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Tuesday, June 20, 2023 9:30 AM
To: Cullen, Kathleen M <kathleen_cullen@fws.gov>
Subject: [EXTERNAL] Hopefully you can clear up something for me!

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

I have a large runway extension project at Carroll County Regional Airport that was approved to move forward back in 2009. The 2009 EA identified only the Indiana Bat on IPAC. The State, however, identified the Bog Turtle as potentially occurring in this area. There did not appear to be additional coordination with FWS other than confirming TOY restrictions for the Indiana Bat on the 2009 EA. The State requested trapping data on the bog turtle and it was found not to be present. A supplement to the EA was approved in 2018 that added some additional clearing and wetlands work (additional surveys were conducted in the Supplemental EA and the Bog turtle was also not found to be present). The state was satisfied with the results, that no Bog turtles were present.

Long story- sorry.. I currently have another Supplemental EA (2023) for yet more clearing and some modifications to the project. 1. Delta Airport Consultants (Mary Ashburn) informally communicated with you on this May 2023). We are following TOY restrictions for the Indiana Bat and received a "No Effect" on the NLEB new D-Key- so the bats should be covered (for now- once the Tri-colored and/or Little brown bat is listed, there will likely be more work to be done).

The Bog turtle trapping events Phase 3 (in accordance with what the State had previously required), were completed in May (I believe the occurred over the entire month, but have not yet seen the final report)- and no Bog Turtles were found. So to FINALLY get to my questions:

1. Should IPAC be identifying the Bog Turtle for this location (I just checked and it is only identifying the two bats and the Monarch butterfly)?
2. Should I be coordinating with your office or the State on the Bog Turtle? It appears that the State (Lori Byrne) was the only contact on the Bog turtle in the past.

Thanks so much for all your continued assistance with my airport projects!!

Genevieve

Genevieve Walker (she/her)
Environmental Protection Specialist
Washington ADO
13783 Park Center Road, Suite 490S
Herndon, VA 20171
(703) 487-3979

!_____
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PHASE 2 BOG TURTLE (*GLYPTHEMYS* *MULENBERGII*) SURVEY REPORT

**CARROLL COUNTY REGIONAL AIRPORT (DMW)
CARROLL COUNTY, MARYLAND**



JUNE 2023

Prepared For:



Prepared By:



COASTAL RESOURCES INC.

25 Old Solomons Island Road, Annapolis, Maryland 21401

Table of Contents

1.0	Introduction	1
2.0	Methodology.....	1
3.0	Results.....	3
4.0	Summary	5

List of Figures

Figure 1: Vicinity Map	2
Figure 2: Phase 2 Bog Turtle Survey Area Map.....	3

List of Tables

Table 1: Average weather conditions recorded for each survey at Carroll County Regional Airport	3
Table 2: Survey effort and herpetofauna observed at Carroll County Regional Airport	4

List of Appendices

Appendix A: January 23, 2023 Email from DNR
Appendix B: Endangered Species Collection Permit
Appendix C: Photographs of Suitable Bog Turtle Habitat and Observed Fauna
Appendix D: Phase 2 Bog Turtle Survey Forms



1.0 Introduction

The Carroll County Regional Airport (DMW) is a general aviation airport in Westminster, Maryland which is owned and operated by the Commissioners of Carroll County (**Figure 1**). On behalf of The Commissioners of Carroll County, Delta Airport Consultants, Inc. (Delta) is preparing a Supplemental Environmental Assessment (SEA) to support ongoing planning studies for future expansion of the DMW. Coastal Resources, Inc. (CRI) was retained by Delta to conduct Phase 2 bog turtle (*Glyptemys muhlenbergii*) surveys in support of the SEA. Previous planning studies identified suitable bog turtle habitat within the project area. Coordination with Maryland Department of Natural Resources (DNR) Wildlife and Heritage Service (WHS) and U.S. Fish and Wildlife Service (USFWS) resulted in presence/absence surveys being conducted in 2009. No bog turtles were found during these earlier studies. However, because sufficient time has elapsed, DNR and USFWS again required presence/absence surveys to be completed within suitable habitat areas. As a condition of the 2018 Finding of No Significant Impact (FONSI), Carroll County was required to conduct bog turtle trapping (Phase 3 surveys) in the entirety of Wetland #9. However, during a field visit on January 20, 2023, Beth Schlimm of DNR determined that only three portions of Wetland #9 contained suitable bog turtle habitat and that these areas could be adequately surveyed using Phase 2 protocols (**Appendix A**). The locations of these wetlands are shown in **Figure 2**. Phase 2 surveys were conducted by qualified bog turtle surveyors (QBTS) Sean Sipple and David Smith.

2.0 Methodology

An Endangered Species Permit (ESP) was obtained from DNR (ESP #58553) that authorized the phase 2 bog turtle surveys at the DMW (**Appendix B**). Surveys were conducted per *Guidelines for Bog Turtle Surveys for the Northern Population Range Phase 1 and 2 Surveys*, dated April 29, 2020, and as noted in the Special Conditions section of the ESP. Sean D. Sipple and David R. Smith of CRI, DNR-recognized QBTS, completed the phase 2 surveys. Sub-permittees Emma Beck (CRI), Shannon Pursell (CRI), and Megan Bolcar (CRI) also assisted with the surveys. Resumes for the sub-permittees were provided in the ESP application.

Phase 2 bog turtle surveys were conducted within the three portions of Wetland #9 that contained suitable bog turtle habitat and were referred to as WL9-Upper, WL9-Middle, and WL9-Lower during the surveys. All bog turtle surveys were initiated after 0830 hours and were completed before 1700 hours. All surveys were conducted only when air temperatures were 55°F or above during periods without rain or with light rain and temperatures 65°F or above. Potential bog turtle wetlands were surveyed by first walking slowly through each wetland to look for basking turtles or turtles moving around on the surface. The initial surface search was then followed by a muddling search comprising a more thorough probing for turtles buried in the muck. The DNR had indicated during the January 20, 2023, field visit that the best bog turtle habitat within the wetlands required both a surface search and muddling search, while the portions of the wetlands without adequate muck required a surface search only. The surveyed habitat in **Figure 2** represents the area of each wetland in which suitable muck was present to conduct a muddling search. The QBTS and two to three assistants conducted all four surveys at both wetlands. Survey effort within each site was at least four person hours per acre of surveyed wetland. At the end of the survey period for each wetland, notes were taken about the condition of the wetland and any herpetofauna or



other wildlife encountered. Photographs were also taken of the surveyed wetland and any herpetofauna observed during the surveys (**Appendix C**).

Figure 1: Vicinity Map

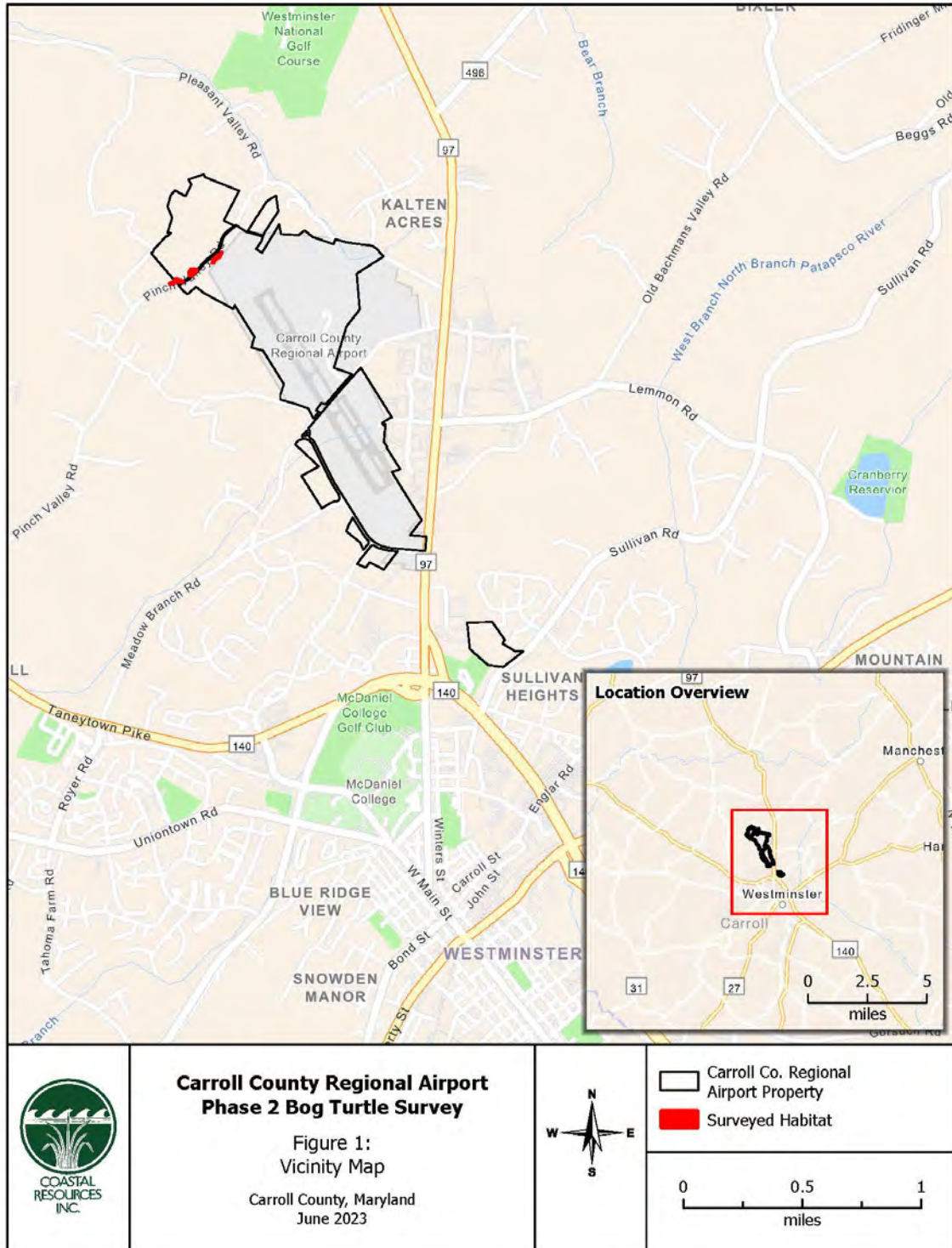
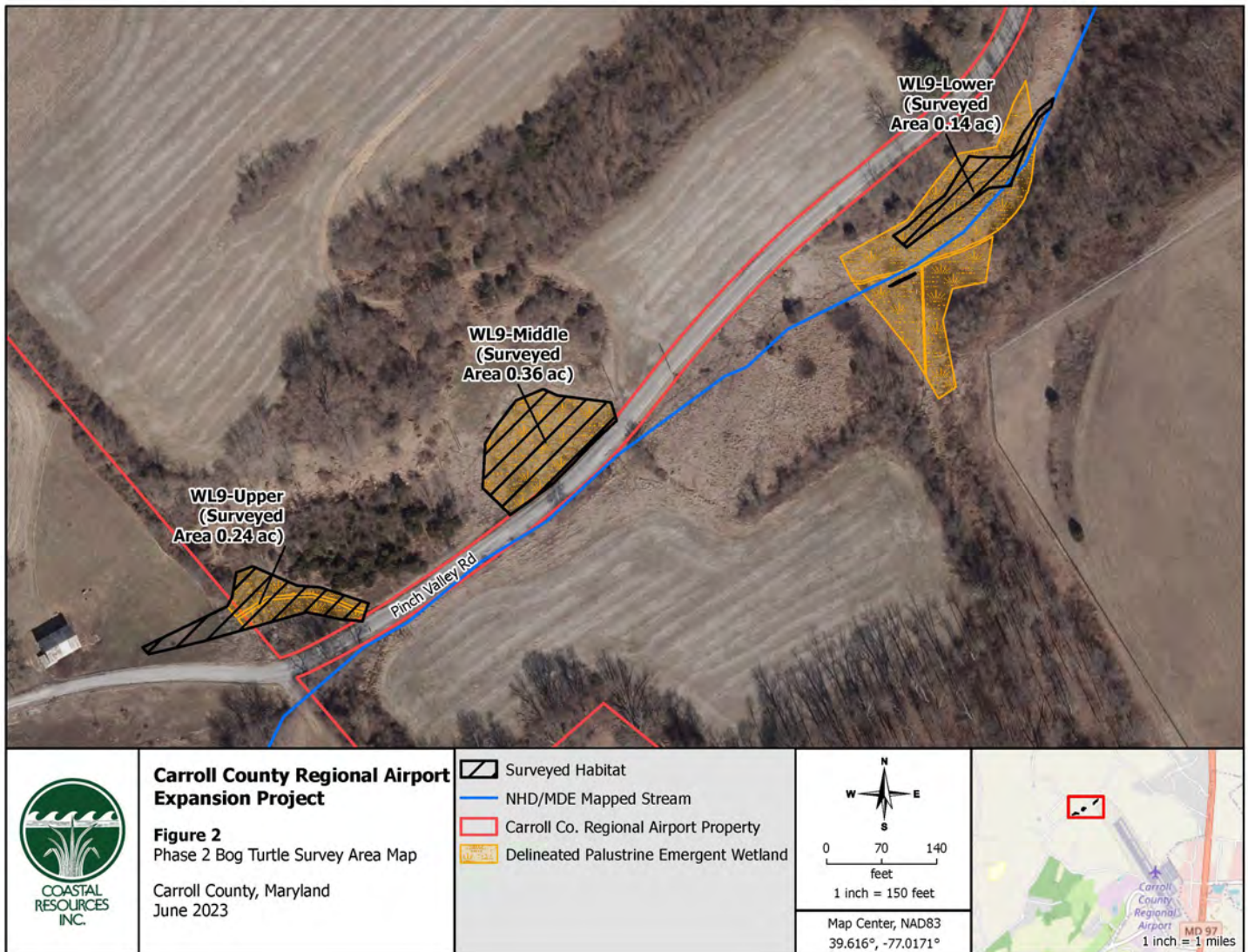


Figure 2: Phase 2 Bog Turtle Survey Area Map



3.0 Results

Weather conditions reported during each survey date are recorded in **Table 1**. Temperatures during the phase 2 bog turtle surveys ranged between 55°F and 73°F during the four surveys.

Table 1: Average weather conditions recorded for each survey at Carroll County Regional Airport

Survey Date	Air Temperature Range (°F)	Wind Speed (mph)	Cloud Cover	Rain (Y/N)
April 25, 2023	55 - 58	1-3	Partly Cloudy	N
May 11, 2023	64 - 72	1-7	Partly Cloudy	N
May 25, 2023	60 - 65	4-12	Clear	N
June 13, 2023	64 - 70	4-7	Partly Cloudy	N



Survey time for visual searches and muddling, wetland area, and overall effort are shown in **Table 2**. All surveyed wetlands exceeded the minimum survey time. In addition, regardless of required survey time, each wetland area was surveyed for at least 60 minutes. No bog turtles were found during any of the four surveys. Other herpetofauna observed during the surveys are included in **Table 2** and included adult and juvenile snapping turtles (*Chelydra serpentina*), northern watersnake (*Nerodia sipedon*), green frog (*Lithobates clamitans*), pickerel frog (*L. palustris*), red salamander (*Pseudotriton ruber*), and unknown toad tadpoles. Note that the red salamander is listed by DNR as a Greatest Conservation Need species. This information is also presented for each wetland for each survey date on Phase 2 Survey Forms included in **Appendix D**.

Table 2: Survey effort and herpetofauna observed at Carroll County Regional Airport

Date	Wetland ID	Wetland Area (ac)	Muddle Area (ac)	# Surveyors	Surface Search Time (Hr)	Muddling Search Time (Hr)	Effort (Person Hr ³ /Ac)	Herpetofauna Observed ¹
April 25, 2023	WL9-Upper	0.24	0.24	4	0.35	0.88	20.6	SNTU
	WL9-Middle	0.36	0.36	4	0.18	0.82	11.1	NOWA
	WL9-Lower	0.79	0.14	4	0.12	0.83	27.1	PIFR
May 11, 2023	WL9-Upper	0.24	0.24	3	0.13	0.88	12.5	None
	WL9-Middle	0.36	0.36	3	0.23	0.93	7.3	None
	WL9-Lower	0.79	0.14	3	0.23	0.93	20.5	None
May 25, 2023	WL9-Upper	0.24	0.24	3	0.18	0.82	12.5	SNTU
	WL9-Middle	0.36	0.36	3	0.12	0.97	9.0	NOWA, GRFR
	WL9-Lower	0.79	0.14	3	0.15	0.87	21.4	SNTU
June 13, 2023	WL9-Upper	0.24	0.24	3	0.20	0.80	12.5	RESA ² , SNTU
	WL9-Middle	0.36	0.36	3	0.13	0.87	8.3	None
	WL9-Lower	0.79	0.14	3	0.33	0.67	21.4	None

¹SNTU = Snapping Turtle, NOWA = Northern Watersnake, PIFR = Pickerel Frog, GRFR = Green Frog, RESA = Red Salamander

²Species of Greatest Conservation Need

³Person Hour = total search time multiplied by the number of surveyors



4.0 Summary

Phase 2 bog turtle field surveys were conducted within three areas associated with Wetland #9 at the Carroll County Regional Airport. Four phase 2 surveys were conducted at each area by CRI's QBTS and two to three assistants. All surveys included a visual surface search of the entire wetland followed by a muddling search of portions of the wetland with adequate mucky soils. The combined area that was muddle surveyed was approximately 0.74 acre. No bog turtles were found within the surveyed wetlands; however, several other herpetofauna were observed and photo-documented within the wetland. The results of these surveys do not prove conclusively that bog turtles do not exist within the surveyed wetland; however, the fact that several snapping turtles and other cryptic herpetofauna were found within these wetlands, suggests that if bog turtles had been present, they would have been detected during the surveys.



Appendix A: January 23, 2023 Email from DNR



From: [Beth Schlimm -DNR-](#)
To: [Mary Ashburn Pearson](#)
Cc: [David Smith](#); [Scott A. Smith -DNR-](#); [Sean Sipple](#)
Subject: Re: Carroll County Regional Airport Bog Turtle Trapping
Date: Monday, January 23, 2023 1:59:27 PM
Attachments: [image001.png](#)
[image002.png](#)

Hi Mary,

Wetland #160422-0930 on the Miller parcel does not need to be surveyed.

Best,

Beth



Beth Schlimm
Conservation Specialist
Natural Heritage Program
Department of Natural Resources
580 Taylor Ave., E-1
Annapolis, Maryland 21401
beth.schlimm1@maryland.gov
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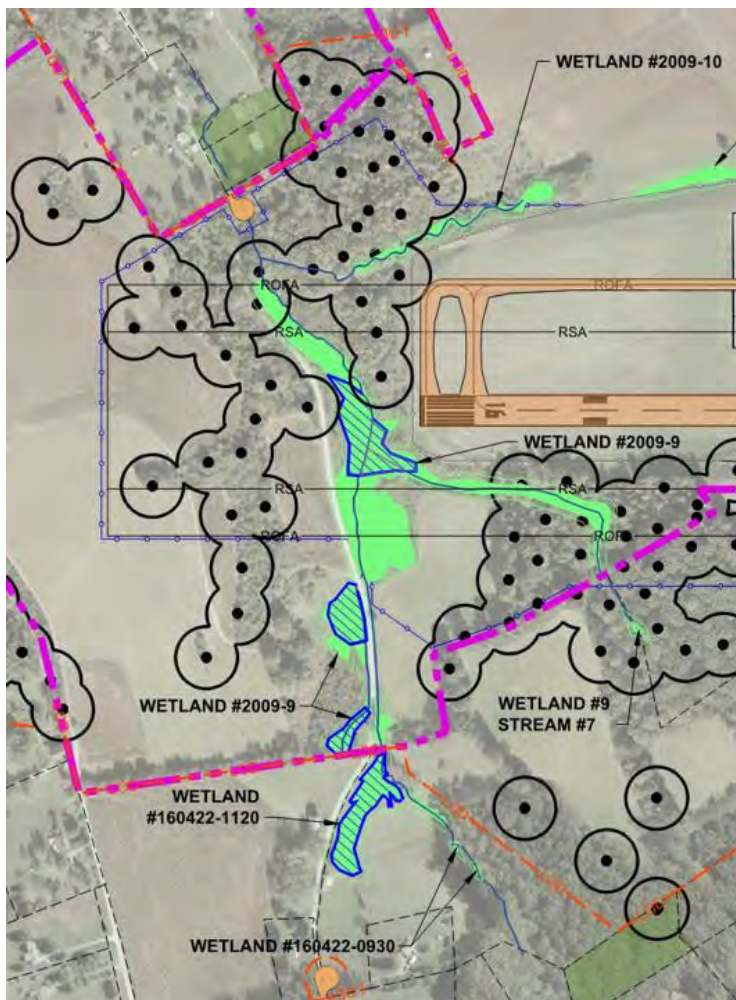
Click [here](#) to complete a three question customer experience survey.

On Mon, Jan 23, 2023 at 9:58 AM Mary Ashburn Pearson <mapearson@deltaairport.com> wrote:

Beth, David and team,

Thank you for the confirmation and for making the field visit on Friday!

Can you please confirm that there is also a wetland 160422-0930 on the adjacent Miller parcel/horse pasture that we understand is also unsuitable Bog Turtle habitat and does not need to be surveyed/trapped? I want to document this in writing before we bring the agency recommendations to FAA.



We will work with CRI to conduct the Phase II trappings as recommended.

Thank you!

Mary Ashburn

Mary Ashburn Pearson, AICP

Project Manager

DELTA AIRPORT CONSULTANTS, INC.

P. 804.955.4556 | WWW.DELTAairport.com

From: Beth Schlimm -DNR- <beth.schlimm1@maryland.gov>
Sent: Monday, January 23, 2023 9:31 AM
To: David Smith <davids@cri.biz>
Cc: Scott A. Smith -DNR- <scott.smith@maryland.gov>; Mary Ashburn Pearson <mapearson@deltaairport.com>; Sean Sipple <seans@cri.biz>
Subject: Re: Carroll County Regional Airport Bog Turtle Trapping

Good Morning,

Dave and I met on-site on Friday afternoon to assess the bog turtle habitat and discuss the survey approach. After seeing the site, I believe that the three wetland sections that make up #2009-9 can be adequately surveyed by a Phase II survey (no need for trapping). The majority of the cattail wetland is no longer suitable for bog turtles due to lack of muck, however, there is a small linear section that will require a phase II. The off-site wetland (#160422-1120) in the horse pasture is not suitable and does not need to be surveyed. Please let me know if you need any additional information from me.

Best,

Beth

Beth Schlimm
Conservation Specialist
Natural Heritage Program
Department of Natural Resources
580 Taylor Ave., E-1
Annapolis, Maryland 21401
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410-260-8557 (O)
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Click [here](#) to complete a three question customer experience survey.

On Fri, Jan 13, 2023 at 4:22 PM Beth Schlimm -DNR- <beth.schlimm1@maryland.gov> wrote:

Perfect - see you then.

Best,

Beth

Beth Schlimm
Conservation Specialist
Natural Heritage Program
Department of Natural Resources
580 Taylor Ave., E-1
Annapolis, Maryland 21401
beth.schlimm1@maryland.gov
410-260-8557 (O)
443-775-9191 (M)
[Website](#) | [Facebook](#) | [Twitter](#)

Click [here](#) to complete a three question customer experience survey.

On Fri, Jan 13, 2023 at 3:42 PM David Smith <davids@cri.biz> wrote:

Beth,

Thanks for getting back to us so quickly. Meeting at 12:30pm onsite would work perfectly for me. I just sent you a Google Earth pin of where we can meet. I look

forward to meeting you out there next Friday.

Thanks again,

David R. Smith | *Senior Environmental Scientist, PWS*

[Coastal Resources, Inc.](#) | [Facebook](#) | [LinkedIn](#)

25 Old Solomons Island Road, Annapolis, MD 21401

Main 410-956-9000 (ext. 114) | Direct 443-837-2154 | Cell 443-995-4108



From: Beth Schlimm -DNR- <beth.schlimm1@maryland.gov>
Sent: Friday, January 13, 2023 3:32 PM
To: David Smith <davids@cri.biz>
Cc: Scott A. Smith -DNR- <scott.smith@maryland.gov>; Mary Ashburn Pearson <mapearson@deltaairport.com>; Sean Sipple <seans@cri.biz>
Subject: Re: Carroll County Regional Airport Bog Turtle Trapping

Hi Dave,

I have a field meeting in Carroll County next Friday morning and could meet you afterwards. I will likely be available around 12:30. Just let me know when and where you would like to meet. Thanks.

Best,

Beth

Beth Schlimm
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Click [here](#) to complete a three question customer experience survey.

On Fri, Jan 13, 2023 at 3:08 PM David Smith <davids@cri.biz> wrote:

Scott and Beth,

I wanted to follow up with you all regarding the above-referenced project that I reached out about earlier this week. As mentioned, CRI has been asked by Delta Airport Consultants, Inc. to prepare a proposal to conduct follow up bog turtle work within wetlands that lie within the airport expansion LOD or within the 300-foot buffer to the expansion on the west side of the existing airport along Pinch Valley Road. Bog turtle work previously conducted by Rettew in 2009 and again in 2016 identified portions of Wetland 9 on airport property and two additional wetlands immediately adjacent to the property (see attached map) as suitable bog turtle habitat. Rettew conducted Phase 2 surveys and trapped the suitable habitat areas of Wetland 9 back in 2009 and found no bog turtles. In their follow-up Phase 1 survey in 2016, these areas, plus the two new offsite wetlands, were identified as suitable habitat. In an email dated September 26, 2016 (see attached), Scott indicated that the Wetland 9 areas would need to be trapped again because greater than five years had elapsed since the original trapping effort, which itself did not continue for the typically required number of days. Scott also indicated that the two new offsite wetlands would also need to be trapped.

To help us prepare our proposal for doing this work, I visited the site yesterday and walked these wetlands. Improvements to Pinch Valley Road and the drainage along

the road have occurred since 2016. Also, the small rivulet streams that drain these wetlands have down cut a foot or two in most places. I believe these changes have resulted in a reduction of suitable bog turtle habitat within most of these wetland areas. The large cattail marsh of Wetland 9 at the northern end and east of Pinch Valley Road was mostly firm bottomed, with only a small area of mucky substrate at the downstream (northern) end of the mapped suitable habitat where a spring discharges into it from the road. The northernmost, roundish-shaped wetland west of Pinch Valley Road, which is a hillslope seep but without a defined spring discharge, also had firmer soils over a portion of its area, with a reduced area of mucky soils in the middle of the wetland. The southernmost wetland west of Pinch Valley Road has several spring discharges and deep muck and appears to be the best habitat for bog turtles. I did not have permission to walk the offsite, linear wetlands at the southern end east of Pinch Valley Road. However, from the road, it appeared that they were mostly somewhat incised stream channels without much if any bog turtle habitat adjacent to them.

Given the apparent amount of change in wetland conditions within this area since the 2016 assessment, we did not feel comfortable preparing a proposal that assumed trapping of the entire areas shown without first having one of you all visit the site with us to see these conditions yourselves. The County is anxious to get our proposal so that they can make sure that this bog turtle work will be funded and can happen during the coming 2023 season. To expedite our preparation of the proposal, would one of you be available later next week to meet me onsite to walk these wetlands and to provide guidance to us and the project team on the appropriate level of bog turtle survey given the current site conditions? I can be available either Thursday or Friday afternoon to walk the site with you. If we can schedule a visit, the project team will coordinate with the adjacent property owner to allow us to walk the offsite wetlands as well. If next week is not good, please let us know if there is a day the following week that might work.

Thanks for your consideration of our request and let us know whether late next week could work for you.

Best,

David R. Smith | *Senior Environmental Scientist, PWS*

[Coastal Resources, Inc.](#) | [Facebook](#) | [LinkedIn](#)

25 Old Solomons Island Road, Annapolis, MD 21401

Main 410-956-9000 (ext. 114) | Direct 443-837-2154 | Cell 443-995-4108



From: Scott A. Smith -DNR- <scott.smith@maryland.gov>
Sent: Wednesday, January 11, 2023 1:24 PM
To: David Smith <davids@cri.biz>
Cc: Sean Sipple <seans@cri.biz>; Beth Schlimm <beth.schlimm1@maryland.gov>
Subject: Re: Carroll County Regional Airport Bog Turtle Trapping

No but there are turtles in the drainage (I think it's Big Pipe Creek watershed?). We also have anecdotal accounts I think.

Sent from my iPhone

On Jan 11, 2023, at 1:03 PM, David Smith <davids@cri.biz> wrote:

Thanks Scott. We will include Beth with any further correspondence on this project. Out of curiosity, was this an historic bog turtle site or at least part of a metapopulation? If so, when the time comes, we will need the metapopulation sheet so we know what turtle numbers to use.

Thanks again,

David R. Smith | *Senior Environmental Scientist, PWS*

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25 Old Solomons Island Road, Annapolis, MD 21401

Main 410-956-9000 (ext. 114) | Direct 443-837-2154 | Cell 443-995-4108

<image001.png>

From: Scott A. Smith -DNR- <scott.smith@maryland.gov>
Sent: Wednesday, January 11, 2023 12:20 PM
To: David Smith <davids@cri.biz>
Cc: Sean Sipple <seans@cri.biz>; Beth Schlimm
<beth.schlimm1@maryland.gov>
Subject: Re: Carroll County Regional Airport Bog Turtle Trapping

Fine on both questions. Please keep Beth in the loop on this as I will be retired before this project has been put to bed, and there would be a conflict of interest for me to get involved after I retire, at least on the consulting end (Beth can always use me as a sounding board). Your TX trip sounds awesome!

Sent from my iPhone

On Jan 11, 2023, at 12:11 PM, David Smith
<davids@cri.biz> wrote:

Hey Scott,

We were contacted by Delta Airport Consultants, Inc., with whom we have worked before on the Cambridge Airport, about a potential Phase 3 bog turtle trapping project on the NW side of the Carroll County Regional Airport, as part of planned expansion of that airport. Delta Airport Consultants, Inc. has asked us to conduct that Phase 3 work, which we are excited about doing. As you know, I will be retiring at the end of the month but continuing to work as needed moving forward. I certainly plan to work on any bog turtle related projects, including our SAT work with you all and any other work-related bog turtle projects, including this trapping project. Because the project will require acquisition of grant funding and because of the timing of when the grants are issued, the county will need the Phase 3 work to begin as soon as the trapping period starts on May 1. Sean and I will be preparing our proposal for conducting the

Phase 3 work over the next week. I plan to head up there this afternoon to recon the specific wetlands where trapping was required, so should be able to speak more specifically about the site after that. I actually did some herping in these wetlands during the Herp Atlas project, because they are mostly right along Pinch Valley Road, and I knew that it was mostly county-owned land outside the fenced airport. Therefore, I already know about them somewhat. Never found boggies or spotted turtle in there but do recall that there was some decent habitat. Anyway, before preparing the proposal, we did have a couple of questions for you about this project and with respect to the trapping protocol itself.

With respect to the project, we are aware that another firm trapped much of the site back in 2015 and did not capture any bog turtles. However, we were told that some additional wetland areas have been added to the areas to be trapped. Some of these appeared to be very small bench wetlands along small seepage streams. We were thinking that in those small areas one or two traps could be placed but that it wouldn't make sense to install a drift fence. Does that seem reasonable to you?

The second question is whether it is allowable for an experienced subpermittee to check traps without a QBTS present? If it is, we are guessing that it would not be admissible for them to process any bog turtles if captured, but rather, a QBTS would need to come out to do that. The reason for the question is that both Sean and I have a conflict the week of May 15. I will be in Big Bend National Park in Texas stalking the Colima warbler and Sean will be teaching his wetland class through Environmental Concern on the Eastern Shore. Emma Beck, who first cut her bog turtle teeth with Ben and Andy at Skelly and Loy and who has worked with us over the past 3+ years, is well on her way to meeting the QBTS qualifications, lacking only some Phase 1 work, which she will be getting in the next few weeks on some projects we have in Delaware, and more Phase 2 days (she is about halfway to the minimum 50 days). She has caught lots of bog turtles over the past three years, so meets the captures requirement. Emma will be assisting us with the drift fence and trap installations, so will be very familiar with the site layout and trap locations. She will also shadow us on days preceding the week of May 15, so there is no question she would know the trap check protocol inside and out before running them on her own. For

the Phase 3 project we did in Hampstead, we checked traps first thing in the morning. However, for this job we were thinking that we would conduct the trap checks later in the day. In this way, it is less likely that turtles would be in traps overnight. Also, for the week that Emma would be checking them on her own, if there was a bog turtle in a trap, Sean could come up after his class to process it and release it before dark.

Thanks for your thoughts on all this. I'm sure we will coordinate with you further as time approaches.

David R. Smith | *Senior Environmental Scientist, PWS*

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25 Old Solomons Island Road, Annapolis, MD 21401

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<image001.png>

Appendix B: Endangered Species Collection Permit





WILDLIFE AND HERITAGE SERVICE
PERMIT/LICENSE

Effective:
01/01/2023

ENDANGERED SPECIES

Expires:
12/31/2023

PERMIT #: 58553

Coastal Resources, Inc.
ATTN: David Raleigh Smith
25 Old Solomons Island Road
ANNAPOLIS, MD 21401

Work Phone: 410-956-9000
County of Residence:
Anne Arundel

Location: Carroll
Carroll County Regional Airport
Authority Statute(s): NR 10-2A-05.1 ACM
Regulation(s): COMAR 08.03.08.03

GENERAL CONDITIONS

Conditions in state law and regulations cited above, are hereby made a part of this permit/license. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity, or renewal, of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information reports.

The validity of this permit is also conditioned upon strict observance of all applicable federal, local or other state laws.

Permittee is not authorized by this permit to access private property or publically held property without express permission from the appropriate authority.

SPECIAL CONDITIONS

Permittee and subpermittees are authorized to conduct bog turtle surveys at Carroll County Regional Airport in Westminster, Carroll County, in accordance with the Guidelines for Bog Turtle Surveys in Maryland (Phase II), using hand capture, as described in the permit application and summarized below:

1. Surveys should only be performed during the period from April 15-June 15.
2. Ambient air temperature at the surface in the shade should be a minimum of 55 F.
3. Surveys should be done during the day, at least one hour after sunrise and no later than one hour before sunset.
4. Surveys may be done when it is sunny or cloudy. In addition, surveys may be conducted during and after light rain, provided air temperatures are greater than 65 degrees F.
5. At least one surveyor must be a recognized qualified bog turtle surveyor, and the others should have at least some previous experience successfully conducting bog turtle surveys or herpetological surveys in wetlands.
6. Either Permittee David Smith or Subpermittee Sean Sipple must be present at each survey.
7. Permittee will complete in its entirety a "Turtle Capture Form" for each individual turtle captured, and a "Phase 2 Survey Form" for each survey conducted. Copies of completed forms will be submitted to DNR upon the completion of the field season (after June 15) and no later than October 31st, 2023.
8. Permittee and subpermittees will all adhere to strict biosecurity protocols as described in NEPARC's "Disinfection of Field Equipment for Amphibian Pathogens", located at <http://northeastparc.org/disinfection-protocol/>

ISSUED BY: Georgia Johnson

PERMITS COORDINATOR

ISSUED: 04/13/2023



WILDLIFE AND HERITAGE SERVICE
PERMIT/LICENSE

Effective:
01/01/2023

ENDANGERED SPECIES

Expires:
12/31/2023

PERMIT #: 58553

All turtles should be released unharmed at the point of capture after measurements are taken. All bog turtle locations must be submitted directly to Beth Schlimm, MD DNR Wildlife and Heritage Service, 580 Taylor Ave. E-1, Annapolis, MD 21401, and USFWS within 24 hours. DNR shall also be provided with a copy of survey results, including a site map, acreage of wetland, dates of site visits, time spent per visit, surveyor's names, weather conditions, presence or absence of turtles, number found and date, and other reptiles.

Subpermittees: Sean Sipple, Emma Beck, Shannon Pursell, Megan Niehaus, Maddie White, Megan Bolcar

ISSUED BY: Georgia Johnson

PERMITS COORDINATOR

ISSUED: 04/13/2023

Appendix C: Photographs of Suitable Bog Turtle Habitat and Observed Fauna



**Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log**



Photo 1: Wetland WL9-Upper looking west (4/25/2023)



Photo 2: Wetland WL0-Upper looking northwest (4/25/2023)

Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log



Photo 3: Snapping turtle from WL9-Upper (4/25/2023)



Photo 4: Red salamander (dead) from WL9-Upper (6/13/2023)

Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log



Photo 5: Juvenile snapping turtle from WL9-Upper (6/13/2023)



Photo 5: Wetland WL9-Middle looking southwest (4/25/2023)

Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log



Photo 6: Northern watersnake from WL9-Middle (4/25/2023)



Photo 7: Northern green frog from WL9-Middle (5/25/2023)

**Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log**



Photo 8: Wetland WL9-Lower looking northwest (4/25/2023)



Photo 9: Pickerel frog from WL9-Lower (4/25/2023)

**Carroll County Regional Airport
Phase 2 Bog Turtle Survey Photo Log**



Photo 10: Juvenile snapping turtle from WL9-Lower (5/25/2023)

Appendix D: Phase 2 Bog Turtle Survey Forms



BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9-Upper Site Name*: Carroll County Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.24 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 4/25/23 Required Survey Time¹: 15 min
 4. Site Visit Number (1, 2, 3, or 4): 1
 5. Lead Surveyor(s): S. S. Apple
 Assistant Surveyor(s): E. Beck, S. Purcell, M. Bolcar

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 1335Rain (circle one): (n) l i hAir Temp (shade): 55 (C or °F)Wind Rank (see chart →): 2Cloud Cover (circle one): c p oNum of Surveyors: 4

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction, leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 1449Rain (circle one): (n) l i hAir Temp (shade): 56 (C or °F)Wind Rank (see chart →): 2Cloud Cover (circle one): c p oNum of Surveyors: 4

C. Survey Results

1. Stopped Searching² (min.): 02. Effort Hrs: 20.06
(person hours³/area)3. Other Turtle Species⁴ Observed:Common Snapping Turtle4. Herpetofauna Species⁴ Observed:Common Snapping Turtle - 2Toad tadpoles - 210005. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____

Num Live Females: _____

Num Live Juveniles: _____

6. # Dead Bog Turtles: 07. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Suitable habitat present upslope of delineated wetland. Additional suitable habitat added to survey. Took photos of herps + survey area.

² Number of person minutes not actively searching³ Number surveyors x number of hours⁴ Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9 - Middle Site Name*: Carroll County Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.34 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 4/23/23 Required Survey Time¹: 22 min
 4. Site Visit Number (1, 2, 3, or 4): 1
 5. Lead Surveyor(s): S. Sipple
 Assistant Surveyor(s): E. Beck, S. Pursell, M. Bolcar

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 1452
 Rain (circle one): (n) l i h
 Air Temp (shade): 57 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 1552
 Rain (circle one): (n) l i h
 Air Temp (shade): 58 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

C. Survey Results

1. Stopped Searching² (min.): 0
 2. Effort Hrs: 11.1
 (person hours³/area)

3. Other Turtle Species⁴ Observed:
None

4. Herpetofauna Species⁴ Observed:
Northern Water Snake - 1

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0
 7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Took photos of survey area and N. water snake. Best habitat is found in portion closest to road.

²Number of person minutes not actively searching
 Number surveyors x number of hours

⁴Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9 - lower Site Name*: Carroll County Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.14 Survey Area (ac) (if different): (or Township)
 3. Survey Date: 4/25/23 Required Survey Time¹: 9 min
 4. Site Visit Number (1, 2, 3, or 4): 1
 5. Lead Surveyor(s): S. Sipple
 Assistant Surveyor(s): E. Beck, S. Parsell, M. Bolcar

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:
 Start Time (military): 1554
 Rain (circle one): (n) l i h
 Air Temp (shade): 58 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):
 End Time (military): 1700
 Rain (circle one): (n) l i h
 Air Temp (shade): 58 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

C. Survey Results

1. Stopped Searching² (min.): 5
 2. Effort Hrs: 27.1
 (person hours³/area)
 3. Other Turtle Species⁴ Observed:
 None
 4. Herpetofauna Species⁴ Observed:
 Pickered Frog - 2

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0
 7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Core area is much smaller than delineated wetland. Two portions of core area surveyed. Photos taken of survey area + pickered frog.

² Number of person minutes not actively searching³ Number surveyors x number of hours⁴ Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: W14and9-10000 Site Name*: Colton County Swamp Town/County*: 1st Prince Georges/Calver
 2. Core Habitat Area (ac): 0.14 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/11/23 Required Survey Time¹: 9 min
 4. Site Visit Number (1, 2, 3, or 4): 2
 5. Lead Surveyor(s): S. S. Pope
 Assistant Surveyor(s): E. P. Pick, M. Bolcar

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:
 Start Time (military): 0925
 Rain (circle one): n l i h
 Air Temp (shade): 64 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

7. End Conditions (End of RA Survey):
 End Time (military): 1035
 Rain (circle one): n l i h
 Air Temp (shade): 70 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction, leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

1. Stopped Searching² (min.): 38
 2. Effort Hrs: 20.5
 (person hours³/area)
 3. Other Turtle Species⁴ Observed:
None
 4. Herpetofauna Species⁴ Observed:
Nyctanolis
Pipilo

² Number of person minutes not actively searching
 Number surveyors x number of hours⁴ Include number of each by species

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0

7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Core area is much smaller than
 delineated wetland.
 Two portions of
 Core area surveyed.

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: 11A-19-middle Site Name*: Carroll County Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.36 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/11/23 Required Survey Time¹: 22 min
 4. Site Visit Number (1, 2, 3, or 4): 2
 5. Lead Surveyor(s): S. S. Pope
 Assistant Surveyor(s): E. Beck, S. Purcell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:
 Start Time (military): 0925
 Rain (circle one): (n) l i h
 Air Temp (shade): 64 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):
 End Time (military): 1036
 Rain (circle one): (n) l i h
 Air Temp (shade): 70 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 3

C. Survey Results

1. Stopped Searching² (min.): 36
 2. Effort Hrs: 7.3
 (person hours³/area)
 3. Other Turtle Species⁴ Observed:
None
 4. Herpetofauna Species⁴ Observed:
N. georgiana

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0

7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Post habitat forest
 in portion adjacent
 to road.

² Number of person minutes not actively searching³ Number surveyors x number of hours⁴ Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9-upper Site Name*: Carroll County Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.24 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/1/23 Required Survey Time¹: 15 min
 4. Site Visit Number (1, 2, 3, or 4): 2
 5. Lead Surveyor(s): S. Sipple
 Assistant Surveyor(s): E. Block, S. Powell, M. Bulant

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).**B. Environmental Factors and Number of Surveyors**

6. Start Conditions:
 Start Time (military): 1108
 Rain (circle one): n l i h
 Air Temp (shade): 72 (C or °F)
 Wind Rank (see chart →): 2
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):
 End Time (military): 1209
 Rain (circle one): n l i h
 Air Temp (shade): 72 (C or °F)
 Wind Rank (see chart →): 3
 Cloud Cover (circle one): c (p) o
 Num of Surveyors: 4

C. Survey Results

1. Stopped Searching² (min.): 0
 2. Effort Hrs: 12.5
 (person hours³/area)

3. Other Turtle Species⁴ Observed:None**4. Herpetofauna Species⁴ Observed:**toad toadpoles, N. green frog

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0

7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

Suitable habitat also present up slope of wetland, habitat added to survey.

²Number of person minutes not actively searching³Number surveyors x number of hours⁴Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Welland 9 - Lower Site Name*: Carroll Co. Airport Town/County*: Westminster | Carroll
 2. Core Habitat Area (ac): 0.14 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/25/23 Required Survey Time¹: 9 min
 4. Site Visit Number (1, 2, 3, or 4): 3
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Pursell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).**B. Environmental Factors and Number of Surveyors****6. Start Conditions:**

Start Time (military): 09:43
 Rain (circle one): n l i h
 Air Temp (shade): 60 (C or °F)
 Wind Rank (see chart →): 4
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 10:43
 Rain (circle one): n l i h
 Air Temp (shade): 61 (C or °F)
 Wind Rank (see chart →): 4
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

C. Survey Results

1. Stopped Searching² (min.): 0
 2. Effort Hrs: 21.4
 (person hours³/area)
 3. Other Turtle Species⁴ Observed:
Juvenile snapping turtle
 4. Herpetofauna Species⁴ Observed:
None

²Number of person minutes not actively searching³Number surveyors x number of hours⁴Include number of each by species**5. # Live Bog Turtles Captured During the Survey Time: 0**

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0**7. Signs of Bog Turtles (y/n): N**

Describe: _____

8. Comments:

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9-Middle Site Name*: Carroll Co Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.36 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/25/23 Required Survey Time¹: 22 min
 4. Site Visit Number (1, 2, 3, or 4): 3
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Purzell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 10:56
 Rain (circle one): n l i h
 Air Temp (shade): 61 (C or °F)
 Wind Rank (see chart →): 4
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 12:01
 Rain (circle one): n l i h
 Air Temp (shade): 62 (C or °F)
 Wind Rank (see chart →): 4
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

C. Survey Results

1. Stopped Searching² (min.): 0
 2. Effort Hrs: 9
 (person hours/area)

3. Other Turtle Species⁴ Observed:None4. Herpetofauna Species⁴ Observed:Watersnake, green frog5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 07. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

²Number of person minutes not actively searching³Number surveyors x number of hours⁴Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9-Lipper Site Name*: Carroll Co Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.24 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 5/25/23 Required Survey Time¹: 15 min
 4. Site Visit Number (1, 2, 3, or 4): 3
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Piusell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 12:45Rain (circle one): n l i hAir Temp (shade): 64 (C or F)Wind Rank (see chart →): 3Cloud Cover (circle one): c p oNum of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 13:45Rain (circle one): n l i hAir Temp (shade): 65 (C or F)Wind Rank (see chart →): 4Cloud Cover (circle one): c p oNum of Surveyors: 3

C. Survey Results

1. Stopped Searching² (min.): 02. Effort Hrs: 12.5
(person hours³/area)3. Other Turtle Species⁴ Observed:Snapping turtle4. Herpetofauna Species⁴ Observed:None5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____

Num Live Females: _____

Num Live Juveniles: _____

6. # Dead Bog Turtles: 07. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

²Number of person minutes not actively searching³Number surveyors x number of hours⁴Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 9 - Lower Site Name*: Carroll Co. Airport Town/County*: Westminster / Carroll
 2. Core Habitat Area (ac): 0.14 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 6/13/23 Required Survey Time¹: 9 min
 4. Site Visit Number (1, 2, 3, or 4) 4
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Russell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).**B. Environmental Factors and Number of Surveyors****6. Start Conditions:**Start Time (military): 08:42Rain (circle one): (n) l i hAir Temp (shade): 64 (C or F) (F)Wind Rank (see chart →): 3Cloud Cover (circle one): c p oNum of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):End Time (military): 09:42Rain (circle one): (n) l i hAir Temp (shade): 64 (C or F) (F)Wind Rank (see chart →): 3Cloud Cover (circle one): c p oNum of Surveyors: 3**C. Survey Results**1. Stopped Searching² (min.): 02. Effort Hrs: 21.4
(person hours³/area)3. Other Turtle Species⁴ Observed:None4. Herpetofauna Species⁴ Observed:None² Number of person minutes not actively searching
³ Number surveyors x number of hours⁴ Include number of each by species5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____

Num Live Females: _____

Num Live Juveniles: _____

6. # Dead Bog Turtles: 07. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Westwind 9-Middle Site Name*: Carroll Co. Airport Town/County*: Westminster/Carroll
 2. Core Habitat Area (ac): 0.36 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 6/13/23 Required Survey Time¹: 22 min
 4. Site Visit Number (1, 2, 3, or 4) 4
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Pursell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people = 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 09:51Rain (circle one): n l i hAir Temp (shade): 64 (C or F)Wind Rank (see chart →): 3Cloud Cover (circle one): c p oNum of Surveyors: 3

7. End Conditions (End of RA Survey):

End Time (military): 10:51Rain (circle one): n l i hAir Temp (shade): 68 (C or F)Wind Rank (see chart →): 3Cloud Cover (circle one): c p oNum of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction, leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

C. Survey Results

1. Stopped Searching² (min.): 02. Effort Hrs: 8.3
(person hours³/area)3. Other Turtle Species⁴ Observed:None4. Herpetofauna Species⁴ Observed:None5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____

Num Live Females: _____

Num Live Juveniles: _____

6. # Dead Bog Turtles: 07. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

² Number of person minutes not actively searching
³ Number surveyors x number of hours⁴ Include number of each by species

BOG TURTLE POPULATION MONITORING: PHASE 2 SURVEY FORM - MARYLAND

last updated on 2/7/2019

A. Site Information, Date and Time, and Surveyors (*optional fields)

1. Monitoring Site ID: Wetland 4-Upper Site Name*: Carmell Co. Airport Town/County*: Westminster/Carmell
 2. Core Habitat Area (ac): 0.24 Survey Area (ac) (if different): _____ (or Township)
 3. Survey Date: 6/13/23 Required Survey Time¹: 15 min
 4. Site Visit Number (1, 2, 3, or 4): 4
 5. Lead Surveyor(s): D. Smith
 Assistant Surveyor(s): E. Beck, S. Pursell

¹ Required survey time for Phase 2 surveys is 4 hours/acre of the survey area (Example: 0.5 acre survey area and 4 people= 30 minutes).

B. Environmental Factors and Number of Surveyors

6. Start Conditions:

Start Time (military): 11:18
 Rain (circle one): n l i h
 Air Temp (shade): 68 (C or °F)
 Wind Rank (see chart →): 3
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

Rain: n = no rain; l = light; i = intermittent; h = heavy:

Wind Categories:

Rank	Wind (mph)	WMO Classification	On Land
1	<1	Calm	Calm, smoke rises vertically
2	1-3	Light Air	Smoke drift indicates wind direction. leaves and wind vanes stationary
3	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
4	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
5	13-18	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches begin to move
6	19-24	Fresh Breeze	Small trees in leaf begin to sway
7	25-31	Strong Breeze	Larger tree branches moving, whistling in wires, umbrella use becomes difficult

Cloud Cover: c = clear; p = partly cloudy; o = overcast

7. End Conditions (End of RA Survey):

End Time (military): 12:18
 Rain (circle one): n l i h
 Air Temp (shade): 70 (C or °F)
 Wind Rank (see chart →): 3
 Cloud Cover (circle one): c p o
 Num of Surveyors: 3

C. Survey Results

1. Stopped Searching² (min.): 0
 2. Effort Hrs: 12.5
 (person hours³/area)

3. Other Turtle Species⁴ Observed:Juvenile snapping turtle4. Herpetofauna Species⁴ Observed:Northern red salamander

5. # Live Bog Turtles Captured During the Survey Time: 0

Num Live Males: _____
 Num Live Females: _____
 Num Live Juveniles: _____

6. # Dead Bog Turtles: 0

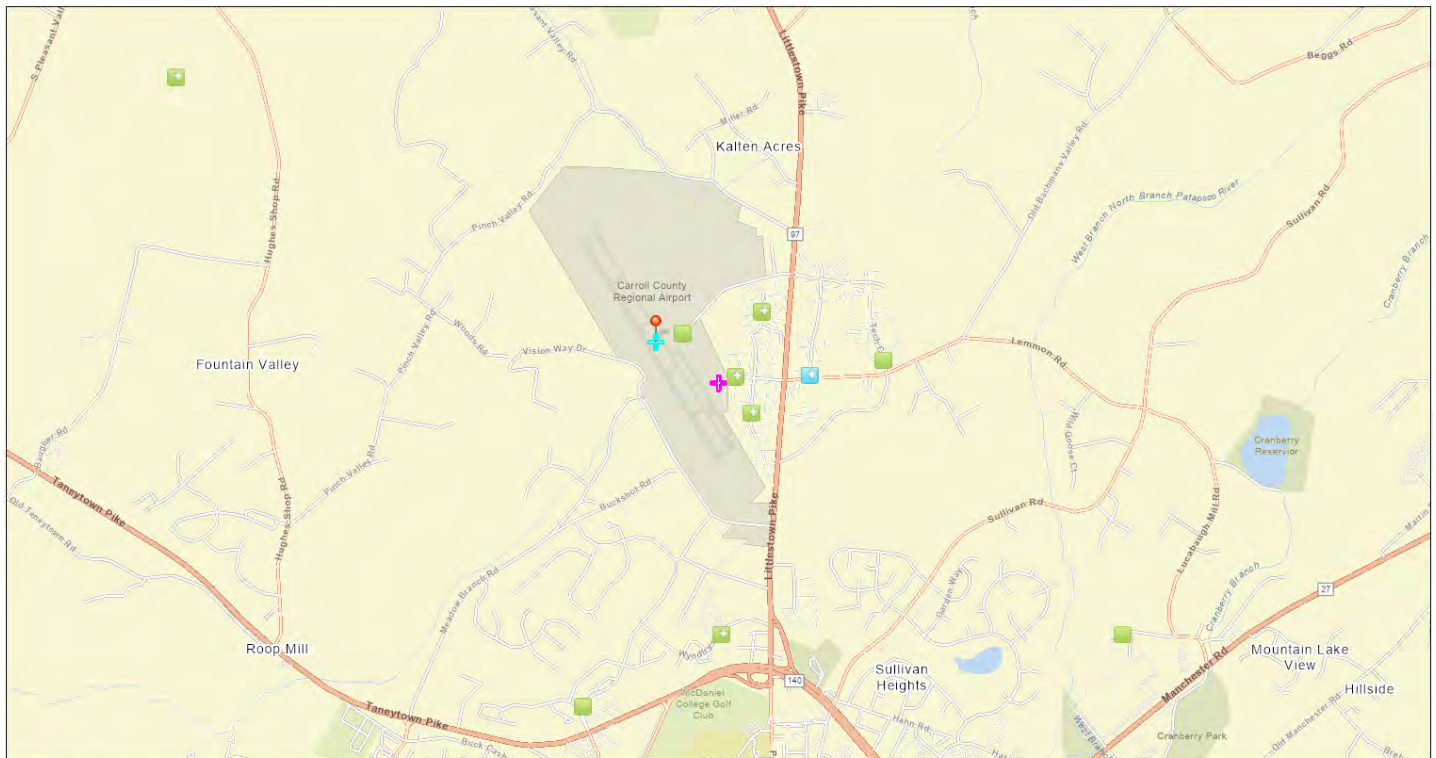
7. Signs of Bog Turtles (y/n): N

Describe: _____

8. Comments:

²Number of person minutes not actively searching³Number surveyors x number of hours⁴Include number of each by species

NEPAssist Report



May 16, 2022

- DMW 2022
- + Hazardous Waste (RCRAInfo)
- + Toxic Releases (TRI)
- + Search Result (point)

1:27,959

0 0.28 0.55 1.1 mi
0 0.42 0.85 1.7 km

Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METINASA, USGS, EPA, NPS, US Census Bureau, USDA

Project Location	39.608666,-77.007269
Within 1 mile of an Ozone 8-hr (1997 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of an Ozone 8-hr (2008 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of a Lead (2008 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a SO2 1-hr (2010 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM2.5 24hr (2006 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM2.5 Annual (1997 standard) Non-Attainment/Maintenance Area?	yes
Within 1 mile of a PM2.5 Annual (2012 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a PM10 (1987 standard) Non-Attainment/Maintenance Area?	no
Within 1 mile of a Federal Land?	no
Within 1 mile of an impaired stream?	yes
Within 1 mile of an impaired waterbody?	no
Within 1 mile of a waterbody?	yes
Within 1 mile of a stream?	yes
Within 1 mile of an NWI wetland?	Available Online
Within 1 mile of a Brownfields site?	no
Within 1 mile of a Superfund site?	no
Within 1 mile of a Toxic Release Inventory (TRI) site?	yes
Within 1 mile of a water discharger (NPDES)?	yes
Within 1 mile of a hazardous waste (RCRA) facility?	yes
Within 1 mile of an air emission facility?	yes

Within 1 mile of a school?	yes
Within 1 mile of an airport?	yes
Within 1 mile of a hospital?	no
Within 1 mile of a designated sole source aquifer?	no
Within 1 mile of a historic property on the National Register of Historic Places?	no
Within 1 mile of a Toxic Substances Control Act (TSCA) site?	no
Within 1 mile of a Land Cession Boundary?	no
Within 1 mile of a tribal area (lower 48 states)?	no
Within 1 mile of the service area of a mitigation or conservation bank?	yes
Within 1 mile of the service area of an In-Lieu-Fee Program?	yes

Created on: 5/16/2022 1:46:46 PM



U.S. Department
of Transportation
**Federal Aviation
Administration**

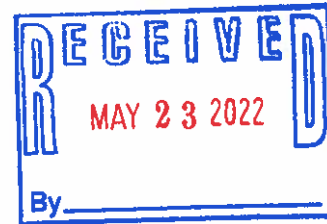
202207370
Washington Airports District Office
13873 Park Center Rd. Ste 490-S
Herndon, VA 20171

T: (703) 487-3980
F: (703) 487-3982

F
FAA
ETZ

May 23, 2022

Maryland Historical Trust
Attention: Beth Cole
100 Community Place
Crownsville, MD 21032



**Subject: Project Review for an Airport Improvement Project (Replacement Runway)
Carroll County Regional Airport (DMW)
Westminster, Maryland**

Dear Ms. Cole:

The Carroll County Regional Airport (DMW) is undergoing a Supplemental Environmental Assessment (EA) for proposed airport improvements, including the construction of a 5,500' replacement runway and the realignment of Meadow Branch Road in Westminster, Maryland.

This development project has been coordinated with your office several times in the past, most recently in 2016 and 2020 as part of two additional Supplemental EAs for this project. (The FAA requires that EAs be supplemented when the Proposed Action changes significantly). MHT concluded "no affect" in its previous reviews. We have included the previous coordination in this review package for your reference.

This 2022 Supplemental EA is being conducted due to several expanded areas of proposed grading and the refinements of various project items (for example, the shifted location of a proposed cul-de-sac). However, the project limits have either remained the same as previously coordinated with MHT or decreased.

Because this project is anticipated to be federally funded, licensed or permitted it is subject to state review to comply with Section 106 of the National Historic Preservation Act of 1966, as amended.

I have enclosed the completed 2022 Project Review Form and project information, and documentation of previous MHT coordination. This letter is intended to initiate Section 106 consultation and solicit any initial comments you may have on the undertaking as proposed in 2022.

If you have any questions or need further information regarding the project, please contact me (Genevieve.J.Walker@faa.gov).

Sincerely,

Genevieve Walker

Genevieve J. Walker
Environmental Protection Specialist
Washington ADO
Federal Aviation Administration
13873 Park Center Road, Suite 490S
Herndon, VA 20171

Enclosures

The Maryland Historical Trust has determined
that there are no historic properties affected by
this undertaking.

Beth Cole 6/8/2022
Date

#1B BC 6/3/2022



PROJECT REVIEW FORM

Request for Comments from the Maryland Historical Trust/
MDSHPO on State and Federal Undertakings

MHT USE ONLY

Date Received:

Log Number:

Project Name

County

Primary Contact:

Contact Name

Company/Agency

Mailing Address

City

State

Zip

Email

Phone Number

Ext.

Project Location:

Address

City/Vicinity

Coordinates (if known): Latitude

Longitude

Waterway

Project Description:

List federal and state sources of funding, permits, or other assistance (e.g. Bond Bill Loan of 2013, Chapter #; HUD/CDBG; MDE/COE permit; etc.).

Agency Type

Agency/Program/Permit Name

Project/Permit/Tracking Number (if applicable)

This project includes (check all applicable):

☐

New Construction

☐

Demolition

☐

Remodeling/Rehabilitation

☐ State or Federal Rehabilitation Tax Credits

☐

Excavation/Ground Disturbance

☐

Shoreline/Waterways/Wetlands

Other\Additional Description:

Known Historic Properties:

This project involves properties (check all applicable):

☐

Listed in the National Register

☐

Subject to an easement held by MHT

☐ Included in the Maryland Inventory of Historic Properties

☐

Designated historic by a local government

☐ Previously subject to archeological investigations

Property\District\Report Name

Attachments:

All attachments are required. Incomplete submittals may result in delays or be returned without comment.

☐

Aerial photograph or USGS Quad Map section with location and boundaries of project clearly marked.

☐

Project Description, Scope of Work, Site Plan, and/or Construction Drawings.

☐

Photographs (print or digital) showing the project site including images of all buildings and structures.

☐

Description of past and present land uses in project area (wooded, mined, developed, agricultural uses, etc).

MHT Determination:

☐ There are **NO HISTORIC PROPERTIES** in the area of potential effect

☐

The project will have **NO ADVERSE EFFECT WITH CONDITIONS**

☐ The project will have **NO EFFECT** on historic properties

☐

The project will have **ADVERSE EFFECTS** on historic properties

☐ The project will have **NO ADVERSE EFFECT** on historic properties

☐

MHT REQUESTS ADDITIONAL INFORMATION

MHT Reviewer:

Date:

Submit printed copy of form and all attachments by mail to: Beth Cole, MHT, 100 Community Place, Crownsville, MD 21032

Background and Project Description

An Environmental Assessment (EA) was completed in April 2009 and a Finding of No Significant Impact (FONSI) was issued by FAA April 30, 2009 for proposed improvement projects at the Carroll County Regional Airport (DMW) to meet the needs of the larger aircraft anticipated by the 2007 Master Plan Update (MPU) to operate at DMW. The alternatives analyzed in the 2009 EA were those presented and evaluated in the 2007 MPU. The Preferred Alternative in the 2009 EA included the following projects, as listed in the 2009 FONSI:

- Construct new (replacement) Runway 6,400-feet by 100-feet with a pavement strength of 91,000 Dual Wheel Gear
- Construct full length taxiway 6,400-feet by 50-feet
- Install a Category I ILS on Runway 16 end
- Acquire approximately 101 acres of fee-simple land for construction of the replacement runway, Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road
- Acquire approximately 33 acres of aviation easements for obstruction removal
- Remove obstructions on approximately 70 acres
- Realign Meadow Branch Road
- Construct four conventional hangars and seven t-hangars and auto parking
- Relocate fuel farm
- Remove 4,000-feet of Pinch Valley Road
- Install perimeter/security fence
- Relocate three residences and three businesses

Coordination with Maryland Historical Trust (MHT) took place during the 2009 EA to satisfy Section 106 requirements, and is enclosed.

Since that time, a new MPU was completed (approved by FAA in July 2015) which includes an updated operations forecast and facility recommendations, including a lesser runway length. A Supplemental EA was finalized in 2018 to update the Preferred Alternative based on the 2015 Airport Master Plan. In 2020, as preliminary design of the project began, additional areas of grading were identified, which required that a second Supplemental EA be prepared.

Coordination with MHT took place during the 2018 and 2020 environmental reviews to satisfy Section 106 requirements and is enclosed.

In 2022, after the design phase began in earnest, the direct APE/study area changed again to include several expanded areas of additional grading as well as the refinements of several development items (for example, a refined location for a cul-de-sac). The proposed development included in the 2018, 2020, and 2022 environmental reviews is depicted conceptually in the attached Exhibit 1.

The differences between the direct APEs associated with the 2018, 2020, and 2022 Proposed Actions are depicted in the attached Exhibit 2.

Previous Section 106 Coordination

A Phase 1 Cultural Resources survey was completed in June 2008 for a 233-acre project area, on airport and adjacent properties. In December 2008 a Phase II evaluation was conducted for three resources recommended as potentially eligible for the National Register of Historic Places (NRHP): the Houck House (CARR-1696); the Lawyer House (CARR-1697); and Saint Benjamin's Lutheran Church (CARR-172). Of these, the Houck House and St. Benjamin's Lutheran Church were found to be ineligible for listing. However, none of these would have been impacted by the Proposed Action in the 2009 EA, including no visual impacts to the resources. Similarly, none of these are anticipated to be impacted by the updated Proposed Action.

The 2008 archaeological and architectural studies were a continuation of a Phase 1 cultural resources survey initiated in 2003 (Lautzenheiser et al. 2003).

A search of the MERLIN website conducted in May 2022 is attached.

Existing Land Use

DMW is an operating, general aviation airport located on approximately 420 acres in Carroll County, Maryland. The topography of the area immediately surrounding the airport consists of rolling hills with gentle to steep slopes. Topography ranges between 700 and 800 feet above mean sea level (MSL). The airport is situated at 789 MSL.

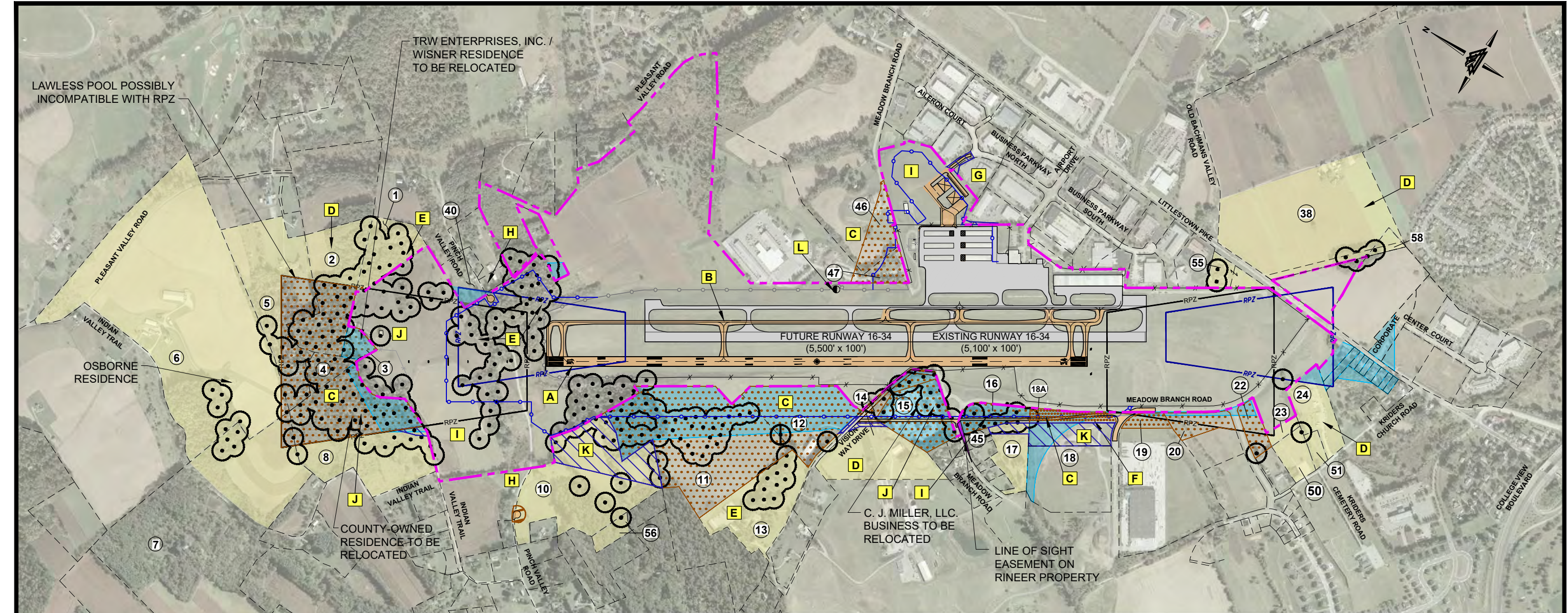
According to the 2008 Phase 1 survey, the project falls within the Monocacy and Patapsco-Back-Middle Drainage Archaeological Research Units (Units 17 and 14, respectively).

The Airport property borders the northwest boundary of the City of Westminster. The Airport property is zoned AG (Agricultural) and IR (Industrial); the surrounding parcels are zoned AG, IR, Conservation, and Residential. North of the airport is predominantly rolling pastureland, agriculture land, and residential land.

The appropriate permissions (including easements) are to be secured on the appropriate properties before obstruction removal and development on off-airport parcels can begin.

Modifications to Landscape

The New Windsor USGS quadrangle map is dated 2019. The Airport and runway are depicted on the map. The road network is unchanged since 2019, including the alignment of Vision Way Drive and Meadow Branch Road in relation to the existing runway (see attached).



DRAWING: 21051-Exhibit1-Proposed-Action-with-Aerial-1.mxd LAYOUT: L1 (2)

ENVIRONMENTAL ASSESSMENT ITEMS

- A** CONSTRUCT REPLACEMENT RUNWAY
- B** CONSTRUCT FULL-LENGTH TAXIWAY
- C** ACQUIRE 109± ACRES FEE SIMPLE
- D** ACQUIRE 245± ACRES AVIGATION EASEMENTS
- E** REMOVE OBSTRUCTIONS ON 105± ACRES
- F** REALIGN MEADOW BRANCH ROAD
- G** CONSTRUCT 2 HANGARS AND AUTOMOBILE PARKING
- H** CUL-DE-SAC PINCH VALLEY ROAD
- I** INSTALL PERIMETER / SECURITY FENCE
- J** RELOCATE 2 RESIDENCES, 2 BUSINESSES, POSSIBLY 1 SWIMMING POOL
- K** ACQUIRE 15± ACRES GRADING EASEMENT
- L** RELOCATE AWOS TO TEMPORARY LOCATION

PROPOSED PROPERTY INTEREST ACQUISITIONS					
PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	ACREAGE		
			FEE SIMPLE	AVIGATION EASEMENT	GRADING EASEMENT
1	30 / 589	MILLER	0.1±	6.7±	
2	30 / 20	ABDELMOMIN	7.4±	7.6±	
3	30 / 394	WISNER, THOMAS ROBERT	1.7±		
4	30 / 276	PATTERSON	2.8±		
5	30 / 482	LAWLESS	7.6±	13.9±	
6	30 / 573	OSBORNE	0.3±	79.1±	
7	30 / 258	CRONE/ TANSILL	0.1±	17.3±	
8	30 / 35	COMMISSIONERS OF CARROLL COUNTY	13.8±	14.3±	0.4±
10	30 / 161	MILLER	0.4±	26.0±	9.4±
11	38 / 676	JRP VISION, LLC	33.2±		
12	38 / 676	JRP VISION, LLC	12.7±		
13	38 / 676	JRP VISION, LLC	0.3±	13.4±	0.1±
14	38 / 798	JRP VISION, LLC	1.7±	11.9±	
15	38 / 197	COMMISSIONERS OF CARROLL COUNTY	8.4±		
16	38 / 759	COMMISSIONERS OF CARROLL COUNTY	3.4±		
17	38/462	COMMISSIONERS OF CARROLL COUNTY	0.1±	4.9±	0.9±
18A	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	2.5±		
18	114 / 6784	TRIPLE M. LLC, JACOBS RIDGE LLC			4.5±

PROPOSED PROPERTY INTEREST ACQUISITIONS				
PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	ACREAGE	
			FEE SIMPLE	AVIGATION EASEMENT
19	114 / 6784	DLH, LLP		0.3±
20	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	3.1±	
22	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	2.5±	
23	38 / 661	BENJAMIN KRIDER'S UNITED CHURCH OF CHRIST	0.1±	1.0±
24	38 / 646	CARROLL COUNTY ARC		5.3±
38	39 / 312	FROCK		33.9±
40	30 / 501	SHAUN JAMES/ ELIZABETH HILL	0.1±	
45	38 / 462	RINEER - LINE OF SIGHT EASEMENT		
46	30 / 36	COMMISSIONERS OF CARROLL COUNTY	4.3±	
47	38 / 600	COMMISSIONERS OF CARROLL COUNTY	2.7±	
50	38 / 817	BENJAMIN'S REFORMED CHURCH OF CARROLL COUNTY		3.2±
51	38 / 646	COMMISSIONERS OF CARROLL COUNTY		1.2±
55	114 / 6801	KBTC INC.		1.7±
56	38 / 555	KLEIN/ KALETA		1.6±
58	39 / 774	COMMISSIONERS OF CARROLL COUNTY		2.0±

OBSTRUCTION REMOVAL
EXISTING = 25± ACRES
PROPOSED = 80± ACRES

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
AIRPORT PROPERTY		NA
ADJACENT PARCEL LINE		NA
FENCE		
RUNWAY PROTECTION ZONE (RPZ)		
AVIGATION EASEMENT		
GRADING EASEMENT	NA	
LAND ACQUISITION	NA	
LIMITS OF OBSTRUCTIONS		SAME
LINE OF SIGHT EASEMENT	NA	
AWOS		

1000 0 1000 2000
SCALE: 1"=1000'
FEET

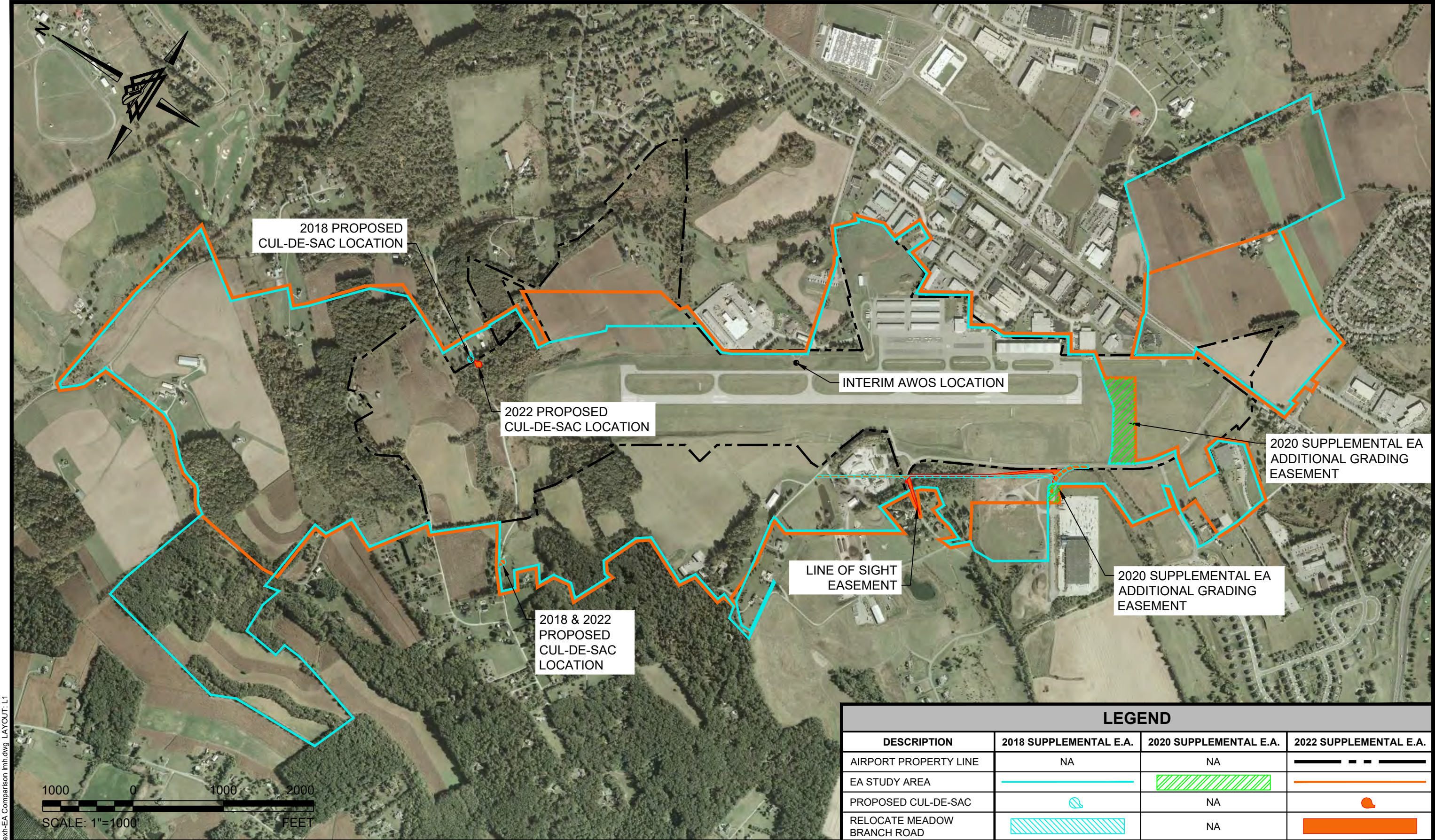


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ALL PROJECT INCLUDED IN PREVIOUS ENVIRONMENTAL REVIEWS, INCLUDING THIS 2022 SUPPLEMENTAL EA
CARROLL COUNTY REGIONAL AIRPORT

DRAWN BY: LMH CHECKED BY: MAP SCALE: 1"=1000' DATE: APRIL 2022

EXHIBIT
1



LEGEND			
DESCRIPTION	2018 SUPPLEMENTAL E.A.	2020 SUPPLEMENTAL E.A.	2022 SUPPLEMENTAL E.A.
AIRPORT PROPERTY LINE	NA	NA	---
EA STUDY AREA	—	▨	—
PROPOSED CUL-DE-SAC	⦿	NA	●
RELOCATE MEADOW BRANCH ROAD	▨	NA	■

COMPARISON OF 2018, 2020, AND 2022 ENVIRONMENTAL STUDY AREAS
CARROLL COUNTY REGIONAL AIRPORT

EXHIBIT
2

DRAWN BY: NYB CHECKED BY: MAP SCALE: 1" = 1000' DATE: MARCH 2022

DRAWING: 21051-ext-EA Comparison.lnh.dwg LAYOUT: L1



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Legend

Find address or place

State Boundary Mask

State Boundary Mask

Physical Boundaries

County Boundaries - Detailed

County Boundaries - Generalized

Maryland Inventory of Historic Properties

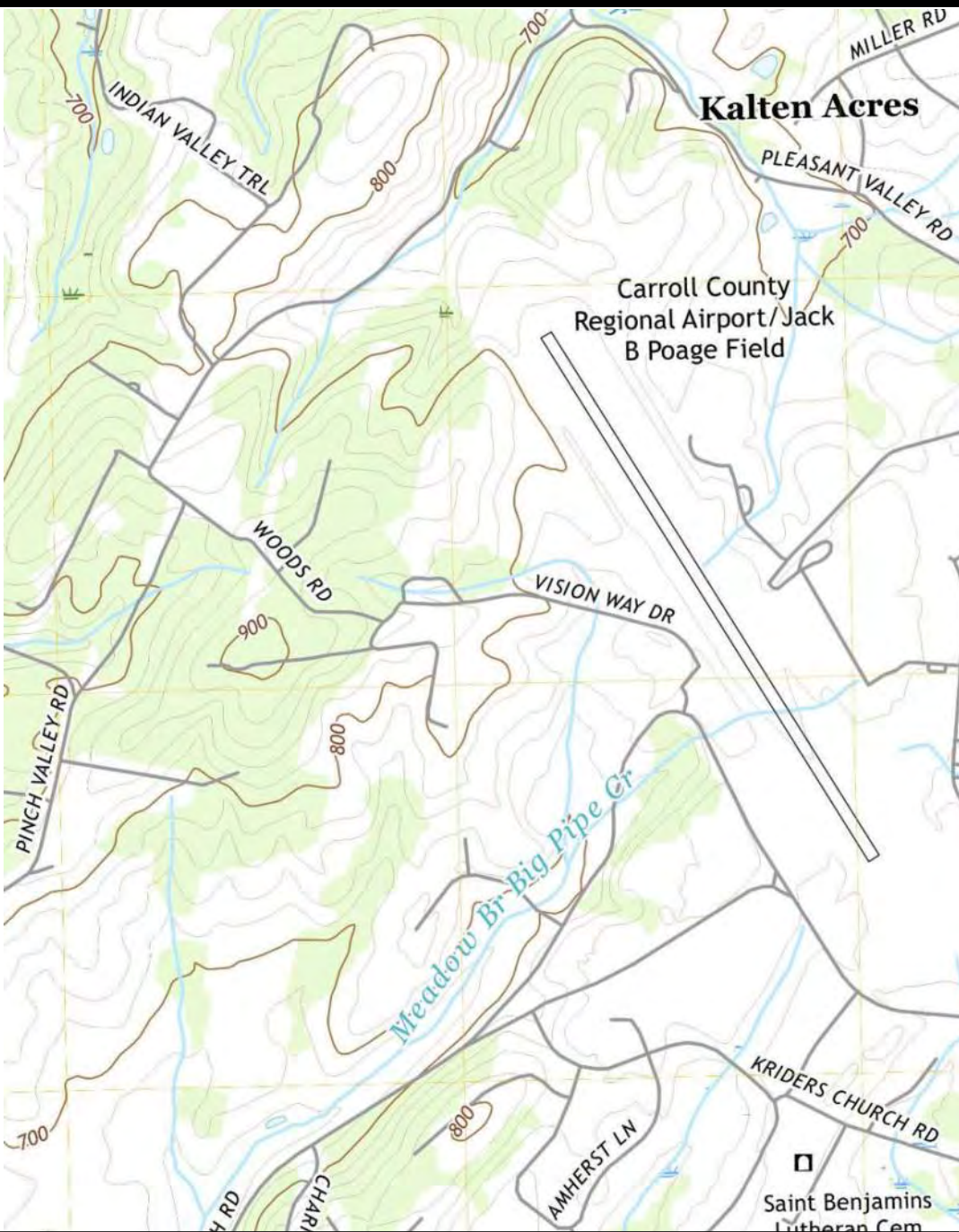
Maryland Inventory of Historic Properties

National Register of Historic Places

National Register Historic Places

MHT Preservation Easements

Preservation Easements



'New Windsor' USGS map excerpt

Carroll County Regional Airport (DMW)
Supplemental Environmental Assessment



Not to Scale



U.S. Department
of Transportation
**Federal Aviation
Administration**

Washington Airports District Office
13873 Park Center Rd. Ste 490-S
Herndon, VA 20171

T: (703) 487-3980
F: (703) 487-3982

May 25, 2022

William Tarrant, THPO
Seneca-Cayuga Nation
PO Box 45322
Grove, OK 74345

**Subject: Project Review for an Airport Improvement Project
Carroll County Regional Airport (DMW), Westminster, Maryland**

Dear Mr. Tarrant:

The Commissioners of Carroll County, owner and operator of the Carroll County Regional Airport (DMW), are proposing several development projects at the Airport to support the construction of a 5,500' long replacement runway. The 2022 Proposed Action includes the following and is depicted conceptually on the attached figure:

- Construction of a new (replacement) runway, 5,500' long by 100' wide, west of the existing Runway 16-34
- Construction of a full parallel taxiway measuring 5,500' long by 35' wide
- Installation of Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)
- Relocation of Meadow Branch Road to be outside of the Runway Object-Free Area (ROFA)
- Termination of Pinch Valley Road on both the eastern and western sides of airport property
- Fee acquisition of approximately 109 acres of land for the construction of the replacement runway, Runway Protection Zone (RPZ) control and the realignment of Meadow Branch Road
- Acquisition of approximately 245 acres of aviation easements for obstruction (tree) removal
- Acquisition of approximately 19 acres of grading easement
- Construction of two conventional hangars and associated automobile parking on airport property

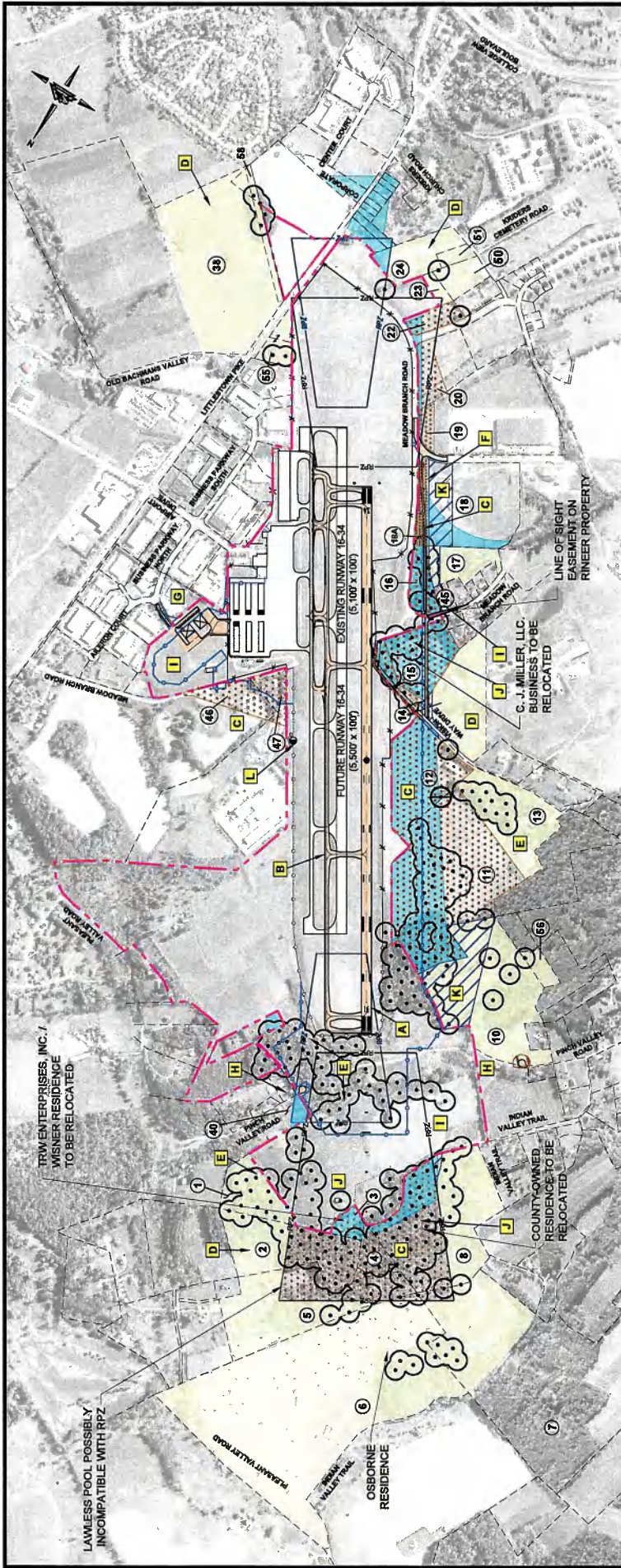
As this project is anticipated to be federally funded, licensed, or permitted it is subject to review to comply with Section 106 of the National Historic Preservation Act of 1966, as amended. Your tribe has expressed interest in Carroll County, Maryland. I am writing this letter to invite your Tribe to comment on the proposed development for the applicant to consider during the environmental review process and to offer an opportunity for Consultation, if you desire.

Note that FAA procedures dictate that in the event a cultural or archeological artifact is discovered during construction, that the construction is halted and the State Historic Preservation Officer (SHPO) and/or the interested Tribe is notified.

If you have any questions or need further information regarding the project, please contact me (Genevieve.J.Walker@faa.gov).

Sincerely,

Genevieve J. Walker
Environmental Protection Specialist
Washington ADO
Federal Aviation Administration
13873 Park Center Road, Suite 490S
Herndon, VA 20171



OBSTRUCTION REMOVAL
EXISTING = 25± ACRES
PROPOSED = 80± ACRES

DESCRIPTION	EXISTING	PROPOSED
AIRPORT PROPERTY	---	NA
ADJACENT PARCEL LINE	---	NA
FENCE	---	RPZ
RUNWAY PROTECTION ZONE (RPZ)	---	RPZ
AVIATION EASEMENT	---	---
GRADING EASEMENT	---	---
LAND ACQUISITION	---	---
LIMITS OF OBSTRUCTIONS	---	---
LINE OF SIGHT EASEMENT	---	---
ANWS	---	---



EXHIBIT
1

PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	FEE SIMPLE	ACREAGE EASEMENT
19	1141794	D.L. LLP	3.15	0.38
20	1141794	COMMISSIONERS OF CARROLL COUNTY	2.52	1.08
21	1141794	COMMISSIONERS OF CARROLL COUNTY	0.14	0.38
22	31741	BENJAMIN ROBERT UNITED CHURCH OF CHRIST	0.14	0.38
23	31741	COMMISSIONERS OF CARROLL COUNTY	0.14	0.38
24	31741	PROCC	0.14	0.38
25	31741	PROCC	0.14	0.38
26	31741	PROCC	0.14	0.38
27	31741	PROCC	0.14	0.38
28	31741	PROCC	0.14	0.38
29	31741	PROCC	0.14	0.38
30	31741	PROCC	0.14	0.38
31	31741	PROCC	0.14	0.38
32	31741	PROCC	0.14	0.38
33	31741	PROCC	0.14	0.38
34	31741	PROCC	0.14	0.38
35	31741	PROCC	0.14	0.38
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37	31741	PROCC	0.14	0.38
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98	31741	PROCC	0.14	0.38
99	31741	PROCC	0.14	0.38
100	31741	PROCC	0.14	0.38

PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	FEE SIMPLE	ACREAGE EASEMENT
1	31741	MILLER	7.45	7.45
2	31741	WILSON	1.75	1.75
3	31741	WILSON	1.75	1.75
4	31741	WILSON	1.75	1.75
5	31741	WILSON	1.75	1.75
6	31741	WILSON	1.75	1.75
7	31741	WILSON	1.75	1.75
8	31741	WILSON	1.75	1.75
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53	31741	WILSON	1.75	1.75
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56	31741	WILSON	1.75	1.75
57	31741	WILSON	1.75	1.75
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70	31741	WILSON	1.75	1.75
71	31741	WILSON	1.75	1.75
72	31741	WILSON	1.75	1.75
73	31741	WILSON	1.75	1.75
74	31741	WILSON	1.75	1.75
75	31741	WILSON	1.75	1.75
76	31741	WILSON	1.75	1.75
77	31741	WILSON	1.75	1.75
78	31741	WILSON	1.75	1.75
79	31741	WILSON	1.75	1.75
80	31741	WILSON	1.75	1.75
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84	31741	WILSON	1.75	1.75
85	31741	WILSON	1.75	1.75
86	31741	WILSON	1.75	1.75
87	31741	WILSON	1.75	1.75
88	31741	WILSON	1.75	1.75
89	31741	WILSON	1.75	1.75
90	31741	WILSON	1.75	1.75
91	31741	WILSON	1.75	1.75
92	31741	WILSON	1.75	1.75
93	31741	WILSON	1.75	1.75
94	31741	WILSON	1.75	1.75
95	31741	WILSON	1.75	1.75
96	31741	WILSON	1.75	1.75
97	31741	WILSON	1.75	1.75
98	31741	WILSON	1.75	1.75
99	31741	WILSON	1.75	1.75
100	31741	WILSON	1.75	1.75

ENVIRONMENTAL ASSESSMENT ITEMS

- CONSTRUCT REPLACEMENT RUNWAY
- CONSTRUCT FULL-LENGTH TAXWAY
- ACQUIRE 109± ACRES FEE SIMPLE
- ACQUIRE 245± ACRES AVIATION EASEMENTS
- REMOVE OBSTRUCTIONS ON 106± ACRES
- REALIGN MEADOW BRANCH ROAD
- CONSTRUCT 2 HANGARS AND AUTOMOBILE PARKING
- CUL-DE-SAC PINCH VALLEY ROAD
- INSTALL PERIMETER / SECURITY FENCE
- RELOCATE 2 RESIDENCES, 2 BUSINESSES, POSSIBLY 1 SWIMMING POOL
- ACQUIRE 15± ACRES GRADING EASEMENT
- RELOCATE ANWS TO TEMPORARY LOCATION

PROPOSED ACTION- 2022 SUPPLEMENTAL EA CARROLL COUNTY REGIONAL AIRPORT

DATE: APRIL 2022
SCALE: 1"=1000'
DRAWN BY: [Redacted]
CHECKED BY: [Redacted]
LUSH: [Redacted]



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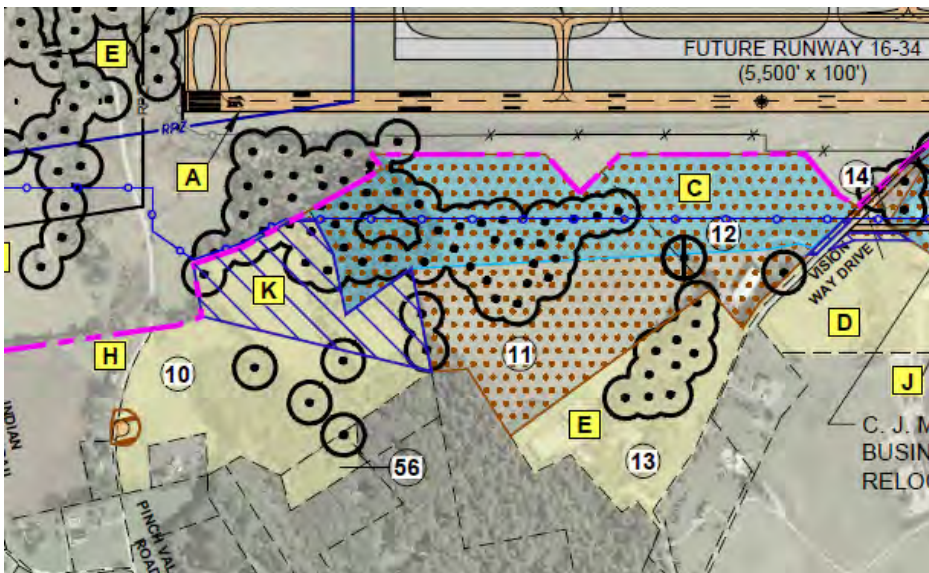
Mary Ashburn Pearson

From: Mary Ashburn Pearson
Sent: Tuesday, May 24, 2022 5:19 PM
To: 'Walker, Genevieve J (FAA)'; Katelyn Lucas
Subject: RE: Carroll County Regional Airport Proposed Action- review request
Attachments: 21051- Exh - Proposed Action.pdf

Hi Katelyn!

The grading will vary throughout the project area, but the areas with the highest extent of grading are west of the proposed runway, on the parcels labeled 10, 11, and 12.

Due to the topography in that area, the terrain itself actually penetrates the airspace associated with the new runway by anywhere from 10 to 40 feet. To comply with FAA standards, the terrain obstructions must be mitigated by grading.



If you need anything else, just let us know.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAIRPORT.COM

From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Tuesday, May 24, 2022 6:30 AM
To: Katelyn Lucas <klucas@delawarenation-nsn.gov>
Cc: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Good Morning Ms. Lucas,

Thank you for the really fast turnaround! I will get you the answers to your questions shortly (I need to check with the airport sponsor and he doesn't get in this early). But to answer one of the questions- yes, the SHPO has been informed of the project and we have requested a determination on potential effects.

I will write back later this morning,
Genevieve

From: Katelyn Lucas <klucas@delawarenation-nsn.gov>
Sent: Monday, May 23, 2022 2:18 PM
To: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Cc: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Hello,

I just have a few additional questions about the project in order to complete my review. What will the extent / depth of ground disturbance be for the listed construction projects, and are there any known archaeological sites existing within the APE? And relatedly, has the MD SHPO been consulted?

Sincerely,
Katelyn Lucas
Delaware Nation Historic Preservation Assistant; PhD Candidate
405-544-8115
klucas@delawarenation-nsn.gov

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From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Monday, May 23, 2022 11:06 AM

To: Katelyn Lucas
Cc: Mary Ashburn Pearson
Subject: Carroll County Regional Airport Proposed Action- review request

Good Morning Ms. Lucas. I hope you and your tribe are well. Attached is a cover letter explaining the proposed project and a request for review and comment or if you prefer, formal Government- to- Government Consultation. The attached figured graphically depicts the various projects proposed in this submittal. If you need any more information, or would like to discuss the project in more depth, please feel free to reach out to me at your earliest convenience.

Stay healthy and safe,
Genevieve

Genevieve Walker
Environmental Protection Specialist
Washington ADO
13783 Park Center Road, Suite 490S
Herndon, VA 20171
(703) 487-3979

!_____
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Mary Ashburn Pearson

From: Katelyn Lucas <klucas@delawarenation-nsn.gov>
Sent: Thursday, May 26, 2022 1:58 PM
To: Walker, Genevieve J (FAA); Mary Ashburn Pearson
Subject: RE: Carroll County Regional Airport Proposed Action- review request
Attachments: Airport Improvement Project Carroll County Regional Airport (DMW) Westminster MD.pdf

Thank you, please see the attached response letter.

Sincerely,
Katelyn Lucas
Delaware Nation Historic Preservation Assistant; PhD Candidate
405-544-8115
klucas@delawarenation-nsn.gov

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From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Thursday, May 26, 2022 1:45 PM
To: Katelyn Lucas; Mary Ashburn Pearson
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Good Afternoon Ms. Lucas, I apologize for the incomplete response earlier. The SHPO has been notified and we are awaiting a response from her. I have attached the Project Review Form we submitted for her comment as it contains a considerable amount of information you may find useful.

A Phase 1 Cultural Resources survey was completed in June 2008 for a 233-acre project area, on airport and adjacent properties. In December 2008 a Phase II evaluation was conducted for three resources recommended as potentially eligible for the National Register of Historic Places (NRHP): the Houck House (CARR-1696); the Lawyer House (CARR-1697); and Saint Benjamin's Lutheran Church (CARR-172). Of these, the Houck House and St. Benjamin's Lutheran Church were found to be ineligible for listing. However, none of these would have been impacted by the Proposed Action in the 2009 EA, including no visual impacts to the resources. Similarly, none of these are anticipated to be impacted by the updated Proposed Action.

The 2008 archaeological and architectural studies were a continuation of a Phase 1 cultural resources survey initiated in 2003 (Lautzenheiser et al. 2003).

There were three archeological sites identified in the APE from the Cultural Resources Surveys, but all are extant. The other identified archeological/historic sites are not in the APE for this project. The third figure in the attached MHT Review Package graphically shows the locations of identified historic and archeological sites (the grey area represents the APE).

Please let me know if you have any further concerns or questions, again, I sincerely apologize for not fully responding earlier. I got my signals crossed with the Airport Sponsor and thought your concerns had been addressed. My fault entirely.

Genevieve

From: Katelyn Lucas <klucas@delawarenation-nsn.gov>

Sent: Thursday, May 26, 2022 1:18 PM

To: Mary Ashburn Pearson <mapearson@deltaairport.com>; Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>

Subject: RE: Carroll County Regional Airport Proposed Action- review request

Hello,

Thank you for this information. Could you please also respond to this additional question: are there any known archaeological sites existing within the APE? And relatedly, has the MD SHPO been consulted?

Sincerely,

Katelyn Lucas

Delaware Nation Historic Preservation Assistant; PhD Candidate

405-544-8115

klucas@delawarenation-nsn.gov

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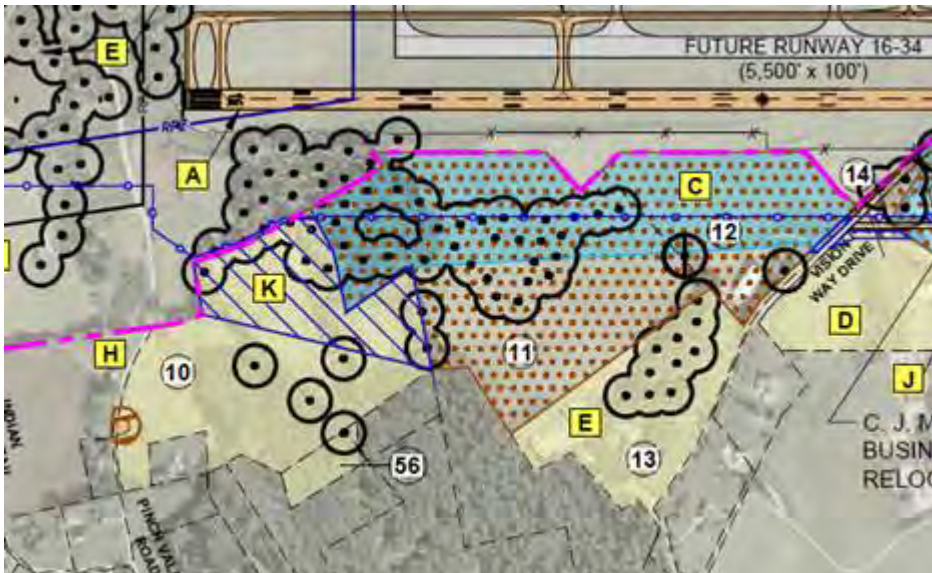
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From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Tuesday, May 24, 2022 5:18 PM
To: 'Walker, Genevieve J (FAA)'; Katelyn Lucas
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Hi Katelyn!

The grading will vary throughout the project area, but the areas with the highest extent of grading are west of the proposed runway, on the parcels labeled 10, 11, and 12.

Due to the topography in that area, the terrain itself actually penetrates the airspace associated with the new runway by anywhere from 10 to 40 feet. To comply with FAA standards, the terrain obstructions must be mitigated by grading.



If you need anything else, just let us know.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAairport.COM

From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Tuesday, May 24, 2022 6:30 AM
To: Katelyn Lucas <klucas@delawarenation-nsn.gov>
Cc: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Good Morning Ms. Lucas,

Thank you for the really fast turnaround! I will get you the answers to your questions shortly (I need to check with the airport sponsor and he doesn't get in this early). But to answer one of the questions- yes, the SHPO has been informed of the project and we have requested a determination on potential effects.

I will write back later this morning,
Genevieve

From: Katelyn Lucas <klucas@delawarenation-nsn.gov>
Sent: Monday, May 23, 2022 2:18 PM
To: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Cc: Mary Ashburn Pearson <mapearson@deltaairport.com>
Subject: RE: Carroll County Regional Airport Proposed Action- review request

Hello,

I just have a few additional questions about the project in order to complete my review. What will the extent / depth of ground disturbance be for the listed construction projects, and are there any known archaeological sites existing within the APE? And relatedly, has the MD SHPO been consulted?

Sincerely,
Katelyn Lucas
Delaware Nation Historic Preservation Assistant; PhD Candidate
405-544-8115
klucas@delawarenation-nsn.gov

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From: Walker, Genevieve J (FAA) <Genevieve.J.Walker@faa.gov>
Sent: Monday, May 23, 2022 11:06 AM
To: Katelyn Lucas
Cc: Mary Ashburn Pearson
Subject: Carroll County Regional Airport Proposed Action- review request

Good Morning Ms. Lucas. I hope you and your tribe are well. Attached is a cover letter explaining the proposed project and a request for review and comment or if you prefer, formal Government- to- Government Consultation. The attached figured graphically depicts the various projects proposed in this submittal. If you need any more information, or would like to discuss the project in more depth, please feel free to reach out to me at your earliest convenience.

Stay healthy and safe,
Genevieve

Genevieve Walker
Environmental Protection Specialist
Washington ADO
13783 Park Center Road, Suite 490S
Herndon, VA 20171
(703) 487-3979

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Delaware Nation

Tribal Historic Preservation Department

31064 State Highway 281

Anadarko, OK 73005

Phone (405)247-2448

May 26, 2022

To Whom It May Concern:

The Delaware Nation Historic Preservation Department received correspondence regarding the following referenced project(s).

Project(s): Airport Improvement Project Carroll County Regional Airport (DMW)
Westminster MD

Our office is committed to protecting tribal heritage, culture, and religion with particular concern for archaeological sites potentially containing burials and associated funerary objects. The Lenape people occupied the area indicated in your letter prior to European contact until their eventual removal to our present locations. **We accept your invitation to consult.** According to our files, the proposed project should have **no adverse effect on** any known cultural or religious sites of interest to the Delaware Nation. But there is always the potential for discovery of archaeological resources in this area. Should the scope of the project be amended to include any additional ground-disturbing activity, you will need to reinitiate consultation with our office.

Please continue with the project as planned keeping in mind during construction should Native American archaeological resources inadvertently be uncovered, all construction and ground disturbing activities should immediately be halted until the appropriate state agencies, as well as this office, are notified (within 24 hours), and a proper archaeological assessment can be made.

Please note that Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Community are the only Federally Recognized Delaware/Lenape entities in the United States and consultation for Lenape homelands must be made with only the designated staff of these three Nations (and/or other federally recognized tribal nations who may have overlapping areas of interest). We appreciate your cooperation in contacting the Delaware Nation Historic Preservation Office to conduct proper Section 106 consultation. Should you have any questions, feel free to contact our offices at 405-247-2448 ext. 1403.

Katelyn Lucas

Katelyn Lucas
Historic Preservation Assistant
Delaware Nation
405-544-8115
klucas@delawarenation-nsn.gov

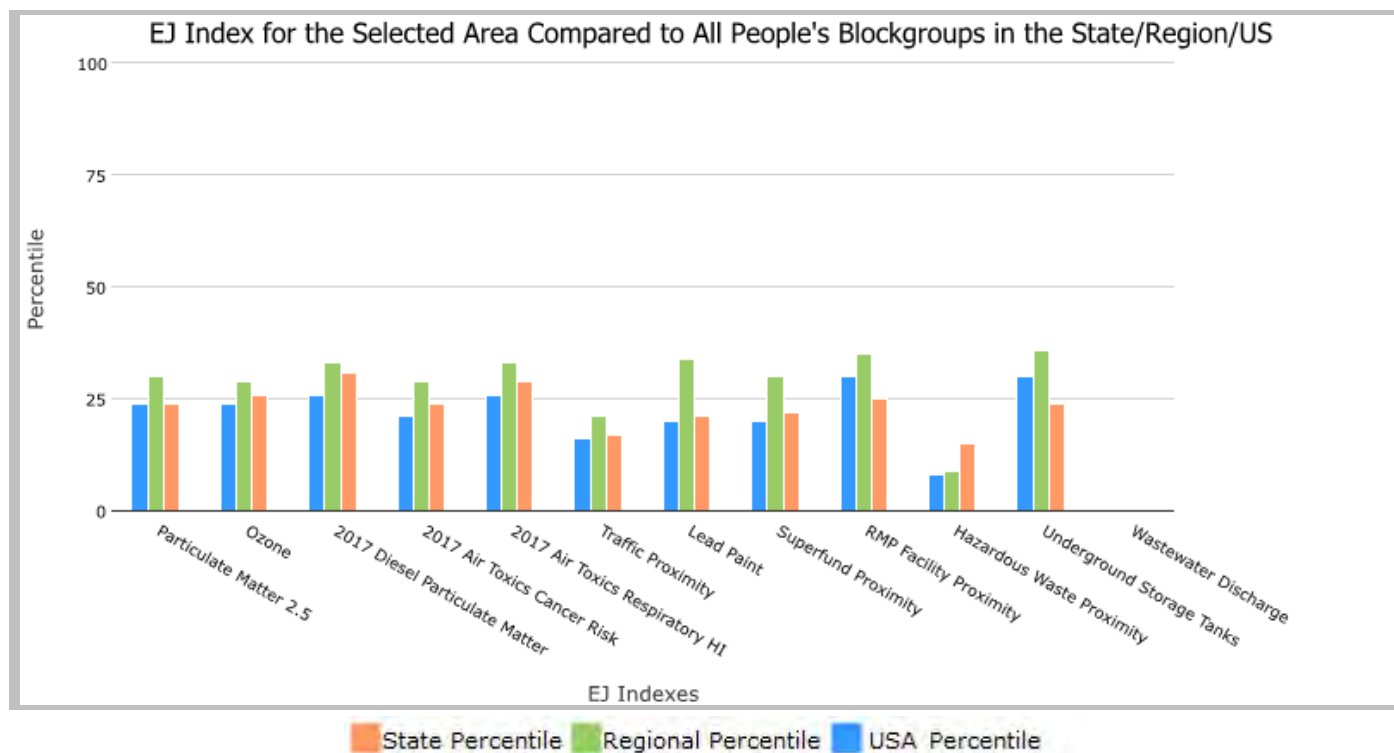
1 mile Ring Centered at 39.609472,-77.007388, MARYLAND, EPA Region 3

Approximate Population: 510

Input Area (sq. miles): 3.14

DMW 2022

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	24	30	24
EJ Index for Ozone	26	29	24
EJ Index for 2017 Diesel Particulate Matter*	31	33	26
EJ Index for 2017 Air Toxics Cancer Risk*	24	29	21
EJ Index for 2017 Air Toxics Respiratory HI*	29	33	26
EJ Index for Traffic Proximity	17	21	16
EJ Index for Lead Paint	21	34	20
EJ Index for Superfund Proximity	22	30	20
EJ Index for RMP Facility Proximity	25	35	30
EJ Index for Hazardous Waste Proximity	15	9	8
EJ Index for Underground Storage Tanks	24	36	30
EJ Index for Wastewater Discharge	N/A	N/A	N/A



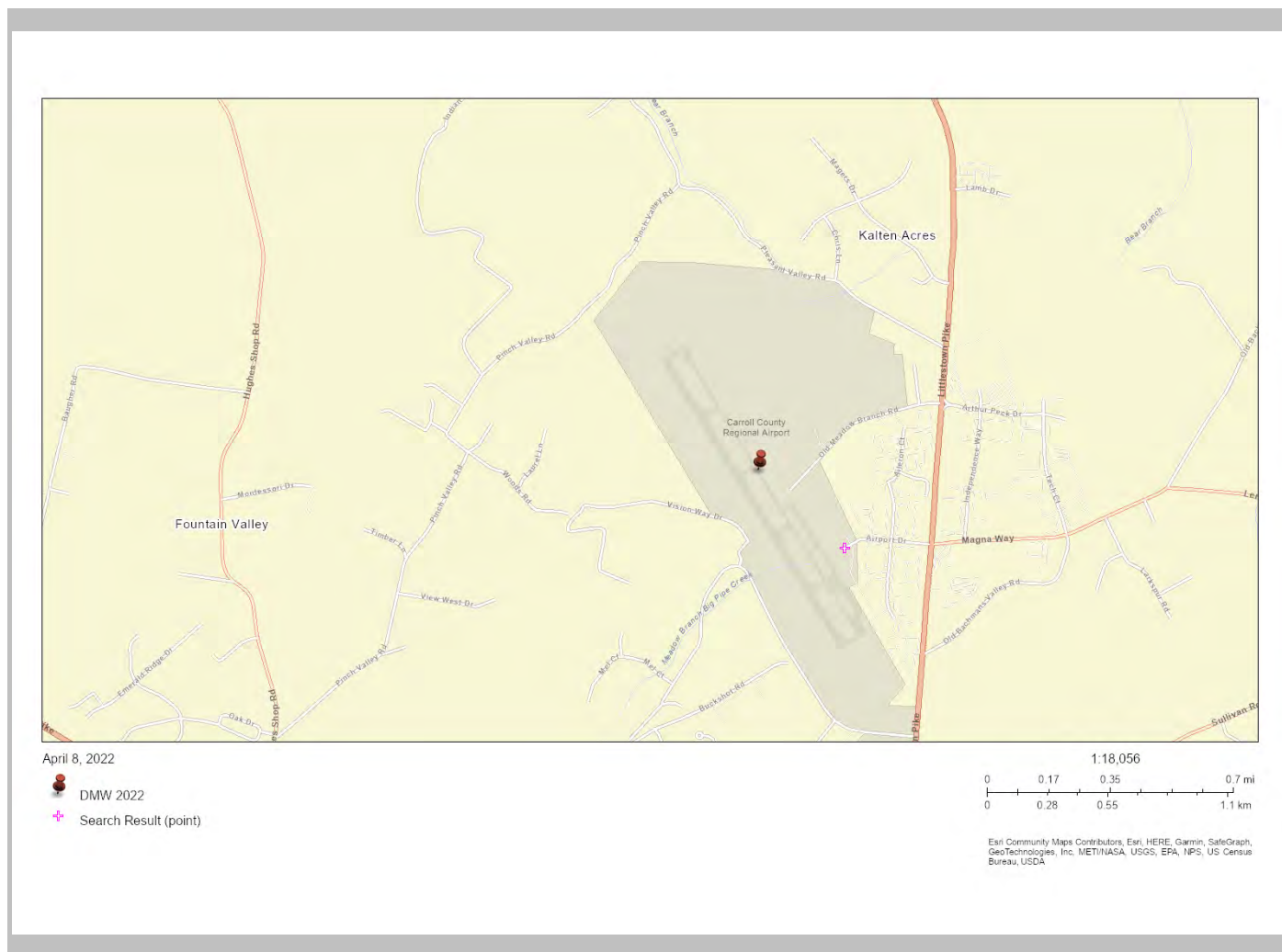
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

1 mile Ring Centered at 39.609472,-77.007388, MARYLAND, EPA Region 3

Approximate Population: 510

Input Area (sq. miles): 3.14

DMW 2022



Sites reporting to EPA

Superfund NPL

0

Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)

0

EJScreen Report (Version 2.0)



1 mile Ring Centered at 39.609472,-77.007388, MARYLAND, EPA Region 3

Approximate Population: 510

Input Area (sq. miles): 3.14

DMW 2022

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Pollution and Sources							
Particulate Matter 2.5 ($\mu\text{g}/\text{m}^3$)	8.28	8.18	40	8.2	48	8.74	41
Ozone (ppb)	43	44.1	23	41.9	64	42.6	57
2017 Diesel Particulate Matter* ($\mu\text{g}/\text{m}^3$)	0.199	0.317	19	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	30	90	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.37	33	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	300	720	49	680	53	710	56
Lead Paint (% Pre-1960 Housing)	0.2	0.28	54	0.35	42	0.28	53
Superfund Proximity (site count/km distance)	0.077	0.13	47	0.15	48	0.13	57
RMP Facility Proximity (facility count/km distance)	0.19	0.67	44	0.63	41	0.75	35
Hazardous Waste Proximity (facility count/km distance)	2.2	3.4	46	1.9	75	2.2	72
Underground Storage Tanks (count/km ²)	0.39	1.8	39	2.7	37	3.9	33
Wastewater Discharge (toxicity-weighted concentration/m distance)	N/A	0.48	N/A	33	N/A	12	N/A
Socioeconomic Indicators							
Demographic Index	18%	35%	25	30%	33	36%	25
People of Color	22%	49%	28	33%	48	40%	39
Low Income	13%	22%	38	27%	28	31%	21
Unemployment Rate	2%	5%	28	5%	30	5%	29
Linguistically Isolated	0%	3%	47	3%	55	5%	45
Less Than High School Education	4%	10%	30	10%	28	12%	25
Under Age 5	7%	6%	61	6%	65	6%	60
Over Age 64	15%	15%	54	16%	45	16%	52

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

For additional information, see: www.epa.gov/environmentaljustice

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

Location: User-specified point center at 39.609472, -77.007388

Ring (buffer): 1-miles radius

Description: DMW 2022

Summary of ACS Estimates		2015 - 2019		
Population		510		
Population Density (per sq. mile)		273		
People of Color Population		112		
% People of Color Population		22%		
Households		162		
Housing Units		168		
Housing Units Built Before 1950		20		
Per Capita Income		40,329		
Land Area (sq. miles) (Source: SF1)		1.87		
% Land Area		100%		
Water Area (sq. miles) (Source: SF1)		0.00		
% Water Area		0%		
		2015 - 2019 ACS Estimates	Percent	MOE (±)
Population by Race				
Total		510	100%	308
Population Reporting One Race		474	93%	480
White		406	80%	273
Black		47	9%	81
American Indian		1	0%	13
Asian		19	4%	89
Pacific Islander		0	0%	12
Some Other Race		1	0%	12
Population Reporting Two or More Races		36	7%	163
Total Hispanic Population		16	3%	109
Total Non-Hispanic Population		494		
White Alone		398	78%	247
Black Alone		39	8%	78
American Indian Alone		1	0%	13
Non-Hispanic Asian Alone		19	4%	89
Pacific Islander Alone		0	0%	12
Other Race Alone		1	0%	12
Two or More Races Alone		36	7%	163
Population by Sex				
Male		237	46%	178
Female		274	54%	200
Population by Age				
Age 0-4		34	7%	68
Age 0-17		140	27%	146
Age 18+		370	73%	240
Age 65+		75	15%	125

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.

N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2015 - 2019

Location: User-specified point center at 39.609472, -77.007388

Ring (buffer): 1-miles radius

Description: DMW 2022

	2015 - 2019 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	341	100%	173
Less than 9th Grade	2	1%	57
9th - 12th Grade, No Diploma	12	4%	44
High School Graduate	77	23%	131
Some College, No Degree	74	22%	131
Associate Degree	19	5%	45
Bachelor's Degree or more	157	46%	138
Population Age 5+ Years by Ability to Speak English			
Total	476	100%	278
Speak only English	462	97%	262
Non-English at Home ¹⁺²⁺³⁺⁴	14	3%	78
¹ Speak English "very well"	13	3%	72
² Speak English "well"	1	0%	20
³ Speak English "not well"	0	0%	28
⁴ Speak English "not at all"	0	0%	12
³⁺⁴ Speak English "less than well"	0	0%	28
²⁺³⁺⁴ Speak English "less than very well"	1	0%	32
Linguistically Isolated Households*			
Total	0	0%	12
Speak Spanish	0	0%	12
Speak Other Indo-European Languages	0	0%	12
Speak Asian-Pacific Island Languages	0	0%	12
Speak Other Languages	0	0%	12
Households by Household Income			
Household Income Base	162	100%	90
< \$15,000	3	2%	30
\$15,000 - \$25,000	6	4%	66
\$25,000 - \$50,000	16	10%	83
\$50,000 - \$75,000	20	12%	66
\$75,000 +	116	72%	122
Occupied Housing Units by Tenure			
Total	162	100%	90
Owner Occupied	152	94%	79
Renter Occupied	10	6%	83
Employed Population Age 16+ Years			
Total	384	100%	214
In Labor Force	269	70%	200
Civilian Unemployed in Labor Force	6	2%	43
Not In Labor Force	115	30%	120

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of anyrace.

N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS)

*Households in which no one 14 and over speaks English "very well" or speaks English only.

EJSCREEN ACS Summary Report



Location: User-specified point center at 39.609472, -77.007388

Ring (buffer): 1-miles radius

Description: DMW 2022

	2015 - 2019 ACS Estimates	Percent	MOE (±)
Population by Language Spoken at Home*			
Total (persons age 5 and above)	N/A	N/A	N/A
English	N/A	N/A	N/A
Spanish	N/A	N/A	N/A
French	N/A	N/A	N/A
French Creole	N/A	N/A	N/A
Italian	N/A	N/A	N/A
Portuguese	N/A	N/A	N/A
German	N/A	N/A	N/A
Yiddish	N/A	N/A	N/A
Other West Germanic	N/A	N/A	N/A
Scandinavian	N/A	N/A	N/A
Greek	N/A	N/A	N/A
Russian	N/A	N/A	N/A
Polish	N/A	N/A	N/A
Serbo-Croatian	N/A	N/A	N/A
Other Slavic	N/A	N/A	N/A
Armenian	N/A	N/A	N/A
Persian	N/A	N/A	N/A
Gujarathi	N/A	N/A	N/A
Hindi	N/A	N/A	N/A
Urdu	N/A	N/A	N/A
Other Indic	N/A	N/A	N/A
Other Indo-European	N/A	N/A	N/A
Chinese	N/A	N/A	N/A
Japanese	N/A	N/A	N/A
Korean	N/A	N/A	N/A
Mon-Khmer, Cambodian	N/A	N/A	N/A
Hmong	N/A	N/A	N/A
Thai	N/A	N/A	N/A
Laotian	N/A	N/A	N/A
Vietnamese	N/A	N/A	N/A
Other Asian	N/A	N/A	N/A
Tagalog	N/A	N/A	N/A
Other Pacific Island	N/A	N/A	N/A
Navajo	N/A	N/A	N/A
Other Native American	N/A	N/A	N/A
Hungarian	N/A	N/A	N/A
Arabic	N/A	N/A	N/A
Hebrew	N/A	N/A	N/A
African	N/A	N/A	N/A
Other and non-specified	N/A	N/A	N/A
Total Non-English	N/A	N/A	N/A

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of any race.

N/A means not available. **Source:** U.S. Census Bureau, American Community Survey (ACS) 2015 - 2019.

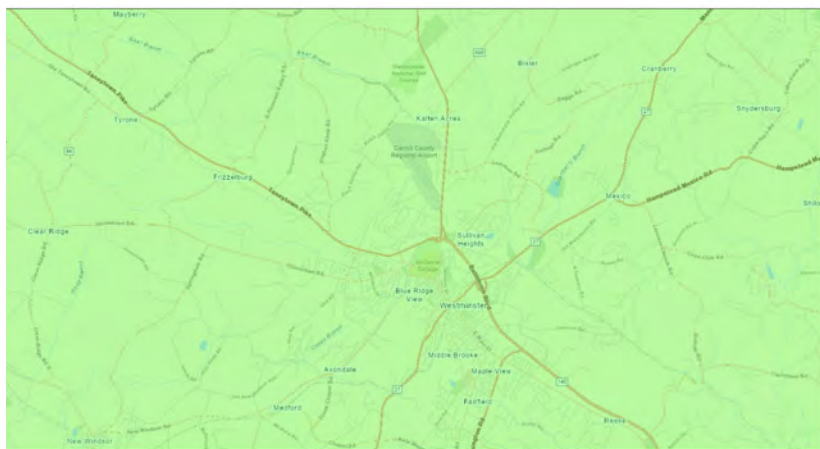
*Population by Language Spoken at Home is available at the census tract summary level and up.

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

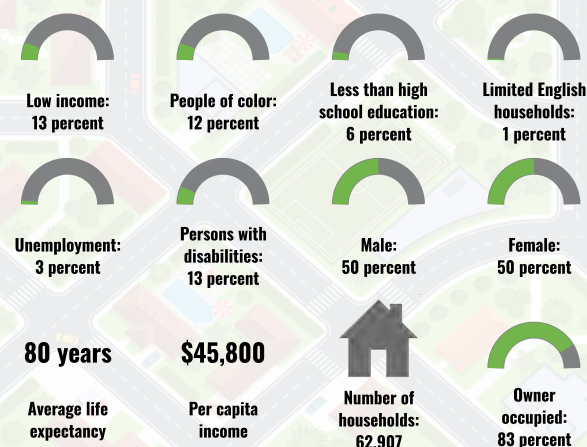
Carroll County, MD

County: Carroll
Population: 172,148
Area in square miles: 452.69

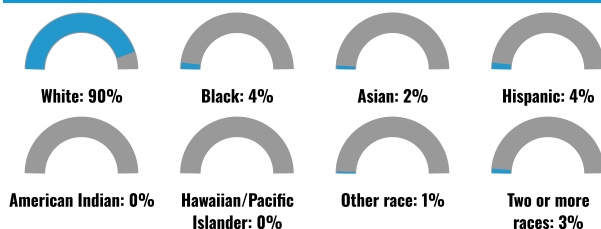


as of 25, 2023
Carroll County, MD
0 0.5 1 2 4 mi
1:72,224
Data: HERE, Garmin, TeleAtlas, GeoTechnologies, Inc., Mapbox, OpenStreetMap, Esri, DeLorme, Swire, USGS, NOAA, IGN, IGP, UPRIS

COMMUNITY INFORMATION



BREAKDOWN BY RACE



BREAKDOWN BY AGE



LIMITED ENGLISH SPEAKING BREAKDOWN



Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race. Source: U.S. Census Bureau, American Community Survey (ACS) 2017-2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	95%
Spanish	2%
Other Indo-European	1%
Total Non-English	5%

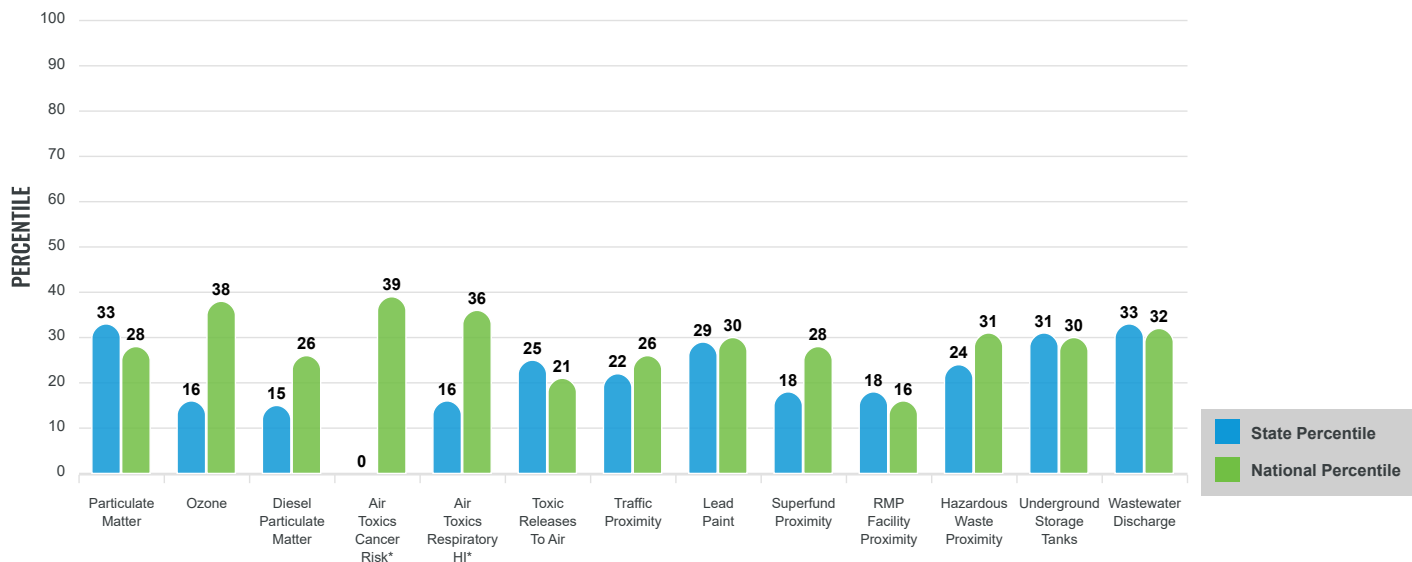
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the [EJScreen website](#).

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

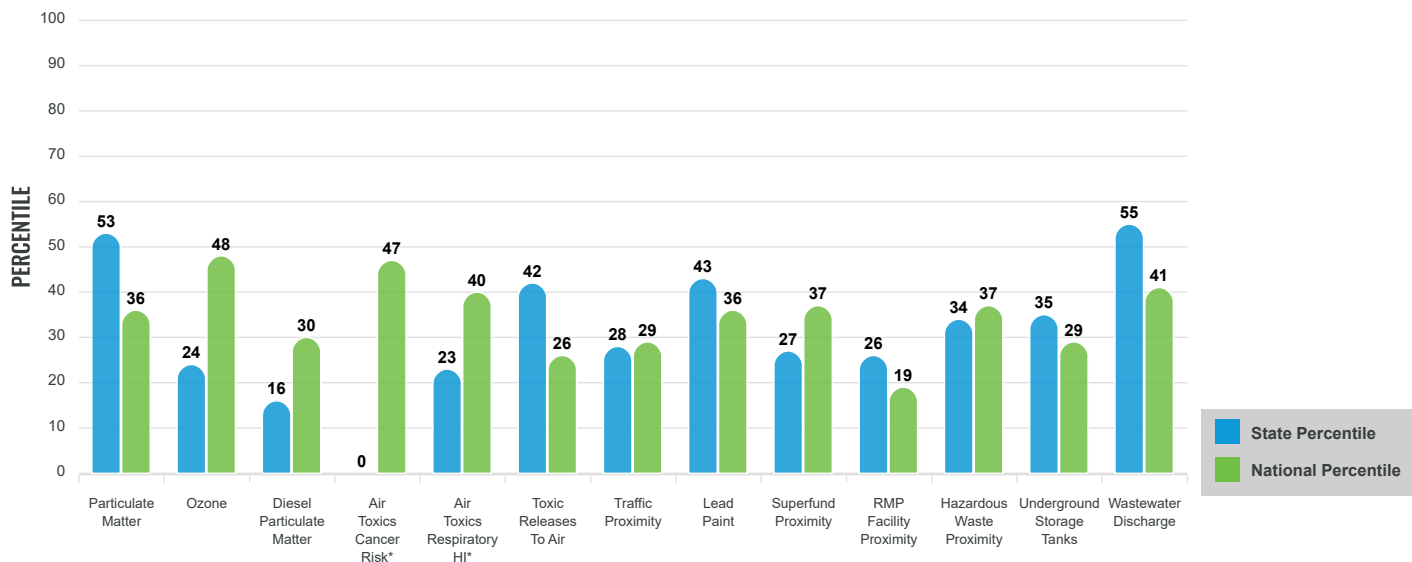
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for County: Carroll

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter ($\mu\text{g}/\text{m}^3$)	7.94	7.84	51	8.08	43
Ozone (ppb)	62.7	66	21	61.6	61
Diesel Particulate Matter ($\mu\text{g}/\text{m}^3$)	0.161	0.288	14	0.261	34
Air Toxics Cancer Risk* (lifetime risk per million)	22	28	0	25	5
Air Toxics Respiratory HI*	0.29	0.34	0	0.31	4
Toxic Releases to Air	220	430	47	4,600	33
Traffic Proximity (daily traffic count/distance to road)	42	180	29	210	36
Lead Paint (% Pre-1960 Housing)	0.19	0.32	47	0.3	47
Superfund Proximity (site count/km distance)	0.054	0.13	27	0.13	46
RMP Facility Proximity (facility count/km distance)	0.091	0.42	36	0.43	26
Hazardous Waste Proximity (facility count/km distance)	0.55	2.1	38	1.9	51
Underground Storage Tanks (count/km ²)	0.63	1.9	41	3.9	42
Wastewater Discharge (toxicity-weighted concentration/m distance)	1.4	1.2	97	22	92
SOCIOECONOMIC INDICATORS					
Demographic Index	13%	36%	17	35%	16
Supplemental Demographic Index	9%	12%	38	14%	25
People of Color	12%	49%	16	39%	27
Low Income	13%	22%	39	31%	23
Unemployment Rate	3%	6%	43	6%	44
Limited English Speaking Households	1%	3%	58	5%	57
Less Than High School Education	6%	10%	46	12%	42
Under Age 5	5%	6%	54	6%	55
Over Age 64	17%	16%	58	17%	55
Low Life Expectancy	19%	19%	53	20%	47

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	6
Water Dischargers	232
Air Pollution	257
Brownfields	3
Toxic Release Inventory	10

Other community features within defined area:

Schools	44
Hospitals	7
Places of Worship	144

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	Yes

Report for County: Carroll

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	19%	53	20%	47
Heart Disease	5.3	5.3	56	6.1	35
Asthma	9.2	9.9	32	10	27
Cancer	7	6.1	69	6.1	67
Persons with Disabilities	12.1%	11.8%	60	13.4%	47

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	4%	7%	52	12%	37
Wildfire Risk	0%	1%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	10%	11%	59	14%	47
Lack of Health Insurance	3%	6%	33	9%	21
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Footnotes

Report for County: Carroll

Carroll County Regional Airport Runway Replacement Project Supplemental Environmental Assessment

Air Quality Analysis Technical Report

Harris Miller Miller & Hanson Inc. (HMMH) is assisting Delta Airport Consultants, Inc. and Carroll County Regional Airport (DMV) on the Supplemental Environmental Assessment (EA) for the proposed Runway Replacement Project (i.e. Proposed Action).

This technical report provides detailed information for the air quality and climate analysis including the methodology and assumptions for the construction and demolition activity based on the information provided by Delta Airport Consultants.

The air quality analysis includes comparison of the emissions from the construction and demolition activities for the Proposed Action. The Proposed Action is not anticipated to increase the number of forecast aircraft operations or change the fleet mix, taxi times, vehicle trips compared to the No Action, therefore, aircraft and associated ancillary activities were not evaluated and the air quality analysis only included the construction and demolition activities.

The next sections present and discuss the potential for air quality impacts from the Proposed Action associated with the construction and demolition activities. Comparing the inventory of air pollutant emissions associated with each year of activity to the General Conformity *de minimis* thresholds for significance is the basis for evaluating the potential for significant impacts.

1. Affected Environment

Under the National Environmental Policy Act (NEPA), federal agencies must consider the impact their actions will have on the environment compared to a no action alternative. According to FAA NEPA implementing guidance (FAA Order 1050.1F and Desk Reference, and FAA Order 5050.4B), impacts to air quality must be considered as part of the environmental analysis under NEPA. Potential effects of the proposed action are evaluated against the National Ambient Air Quality Standards (NAAQS), as promulgated by the United States (US) Environmental Protection Agency (EPA) under the Federal Clean Air Act (CAA).

1.1 National Ambient Air Quality Standards

The US EPA currently regulates six criteria pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM), and lead (Pb). Particulate matter is divided into two particle size categories: coarse particles with a diameter less than 10 micrometers (PM₁₀) and fine particles with a diameter of less than 2.5 micrometers (PM_{2.5}). The NAAQS are expressed in terms of pollutant concentration measured (or averaged) over a defined period of time and are two-tiered. The first tier (the “primary standard”) is intended to protect public health; the second tier (the “secondary standard”) is intended to protect public welfare and prevent further degradation of the environment.

Table 1 shows the primary and secondary NAAQS for the criteria pollutants. Section 176(c) of the CAA states that federal agencies cannot engage, support, or provide financial assistance for licensing, permitting, or approving any project that could cause or contribute to the severity and/or number of violations of the NAAQS, or could inhibit the expeditious attainment of these standards.

The standards in **Table 1** apply to the concentration of a pollutant in outdoor ambient air. If the air quality in a geographic area is equal to or better than the national standard, the US EPA will typically designate the region as an “attainment area.” An area where air quality does not meet the national standard is typically designated by the US EPA as a “non-attainment area.” Once the air quality in a non-attainment area improves to the point where it meets the standards and the additional requirements outlined in the CAA, the US EPA can re-designate the area to attainment upon approval of a Maintenance Plan, and these areas are then referred to as “maintenance areas.” Each state is required to prepare a State Implementation Plan (SIP) that outlines measures that regions within the state will implement to attain the applicable air quality standard in non-attainment areas for applicable criteria air pollutant, and to maintain compliance with the applicable air quality standard in maintenance areas. The status and severity of pollutant concentrations in a particular area will impact the types of measures a state must take to reach attainment with the NAAQS. The US EPA must review and approve each state’s SIP to ensure the proposed measures are sufficient to either attain or maintain compliance with the NAAQS within a set period of time.

The Clean Air Act Amendments (CAAA) of 1990 require states to make recommendations to the US EPA regarding the attainment status of all areas within their borders when the US EPA finalizes an update to any NAAQS. Under its CAAA authority, the US EPA further classifies non-attainment areas for some pollutants – such as ozone – based on the severity of the NAAQS violation as marginal, moderate, serious, severe, and extreme. To further improve the nation’s air quality, the US EPA lowered the ozone standard in 2015 to 0.070 parts per million (ppm).

Table 1. National Ambient Air Quality Standards

Source: US EPA NAAQS <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Pollutant	Averaging Time	Primary Standards	Secondary Standards
CO	Eight-hour	9 parts per million (ppm)	None
	One-hour	35 ppm	
Pb	Rolling Three-Month Average	0.15 micrograms (µg) /cubic meter of air (m ³)	Same as Primary
NO₂	Annual Arithmetic Mean	0.053 ppm (100 µg/m ³)	Same as Primary
	One-hour	0.100 ppm ^{Note 2}	None
O₃	8-hour (2015 standard) ^{Note 4}	0.070 ppm	Same as Primary
PM_{2.5}	Annual Arithmetic Mean	12 µg/m ³ ^{Note 1}	15 µg/m ³
	24-hour	35 µg/m ³	Same as Primary
PM₁₀	24-Hour	150 µg/m ³ ^{Note 1}	Same as Primary
SO₂	One-hour	75 parts per billion (ppb) ^{Note 3}	None
	Three-hour	None	0.5 ppm

Table Notes:

- For PM₁₀, the 24-hour standard is not to be exceeded more than once per year on average over three years. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or are less than the standard.
- To attain this standard, the three-year average of the 98th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).
- Final rule signed June 2, 2010. To attain this standard, the three-year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75 ppb.
- US EPA updated the NAAQS for O₃ to strengthen the primary eight-hour standard to 0.07 ppm on October 1, 2015. An area will meet the standard if the fourth-highest maximum daily eight-hour ozone concentration per year, averaged over three years is equal to or less than 70 ppb.

1.2 Attainment Status

Air quality in the DMV area (Carroll County) is currently designated by the US EPA Greenbook as being in attainment for all criteria pollutants except for the 2008 and 2015 8-hour ozone standard which is designated by US EPA as non-attainment.¹ Because the DMV area is designated as non-attainment for some pollutants, the US EPA General Conformity Rule applies to this Proposed Action.

1.3 General Conformity Rule

The General Conformity Rule defines a federal action as any activity engaged in by a department, agency, or instrumentality of the federal government, or any activity that a department, agency, or instrumentality of the federal government supports in any way, provides financial assistance for, licenses, permits, or approves. General Conformity is defined as demonstrating that a project or action conforms to the State Implementation Plan's (SIP's) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of such standards. Federally funded and approved actions at airports are subject to the US EPA's General Conformity regulations. The

¹ https://www3.epa.gov/airquality/greenbook/anayo_md.html

General Conformity Rule² applies to all federal actions except for certain highway and transit programs which must instead comply with the Transportation Conformity Plans.³

The General Conformity Rule includes annual emissions thresholds for nonattainment and maintenance areas that trigger the need for a General Conformity determination and defines projects that are typically excluded from General Conformity requirements. Since the General Conformity Rule applies to federally funded projects in US EPA-designated non-attainment and maintenance areas, the General Conformity requirements apply to this Proposed Action at DMV.⁴

Under the General Conformity Rule and NEPA, a project's impact on air quality is assessed by evaluating whether it would cause a new violation of a NAAQS or contribute to a new violation in a manner that would increase the frequency or severity of a new violation.⁵ For this analysis, the air emissions from the Proposed Action construction related emissions were compared to the applicable US EPA *de minimis* levels for determining significant impacts.

2. Environmental Consequences of Proposed Action Alternative

Potential air quality impacts associated with construction and demolition activity for the Proposed Action are discussed in this section. The Proposed Action would not induce changes in aircraft operations and additional vehicle trips compared to the No Action alternative during or after construction. Therefore, air emissions associated with aircraft and general access vehicles were not inventoried and evaluated.

2.1 Methodology

This section documents the methods used to calculate emissions of CO, volatile organic compounds (VOCs), oxides of nitrogen (NO_x), sulfur dioxide (SO₂), particulate matter (PM₁₀ and PM_{2.5}), and greenhouse gases (GHG) from construction and demolition-related sources associated with the Proposed Action. This analysis develops emissions inventories pursuant to NEPA as well as determining whether emissions associated with the Proposed Action would exceed applicable *de minimis* thresholds.

Estimates of construction and demolition-related emissions were developed for the Proposed Action using standard industry methodologies and techniques including the FAA *Aviation Emissions and Air Quality Handbook* and associated US EPA guidance,⁶ MOVES4 (latest available edition) for both on road and nonroad source emission factors. These techniques are described in more detail in the following sections. Construction activities associated with the Proposed Action for were estimated for 2023 and 2024 and 2027 through 2031.

2.1.1 Demolition and Construction Activities

Construction and demolition emissions were not estimated for the No Action alternative, because no demolition or construction activity would be associated with the No Action alternative. The demolition and construction associated with the Proposed Action would result in short-term changes in air emissions from sources such as exhaust from nonroad construction equipment such as:

- milling and paving,

² Revisions to the General Conformity Rule are codified under 40 CFR Parts 51 and 93, Subpart W, Revisions to the General Conformity Regulations, Final Rule (April 2010).

³ 40 CFR Part 93, Subpart A.

⁴ DMV is located in an US EPA-designated non-attainment area for ozone.

⁵ https://www.faa.gov/sites/faa.gov/files/about/office_org/headquarters_offices/apl/1-air-quality.pdf

⁶ https://www.faa.gov/regulations_policies/policy_guidance/envir_policy/airquality_handbook



- site clearing,
- grading,
- demolition, and
- runway marking and lighting.

On-road vehicles include those associated with:

- transport and delivery of supplies,
- materials and equipment to and from the site, and
- construction worker trips.

Additionally, fugitive dust emissions sources include:

- site preparation and land clearing,
- equipment movement on unpaved and paved roads, and
- evaporative emissions from the application of asphalt paving.

Demolition and construction activities associated with the Proposed Action are expected to begin in the summer of 2023 and be completed in summer of 2031. **Table 2** presents the primary components of the Proposed Action, area estimates (square feet) and anticipated start and end dates of construction. These area estimates were used for deriving construction equipment schedules with the Airport Cooperative Research Board's (ACRP) Airport Construction Emissions Inventory Tool (ACEIT).⁷

Table 2. Proposed Action Construction and Demolition Activities

Source: Delta Airport Consultants, HMMH 2023¹

Project Action Component	Area (Square Feet)	Construction Start	Construction End
Site Permitting and Grading	19,100,000	09/01/2024	12/31/2024
On Airport Tree Removal	2,390,000	09/01/2024	12/31/2024
Off Airport Tree Removal	2,265,000	09/01/2027	12/31/2027
Runway Rehabilitation	550,000	06/01/2028	08/31/2031
Taxiway Replacement	192,500	06/01/2028	08/31/2031
Concrete Removal from Taxiways	405,000	06/01/2028	08/31/2031
Realign Meadow Branch Road	58,500	05/21/2023	10/31/2023
Asphalt Pavement Removal	61,200	05/21/2023	10/31/2023
Pinch Valley Road Asphalt Placement	87,1200	06/01/2024	08/31/2024
New Parking Spaces	12,600	06/01/2027	08/31/2027
New Fencing	12,000 lf	01/01/2024	12/31/2024
New Hangers	40,000	06/01/2027	08/31/2027
Offsite truck trips soil removal	35,714 truck Trips	09/01/2024	12/31/2031

Note: 1. Preliminary project costs were also used in the ACEIT model to derive the construction schedule.

The ACRP ACEIT model⁸ was used to estimate the construction schedule of equipment only for each project component based on the project dimensions and project costs for each activity. The model has the ability to generate construction schedules for a variety of standard airport construction projects including the associated activity types and the equipment used for this project.

⁷ ACRP, 2014 <https://crp.trb.org/acrp0267/acrp-report-102-guidance-for-estimating-airport-construction-emissions/>

⁸ http://onlinepubs.trb.org/onlinepubs/acrp/docs/ACRP02-33_FR.pdf

ACEIT can also produce emission factors for nonroad and on-road construction equipment, as well as for fugitive emission sources using US EPA and industry standard models and methodologies. *However, the current version of ACEIT includes an older version of the US EPA's Motor Vehicle Emission Simulator (MOVES) emission model, MOVES2010a and NONROADs, which have both been updated over the years. For this analysis, emission factors were generated outside of ACEIT using the current version of MOVES4 (latest Version) to develop on-road and nonroad emission factors for Carroll County.*⁹ These emission factors were applied to estimates of vehicle miles traveled (VMT) and construction equipment (hours, horsepower, load factor), respectively, for each construction activity and year. Spreadsheet calculations for construction and demolition are presented in **Appendix A**.

2.1.2 Off-Road Construction Equipment

As discussed above, off-road equipment emission factors for each construction year using the MOVES4 model which incorporates county level data representative of Carroll County for both criteria pollutants/precursors and greenhouse gases. Emission factors in grams per horsepower (hp-hr) for each off-road equipment type were applied to the equipment size (in hp), load factor, and anticipated activity levels (in hours per year) of expected equipment use, as generated in the construction equipment inventory by ACEIT.

The annual emissions for off-road construction equipment were computed using the following equation:

Off-road Vehicle Construction emissions (tons per year) = emission factor (grams per hp-hr) x size (hp) x load factor x hours per year x (1 pound/453.6 grams) x (1 ton/2,000 pounds)

2.1.3 On-Road Construction Passenger/Truck Delivery Vehicles

VMT data for each on-road employee trip and truck delivery vehicles were derived from round trip distances and the number of employee hours from the activity-specific construction schedule in ACEIT. It is assumed that all on-road equipment would use gasoline for passenger vehicles and diesel fuel for truck deliveries. Emission factors in grams per mile (g/mile) for each on-road vehicle type were applied to the anticipated VMT. Additional truck trips associated with the removal of soil offsite during the site grading activity in 2024 was also included. Trucks trips were estimated based on a total of 500,000 cubic yards (CY) of soil fill removed from the site and an average loader capacity of 14 CY per loader. Similar to the way emissions are estimated for offroad equipment, the MOVES4 model uses US EPA vehicle default data representative of Carroll County for both criteria pollutants/precursors and greenhouse gases to estimate emissions factors in grams per mile. A round trip distance of 30 miles was assumed for employee trips and 40 miles was assumed for material delivery trips which are the standard industry default values used in ACEIT.

The annual emissions for on-road passenger/delivery vehicles were computed for each year using the following equation:

On-road construction vehicles emissions (tons per year) = emission factor (g/mile) x annual VMT x (1 pound/453.6 grams) x (1 ton/2,000 pounds)

Fugitive Dust Emissions

⁹ Construction emissions used in NONROAD2008a assumed a blend of Tier 1, Tier 2, Tier 3, and Tier 4 for Carroll County based on US EPA phasing ratios of older equipment in future years and does not reflect the primary use of either Tier 1 thru Tier 4 engines. MOVES emission factors are specific to Davidson County as generated within MOVES for each year.

Fugitive dust emissions from site preparation and land clearing, equipment movement on unpaved and paved areas, along with evaporative emissions from asphalt paving activities were estimated using US EPA emission factors and methodologies. These are all included in the total construction emissions.

2.2 Summary of Construction-Related Emissions

Construction-related emissions of criteria pollutants during the 2023 thru 2031 construction period under the Proposed Action are summarized in **Table 3**. For this analysis, GHG emissions associated with the Proposed Action were calculated, for disclosure purposes, as carbon dioxide equivalent (CO₂e) in metric tons per year, relevant to their global warming potential.¹⁰ **Section 3** provides additional discussion on GHG emissions related to the Proposed Action.

Table 3. Construction Emission Inventory - Proposed Action

Source: HMMH, 2023

Year	Relevant Criteria Pollutant Emissions (tons per year)Note:3						
	CO	VOC Note 1	NO _x Note 1	SO ₂	PM ₁₀	PM _{2.5}	CO ₂ e Note 2
2023	1.93	0.17	0.64	0.004	0.14	0.03	803
2024	3.15	0.67	3.38	0.007	0.24	0.11	1,974
2027	0.59	0.45	1.29	0.001	0.15	0.06	1,864
2028	1.39	0.14	0.27	0.004	0.14	0.01	721
2029	1.32	0.13	0.25	0.004	0.14	0.01	719
2030	1.26	0.13	0.24	0.004	0.14	0.01	718
2031	1.18	0.13	0.22	0.004	0.14	0.01	717

Notes:

- Following standard industry practice, ozone was evaluated by evaluating emissions of VOC and NO_x, which are precursors in the formation of ozone.
- CO₂e emissions are in metric tons per year equivalent relevant to their global warming potential (GWP).
- Based on MOVES4 for Onroad and NONROAD using construction information provided by Delta Consultants, Inc.

2.3 Aircraft Operational Emissions

As discussed above, implementation of the Proposed Action would not increase the number of aircraft operations compared to the No Action alternatives, therefore, aircraft operational emissions were not estimated as part of the Proposed Action.

2.3.1 Significance Thresholds

As provided in FAA Order 1050.1F, an action would cause a significant air quality impact if pollutant concentrations would exceed one or more of the NAAQS established by the US EPA under the CAA, for any of the time periods analyzed, or would increase the frequency or severity of any such existing violations. Additionally, the CAA requires federal agencies such as the FAA to ensure their actions conform to the appropriate SIP. Conformity requires that a project or action adheres to the SIP's purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving

¹⁰ Global warming potentials are based on the latest Intergovernmental Panel on Climate Change (IPCC), *Fifth Assessment Report (AR5)*, November 2014.

expeditious attainment of such standards. As stated in **Section 1.2**, the General Conformity Rule applies to this project.

If General Conformity applies, an applicability analysis is performed to determine if a General Conformity Determination is required to demonstrate that the Proposed Action conforms to the approved SIP(s). A conformity determination is required if the total direct and indirect pollutant emissions resulting from a project are above the *de minimis* emissions threshold levels specified in the conformity regulations.¹¹ The *de minimis* thresholds represent emission quantities of a NAAQS-regulated pollutant, or its applicable precursors, over which a proposed action in a nonattainment or maintenance area may cause or contribute to a new or continued violation of the NAAQS. A conformity determination is not required if the differences in emissions between the Proposed Action and the No Action alternatives are below the applicable *de minimis* emission threshold levels, or if the Proposed Action is exempt or included in the FAA list of “presumed to conform activities.”

As stated in **Section 1.2**, DMV is located in Carroll County, which the US EPA has designated as “attainment” for all criteria pollutants with the NAAQS except for the 2008 and 2015 8-hour ozone standard¹². Since the area is designated as moderate non-attainment with the current US EPA air quality standards, the General Conformity Rule applies.

Federal US EPA *de minimis* emission thresholds for nonattainment areas relevant to Carroll County are listed in **Table 4**. As noted in the table, pollutants designated as attainment do not have US EPA *de minimis* thresholds, however, the maintenance *de minimis* thresholds were used to determine significant impacts under NEPA for attainment pollutants.

Table 4 General Conformity US EPA De Minimis Pollutant Emission Thresholds²

Source: US EPA, 2023

Pollutants	Attainment Status (Severity)	Pollutants	Threshold (tons Per Year)
Carbon Monoxide (CO)	Attainment ^{Note 3}	CO	100
Nitrogen Dioxide (NO ₂)	Attainment ^{Note 3}	NO ₂	100
Ozone (O ₃) ^{Note 1}	Moderate Non Attainment ^{Note 4}	Nitrogen Oxides (NO _x)	100
		Volatile Organic Compounds (VOC)	50
Fine Particulate Matter (PM _{2.5})	Attainment ^{Note 3}	PM _{2.5}	100
Sulfur Dioxide (SO ₂)	Attainment ^{Note 3}	SO ₂	100
Lead (Pb)	Attainment ^{Note 3}	Pb	25
Notes: 1. Following standard industry practice, ozone was evaluated by evaluating emissions of VOC and NO _x , which are precursors in the formation of ozone. 2. https://www.epa.gov/general-conformity/de-minimis-tables 3. Pollutants designated as attainment, no <i>de minimis</i> threshold exists for attainment pollutants. However the <i>de minimis</i> threshold for maintenance was used to determine significant impacts under NEPA. 4. Moderate non attainment areas <i>de minimis</i> thresholds inside the ozone transport region.			

¹¹ US Environmental Protection Agency, General Conformity *De Minimis* Tables, <https://www.epa.gov/general-conformity/de-minimis-tables> (accessed June 4, 2019).

¹² https://www3.epa.gov/airquality/greenbook/anayo_md.html

2.3.2 Construction Emissions Impacts

Table 5 presents the construction emissions associated with demolition and construction of the Proposed Action for the 2023 thru 2031 construction years compared with the appropriate US EPA *de minimis* thresholds. As the table shows, the annual emissions for the 2023 through 2031 construction years would be below established *de minimis* thresholds for all pollutants. Therefore, a General Conformity determination is not required for the construction and demolition activities for the Proposed Action. Additionally for pollutants not subject to General Conformity, in accordance with the FAA 1050.1 Desk Reference,¹³ the Proposed Action can be determined to “not cause a significant air quality impact, since it is unlikely the pollutant concentration analyzed would exceed *de minimis* thresholds or the NAAQS.” No significant adverse air quality impacts would be expected to result from construction of the Proposed Action. It should be noted that no lead emissions are expected with construction emission activity as expected fuel usage of gasoline and diesel fuel has no lead content.

¹³https://www.faa.gov/about/office_org/headquarters_offices/apl/enviro_n_policy_guidance/policy/faa_nepa_order/desk_ref



Table 5 Total Construction and Demolition Emissions Compared to *De Minimis* Thresholds

Source: HMMH, 2023

Year	Relevant Criteria Pollutant Emissions (tons per year)						
	CO ^{Note 1}	VOC	NO _x	SO ₂ ^{Note 1}	PM ₁₀ ^{Note 1}	PM _{2.5} ^{Note 1}	Lead ^{Note:2}
2023							
Total Emissions of Construction and Demolition	1.93	0.17	0.64	0.004	0.14	0.03	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2024							
Total Emissions of Construction and Demolition	3.15	0.67	3.38	0.007	0.24	0.11	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2027							
Total Emissions of Construction and Demolition	0.59	0.45	1.29	0.001	0.15	0.06	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2028							
Total Emissions of Construction and Demolition	1.39	0.14	0.27	0.004	0.14	0.01	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2029							
Total Emissions of Construction and Demolition	1.32	0.13	0.25	0.004	0.14	0.01	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2030							
Total Emissions of Construction and Demolition	1.26	0.13	0.24	0.004	0.14	0.01	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2031							
Total Emissions of Construction and Demolition	1.18	0.13	0.22	0.004	0.14	0.01	0.0
US EPA De Minimis Threshold	100	50	100	100	100	100	25
Emissions below de minimis thresholds?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Notes:							
1. Since pollutants are designated attainment by US EPA, no <i>de minimis</i> thresholds exist. As a conservative assumption, the maintenance area designation <i>de minimis</i> thresholds were used to determine significance under NEPA.							
2. Pb emissions for construction emissions were not estimated since the fuel use for these sources are gasoline and diesel which do not contain lead							

2.3.3 No Action Alternative

The No Action alternative assumes that the Proposed Action is not implemented, and air quality would remain unchanged for 2023 and 2031. Therefore, no additional air quality impacts would occur as a result of choosing the No Action alternative.

2.3.4 Mitigation

As indicated in Section 2.3.2, air quality impacts associated with construction of the Proposed Action would not be significant; therefore, no mitigation measures are required for construction emissions.

3. Climate

Climate change is a global phenomenon that can have local impacts.¹⁴ Scientific measurements show that Earth's climate is warming, with concurrent impacts including warmer air temperatures, increased sea level rise, increased storm activity, and an increased intensity in precipitation events. Increasing concentrations of GHG emissions in the atmosphere affect global climate.^{15, 16} GHG emissions result from anthropogenic sources, including the combustion of fossil fuels. GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and fluorinated gases.¹⁷ CO₂ is the most important anthropogenic GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years. Anthropogenic sources of GHG emissions include the combustion of fossil fuels. Scientific measurements show that Earth's climate is warming, with concurrent impacts including warmer air temperatures, increased sea level rise, increased storm activity, and an increased intensity in precipitation events.

The earth's global temperature has risen by 1.5°F over the past century and is projected to continue to rise.¹⁸ Small changes in the global temperature over time can translate into large and potentially dangerous shifts in climate and weather on a global scale and even at the local level. Many states have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves.¹⁹

3.1 Regulatory Framework

Research has shown that there is a direct link between fuel combustion and GHG emissions. Therefore, sources that require fuel or power at an airport are the primary sources that would generate GHGs including construction emissions.

While US aviation has seen increased traffic in terms of passengers over the past 30 years, aviation's share of US CO₂ emissions has remained relatively constant. In 2019, civil aviation's share of US CO₂ emissions was about 2.7 percent of total domestic emissions.²⁰ Aircraft in the national air space are operating much more efficiently—moving more passengers using the same amount of energy. In 2018, the U.S aviation sector carried about 32 percent more passengers than in the year 2000, while using

¹⁴ As explained by the US EPA, "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States." U.S. Environmental Protection Agency, Climate Change Division, Office of Atmospheric Programs, Technical Support Document for Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act 2-3, 2009, <https://www.epa.gov/ghgemissions/technical-support-document-endangerment-and-cause-or-contribute-findings-greenhouse>.

¹⁵ Intergovernmental Panel on Climate Change, Fifth Assessment Report, 2014, <https://www.ipcc.ch/report/ar5/syr/9>.

¹⁶ U.S. Global Change Research Program, Global Climate Change Impacts in the United States, 2009, <http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009>.

¹⁷ U.S. Environmental Protection Agency, Overview of Greenhouse Gases, <http://www3.epa.gov/climatechange/ghgemissions/gases.html>.
<https://www.aqhelp.com/AQdocs.html>

¹⁹ <https://aqhelp.com/Documents/FINAL%20-%20AF%20AQ%20EIAP%20Guide%20Vol%201%20-%202019.pdf>

²⁰ US EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks," available at: www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks.



almost the same amount of fuel (and emissions), due in large part as result of the fuel efficiency improvements of the fleet over time. Today's fleet of aircraft has an average fuel efficiency of 57.5 passenger-miles per gallon of fuel.²¹

Researchers developed the Global Warming Potential (GWP) indicator as a way to compare the global warming impacts of different gases, by converting each gas amount to a carbon dioxide equivalent (CO₂e). GWPs provide a common unit of measure, which allows for consistency when estimating emissions of these different gases. CO₂ has a GWP of one because it is the gas used as the reference point. CH₄ does not last as long in the atmosphere as CO₂; however, it absorbs much more energy. In comparison, one ton of CH₄ has 28 times more heat-capturing potential than one ton of CO₂. The amount of CH₄ emissions would be multiplied by 28 to determine its CO₂e value. NO_x lasts in the atmosphere far longer than CO₂. The amount of nitrous oxides emissions would be multiplied by 265 to determine its CO₂e value.

Although no federal standards have been set for GHG emissions, it is well established that GHG emissions can affect climate. The CEQ recently released interim guidance on GHG and climate impacts for NEPA and is currently in the comment period but can be used for new NEPA projects to assist agencies when considering GHG and climate impacts²². The recently issued interim guidance to assist agencies in analyzing GHG and climate change effects of their proposed actions under the NEPA.²³ This interim GHG guidance, effective upon publication, builds upon and updates CEQ's 2016 *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews* ("2016 GHG Guidance"), highlighting best practices for analysis grounded in science and agency experience.²⁴ CEQ issued this guidance to provide for greater clarity and more consistency in how agencies address climate change in NEPA reviews.

Furthermore, per FAA Order 1050.1F, the discussion of potential climate impacts should be documented in a separate section of the NEPA document, distinct from air quality.²⁵ Where the proposed action or alternative(s) would result in an increase in GHG emissions, the emissions should be assessed either qualitatively or quantitatively. The guidance recommends consideration of: (1) the potential effects of a proposed action or its alternatives on climate change as indicated by its GHG emissions; (2) the implications of climate change for the environmental effects of a proposed action or alternatives. The overall reduction of aviation related GHG emissions impacts on climate is a goal, but it is not a regulatory mandate.

3.2 Affected Environment

An internet web search of GHG emissions for the City of Westminster or Carroll County showed no results. However, the state of Maryland has conducted GHG inventories over the years which are included to show baseline emissions for the area.

²¹ United States, "United States Efforts to Address Aviation's Climate Impact," A40-WP/531, ICAO 40th General Assembly, Executive Committee, available at: www.icao.int/Meetings/a40/Documents/WP/wp_531_en.pdf.

²² <https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate>

²³ Federal Register: National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change

²⁴ CEQ, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews, 81 FR 51866 (Aug. 8, 2016), https://ceq.doe.gov/docs/ceq-regulations-and-guidance/nepa_final_ghg_guidance.pdf. On April 5, 2017, CEQ withdrew the final 2016 guidance, as directed by E.O. 13783. 82 FR 16576 (Apr. 5, 2017). On June 26, 2019, CEQ issued draft GHG guidance. 84 FR 30097 (June 26, 2019). CEQ rescinded this draft guidance on February 19, 2021, pursuant to E.O. 13990. 86 FR 10252 (Feb. 19, 2021). In addition, on April 20, 2022, CEQ issued a Final Rule for its "Phase 1" NEPA rulemaking. 87 FR 23453. CEQ will be proceeding with updates to the NEPA regulations as set forth in the 2022 Regulatory Agenda.

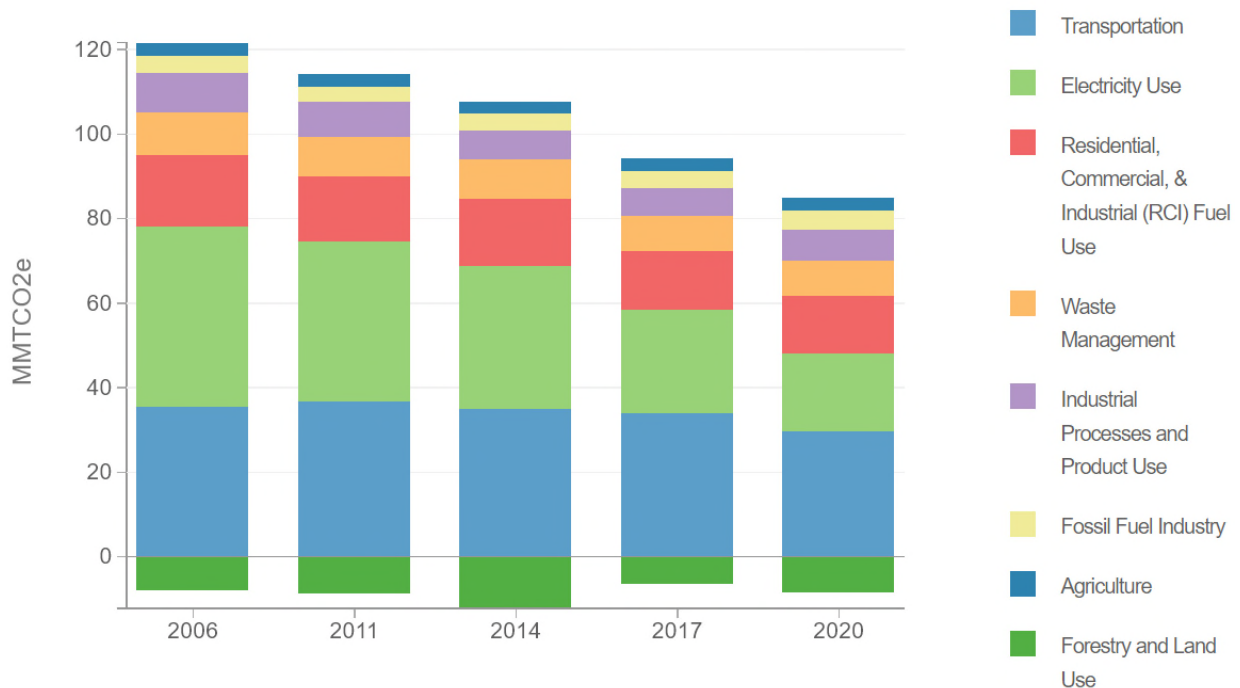
²⁵ https://www.faa.gov/sites/faa.gov/files/about/office_org/headquarters_offices/apl/3-climate.pdf



The Greenhouse Gas Emissions Reduction Act (Maryland Code, Environment Article §2-1203) requires the Department of the Environment to prepare and publish an updated inventory of statewide greenhouse gas emissions on a three-year cycle.

Maryland's greenhouse gas emissions inventory tracks emissions of carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆) occurring in the state and from out-of-state electricity generation consumed in the state. **Figure 1** shows the GHG (CO₂e MMT) emission trends by sector from the latest GHG inventory including the 2006 base year and 2011, 2014, 2017 and 2020 triennial inventories. The data shows there has been a gradual decrease in GHG emissions from the 2006 base year to the most recent 2020 inventory year.

Figure 1 Maryland GHG Emission Trends by Sector 2006 to 2020



Source: <https://mde.maryland.gov/programs/air/climatechange/pages/greenhousegasinventory.aspx>

3.3 Analysis Methodology

For this analysis, GHG emissions were quantified to enable the FAA to make an informed decision whether the Proposed Project would have the potential to cause significant climate change effects. GHG emissions inventories were modeled using MOVES4 for the construction emissions.

The inventories were conducted to provide the estimate of the annual rate of GHG emissions attributable to airport sources (i.e. construction emissions) for the No-Action Alternative and the Proposed Action. The GHG emissions inventories were prepared using the same data and assumptions as developed for the air quality criteria pollutant emissions inventories above.

For this analysis, GHG emissions associated with the Proposed Action were prepared for carbon dioxide, methane, and nitrous oxide and presented as carbon dioxide equivalent (CO₂e) in metric tons per year relevant to their global warming potential. The carbon dioxide equivalent is estimated by taking the mass equivalent of each pollutant (TPY), multiplying by the GWP equivalent of each pollutant, and then adding them together. For example, CO₂ is 1 GWP, CH₄ is 28 GWP, and N₂O is 265 GWP, according to the IPCC Fifth Assessment Report.²⁶

The methodology and assumptions for the GHG analysis are consistent with the air quality analysis discussed in **Section 2.1**. GHG emissions associated with the construction and demolition activities were qualitatively evaluated.

3.4 Environmental Consequences of Proposed Action Alternative

Table 6 presents the annual greenhouse gas emissions for demolition and construction activities associated with the Proposed Action for 2023 thru 2031.

In summary, while there are no significance thresholds established for climate impacts, GHGs associated with the Proposed Action have been calculated in accordance with the latest FAA guidelines (1050.1F) for climate impacts in a NEPA document^{27, 28} and included in the emission spreadsheets in **Appendix A**. As ongoing scientific research works to improve the understanding of aviation's relationship to climate change, FAA guidance will evolve if new federal requirements are established. Given the low percentage of overall emissions generated at State of Maryland GHG inventory, the increase in construction emissions as a result of the project is not substantial on a national or global scale.

Table 6. GHG Emissions Associated with Construction/Demolition and Operations for the Proposed Action

Source: HMMH 2023

Year	Greenhouse Gases (metric tons/year)			CO ₂ e (metric tons/year) <small>Note 2,3</small>
	CO ₂	CH ₄	N ₂ O	
Construction <small>Note 1</small>				
2023	802.3	0.006	0.004	803
2024	1,929	0.03	0.17	1,974
2027	1,862	0.001	0.005	1,864
2028	720	0.003	0.004	721
2029	718	0.003	0.004	719
2030	717	0.003	0.004	718
2031	716	0.003	0.004	717
Notes:				
1. Construction emissions derived from ACEIT and MOVES				
2. GWP values derived from IPC 5th Assessment Report were used in the calculation of CO ₂ e.				
3. Emissions presented in the Table include the GWP for each pollutant.				

²⁶ <https://www.ipcc.ch/assessment-report/ar5/>

²⁷ 1050.1F Desk Reference,
https://www.faa.gov/about/office_org/headquarters_offices/apl/envir_policy_guidance/policy/faa_nepa_order/desk_ref/media/3-climate.pdf

²⁸ FAA Aviation Emissions Air Quality Handbook. Accessed July 2023.
https://www.faa.gov/sites/faa.gov/files/regulations_policies/policy_guidance/envir_policy/airquality_handbook/Air_Quality_Handbook_Tutorial.pdf

3.5 Environmental Consequences of No Action Alternative

The No Action Alternative assumes that the Proposed Action is not implemented, and air quality would remain unchanged for 2023. Therefore, no additional GHG impacts would occur as a result of the No Action case.

3.6 Social Costs of Carbon

The CEQ's *Interim Guidance on Consideration of Greenhouse Gas Emissions and Climate Change* provides direction to better assess and disclose climate impacts. The interim guidance recommends contextualizing greenhouse gas emissions by developing the social cost of carbon dioxide equivalents (SC-CO₂e) for proposed actions.

SC-CO₂e is an estimate of the economic costs of emitting one additional ton of carbon dioxide into the atmosphere, and thus the benefits of reducing emissions. It provides a monetary measure (in U.S. dollars) of the future damages (e.g., changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services) associated with specified quantities of GHG resulting from the Proposed Action. To provide a contextualized monetary measure of the three main greenhouse gases, the social cost of GHG (SC-GHG) was calculated for the CO₂ equivalents (CO₂e) of CO₂, CH₄, and N₂O emissions for the Proposed Action, summarized in **Table 7**. These costs were calculated using the IWG 2021 Technical Support Document (TSD): Social Cost of Carbon, Methane, and Nitrous Oxide developed under EO 13990²⁹.

²⁹ [Technical Support Document: Social Cost of Carbon, Methane, \(whitehouse.gov\)](#)



Table 7. Proposed Action Estimated Social Cost of Carbon Dioxide Equivalents (SC-CO₂e) in U.S. Dollars by IWG Average Discount Rates

Year	Estimated Social Cost by Pollutant (In 2020 Dollars)			
	CO ₂	CH ₄	N ₂ O	Total
2023				
5%	\$12,676.3	\$4.5	\$25.6	\$12,706.4
3%	\$43,324.2	\$9.7	\$79.2	\$43,413.1
2.5%	\$64,344.5	\$12.7	\$115.2	\$64,472.4
3% 95th Percentile	\$130,133.1	\$25.6	\$206.4	\$130,365.0
2024				
5%	\$31,635.6	\$23.2	\$1,122.0	\$32,780.8
3%	\$106,095.0	\$49.8	\$3,468.0	\$109,612.8
2.5%	\$157,406.4	\$64.8	\$4,998.0	\$162,469.2
3% 95th Percentile	\$319,442.4	\$131.4	\$8,976.0	\$328,549.8
2027				
5%	\$33,143.6	\$0.9	\$36.0	\$33,180.5
3%	\$108,740.8	\$1.8	\$109.0	\$108,851.6
2.5%	\$159,014.8	\$2.3	\$156.0	\$159,173.1
3% 95th Percentile	\$328,084.4	\$4.8	\$282.0	\$328,371.2
2028				
5%	\$13,104.0	\$2.7	\$29.6	\$13,136.3
3%	\$42,912.0	\$5.6	\$88.8	\$43,006.4
2.5%	\$62,352.0	\$7.1	\$127.2	\$62,486.3
3% 95th Percentile	\$129,456.0	\$14.8	\$230.4	\$129,701.2
2029				
5%	\$13,354.8	\$2.7	\$30.4	\$13,387.9
3%	\$43,654.4	\$5.8	\$90.4	\$43,750.6
2.5%	\$63,040.4	\$7.3	\$129.6	\$63,177.3
3% 95th Percentile	\$131,681.2	\$15.2	\$235.2	\$131,931.6
2030				
5%	\$13,623.0	\$2.8	\$31.2	\$13,657.0
3%	\$44,454.0	\$6.0	\$92.0	\$44,552.0
2.5%	\$63,813.0	\$7.5	\$132.0	\$63,952.5
3% 95th Percentile	\$134,079.0	\$15.6	\$240.0	\$134,334.6
2031				
5%	\$14,033.6	\$2.9	\$32.2	\$14,068.7
3%	\$45,108.0	\$6.1	\$93.6	\$45,207.7
2.5%	\$64,726.4	\$7.7	\$134.4	\$64,868.5
3% 95th Percentile	\$136,612.8	\$16.1	\$245.6	\$136,874.5

Source: [Technical Support Document: Social Cost of Carbon, Methane, \(whitehouse.gov\)](#)

The SC-GHG_s were calculated using the IWG average discount rates: 5 percent, 3 percent, 2.5 percent and the 95th percentile damage estimate using the 3 percent discount rate interpolated between 2020, 2025, and 2030 to get the years between reflective of the construction period. The 5 percent, 3 percent, and 2.5 percent discount rates reflect the average damages from the multiple simulations at each of the three discount rates. The 95th percentile of damages estimated by applying the 3 percent discount rate reflect higher-than-expected economic impacts from climate change and the associated future economic effects; this is a low probability and high damage scenario that represents an upper bound of damages within the 3% discount rate model. The calculations of social costs for the four discount rates (5%, 3%, 2.5%, and 95th percentile of the 3%) were completed for GHG construction emissions for 2023, 2024 and 2027 thru 2031. The term “discount rate” refers to the reduction or discount in value per year as a future cost or benefit is adjusted to be comparable with a current cost or benefit from a proposed

project. For this analysis, all three discount rates were used to estimate a range of global social costs from the increase in GHG emissions from the Proposed Action.

The social cost of GHG total equivalents is estimated to range from \$12,706 to \$130,365 in 2023, when the Proposed Action begins to \$14,068 and \$136,875 in 2031 at the completion of construction in 2031. This range in costs represents the potential social costs associated with adding GHGs to the atmosphere in a given year. It includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services.

The foregoing social costs are estimates only and are subject to change depending on a variety of factors. They are provided for disclosure and context, but such estimated costs may not actually result.

3.7 Climate Assessment

To evaluate the effects of climate change on a proposed action, two subjective qualitative assessments are performed: (1) the impact of climate change on a proposed action, and (2) the impact of climate change on the action's environmental impacts to address the latest CEQ guidance on GHG and Climate.

The following state and local impacts were discussed for addressing the potential impacts on climate change from the Proposed Action.

3.8 Local Impacts

The US EPA has developed state specific factsheets regarding climate change impacts. The US EPA factsheet for Maryland is presented in **Figure 2** and shows the potential state impacts as follows:

- Saltwater Intrusion
- Homes, and Infrastructure
- Ecosystems
- Fishing and Farms
- Human Health
- Increasing Temperature and Changing Precipitation Patterns
- Rising Seas and Retreating Shores

Figure 2. US EPA Climate Change Impacts for Maryland

Source: https://aqlhelp.com/Documents/CCFactSheets/climate-change-MD_AUG2016.pdf



Saltwater Intrusion

As sea level rises, salt water can mix farther inland or upstream in bays, rivers, and wetlands. Because water on the surface is connected to ground water, salt water can also intrude into aquifers near the coast. Soils may become too salty for the crops and trees that currently grow in low-lying areas.

Homes and Infrastructure

Storms can destroy coastal homes, wash out highways and rail lines, and damage essential communication, energy, and wastewater management infrastructure. In 2003, the storm surge in Chesapeake Bay from Hurricane Isabel flooded downtown Annapolis, North Beach, and several communities on the Eastern Shore, causing about \$400 million in damages. While recent hurricanes have had minimal impacts on Ocean City, about 25 percent of its structures are vulnerable to flooding. On the lower Eastern Shore, communities like Hooper's Island, Smith Island, and parts of Crisfield are so low that water in ditches along the streets rises and falls with the tides. These towns will become more vulnerable to storms and erosion as sea level rises.

Although hurricanes are rare, their wind speeds and rainfall rates are likely to increase as the climate continues to warm. Rising sea level is likely to increase flood insurance rates, while more frequent storms could increase the deductible for wind damage in homeowner insurance policies.



Downtown Annapolis the day after Hurricane Isabel struck the Atlantic coast on September 18, 2003. © James G. Titus; used by permission.

Ecosystems

The loss of tidal marshes could harm fish and birds that depend on a marsh for food or shelter. Small insects and marine organisms that feed in the marsh are a key source of food for crabs, rockfish, and other commercially important fisheries. Striped bass, bluefish, sea trout, and summer flounder also move into and out of the marsh for feeding and shelter. The most vulnerable marshes along Chesapeake Bay are inhabited by great blue heron, bald eagle, American black duck, and snowy egret. The marshes near Ocean City and Assateague Island provide forage for shorebirds, such as sandpipers and plovers, and several species of ducks and geese spend the winter in these marshes.

The loss of bay beaches would remove key habitat for diamondback terrapin that nest on these beaches. Other species that depend on bay beaches include horseshoe crabs, tiger beetles, sand fleas, snails, and several crab species. The loss of those species would remove important sources of food for birds.

Changing temperatures could also disrupt ecosystems. If water temperatures exceed 86°F during summer, eelgrass could be lost. Blue crabs would lose an important hiding place during spring when they are changing shells and vulnerable to predators, and the sea turtles that feed on those crabs in the eelgrass might lose that food source. Wildflowers and woody perennials are blooming—and migratory birds are arriving—sooner in spring. Not all species adjust in the same way, however, so the food that one species needs may no longer be available when that species arrives on its migration.

Fishing and Farms

Parts of Maryland's fishing and agriculture sectors may suffer as the climate changes. Blue crabs and other shellfish are vulnerable to increased acidity in the water, especially during early life stages when acidity impairs their ability to build shells. As sea level rises, the Chesapeake Bay region is expected to lose some of the wetlands that fish and shellfish depend on for nursery grounds. Warmer waters are expected to increase harmful algae, lower oxygen levels, and change the mix of species that thrive in the bay.

Climate change may also pose challenges for agriculture: some farms may be harmed if more hot days and droughts reduce crop yields, or if more flooding and wetter springs delay their planting dates. Other farms may benefit from a longer growing season and the fertilizing effect of carbon dioxide.

Human Health

Hot days can be unhealthy—even dangerous. Certain people are especially vulnerable, including children, the elderly, the sick, and the poor. High air temperatures can cause heat stroke and dehydration, and affect people's cardiovascular and nervous systems. Warmer temperatures can also increase the formation of ground-level ozone, a component of smog that can contribute to respiratory problems. Rising temperatures may also increase the length and severity of the pollen season for plants such as ragweed, which has already been observed in other regions.

The risk of some diseases carried by insects may also increase. The ticks that transmit Lyme disease are active when temperatures are above 45°F, so warmer winters could lengthen the season during which ticks can become infected or people can be exposed to the ticks. The number of cases may or may not increase, depending on what people do to control insect populations and avoid insect bites.

The sources of information about climate and the impacts of climate change in this publication are: the national climate assessments by the U.S. Global Change Research Program, synthesis and assessment products by the U.S. Climate Change Science Program, assessment reports by the Intergovernmental Panel on Climate Change, and EPA's *Climate Change Indicators in the United States*. Mention of a particular season, location, species, or any other aspect of an impact does not imply anything about the likelihood or importance of aspects that are not mentioned. For more information about climate change science, impacts, responses, and what you can do, visit EPA's Climate Change website at www.epa.gov/climatechange.

3.9 Potential Climate Impacts

As stated earlier, there are no defined significance thresholds for aviation GHG emissions, nor has FAA identified any factors to consider in making a significance determination for GHG emissions. Any increases in GHG emissions from construction associated with the Proposed Action would be temporary and essential for implementation of the Proposed Action. The potential impacts of climate change to the Airport as denoted by EPA for Marland in **Figure 2** may be narrowed down based on the location of the airport away from the coast, as such these coastal impacts can be discarded when evaluating potential impacts at the airport environs. Therefore, the potential climate impacts at DMV could include increasing temperature and changing precipitation patterns, homes and infrastructure, ecosystems, fishing farms and human health.

Increases in construction emissions compared to the No Action will be temporary but necessary for the proposed improvements at the airport. However, the increases would comprise a small portion of the state of Maryland 2020 GHG emissions 76.7 million metric tons³⁰ of carbon dioxide equivalent (MMTCO₂e), the US-based emissions of 6,472 million metric tons CO₂e, and even less than the 49 gigatons of carbon dioxide equivalent global GHG emissions.^{31, 32, 33} Based on all this information, no significant impact on GHGs or climate is expected as a result of the Proposed Action.

It should be noted that for this EA, the best available science, data, and rationale for the GHG analysis is based on the interim guidance. FAA's guidance/policy will evolve and change going into the future.

3.10 Mitigation Measures

In the absence of potentially significant impacts, no mitigation measures are proposed. The FAA is developing policies for the aviation industry to reduce GHG and climate impacts including the Aviation Action Plan and the Net Zero Sustainable Aviation System including the Aviation Action Plan, Net Zero Sustainable Aviation System as well as a commitment to a sustainable transportation system which includes;

- Increase the Production of Sustainable Aviation Fuels
- Eliminate Aviation Gasoline Lead Emissions by the End of 2030
- Develop New Aircraft and Engine Technologies
- Increase Operations Efficiency; and
- Reduce Airport Emissions and Improve Fuel Efficiency

³⁰ <https://mde.maryland.gov/programs/air/climatechange/pages/greenhousegasinventory.aspx>

³¹ <https://www.dallasclimateaction.com/ghg-inventory>

³² <https://www.epa.gov/sites/production/files/2019-02/documents/us-ghg-inventory-2019-main-text.pdf>

³³ http://ipcc.ch/publications_and_data/ar4/syr/en/contents.html



Appendix A

Air Emission Spreadsheet Calculations

ID	Year	Project	Construct on Activity	Equipment	MOVES Equipment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Activity	CO2										Exhaust			
											CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO2 (tpy)	NOx (tpy)	SO2 (tpy)		PM10 (tpy)	PM2.5 (tpy)	
1	2023	Access Road	Asphalt Placement	Asphalt Paver	Pavers	Pavers175	Diesel	175	0.59	8.116875	0.204167	0.616608	0.001472	0.050831	0.093232	536.7381	26.04	0.0006	1E-06	SE-05	SE-05	SE-05	0.476	
1	2023	Access Road	Asphalt Placement	Dump Truck	Off-highway Trucks	Rollers100	Diesel	100	0.59	29.232364	0.531766	0.014343	0.081399	0.024356	0.367848	536.7848	76.04	0.0011	1E-06	SE-05	SE-05	SE-05	0.923	
1	2023	Access Road	Asphalt Placement	Other General Equipment	Pickup Truck	Construction Equip	Diesel	175	0.43	16.23375	0.276767	0.711608	0.01504	0.064875	0.062929	536.6756	46.01	0.001	1E-06	SE-05	SE-05	SE-05	0.235	
1	2023	Access Road	Asphalt Placement	Pickup Truck	Off-highway Trucks	Highway Trucks6	Diesel	600	0.59	8.116875	0.071258	0.233604	0.01431	0.014083	0.014359	0.015375	536.7848	26.04	0.0007	1E-06	SE-05	SE-05	SE-05	0.17
1	2023	Access Road	Asphalt Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	8.116875	0.531766	1.364721	0.01614	0.089194	0.031937	0.024272	536.7848	76.04	0.0011	1E-06	SE-05	SE-05	SE-05	0.315
1	2023	Access Road	Asphalt Placement	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders7	Diesel	75	0.21	8.116875	6.555166	5.851869	0.02407	1.050415	0.118083	1.136021	692.0992	0.008	3E-07	1E-04	0.0001	0.008	0.098	
1	2023	Access Road	Asphalt Placement	Infacing Equipment (Grooving)	Construction Equip	Construction Equip	Diesel	25	0.59	18.8866	1.500151	1.65117	0.02143	0.026248	0.026248	536.7848	36.04	0.0008	1E-06	SE-05	SE-05	SE-05	0.091	
1	2023	Access Road	Clearing and Grubbing	Chain Saw	Off-Construction Equip	Construction Equip	Diesel	11	0.17	18	0.276767	0.711608	0.01504	0.064875	0.062929	536.7848	46.01	0.001	1E-06	SE-05	SE-05	SE-05	0.018	
1	2023	Access Road	Clearing and Grubbing	Chipper/Stump Grinder	Off-Construction Equip	Construction Equip	Diesel	100	0.43	18	0.695516	1.434932	0.01617	0.1051	0.101947	0.034705	595.942	66.014	0.0012	1E-06	SE-05	SE-05	SE-05	0.058
1	2023	Access Road	Clearing and Grubbing	Pickup Truck	Off-highway Trucks	Highway Trucks6	Diesel	600	0.59	24	0.071258	0.233604	0.01431	0.014083	0.014359	0.015375	536.7848	76.04	0.0022	1E-06	1E-04	0.001	5.027	
1	2023	Access Road	Curbing	Concrete Truck	Off-highway Trucks	Highway Trucks6	Diesel	600	0.59	23.4	0.071258	0.233604	0.01431	0.014083	0.014359	0.015375	536.7848	76.04	0.0021	1E-06	1E-04	0.001	4.901	
1	2023	Access Road	Curbing	Curb/Gutter Paver	Pavers	Pavers175	Diesel	175	0.59	23.4	0.204167	0.666607	0.01472	0.050831	0.093232	536.7848	76.04	0.0018	1E-06	SE-05	SE-05	SE-05	0.299	
1	2023	Access Road	Other General Equipment	Pickup Truck	Off-Construction Equip	Construction Equip	Diesel	175	0.43	23.4	0.276767	0.711608	0.01504	0.064875	0.062929	536.7848	76.04	0.001	1E-06	SE-05	SE-05	SE-05	0.242	
1	2023	Access Road	Curbing	Pickup Truck	Off-highway Trucks	Highway Trucks6	Diesel	600	0.59	23.4	0.071258	0.233604	0.01431	0.014083	0.014359	0.015375	536.7848	76.04	0.0021	1E-06	1E-04	0.001	4.901	
1	2023	Access Road	Drainage - 24 inch SICPP	Dozer	Crawler Tractor/Dozers	Tractor/Dozer	Diesel	175	0.59	19.01	0.159312	0.496678	0.01455	0.045666	0.039439	0.023566	536.7837	76.04	0.0011	3E-06	SE-05	SE-05	SE-05	1.163
1	2023	Access Road	Drainage - 24 inch SICPP	Dump Truck	Dump Trucks	Highway Trucks6	Diesel	600	0.59	19.01	0.071258	0.233604	0.01431	0.014083	0.014359	0.015375	536.7848	76.04	0.001					

Scenario ID	Year	Project	Equipment	Equipment Category	MOVES Lookup	On road Activity	Fuel	Roadway Type	Round Trip Distance	Distance for fugitive	Number of Veh. cat	Number of Emp. eqs	Number of Pro. eqs	Pro. Length	Pro. Width	Pro. Area	Bu/dg Hg. eq	Open Space Hg. eq	Number of Trees	Activity Rate	VMT	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
1	2023	Access Road	Asphalt 18 Wheeler	Combination Short-haul Truck	Unrestricted Access	Combination Short-haul Truck	Diesel	an Unrestricted Access	40	5	1	--	172	585	100	--	--	--	--	849	2.256	4.304	0.005792	0.082259	0.075678	0.182530052	1726.354	0.021255	0.218758	0.002111	0.004028	5.42E-06	7.7E-05	7.08E-05	0.000171	1.615638	1.99E-05	0.000205	
1	2023	Access Road	Dump Truck - Asphalt	Single Unit Short-haul Truck	Unrestricted Access	Single Unit Short-haul Truck	Diesel	an Unrestricted Access	40	5	1	--	172	585	100	--	--	--	--	1203	1.263	2.015	0.00319	0.060753	0.055892	0.159650385	946.4313	0.016724	0.111772	0.001675	0.002672	4.23E-06	7.41E-05	0.000212	1.255051	2.22E-05	0.000148		
1	2023	Access Road	ump Truck Subbase Mater	Single Unit Short-haul Truck	Unrestricted Access	Single Unit Short-haul Truck	Diesel	an Unrestricted Access	40	5	1	--	172	585	100	--	--	--	--	7215	1.263	2.015	0.00319	0.060753	0.055892	0.159650385	946.4313	0.016724	0.111772	0.010047	0.016026	2.54E-05	0.000483	0.000445	0.00127	7.527174	0.000133	0.000889	
1	2023	Access Road	Passenger Car	Passenger Car	solineUrban Unrestricted Access	Passenger Car	Gasoline	an Unrestricted Access	30	--	78	78	172	--	--	--	--	--	--	402480	3.211	0.158	0.001838	0.002817	0.002492	0.117878579	345.4858	0.011569	0.002256	1.424555	0.070002	0.000816	0.001125	0.001106	0.052298	153.2784	0.005132	0.001001	
2	2023	emolition - Asphalt	Dump Truck	Single Unit Short-haul Truck	Unrestricted Access	Single Unit Short-haul Truck	Diesel	an Unrestricted Access	40	5	1	--	172	612	100	--	--	--	--	13600	1.263	2.015	0.00319	0.060753	0.055892	0.159650385	946.4313	0.016724	0.111772	0.018938	0.030209	4.78E-05	0.000911	0.000838	0.002393	14.18844	0.000251	0.001676	
2	2023	emolition - Asphalt	Passenger Car	Passenger Car	solineUrban Unrestricted Access	Passenger Car	Gasoline	an Unrestricted Access	30	--	11,495	11,495	172	--	--	--	--	--	--	59314	3.211	0.158	0.001838	0.002817	0.002492	0.117878579	345.4858	0.011569	0.002256	0.209939	0.010516	0.00012	0.000184	0.000163	0.007707	22.58884	0.000756	0.000147	
TOTAL																					1.667265	0.133255	0.001019	0.002986	0.002696	0.064051	200.4536	0.006315	0.000606										

Fugitive Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID	Year	Project	Fugitive Source Type	Number of Months	CO	NOx	SO2	PM10	VOC
1	2023	Access Road	Asphalt Drying	8	0	0	0	0	0.071
1	2023	Access Road	Asphalt Storage and Batch	8	0.14155	0.00885	0.001626	0.0097	0.0043835
1	2023	Access Road	Asphalt Movement (Paved Road)	8	0	0	0	0.01195	0
1	2023	Access Road	Asphalt Movement (Unpaved Road)	8	0	0	0	0.0382	0
1	2023	Access Road	Soil Handling	8	0	0	0	0.01655	0
1	2023	Access Road	Stabilized Land and Wind Erosion	8	0	0	0	1.5735E-08	0
2	2023	emolition - Asphalt	Asphalt Movement (Paved Road)	8	0	0	0	0.0039915	0
2	2023	emolition - Asphalt	Asphalt Movement (Unpaved Road)	8	0	0	0	0.0128	0
2	2023	emolition - Asphalt	Soil Handling	8	0	0	0	0.0173	0
2	2023	emolition - Asphalt	Stabilized Land and Wind Erosion	8	0	0	0	1.6465E-08	0
Totals					0.14155	0.00885	0.001626	0.1104915	0.0753835

2023 Totals

Year	Emission Source	CO (TPY)	NOx (TPY)	SO2 (TPY)	PM10 (TPY)	PM2.5 (TPY)	VOC (TPY)	CO2 (MTPY)	CH4 (MTPY)	2D (MTPY)	2Dz (MTPY)
2023	NonRoad	0.126191021	0.361917332	0.001830467	0.02535277	0.024592168	0.026631	883.9628398	--	--	--
2023	OnRoad	1.657265386	0.133254814	0.001018588	0.002985566	0.002695976	0.064051	200.4533636	0.006314676	--	0.004066
2023	Fugitive	0.14155	0.14155	0.001626	0.1104915	--	0.075384	--	--	--	--
2023	TOTAL	1.935006387	0.636002147	0.004475035	0.138829835	0.027288145	0.166065	802.329313	0.005728579	0.003688	803

INPUT DATA AND SPECIFICATIONS

State/County

Maryland

Carroll County

Project Final Selections

Scenario ID Project Construction Act Equipment Fuel Type

- 1 Access RtoAsphalt Placeme Asphalt Paver Diesel
- 1 Access RtoAsphalt Placeme Dump Truck Diesel
- 1 Access RtoAsphalt Placeme Other General Equipment Diesel
- 1 Access RtoAsphalt Placeme Pickup Truck Diesel
- 1 Access RtoAsphalt Placeme Roller Diesel
- 1 Access RtoAsphalt Placeme Skid Steer Loader Diesel
- 1 Access RtoAsphalt Placeme Surfacing Equipment (Gro) Diesel
- 1 Access RtoClearing and Gr Chain Saw Diesel
- 1 Access RtoClearing and Gr Chipper/Stump Grinder Diesel
- 1 Access RtoClearing and Gr Pickup Truck Diesel
- 1 Access RtoCurbing Concrete Truck Diesel
- 1 Access RtoCurbing Curb/Gutter Paver Diesel
- 1 Access RtoCurbing Other General Equipment Diesel
- 1 Access RtoCurbing Pickup Truck Diesel
- 1 Access RtoDrainage - 24 Inc Dozer Diesel
- 1 Access RtoDrainage - 24 Inc Dump Truck Diesel
- 1 Access RtoDrainage - 24 Inc Excavator Diesel
- 1 Access RtoDrainage - 24 Inc Loader Diesel
- 1 Access RtoDrainage - 24 Inc Other General Equipment Diesel
- 1 Access RtoDrainage - 24 Inc Pickup Truck Diesel
- 1 Access RtoDrainage - 24 Inc Roller Diesel
- 1 Access RtoDrainage - 6 inch Dump Truck Diesel
- 1 Access RtoDrainage - 6 inch Loader Diesel
- 1 Access RtoDrainage - 6 inch Other General Equipment Diesel
- 1 Access RtoDrainage - 6 inch Pickup Truck Diesel
- 1 Access RtoDrainage - 6 inch Tractor/Loader/Backhoe Diesel
- 1 Access RtoDust Control Water Truck Diesel
- 1 Access RtoExcavation (Borr) Dozer Diesel
- 1 Access RtoExcavation (Borr) Dump Truck (12 cy) Diesel
- 1 Access RtoExcavation (Borr) Pickup Truck Diesel
- 1 Access RtoExcavation (Borr) Roller Diesel
- 1 Access RtoExcavation (Cut) Dozer Diesel
- 1 Access RtoExcavation (Cut) Dump Truck (12 cy) Diesel
- 1 Access RtoExcavation (Cut) Excavator Diesel
- 1 Access RtoExcavation (Cut) Pickup Truck Diesel
- 1 Access RtoExcavation (Cut) Roller Diesel
- 1 Access RtoExcavation (Cut) Scraper Diesel
- 1 Access RtoExcavation (Top) Dozer Diesel
- 1 Access RtoFencing Concrete Truck Diesel
- 1 Access RtoFencing Dump Truck Diesel
- 1 Access RtoFencing Other General Equipment Diesel
- 1 Access RtoFencing Pickup Truck Diesel
- 1 Access RtoFencing Skid Steer Loader Diesel
- 1 Access RtoFencing Tractors/Loader/Backhoe Diesel
- 1 Access RtoGrading Dozer Diesel
- 1 Access RtoGrading Grader Diesel
- 1 Access RtoGrading Roller Diesel
- 1 Access RtoHydroseeding Hydroseeder Diesel
- 1 Access RtoHydroseeding Off-Road Truck Diesel
- 1 Access RtoMarkings Flatbed Truck Diesel
- 1 Access RtoMarkings Other General Equipment Diesel
- 1 Access RtoMarkings Pickup Truck Diesel
- 1 Access RtoSidewalks Concrete Truck Diesel
- 1 Access RtoSidewalks Dump Truck Diesel
- 1 Access RtoSidewalks Pickup Truck Diesel
- 1 Access RtoSidewalks Tractors/Loader/Backhoe Diesel
- 1 Access RtoSidewalks Vibratory Compactor Diesel
- 1 Access RtoSoil Erosion/Sed Other General Equipment Diesel
- 1 Access RtoSoil Erosion/Sed Pickup Truck Diesel
- 1 Access RtoSoil Erosion/Sed Pumps Diesel
- 1 Access RtoSoil Erosion/Sed Tractors/Loader/Backhoe Diesel
- 1 Access RtoStreet Lighting Dump Truck Diesel
- 1 Access RtoStreet Lighting Loader Diesel
- 1 Access RtoStreet Lighting Other General Equipment Diesel
- 1 Access RtoStreet Lighting Pickup Truck Diesel
- 1 Access RtoStreet Lighting Skid Steer Loader Diesel
- 1 Access RtoStreet Lighting Tractors/Loader/Backhoe Diesel
- 1 Access RtoSubbase Placem Dozer Diesel
- 1 Access RtoSubbase Placem Dump Truck (12 cy) Diesel
- 1 Access RtoSubbase Placem Pickup Truck Diesel

*** GASOLINE DATA USED, DIESEL DATA NOT AVAILABLE ***

1	Access RoSubbase Placem	Roller	Diesel
1	Access RoTopsoil Placeme	Dozer	Diesel
1	Access RoTopsoil Placeme	Dump Truck	Diesel
1	Access RoTopsoil Placeme	Pickup Truck	Diesel
1	Access RoTree Planting	Flatbed Truck	Diesel
1	Access RoTree Planting	Other General Equipment	Diesel
1	Access RoTree Planting	Pickup Truck	Diesel
1	Access RoTree Planting	Tractors/Loader/Backhoe	Diesel
2	Demolition Asphalt Demoliti	Dozer	Diesel
2	Demolition Asphalt Demoliti	Excavator	Diesel
2	Demolition Asphalt Demoliti	Pickup Truck	Diesel

Overall Size

Scenario I	Project	Project Size	Que User Input	Unit
1	Access RoWhat is the estim	1.5	\$ Million(s)	
1	Access RoWhat is the maxi	585	Feet	
1	Access RoWhat is the maxi	100	Feet	
2	Demolition What is the estim	1.045	\$ Million(s)	
2	Demolition What is the maxi	612	Feet	
2	Demolition What is the maxi	100	Feet	

Size Detail (Estimated based on engineering experience)

Scenario I	Project	Construction Act	Default Activity	Size	Unit
1	Access RoAsphalt Placeme			6493.5	Square Yards
1	Access RoClearing and Gru			1.5	Acres
1	Access RoCurbing			1170	Linear Feet
1	Access RoDrainage - 24 Inc			595	Linear Feet
1	Access RoDrainage - 6 inch			1190	Linear Feet
1	Access RoDust Control			240	Days
1	Access RoExcavation (Borr			2705.6	Cubic Yards
1	Access RoExcavation (Cut 1			2705.6	Cubic Yards
1	Access RoExcavation (Topi			6493.5	Square Yards
1	Access RoFencing			585	Linear Feet
1	Access RoGrading			7265	Square Yards
1	Access RoHydroseeding			65450	Square Feet
1	Access RoMarkings			58500	Square Feet
1	Access RoSidewalks			3510	Square Feet
1	Access RoSoil Erosion/Sedi			1.5	Acres
1	Access RoStreet Lighting			5.9	Lights
1	Access RoSubbase Placem			6493.5	Square Yards
1	Access RoSubbase Placem			2164.5	Cubic Yards
1	Access RoTopsoil Placeme			1210.8	Cubic Yards
1	Access RoTree Planting			0	Trees
2	Demolition Asphalt Demoliti			61200	Square Feet

User Activity Size

Activity: Non-Road (Estimated based on engineering experience)

Scenario I	Project	Construction Act	Equipment	Fuel Type	Activity Siz	Activity Rate	Default Activity	Activity Usr	User Activity Data
1	Access RoAsphalt Placeme	Asphalt Paver		Diesel	6493.50	518 Hours per 64		8.12	hours
1	Access RoAsphalt Placeme	Dump Truck		Diesel	6493.50	518 Hours per 11		29.23	hours
1	Access RoAsphalt Placeme	Other General Equipment		Diesel	6493.50	5116 Hours per 1		16.23	hours
1	Access RoAsphalt Placeme	Pickup Truck		Diesel	6493.50	518 Hours per 64		8.12	hours
1	Access RoAsphalt Placeme	Roller		Diesel	6493.50	518 Hours per 64		8.12	hours
1	Access RoAsphalt Placeme	Skid Steer Loader		Diesel	6493.50	518 Hours per 64		8.12	hours
1	Access RoAsphalt Placeme	Surfacing Equipment (Gro		Diesel	6493.50	518 Hours per 91		10.39	hours
1	Access RoClearing and Gru	Chain Saw		Diesel	1.50	Acres 12 Hours per 1		18	hours
1	Access RoClearing and Gru	Chipper/Stump Grinder		Diesel	1.50	Acres 12 Hours per 1		18	hours
1	Access RoClearing and Gru	Pickup Truck		Diesel	1.50	Acres 16 Hours per 1		24	hours
1	Access RoCurbing	Concrete Truck		Diesel	1170.00	118 Hours per 41		23.4	hours
1	Access RoCurbing	Curb/Gutter Paver		Diesel	1170.00	118 Hours per 41		23.4	hours
1	Access RoCurbing	Other General Equipment		Diesel	1170.00	118 Hours per 41		23.4	hours
1	Access RoCurbing	Pickup Truck		Diesel	1170.00	118 Hours per 41		23.4	hours
1	Access RoDrainage - 24 Inc	Dozer		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Dump Truck		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Excavator		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Loader		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Other General Equipment		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Pickup Truck		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 24 Inc	Roller		Diesel	595.00	118 Hours per 21		19.04	hours
1	Access RoDrainage - 6 inch	Dump Truck		Diesel	1190.00	118 Hours per 91		10.58	hours
1	Access RoDrainage - 6 inch	Loader		Diesel	1190.00	118 Hours per 91		10.58	hours
1	Access RoDrainage - 6 inch	Other General Equipment		Diesel	1190.00	118 Hours per 91		10.58	hours
1	Access RoDrainage - 6 inch	Pickup Truck		Diesel	1190.00	118 Hours per 91		10.58	hours
1	Access RoDrainage - 6 inch	Tractors/Loader/Backhoe		Diesel	1190.00	118 Hours per 91		10.58	hours
1	Access RoDust Control	Water Truck		Diesel	240.00	248 Hours per 11		19.02	hours
1	Access RoExcavation (Borr	Dozer		Diesel	2705.60	218 Hours per 61		36.07	hours
1	Access RoExcavation (Borr	Dump Truck (12 cy)		Diesel	2705.60	218 Hours per 61		36.07	hours
1	Access RoExcavation (Borr	Pickup Truck		Diesel	2705.60	218 Hours per 61		36.07	hours
1	Access RoExcavation (Borr	Roller		Diesel	2705.60	218 Hours per 11		16.65	hours
1	Access RoExcavation (Cut 1	Dozer		Diesel	2705.60	218 Hours per 81		27.06	hours
1	Access RoExcavation (Cut 1	Dump Truck (12 cy)		Diesel	2705.60	218 Hours per 31		72.15	hours
1	Access RoExcavation (Cut 1	Excavator		Diesel	2705.60	218 Hours per 11		21.64	hours
1	Access RoExcavation (Cut 1	Pickup Truck		Diesel	2705.60	218 Hours per 11		21.64	hours
1	Access RoExcavation (Cut 1	Roller		Diesel	2705.60	218 Hours per 11		21.64	hours
1	Access RoExcavation (Cut 1	Scraper		Diesel	2705.60	218 Hours per 81		27.06	hours
1	Access RoExcavation (Top	Dozer		Diesel	6493.50	518 Hours per 51		10.19	hours
1	Access RoFencing	Concrete Truck		Diesel	585.00	118 Hours per 11		6.5	hours
1	Access RoFencing	Dump Truck		Diesel	585.00	118 Hours per 11		26	hours
1	Access RoFencing	Other General Equipment		Diesel	585.00	118 Hours per 11		26	hours
1	Access RoFencing	Pickup Truck		Diesel	585.00	118 Hours per 11		26	hours
1	Access RoFencing	Skid Steer Loader		Diesel	585.00	118 Hours per 11		26	hours
1	Access RoFencing	Tractors/Loader/Backhoe		Diesel	585.00	118 Hours per 11		26	hours
1	Access RoGrading	Dozer		Diesel	7265.00	518 Hours per 81		7.27	hours
1	Access RoGrading	Grader		Diesel	7265.00	518 Hours per 81		7.27	hours
1	Access RoGrading	Roller		Diesel	7265.00	518 Hours per 81		7.27	hours
1	Access RoHydroseeding	Hydroseeder		Diesel	65450.00	18 Hours per 81		6.55	hours
1	Access RoHydroseeding	Off-Road Truck		Diesel	65450.00	18 Hours per 81		6.55	hours
1	Access RoMarkings	Flatbed Truck		Diesel	58500.00	18 Hours per 31		133.71	hours
1	Access RoMarkings	Other General Equipment		Diesel	58500.00	18 Hours per 31		133.71	hours
1	Access RoMarkings	Pickup Truck		Diesel	58500.00	18 Hours per 31		133.71	hours
1	Access RoSidewalks	Concrete Truck		Diesel	3510.00	518 Hours per 61		46.8	hours
1	Access RoSidewalks	Dump Truck		Diesel	3510.00	518 Hours per 61		46.8	hours
1	Access RoSidewalks	Pickup Truck		Diesel	3510.00	518 Hours per 61		46.8	hours
1	Access RoSidewalks	Tractors/Loader/Backhoe		Diesel	3510.00	518 Hours per 61		46.8	hours
1	Access RoSidewalks	Vibratory Compactor		Diesel	3510.00	518 Hours per 61		46.8	hours
1	Access RoSoil Erosion/Sedi	Other General Equipment		Diesel	1.50	Acres 4 Hours per 11		6	hours
1	Access RoSoil Erosion/Sedi	Pickup Truck		Diesel	1.50	Acres 8 Hours per 11		12	hours
1	Access RoSoil Erosion/Sedi	Pumps		Diesel	1.50	Acres 4 Hours per 11		6	hours
1	Access RoSoil Erosion/Sedi	Tractors/Loader/Backhoe		Diesel	1.50	Acres 4 Hours per 11		6	hours
1	Access RoStreet Lighting	Dump Truck		Diesel	5.90	Lights8 Hours per 31		15.73	hours
1	Access RoStreet Lighting	Loader		Diesel	5.90	Lights8 Hours per 31		15.73	hours
1	Access RoStreet Lighting	Other General Equipment		Diesel	5.90	Lights8 Hours per 31		15.73	hours

1	Access RoStreet Lighting	Pickup Truck	Diesel	5.90 Lights8 Hours per 3.	15.73 hours
1	Access RoStreet Lighting	Skid Steer Loader	Diesel	5.90 Lights8 Hours per 3.	15.73 hours
1	Access RoStreet Lighting	Tractors/Loader/Backhoe	Diesel	5.90 Lights8 Hours per 3.	15.73 hours
1	Access RoSubbase Placem Dozer		Diesel	6493.50 518 Hours per 3f	13.67 hours
1	Access RoSubbase Placem Dump Truck (12 cy)		Diesel	2164.50 C18 Hours per 3f	96.2 hours
1	Access RoSubbase Placem Pickup Truck		Diesel	6493.50 518 Hours per 3f	13.67 hours
1	Access RoSubbase Placem Roller		Diesel	2164.50 C18 Hours per 1f	13.32 hours
1	Access RoTopsoil PlacemeDozer		Diesel	1210.80 C18 Hours per 6f	16.14 hours
1	Access RoTopsoil Placeme Dump Truck		Diesel	1210.80 C18 Hours per 6f	16.14 hours
1	Access RoTopsoil PlacemePickup Truck		Diesel	1210.80 C18 Hours per 6f	16.14 hours
1	Access RoTree Planting	Flatbed Truck	Diesel	0.00 Trees 8 Hours per 1f	0 hours
1	Access RoTree Planting	Other General Equipment	Diesel	0.00 Trees 8 Hours per 1f	0 hours
1	Access RoTree Planting	Pickup Truck	Diesel	0.00 Trees 8 Hours per 1f	0 hours
1	Access RoTree Planting	Tractors/Loader/Backhoe	Diesel	0.00 Trees 8 Hours per 1f	0 hours
2	DemolitionAsphalt Demoliti Dozer		Diesel	61200.00 18 Hours per 8f	61.2 hours
2	DemolitionAsphalt Demoliti Excavator		Diesel	61200.00 18 Hours per 8f	61.2 hours
2	DemolitionAsphalt DemolitiPickup Truck		Diesel	61200.00 18 Hours per 4f	122.4 hours

Activity: On-Road (Estimated based on engineering experience)

Scenario	I	Project	Equipment	On-road Activity	Fuel	Roadway TRound Trip Dis Number of Employment Number o Project LeProject W Project An Building HOpen Spac Number oActivity SizActivity Default 1 User VMT																					
1	Access Ro	Asphalt 18 Whe	Material Delivery	Diesel	Urban Unr	40	--	172	585	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	849
1	Access Ro	Dump Truck - As	Material Delivery	Diesel	Urban Unr	40	--	172	585	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1203
1	Access Ro	Dump Truck Sub	Material Delivery	Diesel	Urban Unr	40	--	172	585	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7215
1	Access Ro	Passenger Car	Employee Commute	Gasoline	Urban Unr	30	--	78	172	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	402480
2	Demolition	Dump Truck	Material Delivery	Diesel	Urban Unr	40	--	172	612	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13600
2	Demolition	Passenger Car	Employee Commute	Gasoline	Urban Unr	30	11.495	172	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	59314

Emission Factor: Non-Road (from NONROAD)

Item	Project	Construction Activity	Fuel Type	Av	g	Rated	Load	Factor	CO (g/hp-hr)	NOx (g/hp-hr)	CO2 (g/hp-hr)	SO2 (g/hp-hr)	PM10 (g/hp-hr)	PM2.5 (g/hp-hr)	VOC Exha (g/VOC-hr)	VOC Evaporative (g/equipment-day)
1	Access RoAsphalt Placeme	Asphalt Paver	Diesel	175	0.59	0.22065441	0.486861	536.3942	0.002648	0.033239	0.030579	0.144017	0.054559			
1	Access RoAsphalt Placeme	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoAsphalt Placeme	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoAsphalt Placeme	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoAsphalt Placeme	Roller	Diesel	100	0.59	0.667747282	0.643142	595.7042	0.00296	0.053948	0.049632	0.149373	0.050617			
1	Access RoAsphalt Placeme	Skid Steer Loader	Diesel	75	0.21	3.406589232	4.219468	694.0884	0.00404	0.474343	0.436396	0.630536	0.335982			
1	Access RoAsphalt Placeme	Surfacing Equipment (Gro	Diesel	25	0.59	2.354913682	4.461222	594.7306	0.004009	0.35345	0.325174	0.470795	0			
1	Access RoCleaning and Gru	Chain Saw	Diesel	11	0.7	293.5350094	1.322993	685.9964	0.140192	9.748189	8.968334	61.88836	26.30746	*** GASOLINE DATA USED, DIESEL DATA NOT AVAILABLE ***		
1	Access RoCleaning and Gru	Chipper/Sum	Grinder	Diesel	100	0.43	1.34957616	2.337535	589.5146	0.003332	0.222084	0.204317	0.281997	0.298611		
1	Access RoCleaning and Gru	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoCurbing	Concrete Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoCurbing	Curb/Gutter Paver	Diesel	175	0.59	0.22065441	0.486861	536.3942	0.002648	0.033239	0.030579	0.144017	0.054559			
1	Access RoCurbing	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoCurbing	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoDrainage - 24 inc	Dozer	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoDrainage - 24 inc	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoDrainage - 24 inc	Excavator	Diesel	175	0.59	0.160622525	0.343675	536.4064	0.002603	0.015938	0.014663	0.140006	0.015774			
1	Access RoDrainage - 24 inc	Loader	Diesel	175	0.59	0.243065844	0.571426	536.3872	0.002665	0.039376	0.036226	0.146333	0.069428			
1	Access RoDrainage - 24 inc	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoDrainage - 24 inc	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoDrainage - 24 inc	Roller	Diesel	100	0.59	0.667747282	0.643142	595.7042	0.00296	0.053948	0.049632	0.149373	0.050617			
1	Access RoDrainage - 6 inch	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoDrainage - 6 inch	Loader	Diesel	175	0.59	0.243065844	0.571426	536.3872	0.002665	0.039376	0.036226	0.146333	0.069428			
1	Access RoDrainage - 6 inch	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoDrainage - 6 inch	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoDrainage - 6 inch	Tractors/Loader/Backhoe	Diesel	100	0.21	3.090042172	2.246349	694.6279	0.00386	0.396118	0.364429	0.452424	0.486595			
1	Access RoDust Control	Water Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Borr	Dozer	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoExcavation (Borr	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Borr	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Borr	Roller	Diesel	100	0.59	0.667747282	0.643142	595.7042	0.00296	0.053948	0.049632	0.149373	0.050617			
1	Access RoExcavation (Cut	Dozer	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoExcavation (Cut	Dump Truck (12 cy)	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Cut	Excavator	Diesel	175	0.59	0.160622525	0.343675	536.4064	0.002603	0.015938	0.014663	0.140006	0.015774			
1	Access RoExcavation (Cut	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Cut	Roller	Diesel	100	0.59	0.667747282	0.643142	595.7042	0.00296	0.053948	0.049632	0.149373	0.050617			
1	Access RoExcavation (Cut	Scraper	Diesel	600	0.59	0.304836944	0.805747	536.3926	0.002711	0.040032	0.036829	0.144541	0.234411			
1	Access RoExcavation (Top	Dozer	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoExcavation (Top	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Top	General Equipment	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Top	Pickup Truck	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoExcavation (Top	Skid Steer Loader	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoExcavation (Top	Tractors/Loader/Backhoe	Diesel	75	0.21	3.406589232	4.219468	694.0884	0.00404	0.474343	0.436396	0.630536	0.335982			
1	Access RoGrading	Dozer	Diesel	100	0.21	3.090042172	2.246349	694.6279	0.00386	0.396118	0.364429	0.452424	0.486595			
1	Access RoGrading	Grader	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoGrading	Grader	Diesel	300	0.59	0.141229838	0.377992	536.4054	0.002607	0.015089	0.013882	0.140314	0.031536			
1	Access RoGrading	Roller	Diesel	100	0.59	0.667747282	0.643142	595.7042	0.00296	0.053948	0.049632	0.149373	0.050617			
1	Access RoHydroseeding	Hydroseeder	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoHydroseeding	Off-Road Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoMarkings	Flatbed Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoMarkings	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoMarkings	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSidewalks	Concrete Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSidewalks	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSidewalks	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSidewalks	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSidewalks	Tractors/Loader/Backhoe	Diesel	100	0.21	3.090042172	2.246349	694.6279	0.00386	0.396118	0.364429	0.452424	0.486595			
1	Access RoSoil Erosion/Sed	Vibratory Compactor	Diesel	6	0.43	4.455143353	4.348807	588.5693	0.003968	0.360111	0.331302	0.593991	0.001978			
1	Access RoSoil Erosion/Sed	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoSoil Erosion/Sed	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSoil Erosion/Sed	Pumps	Diesel	11	0.43	4.450283448	4.23016	588.5275	0.003967	0.372388	0.342597	0.607792	0.005149			
1	Access RoSoil Erosion/Sed	Tractors/Loader/Backhoe	Diesel	100	0.21	3.090042172	2.246349	694.6279	0.00386	0.396118	0.364429	0.452424	0.486595			
1	Access RoStreet Lighting	Dump Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoStreet Lighting	Loader	Diesel	175	0.59	0.243065844	0.571426	536.3872	0.002665	0.039376	0.036226	0.146333	0.069428			
1	Access RoStreet Lighting	Other General Equipment	Diesel	175	0.43	0.224268292	0.806122	530.5789	0.002706	0.047735	0.043917	0.153062	0.091472			
1	Access RoStreet Lighting	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoStreet Lighting	Skid Steer Loader	Diesel	75	0.21	3.406589232	4.219468	694.0884	0.00404	0.474343	0.436396	0.630536	0.335982			
1	Access RoStreet Lighting	Tractors/Loader/Backhoe	Diesel	100	0.21	3.090042172	2.246349	694.6279	0.00386	0.396118	0.364429	0.452424	0.486595			
1	Access RoSubbase Placem	Dozer	Diesel	175	0.59	0.188493836	0.40593	536.4022	0.002624	0.024173	0.022239	0.141377	0.033998			
1	Access RoSubbase Placem	Dump Truck (12 cy)	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSubbase Placem	Pickup Truck	Diesel	600	0.59	0.149744062	0.333662	536.4083	0.002595	0.011947	0.010991	0.139381	0.028083			
1	Access RoSubbase Placem	Roller	Diesel	100												

Scenario	Project	Typ	Equipment	Fuel Type	Roadway Type	CO(g/mi)	NOx(g/mi)	CO2(g/mi)	SO2(g/mi)	PM10(g/m	PM2.5(g/nCH4(g/mi)	N2O(g/mi)	VOC(g/mi)	RV	CO(g/vr	NOx(g/	RV	CO2	RV	SO2(j	RV	PM	RV	PM	RV	VOC	RP	VOC(g/veh-day)
1	Access Ro	Asphalt	Drying	AR = Application rate of li	Urban Unrestricted Access	0.458112	1.517676604	2511.529466	0.017187	0.037635	0.036507	0.090538	0.072776	0.003464	22.50902	0.393596	296.6	0.002	1E-04	1E-04	6.8801	0						
1	Access Ro	Dump Truck	- As Diesel		Urban Unrestricted Access	0.405184	0.908986195	1376.830853	0.009422	0.01713	0.016617	0.067297	0.07126	0.003464	23.25207	0.144401	282.1	0.0019	1E-04	1E-04	5.7777	0						
1	Access Ro	Dump Truck	Sub Diesel		Urban Unrestricted Access	0.405184	0.908986195	1376.830853	0.009422	0.01713	0.016617	0.067297	0.07126	0.003464	23.25207	0.144401	282.1	0.0019	1E-04	1E-04	5.7777	0						
1	Access Ro	Passenger Car	Gasoline		Urban Unrestricted Access	2.073621	0.083591748	343.120272	0.004813	0.004321	0.003978	0.050516	0.004531	0.001668	25.33661	1.397515	268.5	0.0038	0.033	0.03	5.2187	0						
2	Demolition	Dump Truck	Diesel		Urban Unrestricted Access	0.405184	0.908986195	1376.830853	0.009422	0.01713	0.016617	0.067297	0.07126	0.003464	23.25207	0.144401	282.1	0.0019	1E-04	1E-04	5.7777	0						
2	Demolition	Passenger Car	Gasoline		Urban Unrestricted Access	2.073621	0.083591748	343.120272	0.004813	0.004321	0.003978	0.050516	0.004531	0.001668	25.33661	1.397515	268.5	0.0038	0.033	0.03	5.2187	0						

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario	Project	Fugitive Type	Variable	Default Values	Units	User Value
1	Access Ro	Asphalt Drying	A = Area of land affected +	5434.7	m2	
1	Access Ro	Asphalt Drying	AR = Application rate of li	1.811	l/m2	
1	Access Ro	Asphalt Drying	VD = Volume fraction of d	0.35	fraction	
1	Access Ro	Asphalt Drying	EF = Mass fraction of dilu	0.7	fraction	
1	Access Ro	Asphalt Drying	D = Density of solvent utl	1.8	lbs/l	
1	Access Ro	Asphalt Drying	VOC = A x AR x VD x EF x C	4340.4	lbs	142
1	Access Ro	Asphalt Storage	T = Mass of asphalt loader	707	tons	
1	Access Ro	Asphalt Storage	PM10 = (0.027 + 0.00042)	19.4	lbs	
1	Access Ro	Asphalt Storage	CO = (0.4 + 0.0004) x T	283.1	lbs	
1	Access Ro	Asphalt Storage	NOx = (0.025) x T	17.7	lbs	
1	Access Ro	Asphalt Storage	SOx = (0.0046) x T	3.252	lbs	
1	Access Ro	Asphalt Storage	VOC = (0.0082 + 0.0042) x	8.767	lbs	
1	Access Ro	Material Movem	s = Surface material silt co	0.043	fraction	
1	Access Ro	Material Movem	Wt. = Mean vehicle weigh	32	tons	
1	Access Ro	Material Movem	VT = Vehicle miles trave	2789.9	miles	
1	Access Ro	Material Movem	PM10 = 1.5 x [(s/12)*0.9]	76.4	lbs	
1	Access Ro	Material Movem	sL = Road surface silt load	0.1	g/m3	
1	Access Ro	Material Movem	Wt. = Mean vehicle weigh	32	tons	
1	Access Ro	Material Movem	VT = Vehicle miles trave	2580	miles	
1	Access Ro	Material Movem	PM10 = 0.0022 x (sL*0.91)	23.9	lbs	
1	Access Ro	Unstabilized Lan	A = Area affected = L x Wj	1.343	acres	
1	Access Ro	Unstabilized Lan	TPConv = TSP/PM10 conv	0.5	fraction	
1	Access Ro	Unstabilized Lan	CE = Control efficiency	0.63	fraction	
1	Access Ro	Unstabilized Lan	t = year (e.g. 0.65 year)	0.667	years	
1	Access Ro	Unstabilized Lan	PM10 = 0.38 x A x TPCov	0	lbs	
1	Access Ro	Soil Handling	u = Wind speed	5	mph	
1	Access Ro	Soil Handling	m = Moisture content	0.25	fraction	
1	Access Ro	Soil Handling	T = Mass of aggregate sto	1608.8	tons	
1	Access Ro	Soil Handling	PM10 = T x 0.35 x 0.0032 x	33.1	lbs	
2	Demolition	Soil Handling	u = Wind speed	5	mph	
2	Demolition	Soil Handling	m = Moisture content	0.25	fraction	
2	Demolition	Soil Handling	T = Mass of aggregate sto	1683	tons	
2	Demolition	Soil Handling	PM10 = T x 0.35 x 0.0032 x	34.6	lbs	
2	Demolition	Unstabilized Lan	A = Area affected = L x Wj	1.405	acres	
2	Demolition	Unstabilized Lan	TPConv = TSP/PM10 conv	0.5	fraction	
2	Demolition	Unstabilized Lan	CE = Control efficiency	0.63	fraction	
2	Demolition	Unstabilized Lan	t = year (e.g. 0.65 year)	0.667	years	
2	Demolition	Unstabilized Lan	PM10 = 0.38 x A x TPCov	0	lbs	
2	Demolition	Material Movem	s = Surface material silt co	0.043	fraction	
2	Demolition	Material Movem	Wt. = Mean vehicle weigh	32	tons	
2	Demolition	Material Movem	VT = Vehicle miles trave	936.5	miles	
2	Demolition	Material Movem	PM10 = 1.5 x [(s/12)*0.9]	25.6	lbs	
2	Demolition	Material Movem	sL = Road surface silt load	0.1	g/m3	
2	Demolition	Material Movem	Wt. = Mean vehicle weigh	32	tons	
2	Demolition	Material Movem	VT = Vehicle miles trave	860	miles	
2	Demolition	Material Movem	PM10 = 0.0022 x (sL*0.91)	7.983	lbs	

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)

Delivery of Tanks (3)
Distributing Tanker
Dozer
Dump Truck
Dump Truck (12 cy)
Excavator
Excavator for U/G Services/Tanks
Flat Bed or Dump Trucks
Flatbed Truck
Grader
Grout Wheel Truck
Hoist Equipment with 40 Ton Rig
Hydraulic Hammer
Hydroseeder
Line Painting Truck and Sprayer
Material Deliveries
Off-Road Truck
Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Deliveries
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Hoist- Curbs Del & Place
Tractor Trailer with Boom Hoist- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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STUDY

Study Name

DMV Runway Rehab

Study Description

Construction 2024

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID	Year	Project	Instruction	Activity	Equipment	MOVES Equipment	MOVES Lookup	Fuel	HP	Average	Load Factors of Act	MOVES4 Emissions on Factors (g hp hr)										NONROAD Emissions (TPY)							
												CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO (tpy)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)	VOC (tpy)	CO2 Exhaust (tpy)				
												3	5	8	6	7	10	2											
1	2024	Work - 1000	Construction Mob & L	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0002	0.00075	6E-06	5E-05	5E-05	2E-05	2.09467					
1	2024	Work - 1000	Construction Mob & L	Tractor Trailers Temp Fac.	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	4	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	8E-05	0.0003	2E-06	2E-05	2E-05	2E-05	0.83787					
1	2024	Work - 1000	Remove Tree	Bulldozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	40	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0005	0.00179	7E-06	0.0001	0.0001	8E-05	2.44372					
1	2024	Work - 1000	Remove Tree	Chain Saws	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.7	40	2.47778	4.1837	0.0022	0.2419	0.23462	0.8375	593.76	0.0008	0.00142	7E-07	8E-05	8E-05	0.0003	0.20159					
1	2024	Work - 1000	Remove Tree	Flat Bed or Dump Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	80	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0017	0.006	4E-05	0.0004	0.0004	0.0004	16.7573					
1	2024	Work - 1000	Remove Tree	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	40	2.77966	2.8619	0.0021	0.4426	0.42928	0.5362	694.42	0.0026	0.00265	2E-06	0.0004	0.0004	0.0005	0.64299					
1	2024	Work - 1000	Remove Tree	Grub the site down 2'-0	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	40	0.32926	2.5796	0.0016	0.031	0.03011	0.1008	595.86	0.0003	0.00268	2E-06	3E-05	3E-05	0.0001	0.62004					
1	2024	Work - 1000	Remove Tree	Log Chipper	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0001	1.12997					
1	2024	Work - 1000	Remove Tree	Mulcher	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0001	1.12997					
1	2024	Work - 1000	Remove Tree	Ten Wheelers	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	40	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0008	0.003	2E-05	0.0002	0.0002	0.0002	8.37866					
1	2024	Work - 1000	Remove Tree	Tractor	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	80	2.77966	2.8619	0.0021	0.4426	0.42928	0.5362	694.42	0.0051	0.0053	4E-06	0.0008	0.0008	0.001	1.28599					
1	2024	Work - 1000	Landscaping (	Compacting Equipment	Plate Compactors	Plate Compactors6	Diesel	6	0.43	24	2.5516	4.232	0.0022	0.257	0.24931	0.8345	587.98	0.0002	0.00029	1E-07	2E-05	2E-05	6E-05	0.04013				
1	2024	Work - 1000	Landscaping (	Small Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	24	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0003	0.00107	4E-06	8E-05	8E-05	5E-05	1.46623				
1	2024	Work - 1000	Landscaping (Top S	Fronttruck (Hoist)	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.59	80	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0003	3.10085					
1	2024	Work - 1000	Landscaping (Top S	Roller	Rollers	Rollers100	Diesel	100	0.59	40	0.44136	1.2461	0.0016	0.071	0.06888	0.0334	596.06	0.0011	0.00324	4E-06	0.0002	0.0002	9E-05	1.55063					
1	2024	Work - 1000	Landscaping (Top S	Seed Truck Spreader	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	16	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0003	0.0012	9E-06	7E-05	7E-05	8E-05	3.35146					
1	2024	Work - 1000	Landscaping (Top S	Tractor Trailer- Material Deliver	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	80	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0017	0.006	4E-05	0.0004	0.0004	0.0004	16.7573					
2	2024	Work - 1000	Construction Mob & L	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0002	0.00075	6E-06	5E-05	5E-05	2E-05	2.09467					
2	2024	Work - 1000	Construction Mob & L	Tractor Trailers Temp Fac.	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	4	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	8E-05	0.0003	2E-06	2E-05	2E-05	2E-05	0.83787					
2	2024	Work - 1000	Remove Tree	Bulldozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	40	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0005	0.00179	7E-06	0.0001	0.0001	8E-05	2.44372					
2	2024	Work - 1000	Remove Tree	Chain Saws	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.7	40	2.47778	4.1837	0.0022	0.2419	0.23462	0.8375	593.76	0.0008	0.00142	7E-07	8E-05	8E-05	0.0003	0.20159					
2	2024	Work - 1000	Remove Tree	Flat Bed or Dump Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	80	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0017	0.006	4E-05	0.0004	0.0004	0.0004	16.7573					
2	2024	Work - 1000	Remove Tree	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	40	2.77966	2.8619	0.0021	0.4426	0.42928	0.5362	694.42	0.0026	0.00265	2E-06	0.0004	0.0004	0.0005	0.64299					
2	2024	Work - 1000	Remove Tree	Grub the site down 2'-0	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	40	0.32926	2.5796	0.0016	0.031	0.03011	0.1008	595.86	0.0003	0.00268	2E-06	3E-05	3E-05	0.0001	0.62004					
2	2024	Work - 1000	Remove Tree	Log Chipper	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0001	1.12997					
2	2024	Work - 1000	Remove Tree	Mulcher	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0001	1.12997					
2	2024	Work - 1000	Remove Tree	Ten Wheelers	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	40	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0008	0.003	2E-05	0.0002	0.0002	0.0002	8.37866					
2	2024	Work - 1000	Remove Tree	Tractor	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	80	2.77966	2.8619	0.0021	0.4426	0.42928	0.5362	694.42	0.0051	0.0053	4E-06	0.0008	0.0008	0.001	1.28599					
2	2024	Work - 1000	Landscaping (	Compacting Equipment	Plate Compactors	Plate Compactors6	Diesel	6	0.43	24	2.5516	4.232	0.0022	0.257	0.24931	0.8345	587.98	0.0002	0.00029	1E-07	2E-05	2E-05	6E-05	0.04013				
2	2024	Work - 1000	Landscaping (	Small Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	24	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0003	0.00107	4E-06	8E-05	8E-05	5E-05	1.46623				
2	2024	Work - 1000	Landscaping (Top S	Fronttruck (Hoist)	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.59	80	0.59689	1.3293	0.0017	0.0902	0.08748	0.0608	595.98	0.0001	0.00252	3E-06	0.0002	0.0002	0.0003	3.10085					
2	2024	Work - 1000	Landscaping (Top S	Roller	Rollers	Rollers100	Diesel	100	0.59	40	0.44136	1.2461	0.0016	0.071	0.06888	0.0334	596.06	0.0011	0.00324	4E-06	0.0002	0.0002	9E-05	1.55063					
2	2024	Work - 1000	Landscaping (Top S	Seed Truck Spreader	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	16	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0003	0.0012	9E-06	7E-05	7E-05	8E-05	3.35146					
2	2024	Work - 1000	Landscaping (Top S	Tractor Trailer- Material Deliver	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	80	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0017	0.006	4E-05	0.0004	0.0004	0.0004	16.7573					
3	2024	Work - 1000	Grading	Paving Machine	Pavers	Pavers175	Diesel	175	0.59	16	0.1717	0.4994	0.0015	0.0436	0.04225	0.2063	336.76	0.0003	0.00091	3E-06	8E-05	8E-05	5E-05	0.97745					
3	2024	Work - 1000	Grading	Front Wheelers- Material Deliver	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	16	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0003	0.0012	9E-06	7E-05	7E-05	8E-05	3.35146					
3	2024	Work - 1000	Construction Mob & L	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	4	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	8E-05	0.0003	2E-06	2E-05	2E-05	2E-05	0.83787					
3	2024	Work - 1000	Construction Mob & L	Tractor Trailers Temp Fac.	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	4	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	8E-05	0.0003	2E-06	2E-05	2E-05	2E-05	0.83787					
3	2024	Work - 1000	Curbing	Bob Cat	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes75	Diesel	75	0.21	24	2.86149	3.9188	0.0021	0.4455	0.4321	0.5629	694.33	0.0012	0.00163	9E-07	0.0002	0.0002	0.0002	0.28931					
3	2024	Work - 1000	Curbing	Concrete Ready Mix Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	24	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0005	0.0018	1E-05	0.0001	0.0001	0.0001	5.02772					
3	2024	Work - 1000	Curbing	Material Deliveries	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	24	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0005	0.0018	1E-05	0.0001	0.0001	0.0001	5.02772					
3	2024	Work - 1000	Curbing	Tractor Trailer with Boom Hoist- De	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	24	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0005	0.0018	1E-05	0.0001	0.0001	0.0001	5.02772					
3	2024	Work - 1000	Grub the site down	Bulldozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	16	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0002	0.00072	3E-06	5E-05	5E-05	3E-05	0.97749					
3	2024	Work - 1000	Grub the site down	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	1																					

4	2024	Fencing	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	6.005	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0001	0.00045	3E-06	3E-05	3E-05	3E-05	1.25785
4	2024	Fencing	sion/Sediment	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	5.6	0.24206	0.6565	0.0015	0.0569	0.05515	0.0508	536.68	0.0001	0.0003	7E-07	3E-05	3E-05	2E-05	0.2493
4	2024	Fencing	sion/Sediment	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	11.2	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0002	0.00084	6E-06	9E-05	9E-05	6E-05	2.34603
4	2024	Fencing	sion/Sediment	Pumps	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.43	5.6	2.47778	4.1837	0.0022	0.2419	0.23462	0.8375	593.76	7E-05	0.00012	6E-08	7E-06	7E-06	2E-05	0.01734
4	2024	Fencing	sion/Sediment	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	5.6	2.77966	2.8619	0.0021	0.4426	0.42928	0.5362	694.42	0.0004	0.00037	3E-07	6E-05	6E-05	7E-05	0.09002
4	2024	Fencing	opsoil Placem	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	37.03067	0.12056	0.3935	0.0014	0.0301	0.02923	0.0181	536.78	0.0005	0.00166	6E-06	0.0001	0.0001	8E-05	2.26232
4	2024	Fencing	opsoil Placem	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	37.03067	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0008	0.00278	2E-05	0.0002	0.0002	0.0002	7.75668
4	2024	Fencing	opsoil Placem	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	37.03067	0.05344	0.1923	0.0014	0.0119	0.01153	0.0133	536.79	0.0008	0.00278	2E-05	0.0002	0.0002	0.0002	7.75668
TOTAL 0.196 0.37532 0.0014 0.0353 0.0343 0.0398 531.048																								

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID		Year	Project	Equipment	Equipment Category	MOVES Lookup															MOVES Em ss on Factors (g/mi e)												MOVES ONROAD Emiss ons (tpy)											
						On road Act v ty	Fuel	Roadway Type	Round Trip Distance	Distance for fug tive	Number of Veh c	Number of Emp oy	Number of Pro ect	Pro ect Length	Pro ect W dth	Pro ect Area	Bu d ing Height (Bu d n	Open Space Height	Number of Trees	Activ ty Rate	VMT	CO	NOx	SO2	PM10	PM2 5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2 5	VOC	CO2	CH4	N2O					
1	2024	ork - 1000Truck Subbase N	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Single Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	86	--	--	10000	--	--	--	--	--	--	1233	1.2073	1.83822	0.003102	0.053707	0.04941	0.139745	921.4807	0.015601	0.113191	0.00164	0.0025	4.2E-06	7.3E-05	7E-05	0.00019	1.25244	2E-05	0.0002			
1	2024	ork - 1000 Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Passenger Car	oyee Comr	Gasoline	Inrestrictee	30	--	29.48	29.48	86	--	--	--	--	--	--	--	--	--	76058	3.1049	0.12246	0.001802	0.00263	0.002327	0.107144	338.6942	0.009961	0.002048	0.26032	0.01027	0.00015	0.00022	0.0002	0.00898	28.3961	0.0008	0.0002			
1	2024	ork - 1000 Tractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted Access	Combination Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	86	--	--	10000	--	--	--	--	--	--	0.008	800	2.1822	4.04306	0.005676	0.070278	0.064655	0.165777	1692.721	0.020157	0.221022	0.00192	0.00357	5E-06	6.2E-05	6E-05	0.00015	1.49273	2E-05	0.0002		
2	2024	ork - 1000Truck Subbase N	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Single Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	86	--	--	10000	--	--	--	--	--	--	--	1233	1.2073	1.83822	0.003102	0.053707	0.04941	0.139745	921.4807	0.015601	0.113191	0.00164	0.0025	4.2E-06	7.3E-05	7E-05	0.00019	1.25244	2E-05	0.0002		
2	2024	ork - 1000 Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Passenger Car	oyee Comr	Gasoline	Inrestrictee	30	--	3.498	3.498	86	--	--	--	--	--	--	--	--	--	9025	3.1049	0.12246	0.001802	0.00263	0.002327	0.107144	338.6942	0.009961	0.002048	0.03089	0.00122	1.8E-05	2.6E-05	2E-05	0.00107	3.36947	1E-04	2E-05			
2	2024	ork - 1000 Tractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted Access	Combination Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	86	--	--	10000	--	--	--	--	--	--	0.008	800	2.1822	4.04306	0.005676	0.070278	0.064655	0.165777	1692.721	0.020157	0.221022	0.00192	0.00357	5E-06	6.2E-05	6E-05	0.00015	1.49273	2E-05	0.0002		
3	2024	ot @GradTruck Subbase N	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Single Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	65	--	--	10000	--	--	--	--	--	--	1233	1.2073	1.83822	0.003102	0.053707	0.04941	0.139745	921.4807	0.015601	0.113191	0.00164	0.0025	4.2E-06	7.3E-05	7E-05	0.00019	1.25244	2E-05	0.0002			
3	2024	ot @Grad Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Passenger Car	oyee Comr	Gasoline	Inrestrictee	30	--	3.3	3.3	65	--	--	--	--	--	--	--	--	--	6435	3.1049	0.12246	0.001802	0.00263	0.002327	0.107144	338.6942	0.009961	0.002048	0.02202	0.00087	1.3E-05	1.9E-05	2E-05	0.00076	2.4025	7E-05	1E-05			
4	2024	ork @Grad Tractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted Access	Combination Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	1	--	65	--	--	10000	--	--	--	--	--	--	0.0012	120	2.1822	4.04306	0.005676	0.070278	0.064655	0.165777	1692.721	0.020157	0.221022	0.00029	0.00053	7.5E-07	9.3E-06	9E-06	2.2E-05	0.22391	3E-06	3E-05		
4	2024	Fencing Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Single Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	5	2	--	258	12000	10	--	--	--	--	--	--	--	27750	1.2073	1.83822	0.003102	0.053707	0.04941	0.139745	921.4807	0.015601	0.113191	0.03693	0.05623	9.5E-05	0.00164	0.0015	0.00427	28.1874	0.0005	0.0035			
4	2024	Fencing Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Passenger Car	oyee Comr	Gasoline	Inrestrictee	30	--	26	26	258	--	--	--	--	--	--	--	--	--	201240	3.1049	0.12246	0.001802	0.00263	0.002327	0.107144	338.6942	0.009961	0.002048	0.68876	0.02716	0.0004	0.00058	0.0005	0.02377	75.1326	0.0022	0.0005			
3	2024	te SoilRenTruck Subbase N	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Single Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictee	40	--	35714	--	--	--	--	--	--	--	--	--	--	--	1E+06	1.2073	1.83822	0.003102	0.053707	0.04941	0.139745	921.4807	0.015601	0.113191	1.90117	2.89469	0.00489	0.08457	0.0778	0.22006	1451.08	0.0246	0.1782			
TOTAL 2.94915 3.0056 0.00559 0.08742 0.0804 0.25979 1595.53 0.0284 0.1832																																												

Fugitive Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenar o ID	Year	Pro ect	Fug t ve Source Type	Number of Months			CO	NOx	SO2	PM10	VOC
1	2024	ork - 1000	Movement (Pave	4			0	0	0	0.001996	0
1	2024	ork - 1000	ovement (Unpa	4			0	0	0	0.00625	0
1	2024	ork - 1000	Soil Handling	4			0	0	0	0.002831	0
1	2024	ork - 1000	ed Land and Wtr	4			0	0	0	1.345E-09	0
2	2024	ork - 1000	Movement (Pave	4			0	0	0	0.001996	0
2	2024	ork - 1000	ovement (Unpa	4			0	0	0	0.00625	0
2	2024	ork - 1000	Soil Handling	4			0	0	0	0.002831	0
2	2024	ork - 1000	ed Land and Wtr	4			0	0	0	1.345E-09	0
3	2024	ot @Grad	Asphalt Drying	3			0	0	0	0	0.37095
3	2024	ot @Grad	Movement (Pave	3			0	0	0	0.001509	0
3	2024	ot @Grad	ovement (Unpa	3			0	0	0	0.004588	0
3	2024	ot @Grad	Soil Handling	3			0	0	0	0.002831	0
3	2024	ot @Graded Land and Wtr		3			0	0	0	.00895E-09	0
4	2024	Fencing	Movement (Pave	12			0	0	0	0.01195	0
4	2024	Fencing	ovement (Unpa	12			0	0	0	0.0364	0
4	2024	Fencing	Soil Handling	12			0	0	0	0.03395	0
4	2024	Fencing	ed Land and Wtr	12			0	0	0	.8415E-09	0
Totals							0	0	0	0.11338	0.37095

2024 Totals

Year	Em ss on Source	CO	NOx	SO2		PM10	PM2.5	VOC	CO2	CH4	N2O	CO2e
2024	NonRoad	0.20	0.38			0.04	0.03	0.04	531.05	--	--	
2024	OnRoad	2.94915	3.00559	0.022	0.005585063	0.087416892	0.080399	0.259795	1595.535	0.028361	0.18325	
2024	Fugitive	0	0	0		0.1133795	0	0.37095				
2024 TOTAL		3.15	3.38	0.027		0.24	0.11	0.671	1929	0.025729	0.16624	1974

INPUT DATA AND SPECIFICATIONS

State/County

Maryland

Carroll County

Project Final Selections

Scenario ID	Project	Constructi Equipment	Fuel Type
1	Site Work	Constructi Survey Crew Tru	Diesel
1	Site Work	Constructi Tractor Trailers	Diesel
1	Site Work	Site Cleari Bulldozer	Diesel
1	Site Work	Site Cleari Chain Saws	Diesel
1	Site Work	Site Cleari Flat Bed or Dum	Diesel
1	Site Work	Site Cleari Front Loader	Diesel
1	Site Work	Site Cleari Grub the site do	Diesel
1	Site Work	Site Cleari Log Chipper	Diesel
1	Site Work	Site Cleari Mulcher	Diesel
1	Site Work	Site Cleari Ten Wheelers	Diesel
1	Site Work	Site Cleari Tractor	Diesel
1	Site Work	Site Resto Compacting Equ	Diesel
1	Site Work	Site Resto Small Dozer	Diesel
1	Site Work	Site Resto Forktruck (Hoist)	Diesel
1	Site Work	Site Resto Roller	Diesel
1	Site Work	Site Resto Seed Truck Spr	Diesel
1	Site Work	Site Resto Tractor Trailer-I	Diesel
2	Site Work	Constructi Survey Crew Tru	Diesel
2	Site Work	Constructi Tractor Trailers	Diesel
2	Site Work	Site Cleari Bulldozer	Diesel
2	Site Work	Site Cleari Chain Saws	Diesel
2	Site Work	Site Cleari Flat Bed or Dum	Diesel
2	Site Work	Site Cleari Front Loader	Diesel
2	Site Work	Site Cleari Grub the site do	Diesel
2	Site Work	Site Cleari Log Chipper	Diesel
2	Site Work	Site Cleari Mulcher	Diesel
2	Site Work	Site Cleari Ten Wheelers	Diesel
2	Site Work	Site Cleari Tractor	Diesel
2	Site Work	Site Resto Compacting Equ	Diesel
2	Site Work	Site Resto Small Dozer	Diesel
2	Site Work	Site Resto Forktruck (Hoist)	Diesel
2	Site Work	Site Resto Roller	Diesel
2	Site Work	Site Resto Seed Truck Spr	Diesel
2	Site Work	Site Resto Tractor Trailer-I	Diesel
3	Open Park Binder	Co-Paving Machine	Diesel
3	Open Park Binder	Co-Ten Wheelers-I	Diesel
3	Open Park	Constructi Survey Crew Tru	Diesel
3	Open Park	Constructi Tractor Trailers	Diesel

3	Open Park	Curbing	Bob Cat	Diesel
3	Open Park	Curbing	Concrete Ready	Diesel
3	Open Park	Curbing	Material Deliver	Diesel
3	Open Park	Curbing	Tractor Trailer w	Diesel
3	Open Park	Grub the s	Bulldozer	Diesel
3	Open Park	Grub the s	Front Loader	Diesel
3	Open Park	Grub the s	Ten Wheelers	Diesel
3	Open Park	Lighting Pr	Auger Drill	Diesel
3	Open Park	Lighting Pr	Fork Truck	Diesel
3	Open Park	Lighting Pr	Front Loader	Diesel
3	Open Park	Lighting Pr	Tractor Trailer- I	Diesel
3	Open Park	Remove Ti	Bulldozer	Diesel
3	Open Park	Remove Ti	Chain Saws	Diesel
3	Open Park	Remove Ti	Flat Bed or Dum	Diesel
3	Open Park	Remove Ti	Log Chipper	Diesel
3	Open Park	Remove Ti	Mulcher	Diesel
3	Open Park	Remove Ti	Tractor	Diesel
3	Open Park	Rough Gra	Compacting Equ	Diesel
3	Open Park	Rough Gra	Small Dozer	Diesel
3	Open Park	Set in-plac	40 Ton Rough Tr	Diesel
3	Open Park	Set in-plac	High Lift	Diesel
3	Open Park	Set in-plac	Tractor Trailer- I	Diesel
3	Open Park	Stripping	Line Painting Tr	Diesel
3	Open Park	Subgrade I	Backhoe	Diesel
3	Open Park	Subgrade I	Roller	Diesel
3	Open Park	Subgrade I	Tractor Trailer- I	Diesel
3	Open Park	Top Coat c	Paving Machine	Diesel
3	Open Park	Top Coat c	Ten Wheelers- I	Diesel
3	Open Park	Undergrol	Backhoe	Diesel
3	Open Park	Undergrol	Fork Truck	Diesel
3	Open Park	Undergrol	Tractor Trailer- I	Diesel
4	Fencing	Clearing at	Chain Saw	Diesel
4	Fencing	Clearing at	Chipper/Stump	Diesel
4	Fencing	Clearing at	Pickup Truck	Diesel
4	Fencing	Excavation	Dozer	Diesel
4	Fencing	Excavation	Dump Truck (12	Diesel
4	Fencing	Excavator	Excavator	Diesel
4	Fencing	Excavator	Pickup Truck	Diesel
4	Fencing	Excavator	Roller	Diesel
4	Fencing	Fencing	Concrete Truck	Diesel
4	Fencing	Fencing	Dump Truck	Diesel
4	Fencing	Fencing	Other General E	Diesel
4	Fencing	Fencing	Pickup Truck	Diesel
4	Fencing	Fencing	Skid Steer Load	Diesel
4	Fencing	Fencing	Tractors/Loader	Diesel
4	Fencing	Grading	Dozer	Diesel
4	Fencing	Grading	Grader	Diesel
4	Fencing	Grading	Roller	Diesel
4	Fencing	Hydroseec	Hydroseeder	Diesel
4	Fencing	Hydroseec	Off-Road Truck	Diesel
4	Fencing	Soil Erosio	Other General E	Diesel
4	Fencing	Soil Erosio	Pickup Truck	Diesel
4	Fencing	Soil Erosio	Pumps	Diesel
4	Fencing	Soil Erosio	Tractors/Loader	Diesel
4	Fencing	Topsoil Pl	Dozer	Diesel
4	Fencing	Topsoil Pl	Dump Truck	Diesel
4	Fencing	Topsoil Pl	Pickup Truck	Diesel

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

Overall Size

Scenario ID	Project	Project Siz	User Input	Unit
1	Site Work	What is th	2.68	\$ Million(s)
2	Site Work	What is th	0.318	\$ Million(s)
3	Open Park	What is th	0.3	\$ Million(s)
4	Fencing	What is th	0.6	\$ Million(s)
4	Fencing	What is th	12000	Feet

Size Detail (Estimated based on engineering experience)

Scenario ID	Project	Constructi	Default Activity	Unit
4	Fencing	Clearing at	1.4	Acres
4	Fencing	Excavator	2775	Cubic Yards
4	Fencing	Fencing	12000	Linear Feet
4	Fencing	Grading	6665.6	Square Yards
4	Fencing	Hydroseec	60050	Square Feet
4	Fencing	Soil Erosio	1.4	Acres
4	Fencing	Topsoil Pl	2777.3	Cubic Yards

User Activity Size

Activity: Non-Road (Estimated based on engineering experience)

Scenario ID	Project	Constructi	Equipment	Fuel Type	Activity Siz	Activity R	Default	Ac	Activity Ur	User Activity Data
1	Site Work	Constructi	Survey Crew Tru	Diesel	10000.00	0.0	0.001	Hou	10	hours
1	Site Work	Constructi	Tractor Trailers	Diesel	10000.00	0.0	0.0004	Hou	4	hours
1	Site Work	Site Cleari	Bulldozer	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Chain Saws	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Flat Bed or Dum	Diesel	10000.00	0.0	0.008	Hou	80	hours
1	Site Work	Site Cleari	Front Loader	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Grub the site do	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Log Chipper	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Mulcher	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Ten Wheelers	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Cleari	Tractor	Diesel	10000.00	0.0	0.008	Hou	80	hours
1	Site Work	Site Resto	Compacting Equ	Diesel	10000.00	0.0	0.0024	Hou	24	hours
1	Site Work	Site Resto	Small Dozer	Diesel	10000.00	0.0	0.0024	Hou	24	hours
1	Site Work	Site Resto	Forktruck (Hoist)	Diesel	10000.00	0.0	0.008	Hou	80	hours
1	Site Work	Site Resto	Roller	Diesel	10000.00	0.0	0.004	Hou	40	hours
1	Site Work	Site Resto	Seed Truck Spre	Diesel	10000.00	0.0	0.0016	Hou	16	hours
1	Site Work	Site Resto	Tractor Trailer- I	Diesel	10000.00	0.0	0.008	Hou	80	hours
2	Site Work	Constructi	Survey Crew Tru	Diesel	10000.00	0.0	0.001	Hou	10	hours
2	Site Work	Constructi	Tractor Trailers	Diesel	10000.00	0.0	0.0004	Hou	4	hours
2	Site Work	Site Cleari	Bulldozer	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Chain Saws	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Flat Bed or Dum	Diesel	10000.00	0.0	0.008	Hou	80	hours
2	Site Work	Site Cleari	Front Loader	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Grub the site do	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Log Chipper	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Mulcher	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Ten Wheelers	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Cleari	Tractor	Diesel	10000.00	0.0	0.008	Hou	80	hours
2	Site Work	Site Resto	Compacting Equ	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Site Work	Site Resto	Small Dozer	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Site Work	Site Resto	Forktruck (Hoist)	Diesel	10000.00	0.0	0.008	Hou	80	hours
2	Site Work	Site Resto	Roller	Diesel	10000.00	0.0	0.004	Hou	40	hours
2	Site Work	Site Resto	Seed Truck Spre	Diesel	10000.00	0.0	0.0016	Hou	16	hours

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

2	Site Work	Site Resto	Tractor Trailer- I	Diesel	10000.00	50.008	Hou	80	hours
3	Open Park Binder	Co	Paving Machine	Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Binder	Co	Ten Wheelers- I	Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Constructi	Survey Crew	Tru	Diesel	10000.00	50.0004	Hoi	4	hours
3	Open Park Constructi	Tractor Trailers		Diesel	10000.00	50.0004	Hoi	4	hours
3	Open Park Curbing	Bob Cat		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Curbing	Concrete Ready		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Curbing	Material Deliver		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Curbing	Tractor Trailer w		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Grub the s	Bulldozer		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Grub the s	Front Loader		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Grub the s	Ten Wheelers		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Lighting P	r Auger Drill		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Lighting P	r Fork Truck		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Lighting P	r Front Loader		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Lighting P	r Tractor Trailer- I	Diesel	10000.00	50.0012	Hoi	12	hours	
3	Open Park Remove T	i Bulldozer		Diesel	10000.00	50.004	Hou	40	hours
3	Open Park Remove T	i Chain Saws		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Remove T	i Flat Bed or Dum		Diesel	10000.00	50.004	Hou	40	hours
3	Open Park Remove T	i Log Chipper		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Remove T	i Mulcher		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Remove T	i Tractor		Diesel	10000.00	50.004	Hou	40	hours
3	Open Park Rough Gra	Compacting Equ		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Rough Gra	Small Dozer		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Set in-pla	40 Ton Rough Tr		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Set in-pla	High Lift		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Set in-pla	Tractor Trailer- I	Diesel	10000.00	50.0016	Hoi	16	hours	
3	Open Park Stripping	Line Painting Tr		Diesel	10000.00	50.0008	Hoi	8	hours
3	Open Park Subgrade	I Backhoe		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Subgrade	I Roller		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Subgrade	I Tractor Trailer- I	Diesel	10000.00	50.0016	Hoi	16	hours	
3	Open Park Top Coat	c Paving Machine		Diesel	10000.00	50.0016	Hoi	16	hours
3	Open Park Top Coat	c Ten Wheelers- I	Diesel	10000.00	50.0016	Hoi	16	hours	
3	Open Park Undergro	Backhoe		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Undergro	Fork Truck		Diesel	10000.00	50.0024	Hoi	24	hours
3	Open Park Undergro	Tractor Trailer- I	Diesel	10000.00	50.0012	Hoi	12	hours	
4	Fencing	Clearing at Chain	Saw	Diesel	1.40	Acre	12	Hours	p
4	Fencing	Clearing at Chipper	Stump	Diesel	1.40	Acre	12	Hours	p
4	Fencing	Clearing at Pickup	Truck	Diesel	1.40	Acre	16	Hours	p
4	Fencing	Excavator Dozer		Diesel	2775.00	C8	Hours	pe	22.2
4	Fencing	Excavator Dump Truck	12	Diesel	2775.00	C8	Hours	pe	74
4	Fencing	Excavator Excavator		Diesel	2775.00	C8	Hours	pe	22.2
4	Fencing	Excavator Pickup Truck		Diesel	2775.00	C8	Hours	pe	22.2
4	Fencing	Excavator Roller		Diesel	2775.00	C8	Hours	pe	22.2
4	Fencing	Fencing Concrete	Truck	Diesel	12000.00	12	Hours	pe	133.33
4	Fencing	Fencing Dump Truck		Diesel	12000.00	18	Hours	pe	533.33
4	Fencing	Fencing Other General	E Diesel	12000.00	18	Hours	pe	533.33	hours
4	Fencing	Fencing Pickup Truck		Diesel	12000.00	18	Hours	pe	533.33
4	Fencing	Fencing Skid Steer	Loads	Diesel	12000.00	18	Hours	pe	533.33
4	Fencing	Fencing Tractors/Loader		Diesel	12000.00	18	Hours	pe	533.33
4	Fencing	Grading Dozer		Diesel	6665.60	S18	Hours	pe	6.67
4	Fencing	Grading Grader		Diesel	6665.60	S18	Hours	pe	6.67
4	Fencing	Grading Roller		Diesel	6665.60	S18	Hours	pe	6.67
4	Fencing	Hydroseec Hydroseeder		Diesel	60050.00	18	Hours	pe	6.01
4	Fencing	Hydroseec Off-Road	Truck	Diesel	60050.00	18	Hours	pe	6.01
4	Fencing	Soll Erosio Other General	E Diesel	1.40	Acre	4	Hours	pe	5.6
4	Fencing	Soll Erosio Pickup	Truck	Diesel	1.40	Acre	8	Hours	pe
4	Fencing	Soll Erosio Pumps		Diesel	1.40	Acre	4	Hours	pe
4	Fencing	Soll Erosio Tractors/Loader		Diesel	1.40	Acre	4	Hours	pe
4	Fencing	Topsoil Plz Dozer		Diesel	2777.30	C8	Hours	pe	37.03
4	Fencing	Topsoil Plz Dump	Truck	Diesel	2777.30	C8	Hours	pe	37.03
4	Fencing	Topsoil Plz Pickup	Truck	Diesel	2777.30	C8	Hours	pe	37.03

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

Activity: On-Road (Estimated based on engineering experience)

Scenario ID	Project	Equipmen	On-road Activity	Fuel	Roadway T	Round Trip	Number o	Number o	Project Le	Project	Project /Building	Open Spa	Number Activity	Activity I	Default	User	VMT
1	Site Work	Dump Tru	Material Deliver	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	--	--	1233
1	Site Work	Passenger Employee	Comm	Gasoline	Urban Unr	30	29.48	86	--	--	--	--	--	--	--	--	76058
1	Site Work	Tractor Tr	Material Deliver	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	--	0.008	800
2	Site Work	Dump Tru	Material Deliver	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	--	--	1233
2	Site Work	Passenger Employee	Comm	Gasoline	Urban Unr	30	3.498	86	--	--	--	--	--	--	--	--	9025
2	Site Work	Tractor Tr	Material Deliver	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	--	0.008	800
3	Open Park	Dump Tru	Material Deliver	Diesel	Urban Unr	40	--	65	--	--	10000	--	--	--	--	--	1233
3	Open Park	Passenger Employee	Comm	Gasoline	Urban Unr	30	3.3	65	--	--	--	--	--	--	--	--	6435
3	Open Park	Tractor Tr	Material Deliver	Diesel	Urban Unr	40	--	65	--	--	10000	--	--	--	--	0.0012	120
4	Fencing	Cement M	Material Deliver	Diesel	Urban Unr	40	--	258	12000	10	--	--	--	--	--	--	27750
4	Fencing	Passenger Employee	Comm	Gasoline	Urban Unr	30	26	258	--	--	--	--	--	--	--	--	201240

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario ID	Project	Fugitive T	Variable	Default Values	Units	User Value
1	Site Work	Material N	s = Surface mate	0.043	fraction	
1	Site Work	Material N	Wt. = Mean vehi	32	tons	
1	Site Work	Material N	WMT = Vehicle n	455	miles	
1	Site Work	Material N	PM10 = 1.5 x [(s,	12.5	lbs	
1	Site Work	Material N	SL = Road surfac	0.1	g/m3	
1	Site Work	Material N	Wt. = Mean vehi	32	tons	
1	Site Work	Material N	WMT = Vehicle n	430	miles	
1	Site Work	Material N	PM10 = 0.0022 x	3.992	lbs	
1	Site Work	Soil Handl	u = Wind speed	5	mph	
1	Site Work	Soil Handl	m = Moisture co	0.25	fraction	
1	Site Work	Soil Handl	T = Mass of aggr	275	tons	
1	Site Work	Soil Handl	PM10 = T x 0.35	5.661	lbs	
1	Site Work	Unstabiliza	A = Area affecte	0.23	acres	
1	Site Work	Unstabiliza	TP Conv = TSP/PI	0.5	fraction	
1	Site Work	Unstabiliza	CE = Control effi	0.63	fraction	
1	Site Work	Unstabiliza	t = year (e.g. 0.6	0.333	years	
1	Site Work	Unstabiliza	PM10 = 0.38 x A	0	lbs	
2	Site Work	Material N	s = Surface mate	0.043	fraction	
2	Site Work	Material N	Wt. = Mean vehi	32	tons	
2	Site Work	Material N	WMT = Vehicle n	455	miles	
2	Site Work	Material N	PM10 = 1.5 x [(s,	12.5	lbs	
2	Site Work	Material N	SL = Road surfac	0.1	g/m3	
2	Site Work	Material N	Wt. = Mean vehi	32	tons	
2	Site Work	Material N	WMT = Vehicle n	430	miles	
2	Site Work	Material N	PM10 = 0.0022 x	3.992	lbs	
2	Site Work	Soil Handl	u = Wind speed	5	mph	
2	Site Work	Soil Handl	m = Moisture co	0.25	fraction	
2	Site Work	Soil Handl	T = Mass of aggr	275	tons	
2	Site Work	Soil Handl	PM10 = T x 0.35	5.661	lbs	
2	Site Work	Unstabiliza	A = Area affecte	0.23	acres	
2	Site Work	Unstabiliza	TP Conv = TSP/PI	0.5	fraction	
2	Site Work	Unstabiliza	CE = Control effi	0.63	fraction	
2	Site Work	Unstabiliza	t = year (e.g. 0.6	0.333	years	

2 Site Work	Unstabiliz	PM10 = 0.38 x A	0	lbs
3 Open Park Material	N sL = Road surfac		0.1	g/m3
3 Open Park Material	N Wt. = Mean vehi		32	tons
3 Open Park Material	N VMT = Vehicle n		325	miles
3 Open Park Material	N PM10 = 0.0022 x		3.017	lbs
3 Open Park Material	N s = Surface mate		0.043	fraction
3 Open Park Material	N Wt. = Mean vehi		32	tons
3 Open Park Material	N VMT = Vehicle n		335	miles
3 Open Park Material	N PM10 = 1.5 x [(s,		9.175	lbs
3 Open Park Soil	Handli u = Wind speed		5	mph
3 Open Park Soil	Handli m = Moisture co		0.25	fraction
3 Open Park Soil	Handli T = Mass of aggr		275	tons
3 Open Park Soil	Handli PM10 = T x 0.35		5.661	lbs
3 Open Park Unstabiliz	A = Area affecte		0.23	acres
3 Open Park Unstabiliz	TP Conv = TSP/PI		0.5	fraction
3 Open Park Unstabiliz	CE = Control effi		0.63	fraction
3 Open Park Unstabiliz	t = year (e.g. 0.6		0.25	years
3 Open Park Unstabiliz	PM10 = 0.38 x A		0	lbs
3 Open Park Asphalt	Dr A = Area of land		929	m2
3 Open Park Asphalt	Dr AR = Application		1.811	l/m2
3 Open Park Asphalt	Dr VD = Volume fra		0.35	fraction
3 Open Park Asphalt	Dr EF = Mass fracti		0.7	fraction
3 Open Park Asphalt	Dr D = Density of sc		1.8	lbs/l
3 Open Park Asphalt	Dr VOC = A x AR x v		741.9	lbs
4 Fencing	Soil Handli u = Wind speed		5	mph
4 Fencing	Soil Handli m = Moisture co		0.25	fraction
4 Fencing	Soil Handli T = Mass of aggr		3300	tons
4 Fencing	Soil Handli PM10 = T x 0.35		67.9	lbs
4 Fencing	Unstabiliz A = Area affecte		2.755	acres
4 Fencing	Unstabiliz TP Conv = TSP/PI		0.5	fraction
4 Fencing	Unstabiliz CE = Control effi		0.63	fraction
4 Fencing	Unstabiliz t = year (e.g. 0.6		1	years
4 Fencing	Unstabiliz PM10 = 0.38 x A		0	lbs
4 Fencing	Material N s = Surface mate		0.043	fraction
4 Fencing	Material N Wt. = Mean vehi		32	tons
4 Fencing	Material N VMT = Vehicle n		2657.3	miles
4 Fencing	Material N PM10 = 1.5 x [(s,		72.8	lbs
4 Fencing	Material N sL = Road surfac		0.1	g/m3
4 Fencing	Material N Wt. = Mean vehi		32	tons
4 Fencing	Material N VMT = Vehicle n		2580	miles
4 Fencing	Material N PM10 = 0.0022 x		23.9	lbs

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES4

Non-Road Equipment: MOVES4 NONROAD

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Doser
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks
- Flatbed Truck
- Grader
- Grout Wheel Truck
- Holist Equipment with 40 Ton Rig
- Hydraulic Hammer
- Hydroseeder
- Line Painting Truck and Sprayer
- Material Deliveries
- Off-Road Truck

Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Holst- Curbs Del & Place
Tractor Trailer with Boom Holst- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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STUDY

Study Name

DMV Runway Rehab

Study Description

Construction 2027

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

Data for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton											MOVES Ems on Factors (g hp hr)										NONROAD Em as on (TPV)									
Searn o D	Year	Pro ect	Construct on Act v ty	Equip ment	MOVES Equip ment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Act v ty	CO2					CH4					N2O					CO2 Exhaust				
											CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO	TPV	NOx	TPV	SO2	TPV	PM10	PM2.5		VOC	TPV		
1	2027	ork-1000s Remove Tre	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	10	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0001	0.0005	46.06	36.05	36.05	46.06	2.0247							
1	2027	ork-1000s Remove Tre	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	4	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	4E-0002	0.0002	26.06	16.05	16.05	26.08	0.8393							
1	2027	ork-1000s Remove Tre	Builder	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	55.9	40	0.074156	0.254487	0.004213	0.026718	0.01708	0.016779	536.7981	0.0003	0.0012	66.06	86.05	86.05	86.05	2.4438							
1	2027	ork-1000s Remove Tre	Chain Saws	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.7	40	2.460146	0.183443	0.002183	0.238761	0.231555	0.081727	593.7565	0.0008	0.014	76.07	86.05	86.05	86.05	0.2016							
1	2027	ork-1000s Remove Tre	Flat Bed or Dump Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	80	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0008	0.0039	46.06	26.04	26.04	26.04	0.6781							
1	2027	ork-1000s Remove Tre	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	55.9	24	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0008	0.0039	46.06	26.04	26.04	26.04	0.6781							
1	2027	ork-1000s Remove Tre	Grub the site down 2-0	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	40	0.281314	0.251063	0.001517	0.021028	0.020397	0.09268	595.8803	0.0003	0.0026	26.05	26.05	26.05	26.05	16.0201							
1	2027	ork-1000s Remove Tre	Log Chipper	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.378143	0.130037	0.006119	0.08486	0.056712	0.032273	596.065	0.0007	0.0021	36.06	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Remove Tre	Mulcher	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.378143	0.130037	0.006119	0.08486	0.056712	0.032273	596.065	0.0007	0.0021	36.06	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Remove Tre	Ten Wheelers	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	40	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0004	0.002	26.05	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Remove Tre	Tractor Trailers	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	80	0.161583	0.201892	0.001496	0.26919	0.261619	0.317254	595.0635	0.0007	0.0017	76.07	86.05	86.05	86.05	0.8393							
1	2027	ork-1000s Landscaping	Compacting Equipment	Plate Compactors	Plate Compactors6	Diesel	6	0.43	24	2.507773	0.193876	0.002162	0.249776	0.242283	0.038795	587.9693	0.0002	0.0003	16.07	26.05	26.05	26.05	0.0001							
1	2027	ork-1000s Landscaping	Small Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	55.9	24	0.074156	0.254487	0.004213	0.026718	0.01708	0.016779	536.7981	0.0002	0.0007	46.06	56.05	56.05	56.05	1.4663							
1	2027	ork-1000s Landscaping (Top s)	Forktruck (Hoist)	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.59	80	0.378143	0.130037	0.006119	0.08486	0.056712	0.032273	596.065	0.0007	0.0021	36.06	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Roller	Rollers	Rollers100	Diesel	100	0.59	40	0.165731	0.070795	0.001586	0.030463	0.029549	0.04098	596.1175	0.0004	0.0023	46.06	86.05	86.05	86.05	1.5508							
1	2027	ork-1000s Landscaping (Top s)	Seed Treater - Sprayer	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	80	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0008	0.0039	46.06	26.04	26.04	26.04	0.6781							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailer - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	80	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0008	0.0039	46.06	26.04	26.04	26.04	0.6781							
1	2027	ork-1000s Landscaping (Top s)	Paving Machine	Pavers	Pavers175	Diesel	175	55.9	16	0.0865	0.287056	0.004218	0.020967	0.020388	0.03446	536.7927	0.0002	0.0005	36.06	46.05	46.05	46.05	26.075							
1	2027	ork-1000s Landscaping (Top s)	Ten Wheelers - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	16	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0008	36.06	56.05	56.05	56.05	3.3515							
1	2027	ork-1000s Landscaping (Top s)	Survey Crew Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	40	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	4E-0002	0.0002	26.06	16.05	16.05	26.08	0.8393							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailers Temp.Fac.	Tractor Trailers Temp.Fac.	Tractor Trailers Temp.Fac.	Diesel	600	55.9	40	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	4E-0002	0.0002	26.06	16.05	16.05	26.08	0.8393							
1	2027	ork-1000s Landscaping (Top s)	Bob Cat	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes75	Diesel	75	0.21	24	1.71903	0.343938	0.001946	0.273519	0.265314	0.350818	594.9577	0.0007	0.0014	86.07	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Concrete Ready Mix Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	24	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0012	16.05	76.05	76.05	76.05	15.0273							
1	2027	ork-1000s Landscaping (Top s)	Material Deliveries	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	24	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0012	16.05	76.05	76.05	76.05	15.0273							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailer with Boom Hoist-Del.	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	24	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0012	16.05	76.05	76.05	76.05	15.0273							
1	2027	ork-1000s Landscaping (Top s)	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	24	0.161583	0.201892	0.001496	0.26919	0.261619	0.317254	595.0635	0.0006	0.0007	76.07	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Ten Wheelers	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	16	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0008	36.06	56.05	56.05	56.05	3.3515							
1	2027	ork-1000s Landscaping (Top s)	Auger Drill	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	24	0.164399	0.040889	0.001458	0.039634	0.038445	0.02997	536.7454	0.0003	0.0008	36.06	86.05	86.05	86.05	1.0685							
1	2027	ork-1000s Landscaping (Top s)	Forck Truck	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.59	24	0.378143	0.130037	0.006119	0.08486	0.056712	0.032273	596.065	0.0006	0.0017	36.06	96.05	96.05	96.05	0.9304							
1	2027	ork-1000s Landscaping (Top s)	Front Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	24	0.161583	0.201892	0.001496	0.26919	0.261619	0.317254	595.0635	0.0006	0.0017	76.07	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailer - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	12	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0001	0.0006	76.07	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Builder	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	40	0.074156	0.254487	0.004213	0.026718	0.01708	0.016779	536.7981	0.0003	0.0012	66.06	86.05	86.05	86.05	2.4438							
1	2027	ork-1000s Landscaping (Top s)	Chain Saws	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.7	40	2.460146	0.183443	0.002183	0.238761	0.231555	0.081727	593.7565	0.0005	0.009	46.07	56.05	56.05	56.05	2.021							
1	2027	ork-1000s Landscaping (Top s)	Flat Bed or Dump Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	40	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0004	0.002	26.05	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Log Chipper	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	40	0.378143	0.130037	0.006119	0.08486	0.056712	0.032273	596.065	0.0004	0.0013	26.06	76.05	76.05	76.05	0.6781							
1	2027	ork-1000s Landscaping (Top s)	Tractor	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	40	0.161583	0.201892	0.001496	0.26919	0.261619	0.317254	595.0635	0.0015	0.0019	26.07	26.04	26.04	26.04	0.6781							
1	2027	ork-1000s Landscaping (Top s)	Compacting Equipment	Plate Compactors	Plate Compactors6	Diesel	6	0.43	16	2.507773	0.193876	0.002162	0.249776	0.242283	0.038795	587.9693	0.0001	0.0002	16.07	16.05	16.05	16.05	0.0268							
1	2027	ork-1000s Landscaping (Top s)	Small Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	16	0.074156	0.254487	0.004213	0.026718	0.01708	0.016779	536.7981	0.0001	0.0005	36.06	36.05	36.05	36.05	26.075							
1	2027	ork-1000s Landscaping (Top s)	40 Ton Rough Terrain Crane	Crane	Crane300	Diesel	300	0.43	16	0.045115	0.045115	0.001199	0.00863	0.00863	0.00863	596.0987	0.0003	0.003	36.06	36.05	36.05	36.05	0.6781							
1	2027	ork-1000s Landscaping (Top s)	Rough Terrain Forklifts100	Rough Terrain Forklifts100	Rough Terrain Forklifts100	Diesel	100	15.9	16	0.273788	0.148322	0.002163	0.04423	0.043901	0.022318	596.0937	0.0003	0.0011	26.07	26.05	26.05	26.05	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailer - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	16	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0008	36.06	56.05	56.05	56.05	3.3515							
1	2027	ork-1000s Landscaping (Top s)	Line Painting Truck and Sprayer	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	8	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	8E-0004	0.0004	46.06	26.05	26.05	26.05	1.6758							
1	2027	ork-1000s Landscaping (Top s)	Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	16	0.161583	0.201892	0.001496	0.26919	0.261619	0.317254	595.0635	0.0006	0.0007	76.07	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Roller	Rollers	Rollers100	Diesel	100	0.59	16	0.165731	0.070795	0.001586	0.030463	0.029549	0.04098	596.1175	0.0002	0.001	26.06	16.04	16.04	16.04	0.0001							
1	2027	ork-1000s Landscaping (Top s)	Tractor Trailer - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	16	0.026623	0.126166	0.004116	0.076707	0.007379	0.003178	536.8	0.0002	0.0008	36.06	56.05	56.05	56.05	3.3515							
1	2027	ork-1000s Landscaping (Top s)	Paving Machine	Pavers	Pavers175	Diesel	175	0.59	16	0.0865	0.287056	0.004218	0.020967	0.020388	0.03446	536.7927	0.0002	0.0005	36.06	46.05	46.05	46.05	26.075							
1	2027	ork-1000s Landscaping (Top s)	Ten Wheelers - Material Delivery	Off-highway Trucks	Off-highway Trucks600	Diesel	600	55.9	16	0.026623	0.126166	0.004116																		

On-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Pro-act	Equ-pment	Equ-pment Category	MOVES Lookup	On-road Act-vty	Fuel	Roadway Type	Round Trip Distance	Distance for fug-tive	Number of Veh-cles	Number of Emp-oyees	Number of Pro-ect Days	Pro-ect Length	Pro-ect Width	Pro-ect Area	Bu-d'n g Height	Open Space Height	Number of Trees	Act-vty Rate	VMT	MOVES Emission Factors (g/mi-e)																	
																						CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O
1	2027	Work - 1000Truck Subbase I	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	1	--	86	--	--	--	10000	--	--	--	--	1233	1.077	1.4246	0.0029	0.0329	0.03024	0.09514	862.778	0.01367	0.1155	0.0015	0.0019	3.9E-06	4.5E-05	4.1E-05	0.00013	1.1727	1.9E-05	0.00016
1	2027	Work - 1000Passenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	oyee Comr	Gasoline	Inrestrictees	30	--	11	11	86	--	--	--	--	--	--	--	--	28380	2.748	0.0723	0.00171	0.0022	0.00197	0.08531	322.256	0.00774	0.0017	0.086	0.0023	5.4E-05	7E-05	6.2E-05	0.00267	10.081	0.00024	5.4E-05
1	2027	Work - 1000Tractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	1	--	86	--	--	--	10000	--	--	--	0.008	800	2.001	3.3213	0.00537	0.0433	0.03982	0.12712	1604.62	0.01828	0.2242	0.0018	0.0029	4.7E-06	3.8E-05	3.5E-05	0.00011	1.415	1.6E-05	0.0002
2	2027	Lot @Gradtruck Subbase I	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	1	--	86	--	--	--	10000	--	--	--	--	1233	1.077	1.4246	0.0029	0.0329	0.03024	0.09514	862.778	0.01367	0.1155	0.0015	0.0019	3.9E-06	4.5E-05	4.1E-05	0.00013	1.1727	1.9E-05	0.00016
2	2027	Lot @GradPassenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	oyee Comr	Gasoline	Inrestrictees	30	--	5.5	5.5	65	--	--	--	--	--	--	--	--	10725	2.748	0.0723	0.00171	0.0022	0.00197	0.08531	322.256	0.00774	0.0017	0.0925	0.0009	2E-05	2.6E-05	2.3E-05	0.00101	3.8098	9.2E-05	2.1E-05
2	2027	Lot @GradTractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	1	--	65	--	--	--	10000	--	--	--	0.001	120	2.001	3.3213	0.00537	0.0433	0.03982	0.12712	1604.62	0.01828	0.2242	0.0003	0.0004	7.1E-07	5.7E-06	5.3E-06	1.7E-05	0.2123	2.4E-06	3E-05
3	2027	00000 sqftCement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	5	--	65	--	--	--	100000	--	--	--	--	23125	1.077	1.4246	0.0029	0.0329	0.03024	0.09514	862.778	0.01367	0.1155	0.0274	0.0363	7.4E-05	0.00084	0.00077	0.00243	21.993	0.00035	0.00294
3	2027	00000 sqftTruck Subbase I	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	3	--	65	--	--	--	100000	--	--	--	--	12333	1.077	1.4246	0.0029	0.0329	0.03024	0.09514	862.778	0.01367	0.1155	0.0146	0.0194	3.9E-05	0.00045	0.00041	0.00129	11.729	0.00019	0.00157
3	2027	00000 sqft Passenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	oyee Comr	Gasoline	Inrestrictees	30	--	13.75	13.75	65	--	--	--	--	--	--	--	--	26813	2.748	0.0723	0.00171	0.0022	0.00197	0.08531	322.256	0.00774	0.0017	0.0812	0.0021	5.1E-05	6.6E-05	5.8E-05	0.00252	9.5247	0.00023	5.1E-05
3	2027	00000 sqftTractor Trailer	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Inrestrictees	40	5	1	--	65	--	--	--	100000	--	--	--	0.002	2400	2.001	3.3213	0.00537	0.0433	0.03982	0.12712	1604.62	0.01828	0.2242	0.0953	0.0088	1.4E-05	0.00011	0.00011	0.00034	4.2451	4.8E-05	0.00059
																						TOTAL								0.252	0.077	0.00027	0.00169	0.00155	0.01064	65.356	0.0012	0.00577	

Fugitive Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Scenario ID	Year	Pro ect	Fug t ve Source Type	Number of Months	CO	NOx	SO2	PM10	VOC
1	2027	Work - 1000Movement (Pav		4	0	0	0	0.001996	0
1	2027	Work - 1000Movement (Unpi		4	0	0	0	0.00625	0
1	2027	Work - 1000 Soil Handling		4	0	0	0	0.002831	0
1	2027	Work - 1000 Soil Land and Wi		4	0	0	0	1.345E-09	0
2	2027	Lot @GradAsphalt Drying		3	0	0	0	0	0.37095
2	2027	Lot @GradMovement (Pav		3	0	0	0	0.001509	0
2	2027	Lot @GradMovement (Unpi		3	0	0	0	0.004588	0
2	2027	Lot @Grad Soil Handling		3	0	0	0	0.002831	0
2	2027	Lot @Gradd Land and Wi		3	0	0	0	1.0085E-09	0
3	2027	00000 sqftrete Mining/Bat		3	0	0	0	0.08555	0
3	2027	00000 sqftMovement (Pav		3	0	0	0	0.01205	0
3	2027	00000 sqftMovement (Unpi		3	0	0	0	0.03695	0
Totals					0	0	0	0.154553	0.37095

2027 Totals

Year	Em ss on Source	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO2e
2027	NonRoad	0.34	1.21	0.01	0.06	0.06	0.07	1987.32	--	--	
2027	OnRoad	0.25201	0.076966165	0.000265334	0.001694373	0.001553097	0.010641	65.35621	0.001201	0.005774	
2027	Fugitive	0	0	0	0.154553	--	0.37095	--	--	--	
2024 TOTAL		0.59	1.29	0.000	0.15	0.06	0.447	1862	0.001089	0.005238	1864

INPUT DATA AND SPECIFICATIONS

State/County

Maryland

Carroll County

Project Final Selections

Scenario IDProject ConstructEquipment Fuel Type

1	Site Work	Construct	Survey Crew T	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
1	Site Work	Construct	Tractor Trailer	Diesel	
1	Site Work	Site Clear	Bulldozer	Diesel	
1	Site Work	Site Clear	Chain Saws	Diesel	
1	Site Work	Site Clear	Flat Bed or Du	Diesel	
1	Site Work	Site Clear	Front Loader	Diesel	
1	Site Work	Site Clear	Grub the site	Diesel	
1	Site Work	Site Clear	Log Chipper	Diesel	
1	Site Work	Site Clear	Mulcher	Diesel	
1	Site Work	Site Clear	Ten Wheelers	Diesel	
1	Site Work	Site Clear	Tractor	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
1	Site Work	Site Resto	Compacting E	Diesel	
1	Site Work	Site Resto	Small Dozer	Diesel	
1	Site Work	Site Resto	Forktruck (Ho)	Diesel	
1	Site Work	Site Resto	Roller	Diesel	
1	Site Work	Site Resto	Seed Truck Sp	Diesel	
1	Site Work	Site Resto	Tractor Trailer	Diesel	
2	Open Park	Binder Co	Paving Machin	Diesel	
2	Open Park	Binder Co	Ten Wheelers	Diesel	
2	Open Park	Construct	Survey Crew T	Diesel	
2	Open Park	Construct	Tractor Trailer	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Open Park	Curbing	Bob Cat	Diesel	
2	Open Park	Curbing	Concrete Reac	Diesel	
2	Open Park	Curbing	Material Deliv	Diesel	
2	Open Park	Curbing	Tractor Trailer	Diesel	
2	Open Park	Grub the s	Bulldozer	Diesel	
2	Open Park	Grub the s	Front Loader	Diesel	
2	Open Park	Grub the s	Ten Wheelers	Diesel	
2	Open Park	Lighting	Pr Auger Drill	Diesel	
2	Open Park	Lighting	Pr Fork Truck	Diesel	
2	Open Park	Lighting	Pr Front Loader	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Open Park	Lighting	Pr Tractor Trailer	Diesel	
2	Open Park	Remove T	Bulldozer	Diesel	
2	Open Park	Remove T	Chain Saws	Diesel	
2	Open Park	Remove T	Flat Bed or Du	Diesel	
2	Open Park	Remove T	Log Chipper	Diesel	
2	Open Park	Remove T	Mulcher	Diesel	
2	Open Park	Remove T	Tractor	Diesel	
2	Open Park	Rough Gra	Compacting E	Diesel	
2	Open Park	Rough Gra	Small Dozer	Diesel	
2	Open Park	Set in-plac	40 Ton Rough	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Open Park	Set in-plac	High Lift	Diesel	
2	Open Park	Set in-plac	Tractor Trailer	Diesel	
2	Open Park	Striping	Line Painting	Diesel	
2	Open Park	Subgrade	Backhoe	Diesel	
2	Open Park	Subgrade	Roller	Diesel	
2	Open Park	Subgrade	Tractor Trailer	Diesel	
2	Open Park	Top Coat c	Paving Machin	Diesel	
2	Open Park	Top Coat c	Ten Wheelers	Diesel	
2	Open Park	Undergro	Backhoe	Diesel	
2	Open Park	Undergro	Fork Truck	Diesel	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Open Park	Undergro	Tractor Trailer	Diesel	
3	Building	- I	Concrete B	Backhoe	
3	Building	- I	Concrete I	Concrete Pum	
3	Building	- I	Concrete I	Concrete Reac	
3	Building	- I	Concrete I	Excavator	
3	Building	- I	Concrete I	Fork Truck	
3	Building	- I	Concrete I	Tool Truck	
3	Building	- I	Concrete I	Tractor Trailer	
3	Building	- I	Construct	Survey Crew T	
3	Building	- I	Construct	Tractor Trailer	
3	Building	- I	Exterior W	Fork Truck	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
3	Building	- I	Exterior W	Generator	
3	Building	- I	Exterior W	Grout Mixer	
3	Building	- I	Exterior W	Grout Wheel T	Diesel

3	Building - 1Exterior W Man Lift	Diesel
3	Building - 1Exterior W Tool Truck	Diesel
3	Building - 1Exterior W Tractor Trailer Diesel	
3	Building - 1Exterior W Truck Tower (Diesel)	
3	Building - 1Interior Bu Fork Truck	Diesel
3	Building - 1Interior Bu Man Lift	Diesel
3	Building - 1Interior Bu Tool Truck	Diesel
3	Building - 1Interior Bu Tractor Trailer Diesel	
3	Building - 1Roofing High Lift	Diesel
3	Building - 1Roofing Man Lift	Diesel
3	Building - 1Roofing Material Deliv	Diesel
3	Building - 1Roofing Tractor Trailer Diesel	
3	Building - 1Roofing Truck Tower (Diesel)	
3	Building - 1Security & High Lift	Diesel
3	Building - 1Security & Tool Truck	Diesel
3	Building - 1Structural 90 Ton Crane	Diesel
3	Building - 1Structural Concrete Pum	Diesel
3	Building - 1Structural Concrete Truc	Diesel
3	Building - 1Structural Fork Truck	Diesel
3	Building - 1Structural Tool Truck	Diesel
3	Building - 1Structural Tractor Trailer Diesel	
3	Building - 1Structural Trowel Machi	Diesel
3	Building - 1Structural Truck Tower (Diesel)	

Overall Size

Scenario I	Project	Project Siz	User Input	Unit
1	Site Work	What is th	1	\$ Million(s)
2	Open Park	What is th	0.5	\$ Million(s)
3	Building - 1	What is th	1.25	\$ Million(s)

Size Detail (Estimated based on engineering experience)

Scenario I	Project	Constructi	Default Activi	Unit	User Activity Size
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Activity: Non-Road (Estimated based on engineering experience)

Scenario I	Project	Constructi	Equipment	Fuel Type	Activity Siz	Activity R	Default	Ac	Activity Ur	User Activity Data
1	Site Work	Constructi	Survey Crew	T Diesel	10000.00	0.0	0.001	Hou	10	hours
1	Site Work	Constructi	Tractor Trailer Diesel		10000.00	0.0	0.0004	Hou	4	hours
1	Site Work	Site Cleari	Bulldozer	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Chain Saws	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Flat Bed or Du Diesel		10000.00	0.0	0.0008	Hou	80	hours
1	Site Work	Site Cleari	Front Loader	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Grub the Site Diesel		10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Log Chipper	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Mulcher	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Ten Wheelers Diesel		10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Cleari	Tractor	Diesel	10000.00	0.0	0.0008	Hou	80	hours
1	Site Work	Site Resto	Compacting B Diesel		10000.00	0.0	0.0024	Hou	24	hours
1	Site Work	Site Resto	Small Dozer	Diesel	10000.00	0.0	0.0024	Hou	24	hours
1	Site Work	Site Resto	Forktruck (Hol Diesel		10000.00	0.0	0.0008	Hou	80	hours
1	Site Work	Site Resto	Roller	Diesel	10000.00	0.0	0.0004	Hou	40	hours
1	Site Work	Site Resto	Seed Truck Sp Diesel		10000.00	0.0	0.0016	Hou	16	hours
1	Site Work	Site Resto	Tractor Trailer Diesel		10000.00	0.0	0.0008	Hou	80	hours
2	Open Park	Blinder Co	Paving Machi Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Blinder Co	Ten Wheelers Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Constructi	Survey Crew T Diesel		10000.00	0.0	0.0004	Hou	4	hours
2	Open Park	Constructi	Tractor Trailer Diesel		10000.00	0.0	0.0004	Hou	4	hours
2	Open Park	Curbing	Bob Cat	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Curbing	Concrete Rea Diesel		10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Curbing	Material Deliv Diesel		10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Curbing	Tractor Trailer Diesel		10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Grub the s	Bulldozer	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Grub the s	Front Loader	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Grub the s	Ten Wheelers Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Lighting P	Auger Drill	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Lighting P	Fork Truck	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Lighting P	Front Loader	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Lighting P	Tractor Trailer Diesel		10000.00	0.0	0.0012	Hou	12	hours
2	Open Park	Remove T	Bulldozer	Diesel	10000.00	0.0	0.0004	Hou	40	hours
2	Open Park	Remove T	Chain Saws	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Remove T	Flat Bed or Du Diesel		10000.00	0.0	0.0004	Hou	40	hours
2	Open Park	Remove T	Log Chipper	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Remove T	Mulcher	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Remove T	Tractor	Diesel	10000.00	0.0	0.0004	Hou	40	hours
2	Open Park	Rough Gr	Compacting B Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Rough Gr	Small Dozer	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Set in-plac	40 Ton Rough Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Set in-plac	High Lift	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Set in-plac	Tractor Trailer Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Stripping	Line Painting T Diesel		10000.00	0.0	0.0008	Hou	8	hours
2	Open Park	Subgrade	Backhoe	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Subgrade	Roller	Diesel	10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Subgrade	Tractor Trailer Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Top Coat c	Paving Machi Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Top Coat c	Ten Wheelers Diesel		10000.00	0.0	0.0016	Hou	16	hours
2	Open Park	Undergro	Backhoe	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Undergro	Fork Truck	Diesel	10000.00	0.0	0.0024	Hou	24	hours
2	Open Park	Undergro	Tractor Trailer Diesel		10000.00	0.0	0.0012	Hou	12	hours
3	Building - 1	Concrete f	Backhoe	Diesel	100000.00	0.0	0.0048	Hou	480	hours
3	Building - 1	Concrete f	Concrete Pum Diesel		100000.00	0.0	0.0018	Hou	180	hours
3	Building - 1	Concrete f	Concrete Reac Diesel		100000.00	0.0	0.0036	Hou	360	hours
3	Building - 1	Concrete f	Excavator	Diesel	100000.00	0.0	0.0016	Hou	160	hours
3	Building - 1	Concrete f	Fork Truck	Diesel	100000.00	0.0	0.0048	Hou	480	hours
3	Building - 1	Concrete f	Tool Truck	Diesel	100000.00	0.0	0.0012	Hou	120	hours
3	Building - 1	Concrete f	Tractor Trailer Diesel		100000.00	0.0	0.0024	Hou	240	hours
3	Building - 1	Constructi	Survey Crew T Diesel		100000.00	0.0	0.0001	Hou	10	hours
3	Building - 1	Constructi	Tractor Trailer Diesel		100000.00	0.0	0.0004	H	4	hours
3	Building - 1	Exterior W	Fork Truck	Diesel	100000.00	0.0	0.0084	Hou	840	hours
3	Building - 1	Exterior W	Generator	Diesel	100000.00	0.0	0.0008	Hou	80	hours
3	Building - 1	Exterior W	Grout Mixer	Diesel	100000.00	0.0	0.0042	Hou	420	hours
3	Building - 1	Exterior W	Grout Wheel T Diesel		100000.00	0.0	0.0016	Hou	160	hours
3	Building - 1	Exterior W	Man Lift	Diesel	100000.00	0.0	0.0168	Hou	1680	hours
3	Building - 1	Exterior W	Tool Truck	Diesel	100000.00	0.0	0.0042	Hou	420	hours
3	Building - 1	Exterior W	Tractor Trailer Diesel		100000.00	0.0	0.0084	Hou	840	hours
3	Building - 1	Exterior W	Truck Tower (Diesel)		100000.00	0.0	0.0008	Hou	80	hours
3	Building - 1	Interior Bu	Fork Truck	Diesel	100000.00	0.0	0.016	Hou	1600	hours
3	Building - 1	Interior Bu	Man Lift	Diesel	100000.00	0.0	0.032	Hou	3200	hours
3	Building - 1	Interior Bu	Tool Truck	Diesel	100000.00	0.0	0.016	Hou	1600	hours
3	Building - 1	Interior Bu	Tractor Trailer Diesel		100000.00	0.0	0.016	Hou	1600	hours
3	Building - 1	Roofing	High Lift	Diesel	100000.00	0.0	0.0016	Hou	160	hours
3	Building - 1	Roofing	Man Lift	Diesel	100000.00	0.0	0.0004	Hou	40	hours
3	Building - 1	Roofing	Material Deliv Diesel		100000.00	0.0	0.0006	Hou	60	hours
3	Building - 1	Roofing	Tractor Trailer Diesel		100000.00	0.0	0.0004	Hou	40	hours
3	Building - 1	Roofing	Truck Tower (Diesel)		100000.00	0.0	0.0012	Hou	120	hours
3	Building - 1	Security & High Lift	Diesel		100000.00	0.0	0.008	Hou	800	hours

3 Building - 1Security & Tool Truck Diesel	100000.000.008 Hoi	800 hours
3 Building - 1Structural 90 Ton Crane Diesel	100000.000.0024 Hoi	240 hours
3 Building - 1Structural Concrete Pump Diesel	100000.000.0006 Hoi	60 hours
3 Building - 1Structural Concrete Truck Diesel	100000.000.0006 Hoi	60 hours
3 Building - 1Structural Fork Truck Diesel	100000.000.0064 Hoi	640 hours
3 Building - 1Structural Tool Truck Diesel	100000.000.0016 Hoi	160 hours
3 Building - 1Structural Tractor Trailer Diesel	100000.000.0036 Hoi	360 hours
3 Building - 1Structural Trowel Machine Diesel	100000.000.0004 Hoi	40 hours
3 Building - 1Structural Truck Tower (Diesel)	100000.000.0072 Hoi	720 hours

Activity: On-Road (Estimated based on engineering experience)

Scenario ID	Project	Equipment	On-road Activity	Fuel	Roadway	Round Trip	Number of Project	Leaves Project	W/Project	AnBuilding	H Open	Space	Number of Activity	Site Activity	IDefault	User VMT
1	Site Work	Dump Truck	Material Delivery	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	--	1233
1	Site Work	Passenger Employee	ConGasoline		Urban Unr	30	11	86	--	--	--	--	--	--	--	28380
1	Site Work	Tractor Trailer	Material Delivery	Diesel	Urban Unr	40	--	86	--	--	10000	--	--	--	0.008	800
2	Open Park	Dump Truck	Material Delivery	Diesel	Urban Unr	40	--	65	--	--	10000	--	--	--	--	1233
2	Open Park	Passenger Employee	ConGasoline		Urban Unr	30	5.5	65	--	--	--	--	--	--	--	10725
2	Open Park	Tractor Trailer	Material Delivery	Diesel	Urban Unr	40	--	65	--	--	10000	--	--	--	0.0012	120
3	Building - 1	Cement Mix	Material Delivery	Diesel	Urban Unr	40	--	65	--	--	100000	--	--	--	--	23125
3	Building - 1	Dump Truck	Material Delivery	Diesel	Urban Unr	40	--	65	--	--	100000	--	--	--	--	12333
3	Building - 1	Passenger Employee	ConGasoline		Urban Unr	30	13.75	65	--	--	--	--	--	--	--	26813
3	Building - 1	Tractor Trailer	Material Delivery	Diesel	Urban Unr	40	--	65	--	--	100000	--	--	--	0.0024	2400

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario ID	Project	Fugitive Variable	Default Values	Units	User Value
1	Site Work	Material h/s = Surface ma	0.043	fraction	
1	Site Work	Material h/Wt. = Mean ve	32	tons	
1	Site Work	Material h/VMT = Vehicle	455	miles	
1	Site Work	Material h/PM10 = 1.5 x [	12.5	lbs	
1	Site Work	Material h/sl. = Road surf	0.1	g/m3	
1	Site Work	Material h/Wt. = Mean ve	32	tons	
1	Site Work	Material h/VMT = Vehicle	430	miles	
1	Site Work	Material h/PM10 = 0.002;	3.992	lbs	
1	Site Work	Soil Handl u = Wind spee	5	mph	
1	Site Work	Soil Handl m = Moisture	0.25	fraction	
1	Site Work	Soil Handl T = Mass of ag	275	tons	
1	Site Work	Soil Handl PM10 = T x 0.3	5.661	lbs	
1	Site Work	Unstabiliz A = Area affec	0.23	acres	
1	Site Work	Unstabiliz TPCConv = TSP/	0.5	fraction	
1	Site Work	Unstabiliz CE = Control e	0.63	fraction	
1	Site Work	Unstabiliz t = year (e.g. 0	0.333	years	
1	Site Work	Unstabiliz PM10 = 0.38 x	0	lbs	
2	Open Park	Material h/sl. = Road surf	0.1	g/m3	
2	Open Park	Material h/Wt. = Mean ve	32	tons	
2	Open Park	Material h/VMT = Vehicle	325	miles	
2	Open Park	Material h/PM10 = 0.002;	3.017	lbs	
2	Open Park	Material h/s = Surface ma	0.043	fraction	
2	Open Park	Material h/Wt. = Mean ve	32	tons	
2	Open Park	Material h/VMT = Vehicle	335	miles	
2	Open Park	Material h/PM10 = 1.5 x [	9.175	lbs	
2	Open Park	Soil Handl u = Wind spee	5	mph	
2	Open Park	Soil Handl m = Moisture	0.25	fraction	
2	Open Park	Soil Handl T = Mass of ag	275	tons	
2	Open Park	Soil Handl PM10 = T x 0.3	5.661	lbs	
2	Open Park	Unstabiliz A = Area affec	0.23	acres	
2	Open Park	Unstabiliz TPCConv = TSP/	0.5	fraction	
2	Open Park	Unstabiliz CE = Control e	0.63	fraction	
2	Open Park	Unstabiliz t = year (e.g. 0	0.25	years	
2	Open Park	Unstabiliz PM10 = 0.38 x	0	lbs	
2	Open Park	Asphalt Dr A = Area of lan	929	m2	
2	Open Park	Asphalt Dr AR = Applicati	1.811	l/m2	
2	Open Park	Asphalt Dr VD = Volume f	0.35	fraction	
2	Open Park	Asphalt Dr EF = Mass frac	0.7	fraction	
2	Open Park	Asphalt Dr D = Density of	1.8	lbs/l	
2	Open Park	Asphalt Dr VOC = A x AR >	741.9	lbs	
3	Building - 1	Concrete V = Volume of	4625	yd3	
3	Building - 1	Concrete f PM10 = 0.037	171.1	lbs	
3	Building - 1	Material h/sl. = Road surf	0.1	g/m3	
3	Building - 1	Material h/Wt. = Mean ve	32	tons	
3	Building - 1	Material h/VMT = Vehicle	2600	miles	
3	Building - 1	Material h/PM10 = 0.002;	24.1	lbs	
3	Building - 1	Material h/s = Surface ma	0.043	fraction	
3	Building - 1	Material h/Wt. = Mean ve	32	tons	
3	Building - 1	Material h/VMT = Vehicle	2700	miles	
3	Building - 1	Material h/PM10 = 1.5 x [73.9	lbs	

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES4

Non-Road Equipment: MOVES4 NONROAD

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Dozer
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks
- Flatbed Truck
- Grader
- Grout Wheel Truck
- Hoist Equipment with 40 Ton Rig
- Hydraulic Hammer
- Hydroseeder
- Line Painting Truck and Sprayer
- Material Deliveries
- Off-Road Truck
- Pickup Truck
- Scraper
- Seed Truck Spreader
- Small Dozer
- Survey Crew Trucks
- Ten Wheelers
- Ten Wheelers- Material Delivery
- Tool Truck
- Tractor Trailer- Equipment Delivery
- Tractor Trailer- Material Delivery
- Tractor Trailer- Steel Deliveries
- Tractor Trailer- Stone Delivery
- Tractor Trailer- Topsoil & Seed
- Tractor Trailer- Truck Delivery
- Tractor Trailer with Boom Hoist- Curbs Del & Place
- Tractor Trailer with Boom Hoist- Delivery
- Tractor Trailers- Rebar Deliveries
- Tractor Trailers Temp Fac.
- Truck for Topsoil & Seed Del&Spread
- Water Truck
- Excavator with Bucket
- Excavator with Hoe Ram

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STUDY

Study Name

DMV Runway Rehab

Study Description

Construction 2028

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

For Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton											MOVES Emissions on Factors (g/gp/hr)										NONROAD Emissions (TPY)									
Scenario ID	Year	Project	Construct on Activity	Equipment	MOVES Equipment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Activity	MOVES Emissions on Factors (g/gp/hr)						NONROAD Emissions (TPY)													
											CO2	NOx	SO2	PM10	PM2.5	VOC	CO2	CO (tpy)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)	VOC (tpy)	CO2 Exhaust (tpy)						
1	2028	Habitatate Runway	Asphalt Placement	Asphalt Paver	Pavers	Pavers175	Diesel	175	0.59	6.3625	0.0784	0.2611	0.00142	0.01874	0.01818	0.0123	536.796	6E-05	2E-04	1E-06	1E-05	1E-05	9E-06	0.3887						
1	2028	Habitatate Runway	Asphalt Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	22.91503	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0002	0.001	1E-05	6E-05	6E-05	9E-05	4.8						
1	2028	Habitatate Runway	Asphalt Placement	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	12.725	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0001	4E-04	2E-06	4E-05	4E-05	3E-05	0.5666						
1	2028	Habitatate Runway	Asphalt Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	6.3625	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	6E-05	3E-04	4E-06	7E-05	2E-05	2E-05	0.2467						
1	2028	Habitatate Runway	Asphalt Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	6.3625	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	6E-05	4E-04	7E-07	1E-05	1E-05	5E-06	0.2467						
1	2028	Habitatate Runway	Asphalt Placement	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	6.3625	3.4553	4.25734	0.00214	0.55746	0.54073	0.7125	693.886	0.0004	5E-04	2E-07	6E-05	6E-05	8E-05	0.0766						
1	2028	Habitatate Runway	Asphalt Placement	Surfacing Equipment (Grooving)	Other Construction Equipment	Other Construction Equipment25	Diesel	25	0.59	8.144	1.4868	3.76218	0.00219	0.16986	0.16476	0.3516	595.151	0.0002	5E-04	3E-07	2E-05	2E-05	5E-05	0.0788						
1	2028	Habitatate Runway	Cold Milling	Cold Planer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	10.18	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0002	4E-04	2E-06	4E-05	4E-05	3E-05	0.6219						
1	2028	Habitatate Runway	Cold Milling	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0002	5E-04	2E-06	4E-05	4E-05	3E-05	0.6219						
1	2028	Habitatate Runway	Cold Milling	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0002	5E-04	2E-06	4E-05	4E-05	3E-05	0.6219						
1	2028	Habitatate Runway	Cold Milling	Sweepers	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.18	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0001	3E-04	1E-06	3E-05	3E-05	2E-05	0.4533						
1	2028	Habitatate Runway	Cold Milling	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0002	5E-04	2E-06	4E-05	4E-05	3E-05	0.6219						
1	2028	Habitatate Runway	Concrete Demolition	Concrete Saws	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	9.17126	0.2785	2.52876	0.00157	0.20304	0.01973	0.0924	595.88	0.0007	0.006	4E-06	5E-05	5E-05	0.0002	1.4211						
1	2028	Habitatate Runway	Concrete Demolition	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	9.17126	0.2785	2.52876	0.00157	0.20304	0.01973	0.0924	595.88	0.0008	0.004	5E-05	0.0002	2E-04	0.0004	19.211						
1	2028	Habitatate Runway	Concrete Demolition	Excavator	Excavators	Excavators175	Diesel	175	0.59	9.17126	0.0534	0.17923	0.00142	0.01206	0.0117	0.0088	536.807	0.0006	0.002	1E-05	0.0001	1E-04	9E-05	5.6093						
1	2028	Habitatate Runway	Concrete Demolition	Hydraulic Hammer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	9.17126	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0015	0.004	2E-05	0.0004	3E-04	0.0003	5.6028						
1	2028	Habitatate Runway	Concrete Demolition	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	9.17126	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0011	0.003	1E-05	0.0003	3E-04	0.0002	4.0834						
1	2028	Habitatate Runway	Concrete Demolition	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	9.17126	0.2785	2.52876	0.00157	0.20304	0.01973	0.0924	595.88	0.0008	0.004	5E-05	0.0002	2E-04	0.0004	19.211						
1	2028	Habitatate Runway	Dust Control	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	720	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0064	0.033	4E-04	0.0019	0.002	0.0028	150.82						
1	2028	Habitatate Runway	Fill (Assume 20% Filler)	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.3936	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	3E-05	9E-06	5E-07	6E-06	6E-06	4E-06	0.2073						
1	2028	Habitatate Runway	Fill (Assume 20% Filler)	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	11.312	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0001	5E-04	6E-06	3E-05	3E-05	4E-05	2.3605						
1	2028	Habitatate Runway	Fill (Assume 20% Filler)	Excavator	Excavators	Excavators175	Diesel	175	0.59	3.3936	0.0534	0.17923	0.00142	0.01206	0.0117	0.0088	536.807	2E-05	7E-05	5E-07	5E-06	5E-06	3E-06	0.2073						
1	2028	Habitatate Runway	Fill (Assume 20% Filler)	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.3936	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	3E-05	2E-04	2E-06	9E-06	9E-06	1E-05	0.7109						
1	2028	Habitatate Runway	Fill (Assume 20% Filler)	Roller	Rollers	Rollers100	Diesel	100	0.59	3.3936	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	3E-05	2E-04	3E-07	6E-06	6E-06	3E-06	0.1316						
1	2028	Habitatate Runway	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.98683	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	1E-05	4E-05	4E-07	3E-06	3E-06	2E-06	0.0976						
1	2028	Habitatate Runway	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.329	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	1E-05	4E-05	2E-07	2E-06	2E-06	2E-06	0.0814						
1	2028	Habitatate Runway	Grading	Grader	Graders	Graders100	Diesel	100	0.59	1.329	0.0299	0.13671	0.00142	0.00835	0.0081	0.0111	536.798	8E-06	4E-05	4E-07	2E-06	2E-06	3E-06	0.1396						
1	2028	Habitatate Runway	Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	1.329	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	1E-05	8E-05	1E-07	2E-06	2E-06	1E-06	0.0517						
1	2028	Habitatate Runway	Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	0.13329	0.4005	1.03891	0.00152	0.05525	0.05359	0.0573	536.663	2E-05	5E-05	8E-08	3E-06	3E-06	3E-06	0.0279						
1	2028	Habitatate Runway	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	0.13329	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	1E-06	6E-06	7E-08	4E-07	3E-07	5E-07	0.0279						
1	2028	Habitatate Runway	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0002	9E-04	1E-05	5E-05	5E-05	7E-05	3.9394						
1	2028	Habitatate Runway	Lighting	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.778	0.2696	1.28517	0.00177	0.13324	0.12924	0.1907	625.985	0.0003	0.003	4E-06	0.0003	3E-04	0.0004	1.3379						
1	2028	Habitatate Runway	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.778	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0002	5E-04	2E-06	5E-05	5E-05	4E-05	0.8361						
1	2028	Habitatate Runway	Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0002	9E-04	1E-05	5E-05	5E-05	7E-05	3.9394						
1	2028	Habitatate Runway	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.778	3.4553	4.25734	0.00214	0.55746	0.54073	0.7125	693.886	0.0001	0.001	7E-07	2E-06	2E-06	4E-06	0.0002	0.2262					
1	2028	Habitatate Runway	Lighting	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.778	1.4029	1.86369	0.00196	0.23416	0.22714	0.2741	695.192	0.0008	8E-04	9E-07	0.0001	1E-04	0.0001	0.3022						
1	2028	Habitatate Runway	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	104.8144	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0009	0.005	6E-05	0.0003	3E-04	0.0004	21.956						
1	2028	Habitatate Runway	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	104.8144	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0012	0.003	1E-05	0.0003	3E-04	0.0002	4.6668						
1	2028	Habitatate Runway	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	104.8144	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0009	0.005	6E-05	0.0003	3E-04	0.0004	21.956						
1	2028	Habitatate Runway	Sealing Random Crack																											

2	2028	Taxiways	Excavation (Cut to Fill)	Excavator	Excavators	Excavators175	Diesel	175	0.59	5.9368	0.0534	0.17923	0.00142	0.01206	0.0117	0.0088	536.807	4E-05	1E-04	1E-06	8E-06	8E-06	6E-06	0.3627
2	2028	Taxiways	Excavation (Cut to Fill)	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.9368	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	5E-05	3E-04	3E-06	2E-05	2E-05	2E-05	1.2436
2	2028	Taxiways	Excavation (Cut to Fill)	Roller	Rollers	Rollers100	Diesel	100	0.59	5.9368	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	5E-05	4E-04	4E-07	1E-05	1E-05	5E-06	0.2302
2	2028	Taxiways	Excavation (Cut to Fill)	Scrapper	Scrapers	Scrapers600	Diesel	600	0.59	7.421	0.0822	0.24242	0.00144	0.01672	0.01622	0.0174	536.781	0.0002	7E-04	4E-06	5E-05	5E-05	5E-05	1.5544
2	2028	Taxiways	Excavation (Topsoil Strip)	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	2.793882	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	2E-05	7E-05	5E-07	5E-06	5E-06	3E-06	0.1707
2	2028	Taxiways	Fencing	Concrete Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	15.27778	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0001	7E-04	8E-06	4E-05	4E-05	6E-05	3.2002
2	2028	Taxiways	Fencing	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0005	0.003	3E-05	0.0002	2E-04	0.0002	12.801
2	2028	Taxiways	Fencing	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	61.11111	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0007	0.002	7E-06	0.0002	2E-04	0.0001	2.7209
2	2028	Taxiways	Fencing	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0005	0.003	3E-05	0.0002	2E-04	0.0002	12.801
2	2028	Taxiways	Fencing	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	61.11111	3.4553	4.25734	0.00214	0.55746	0.54073	0.7125	693.886	0.0037	0.005	2E-06	0.0006	6E-04	0.0008	0.7362
2	2028	Taxiways	Fencing	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	61.11111	1.4029	1.86369	0.00196	0.23416	0.22714	0.2741	695.192	0.002	0.003	3E-06	0.0003	3E-04	0.0004	0.9834
2	2028	Taxiways	Grading	Crawler Tractor/Dozers	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.3314	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	3E-05	9E-05	5E-07	6E-06	6E-06	4E-06	0.2035
2	2028	Taxiways	Grading	Grader	Graders	Graders300	Diesel	300	0.59	3.3314	0.0299	0.13671	0.00142	0.00835	0.0081	0.0111	536.798	2E-05	9E-05	9E-07	5E-06	5E-06	7E-06	0.3489
2	2028	Taxiways	Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	3.3314	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	3E-05	2E-04	3E-07	6E-06	6E-06	3E-06	0.1292
2	2028	Taxiways	Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	3.0013	0.0405	1.03891	0.00152	0.05325	0.05359	0.0573	536.663	0.0005	0.001	2E-06	6E-05	6E-05	7E-05	0.6285
2	2028	Taxiways	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.0013	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	3E-05	1E-04	2E-06	8E-06	8E-06	1E-05	0.6287
2	2028	Taxiways	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0002	8E-04	1E-05	5E-05	5E-05	7E-05	3.8728
2	2028	Taxiways	Lighting	Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.48867	0.6296	1.28517	0.00177	0.13324	0.12924	0.1907	625.985	0.0013	0.003	4E-06	0.0003	3E-04	0.0004	1.3172
2	2028	Taxiways	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.48867	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0005	0.003	4E-06	0.0002	2E-05	4E-05	0.8232
2	2028	Taxiways	Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0003	8E-04	1E-05	5E-05	5E-05	7E-05	3.8728
2	2028	Taxiways	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.48867	3.4553	4.25734	0.00214	0.55746	0.54073	0.7125	693.886	0.0011	0.001	7E-07	0.0002	2E-04	0.0002	0.2227
2	2028	Taxiways	Lighting	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.48867	1.4029	1.86369	0.00196	0.23416	0.22714	0.2741	695.192	0.0006	8E-04	8E-07	0.0001	1E-04	0.0001	0.2975
2	2028	Taxiways	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0003	0.002	2E-05	1E-04	1E-04	0.0001	7.6828
2	2028	Taxiways	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	36.67726	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	0.0004	0.001	4E-06	0.0001	1E-04	8E-05	1.633
2	2028	Taxiways	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0003	0.002	2E-05	1E-04	1E-04	0.0001	7.6828
2	2028	Taxiways	rosion/Sediment Control	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	2.8	0.1412	0.35087	0.00145	0.03431	0.03328	0.0247	536.761	3E-05	8E-05	3E-07	8E-06	8E-06	4E-06	0.1247
2	2028	Taxiways	rosion/Sediment Control	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.6	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	5E-05	3E-04	3E-06	2E-05	1E-05	2E-05	1.173
2	2028	Taxiways	rosion/Sediment Control	Pumps	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.43	2.8	2.4573	4.18322	0.00218	0.23807	0.23093	0.8376	593.756	4E-05	6E-05	3E-08	3E-06	3E-06	1E-05	0.0087
2	2028	Taxiways	rosion/Sediment Control	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	2.8	1.4029	1.86369	0.00196	0.23416	0.22714	0.2741	695.192	9E-05	1E-04	1E-07	2E-05	1E-05	2E-05	0.0451
2	2028	Taxiways	Subbase Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.749684	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	3E-05	1E-04	6E-07	7E-06	6E-06	5E-06	0.2291
2	2028	Taxiways	Subbase Placement	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.3667	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0002	0.001	1E-05	7E-05	7E-05	0.0001	5.5272
2	2028	Taxiways	Subbase Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.749684	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	3E-05	2E-04	2E-06	1E-05	1E-05	1E-05	0.7854
2	2028	Taxiways	Subbase Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	3.653538	0.1409	0.94588	0.00158	0.02637	0.02557	0.0127	596.122	3E-05	2E-04	4E-07	6E-06	6E-06	3E-06	0.1416
2	2028	Taxiways	Topsoil Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	7.402667	0.0662	0.22617	0.00142	0.0155	0.01503	0.0106	536.801	6E-05	2E-04	1E-06	1E-05	1E-05	9E-06	0.4523
2	2028	Taxiways	Topsoil Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	7E-05	3E-04	4E-06	2E-05	2E-05	3E-05	1.5506
2	2028	Taxiways	Topsoil Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0003	9E-04	7E-06	6E-05	6E-05	5E-05	2.7548
3	2028	Emm	molition - Concrete	Concrete Demolition	Excavator with Hoe Ram	Excavators	Diesel	175	0.59	45.09	0.0534	0.17923	0.00142	0.01206	0.0117	0.0088	536.807	0.0003	9E-04	7E-06	6E-05	6E-05	5E-05	2.7548
3	2028	Emm	molition - Concrete	Concrete Demolition	Pickup Truck	Off-highway Trucks	Diesel	600	0.59	90.18	0.0227	0.11778	0.00141	0.00692	0.00671	0.0099	536.802	0.0008	0.004	5E-05	0.0002	2E-04	0.0003	18.89
																		TOTAL 0.0548 0.195 0.002 0.0133 0.013 0.0172 629.87						

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Project	Equipment	Equipment Category	MOVES Lookup	On road Activity	Fuel	Roadway Type	Tr p Distance (mi)	t for 1 h	Number of Vehicles	Number of Employees	Project Length (mi)	Project Width (ft)	Project Area (sq ft)	Surface Height (ft)	Surface Height (ft)	Number of Trees	Activity Rate	VMT	MOVES Emissions Factors (g/mi)																								
																					CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O							
1	2028	ehabilitate Runway	Asphalt 18 Wheeler	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	665	1.9482	3.0056	0.00528	0.035	0.0322	0.11721	1576.55	0.0179	0.22476	0.0014	0.0022	3.9E-06	2.6E-05	2E-05	8.8E-05	1.1557	1E-05	0.0002							
1	2028	ehabilitate Runway	Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	3	--	65	1375	33.35	--	--	--	--	10604	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0122	0.01517	3.3E-05	0.00029	0.0003	0.00099	9.9025	0.0002	0.0014							
1	2028	ehabilitate Runway	ump Truck - Asphalt	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	943	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0011	0.00135	3E-06	2.6E-05	2E-05	8.8E-05	0.8806	1E-05	0.0001							
1	2028	ehabilitate Runway	Subbase Material	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	2	--	65	1375	33.35	--	--	--	--	5656	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0011	0.00135	3E-06	2.6E-05	2E-05	8.8E-05	0.8806	1E-05	0.0001							
1	2028	ehabilitate Runway	Passenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	Employee Commute	Gasoline	Inrestricte	30	--	98.01	98.01	65	--	--	--	--	--	--	2E-05	2.6443	0.599	0.00169	0.0022	0.0019	0.0812	317.757	0.0073	0.0017	0.5571	0.02161	0.00036	0.00046	0.0004	0.0019	67.943	0.0015	0.0004							
2	2028	Taxiways	Asphalt 18 Wheeler	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	233	1.9482	3.0056	0.00528	0.035	0.0322	0.11721	1576.55	0.0179	0.22476	0.0005	0.0007	1.4E-06	9E-06	8E-06	3E-05	0.4459	5E-06	6E-05							
2	2028	Taxiways	Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	3711	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0003	0.00031	1.2E-05	9E-06	9E-06	0.00035	3.4655	5E-06	6E-05							
2	2028	Taxiways	Dump Truck - Asphalt	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	10604	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0011	0.00135	3E-06	2.6E-05	2E-05	8.8E-05	0.8806	1E-05	0.0001							
2	2028	Taxiways	Truck Subbase Material	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	5656	1.0449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0011	0.00135	3E-06	2.6E-05	2E-05	8.8E-05	0.8806	1E-05	0.0001							
2	2028	Taxiways	Passenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	Employee Commute	Gasoline	Inrestricte	30	--	73	73	65	--	--	--	--	--	1E-05	2.6443	0.599	0.00169	0.0022	0.0019	0.0812	317.757	0.0073	0.0017	0.4149	0.00239	0.00027	0.00034	0.0003	0.01273	4.9E-06	0.0011	0.0013								
3	2028	molition - Concrete	Dump Truck	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	Material Delivery	Diesel	Inrestricte	40	5	1	--	65	1012.5	33.4	--	--	--	--	2088	1.9449	1.2976	0.00284	0.0251	0.0231	0.08497	847.165	0.0132	0.11603	0.0022	0.00249	6.5E-06	5.8E-05	5E-05	0.0002	1.9499	3E-06	0.0003							
3	2028	molition - Concrete	Passenger Car	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	Employee Commute	Gasoline	Inrestricte	30	--	31.79	31.79	65	--	--	--	--	--	6191	2.6443	0.599	0.00169	0.0022	0.0019	0.0812	317.757	0.0073	0.0017	0.0017	0.00405	0.00012	0.00015	0.00015	0.00015	0.00015	0.00015	0.00015								
																					TOTAL																1.1838	0.06228	0.00062	0.00169	0.0015	0.03785	163.71	0.0036	0.00042

1	RehabilitatCold Milling	Pickup Truck	Diesel
1	RehabilitatCold Milling	Sweepers	Diesel
1	RehabilitatCold Milling	Water Truck	Diesel
1	RehabilitatConcrete Demoli	Concrete Saws	Diesel
1	RehabilitatConcrete Demoli	Dump Truck	Diesel
1	RehabilitatConcrete Demoli	Excavator	Diesel
1	RehabilitatConcrete Demoli	Hydraulic Hammer	Diesel
1	RehabilitatConcrete Demoli	Other General Equi	Diesel
1	RehabilitatConcrete Demoli	Pickup Truck	Diesel
1	RehabilitatDust Control	Water Truck	Diesel
1	RehabilitatExcavation (Cut t	Dozer	Diesel
1	RehabilitatExcavation (Cut t	Dump Truck (12 cy)	Diesel
1	RehabilitatExcavation (Cut t	Excavator	Diesel
1	RehabilitatExcavation (Cut t	Pickup Truck	Diesel
1	RehabilitatExcavation (Cut t	Roller	Diesel
1	RehabilitatExcavation (Tops	Dozer	Diesel
1	RehabilitatGrading	Dozer	Diesel
1	RehabilitatGrading	Grader	Diesel
1	RehabilitatGrading	Roller	Diesel
1	RehabilitatHydroseeding	Hydroseeder	Diesel
1	RehabilitatHydroseeding	Off-Road Truck	Diesel
1	RehabilitatLighting	Dump Truck	Diesel
1	RehabilitatLighting	Loader	Diesel
1	RehabilitatLighting	Other General Equi	Diesel
1	RehabilitatLighting	Pickup Truck	Diesel
1	RehabilitatLighting	Skid Steer Loader	Diesel
1	RehabilitatLighting	Tractors/Loader/Bu	Diesel
1	RehabilitatMarkings	Flatbed Truck	Diesel
1	RehabilitatMarkings	Other General Equi	Diesel
1	RehabilitatMarkings	Pickup Truck	Diesel
1	RehabilitatSealing Random (	Crack Cleaner	Diesel
1	RehabilitatSealing Random (	Crack Filler (Trailer)	Diesel
1	RehabilitatSealing Random (	Flatbed Truck	Diesel
1	RehabilitatSealing Random (	Other General Equi	Diesel
1	RehabilitatSealing Random (	Pickup Truck	Diesel
1	RehabilitatSoil Erosion/Sedi	Other General Equi	Diesel
1	RehabilitatSoil Erosion/Sedi	Pickup Truck	Diesel
1	RehabilitatSoil Erosion/Sedi	Pumps	Diesel
1	RehabilitatSoil Erosion/Sedi	Tractors/Loader/Bu	Diesel
1	RehabilitatSubbase Placem	Dozer	Diesel
1	RehabilitatSubbase Placem	Dump Truck (12 cy)	Diesel
1	RehabilitatSubbase Placem	Pickup Truck	Diesel
1	RehabilitatSubbase Placem	Roller	Diesel
1	RehabilitatTopsoil Placem	Dozer	Diesel
1	RehabilitatTopsoil Placem	Dump Truck	Diesel
1	RehabilitatTopsoil Placem	Pickup Truck	Diesel
2	Taxiways	Asphalt Placem	Asphalt Paver
2	Taxiways	Asphalt Placem	Dump Truck
2	Taxiways	Asphalt Placem	Other General Equi
2	Taxiways	Asphalt Placem	Pickup Truck
2	Taxiways	Asphalt Placem	Roller
2	Taxiways	Asphalt Placem	Skid Steer Loader
2	Taxiways	Asphalt Placem	Surfacing Equipme
2	Taxiways	Clearing and Grul	Chain Saw
2	Taxiways	Clearing and Grul	Chipper/Stump Gr
2	Taxiways	Clearing and Grul	Pickup Truck
2	Taxiways	Concrete Placem	Air Compressor
2	Taxiways	Concrete Placem	Concrete Saws
2	Taxiways	Concrete Placem	Concrete Truck
2	Taxiways	Concrete Placem	Other General Equi
2	Taxiways	Concrete Placem	Pickup Truck
2	Taxiways	Concrete Placem	Rubber Tired Load
2	Taxiways	Concrete Placem	Slip Form Paver
2	Taxiways	Concrete Placem	Surfacing Equipme
2	Taxiways	Drainage - 24 incl	Dozer
2	Taxiways	Drainage - 24 incl	Dump Truck
2	Taxiways	Drainage - 24 incl	Excavator
2	Taxiways	Drainage - 24 incl	Loader
2	Taxiways	Drainage - 24 incl	Other General Equi
2	Taxiways	Drainage - 24 incl	Pickup Truck
2	Taxiways	Drainage - 24 incl	Roller
2	Taxiways	Drainage - 6 inch	Dump Truck
2	Taxiways	Drainage - 6 inch	Loader
2	Taxiways	Drainage - 6 inch	Other General Equi
2	Taxiways	Drainage - 6 inch	Pickup Truck
2	Taxiways	Drainage - 6 inch	Tractors/Loader/Bu
2	Taxiways	Dust Control	Water Truck
2	Taxiways	Excavation (Borrc	Dozer
2	Taxiways	Excavation (Borrc	Dump Truck (12 cy)
2	Taxiways	Excavation (Borrc	Pickup Truck
2	Taxiways	Excavation (Borrc	Roller
2	Taxiways	Excavation (Cut t	Dozer
2	Taxiways	Excavation (Cut t	Dump Truck (12 cy)
2	Taxiways	Excavation (Cut t	Excavator
2	Taxiways	Excavation (Cut t	Pickup Truck
2	Taxiways	Excavation (Cut t	Roller
2	Taxiways	Excavation (Cut t	Scraper
2	Taxiways	Excavation (Tops	Dozer
2	Taxiways	Fencing	Concrete Truck
2	Taxiways	Fencing	Dump Truck
2	Taxiways	Fencing	Other General Equi
2	Taxiways	Fencing	Pickup Truck
2	Taxiways	Fencing	Skid Steer Loader
2	Taxiways	Fencing	Tractors/Loader/Bu
2	Taxiways	Grading	Dozer
2	Taxiways	Grading	Grader
2	Taxiways	Grading	Roller
2	Taxiways	Hydroseeding	Hydroseeder
2	Taxiways	Hydroseeding	Off-Road Truck
2	Taxiways	Lighting	Dump Truck
2	Taxiways	Lighting	Loader
2	Taxiways	Lighting	Other General Equi
2	Taxiways	Lighting	Pickup Truck
2	Taxiways	Lighting	Skid Steer Loader
2	Taxiways	Lighting	Tractors/Loader/Bu
2	Taxiways	Markings	Flatbed Truck
2	Taxiways	Markings	Other General Equi
2	Taxiways	Markings	Pickup Truck
2	Taxiways	Soil Erosion/Sedi	Other General Equi
2	Taxiways	Soil Erosion/Sedi	Pickup Truck
2	Taxiways	Soil Erosion/Sedi	Pumps
2	Taxiways	Soil Erosion/Sedi	Tractors/Loader/Bu
2	Taxiways	Subbase Placem	Dozer
2	Taxiways	Subbase Placem	Dump Truck (12 cy)
2	Taxiways	Subbase Placem	Pickup Truck
2	Taxiways	Subbase Placem	Roller
2	Taxiways	Topsoil Placem	Dozer
2	Taxiways	Topsoil Placem	Dump Truck
2	Taxiways	Topsoil Placem	Pickup Truck
3	DemolitionConcrete Demoli	Excavator with Buc	Diesel

3	Demolition	Concrete Demolition	Excavator with Hoe Diesel	
3	Demolition	Concrete Demolition	Pickup Truck Diesel	

Overall Size

Scenario ID	Project	Construction Act	Default Activity Size	Unit
1	Rehabilitat	What is the estir	8.91	\$ Million(s)
1	Rehabilitat	What is the maxi	1375	Feet
1	Rehabilitat	What is the maxi	33.35	Feet
2	Taxiways	What is the estir	1.36	\$ Million(s)
2	Taxiways	What is the maxi	1375	Feet
2	Taxiways	What is the maxi	11.67	Feet
3	Demolition	What is the estir	2.89	\$ Million(s)
3	Demolition	What is the maxi	1012.5	Feet
3	Demolition	What is the maxi	33.4	Feet

Size Detail (Estimated based on engineering experience)

Scenario ID	Project	Construction Act	Default Activity Size	Unit
1	Rehabilitat	Asphalt Placeme	5090	Square Yards
1	Rehabilitat	Cold Milling	5090	Square Yards
1	Rehabilitat	Concrete Demoli	5090	Square Feet
1	Rehabilitat	Concrete Demoli	45856.3	Square Feet
1	Rehabilitat	Dust Control	90	Days
1	Rehabilitat	Excavation (Cut t	424.2	Cubic Yards
1	Rehabilitat	Excavation (Tops	1018	Square Yards
1	Rehabilitat	Grading	1332.9	Square Yards
1	Rehabilitat	Hydroseeding	1332.9	Square Feet
1	Rehabilitat	Lighting	2816.7	Linear Feet
1	Rehabilitat	Markings	45856.3	Square Feet
1	Rehabilitat	Sealing Random (	1375	Linear Feet
1	Rehabilitat	Soil Erosion/Sedi	0.3	Acres
1	Rehabilitat	Subbase Placeme	5090	Square Yards
1	Rehabilitat	Subbase Placeme	1696.7	Cubic Yards
1	Rehabilitat	Topsoil Placeme	222.1	Cubic Yards
2	Taxiways	Asphalt Placeme	1781.1	Square Yards
2	Taxiways	Clearing and Grul	0.7	Acres
2	Taxiways	Concrete Placem	742.1	Cubic Yards
2	Taxiways	Drainage - 24 incl	1385	Linear Feet
2	Taxiways	Drainage - 6 inch	2770	Linear Feet
2	Taxiways	Dust Control	90	Days
2	Taxiways	Excavation (Borrc	742.1	Cubic Yards
2	Taxiways	Excavation (Cut t	742.1	Cubic Yards
2	Taxiways	Excavation (Tops	1781.1	Square Yards
2	Taxiways	Fencing	1375	Linear Feet
2	Taxiways	Grading	3331.4	Square Yards
2	Taxiways	Hydroseeding	30013	Square Feet
2	Taxiways	Lighting	2773.3	Linear Feet
2	Taxiways	Markings	16046.3	Square Feet
2	Taxiways	Soil Erosion/Sedi	0.7	Acres
2	Taxiways	Subbase Placeme	1781.1	Square Yards
2	Taxiways	Subbase Placeme	593.7	Cubic Yards
2	Taxiways	Topsoil Placeme	555.2	Cubic Yards
3	Demolition	Concrete Demoli	33817.5	Square Feet

Activity: Non-Road (Estimated based on engineering experience)

Scenario ID	Project	Construction Act	Equipment	Fuel Type	Activity Size	Activity R: Default	Ac Activity Ur	User Activity Data
1	Rehabilitat	Asphalt Placeme	Asphalt Paver	Diesel	5090.00 SY	8 Hours pe	6.36	hours
1	Rehabilitat	Asphalt Placeme	Dump Truck	Diesel	5090.00 SY	8 Hours pe	22.92	hours
1	Rehabilitat	Asphalt Placeme	Other General Equi	Diesel	5090.00 SY	16 Hours f	12.73	hours
1	Rehabilitat	Asphalt Placeme	Pickup Truck	Diesel	5090.00 SY	8 Hours pe	6.36	hours
1	Rehabilitat	Asphalt Placeme	Roller	Diesel	5090.00 SY	8 Hours pe	6.36	hours
1	Rehabilitat	Asphalt Placeme	Skid Steer Loader	Diesel	5090.00 SY	8 Hours pe	6.36	hours
1	Rehabilitat	Asphalt Placeme	Surfacing Equipme	Diesel	5090.00 SY	8 Hours pe	8.14	hours
1	Rehabilitat	Cold Milling	Cold Planer	Diesel	5090.00 SY	8 Hours pe	10.18	hours
1	Rehabilitat	Cold Milling	Dump Truck	Diesel	5090.00 SY	8 Hours pe	10.18	hours
1	Rehabilitat	Cold Milling	Pickup Truck	Diesel	5090.00 SY	8 Hours pe	10.18	hours
1	Rehabilitat	Cold Milling	Sweepers	Diesel	5090.00 SY	8 Hours pe	10.18	hours
1	Rehabilitat	Cold Milling	Water Truck	Diesel	5090.00 SY	8 Hours pe	10.18	hours
1	Rehabilitat	Concrete Demoli	Concrete Saws	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Concrete Demoli	Dump Truck	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Concrete Demoli	Excavator	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Concrete Demoli	Hydraulic Hammer	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Concrete Demoli	Other General Equi	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Concrete Demoli	Pickup Truck	Diesel	45856.30 SF	8 Hours pe	91.71	hours
1	Rehabilitat	Dust Control	Water Truck	Diesel	90.00 Day	8 Hours pe	720	hours
1	Rehabilitat	Excavation (Cut t	Dozer	Diesel	424.20 CY	8 Hours pe	3.39	hours
1	Rehabilitat	Excavation (Cut t	Dump Truck (12 cy)	Diesel	424.20 CY	8 Hours pe	11.31	hours
1	Rehabilitat	Excavation (Cut t	Excavator	Diesel	424.20 CY	8 Hours pe	3.39	hours
1	Rehabilitat	Excavation (Cut t	Pickup Truck	Diesel	424.20 CY	8 Hours pe	3.39	hours
1	Rehabilitat	Excavation (Cut t	Roller	Diesel	424.20 CY	8 Hours pe	3.39	hours
1	Rehabilitat	Excavation (Tops	Dozer	Diesel	1018.00 SY	8 Hours pe	1.6	hours
1	Rehabilitat	Grading	Dozer	Diesel	1332.90 SY	8 Hours pe	1.33	hours
1	Rehabilitat	Grading	Grader	Diesel	1332.90 SY	8 Hours pe	1.33	hours
1	Rehabilitat	Grading	Roller	Diesel	1332.90 SY	8 Hours pe	1.33	hours
1	Rehabilitat	Hydroseeding	Hydroseeder	Diesel	1332.90 SF	8 Hours pe	0.13	hours
1	Rehabilitat	Hydroseeding	Off-Road Truck	Diesel	1332.90 SF	8 Hours pe	0.13	hours
1	Rehabilitat	Lighting	Dump Truck	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Lighting	Loader	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Lighting	Other General Equi	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Lighting	Pickup Truck	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Lighting	Skid Steer Loader	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Lighting	Tractors/Loader/Bl	Diesel	2816.70 LF	8 Hours pe	18.78	hours
1	Rehabilitat	Markings	Flatbed Truck	Diesel	45856.30 SF	8 Hours pe	104.81	hours
1	Rehabilitat	Markings	Other General Equi	Diesel	45856.30 SF	8 Hours pe	104.81	hours
1	Rehabilitat	Markings	Pickup Truck	Diesel	45856.30 SF	8 Hours pe	104.81	hours
1	Rehabilitat	Sealing Random (Crack Cleaner		Diesel	1375.00 LF	8 Hours pe	3.93	hours
1	Rehabilitat	Sealing Random (Crack Filler (Trailer		Diesel	1375.00 LF	8 Hours pe	3.93	hours
1	Rehabilitat	Sealing Random (Flatbed		Diesel	1375.00 LF	8 Hours pe	3.93	hours
1	Rehabilitat	Sealing Random (Other General Equi		Diesel	1375.00 LF	8 Hours pe	3.93	hours
1	Rehabilitat	Sealing Random (Pickup Truck		Diesel	1375.00 LF	8 Hours pe	3.93	hours
1	Rehabilitat	Soil Erosion/Sedi	Other General Equi	Diesel	0.30 Acre	4 Hours pe	1.2	hours
1	Rehabilitat	Soil Erosion/Sedi	Pickup Truck	Diesel	0.30 Acre	8 Hours pe	2.4	hours
1	Rehabilitat	Soil Erosion/Sedi	Pumps	Diesel	0.30 Acre	4 Hours pe	1.2	hours
1	Rehabilitat	Soil Erosion/Sedi	Tractors/Loader/Bl	Diesel	0.30 Acre	4 Hours pe	1.2	hours
1	Rehabilitat	Subbase Placeme	Dozer	Diesel	5090.00 SY	8 Hours pe	10.72	hours
1	Rehabilitat	Subbase Placeme	Dump Truck (12 cy)	Diesel	1696.70 CY	8 Hours pe	75.41	hours
1	Rehabilitat	Subbase Placeme	Pickup Truck	Diesel	5090.00 SY	8 Hours pe	10.72	hours
1	Rehabilitat	Subbase Placeme	Roller	Diesel	1696.70 CY	8 Hours pe	10.44	hours
1	Rehabilitat	Topsoil Placeme	Dozer	Diesel	222.10 CY	8 Hours pe	2.96	hours
1	Rehabilitat	Topsoil Placeme	Dump Truck	Diesel	222.10 CY	8 Hours pe	2.96	hours
1	Rehabilitat	Topsoil Placeme	Pickup Truck	Diesel	222.10 CY	8 Hours pe	2.96	hours
2	Taxiways	Asphalt Placeme	Asphalt Paver	Diesel	1781.10 SY	8 Hours pe	2.23	hours
2	Taxiways	Asphalt Placeme	Dump Truck	Diesel	1781.10 SY	8 Hours pe	8.02	hours
2	Taxiways	Asphalt Placeme	Other General Equi	Diesel	1781.10 SY	16 Hours f	4.45	hours
2	Taxiways	Asphalt Placeme	Pickup Truck	Diesel	1781.10 SY	8 Hours pe	2.23	hours

2	Taxiways	Asphalt Placeme	Roller	Diesel	1781.10 SY	8 Hours pe	2.23 hours
2	Taxiways	Asphalt Placeme	Skid Steer Loader	Diesel	1781.10 SY	8 Hours pe	2.23 hours
2	Taxiways	Asphalt Placeme	Surfacing Equipme	Diesel	1781.10 SY	8 Hours pe	2.85 hours
2	Taxiways	Clearing and Grul	Chain Saw	Diesel	0.70 Acre	12 Hours f	8.4 hours
2	Taxiways	Clearing and Grul	Chipper/Stump Gr	Diesel	0.70 Acre	12 Hours f	8.4 hours
2	Taxiways	Clearing and Grul	Pickup Truck	Diesel	0.70 Acre	16 Hours f	11.2 hours
2	Taxiways	Concrete Placem	Air Compressor	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Concrete Placem	Concrete Saws	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Concrete Placem	Concrete Truck	Diesel	742.10 CY	8 Hours pe	24.74 hours
2	Taxiways	Concrete Placem	Other General Equi	Diesel	742.10 CY	16 Hours f	11.87 hours
2	Taxiways	Concrete Placem	Pickup Truck	Diesel	742.10 CY	24 Hours f	17.81 hours
2	Taxiways	Concrete Placem	Rubber Tired Load	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Concrete Placem	Slip Form Paver	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Concrete Placem	Surfacing Equipme	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Drainage - 24 in	clDozer	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clDump Truck	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clExcavator	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clLoader	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clOther General Equi	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clPickup Truck	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 24 in	clRoller	Diesel	1385.00 LF	8 Hours pe	44.32 hours
2	Taxiways	Drainage - 6 in	ch Dump Truck	Diesel	2770.00 LF	8 Hours pe	24.62 hours
2	Taxiways	Drainage - 6 in	ch Loader	Diesel	2770.00 LF	8 Hours pe	24.62 hours
2	Taxiways	Drainage - 6 in	ch Other General Equi	Diesel	2770.00 LF	8 Hours pe	24.62 hours
2	Taxiways	Drainage - 6 in	ch Pickup Truck	Diesel	2770.00 LF	8 Hours pe	24.62 hours
2	Taxiways	Drainage - 6 in	ch Tractor/Loader/Bu	Diesel	2770.00 LF	8 Hours pe	24.62 hours
2	Taxiways	Dust Control	Water Truck	Diesel	90.00 Day	8 Hours pe	720 hours
2	Taxiways	Excavation (Borrc	Dozer	Diesel	742.10 CY	8 Hours pe	9.89 hours
2	Taxiways	Excavation (Borrc	Dump Truck (12 cy)	Diesel	742.10 CY	8 Hours pe	9.89 hours
2	Taxiways	Excavation (Borrc	Pickup Truck	Diesel	742.10 CY	8 Hours pe	9.89 hours
2	Taxiways	Excavation (Borrc	Roller	Diesel	742.10 CY	8 Hours pe	4.57 hours
2	Taxiways	Excavation (Cut t	Dozer	Diesel	742.10 CY	8 Hours pe	7.42 hours
2	Taxiways	Excavation (Cut t	Dump Truck (12 cy)	Diesel	742.10 CY	8 Hours pe	19.79 hours
2	Taxiways	Excavation (Cut t	Excavator	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Excavation (Cut t	Pickup Truck	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Excavation (Cut t	Roller	Diesel	742.10 CY	8 Hours pe	5.94 hours
2	Taxiways	Excavation (Cut t	Scraper	Diesel	742.10 CY	8 Hours pe	7.42 hours
2	Taxiways	Excavation (Tops	Dozer	Diesel	1781.10 SY	8 Hours pe	2.79 hours
2	Taxiways	Fencing	Concrete Truck	Diesel	1375.00 LF	2 Hours pe	15.28 hours
2	Taxiways	Fencing	Dump Truck	Diesel	1375.00 LF	8 Hours pe	61.11 hours
2	Taxiways	Fencing	Other General Equi	Diesel	1375.00 LF	8 Hours pe	61.11 hours
2	Taxiways	Fencing	Pickup Truck	Diesel	1375.00 LF	8 Hours pe	61.11 hours
2	Taxiways	Fencing	Skid Steer Loader	Diesel	1375.00 LF	8 Hours pe	61.11 hours
2	Taxiways	Fencing	Tractors/Loader/Bu	Diesel	1375.00 LF	8 Hours pe	61.11 hours
2	Taxiways	Grading	Dozer	Diesel	3331.40 SY	8 Hours pe	3.33 hours
2	Taxiways	Grading	Grader	Diesel	3331.40 SY	8 Hours pe	3.33 hours
2	Taxiways	Grading	Roller	Diesel	3331.40 SY	8 Hours pe	3.33 hours
2	Taxiways	Hydroseeding		Diesel	30013.00 SF	8 Hours pe	3 hours
2	Taxiways	Hydroseeding	Off-Road Truck	Diesel	30013.00 SF	8 Hours pe	3 hours
2	Taxiways	Lighting	Dump Truck	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Lighting	Loader	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Lighting	Other General Equi	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Lighting	Pickup Truck	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Lighting	Skid Steer Loader	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Lighting	Tractors/Loader/Bu	Diesel	2773.30 LF	8 Hours pe	18.49 hours
2	Taxiways	Markings	Flatbed Truck	Diesel	16046.30 SF	8 Hours pe	36.68 hours
2	Taxiways	Markings	Other General Equi	Diesel	16046.30 SF	8 Hours pe	36.68 hours
2	Taxiways	Markings	Pickup Truck	Diesel	16046.30 SF	8 Hours pe	36.68 hours
2	Taxiways	Soil Erosion/Sedi	Other General Equi	Diesel	0.70 Acre	4 Hours pe	2.8 hours
2	Taxiways	Soil Erosion/Sedi	Pickup Truck	Diesel	0.70 Acre	8 Hours pe	5.6 hours
2	Taxiways	Soil Erosion/Sedi	Pumps	Diesel	0.70 Acre	4 Hours pe	2.8 hours
2	Taxiways	Soil Erosion/Sedi	Tractors/Loader/Bu	Diesel	0.70 Acre	4 Hours pe	2.8 hours
2	Taxiways	Subbase Placem	Dozer	Diesel	1781.10 SY	8 Hours pe	3.75 hours
2	Taxiways	Subbase Placem	Dump Truck (12 cy)	Diesel	593.70 CY	8 Hours pe	26.39 hours
2	Taxiways	Subbase Placem	Pickup Truck	Diesel	1781.10 SY	8 Hours pe	3.75 hours
2	Taxiways	Subbase Placem	Roller	Diesel	593.70 CY	8 Hours pe	3.65 hours
2	Taxiways	Topsoil Placem	Dozer	Diesel	555.20 CY	8 Hours pe	7.4 hours
2	Taxiways	Topsoil Placem	Dump Truck	Diesel	555.20 CY	8 Hours pe	7.4 hours
2	Taxiways	Topsoil Placem	Pickup Truck	Diesel	555.20 CY	8 Hours pe	7.4 hours
3	Demolitor	Concrete Demoli	Excavator with Bu	Diesel	33817.50 SF	8 Hours pe	45.09 hours
3	Demolitor	Concrete Demoli	Excavator with Ho	Diesel	33817.50 SF	8 Hours pe	45.09 hours
3	Demolitor	Concrete Demoli	Pickup Truck	Diesel	33817.50 SF	8 Hours pe	90.18 hours

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

Activity: On-Road (Estimated based on engineering experience)

Scenario I	Project	Equipment	On-road Activity	Fuel	Roadway Type	Round	Trig	Number o	Number o	Project L	Project W	Project A	Building I	Open Sp	Number	Activity S	Activity I	Default User	VTM
1	Rehabilitat	Asphalt 18 Wheel	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	33.35	--	--	--	--	--	--	--	665	
1	Rehabilitat	Cement Mixer	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	33.35	--	--	--	--	--	--	--	10604	
1	Rehabilitat	Dump Truck - Asq	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	33.35	--	--	--	--	--	--	--	943	
1	Rehabilitat	Dump Truck Sub	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	33.35	--	--	--	--	--	--	--	5566	
1	Rehabilitat	Passenger Car	Employee Commut	Gasoline	Urban Unrestricted	30	98.01	65	--	--	--	--	--	--	--	--	--	2E+05	
2	Taxiways	Asphalt 18 Wheel	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	11.67	--	--	--	--	--	--	--	233	
2	Taxiways	Cement Mixer	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	11.67	--	--	--	--	--	--	--	3711	
2	Taxiways	Dump Truck - Asq	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	11.67	--	--	--	--	--	--	--	330	
2	Taxiways	Dump Truck Sub	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1375	11.67	--	--	--	--	--	--	--	1979	
2	Taxiways	Passenger Car	Employee Commut	Gasoline	Urban Unrestricted	30	73	65	--	--	--	--	--	--	--	--	--	1E+05	
3	Demolitor	Dump Truck	Material Delivery	Diesel	Urban Unrestricted	40	--	65	1012.5	33.4	--	--	--	--	--	--	--	2088	
3	Demolitor	Passenger Car	Employee Commut	Gasoline	Urban Unrestricted	30	31.79	65	--	--	--	--	--	--	--	--	--	61991	

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario I	Project	Fugitive Type	Variable	Default Values	Units	User Value
1	Rehabilitat	Asphalt Drying	A = Area of land aff	4260	m2	
1	Rehabilitat	Asphalt Drying	AR = Application ra	1.811	/m2	
1	Rehabilitat	Asphalt Drying	VD = Volume Fracti	0.35	fraction	
1	Rehabilitat	Asphalt Drying	EF = Mass fraction	0.7	fraction	
1	Rehabilitat	Asphalt Drying	D = Density of solv	1.8	lbs/l	
1	Rehabilitat	Asphalt Drying	VOC = A x AR x VD x	3402.3	lbs	111.3
1	Rehabilitat	Asphalt Storage	t T = Mass of asphalt	554.2	tons	
1	Rehabilitat	Asphalt Storage	t PM10 = (0.027 + 0.1	15.2	lbs	
1	Rehabilitat	Asphalt Storage	t CO = (0.4 + 0.0004)	221.9	lbs	
1	Rehabilitat	Asphalt Storage	t NOx = (0.025) x T	13.9	lbs	
1	Rehabilitat	Asphalt Storage	t SOx = (0.0046) x T	2.549	lbs	
1	Rehabilitat	Asphalt Storage	t VOC = (0.0082 + 0.0	6.872	lbs	
1	Rehabilitat	Material Movem	t S = Surface materia	0.043	fraction	
1	Rehabilitat	Material Movem	t Wt. = Mean vehicle	32	tons	
1	Rehabilitat	Material Movem	t VMT = Vehicle mile	2373	miles	
1	Rehabilitat	Material Movem	t PM10 = 1.5 x [(s/12	65	lbs	
1	Rehabilitat	Material Movem	t S1 = Road surface si	0.1	g/m3	
1	Rehabilitat	Material Movem	t Wt. = Mean vehicle	32	tons	
1	Rehabilitat	Material Movem	t VMT = Vehicle mile	2275	miles	
1	Rehabilitat	Material Movem	t PM10 = 0.0022 x (s	21.1	lbs	
1	Rehabilitat	Soil Handling	u = Wind speed	5	mph	
1	Rehabilitat	Soil Handling	m = Moisture cont	0.25	fraction	
1	Rehabilitat	Soil Handling	T = Mass of aggreg	1261	tons	
1	Rehabilitat	Soil Handling	PM10 = T x 0.35 x 0	26	lbs	
1	Rehabilitat	Unstabilized Lanc	A = Area affected =	1.053	acres	
1	Rehabilitat	Unstabilized Lanc	T PConv = TSP/PM1	0.5	fraction	

1	RehabilitatUnstabilized Lanc CE = Control effice	0.63	fraction
1	RehabilitatUnstabilized Lanc t = year (e.g. 0.65 y	0.25	years
1	RehabilitatUnstabilized Lanc PM10 = 0.38 x A x 1	0	lbs
2	Taxiways Asphalt Drying A = Area of land aff	1490.7	m2
2	Taxiways Asphalt Drying AR = Application ra	1.811	/m2
2	Taxiways Asphalt Drying VD = Volume fracti	0.35	fraction
2	Taxiways Asphalt Drying EF = Mass fraction i	0.7	fraction
2	Taxiways Asphalt Drying D = Density of solv	1.8	lbs/l
2	Taxiways Asphalt Drying VOC = A x AR x VD i	1190.5	lbs
2	Taxiways Asphalt Storage t T = Mass of asphalt	193.9	tons
2	Taxiways Asphalt Storage t PM10 = (0.027 x 0.i	5.318	lbs
2	Taxiways Asphalt Storage t CO = (0.4 + 0.0004)	77.6	lbs
2	Taxiways Asphalt Storage t NOx = (0.025) x T	4.848	lbs
2	Taxiways Asphalt Storage t SOx = (0.0046) x T	0.892	lbs
2	Taxiways Asphalt Storage t VOC = (0.0082 + 0.C	2.405	lbs
2	Taxiways Material Movem s = Surface materia	0.043	fraction
2	Taxiways Material Movem Wt. = Mean vehicle	32	tons
2	Taxiways Material Movem VMT = Vehicle mile	1482.1	miles
2	Taxiways Material Movem PM10 = 1.5 x [(t/12	40.6	lbs
2	Taxiways Material Movem sL = Road surface s	0.1	g/m3
2	Taxiways Material Movem Wt. = Mean vehicle	32	tons
2	Taxiways Material Movem VMT = Vehicle mile	1300	miles
2	Taxiways Material Movem PM10 = 0.0022 x (s	12.1	lbs
2	Taxiways Concrete Mixing V = Volume of asph	742.1	yd3
2	Taxiways Concrete Mixing PM10 = 0.037 x V	27.5	lbs
2	Taxiways Unstabilized Lanc A = Area affected =	0.368	acres
2	Taxiways Unstabilized Lanc TPConv = TSP/PM1	0.5	fraction
2	Taxiways Unstabilized Lanc CE = Control effice	0.63	fraction
2	Taxiways Unstabilized Lanc t = year (e.g. 0.65 y	0.25	years
2	Taxiways Soil Handling u = Wind speed	5	mph
2	Taxiways Soil Handling m = Moisture conti	0.25	fraction
2	Taxiways Soil Handling T = Mass of aggreg	441.3	tons
2	Taxiways Soil Handling PM10 = T x 0.35 x 0	9.083	lbs
3	DemolitorSoil Handling u = Wind speed	5	mph
3	DemolitorSoil Handling m = Moisture conti	0.25	fraction
3	DemolitorSoil Handling T = Mass of aggreg	930	tons
3	DemolitorSoil Handling PM10 = T x 0.35 x 0	19.1	lbs
3	DemolitorUnstabilized Lanc A = Area affected =	0.776	acres
3	DemolitorUnstabilized Lanc TPConv = TSP/PM1	0.5	fraction
3	DemolitorUnstabilized Lanc CE = Control effice	0.63	fraction
3	DemolitorUnstabilized Lanc t = year (e.g. 0.65 y	0.25	years
3	DemolitorUnstabilized Lanc PM10 = 0.38 x A x 1	0	lbs
3	DemolitorMaterial Movem s = Surface materia	0.043	fraction
3	DemolitorMaterial Movem Wt. = Mean vehicle	32	tons
3	DemolitorMaterial Movem VMT = Vehicle mile	381.4	miles
3	DemolitorMaterial Movem PM10 = 1.5 x [(t/12	10.4	lbs
3	DemolitorMaterial Movem sL = Road surface s	0.1	g/m3
3	DemolitorMaterial Movem Wt. = Mean vehicle	32	tons
3	DemolitorMaterial Movem VMT = Vehicle mile	325	miles
3	DemolitorMaterial Movem PM10 = 0.0022 x (s	3.017	lbs

===== ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Dozer
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks
- Flatbed Truck
- Grader

Grout Wheel Truck
Hoist Equipment with 40 Ton Rig
Hydraulic Hammer
Hydroseeder
Line Painting Truck and Sprayer
Material Deliveries
Off-Road Truck
Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Hoist- Curbs Del & Place
Tractor Trailer with Boom Hoist- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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Airport Construction Emissions Inventory Tool (ACEIT)																									
Version 1.0																									
Run Date & Time: 10/25/2023 11:26:27 AM																									
STUDY																									
Study Name																									
DMV Runway Rehab																									
Study Description																									
Construction 2029																									
EMISSIONS INVENTORY - DETAILS:																									
Non-Road Sources																									
Units for Non-Greenhouse Gases Emission: Short Ton																									
Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton																									
Scenario ID	Year	Project	Construct on Activity	Equipment	MOVES Equipment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Activity	MOVES Emissions on Factors (g hp hr)										NONROAD Emissions (tpy)				
											CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO (tpy)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)	VOC (tpy)	CO2 Exhaust (tpy)	
1	2029	Millitate Ru	Asphalt Placemen	Asphalt Paver	Pavers	Pavers175	Diesel	175	0.59	6.3625	0.0717	0.2384	0.0014	0.01694	0.01643	0.01137	536.798	56-05	0.0002	1E-06	1E-05	1E-05	8E-06	0.388719	
1	2029	Millitate Ru	Asphalt Placemen	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	22.91503	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0001	0.001	1E-05	6E-05	6E-05	9E-05	4.800029	
1	2029	Millitate Ru	Asphalt Placemen	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	12.725	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0001	0.0003	2E-06	3E-05	3E-05	2E-05	0.566585	
1	2029	Millitate Ru	Asphalt Placemen	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	6.3625	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	5E-05	0.0003	4E-06	2E-05	2E-05	2E-05	1.332758	
1	2029	Millitate Ru	Asphalt Placemen	Roller	Rollers	Rollers100	Diesel	100	0.59	6.3625	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	5E-05	0.0004	7E-07	1E-05	9E-06	5E-06	0.246674	
1	2029	Millitate Ru	Asphalt Placemen	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	6.3625	3.0635	4.0453	0.0021	0.49215	0.47739	0.63133	694.126	0.0001	0.0004	2E-07	5E-05	5E-05	7E-05	0.076675	
1	2029	Millitate Ru	Asphalt Placemen	Surfacing Equipment (Grooving)	Other Construction Equipment	Other Construction Equipment25	Diesel	25	0.59	8.144	1.4876	3.7623	0.0022	0.1701	0.165	0.35159	595.149	0.0002	0.0005	3E-07	2E-05	2E-05	5E-05	0.078807	
1	2029	Millitate Ru	Cold Milling	Cold Planer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	10.18	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0001	0.0003	2E-06	3E-05	3E-05	2E-05	0.621926	
1	2029	Millitate Ru	Cold Milling	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	8E-05	0.0005	6E-06	3E-05	3E-05	4E-05	2.124313	
1	2029	Millitate Ru	Cold Milling	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	8E-05	0.0005	6E-06	3E-05	3E-05	4E-05	2.124313	
1	2029	Millitate Ru	Cold Milling	Sweepers	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.18	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	9E-05	0.0002	1E-06	2E-05	2E-05	4E-05	0.453268	
1	2029	Millitate Ru	Cold Milling	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	8E-05	0.0005	6E-06	3E-05	3E-05	4E-05	2.124313	
1	2029	Millitate Ru	Concrete Demoliti	Concrete Saws	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	91.7126	0.2779	2.5283	0.0016	0.0202	0.01959	0.0924	595.88	0.0007	0.0006	4E-06	5E-05	5E-05	2E-04	1.421095	
1	2029	Millitate Ru	Concrete Demoliti	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0007	0.0004	5E-05	0.0002	0.0002	3E-04	19.21111	
1	2029	Millitate Ru	Concrete Demoliti	Excavator	Excavators	Excavators175	Diesel	175	0.59	91.7126	0.0509	0.1714	0.0014	0.01137	0.01103	0.00846	536.807	0.0005	0.0018	1E-05	0.0001	0.0001	9E-05	5.603301	
1	2029	Millitate Ru	Concrete Demoliti	Hydraulic Hammer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	91.7126	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0011	0.003	1E-05	0.0003	0.0003	2E-04	5.60299	
1	2029	Millitate Ru	Concrete Demoliti	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	91.7126	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0008	0.0022	1E-05	0.0002	0.0002	1E-04	4.083535	
1	2029	Millitate Ru	Concrete Demoliti	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0007	0.0004	5E-05	0.0002	0.0002	3E-04	19.21111	
1	2029	Millitate Ru	Dust Control	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	720	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0008	0.0004	0.0001	0.0001	0.0001	0.0001	150.818	
1	2029	Millitate Ru	Fill (Assume 20	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.9396	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	2E-05	9E-05	5E-07	5E-06	5E-06	4E-06	0.207335	
1	2029	Millitate Ru	Fill (Assume 20	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	11.312	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	9E-05	0.0005	6E-06	3E-05	3E-05	4E-05	2.369534	
1	2029	Millitate Ru	Fill (Assume 20	Excavator	Excavators	Excavators175	Diesel	175	0.59	3.9396	0.0509	0.1714	0.0014	0.01137	0.01103	0.00846	536.807	2E-05	7E-05	5E-07	4E-06	4E-06	3E-06	0.207336	
1	2029	Millitate Ru	Fill (Assume 20	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.9396	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	3E-05	0.0002	2E-06	9E-06	8E-06	1E-05	0.71086	
1	2029	Millitate Ru	Fill (Assume 20	Roller	Rollers	Rollers100	Diesel	100	0.59	3.9396	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	3E-05	0.0002	3E-07	5E-06	5E-06	3E-06	0.13157	
1	2029	Millitate Ru	Grading Random C	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.598623	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	1E-05	4E-05	5E-07	2E-06	2E-06	0.097922		
1	2029	Millitate Ru	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.3329	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	9E-06	3E-05	2E-07	2E-06	2E-06	1E-06	0.081435	
1	2029	Millitate Ru	Grading	Grader	Graders	Graders300	Diesel	300	0.59	1.3329	0.0254	0.1247	0.0014	0.00753	0.00731	0.01045	536.8	7E-06	3E-05	4E-07	2E-06	2E-06	3E-06	0.139601	
1	2029	Millitate Ru	Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	1.3329	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	1E-05	8E-05	1E-07	2E-06	2E-06	1E-06	0.051676	
1	2029	Millitate Ru	Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	0.13329	0.3421	0.9072	0.0015	0.04775	0.04631	0.04958	536.685	2E-05	5E-05	8E-08	2E-06	2E-06	3E-06	0.027914	
1	2029	Millitate Ru	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	0.13329	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	1E-06	5E-06	7E-08	3E-07	5E-07	5E-07	0.02792	
1	2029	Millitate Ru	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0001	0.0008	1E-05	5E-05	5E-05	7E-05	3.939443	
1	2029	Millitate Ru	Lighting	Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.778	0.5366	1.1264	0.0018	0.11572	0.11225	0.16416	626.063	0.0011	0.0024	4E-06	0.0002	0.0002	4E-04	1.338024	
1	2029	Millitate Ru	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.778	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0002	0.0004	2E-06	4E-05	4E-05	5E-05	0.836097	
1	2029	Millitate Ru	Lighting	Off-highway Trucks	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0002	0.0008	1E-05	5E-05	5E-05	7E-05	3.939443	
1	2029	Millitate Ru	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.778	3.0635	4.0453	0.0021	0.49215	0.47739	0.63133	694.126	0.001	0.0013	7E-07	0.0002	0.0002	2E-04	0.226295	
1	2029	Millitate Ru	Lighting	Tractor/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.778	1.2131	1.7254	0.0019	0.2023	0.19623	0.23542	695.307	0.0005	0.0008	8E-07	9E-05	9E-05	1E-04	0.30224	
1	2029	Millitate Ru	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.8414	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0007	0.0004	6E-05	0.0003	0.0003	4E-04	21.95556	
1	2029	Millitate Ru	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.8414	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0009	0.0025	1E-05	0.0002	0.0002	2E-04	4.666897	
1	2029	Millitate Ru	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.8414	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0007	0.0004	6E-05	0.0003	0.0003	4E-04	21.95556	
1	2029	Millitate Ru	Crack Cleaning	Crack Cleaner	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	3.928571	0.2779	2.5283	0.0016	0.0202	0.01959	0.0924	595.88	0.0003	0.0003	2E-07	2E-06	2E-06	9E-06	0.060899	
1	2029	Millitate Ru	Crack Filler (Trailer Mounted)	Crack Filler (Trailer Mounted)	Other Construction Equipment	Other Construction Equipment100	Diesel	100	0.43	3.928571	0.2163	0.9819	0.0016	0.03543	0.03437	0.01897	596.104	4E-05	0.0002	3E-07	7E-06	6E-06	4E-06	0.111002	
1	2029	Millitate Ru	Flatbed Truck	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.928571	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	3E-05	0.0002	2E-06	1E-05	1E-05	1E-05	0.822921	
1	2029	Millitate Ru	Flatbed Truck	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	3.928571	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	4E-05	9E-05	5E-07	8E-06	8E-06	6E-06	0.174921	
1	2029	Millitate Ru	Grading Random C	Dozer	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.928571	0.0205	0.1139	0.0014												

2	2029	Taxiways	Excavation (Cut to Level)	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	19.78933	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0002	0.0009	1E-05	5E-05	5E-05	7E-05	4.145288	
2	2029	Taxiways	Excavation (Cut to Level)	Excavator	Excavators	Excavators175	Diesel	175	0.59	5.9368	0.0509	0.1714	0.0014	0.01137	0.01103	0.00846	536.807	0.0003	0.0001	1E-06	8E-06	7E-06	6E-06	0.362717	
2	2029	Taxiways	Excavation (Cut to Level)	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.9368	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	5E-05	0.0003	3E-06	2E-05	1E-05	2E-05	1.243586	
2	2029	Taxiways	Excavation (Cut to Level)	Roller	Rollers	Rollers100	Diesel	100	0.59	5.9368	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	5E-05	0.0004	6E-07	9E-06	4E-06	4E-06	0.230169	
2	2029	Taxiways	Excavation (Cut to Level)	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	61.11111	3.0635	0.4053	0.0021	0.49215	0.47739	0.63133	694.126	0.0003	0.0043	2E-06	0.0005	0.0005	7E-04	0.736454	
2	2029	Taxiways	Excavation (Topsoil Str)	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	2.793882	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	2E-05	6E-05	5E-07	4E-06	4E-06	3E-06	0.170695	
2	2029	Taxiways	Fencing	Concrete Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	15.27778	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0001	0.0007	8E-06	4E-05	4E-05	6E-05	3.200249	
2	2029	Taxiways	Fencing	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0005	0.0027	3E-05	0.0002	0.0002	2E-04	12.80099	
2	2029	Taxiways	Fencing	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	61.11111	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0005	0.0014	7E-06	0.0003	0.0001	9E-05	2.720993	
2	2029	Taxiways	Fencing	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0005	0.0027	3E-05	0.0002	0.0002	2E-04	12.80099	
2	2029	Taxiways	Fencing	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	61.11111	3.0635	0.4053	0.0021	0.49215	0.47739	0.63133	694.126	0.0003	0.0043	2E-06	0.0005	0.0005	7E-04	0.736454	
2	2029	Taxiways	Fencing	Tractors/Loader/Backhoe	Tractors/Loader/Backhoes	Tractors/Loader/Backhoes100	Diesel	100	0.21	61.11111	1.2131	1.7254	0.0019	0.2023	0.19623	0.23542	695.307	0.0017	0.0024	3E-06	0.0003	0.0003	3E-06	0.983609	
2	2029	Taxiways	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.3314	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	2E-05	8E-05	5E-07	5E-06	5E-06	4E-06	0.203535	
2	2029	Taxiways	Grading	Grader	Graders	Graders300	Diesel	300	0.59	3.3314	0.0254	0.1247	0.0014	0.00753	0.00731	0.01045	536.8	2E-05	8E-05	9E-07	5E-06	5E-06	7E-06	0.348915	
2	2029	Taxiways	Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	3.3314	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	3E-05	0.0002	3E-07	5E-06	5E-06	3E-06	0.129158	
2	2029	Taxiways	Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	3.0013	0.3421	0.9072	0.0015	0.04775	0.04631	0.04958	536.685	0.0004	0.0011	2E-06	6E-05	5E-05	6E-05	0.628548	
2	2029	Taxiways	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.0013	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	2E-05	0.0001	2E-06	8E-06	7E-06	1E-05	0.628685	
2	2029	Taxiways	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0001	0.0008	1E-05	5E-05	5E-05	7E-05	3.872836	
2	2029	Taxiways	Lighting	Loader	Tractors/Loader/Backhoes	Tractors/Loader/Backhoes175	Diesel	175	0.59	18.48867	0.5366	1.1264	0.0018	0.11572	0.11225	0.16416	626.063	0.0001	0.0004	4E-06	0.0002	0.0002	3E-04	1.317408	
2	2029	Taxiways	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.48867	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0002	0.0004	2E-06	4E-05	4E-05	3E-05	0.823214	
2	2029	Taxiways	Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0001	0.0008	1E-05	5E-05	5E-05	7E-05	3.872836	
2	2029	Taxiways	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.48867	3.0635	0.4053	0.0021	0.49215	0.47739	0.63133	694.126	0.001	0.0013	7E-07	0.0002	0.0002	2E-04	0.222808	
2	2029	Taxiways	Lighting	Tractors/Loader/Backhoe	Tractors/Loader/Backhoes	Tractors/Loader/Backhoes100	Diesel	100	0.21	18.48867	1.2131	1.7254	0.0019	0.2023	0.19623	0.23542	695.307	0.0005	0.0007	8E-07	9E-05	8E-05	1E-04	0.297583	
2	2029	Taxiways	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0003	0.0016	2E-05	9E-05	9E-05	1E-04	7.682815	
2	2029	Taxiways	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	36.67726	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	0.0003	0.0009	4E-06	8E-05	8E-05	1E-04	1.633067	
2	2029	Taxiways	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0003	0.0016	3E-05	9E-05	9E-05	1E-04	7.682815	
2	2029	Taxiways	Position/Sediment Control	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	2.8	0.1082	0.2835	0.0014	0.02594	0.02516	0.01873	536.777	3E-05	7E-05	3E-07	6E-06	6E-06	4E-06	0.124671	
2	2029	Taxiways	Position/Sediment Control	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.6	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	4E-05	0.0002	3E-06	1E-05	1E-05	1E-05	1.173037	
2	2029	Taxiways	Position/Sediment Control	Pumps	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.43	2.8	2.4586	4.1833	0.0022	0.23841	0.23126	0.83771	593.756	4E-05	8E-05	3E-08	3E-06	3E-06	1E-05	0.008668	
2	2029	Taxiways	Position/Sediment Control	Tractors/Loader/Backhoe	Tractors/Loader/Backhoes	Tractors/Loader/Backhoes100	Diesel	100	0.21	2.8	1.2131	1.7254	0.0019	0.2023	0.19623	0.23542	695.307	8E-05	0.0001	1E-07	1E-05	1E-05	2E-05	0.045067	
2	2029	Taxiways	Subbase Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.749684	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	3E-05	9E-05	6E-07	6E-06	6E-06	4E-06	0.22509	
2	2029	Taxiways	Subbase Placement	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	26.38667	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0002	0.0012	1E-05	7E-05	6E-05	1E-04	5.527237	
2	2029	Taxiways	Subbase Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.749684	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	3E-05	0.0002	2E-06	1E-05	9E-06	1E-05	0.785449	
2	2029	Taxiways	Subbase Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	3.635358	0.1223	0.9275	0.0016	0.02333	0.02263	0.01163	596.124	3E-05	0.0002	4E-07	6E-06	5E-06	3E-06	0.141647	
2	2029	Taxiways	Topsoil Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	7.402667	0.0593	0.2009	0.0014	0.01367	0.01326	0.00962	536.804	5E-05	0.0002	1E-06	1E-05	1E-05	8E-06	0.452273	
2	2029	Taxiways	Topsoil Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	6E-05	0.0003	4E-06	2E-05	2E-05	3E-05	1.550643	
2	2029	Taxiways	Topsoil Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	6E-05	0.0003	4E-06	2E-05	2E-05	3E-05	1.550643	
3	2029	Excavation - Concrete Demolition	Excavator with Bucket	Excavator with Bucket	Excavators	Excavators175	Diesel	175	0.59	45.09	0.0509	0.1714	0.0014	0.01137	0.01103	0.00846	536.807	0.0003	0.0009	7E-06	6E-05	6E-05	4E-05	2.754832	
3	2029	Excavation - Concrete Demolition	Excavator with Hoe Ram	Excavator with Hoe Ram	Excavators	Excavators175	Diesel	175	0.59	45.09	0.0509	0.1714	0.0014	0.01137	0.01103	0.00846	536.807	0.0003	0.0009	7E-06	6E-05	6E-05	4E-05	2.754832	
3	2029	Excavation - Concrete Demolition	Pickup Truck	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	90.18	0.0205	0.1139	0.0014	0.0065	0.0063	0.00965	536.802	0.0007	0.004	5E-05	0.0002	0.0002	3E-04	18.89008	
										TOTAL 0.0479 0.1833 0.0017 0.0119 0.0116 629.8768															

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

Scenario ID	Year	Pro. ect	Equipment	Equipment Category	MOVES Lookup	On road Act v ty	Fuel	Roadway Type	Round Trip Distance	Distance for fuel Vehicle	Number of Vehicles	Number of Employees	Number of Passengers	Pro. ect Length	Pro. ect Width	Pro. ect Area	Build ing Height	Open Space Height	Number of Trees	Act v ty Rate	VMT	MOVES Emissions on Factors (g/mile)										MOVES ONROAD Emissions (tpy)							
																						CO	NOx	SO ₂	PM10	PM2.5	VOC	CO ₂	CH ₄	N ₂ O	CO	NOx	SO ₂	PM10	PM2.5	VOC	CO ₂	CH ₄	N ₂ O
1	2029	illabitate Ru	Asphalt 18 Wheel	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Interstrect	40	5	1	--	65	1375	33.35	--	--	--	--	--	665	1.905	2.703694	0.005193	0.029708	0.027331	0.108593	1551.807	0.017542	0.22528	0.0014	0.00198	3.8E-06	2.2E-05	2E-05	8E-05	1.13754	1.3E-05	0.00017
1	2029	illabitate Ru	Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Interstrect	40	5	3	--	65	1375	33.35	--	--	--	--	--	10604	1.015	1.156665	0.002788	0.020793	0.01913	0.074579	831.7483	0.012835	0.11656	0.01186	0.01352	3.3E-05	0.00024	0.0002	0.00087	9.72228	0.00015	0.00

	1	Rehabilitat	Concrete I	Other General Ec	Diesel
	1	Rehabilitat	Concrete I	Pickup Truck	Diesel
	1	Rehabilitat	Dust Cont	Water Truck	Diesel
	1	Rehabilitat	Excavator	Dozer	Diesel
	1	Rehabilitat	Excavator	Dump Truck (12 -	Diesel
	1	Rehabilitat	Excavator	Excavator	Diesel
	1	Rehabilitat	Excavator	Pickup Truck	Diesel
	1	Rehabilitat	Excavator	Roller	Diesel
	1	Rehabilitat	Excavator	Dozer	Diesel
	1	Rehabilitat	Grading	Dozer	Diesel
	1	Rehabilitat	Grading	Grader	Diesel
	1	Rehabilitat	Grading	Roller	Diesel
	1	Rehabilitat	Hydroseed	Hydroseeder	Diesel
	1	Rehabilitat	Hydroseed	Off-Road Truck	Diesel
	1	Rehabilitat	Lighting	Dump Truck	Diesel
	1	Rehabilitat	Lighting	Loader	Diesel
	1	Rehabilitat	Lighting	Other General Ec	Diesel
	1	Rehabilitat	Lighting	Pickup Truck	Diesel
	1	Rehabilitat	Lighting	Skid Steer Load	Diesel
	1	Rehabilitat	Lighting	Tractors/Loader/	Diesel
	1	Rehabilitat	Markings	Flatbed Truck	Diesel
	1	Rehabilitat	Markings	Other General Ec	Diesel
	1	Rehabilitat	Markings	Pickup Truck	Diesel
	1	Rehabilitat	Sealing Ra	Crack Cleaner	Diesel
	1	Rehabilitat	Sealing Ra	Crack Filler (Trail	Diesel
	1	Rehabilitat	Sealing Ra	Flatbed Truck	Diesel
	1	Rehabilitat	Sealing Ra	Other General Ec	Diesel
	1	Rehabilitat	Sealing Ra	Pickup Truck	Diesel
	1	Rehabilitat	Soil Erosio	Other General Ec	Diesel
	1	Rehabilitat	Soil Erosio	Pickup Truck	Diesel
	1	Rehabilitat	Soil Erosio	Pumps	Diesel
	1	Rehabilitat	Soil Erosio	Tractors/Loader/	Diesel
	1	Rehabilitat	Subbase P	Dozer	Diesel
	1	Rehabilitat	Subbase P	Dump Truck (12 -	Diesel
	1	Rehabilitat	Subbase P	Pickup Truck	Diesel
	1	Rehabilitat	Subbase P	Roller	Diesel
	1	Rehabilitat	Topsoil P/	Dozer	Diesel
	1	Rehabilitat	Topsoil P/	Dump Truck	Diesel
	1	Rehabilitat	Topsoil P/	Pickup Truck	Diesel
	2	Taxiways	Asphalt P/	Asphalt Paver	Diesel
	2	Taxiways	Asphalt P/	Dump Truck	Diesel
	2	Taxiways	Asphalt P/	Other General Ec	Diesel
	2	Taxiways	Asphalt P/	Pickup Truck	Diesel
	2	Taxiways	Asphalt P/	Roller	Diesel
	2	Taxiways	Asphalt P/	Skid Steer Load	Diesel
	2	Taxiways	Asphalt P/	Skid Steer Load	Diesel
	2	Taxiways	Asphalt P/	Surfacing Equipn	Diesel
	2	Taxiways	Cleaning at	Chain Saw	Diesel
	2	Taxiways	Cleaning at	Chipper/Stump	Diesel
	2	Taxiways	Cleaning at	Pickup Truck	Diesel
	2	Taxiways	Concrete I	Air Compressor	Diesel
	2	Taxiways	Concrete I	Concrete Saws	Diesel
	2	Taxiways	Concrete I	Concrete Truck	Diesel
	2	Taxiways	Concrete I	Other General Ec	Diesel
	2	Taxiways	Concrete I	Pickup Truck	Diesel
	2	Taxiways	Concrete I	Rubber Tired Load	Diesel
	2	Taxiways	Concrete I	Slip Form Paver	Diesel
	2	Taxiways	Concrete I	Surfacing Equipn	Diesel
	2	Taxiways	Drainage -	Dozer	Diesel
	2	Taxiways	Drainage -	Dump Truck	Diesel
	2	Taxiways	Drainage -	Excavator	Diesel
	2	Taxiways	Drainage -	Loader	Diesel
	2	Taxiways	Drainage -	Other General Ec	Diesel
	2	Taxiways	Drainage -	Pickup Truck	Diesel
	2	Taxiways	Drainage -	Roller	Diesel
	2	Taxiways	Drainage -	Dump Truck	Diesel
	2	Taxiways	Drainage -	Loader	Diesel
	2	Taxiways	Drainage -	Other General Ec	Diesel
	2	Taxiways	Drainage -	Pickup Truck	Diesel
	2	Taxiways	Drainage -	Tractors/Loader/	Diesel
	2	Taxiways	Dust Cont	Water Truck	Diesel
	2	Taxiways	Excavator	Dozer	Diesel
	2	Taxiways	Excavator	Dump Truck (12 -	Diesel
	2	Taxiways	Excavator	Pickup Truck	Diesel
	2	Taxiways	Excavator	Roller	Diesel
	2	Taxiways	Excavator	Dozer	Diesel
	2	Taxiways	Excavator	Dump Truck (12 -	Diesel
	2	Taxiways	Excavator	Excavator	Diesel
	2	Taxiways	Excavator	Pickup Truck	Diesel
	2	Taxiways	Excavator	Roller	Diesel
	2	Taxiways	Excavator	Scraper	Diesel
	2	Taxiways	Excavator	Dozer	Diesel
	2	Taxiways	Fencing	Concrete Truck	Diesel
	2	Taxiways	Fencing	Dump Truck	Diesel
	2	Taxiways	Fencing	Other General Ec	Diesel
	2	Taxiways	Fencing	Pickup Truck	Diesel
	2	Taxiways	Fencing	Skid Steer Load	Diesel
	2	Taxiways	Fencing	Tractors/Loader/	Diesel
	2	Taxiways	Grading	Dozer	Diesel
	2	Taxiways	Grading	Grader	Diesel
	2	Taxiways	Grading	Roller	Diesel
	2	Taxiways	Hydroseed	Hydroseeder	Diesel
	2	Taxiways	Hydroseed	Off-Road Truck	Diesel
	2	Taxiways	Lighting	Dump Truck	Diesel
	2	Taxiways	Lighting	Loader	Diesel
	2	Taxiways	Lighting	Other General Ec	Diesel
	2	Taxiways	Lighting	Pickup Truck	Diesel
	2	Taxiways	Lighting	Skid Steer Load	Diesel
	2	Taxiways	Lighting	Tractors/Loader/	Diesel
	2	Taxiways	Markings	Flatbed Truck	Diesel
	2	Taxiways	Markings	Other General Ec	Diesel
	2	Taxiways	Markings	Pickup Truck	Diesel
	2	Taxiways	Soil Erosio	Other General Ec	Diesel
	2	Taxiways	Soil Erosio	Pickup Truck	Diesel
	2	Taxiways	Soil Erosio	Pumps	Diesel
	2	Taxiways	Soil Erosio	Tractors/Loader/	Diesel
	2	Taxiways	Subbase P	Dozer	Diesel
	2	Taxiways	Subbase P	Dump Truck (12 -	Diesel
	2	Taxiways	Subbase P	Pickup Truck	Diesel
	2	Taxiways	Subbase P	Roller	Diesel
	2	Taxiways	Topsoil P/	Dozer	Diesel
	2	Taxiways	Topsoil P/	Dump Truck	Diesel
	2	Taxiways	Topsoil P/	Pickup Truck	Diesel
	3	Demolitor	Concrete I	Excavator with B	Diesel
	3	Demolitor	Concrete I	Excavator with H	Diesel
	3	Demolitor	Concrete I	Pickup Truck	Diesel

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

Overall Size

Scenario IProjectProject SizUser InputUnit

1	RehabilitatWhat is th	8.91 \$ Million(s)
1	RehabilitatWhat is th	1375 Feet
1	RehabilitatWhat is th	33.35 Feet
2	Taxiways What is th	1.36 \$ Million(s)
2	Taxiways What is th	1375 Feet
2	Taxiways What is th	11.67 Feet
3	DemolitionWhat is th	2.89 \$ Million(s)
3	DemolitionWhat is th	1012.5 Feet
3	DemolitionWhat is th	33.4 Feet

Size Detail (Estimated based on engineering experience)

ScenarioID	Project	Constructi	Default Activity	Unit	User Activity Size
1	Rehabilitat	Asphalt Pl	5090 Square Yards		
1	Rehabilitat	Cold Millin	5090 Square Yards		
1	Rehabilitat	Concrete f	5090 Square Feet		
1	Rehabilitat	Concrete f	45856.3 Square Feet		
1	Rehabilitat	Dust Conti	90 Days		
1	Rehabilitat	Excavator	424.2 Cubic Yards		
1	Rehabilitat	Excavator	1018 Square Yards		
1	Rehabilitat	Grading	1332.9 Square Yards		
1	Rehabilitat	Hydroseec	1332.9 Square Feet		
1	Rehabilitat	Lighting	2816.7 Linear Feet		
1	Rehabilitat	Markings	45856.3 Square Feet		
1	Rehabilitat	Sealing Ra	1375 Linear Feet		
1	Rehabilitat	Soil Erosio	0.3 Acres		
1	Rehabilitat	Subbase P	5090 Square Yards		
1	Rehabilitat	Subbase P	1696.7 Cubic Yards		
1	Rehabilitat	Topsoil P/c	222.1 Cubic Yards		
2	Taxiways	Asphalt Pl	1781.1 Square Yards		
2	Taxiways	Clearing ai	0.7 Acres		
2	Taxiways	Concrete f	742.1 Cubic Yards		
2	Taxiways	Drainage -	1385 Linear Feet		
2	Taxiways	Drainage -	2770 Linear Feet		
2	Taxiways	Dust Conti	90 Days		
2	Taxiways	Excavator	742.1 Cubic Yards		
2	Taxiways	Excavator	742.1 Cubic Yards		
2	Taxiways	Excavator	1781.1 Square Yards		
2	Taxiways	Fencing	1375 Linear Feet		
2	Taxiways	Grading	3331.4 Square Yards		
2	Taxiways	Hydroseec	30013 Square Feet		
2	Taxiways	Lighting	2773.3 Linear Feet		
2	Taxiways	Markings	16046.3 Square Feet		
2	Taxiways	Soil Erosio	0.7 Acres		
2	Taxiways	Subbase P	1781.1 Square Yards		
2	Taxiways	Subbase P	593.7 Cubic Yards		
2	Taxiways	Topsoil P/c	555.2 Cubic Yards		
3	Demolition	Concrete f	33817.5 Square Feet		

Activity: Non-Road (Estimated based on engineering experience)

Scenario I	Project	Constructi	Equipment	Fuel Type	Activity Siz	Activity R	Default Ac	Activity Ur	User Activity Data
1	Rehabilitat	Asphalt Pl	Asphalt Paver	Diesel	5090.00	S18	Hours pe	6.36	hours
1	Rehabilitat	Asphalt Pl	Dump Truck	Diesel	5090.00	S18	Hours pe	22.92	hours
1	Rehabilitat	Asphalt Pl	Other General Ec	Diesel	5090.00	S16	Hours p	12.73	hours
1	Rehabilitat	Asphalt Pl	Pickup Truck	Diesel	5090.00	S18	Hours pe	6.36	hours
1	Rehabilitat	Asphalt Pl	Roller	Diesel	5090.00	S18	Hours pe	6.36	hours
1	Rehabilitat	Asphalt Pl	Skid Steer Loader	Diesel	5090.00	S18	Hours pe	6.36	hours
1	Rehabilitat	Asphalt Pl	Surfacing Equipm	Diesel	5090.00	S18	Hours pe	8.14	hours
1	Rehabilitat	Cold Millin	Cold Planer	Diesel	5090.00	S18	Hours pe	10.18	hours
1	Rehabilitat	Cold Millin	Dump Truck	Diesel	5090.00	S18	Hours pe	10.18	hours
1	Rehabilitat	Cold Millin	Pickup Truck	Diesel	5090.00	S18	Hours pe	10.18	hours
1	Rehabilitat	Cold Millin	Sweepers	Diesel	5090.00	S18	Hours pe	10.18	hours
1	Rehabilitat	Cold Millin	Water Truck	Diesel	5090.00	S18	Hours pe	10.18	hours
1	Rehabilitat	Concrete f	Concrete Saws	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Concrete f	Dump Truck	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Concrete f	Excavator	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Concrete f	Hydraulic Hammer	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Concrete f	Other General Ec	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Concrete f	Pickup Truck	Diesel	45856.30	S18	Hours pe	91.71	hours
1	Rehabilitat	Dust Conti	Water Truck	Diesel	90.00	Day 8	Hours pe	720	hours
1	Rehabilitat	Excavator	Dozer	Diesel	424.20	CY 8	Hours pe	3.39	hours
1	Rehabilitat	Excavator	Dump Truck (12	Diesel	424.20	CY 8	Hours pe	11.31	hours
1	Rehabilitat	Excavator	Excavator	Diesel	424.20	CY 8	Hours pe	3.39	hours
1	Rehabilitat	Excavator	Pickup Truck	Diesel	424.20	CY 8	Hours pe	3.39	hours
1	Rehabilitat	Excavator	Roller	Diesel	424.20	CY 8	Hours pe	3.39	hours
1	Rehabilitat	Excavator	Dozer	Diesel	1018.00	S18	Hours pe	1.6	hours
1	Rehabilitat	Grading	Dozer	Diesel	1332.90	S18	Hours pe	1.33	hours
1	Rehabilitat	Grading	Grader	Diesel	1332.90	S18	Hours pe	1.33	hours
1	Rehabilitat	Grading	Roller	Diesel	1332.90	S18	Hours pe	1.33	hours
1	Rehabilitat	Hydroseec	Hydroseeder	Diesel	1332.90	S18	Hours pe	0.13	hours
1	Rehabilitat	Hydroseec	Off-Road Truck	Diesel	1332.90	S18	Hours pe	0.13	hours
1	Rehabilitat	Lighting	Dump Truck	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Lighting	Loader	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Lighting	Other General Ec	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Lighting	Pickup Truck	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Lighting	Skid Steer Loader	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Lighting	Tractors/Loader	Diesel	2816.70	Lf8	Hours pe	18.78	hours
1	Rehabilitat	Markings	Flatbed Truck	Diesel	45856.30	S18	Hours pe	104.81	hours
1	Rehabilitat	Markings	Other General Ec	Diesel	45856.30	S18	Hours pe	104.81	hours
1	Rehabilitat	Markings	Pickup Truck	Diesel	45856.30	S18	Hours pe	104.81	hours
1	Rehabilitat	Sealing Ra	Crack Cleaner	Diesel	1375.00	Lf8	Hours pe	3.93	hours
1	Rehabilitat	Sealing Ra	Crack Filler (Trail)	Diesel	1375.00	Lf8	Hours pe	3.93	hours
1	Rehabilitat	Sealing Ra	Flatbed Truck	Diesel	1375.00	Lf8	Hours pe	3.93	hours
1	Rehabilitat	Sealing Ra	Other General Ec	Diesel	1375.00	Lf8	Hours pe	3.93	hours
1	Rehabilitat	Sealing Ra	Pickup Truck	Diesel	1375.00	Lf8	Hours pe	3.93	hours
1	Rehabilitat	Soil Erosio	Other General Ec	Diesel	0.30	Acre 4	Hours pe	1.2	hours
1	Rehabilitat	Soil Erosio	Pickup Truck	Diesel	0.30	Acre 8	Hours pe	2.4	hours
1	Rehabilitat	Soil Erosio	Pumps	Diesel	0.30	Acre 4	Hours pe	1.2	hours
1	Rehabilitat	Soil Erosio	Tractors/Loader	Diesel	0.30	Acre 4	Hours pe	1.2	hours
1	Rehabilitat	Subbase P	Dozer	Diesel	5090.00	S18	Hours pe	10.72	hours
1	Rehabilitat	Subbase P	Dump Truck (12	Diesel	1696.70	C18	Hours pe	75.41	hours
1	Rehabilitat	Subbase P	Pickup Truck	Diesel	5090.00	S18	Hours pe	10.72	hours
1	Rehabilitat	Subbase P	Roller	Diesel	1696.70	C18	Hours pe	10.44	hours
1	Rehabilitat	Topsoil P/c	Dozer	Diesel	222.10	CY 8	Hours pe	2.96	hours
1	Rehabilitat	Topsoil P/c	Dump Truck	Diesel	222.10	CY 8	Hours pe	2.96	hours
1	Rehabilitat	Topsoil P/c	Pickup Truck	Diesel	222.10	CY 8	Hours pe	2.96	hours
2	Taxiways	Asphalt Pl	Asphalt Paver	Diesel	1781.10	S18	Hours pe	2.23	hours
2	Taxiways	Asphalt Pl	Dump Truck	Diesel	1781.10	S18	Hours pe	8.02	hours
2	Taxiways	Asphalt Pl	Other General Ec	Diesel	1781.10	S16	Hours p	4.45	hours
2	Taxiways	Asphalt Pl	Pickup Truck	Diesel	1781.10	S18	Hours pe	2.23	hours
2	Taxiways	Asphalt Pl	Roller	Diesel	1781.10	S18	Hours pe	2.23	hours
2	Taxiways	Asphalt Pl	Skid Steer Loader	Diesel	1781.10	S18	Hours pe	2.23	hours
2	Taxiways	Asphalt Pl	Surfacing Equipm	Diesel	1781.10	S18	Hours pe	2.85	hours
2	Taxiways	Clearing ai	Chain Saw	Diesel	0.70	Acre 12	Hours p	8.4	hours
2	Taxiways	Clearing ai	Chipper/Stump C	Diesel	0.70	Acre 12	Hours p	8.4	hours
2	Taxiways	Clearing ai	Pickup Truck	Diesel	0.70	Acre 16	Hours p	11.2	hours
2	Taxiways	Concrete f	Air Compressor	Diesel	742.10	CY 8	Hours pe	5.94	hours

2 Taxiways Concrete I Concrete Saws Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Concrete I Concrete Truck Diesel	742.10 CY 8 Hours pe	24.74 hours
2 Taxiways Concrete I Other General Ec Diesel	742.10 CY 16 Hours pe	11.87 hours
2 Taxiways Concrete I Pickup Truck Diesel	742.10 CY 24 Hours pe	17.81 hours
2 Taxiways Concrete I Rubber Tired Load Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Concrete I Slip Form Paver Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Concrete I Surfacing Equip Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Drainage - Dozer Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Dump Truck Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Excavator Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Loader Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Other General Ec Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Pickup Truck Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Roller Diesel	1385.00 L8 Hours pe	44.32 hours
2 Taxiways Drainage - Dump Truck Diesel	2770.00 L8 Hours pe	24.62 hours
2 Taxiways Drainage - Loader Diesel	2770.00 L8 Hours pe	24.62 hours
2 Taxiways Drainage - Other General Ec Diesel	2770.00 L8 Hours pe	24.62 hours
2 Taxiways Drainage - Pickup Truck Diesel	2770.00 L8 Hours pe	24.62 hours
2 Taxiways Drainage - Tractors/Loader/Diesel	2770.00 L8 Hours pe	24.62 hours
2 Taxiways Dust Cont-Water Truck Diesel	90.00 Day 8 Hours pe	720 hours
2 Taxiways Excavator Dozer Diesel	742.10 CY 8 Hours pe	9.89 hours
2 Taxiways Excavator Dump Truck (12) Diesel	742.10 CY 8 Hours pe	9.89 hours
2 Taxiways Excavator Pickup Truck Diesel	742.10 CY 8 Hours pe	9.89 hours
2 Taxiways Excavator Roller Diesel	742.10 CY 8 Hours pe	4.57 hours
2 Taxiways Excavator Dozer Diesel	742.10 CY 8 Hours pe	7.42 hours
2 Taxiways Excavator Dump Truck (12) Diesel	742.10 CY 8 Hours pe	19.79 hours
2 Taxiways Excavator Excavator Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Excavator Pickup Truck Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Excavator Roller Diesel	742.10 CY 8 Hours pe	5.94 hours
2 Taxiways Excavator Scraper Diesel	742.10 CY 8 Hours pe	7.42 hours
2 Taxiways Excavator Dozer Diesel	1781.10 S18 Hours pe	2.79 hours
2 Taxiways Fencing Concrete Truck Diesel	1375.00 Lf 2 Hours pe	15.28 hours
2 Taxiways Fencing Dump Truck Diesel	1375.00 L8 Hours pe	61.11 hours
2 Taxiways Fencing Other General Ec Diesel	1375.00 L8 Hours pe	61.11 hours
2 Taxiways Fencing Pickup Truck Diesel	1375.00 L8 Hours pe	61.11 hours
2 Taxiways Fencing Skid Steer Loader Diesel	1375.00 L8 Hours pe	61.11 hours
2 Taxiways Fencing Tractors/Loader/Diesel	1375.00 L8 Hours pe	61.11 hours
2 Taxiways Grading Dozer Diesel	3331.40 S18 Hours pe	3.33 hours
2 Taxiways Grading Grader Diesel	3331.40 S18 Hours pe	3.33 hours
2 Taxiways Grading Roller Diesel	3331.40 S18 Hours pe	3.33 hours
2 Taxiways Hydroseed Hydroseeder Diesel	30013.00 S18 Hours pe	3 hours
2 Taxiways Hydroseed Off-Road Truck Diesel	30013.00 S18 Hours pe	3 hours
2 Taxiways Lighting Dump Truck Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Lighting Loader Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Lighting Other General Ec Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Lighting Pickup Truck Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Lighting Skid Steer Loader Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Lighting Tractors/Loader/Diesel	2773.30 L8 Hours pe	18.49 hours
2 Taxiways Markings Flatbed Truck Diesel	16046.30 S18 Hours pe	36.68 hours
2 Taxiways Markings Other General Ec Diesel	16046.30 S18 Hours pe	36.68 hours
2 Taxiways Markings Pickup Truck Diesel	16046.30 S18 Hours pe	36.68 hours
2 Taxiways Soil Erosion Other General Ec Diesel	0.70 Acre 4 Hours pe	2.8 hours
2 Taxiways Soil Erosion Pickup Truck Diesel	0.70 Acre 8 Hours pe	5.6 hours
2 Taxiways Soil Erosion Pumps Diesel	0.70 Acre 4 Hours pe	2.8 hours
2 Taxiways Soil Erosion Tractors/Loader/Diesel	0.70 Acre 4 Hours pe	2.8 hours
2 Taxiways Subbase P Dozer Diesel	1781.10 S18 Hours pe	3.75 hours
2 Taxiways Subbase P Dump Truck (12) Diesel	593.70 CY 8 Hours pe	26.39 hours
2 Taxiways Subbase P Pickup Truck Diesel	1781.10 S18 Hours pe	3.75 hours
2 Taxiways Subbase P Roller Diesel	593.70 CY 8 Hours pe	3.65 hours
2 Taxiways Topsoil P/D Dozer Diesel	555.20 CY 8 Hours pe	7.4 hours
2 Taxiways Topsoil P/D Dump Truck Diesel	555.20 CY 8 Hours pe	7.4 hours
2 Taxiways Topsoil P/D Pickup Truck Diesel	555.20 CY 8 Hours pe	7.4 hours
3 Demolition Concrete I Excavator with B Diesel	33817.50 S18 Hours pe	45.09 hours
3 Demolition Concrete I Excavator with H Diesel	33817.50 S18 Hours pe	45.09 hours
3 Demolition Concrete I Pickup Truck Diesel	33817.50 S18 Hours pe	90.18 hours

Activity: On-Road (Estimated based on engineering experience)

Scenario I	Project	Equipment	On-road Activity	Fuel	Roadway Round Trip	Number of Project	Project	Building	Open Space	Number	Activity	Default	User	Value
1	Rehabilitat	Asphalt	18 Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	665
1	Rehabilitat	Cement	M Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	10604
1	Rehabilitat	Dump	Tru Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	943
1	Rehabilitat	Dump	Tru Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	5656
1	Rehabilitat	Passenger Employee Comm	Gasoline		Urban Unr	30	98.01	65	--	--	--	--	--	191120
2	Taxiways	Asphalt	18 Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	233
2	Taxiways	Cement	M Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	3711
2	Taxiways	Dump	Tru Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	330
2	Taxiways	Dump	Tru Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	1979
2	Taxiways	Passenger Employee Comm	Gasoline		Urban Unr	30	73	65	--	--	--	--	--	142350
3	Demolition	Dump	Tru Material Delivery	Diesel	Urban Unr	40	--	65	1012.5	33.4	--	--	--	2068
3	Demolition	Passenger Employee Comm	Gasoline		Urban Unr	30	31.79	65	--	--	--	--	--	61991

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario II	Project	Fugitive T	Variable	Default Values	Units	User Value
1	Rehabilitat	Asphalt	Dr A = Area of land	4260	m2	
1	Rehabilitat	Asphalt	Dr AR = Application	1.811	l/m2	
1	Rehabilitat	Dump	Dr VD = Volume frac	0.35	fraction	
1	Rehabilitat	Asphalt	Dr EF = Mass fractio	0.7	fraction	
1	Rehabilitat	Asphalt	Dr D = Density of so	1.8	lbs/y	
1	Rehabilitat	Asphalt	Dr VOC = A x AR x V	3402.3	lbs	111.3
1	Rehabilitat	Asphalt	St T = Mass of asph	554.2	tons	
1	Rehabilitat	Asphalt	St PM10 = (0.027 +	15.2	lbs	
1	Rehabilitat	Asphalt	St CO = (0.4 + 0.000	221.9	lbs	
1	Rehabilitat	Asphalt	St NOx = (0.025) x T	13.9	lbs	
1	Rehabilitat	Asphalt	St SOx = (0.0046) x	2.549	lbs	
1	Rehabilitat	Asphalt	St VOC = (0.0082 + i	6.872	lbs	
1	Rehabilitat	Material	N s = Surface mate	0.043	fraction	
1	Rehabilitat	Material	N Wt. = Mean vehi	32	tons	
1	Rehabilitat	Material	N VMT = Vehicle m	2373	miles	
1	Rehabilitat	Material	N PM10 = 1.5 x (V	65	lbs	
1	Rehabilitat	Material	N sL = Road surface	0.1	g/m3	
1	Rehabilitat	Material	N Wt. = Mean vehi	32	tons	
1	Rehabilitat	Material	N VMT = Vehicle m	2275	miles	
1	Rehabilitat	Material	N PM10 = 0.0022 x	21.1	lbs	
1	Rehabilitat	Soil	Handl m = Wind speed	5	mph	
1	Rehabilitat	Soil	Handl m = Moisture co	0.25	fraction	
1	Rehabilitat	Soil	Handl T = Mass of aggr	1261	tons	
1	Rehabilitat	Soil	Handl PM10 = T x 0.35	26	lbs	
1	Rehabilitat	Unstabiliz	A = Area affectec	1.053	acres	
1	Rehabilitat	Unstabiliz	TPConv = TSP/Pb	0.5	fraction	
1	Rehabilitat	Unstabiliz	CE = Control effe	0.63	fraction	
1	Rehabilitat	Unstabiliz	t = year (e.g. 0.65	0.25	years	
1	Rehabilitat	Unstabiliz	PM10 = 0.38 x A	0	lbs	
2	Taxiways	Asphalt	Dr A = Area of land	1490.7	m2	
2	Taxiways	Asphalt	Dr AR = Application	1.811	l/m2	
2	Taxiways	Asphalt	Dr VD = Volume frac	0.35	fraction	
2	Taxiways	Asphalt	Dr EF = Mass fractio	0.7	fraction	

2 Taxiways	Asphalt Dr D = Density of so	1.8	lbs/l	
2 Taxiways	Asphalt Dr VOC = A x AR x VI	1190.5	lbs	53
2 Taxiways	Asphalt St T = Mass of asph	193.9	tons	
2 Taxiways	Asphalt St PM10 = (0.027 x	5.318	lbs	
2 Taxiways	Asphalt St CO = (0.4 + 0.000	77.6	lbs	
2 Taxiways	Asphalt St NOx = (0.025) x T	4.848	lbs	
2 Taxiways	Asphalt St SOx = (0.0046) x	0.892	lbs	
2 Taxiways	Asphalt St VOC = (0.0082 + i	2.405	lbs	
2 Taxiways	Material h s = Surface mate	0.043	fraction	
2 Taxiways	Material h Wt. = Mean vehi	32	tons	
2 Taxiways	Material h VMT = Vehicle m	1482.1	miles	
2 Taxiways	Material h PM10 = 1.5 x [(s/	40.6	lbs	
2 Taxiways	Material h sl. = Road surface	0.1	g/m3	
2 Taxiways	Material h Wt. = Mean vehi	32	tons	
2 Taxiways	Material h VMT = Vehicle m	1300	miles	
2 Taxiways	Material h PM10 = 0.0022 x	12.1	lbs	
2 Taxiways	Concrete TV = Volume of as	742.1	yd3	
2 Taxiways	Concrete f PM10 = 0.037 x v	27.5	lbs	
2 Taxiways	Unstabiliz A = Area affectec	0.368	acres	
2 Taxiways	Unstabiliz fPCConv = TSP/PA	0.5	fraction	
2 Taxiways	Unstabiliz CE = Control effc	0.63	fraction	
2 Taxiways	Unstabiliz t = year (e.g. 0.65	0.25	years	
2 Taxiways	Unstabiliz PM10 = 0.38 x A :	0	lbs	
2 Taxiways	Soil Handl u = Wind speed	5	mph	
2 Taxiways	Soil Handl m = Moisture coi	0.25	fraction	
2 Taxiways	Soil Handl T = Mass of aggr	441.3	tons	
2 Taxiways	Soil Handl PM10 = T x 0.35)	9.083	lbs	
3 Demolitor	Soil Handl u = Wind speed	5	mph	
3 Demolitor	Soil Handl m = Moisture coi	0.25	fraction	
3 Demolitor	Soil Handl T = Mass of aggr	930	tons	
3 Demolitor	Soil Handl PM10 = T x 0.35)	19.1	lbs	
3 Demolitor	Unstabiliz A = Area affectec	0.776	acres	
3 Demolitor	Unstabiliz fPCConv = TSP/PA	0.5	fraction	
3 Demolitor	Unstabiliz CE = Control effc	0.63	fraction	
3 Demolitor	Unstabiliz t = year (e.g. 0.65	0.25	years	
3 Demolitor	Unstabiliz PM10 = 0.38 x A :	0	lbs	
3 Demolitor	Material h s = Surface mate	0.043	fraction	
3 Demolitor	Material h Wt. = Mean vehi	32	tons	
3 Demolitor	Material h VMT = Vehicle m	381.4	miles	
3 Demolitor	Material h PM10 = 1.5 x [(s/	10.4	lbs	
3 Demolitor	Material h sl. = Road surface	0.1	g/m3	
3 Demolitor	Material h Wt. = Mean vehi	32	tons	
3 Demolitor	Material h VMT = Vehicle m	325	miles	
3 Demolitor	Material h PM10 = 0.0022 x	3.017	lbs	

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES4

Non-Road Equipment: MOVES4 NONROAD

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Dozer
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks
- Flatbed Truck
- Grader
- Grout Wheel Truck
- Hoist Equipment with 40 Ton Rig
- Hydraulic Hammer
- Hydroseeder
- Line Painting Truck and Sprayer
- Material Deliveries
- Off-Road Truck

Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Holst- Curbs Del & Place
Tractor Trailer with Boom Holst- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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STUDY

Study Name

DMV Runway Rehab

Study Description

Construction 2030

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

Scenario for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton												MOVES4 Emissions on Factors (g hp hr)										NONROAD Emissions (TPY)									
Scenario ID	Year	Pro.ect	Constructi.on Activity	Equipment	MOVES Equipment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Act.vty	MOVES4 Emissions on Factors (g hp hr)					NONROAD Emissions (TPY)															
											CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO (tpy)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)	VOC (tpy)	CO2 Exhaust (tpy)							
1	2030	illitate Runway Placement	Asphalt Paver	Pavers	Pavers175	Diesel	175	0.59	6.3625	0.06563	0.21833	0.00142	0.01529	0.0148	0.0105	536.801	5E-05	2E-04	1E-06	1E-05	1.1E-05	9E-06	0.38872								
1	2030	illitate Runway Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	22.91503	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0002	0.001	1E-05	6E-05	5.5E-05	9E-05	4.80003								
1	2030	illitate Runway Placement	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	12.725	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	9E-05	2E-04	2E-06	2E-05	2E-05	2E-05	0.5666								
1	2030	illitate Runway Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	6.3625	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	5E-05	3E-04	4E-06	2E-05	1.5E-05	2E-05	1.33216								
1	2030	illitate Runway Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	6.3625	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	4E-05	4E-04	7E-07	9E-06	8.3E-06	4E-06	0.24667								
1	2030	illitate Runway Placement	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	6.3625	2.62582	3.82055	0.02026	0.42554	0.4128	0.5459	694.377	0.0003	4E-04	2E-07	5E-05	4.6E-05	6E-05	0.0767								
1	2030	illitate Runway Placement	Surfacing Equipment (Grooving)	Other Construction Equipment	Other Construction Equipment25	Diesel	25	0.59	8.144	1.48788	3.76234	0.00219	0.17019	0.1651	0.3516	595.15	0.0002	5E-05	3E-07	2E-05	2.2E-05	5E-05	0.07881								
1	2030	illitate Runway Cold Milling	Cold Planer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	10.18	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	1E-04	3E-04	2E-06	2E-05	2.2E-05	2E-05	0.62194								
1	2030	illitate Runway Cold Milling	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	8E-05	4E-04	6E-06	3E-05	2.4E-05	4E-05	2.13241								
1	2030	illitate Runway Cold Milling	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	8E-05	4E-04	6E-06	3E-05	2.4E-05	4E-05	2.13241								
1	2030	illitate Runway Cold Milling	Sweepers	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.18	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	7E-05	2E-04	1E-06	2E-05	1.6E-05	1E-05	0.45328								
1	2030	illitate Runway Cold Milling	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	8E-05	4E-04	6E-06	3E-05	2.4E-05	4E-05	2.13241								
1	2030	illitate Runway Demolition	Concrete Saws	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	91.7126	0.27771	2.5281	0.00157	0.02014	0.0195	0.0924	595.882	0.0007	0.006	4E-05	5E-05	4.7E-05	2E-04	1.4217								
1	2030	illitate Runway Demolition	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0007	0.004	5E-05	0.0002	0.00022	3E-04	19.2111								
1	2030	illitate Runway Demolition	Excavator	Excavators	Excavators175	Diesel	175	0.59	91.7126	0.04945	0.16906	0.00141	0.01095	0.0106	0.0083	536.807	0.0005	0.002	1E-05	0.0001	0.00011	9E-05	5.6033								
1	2030	illitate Runway Demolition	Hydraulic Hammer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	91.7126	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0009	0.002	1E-05	0.0002	0.0002	1E-04	5.60312								
1	2030	illitate Runway Demolition	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	91.7126	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0006	0.002	1E-05	0.0002	0.00015	1E-04	0.48363								
1	2030	illitate Runway Demolition	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0007	0.004	5E-05	0.0002	0.00022	3E-04	19.2111								
1	2030	illitate Runway Dust Control	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	720	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0055	0.032	0.0004	0.0018	0.00173	0.003	150.819								
1	2030	illitate Runway Grading	Dozer	Tractors/Loaders/Backhoes	Crawler Tractor/Dozers175	Diesel	175	0.59	104.8144	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	2E-05	7E-05	5E-07	5E-06	4.7E-06	9E-06	0.20734								
1	2030	illitate Runway (Assume)	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	11.312	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	9E-05	5E-04	6E-06	3E-05	2.7E-05	4E-05	2.36954								
1	2030	illitate Runway (Assume)	Excavator	Excavators	Excavators175	Diesel	175	0.59	3.3936	0.04945	0.16906	0.00141	0.01095	0.0106	0.0083	536.807	2E-05	7E-05	5E-07	4E-06	4.1E-06	3E-06	0.20734								
1	2030	illitate Runway (Assume)	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.3936	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	3E-05	1E-04	2E-06	8E-06	8.1E-06	1E-05	0.71086								
1	2030	illitate Runway (Assume)	Roller	Rollers	Rollers100	Diesel	100	0.59	3.3936	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	2E-05	2E-04	3E-07	5E-06	4.4E-06	2E-06	0.13157								
1	2030	illitate Runway (Topsoil)	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.596863	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	1E-05	3E-05	3E-07	2E-06	2.2E-06	2E-06	0.09756								
1	2030	illitate Runway (Topsoil)	Grader	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.3329	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	1E-05	3E-05	3E-07	2E-06	2.2E-06	2E-06	0.09756								
1	2030	illitate Runway Grading	Grader	Graders	Graders300	Diesel	300	0.59	1.3329	0.02203	0.1173	0.00141	0.00685	0.0066	0.0099	536.801	6E-06	3E-05	4E-07	2E-06	1.7E-06	3E-06	0.1396								
1	2030	illitate Runway Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	1.3329	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	9E-06	8E-05	1E-07	2E-06	1.7E-06	9E-07	0.05168								
1	2030	illitate Runway drossedir	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	0.13329	0.28659	0.77936	0.00149	0.04061	0.0394	0.0423	536.707	1E-05	4E-05	8E-08	2E-06	2E-06	2E-06	0.02792								
1	2030	illitate Runway drossedir	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	0.13329	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	2E-06	6E-06	7E-08	3E-07	3.2E-07	9E-07	0.02792								
1	2030	illitate Runway Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0001	8E-04	1E-05	5E-05	4.5E-05	7E-05	3.93345								
1	2030	illitate Runway Lighting	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.778	0.45054	0.97351	0.00174	0.00886	0.0059	0.1389	626.138	0.001	0.002	4E-06	0.0002	0.0002	3E-04	1.33818								
1	2030	illitate Runway Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.778	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0001	4E-04	2E-06	3E-05	3E-05	2E-05	0.83612								
1	2030	illitate Runway Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0001	8E-04	1E-05	5E-05	4.5E-05	7E-05	3.93345								
1	2030	illitate Runway Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.778	2.62582	3.82055	0.02026	0.42554	0.4128	0.5459	694.377	0.0009	0.001	7E-07	0.0001	0.00013	2E-04	0.22638								
1	2030	illitate Runway Lighting	Tractors/Loaders/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.778	1.02828	1.58984	0.00193	0.1711	0.166	0.1978	695.418	0.0004	7E-04	8E-07	7E-05	7.2E-05	9E-06	0.30229								
1	2030	illitate Runway Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	104.8144	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0008	0.004	6E-05	0.0003	0.00025	4E-04	21.9556								
1	2030	illitate Runway Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	104.8144	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0007	0.002	1E-05	0.0002	0.00017	1E-04	4.66701								
1	2030	illitate Runway Random	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	104.8144	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0008	0.005	6E-05	0.0003	0.00025	4E-04	21.9556								
1	2030	illitate Runway Random	Crack Cleaner (Trailer Mounted)	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	3.928571	0.27771	2.5281	0.00157	0.02014	0.0195	0.0924	595.882	3E-05	3E-04	2E-07	2E-06	2E-06	9E									

2	2030	Taxiways	ation (Cut	Excavator	Excavators	Excavators175	Diesel	175	0.59	5.9368	0.04945	0.16906	0.00141	0.01095	0.0106	0.0083	536.807	3E-05	1E-04	1E-06	7E-06	7.2E-06	6E-06	0.36272
2	2030	Taxiways	ation (Cut	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.9368	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	3E-05	3E-04	3E-06	1E-05	1.4E-05	2E-05	1.24359
2	2030	Taxiways	ation (Cut	Roller	Rollers	Rollers100	Diesel	100	0.59	5.9368	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	4E-05	4E-04	6E-07	8E-06	7.8E-06	4E-06	0.23017
2	2030	Taxiways	ation (Cut	Scrapper	Scrapers	Scrapers600	Diesel	600	0.59	7.421	0.04463	0.16049	0.00142	0.01066	0.0103	0.0127	536.794	0.0001	5E-04	4E-06	3E-05	3E-05	4E-05	1.55446
2	2030	Taxiways	n (Topsoil)	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	2.793882	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	2E-05	6E-05	5E-07	4E-06	3.9E-06	3E-06	0.1707
2	2030	Taxiways	Fencing	Concrete Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	15.27778	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0001	7E-04	8E-06	4E-05	3.7E-05	6E-05	3.20025
2	2030	Taxiways	Fencing	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0005	0.003	3E-05	0.0002	0.00015	2E-04	12.801
2	2030	Taxiways	Fencing	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	61.11111	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0004	0.001	7E-06	0.0001	9.7E-05	1E-05	2.72106
2	2030	Taxiways	Fencing	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0005	0.003	3E-05	0.0002	0.00015	2E-04	12.801
2	2030	Taxiways	Fencing	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	61.11111	2.62582	3.82055	0.00206	0.42554	0.4128	0.5459	694.377	0.0028	0.004	2E-06	0.0005	0.00044	6E-04	0.73672
2	2030	Taxiways	Fencing	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	61.11111	1.02828	1.58984	0.00193	0.1711	0.166	0.1978	695.418	0.0015	0.002	3E-06	0.0002	0.00023	3E-04	0.98377
2	2030	Taxiways	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.3314	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	2E-05	7E-05	5E-07	5E-06	4.6E-06	3E-06	0.20354
2	2030	Taxiways	Grading	Grader	Graders	Graders300	Diesel	300	0.59	3.3314	0.02203	0.1173	0.00141	0.00689	0.0066	0.0099	536.801	1E-05	8E-05	9E-07	4E-06	4.3E-06	6E-06	0.34892
2	2030	Taxiways	Grading	Roller	Rollers	Rollers100	Diesel	100	0.59	3.3314	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	2E-05	2E-04	3E-07	4E-06	4.4E-06	4E-06	0.12916
2	2030	Taxiways	Hydroseedi	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	3.0013	0.28659	0.77936	0.00149	0.40651	0.0394	0.4243	536.707	0.0003	9E-04	2E-06	5E-05	4.6E-05	4E-05	0.62857
2	2030	Taxiways	Hydroseedi	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.0013	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	2E-05	1E-04	2E-06	7E-06	7.2E-06	1E-05	0.62869
2	2030	Taxiways	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0001	8E-04	1E-05	5E-05	4.4E-05	7E-05	3.87284
2	2030	Taxiways	Lighting	Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.48867	0.45054	0.97351	0.00174	0.08886	0.0959	0.1389	626.138	0.0009	0.002	4E-06	0.0002	0.0002	3E-04	1.31757
2	2030	Taxiways	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.48867	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0001	4E-04	2E-06	3E-05	2.9E-05	2E-05	0.82323
2	2030	Taxiways	Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0001	8E-04	1E-05	5E-05	4.4E-05	7E-05	3.87284
2	2030	Taxiways	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.48867	2.62582	3.82055	0.00206	0.42554	0.4128	0.5459	694.377	0.0008	0.001	7E-07	0.0001	0.00013	2E-04	0.22289
2	2030	Taxiways	Lighting	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.48867	1.02828	1.58984	0.00193	0.1711	0.166	0.1978	695.418	0.0004	7E-04	8E-07	7E-05	7.1E-05	8E-05	0.29763
2	2030	Taxiways	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0003	0.002	2E-05	9E-05	8.8E-05	1E-04	7.68282
2	2030	Taxiways	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	36.67726	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	0.0003	7E-04	4E-06	6E-05	5.8E-05	4E-05	1.63311
2	2030	Taxiways	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0003	0.002	2E-05	9E-05	8.8E-05	1E-04	7.68282
2	2030	Taxiways	n/Sedime	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	2.8	0.08388	0.23528	0.00143	0.01981	0.0192	0.0142	536.79	3E-05	5E-05	3E-07	5E-06	4.5E-06	3E-06	0.12467
2	2030	Taxiways	n/Sedime	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.6	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	4E-05	2E-04	3E-06	1E-05	1.3E-05	2E-05	1.17304
2	2030	Taxiways	n/Sedime	Pumps	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.43	2.8	2.45905	4.1834	0.00218	0.23853	0.2314	0.8377	593.756	4E-05	6E-05	3E-08	3E-06	3.4E-06	1E-05	0.00867
2	2030	Taxiways	n/Sedime	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	2.8	1.02828	1.58984	0.00193	0.1711	0.166	0.1978	695.418	7E-05	1E-04	1E-07	1E-05	1.1E-05	1E-05	0.04507
2	2030	Taxiways	ase Place	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.749684	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	2E-05	8E-05	6E-07	5E-06	5.2E-06	4E-06	0.22909
2	2030	Taxiways	ase Place	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	26.38657	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0002	0.001	1E-05	7E-05	6.3E-05	1E-04	5.52724
2	2030	Taxiways	ase Place	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.749684	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	3E-05	2E-04	2E-06	9E-06	9E-06	1E-05	0.78545
2	2030	Taxiways	ase Place	Roller	Rollers	Rollers100	Diesel	100	0.59	3.653538	0.10649	0.91164	0.00158	0.02076	0.0201	0.0107	596.127	3E-05	2E-04	4E-07	5E-06	4.8E-06	3E-06	0.14165
2	2030	Taxiways	oil Place	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	7.402667	0.05512	0.18378	0.00142	0.01251	0.0121	0.009	536.806	5E-05	2E-04	1E-06	1E-05	1E-05	8E-06	0.45227
2	2030	Taxiways	oil Place	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	6E-05	3E-04	4E-06	2E-05	1.8E-05	3E-05	1.55064
3	2030	iltion - Correte Demc	Excavator with Bucket	Excavators	Excavators175	Diesel	175	0.59	45.09	0.04945	0.16906	0.00141	0.01095	0.0106	0.0083	536.807	0.0003	9E-04	7E-06	6E-05	5.5E-05	4E-05	2.75483	
3	2030	iltion - Correte Demc	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	90.18	0.01962	0.11237	0.00141	0.00633	0.0061	0.0095	536.802	0.0007	0.004	5E-05	0.0002	0.00022	3E-04	18.8901	
TOTAL																		0.043	0.176	0.0017	0.011	0.01063	0.015	629.88

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Pro ect	Equ pment	Equ pment Category	MOVES Lookup										MOVES Emission Factors (g/mile)										MOVES Onroad Emission (tpy)																		
					On road Act vity	Fuel	Roadway Type	Round Trip Distance	Distance for fuel t	Number of Veh cles	Number of Em ploy ees	Number of Pro ect	Pro ect Length	Pro ect Width	Pro ect Area	Bu d n g H eigh t	Open Space H eigh t	Number of Trees	Act v ty Rate	VMT	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2.5	7.4E-05	CO2	CH4	N2O					
1	2030	illitate Runumt	18 Wh	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	--	665	1.87	2.45311	0.00512	0.02512	0.02311	0.10155	1530.2	0.0173	0.2258	0.00137	0.0018	4E-06	1.8E-05	1.7E-05	7.4E-05	1.12168	1.3E-05	0.00017				
1	2030	illitate Ruemnt Mix	Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	--	10604	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.01165	0.01247	3E-05	0.00021	0.0002	0.00081	9.57453	0.00015	0.00137				
1	2030	illitate Ruu Truck - As	3	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	--	943	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00104	0.00111	3E-06	1.9E-05	1.7E-05	7.2E-05	0.85145	1.3E-05	0.00012				
1	2030	illitate Ruu Subba	3	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	2	--	65	1375	33.35	--	--	--	--	--	5656	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00621	0.00665	2E-05	0.00011	0.0001	0.00043	5.1069	7.8E-05	0.00073				
1	2030	illitate Ruussenger C	3	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	loyee Comr	Gasoline	Inrestricte	30	--	98.01	98.01	--	--	--	--	--	--	--	--	19210	2.377	0.04151	0.00166	0.02005	0.00181	0.07447	312.02	0.0065	0.061	0.50076	0.00875	0.0003	0.00043	0.00038	0.15659	65.7338	0.0137	0.0034				
2	2030	Taxiways 'rak 18 Wh	Mix	Combination Short-haul Truck	DieselUrban Unrestricted AccessCombination Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	233	1.87	2.45311	0.00512	0.02512	0.02311	0.10155	1530.2	0.0173	0.2258	0.00038	0.00063	1E-06	6.5E-06	5.9E-06	2.8E-05	0.39301	4.4E-05	5.8E-05				
2	2030	Taxiways 'rak 18 Wh	Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	3711	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00038	0.00063	1E-06	6.5E-06	5.9E-06	2.8E-05	0.39301	4.4E-05	5.8E-05				
2	2030	Taxiways 'rak 18 Wh	Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	330	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00036	0.00039	1E-06	6.5E-06	6.1E-06	2.5E-05	0.27996	4.6E-05	4.2E-05				
2	2030	Taxiways 'rak Subba	3	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	1979	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00127	0.00233	6E-06	4E-06	3.7E-05	0.11581	1.78867	2.7E-05	0.00025				
2	2030	Taxiways 'ssenger C	3	Passenger Car	GasolineUrban Unrestricted AccessPassenger Car	loyee Comr	Gasoline	Inrestricte	30	--	73	73	65	--	--	--	--	--	--	142330	2.377	0.04151	0.00166	0.02005	0.00181	0.07447	312.02	0.0065	0.061	0.37298	0.00501	0.0003	0.00032	0.00028	0.11659	48.9598	0.01002	0.0025					
3	2030	illiton - Corum Truck	Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted AccessSingle Unit Short-haul Truck	terial Deliv	Diesel	Inrestricte	40	5	1	--	65	1012.5	33.4	--	--	--	--	--	2088	0.997	1.06673	0.00274	0.01825	0.01679	0.06892	819.11	0.0125	0.1168	0.00022	0.00046	6E-06	4.2E-05	3.9E-05	0.18853	1.88529	2.9E-05	0.00027				
3	2030	illiton - Consueger Car	3	Single Unit Short-haul Truck	GasolineUrban Unrestricted AccessPassenger Car	loyee Comr	Gasoline	Inrestricte	30	--	31.79	31.79	65	--	--	--	--	--	--	63991	2.377	0.04151	0.00166	0.02025	0.00181	0.07447	312.02	0.0065	0.061	0.35424	0.00041	0.00014	0.00012	0.15012	46.9827	0.01002	0.0025						
															TOTAL															1.06582	0.05029	0.00088	0.0143	0.028	0.03449	160.383	0.0032	0.0018					

1	RehabilitatCold MillinDump Tru Diesel	
1	RehabilitatCold MillinPickup Tru Diesel	
1	RehabilitatCold MillinSweepers Diesel	
1	RehabilitatCold MillinWater Tru Diesel	
1	RehabilitatConcrete I Concrete S Diesel	
1	RehabilitatConcrete I Dump Tru Diesel	
1	RehabilitatConcrete I Excavator Diesel	
1	RehabilitatConcrete I Hydraulic Diesel	
1	RehabilitatConcrete I Other Gen Diesel	
1	RehabilitatConcrete I Pickup Tru Diesel	
1	RehabilitatDust Cont: Water Tru Diesel	
1	RehabilitatExcavator Dozer Diesel	
1	RehabilitatExcavator Dump Tru Diesel	
1	RehabilitatExcavator Excavator Diesel	
1	RehabilitatExcavator Pickup Tru Diesel	
1	RehabilitatExcavator Roller Diesel	
1	RehabilitatExcavator Dozer Diesel	
1	RehabilitatGrading Dozer Diesel	
1	RehabilitatGrading Grader Diesel	
1	RehabilitatGrading Roller Diesel	
1	RehabilitatHydroseecHydroseec Diesel	
1	RehabilitatHydroseec Off-Road T Diesel	
1	RehabilitatLighting Dump Tru Diesel	
1	RehabilitatLighting Loader Diesel	
1	RehabilitatLighting Other Gen Diesel	
1	RehabilitatLighting Pickup Tru Diesel	
1	RehabilitatLighting Skid Steer Diesel	
1	RehabilitatLighting Tractors/L Diesel	
1	RehabilitatMarkings Flatbed Tr Diesel	
1	RehabilitatMarkings Other Gen Diesel	
1	RehabilitatMarkings Pickup Tru Diesel	
1	RehabilitatSealing Ra Crack Clea Diesel	
1	RehabilitatSealing Ra Crack Fille Diesel	
1	RehabilitatSealing Ra Flatbed Tr Diesel	
1	RehabilitatSealing Ra Other Gen Diesel	
1	RehabilitatSealing Ra Pickup Tru Diesel	
1	RehabilitatSoil Erosio Other Gen Diesel	
1	RehabilitatSoil Erosio Pickup Tru Diesel	
1	RehabilitatSoil Erosio Pumps Diesel	
1	RehabilitatSoil Erosio Tractors/L Diesel	
1	RehabilitatSubbase P Dozer Diesel	
1	RehabilitatSubbase P Dump Tru Diesel	
1	RehabilitatSubbase P Pickup Tru Diesel	
1	RehabilitatSubbase P Roller Diesel	
1	RehabilitatTopsoil Pic Dozer Diesel	
1	RehabilitatTopsoil Pic Dump Tru Diesel	
1	RehabilitatTopsoil Pic Pickup Tru Diesel	
2	Taxiways Asphalt PI Asphalt Pa Diesel	
2	Taxiways Asphalt PI Dump Tru Diesel	
2	Taxiways Asphalt PI Other Gen Diesel	
2	Taxiways Asphalt PI Pickup Tru Diesel	
2	Taxiways Asphalt PI Roller Diesel	
2	Taxiways Asphalt PI Skid Steer Diesel	
2	Taxiways Asphalt PI Surfacing I Diesel	
2	Taxiways Clearing at Chain Saw Diesel	
2	Taxiways Clearing at Chipper/St Diesel	
2	Taxiways Clearing at Pickup Tru Diesel	
2	Taxiways Concrete I Air Compr Diesel	
2	Taxiways Concrete I Concrete S Diesel	
2	Taxiways Concrete I Concrete T Diesel	
2	Taxiways Concrete I Other Gen Diesel	
2	Taxiways Concrete I Pickup Tru Diesel	
2	Taxiways Concrete I Rubber Tr Diesel	
2	Taxiways Concrete I Slip Form Diesel	
2	Taxiways Concrete I Surfacing I Diesel	
2	Taxiways Drainage - Dozer Diesel	
2	Taxiways Drainage - Dump Tru Diesel	
2	Taxiways Drainage - Excavator Diesel	
2	Taxiways Drainage - Loader Diesel	
2	Taxiways Drainage - Other Gen Diesel	
2	Taxiways Drainage - Pickup Tru Diesel	
2	Taxiways Drainage - Roller Diesel	
2	Taxiways Drainage - Dump Tru Diesel	
2	Taxiways Drainage - Loader Diesel	
2	Taxiways Drainage - Other Gen Diesel	
2	Taxiways Drainage - Pickup Tru Diesel	
2	Taxiways Drainage - Tractors/L Diesel	
2	Taxiways Dust Cont: Water Tru Diesel	
2	Taxiways Excavator Dozer Diesel	
2	Taxiways Excavator Dump Tru Diesel	
2	Taxiways Excavator Pickup Tru Diesel	
2	Taxiways Excavator Roller Diesel	
2	Taxiways Excavator Dozer Diesel	
2	Taxiways Excavator Dump Tru Diesel	
2	Taxiways Excavator Excavator Diesel	
2	Taxiways Excavator Pickup Tru Diesel	
2	Taxiways Excavator Roller Diesel	
2	Taxiways Excavator Scraper Diesel	
2	Taxiways Excavator Dozer Diesel	
2	Taxiways Fencing Concrete T Diesel	
2	Taxiways Fencing Dump Tru Diesel	
2	Taxiways Fencing Other Gen Diesel	
2	Taxiways Fencing Pickup Tru Diesel	
2	Taxiways Fencing Skid Steer Diesel	
2	Taxiways Fencing Tractors/L Diesel	
2	Taxiways Grading Dozer Diesel	
2	Taxiways Grading Grader Diesel	
2	Taxiways Grading Roller Diesel	
2	Taxiways HydroseecHydroseec Diesel	
2	Taxiways Hydroseec Off-Road T Diesel	
2	Taxiways Lighting Dump Tru Diesel	
2	Taxiways Lighting Loader Diesel	
2	Taxiways Lighting Other Gen Diesel	
2	Taxiways Lighting Pickup Tru Diesel	
2	Taxiways Lighting Skid Steer Diesel	
2	Taxiways Lighting Tractors/L Diesel	
2	Taxiways Markings Flatbed Tr Diesel	
2	Taxiways Markings Other Gen Diesel	
2	Taxiways Markings Pickup Tru Diesel	
2	Taxiways Soil Erosio Other Gen Diesel	
2	Taxiways Soil Erosio Pickup Tru Diesel	
2	Taxiways Soil Erosio Pumps Diesel	
2	Taxiways Soil Erosio Tractors/L Diesel	
2	Taxiways Subbase P Dozer Diesel	
2	Taxiways Subbase P Dump Tru Diesel	
2	Taxiways Subbase P Pickup Tru Diesel	
2	Taxiways Subbase P Roller Diesel	
2	Taxiways Topsoil Pic Dozer Diesel	
2	Taxiways Topsoil Pic Dump Tru Diesel	
2	Taxiways Topsoil Pic Pickup Tru Diesel	

3	Demolition	Concrete	Excavator	Diesel
3	Demolition	Concrete	Excavator	Diesel
3	Demolition	Concrete	Pickup Tru	Diesel

Overall Size

Scenario	Project	Construct	Size	Default	Ac	Unit
1	Rehabilitat	What is th	8.91	\$	Million(s)	
1	Rehabilitat	What is th	1375		Feet	
1	Rehabilitat	What is th	33.35		Feet	
2	Taxiways	What is th	1.36	\$	Million(s)	
2	Taxiways	What is th	1375		Feet	
2	Taxiways	What is th	11.67		Feet	
3	Demolition	What is th	2.89	\$	Million(s)	
3	Demolition	What is th	1012.5		Feet	
3	Demolition	What is th	33.4		Feet	

Size Detail (Estimated based on engineering experience)

Scenario	Project	Construct	Default	Ac	Unit	User Activity	Size
1	Rehabilitat	Asphalt Pl	5090		Square Yards		
1	Rehabilitat	Cold Millin	5090		Square Yards		
1	Rehabilitat	Concrete	5090		Square Feet		
1	Rehabilitat	Concrete	45856.3		Square Feet		
1	Rehabilitat	Dust Cont	90		Days		
1	Rehabilitat	Excavation	424.2		Cubic Yards		
1	Rehabilitat	Excavation	1018		Square Yards		
1	Rehabilitat	Grading	1332.9		Square Feet		
1	Rehabilitat	Hydroseec	1332.9		Square Feet		
1	Rehabilitat	Lighting	2816.7		Linear Feet		
1	Rehabilitat	Markings	45856.3		Square Feet		
1	Rehabilitat	Sealing Ra	1375		Linear Feet		
1	Rehabilitat	Soil Erosio	0.3		Acres		
1	Rehabilitat	Subbase P	5090		Square Yards		
1	Rehabilitat	Subbase P	1696.7		Cubic Yards		
1	Rehabilitat	Topsoil Pl	222.1		Cubic Yards		
2	Taxiways	Asphalt Pl	1781.1		Square Yards		
2	Taxiways	Clearing ar	0.7		Acres		
2	Taxiways	Concrete	742.1		Cubic Yards		
2	Taxiways	Drainage -	1385		Linear Feet		
2	Taxiways	Drainage -	2770		Linear Feet		
2	Taxiways	Dust Cont	90		Days		
2	Taxiways	Excavation	742.1		Cubic Yards		
2	Taxiways	Excavation	742.1		Cubic Yards		
2	Taxiways	Excavation	1781.1		Square Yards		
2	Taxiways	Fencing	1375		Linear Feet		
2	Taxiways	Grading	3331.4		Square Yards		
2	Taxiways	Hydroseec	30013		Square Feet		
2	Taxiways	Lighting	2773.3		Linear Feet		
2	Taxiways	Markings	16046.3		Square Feet		
2	Taxiways	Soil Erosio	0.7		Acres		
2	Taxiways	Subbase P	1781.1		Square Yards		
2	Taxiways	Subbase P	593.7		Cubic Yards		
2	Taxiways	Topsoil Pl	555.2		Cubic Yards		
3	Demolition	Concrete	33817.5		Square Feet		

Activity: Non-Road (Estimated based on engineering experience)

IT Project	Construct	Equipmen	Fuel	Type	Activity	Size	Activity R	Default	Ac	Activity Ur	User	Activity Data	
1	Rehabilitat	Asphalt Pl	Asphalt	P	Diesel		5090.00	518	Hours	pt	6.36	hours	
1	Rehabilitat	Asphalt Pl	Dump	Tru	Diesel		5090.00	518	Hours	pt	22.92	hours	
1	Rehabilitat	Asphalt Pl	Other	Gen	Diesel		5090.00	5116	Hours	pt	12.73	hours	
1	Rehabilitat	Asphalt Pl	Pickup	Tru	Diesel		5090.00	518	Hours	pt	6.36	hours	
1	Rehabilitat	Asphalt Pl	Roller		Diesel		5090.00	518	Hours	pt	6.36	hours	
1	Rehabilitat	Asphalt Pl	Skid Steer		Diesel		5090.00	518	Hours	pt	6.36	hours	
1	Rehabilitat	Asphalt Pl	Surfacing	I	Diesel		5090.00	518	Hours	pt	8.14	hours	
1	Rehabilitat	Cold Millin	Cold	Plane	Diesel		5090.00	518	Hours	pt	10.18	hours	
1	Rehabilitat	Cold Millin	Dump	Tru	Diesel		5090.00	518	Hours	pt	10.18	hours	
1	Rehabilitat	Cold Millin	Pickup	Tru	Diesel		5090.00	518	Hours	pt	10.18	hours	
1	Rehabilitat	Cold Millin	Sweepers		Diesel		5090.00	518	Hours	pt	10.18	hours	
1	Rehabilitat	Cold Millin	Water	Tru	Diesel		5090.00	518	Hours	pt	10.18	hours	
1	Rehabilitat	Concrete	C	Concrete	S	Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Concrete	C	Dump	Tru	Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Concrete	C	Excavator		Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Concrete	C	Hydraulic	H	Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Concrete	C	Other	Gen	Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Concrete	C	Pickup	Tru	Diesel	45856.30	58	Hours	pt	91.71	hours	
1	Rehabilitat	Dust Cont	Water	Tru	Diesel		90.00	Day	8	Hours	pt	720	hours
1	Rehabilitat	Excavator	Dozer		Diesel		424.20	CY	8	Hours	pt	3.39	hours
1	Rehabilitat	Excavator	Dump	Tru	Diesel		424.20	CY	8	Hours	pt	11.31	hours
1	Rehabilitat	Excavator	Excavator		Diesel		424.20	CY	8	Hours	pt	3.39	hours
1	Rehabilitat	Excavator	Pickup	Tru	Diesel		424.20	CY	8	Hours	pt	3.39	hours
1	Rehabilitat	Excavator	Roller		Diesel		424.20	CY	8	Hours	pt	3.39	hours
1	Rehabilitat	Excavator	Dozer		Diesel		1018.00	518	Hours	pt	1.6	hours	
1	Rehabilitat	Grading	Dozer		Diesel		1332.90	518	Hours	pt	1.33	hours	
1	Rehabilitat	Grading	Grader		Diesel		1332.90	518	Hours	pt	1.33	hours	
1	Rehabilitat	Grading	Roller		Diesel		1332.90	518	Hours	pt	1.33	hours	
1	Rehabilitat	Hydroseec	Hydroseec		Diesel		1332.90	518	Hours	pt	0.13	hours	
1	Rehabilitat	Hydroseec	Off-Road	T	Diesel		1332.90	518	Hours	pt	0.13	hours	
1	Rehabilitat	Lighting	Dump	Tru	Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Lighting	Loader		Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Lighting	Other	Gen	Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Lighting	Pickup	Tru	Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Lighting	Skid Steer		Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Lighting	Tractors/L		Diesel		2816.70	Lf8	Hours	pt	18.78	hours	
1	Rehabilitat	Markings	Flatbed	Tr	Diesel		45856.30	58	Hours	pt	104.81	hours	
1	Rehabilitat	Markings	Other	Gen	Diesel		45856.30	58	Hours	pt	104.81	hours	
1	Rehabilitat	Markings	Pickup	Tru	Diesel		45856.30	58	Hours	pt	104.81	hours	
1	Rehabilitat	Sealing Ra	Crack	Clea	Diesel		1375.00	Lf8	Hours	pt	3.93	hours	
1	Rehabilitat	Sealing Ra	Crack	Fill	Diesel		1375.00	Lf8	Hours	pt	3.93	hours	
1	Rehabilitat	Sealing Ra	Flatbed	Tr	Diesel		1375.00	Lf8	Hours	pt	3.93	hours	
1	Rehabilitat	Sealing Ra	Other	Gen	Diesel		1375.00	Lf8	Hours	pt	3.93	hours	
1	Rehabilitat	Sealing Ra	Pickup	Tru	Diesel		1375.00	Lf8	Hours	pt	3.93	hours	
1	Rehabilitat	Soil Erosio	Other	Gen	Diesel		0.30	Acre	4	Hours	pt	1.2	hours
1	Rehabilitat	Soil Erosio	Pickup	Tru	Diesel		0.30	Acre	8	Hours	pt	2.4	hours
1	Rehabilitat	Soil Erosio	Pumps		Diesel		0.30	Acre	4	Hours	pt	1.2	hours
1	Rehabilitat	Soil Erosio	Tractors/L		Diesel		0.30	Acre	4	Hours	pt	1.2	hours
1	Rehabilitat	Subbase P	Dozer		Diesel		5090.00	518	Hours	pt	10.72	hours	
1	Rehabilitat	Subbase P	Dump	Tru	Diesel		1696.70	Cb	Hours	pt	75.41	hours	
1	Rehabilitat	Subbase P	Pickup	Tru	Diesel		5090.00	518	Hours	pt	10.72	hours	
1	Rehabilitat	Subbase P	Roller		Diesel		1696.70	Cb	Hours	pt	10.44	hours	
1	Rehabilitat	Topsoil Pl	Dozer		Diesel		222.10	CY	8	Hours	pt	2.96	hours
1	Rehabilitat	Topsoil Pl	Dump	Tru	Diesel		222.10	CY	8	Hours	pt	2.96	hours
1	Rehabilitat	Topsoil Pl	Pickup	Tru	Diesel		222.10	CY	8	Hours	pt	2.96	hours
2	Taxiways	Asphalt Pl	Asphalt	P	Diesel		1781.10	518	Hours	pt	2.23	hours	
2	Taxiways	Asphalt Pl	Dump	Tru	Diesel		1781.10	518	Hours	pt	8.02	hours	
2	Taxiways	Asphalt Pl	Other	Gen	Diesel		1781.10	5116	Hours	pt	4.45	hours	

2	Taxiways	Asphalt PI Pickup Tru Diesel	1781.10 518 Hours pt	2.23 hours	
2	Taxiways	Asphalt PI Roller Diesel	1781.10 518 Hours pt	2.23 hours	
2	Taxiways	Asphalt PI Skid Steer Diesel	1781.10 518 Hours pt	2.23 hours	
2	Taxiways	Asphalt PI Surfacing Diesel	1781.10 518 Hours pt	2.85 hours	
2	Taxiways	Clearing at Chain Saw Diesel	0.70 Acre 12 Hours f	8.4 hours	*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***
2	Taxiways	Clearing at Chipper/St Diesel	0.70 Acre 12 Hours f	8.4 hours	
2	Taxiways	Clearing at Pickup Tru Diesel	0.70 Acre 16 Hours f	11.2 hours	
2	Taxiways	Concrete I Air Comp Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Concrete I Concrete S Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Concrete I Concrete T Diesel	742.10 CY 8 Hours pt	24.74 hours	
2	Taxiways	Concrete I Other Gen Diesel	742.10 CY 16 Hours f	11.87 hours	
2	Taxiways	Concrete I Pickup Tru Diesel	742.10 CY 24 Hours f	17.81 hours	
2	Taxiways	Concrete I Rubber Tr Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Concrete I Slip Form Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Concrete I Surfacing Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Drainage - Dozer Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Dump Tru Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Excavator Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Loader Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Other Gen Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Pickup Tru Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Roller Diesel	1385.00 LF8 Hours pt	44.32 hours	
2	Taxiways	Drainage - Dump Tru Diesel	2770.00 LF8 Hours pt	24.62 hours	
2	Taxiways	Drainage - Loader Diesel	2770.00 LF8 Hours pt	24.62 hours	
2	Taxiways	Drainage - Other Gen Diesel	2770.00 LF8 Hours pt	24.62 hours	
2	Taxiways	Drainage - Pickup Tru Diesel	2770.00 LF8 Hours pt	24.62 hours	
2	Taxiways	Drainage - Tractors/L Diesel	2770.00 LF8 Hours pt	24.62 hours	
2	Taxiways	Dust Cont Water Tru Diesel	90.00 Day 8 Hours pt	720 hours	
2	Taxiways	Excavator Dozer Diesel	742.10 CY 8 Hours pt	9.89 hours	
2	Taxiways	Excavator Dump Tru Diesel	742.10 CY 8 Hours pt	9.89 hours	
2	Taxiways	Excavator Pickup Tru Diesel	742.10 CY 8 Hours pt	9.89 hours	
2	Taxiways	Excavator Roller Diesel	742.10 CY 8 Hours pt	4.57 hours	
2	Taxiways	Excavator Dozer Diesel	742.10 CY 8 Hours pt	7.42 hours	
2	Taxiways	Excavator Dump Tru Diesel	742.10 CY 8 Hours pt	19.79 hours	
2	Taxiways	Excavator Excavator Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Excavator Pickup Tru Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Excavator Roller Diesel	742.10 CY 8 Hours pt	5.94 hours	
2	Taxiways	Excavator Scraper Diesel	742.10 CY 8 Hours pt	7.42 hours	
2	Taxiways	Excavator Dozer Diesel	1781.10 518 Hours pt	2.79 hours	
2	Taxiways	Fencing Concrete T Diesel	1375.00 LF2 Hours pt	15.28 hours	
2	Taxiways	Fencing Dump Tru Diesel	1375.00 LF8 Hours pt	61.11 hours	
2	Taxiways	Fencing Other Gen Diesel	1375.00 LF8 Hours pt	61.11 hours	
2	Taxiways	Fencing Pickup Tru Diesel	1375.00 LF8 Hours pt	61.11 hours	
2	Taxiways	Fencing Skid Steer Diesel	1375.00 LF8 Hours pt	61.11 hours	
2	Taxiways	Fencing Tractors/L Diesel	1375.00 LF8 Hours pt	61.11 hours	
2	Taxiways	Grading Dozer Diesel	3331.40 518 Hours pt	3.33 hours	
2	Taxiways	Grading Grader Diesel	3331.40 518 Hours pt	3.33 hours	
2	Taxiways	Grading Roller Diesel	3331.40 518 Hours pt	3.33 hours	
2	Taxiways	Hydroseec Hydroseec Diesel	30013.00 58 Hours pt	3 hours	
2	Taxiways	Hydroseec Off-Road T Diesel	30013.00 58 Hours pt	3 hours	
2	Taxiways	Lighting Dump Tru Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Lighting Loader Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Lighting Other Gen Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Lighting Pickup Tru Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Lighting Skid Steer Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Lighting Tractors/L Diesel	2773.30 LF8 Hours pt	18.49 hours	
2	Taxiways	Markings Flatted Tr Diesel	16046.30 58 Hours pt	36.68 hours	
2	Taxiways	Markings Other Gen Diesel	16046.30 58 Hours pt	36.68 hours	
2	Taxiways	Markings Pickup Tru Diesel	16046.30 58 Hours pt	36.68 hours	
2	Taxiways	Soil Erosio Other Gen Diesel	0.70 Acre 4 Hours pt	2.8 hours	
2	Taxiways	Soil Erosio Pickup Tru Diesel	0.70 Acre 8 Hours pt	5.6 hours	
2	Taxiways	Soil Erosio Pumps Diesel	0.70 Acre 4 Hours pt	2.8 hours	
2	Taxiways	Soil Erosio Tractors/L Diesel	0.70 Acre 4 Hours pt	2.8 hours	
2	Taxiways	Subbase P Dozer Diesel	1781.10 518 Hours pt	3.75 hours	
2	Taxiways	Subbase P Dump Tru Diesel	593.70 CY 8 Hours pt	26.39 hours	
2	Taxiways	Subbase P Pickup Tru Diesel	1781.10 518 Hours pt	3.75 hours	
2	Taxiways	Subbase P Roller Diesel	593.70 CY 8 Hours pt	3.65 hours	
2	Taxiways	Topsoil P/D Dozer Diesel	555.20 CY 8 Hours pt	7.4 hours	
2	Taxiways	Topsoil P/D Dump Tru Diesel	555.20 CY 8 Hours pt	7.4 hours	
2	Taxiways	Topsoil P/D Pickup Tru Diesel	555.20 CY 8 Hours pt	7.4 hours	
3	Demolitor Concrete I Excavator Diesel		33817.50 58 Hours pt	45.09 hours	
3	Demolitor Concrete I Excavator Diesel		33817.50 58 Hours pt	45.09 hours	
3	Demolitor Concrete I Pickup Tru Diesel		33817.50 58 Hours pt	90.18 hours	

Activity: On-Road (Estimated based on engineering experience)

Scenario I/ Project	Equipment	On-road A Fuel	Roadway T/Round Tri/ Number o/ Project Le/Project A/Building H/ Open Sp/ Number Activity S/ Activity/ Default User VMT
1	Rehabilitat/Asphalt I/8 Material D Diesel		Urban Unr 40 -- 65 1375 33.35 -- -- -- -- -- 665
1	Rehabilitat/Cement M Material D Diesel		Urban Unr 40 -- 65 1375 33.35 -- -- -- -- -- 10604
1	Rehabilitat/Dump Tru Material D Diesel		Urban Unr 40 -- 65 1375 33.35 -- -- -- -- -- 943
1	Rehabilitat/Dump Tru Material D Diesel		Urban Unr 40 -- 65 1375 33.35 -- -- -- -- -- 5656
1	Rehabilitat/Passenger Employee Gasoline		Urban Unr 30 98.01 65 -- -- -- -- -- -- 2E+05
2	Taxiways Asphalt I/8 Material D Diesel		Urban Unr 40 -- 65 1375 11.67 -- -- -- -- -- 233
2	Taxiways Cement M Material D Diesel		Urban Unr 40 -- 65 1375 11.67 -- -- -- -- -- 3711
2	Taxiways Dump Tru Material D Diesel		Urban Unr 40 -- 65 1375 11.67 -- -- -- -- -- 330
2	Taxiways Dump Tru Material D Diesel		Urban Unr 40 -- 65 1375 11.67 -- -- -- -- -- 1979
2	Taxiways Passenger Employee Gasoline		Urban Unr 30 73 65 -- -- -- -- -- -- 1E+05
3	Demolitor/Dump Tru Material D Diesel		Urban Unr 40 -- 65 1012.5 33.4 -- -- -- -- -- 2088
3	Demolitor/Passenger Employee Gasoline		Urban Unr 30 31.79 65 -- -- -- -- -- -- 61991

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario I/ Project	Fugitive T/ Variable	Default Values	Units	User Value
1	Rehabilitat/Asphalt Dr A = Area o	4260	m2	
1	Rehabilitat/Asphalt Dr AR = Appl	1.811	l/m2	
1	Rehabilitat/Asphalt Dr VO = Volu	0.35	fraction	
1	Rehabilitat/Asphalt Dr EF = Mass	0.7	fraction	
1	Rehabilitat/Asphalt Dr D = Densit	1.8	lbs/l	
1	Rehabilitat/Asphalt Dr VOC = A x	3402.3	lbs	111.3
1	Rehabilitat/Asphalt St T = Mass o	554.2	tons	
1	Rehabilitat/Asphalt St PM10 = (D	15.2	lbs	
1	Rehabilitat/Asphalt St CO = (D +	221.9	lbs	
1	Rehabilitat/Asphalt St NOx = (0.0	13.9	lbs	
1	Rehabilitat/Asphalt St SOx = (0.0	2.549	lbs	
1	Rehabilitat/Asphalt St VOC = (0.0	6.872	fraction	
1	Rehabilitat/Material N s = Surface	0.043	fraction	
1	Rehabilitat/Material N WT = Mea	92	tons	
1	Rehabilitat/Material N VMT = Vel	2373	miles	
1	Rehabilitat/Material N PM10 = 1.1	65	lbs	
1	Rehabilitat/Material N sL = Road	0.1	g/m3	
1	Rehabilitat/Material N WT = Mea	32	tons	
1	Rehabilitat/Material N VMT = Vel	2275	miles	
1	Rehabilitat/Material N PM10 = 0.1	21.1	lbs	
1	Rehabilitat/Soil Handl u = Wind s	5	mph	
1	Rehabilitat/Soil Handl m = Moist	0.25	fraction	
1	Rehabilitat/Soil Handl T = Mass o	1261	tons	
1	Rehabilitat/Soil Handl PM10 = T	26	lbs	
1	Rehabilitat/Unstabiliz A = Area s	1.053	acres	

1	RehabilitatUnstabilizTPConv = 1	0.5	fraction	
1	RehabilitatUnstabilizCE = Contr	0.63	fraction	
1	RehabilitatUnstabilizt = year (e.	0.25	years	
1	RehabilitatUnstabilizPM10 = 0:	0	lbs	
2	Taxiways Asphalt Dr A = Area o	1490.7	m2	
2	Taxiways Asphalt Dr AR = Appli	1.811	/m2	
2	Taxiways Asphalt Dr VD = Volur	0.35	fraction	
2	Taxiways Asphalt Dr EF = Mass	0.7	fraction	
2	Taxiways Asphalt Dr D = Denist	1.8	lb/cf	
2	Taxiways Asphalt Dr VOC = A x.	1190.5	lbs	53
2	Taxiways Asphalt St T = Mass o	193.9	tons	
2	Taxiways Asphalt St PM10 = (0	5.318	lbs	
2	Taxiways Asphalt St CO = (0.4 +	77.6	lbs	
2	Taxiways Asphalt St NOx = (0.0	4.948	lbs	
2	Taxiways Asphalt St SOx = (0.0	0.892	lbs	
2	Taxiways Asphalt St VOC = (0.0	2.405	lbs	
2	Taxiways Material N s = Surface	0.043	fraction	
2	Taxiways Material N Wt. = Mea	32	tons	
2	Taxiways Material N VMT = Ve	1482.1	miles	
2	Taxiways Material N PM10 = 1:	40.6	lbs	
2	Taxiways Material N sL = Road :	0.1	g/m3	
2	Taxiways Material N Wt. = Mea	32	tons	
2	Taxiways Material N VMT = Ve	1300	miles	
2	Taxiways Material N PM10 = 0:	12.1	lbs	
2	Taxiways Concrete IV = Volum	742.1	yd3	
2	Taxiways Concrete I PM10 = 0:	27.5	lbs	
2	Taxiways Unstabiliz A = Area a	0.368	acres	
2	Taxiways UnstabilizTPConv = 1	0.5	fraction	
2	Taxiways UnstabilizCE = Contr	0.63	fraction	
2	Taxiways Unstabilizt = year (e.	0.25	years	
2	Taxiways UnstabilizPM10 = 0:	0	lbs	
2	Taxiways Soil Handli u = Wind s	5	mph	
2	Taxiways Soil Handli m = Moist	0.25	fraction	
2	Taxiways Soil Handli T = Mass o	441.3	tons	
2	Taxiways Soil Handli PM10 = T :	9.083	lbs	
3	DemolitorSoil Handli u = Wind s	5	mph	
3	DemolitorSoil Handli m = Moist	0.25	fraction	
3	DemolitorSoil Handli T = Mass o	930	tons	
3	DemolitorSoil Handli PM10 = T :	19.1	lbs	
3	DemolitorUnstabiliz A = Area a	0.776	acres	
3	DemolitorUnstabilizTPConv = 1	0.5	fraction	
3	DemolitorUnstabilizCE = Contr	0.63	fraction	
3	DemolitorUnstabilizt = year (e.	0.25	years	
3	DemolitorUnstabilizPM10 = 0:	0	lbs	
3	DemolitorMaterial N s = Surface	0.043	fraction	
3	DemolitorMaterial N Wt. = Mea	32	tons	
3	DemolitorMaterial N VMT = Ve	361.4	miles	
3	DemolitorMaterial N PM10 = 1:	10.4	lbs	
3	DemolitorMaterial N sL = Road :	0.1	g/m3	
3	DemolitorMaterial N Wt. = Mea	32	tons	
3	DemolitorMaterial N VMT = Ve	325	miles	
3	DemolitorMaterial N PM10 = 0:	3.017	lbs	

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Doser
- Dump Truck
- Dump Truck (12 cy)
- Excavator
- Excavator for U/G Services/Tanks
- Flat Bed or Dump Trucks
- Flatbed Truck

Grader
Grout Wheel Truck
Hoist Equipment with 40 Ton Rig
Hydraulic Hammer
Hydroseeder
Line Painting Truck and Sprayer
Material Deliveries
Off-Road Truck
Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Hoist- Curbs Del & Place
Tractor Trailer with Boom Hoist- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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STUDY

Study Name

DMV Runway Rehab

Study Description

Construction 2031

EMISSIONS INVENTORY - DETAILS:

Non-Road Sources
Units for Non-Greenhouse Gases Emission: Short Ton
Units for Greenhouse Gases (CO₂, CH₄, and N₂O) Emission: Metric Ton

Scenario ID											MOVES4 Em ss on Factors (g hp hr)											NONROAD Em ss ons (TPY)										
Scenario ID	Year	Pro ect	Construct on Act v ty	Equipment	Moves Equipment	MOVES Lookup	Fuel	HP Average	Load Factor	Hours of Act v ty	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CO (tpy)	NOx (tpy)	SO2 (tpy)	PM10 (tpy)	PM2.5 (tpy)	VOC (tpy)	CO2 (tpy)								
1	2031	Rehabilitat Asphalt Placement	Asphalt Paver	Pavers	Pavers175	Diesel	175	0.59	6.3625	0.06035	0.20096	0.00142	0.01389	0.01347	0.00978	536.803	4E-05	0.0001	1E-06	1E-05	9.76E-06	7E-06	0.388972									
1	2031	Rehabilitat Asphalt Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	22.91503	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0002	0.001	1E-05	5.6E-05	5.43E-05	8E-05	4.80004									
1	2031	Rehabilitat Asphalt Placement	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	12.725	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	8E-05	0.0002	2E-06	1.8E-05	1.78E-05	1E-05	0.5666									
1	2031	Rehabilitat Asphalt Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	6.3625	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	5E-05	0.0003	4E-06	1.6E-05	1.51E-05	1E-05	1.33276									
1	2031	Rehabilitat Asphalt Placement	Roller	Rollers	Rollers100	Diesel	100	0.59	6.3625	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.129	4E-05	0.0004	7E-07	7.7E-06	7.5E-06	4E-06	0.24668									
1	2031	Rehabilitat Asphalt Placement	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	6.3625	2.24155	3.62612	0.00202	0.36816	0.35711	0.47213	694.594	0.0002	0.0004	2E-07	4.1E-05	3.94E-05	5E-05	0.07673									
1	2031	Rehabilitat Asphalt Placement	Surfacing Equipment (Grooving)	Other Construction Equipment	Other Construction Equipment25	Diesel	25	0.59	8.1484	1.48843	3.76242	0.00219	0.17035	0.16524	0.35163	595.15	0.0002	0.0005	3E-07	2.3E-05	2.19E-05	5E-05	0.07881									
1	2031	Rehabilitat Cold Milling	Cold Panner	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	10.18	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	9E-05	0.0002	2E-06	2E-05	1.95E-05	1E-05	0.62195									
1	2031	Rehabilitat Cold Milling	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	8E-05	0.0004	6E-06	2.5E-05	2.41E-05	4E-05	2.13242									
1	2031	Rehabilitat Cold Milling	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	8E-05	0.0004	6E-06	2.5E-05	2.41E-05	4E-05	2.13242									
1	2031	Rehabilitat Cold Milling	Sweepers	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.18	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	6E-05	0.0002	1E-06	1.5E-05	1.42E-05	1E-05	0.45328									
1	2031	Rehabilitat Cold Milling	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.18	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	8E-05	0.0004	6E-06	2.5E-05	2.41E-05	4E-05	2.13242									
1	2031	Rehabilitat Concrete Demolitic	Concrete Saws	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	91.7126	0.27781	2.52815	0.00157	0.20216	0.01956	0.09238	595.881	0.0007	0.006	4E-06	4.8E-05	4.67E-05	0.0002	1.4217									
1	2031	Rehabilitat Concrete Demolitic	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0007	0.004	5E-05	0.00022	0.000217	0.0003	19.2111									
1	2031	Rehabilitat Concrete Demolitic	Excavator	Excavators175	Diesel	175	0.59	91.7126	0.049	0.16827	0.00141	0.01085	0.01052	0.00819	536.808	0.0005	0.0018	1E-05	0.00011	0.00011	9E-05	5.60391										
1	2031	Rehabilitat Concrete Demolitic	Hydraulic Hammer	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.59	91.7126	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0008	0.0002	1E-05	0.00018	0.000176	0.0001	5.60319									
1	2031	Rehabilitat Concrete Demolitic	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	91.7126	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0006	0.0016	1E-05	0.00013	0.000128	9E-05	0.48368									
1	2031	Rehabilitat Concrete Demolitic	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0007	0.004	5E-05	0.00022	0.000217	0.0001	19.2111									
1	2031	Rehabilitat Dust Control	Water Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	720	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0054	0.0313	0.0004	0.00176	0.001707	0.0027	150.819									
1	2031	Rehabilitat Excavation (Cut to Dozer)	Excavators	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.329	0.05188	0.21316	0.00141	0.01162	0.01127	0.0086	536.807	8E-05	0.05	5E-07	4.5E-06	4.35E-06	3E-06	0.20734									
1	2031	Rehabilitat Excavation (Cut to Dump Truck (12 cy))	Excavators	Excavators175	Diesel	600	0.59	11.312	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	8E-05	0.0005	6E-06	2.8E-05	2.68E-05	4E-05	2.36954										
1	2031	Rehabilitat Excavation (Cut to Excavator)	Excavators	Excavators175	Diesel	175	0.59	3.3936	0.049	0.16827	0.00141	0.01085	0.01052	0.00819	536.808	2E-05	6E-05	5E-07	4.2E-06	4.06E-06	3E-06	0.20734										
1	2031	Rehabilitat Excavation (Cut to Pickup Truck)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.3936	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	3E-05	0.0001	2E-06	8.3E-06	8.04E-06	1E-05	0.71086										
1	2031	Rehabilitat Excavation (Cut to Roller)	Rollers	Rollers100	Diesel	100	0.59	3.3936	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.129	2E-05	0.0002	3E-07	4.1E-06	4E-06	2E-06	0.13157										
1	2031	Rehabilitat Excavation (Topsoid Dozer)	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.959683	0.05188	0.21316	0.00141	0.01162	0.01127	0.0086	536.807	9E-06	3E-05	4E-07	2.1E-06	2.05E-06	2E-06	0.097956										
1	2031	Rehabilitat Excavation (Topsoid Dozer)	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	1.329	0.05188	0.21316	0.00141	0.01162	0.01127	0.0086	536.807	8E-05	0.05	5E-07	4.5E-06	4.35E-06	3E-06	0.20734										
1	2031	Rehabilitat Excavation (Topsoid Dozer)	Graders	Graders300	Diesel	300	0.59	1.329	0.02021	0.11369	0.00141	0.00647	0.00627	0.00965	536.801	5E-06	3E-05	4E-07	1.7E-06	1.63E-06	3E-06	0.13936										
1	2031	Rehabilitat Excavation (Topsoid Dozer)	Rollers	Rollers100	Diesel	100	0.59	1.329	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.129	8E-06	8E-05	1E-07	1.6E-06	1.57E-06	9E-07	0.05168										
1	2031	Rehabilitat Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment500	Diesel	600	0.59	0.13329	0.24241	0.67768	0.00148	0.03494	0.03389	0.03657	536.724	1E-05	4E-05	8E-08	1.8E-06	1.76E-06	2E-06	0.02792									
1	2031	Rehabilitat Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	0.13329	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	1E-06	6E-06	7E-08	3.3E-07	3.16E-07	5E-07	0.02792									
1	2031	Rehabilitat Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.05188	0.21316	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0008	1E-05	4.6E-05	4.45E-05	7E-05	3.93345									
1	2031	Rehabilitat Lighting	Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.778	0.38334	0.85036	0.00173	0.0853	0.08274	0.11862	626.197	0.0008	0.0018	4E-06	0.00018	0.000177	0.0003	1.33831									
1	2031	Rehabilitat Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.778	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0001	0.0008	2E-06	2.7E-05	2.62E-05	2E-05	0.88613									
1	2031	Rehabilitat Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.778	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0008	2E-06	4.7E-05	4.45E-05	7E-05	3.93345									
1	2031	Rehabilitat Lighting	Skid Steer Loader	Skid Steer Loaders75	Diesel	75	0.21	6.3625	2.24155	3.62612	0.00202	0.36816	0.35711	0.47213	694.594	0.0002	0.0004	2E-07	4.1E-05	3.94E-05	5E-05	0.07673										
1	2031	Rehabilitat Lighting	Tractors/Loader/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.778	0.89892	1.41545	0.0192	0.14621	0.14182	0.16778	695.507	0.0004	0.0006	8E-07	6.4E-05	6.16E-05	7E-05	0.30233										
1	2031	Rehabilitat Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.84144	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	10.84144	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0008	0.0019	1E-05	0.00015	0.000146	0.0001	4.66706									
1	2031	Rehabilitat Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	10.84144	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Sealing Random Cr	Dump Truck	Other Construction Equipment	Other Construction Equipment40	Diesel	40	0.59	91.7126	0.27781	2.52815	0.00157	0.20216	0.01956	0.09238	595.881	0.0007	0.006	4E-06	4.8E-05	4.67E-05	0.0002	1.4217									
1	2031	Rehabilitat Sealing Random Cr	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Sealing Random Cr	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	91.7126	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0008	0.0019	1E-05	0.00015	0.000146	0.0001	4.66706									
1	2031	Rehabilitat Sealing Random Cr	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Sealing Random Cr	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Sealing Random Cr	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	91.7126	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.796	0.0008	0.0019	1E-05	0.00015	0.000146	0.0001	4.66706									
1	2031	Rehabilitat Sealing Random Cr	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026	0.000248	0.0004	2.9556									
1	2031	Rehabilitat Sealing Random Cr	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	91.7126	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0008	0.0046	6E-05	0.00026												

2	2031	Taxiways	Excavation (Cut to Excavator	Excavators	Excavators175	Diesel	175	0.59	5.9368	0.049	0.16827	0.00141	0.01085	0.01052	0.00819	536.808	3E-05	0.0001	1E-06	7.3E-06	7.11E-06	6E-06	0.36272	
2	2031	Taxiways	Excavation (Cut to Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.9368	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	4E-05	0.0003	3E-06	1.5E-05	1.41E-05	2E-05	1.24359	
2	2031	Taxiways	Excavation (Cut to Roller	Rollers	Rollers100	Diesel	100	0.59	5.9368	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.128	4E-05	0.0003	6E-07	7.2E-06	7E-06	4E-06	0.23013	
2	2031	Taxiways	Excavation (Cut to Scraper	Scrapers	Scrapers600	Diesel	600	0.59	7.4221	0.03447	0.13872	0.00142	0.00897	0.0087	0.01139	536.798	1E-04	0.0004	4E-06	2.6E-05	2.52E-05	3E-05	1.55447	
2	2031	Taxiways	Excavation (Topsoli Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	2.793882	0.05188	0.17311	0.00141	0.01162	0.01127	0.0086	536.807	2E-05	6E-05	4E-07	3.7E-06	3.58E-06	3E-06	0.1707	
2	2031	Taxiways	Fencing	Concrete Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	15.27778	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0007	8E-06	3.7E-05	3.62E-05	6E-05	3.20025
2	2031	Taxiways	Fencing	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0005	0.0027	3E-05	0.00015	0.000145	0.0002	12.801
2	2031	Taxiways	Fencing	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	61.11111	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.798	0.0004	0.0011	7E-06	8.8E-05	8.53E-05	6E-05	2.72109
2	2031	Taxiways	Fencing	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	61.11111	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0005	0.0027	3E-05	0.00015	0.000145	0.0002	12.801
2	2031	Taxiways	Fencing	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	61.11111	2.24155	3.62612	0.00202	0.36816	0.35711	0.47213	694.594	0.0024	0.0038	2E-06	0.00039	0.000379	0.0005	0.76395
2	2031	Taxiways	Fencing	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	61.11111	0.88092	1.48145	0.00192	0.14621	0.14182	0.16778	695.507	0.0012	0.0021	3E-06	0.00021	0.000201	0.0002	0.98389
2	2031	Taxiways	Grading	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.3314	0.05188	0.17311	0.00141	0.01162	0.01127	0.0086	536.807	2E-05	7E-05	5E-07	4.4E-06	4.27E-06	3E-06	0.20354
2	2031	Taxiways	Grading	Grader	Graders	Graders300	Diesel	300	0.59	3.3314	0.02021	0.11369	0.00141	0.00647	0.00627	0.00965	536.801	1E-05	7E-05	9E-07	4.2E-06	4.08E-06	6E-06	0.34892
2	2031	Taxiways	Grading	Rollers	Rollers100	Rollers100	Diesel	100	0.59	3.3314	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.128	2E-05	0.0002	3E-07	4.1E-06	3.93E-06	2E-06	0.12916
2	2031	Taxiways	Hydroseeding	Hydroseeder	Other Construction Equipment	Other Construction Equipment600	Diesel	600	0.59	3.0013	0.24241	0.67768	0.00148	0.03494	0.03389	0.03657	536.734	0.0003	0.0008	2E-06	4.1E-05	3.97E-05	4E-05	0.62859
2	2031	Taxiways	Hydroseeding	Off-Road Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.0013	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	2E-05	0.0001	2E-06	7.3E-06	7.11E-06	1E-05	0.62869
2	2031	Taxiways	Lighting	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0008	1E-05	4.5E-05	4.38E-05	7E-05	3.87284
2	2031	Taxiways	Lighting	Loader	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes175	Diesel	175	0.59	18.48867	0.38134	0.85036	0.00173	0.0853	0.08274	0.11862	626.197	0.0008	0.0018	4E-06	0.00018	0.000174	0.0002	1.31769
2	2031	Taxiways	Lighting	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	18.48867	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.798	0.0003	0.0003	2E-06	2.7E-05	2.58E-05	2E-05	0.83234
2	2031	Taxiways	Lighting	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	18.48867	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0008	1E-05	4.5E-05	4.38E-05	7E-05	3.87284
2	2031	Taxiways	Lighting	Skid Steer Loader	Skid Steer Loaders	Skid Steer Loaders75	Diesel	75	0.21	18.48867	2.24155	3.62612	0.00202	0.36816	0.35711	0.47213	694.594	0.0007	0.0012	6E-07	0.00012	0.000115	0.0002	0.22296
2	2031	Taxiways	Lighting	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	18.48867	0.88092	1.48145	0.00192	0.14621	0.14182	0.16778	695.507	0.0004	0.0006	8E-07	6.3E-05	6.07E-05	7E-05	0.29767
2	2031	Taxiways	Markings	Flatbed Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0003	0.0016	2E-05	9E-05	8.69E-05	0.0001	7.68283
2	2031	Taxiways	Markings	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	36.67726	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.798	0.0002	0.0006	4E-06	5.3E-05	5.12E-05	4E-05	1.63313
2	2031	Taxiways	Markings	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	36.67726	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0003	0.0016	2E-05	9E-05	8.69E-05	0.0001	7.68283
2	2031	Taxiways	Soil Erosion/Sedim	Other General Equipment	Other Construction Equipment	Other Construction Equipment175	Diesel	175	0.43	2.8	0.07376	0.21316	0.00142	0.01735	0.01683	0.01214	536.798	2E-05	3E-05	3E-07	4E-06	3.91E-06	3E-06	0.11468
2	2031	Taxiways	Soil Erosion/Sedim	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	5.6	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	4E-05	0.0002	3E-06	1.4E-05	1.33E-05	2E-05	1.17304
2	2031	Taxiways	Soil Erosion/Sedim	Pumps	Other Construction Equipment	Other Construction Equipment11	Diesel	11	0.43	2.8	2.45996	1.48148	0.00218	0.23876	0.2316	0.8378	593.756	4E-05	6E-05	3E-08	3.5E-06	3.38E-06	1E-05	0.00867
2	2031	Taxiways	Soil Erosion/Sedim	Tractors/Loader/Backhoe	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes100	Diesel	100	0.21	2.8	0.88092	1.48145	0.00192	0.14621	0.14182	0.16778	695.507	6E-05	1E-04	1E-07	9.5E-06	9.19E-06	1E-05	0.04508
2	2031	Taxiways	Subbase Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	3.749684	0.05188	0.17311	0.00141	0.01162	0.01127	0.0086	536.807	2E-05	7E-05	6E-07	3E-06	4.81E-06	4E-06	0.22909
2	2031	Taxiways	Subbase Placement	Dump Truck (12 cy)	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.749684	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0001	0.0011	1E-05	6.4E-05	6.25E-05	1E-04	5.52724
2	2031	Taxiways	Subbase Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	3.749684	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	3E-05	0.0002	2E-06	9.2E-06	8.89E-06	1E-05	0.78545
2	2031	Taxiways	Subbase Placement	Rollers	Rollers100	Rollers100	Diesel	100	0.59	3.653538	0.09383	0.89851	0.00158	0.0187	0.01814	0.00999	596.129	2E-05	0.0002	4E-07	4.4E-06	4.31E-06	2E-06	0.14165
2	2031	Taxiways	Topsoli Placement	Dozer	Crawler Tractor/Dozers	Crawler Tractor/Dozers175	Diesel	175	0.59	7.402667	0.05188	0.17311	0.00141	0.01162	0.01127	0.0086	536.807	4E-05	0.0001	1E-06	9.8E-06	9.49E-06	7E-06	0.45228
2	2031	Taxiways	Topsoli Placement	Dump Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	6E-05	0.0003	4E-06	1.8E-05	1.75E-05	3E-05	1.55064
2	2031	Taxiways	Topsoli Placement	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	7.402667	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	6E-05	0.0003	4E-06	1.8E-05	1.75E-05	3E-05	1.55064
2	2031	Demolition	Concrete Demolitic	Excavator with Hoe Ram	Excavators	Excavators175	Diesel	175	0.59	45.09	0.049	0.16827	0.00141	0.01085	0.01052	0.00819	536.808	0.0003	0.0009	7E-06	5.6E-05	5.4E-05	4E-05	2.75484
2	2031	Demolition	Concrete Demolitic	Excavator with Hoe Ram	Excavators	Excavators175	Diesel	175	0.59	45.09	0.049	0.16827	0.00141	0.01085	0.01052	0.00819	536.808	0.0003	0.0009	7E-06	5.6E-05	5.4E-05	4E-05	2.75484
3	2031	Demolition	Concrete Demolitic	Pickup Truck	Off-highway Trucks	Off-highway Trucks600	Diesel	600	0.59	90.18	0.01917	0.11156	0.00141	0.00626	0.00607	0.00948	536.802	0.0007	0.0039	5E-05	0.00022	0.000214	0.0003	18.8901
																	TOTAL 0.0397 0.1713 0.0017 0.01038 0.010066 0.0143 629.882							

On-Road Sources

Units for Non-Greenhouse Gases Emission: Short Ton

Units for Greenhouse Gases (CO2, CH4, and N2O) Emission: Metric Ton

Scenario ID	Year	Pro-ect	Equip-ment	Equip-ment Category	MOVES Lookup	On-road Act-iv-ty	Fuel	Roadway Type	Round Trip Distance	Distance traveled (miles)	Number of Vehicles	Number of Employees	Number of Projects	Pro-ect Length	Pro-ect Width	Pro-ect Area	Building Height (feet)	Open Space Height	Number of Trees	Activity Rate	VMT	MOVES Emission Factors (g/mile)										MOVES ONROAD Emissions (tpy)															
																						CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O	CO	NOx	SO2	PM10	PM2.5	VOC	CO2	CH4	N2O								
1	2031	illitate Ru	Asphalt Drying	Combination Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	--	--	665	1.8265	2.8966	0.005055	0.021561	0.019836	0.095390	1511.343	0.01693	0.22607	0.001339	0.001605	3.71E-06	1.58E-05	1.45E-05	6.99E-05	1.107876	1.2E-05	0.00017								
1	2031	illitate Ru	Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	3	--	65	1375	33.35	--	--	--	--	--	--	10604	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
1	2031	illitate Ru	Asphalt Drying	Combination Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	33.35	--	--	--	--	--	--	665	1.8265	2.8966	0.005055	0.021561	0.019836	0.095390	1511.343	0.01693	0.22607	0.001339	0.001605	3.71E-06	1.58E-05	1.45E-05	6.99E-05	1.107876	1.2E-05	0.00017								
1	2031	illitate Ru	Truck Subbase Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	2	--	65	1375	33.35	--	--	--	--	--	--	5656	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
1	2031	illitate Ru	Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Gasoline	Inrestricte	30	--	98.01	98.01	--	--	--	--	--	--	--	--	--	19120	2.2156	0.2052	0.001649	0.020006	0.010775	0.771493	309.943	0.0063	0.00152	0.466762	0.00531	0.00347	0.544236	0.00347	0.015062	65.2972	0.00133	0.00026								
2	2031	Taxiways Asphalt	18 Wheeler	Combination Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	--	233	1.8265	2.8966	0.005055	0.021561	0.019836	0.095390	151.133	0.01693	0.22607	0.001339	0.001605	3.71E-06	1.58E-05	1.45E-05	6.99E-05	0.388173	4.3E-05	0.00012								
2	2031	Taxiways Cement Mixer	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	--	--	3711	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
2	2031	Taxiways Jump Truck - Aspha	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	--	--	330	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
2	2031	Taxiways > Truck Subbase Mix	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1375	11.67	--	--	--	--	--	--	--	1979	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
2	2031	Taxiways Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Gasoline	Inrestricte	30	--	73	73	65	--	--	--	--	--	--	--	--	--	42350	2.2156	0.2052	0.001649	0.020006	0.010775	0.771493	309.943	0.0063	0.00152	0.466762	0.00531	0.00347	0.544236	0.00347	0.015062	65.2972	0.00133	0.00026								
3	2031	Illion - Cor Dump Truck	Single Unit Short-haul Truck	DieselUrban Unrestricted Access	Diesel	Inrestricte	40	5	1	--	65	1012.5	11.67	--	--	--	--	--	--	--	2088	0.9701	0.95857	0.002704	0.015153	0.013941	0.061854	807.3454	0.01215	0.11707	0.011334	0.011205	3.16E-05	0.000177	0.000163	0.000723	9.437037	0.00014	0.000137								
3	2031	Illion - Cor Passenger Car	Passenger Car	GasolineUrban Unrestricted Access	Gasoline	Inrestricte	30	--	31.79	31.79	65	--	--	--	--	--	--	--	--	--	61991	2.2156	0.2052	0.001649	0.020006	0.010775	0.771493	309.943	0.0063	0.00152	0.466762	0.00531	0.00347	0.544236	0.00347	0.015062	65.2972	0.00133	0.00026								
																						TOTAL																	0.994688	0.0399	0.000799	0.013319	0.001182	0.023986	159.133	0.0031	0.0001

1 RehabilitatCold MillinDump Truck Diesel
1 RehabilitatCold MillinPickup Truck Diesel
1 RehabilitatCold MillinSweepers Diesel
1 RehabilitatCold MillinWater Truck Diesel
1 RehabilitatConcrete I Concrete Saws Diesel
1 RehabilitatConcrete I Dump Truck Diesel
1 RehabilitatConcrete I Excavator Diesel
1 RehabilitatConcrete I Hydraulic Hammer Diesel
1 RehabilitatConcrete IOther General EquiDiesel
1 RehabilitatConcrete I Pickup Truck Diesel
1 RehabilitatDust Cont:Water Truck Diesel
1 RehabilitatExcavator Dozer Diesel
1 RehabilitatExcavator Dump Truck (12 cy)Diesel
1 RehabilitatExcavator Excavator Diesel
1 RehabilitatExcavator Pickup Truck Diesel
1 RehabilitatExcavator Roller Diesel
1 RehabilitatExcavator Dozer Diesel
1 RehabilitatGrading Dozer Diesel
1 RehabilitatGrading Grader Diesel
1 RehabilitatGrading Roller Diesel
1 RehabilitatHydroseecHydroseeder Diesel
1 RehabilitatHydroseecOff-Road Truck Diesel
1 RehabilitatLighting Dump Truck Diesel
1 RehabilitatLighting Loader Diesel
1 RehabilitatLighting Other General EquiDiesel
1 RehabilitatLighting Pickup Truck Diesel
1 RehabilitatLighting Skid Steer Loader Diesel
1 RehabilitatLighting Tractors/Loader/BiDiesel
1 RehabilitatMarkings Flatbed Truck Diesel
1 RehabilitatMarkings Other General EquiDiesel
1 RehabilitatMarkings Pickup Truck Diesel
1 RehabilitatSealing Ra Crack Cleaner Diesel
1 RehabilitatSealing Ra Crack Filler (Trailer) Diesel
1 RehabilitatSealing Ra Flatbed Truck Diesel
1 RehabilitatSealing Ra Other General EquiDiesel
1 RehabilitatSealing Ra Pickup Truck Diesel
1 RehabilitatSoil Erosio Other General EquiDiesel
1 RehabilitatSoil Erosio Pickup Truck Diesel
1 RehabilitatSoil Erosio Pumps Diesel
1 RehabilitatSoil Erosio Tractors/Loader/BiDiesel
1 RehabilitatSubbase P Dozer Diesel
1 RehabilitatSubbase P Dump Truck (12 cy)Diesel
1 RehabilitatSubbase P Pickup Truck Diesel
1 RehabilitatSubbase P Roller Diesel
1 RehabilitatTopsoil P/Di Dozer Diesel
1 RehabilitatTopsoil P/Di Dump Truck Diesel
1 RehabilitatTopsoil P/Di Pickup Truck Diesel
2 Taxiways Asphalt P/Asphalt Paver Diesel
2 Taxiways Asphalt P/Dump Truck Diesel
2 Taxiways Asphalt P/Other General EquiDiesel
2 Taxiways Asphalt P/Pickup Truck Diesel
2 Taxiways Asphalt P/Skid Steer Loader Diesel
2 Taxiways Asphalt P/Surfacing EquipmeDiesel
2 Taxiways Clearing atChain Saw Diesel
2 Taxiways Clearing atChipper/Stump GriDiesel
2 Taxiways Clearing atPickup Truck Diesel
2 Taxiways Concrete IAir Compressor Diesel
2 Taxiways Concrete IConcrete Saws Diesel
2 Taxiways Concrete IConcrete Truck Diesel
2 Taxiways Concrete IOther General EquiDiesel
2 Taxiways Concrete IPickup Truck Diesel
2 Taxiways Concrete IRubber Tired LoadDiesel
2 Taxiways Concrete ISlip Form Paver Diesel
2 Taxiways Concrete ISurfacing EquipmeDiesel
2 Taxiways Drainage - Dozer Diesel
2 Taxiways Drainage - Dump Truck Diesel
2 Taxiways Drainage - Excavator Diesel
2 Taxiways Drainage - Loader Diesel
2 Taxiways Drainage -Other General EquiDiesel
2 Taxiways Drainage - Pickup Truck Diesel
2 Taxiways Drainage - Roller Diesel
2 Taxiways Drainage - Dump Truck Diesel
2 Taxiways Drainage - Loader Diesel
2 Taxiways Drainage - Other General EquiDiesel
2 Taxiways Drainage - Pickup Truck Diesel
2 Taxiways Drainage - Tractors/Loader/BiDiesel
2 Taxiways Dust Cont:Water Truck Diesel
2 Taxiways Excavator Dozer Diesel
2 Taxiways Excavator Dump Truck (12 cy)Diesel
2 Taxiways Excavator Pickup Truck Diesel
2 Taxiways Excavator Roller Diesel
2 Taxiways Excavator Dozer Diesel
2 Taxiways Excavator Dump Truck (12 cy)Diesel
2 Taxiways Excavator Excavator Diesel
2 Taxiways Excavator Pickup Truck Diesel
2 Taxiways Excavator Roller Diesel
2 Taxiways Excavator Scraper Diesel
2 Taxiways Excavator Dozer Diesel
2 Taxiways Fencing Concrete Truck Diesel
2 Taxiways Fencing Dump Truck Diesel
2 Taxiways Fencing Other General EquiDiesel
2 Taxiways Fencing Pickup Truck Diesel
2 Taxiways Fencing Skid Steer Loader Diesel
2 Taxiways Fencing Tractors/Loader/BiDiesel
2 Taxiways Grading Dozer Diesel
2 Taxiways Grading Grader Diesel
2 Taxiways Grading Roller Diesel
2 Taxiways HydroseecHydroseeder Diesel
2 Taxiways HydroseecOff-Road Truck Diesel
2 Taxiways Lighting Dump Truck Diesel
2 Taxiways Lighting Loader Diesel
2 Taxiways Lighting Other General EquiDiesel
2 Taxiways Lighting Pickup Truck Diesel
2 Taxiways Lighting Skid Steer Loader Diesel
2 Taxiways Lighting Tractors/Loader/BiDiesel
2 Taxiways Markings Flatbed Truck Diesel
2 Taxiways Markings Other General EquiDiesel
2 Taxiways Markings Pickup Truck Diesel
2 Taxiways Soil Erosio Other General EquiDiesel
2 Taxiways Soil Erosio Pickup Truck Diesel
2 Taxiways Soil Erosio Pumps Diesel
2 Taxiways Soil Erosio Tractors/Loader/BiDiesel
2 Taxiways Subbase P Dozers Diesel
2 Taxiways Subbase P Dump Truck (12 cy)Diesel
2 Taxiways Subbase P Pickup Truck Diesel
2 Taxiways Subbase P Roller Diesel
2 Taxiways Topsoil P/Di Dozer Diesel
2 Taxiways Topsoil P/Di Dump Truck Diesel
2 Taxiways Topsoil P/Di Pickup Truck Diesel

*** GASOLINE DATA USED. DIESEL DATA NOT AVAILABLE ***

3	Demolition	Concrete	Excavator with Buc Diesel
3	Demolition	Concrete	Excavator with Hoe Diesel
3	Demolition	Concrete	Pickup Truck Diesel

Overall Size

Scenario	Project	Project Size	User Input	Unit
1	Rehabilitat	What is th	8.91	5 Million(s)
1	Rehabilitat	What is th	1375	Feet
1	Rehabilitat	What is th	33.35	Feet
2	Taxiways	What is th	1.36	5 Million(s)
2	Taxiways	What is th	1375	Feet
2	Taxiways	What is th	11.67	Feet
3	Demolition	What is th	2.89	5 Million(s)
3	Demolition	What is th	1012.5	Feet
3	Demolition	What is th	33.4	Feet

Size Detail (Estimated based on engineering experience)

Scenario	Project	Construct	Default Activity Size	Unit
1	Rehabilitat	Asphalt Pl	5090	Square Yards
1	Rehabilitat	Cold Millin	5090	Square Yards
1	Rehabilitat	Concrete	5090	Square Feet
1	Rehabilitat	Concrete	45856.3	Square Feet
1	Rehabilitat	Dust Cont	90	Days
1	Rehabilitat	Excavator	424.2	Cubic Yards
1	Rehabilitat	Excavator	1018	Square Yards
1	Rehabilitat	Grading	1332.9	Square Yards
1	Rehabilitat	Hydroseec	1332.9	Square Feet
1	Rehabilitat	Lighting	2816.7	Linear Feet
1	Rehabilitat	Markings	45856.3	Square Feet
1	Rehabilitat	Sealing Ra	1375	Linear Feet
1	Rehabilitat	Soil Erosio	0.3	Acres
1	Rehabilitat	Subbase P	5090	Square Yards
1	Rehabilitat	Subbase P	1696.7	Cubic Yards
1	Rehabilitat	Topsoil Pl	222.1	Cubic Yards
2	Taxiways	Asphalt Pl	1781.1	Square Yards
2	Taxiways	Clearing ar	0.7	Acres
2	Taxiways	Concrete	742.1	Cubic Yards
2	Taxiways	Drainage -	1385	Linear Feet
2	Taxiways	Drainage -	2770	Linear Feet
2	Taxiways	Dust Cont	90	Days
2	Taxiways	Excavator	742.1	Cubic Yards
2	Taxiways	Excavator	742.1	Cubic Yards
2	Taxiways	Excavator	1781.1	Square Yards
2	Taxiways	Fencing	1375	Linear Feet
2	Taxiways	Grading	3331.4	Square Yards
2	Taxiways	Hydroseec	30013	Square Feet
2	Taxiways	Lighting	2773.3	Linear Feet
2	Taxiways	Markings	16046.3	Square Feet
2	Taxiways	Soil Erosio	0.7	Acres
2	Taxiways	Subbase P	1781.1	Square Yards
2	Taxiways	Subbase P	593.7	Cubic Yards
2	Taxiways	Topsoil Pl	555.2	Cubic Yards
3	Demolition	Concrete	33817.5	Square Feet

User Activity Size

Activity: Non-Road (Estimated based on engineering experience)

Scenario	Project	Construct	Equipment	Fuel Type
1	Rehabilitat	Asphalt Pl	Asphalt Paver	Diesel
1	Rehabilitat	Asphalt Pl	Dump Truck	Diesel
1	Rehabilitat	Asphalt Pl	Other General Equi	Diesel
1	Rehabilitat	Asphalt Pl	Pickup Truck	Diesel
1	Rehabilitat	Asphalt Pl	Roller	Diesel
1	Rehabilitat	Asphalt Pl	Skid Steer Loader	Diesel
1	Rehabilitat	Asphalt Pl	Surfacing Equipme	Diesel
1	Rehabilitat	Cold Millin	Cold Planer	Diesel
1	Rehabilitat	Cold Millin	Dump Truck	Diesel
1	Rehabilitat	Cold Millin	Pickup Truck	Diesel
1	Rehabilitat	Cold Millin	Sweepers	Diesel
1	Rehabilitat	Cold Millin	Water Truck	Diesel
1	Rehabilitat	Concrete	Concrete Saws	Diesel
1	Rehabilitat	Concrete	Dump Truck	Diesel
1	Rehabilitat	Concrete	Excavator	Diesel
1	Rehabilitat	Concrete	Hydraulic Hammer	Diesel
1	Rehabilitat	Concrete	Other General Equi	Diesel
1	Rehabilitat	Concrete	Pickup Truck	Diesel
1	Rehabilitat	Dust Cont	Water Truck	Diesel
1	Rehabilitat	Excavator	Dozer	Diesel
1	Rehabilitat	Excavator	Dump Truck (12 cy	Diesel
1	Rehabilitat	Excavator	Excavator	Diesel
1	Rehabilitat	Excavator	Pickup Truck	Diesel
1	Rehabilitat	Excavator	Roller	Diesel
1	Rehabilitat	Excavator	Dozer	Diesel
1	Rehabilitat	Grading	Dozer	Diesel
1	Rehabilitat	Grading	Grader	Diesel
1	Rehabilitat	Grading	Roller	Diesel
1	Rehabilitat	Hydroseec	Hydroseeder	Diesel
1	Rehabilitat	Hydroseec	Off-Road Truck	Diesel
1	Rehabilitat	Lighting	Dump Truck	Diesel
1	Rehabilitat	Lighting	Loader	Diesel
1	Rehabilitat	Lighting	Other General Equi	Diesel
1	Rehabilitat	Lighting	Pickup Truck	Diesel
1	Rehabilitat	Lighting	Skid Steer Loader	Diesel
1	Rehabilitat	Lighting	Tractors/Loader/B	Diesel
1	Rehabilitat	Markings	Flatbed Truck	Diesel
1	Rehabilitat	Markings	Other General Equi	Diesel
1	Rehabilitat	Markings	Pickup Truck	Diesel
1	Rehabilitat	Sealing Ra	Crack Cleaner	Diesel
1	Rehabilitat	Sealing Ra	Crack Filler (Trailer	Diesel
1	Rehabilitat	Sealing Ra	Flatbed Truck	Diesel
1	Rehabilitat	Sealing Ra	Other General Equi	Diesel
1	Rehabilitat	Sealing Ra	Pickup Truck	Diesel
1	Rehabilitat	Soil Erosio	Other General Equi	Diesel
1	Rehabilitat	Soil Erosio	Pickup Truck	Diesel
1	Rehabilitat	Soil Erosio	Pumps	Diesel
1	Rehabilitat	Soil Erosio	Tractors/Loader/B	Diesel
1	Rehabilitat	Subbase P	Dozer	Diesel
1	Rehabilitat	Subbase P	Dump Truck (12 cy	Diesel
1	Rehabilitat	Subbase P	Pickup Truck	Diesel
1	Rehabilitat	Subbase P	Roller	Diesel
1	Rehabilitat	Topsoil Pl	Dozer	Diesel
1	Rehabilitat	Topsoil Pl	Dump Truck	Diesel
1	Rehabilitat	Topsoil Pl	Pickup Truck	Diesel
2	Taxiways	Asphalt Pl	Asphalt Paver	Diesel
2	Taxiways	Asphalt Pl	Dump Truck	Diesel
2	Taxiways	Asphalt Pl	Other General Equi	Diesel

Activity Size Activity Size Default Activity User Activity Data

5090.00	518	Hours	pe	6.36	hours	
5090.00	518	Hours	pe	22.92	hours	
5090.00	5116	Hours	p	12.73	hours	
5090.00	518	Hours	pe	6.36	hours	
5090.00	518	Hours	pe	6.36	hours	
5090.00	518	Hours	pe	8.14	hours	
5090.00	518	Hours	pe	10.18	hours	
5090.00	518	Hours	pe	10.18	hours	
5090.00	518	Hours	pe	10.18	hours	
5090.00	518	Hours	pe	10.18	hours	
45856.30	518	Hours	pe	91.71	hours	
45856.30	518	Hours	pe	91.71	hours	
45856.30	518	Hours	pe	91.71	hours	
45856.30	518	Hours	pe	91.71	hours	
45856.30	518	Hours	pe	91.71	hours	
90.00	Day	8	Hours	pe	720	hours
424.20	CY	8	Hours	pe	3.39	hours
424.20	CY	8	Hours	pe	11.31	hours
424.20	CY	8	Hours	pe	3.39	hours
424.20	CY	8	Hours	pe	3.39	hours
1018.00	518	Hours	pe	1.6	hours	
1332.90	518	Hours	pe	1.33	hours	
1332.90	518	Hours	pe	1.33	hours	
1332.90	518	Hours	pe	0.13	hours	
1332.90	518	Hours	pe	0.13	hours	
2816.70	LF8	Hours	pe	18.78	hours	
2816.70	LF8	Hours	pe	18.78	hours	
2816.70	LF8	Hours	pe	18.78	hours	
2816.70	LF8	Hours	pe	18.78	hours	
2816.70	LF8	Hours	pe	18.78	hours	
45856.30	518	Hours	pe	104.81	hours	
45856.30	518	Hours	pe	104.81	hours	
1375.00	LF8	Hours	pe	3.93	hours	
1375.00	LF8	Hours	pe	3.93	hours	
1375.00	LF8	Hours	pe	3.93	hours	
1375.00	LF8	Hours	pe	3.93	hours	
0.30	Acce	4	Hours	pe	1.2	hours
0.30	Acce	8	Hours	pe	2.4	hours
0.30	Acce	4	Hours	pe	1.2	hours
0.30	Acce	4	Hours	pe	1.2	hours
5090.00	518	Hours	pe	10.72	hours	
1696.70	C18	Hours	pe	75.41	hours	
5090.00	518	Hours	pe	10.72	hours	
1696.70	C18	Hours	pe	10.44	hours	
222.10	CY	8	Hours	pe	2.96	hours
222.10	CY	8	Hours	pe	2.96	hours
222.10	CY	8	Hours	pe	2.96	hours
1781.10	518	Hours	pe	2.23	hours	
1781.10	518	Hours	pe	8.02	hours	
1781.10	5116	Hours	p	4.45	hours	

2	Taxiways	Asphalt PI	Pickup Truck	Diesel	1781.10	5/8	Hours	pe	2.23	hours	
2	Taxiways	Asphalt PI	Roller	Diesel	1781.10	5/8	Hours	pe	2.23	hours	
2	Taxiways	Asphalt PI	Skid Steer Loader	Diesel	1781.10	5/8	Hours	pe	2.23	hours	
2	Taxiways	Asphalt PI	Surfacing Equipme	Diesel	1781.10	5/8	Hours	pe	2.85	hours	
2	Taxiways	Clearing a	Chain Saw	Diesel	0.70	Acre	12	Hours	p	8.4	hours
2	Taxiways	Clearing a	Chipper/Stump Gri	Diesel	0.70	Acre	12	Hours	p	8.4	hours
2	Taxiways	Clearing a	Pickup Truck	Diesel	0.70	Acre	16	Hours	p	11.2	hours
2	Taxiways	Concrete I	Air Compressor	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Concrete I	Concrete Saws	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Concrete I	Concrete Truck	Diesel	742.10	CY	8	Hours	pe	24.74	hours
2	Taxiways	Concrete I	Other General Equi	Diesel	742.10	CY	16	Hours	p	11.87	hours
2	Taxiways	Concrete I	Pickup Truck	Diesel	742.10	CY	24	Hours	p	17.81	hours
2	Taxiways	Concrete I	Rubber Tired Load	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Concrete I	Slip Form Paver	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Concrete I	Surfacing Equipme	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Drainage -	Dozer	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Dump Truck	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Excavator	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Loader	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Other General Equi	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Pickup Truck	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Roller	Diesel	1385.00	L8	Hours	pe	44.32	hours	
2	Taxiways	Drainage -	Dump Truck	Diesel	2770.00	L8	Hours	pe	24.62	hours	
2	Taxiways	Drainage -	Loader	Diesel	2770.00	L8	Hours	pe	24.62	hours	
2	Taxiways	Drainage -	Other General Equi	Diesel	2770.00	L8	Hours	pe	24.62	hours	
2	Taxiways	Drainage -	Pickup Truck	Diesel	2770.00	L8	Hours	pe	24.62	hours	
2	Taxiways	Drainage -	Tractors/Loader/B	Diesel	2770.00	L8	Hours	pe	24.62	hours	
2	Taxiways	Dust Cont	Water Truck	Diesel	90.00	Day	8	Hours	pe	720	hours
2	Taxiways	Excavator	Dozer	Diesel	742.10	CY	8	Hours	pe	9.89	hours
2	Taxiways	Excavator	Dump Truck (12 cy	Diesel	742.10	CY	8	Hours	pe	9.89	hours
2	Taxiways	Excavator	Pickup Truck	Diesel	742.10	CY	8	Hours	pe	9.89	hours
2	Taxiways	Excavator	Roller	Diesel	742.10	CY	8	Hours	pe	4.57	hours
2	Taxiways	Excavator	Dozer	Diesel	742.10	CY	8	Hours	pe	7.42	hours
2	Taxiways	Excavator	Dump Truck (12 cy	Diesel	742.10	CY	8	Hours	pe	19.79	hours
2	Taxiways	Excavator	Excavator	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Excavator	Pickup Truck	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Excavator	Roller	Diesel	742.10	CY	8	Hours	pe	5.94	hours
2	Taxiways	Excavator	Scraper	Diesel	742.10	CY	8	Hours	pe	7.42	hours
2	Taxiways	Excavator	Dozer	Diesel	1781.10	5/8	Hours	pe	2.79	hours	
2	Taxiways	Fencing	Concrete Truck	Diesel	1375.00	LF2	Hours	pe	15.28	hours	
2	Taxiways	Fencing	Dump Truck	Diesel	1375.00	L8	Hours	pe	61.11	hours	
2	Taxiways	Fencing	Other General Equi	Diesel	1375.00	L8	Hours	pe	61.11	hours	
2	Taxiways	Fencing	Pickup Truck	Diesel	1375.00	L8	Hours	pe	61.11	hours	
2	Taxiways	Fencing	Skid Steer Loader	Diesel	1375.00	L8	Hours	pe	61.11	hours	
2	Taxiways	Fencing	Tractors/Loader/B	Diesel	1375.00	L8	Hours	pe	61.11	hours	
2	Taxiways	Grading	Dozer	Diesel	3331.40	5/8	Hours	pe	3.33	hours	
2	Taxiways	Grading	Grader	Diesel	3331.40	5/8	Hours	pe	3.33	hours	
2	Taxiways	Grading	Roller	Diesel	3331.40	5/8	Hours	pe	3.33	hours	
2	Taxiways	Hydroseed	Hydroseeder	Diesel	30013.00	5/8	Hours	pe	3	hours	
2	Taxiways	Hydroseed	Off-Road Truck	Diesel	30013.00	5/8	Hours	pe	3	hours	
2	Taxiways	Lighting	Dump Truck	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Lighting	Loader	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Lighting	Other General Equi	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Lighting	Pickup Truck	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Lighting	Skid Steer Loader	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Lighting	Tractors/Loader/B	Diesel	2773.30	L8	Hours	pe	18.49	hours	
2	Taxiways	Markings	Flatbed Truck	Diesel	16046.30	5/8	Hours	pe	36.68	hours	
2	Taxiways	Markings	Other General Equi	Diesel	16046.30	5/8	Hours	pe	36.68	hours	
2	Taxiways	Markings	Pickup Truck	Diesel	16046.30	5/8	Hours	pe	36.68	hours	
2	Taxiways	Soil Erosio	Other General Equi	Diesel	0.70	Acre	4	Hours	pe	2.8	hours
2	Taxiways	Soil Erosio	Pickup Truck	Diesel	0.70	Acre	8	Hours	pe	5.6	hours
2	Taxiways	Soil Erosio	Pumps	Diesel	0.70	Acre	4	Hours	pe	2.8	hours
2	Taxiways	Soil Erosio	Tractors/Loader/B	Diesel	0.70	Acre	4	Hours	pe	2.8	hours
2	Taxiways	Subbase P	Dozer	Diesel	1781.10	5/8	Hours	pe	3.75	hours	
2	Taxiways	Subbase P	Dump Truck (12 cy	Diesel	1781.10	5/8	Hours	pe	3.75	hours	
2	Taxiways	Subbase P	Pickup Truck	Diesel	1781.10	5/8	Hours	pe	3.75	hours	
2	Taxiways	Subbase P	Roller	Diesel	593.70	CY	8	Hours	pe	3.65	hours
2	Taxiways	Topsoil PI	Dozer	Diesel	555.20	CY	8	Hours	pe	7.4	hours
2	Taxiways	Topsoil PI	Dump Truck	Diesel	555.20	CY	8	Hours	pe	7.4	hours
2	Taxiways	Topsoil PI	Pickup Truck	Diesel	555.20	CY	8	Hours	pe	7.4	hours
3	Demolitor	Concrete I	Excavator with Hoe	Diesel	33817.50	5/8	Hours	pe	45.09	hours	
3	Demolitor	Concrete I	Excavator with Buck	Diesel	33817.50	5/8	Hours	pe	45.09	hours	
3	Demolitor	Concrete I	Pickup Truck	Diesel	33817.50	5/8	Hours	pe	90.18	hours	

Activity: On-Road (Estimated based on engineering experience)

Scenario I	Project	Equipment	On-road Activity	Fuel	Roadway	T Round	Tri	Number	o	Number	o	Project	Le	Project	W	Project	A	Building	+	Open	Spa	Number	(Activity	SI	Activity	#	Default	User	VTM
1	Rehabilitat	Asphalt I	Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	665		
1	Rehabilitat	Cement M	Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10604		
1	Rehabilitat	Dump Tru	Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	943		
1	Rehabilitat	Dump Tru	Material Delivery	Diesel	Urban Unr	40	--	65	1375	33.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5656		
1	Rehabilitat	Passenger	Employee Commut	Gasoline	Urban Unr	30	98.01	65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	191120		
2	Taxiways	Asphalt I	Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	233		
2	Taxiways	Cement M	Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3711		
2	Taxiways	Dump Tru	Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330		
2	Taxiways	Dump Tru	Material Delivery	Diesel	Urban Unr	40	--	65	1375	11.67	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1979		
2	Taxiways	Passenger	Employee Commut	Gasoline	Urban Unr	30	73	65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	142350		
3	Demolitor	Dump Tru	Material Delivery	Diesel	Urban Unr	40	--	65	1012.5	33.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2088		
3	Demolitor	Passenger	Employee Commut	Gasoline	Urban Unr	30	31.79	65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61991		

Emission Factor: Non-Road (from NONROAD)

Fugitive Emissions (Emission Factors from Various Sources including AP-42)

Scenario I	Project	Fugitive T	Variable	Default Values	Units	User Value
1	Rehabilitat	Asphalt Dr A	= Area of land aff	4260	m2	
1	Rehabilitat	Asphalt Dr AR	= Application ra	1.811	l/m2	
1	Rehabilitat	Asphalt Dr VD	= Volume fracti	0.35	fraction	
1	Rehabilitat	Asphalt Dr EF	= Mass fraction	0.7	fraction	
1	Rehabilitat	Asphalt Dr D	= Density of solv	1.8	lbs/l	
1	Rehabilitat	Asphalt Dr VOC	= A x AR x VD	3402.3	lbs	111.3
1	Rehabilitat	Asphalt St T	= Mass of asphalt	554.2	tons	
1	Rehabilitat	Asphalt St PM10	= (0.027 + 0.1	15.2	lbs	
1	Rehabilitat	Asphalt St CO	= (0.4 + 0.0004)	221.9	lbs	
1	Rehabilitat	Asphalt St NOx	= (0.025) x T	13.9	lbs	
1	Rehabilitat	Asphalt St SOx	= (0.0046) x T	2.549	lbs	
1	Rehabilitat	Asphalt St VOC	= (0.0082 + 0.1	6.872	lbs	
1	Rehabilitat	Material h	s = Surface materia	0.043	fraction	
1	Rehabilitat	Material h	Wt. = Mean vehicle	32	tons	
1	Rehabilitat	Material h	WMT = Vehicle mile	2373	miles	
1	Rehabilitat	Material h	PM10 = 1.5 x (1/12	65	lbs	
1	Rehabilitat	Material h	sL = Road surface s	0.1	g/m3	
1	Rehabilitat	Material h	Wt. = Mean vehicle	32	tons	
1	Rehabilitat	Material h	WMT = Vehicle mile	2275	miles	
1	Rehabilitat	Material h	PM10 = 0.0022 x (s	21.1	lbs	
1	Rehabilitat	Soil Handl	u = Wind speed	5	mph	
1	Rehabilitat	Soil Handl	m = Moisture cont	0.25	fraction	

1 RehabilitatSoil Handl T = Mass of aggreg:	1261	tons	
1 RehabilitatSoil Handl PM10 = T x 0.35 x 0	26	lbs	
1 RehabilitatUnstabiliz A = Area affected =	1.053	acres	
1 RehabilitatUnstabiliz TPCConv = TSP/PM1	0.5	fraction	
1 RehabilitatUnstabiliz CE = Control efficie	0.63	fraction	
1 RehabilitatUnstabiliz t = year (e.g. 0.65 y	0.25	years	
1 RehabilitatUnstabiliz PM10 = 0.38 x A x 1	0	lbs	
2 Taxiways Asphalt Dr A = Area of land aff	1490.7	m2	
2 Taxiways Asphalt Dr AR = Application ra	1.811	l/m2	
2 Taxiways Asphalt Dr VD = Volume fracti	0.35	fraction	
2 Taxiways Asphalt Dr EF = Mass fraction	0.7	fraction	
2 Taxiways Asphalt Dr D = Density of solv	1.8	lbs/l	
2 Taxiways Asphalt Dr VOC = A x AR x VD :	1190.5	lbs	53
2 Taxiways Asphalt St T = Mass of asphalt	193.9	tons	
2 Taxiways Asphalt St PM10 = (0.027 + D.I	5.318	lbs	
2 Taxiways Asphalt St CO = (0.4 + 0.0004)	77.6	lbs	
2 Taxiways Asphalt St NOx = (0.025) x T	4.848	lbs	
2 Taxiways Asphalt St SOx = (0.0046) x T	0.892	lbs	
2 Taxiways Asphalt St VOC = (0.0082 + 0.0	2.405	lbs	
2 Taxiways Material h s = Surface materia	0.043	fraction	
2 Taxiways Material h Wt. = Mean vehicle	32	tons	
2 Taxiways Material h VMT = Vehicle mile	1482.1	miles	
2 Taxiways Material h PM10 = 1.5 x [(s/12	40.6	lbs	
2 Taxiways Material h sL = Road surface s	0.1	g/m3	
2 Taxiways Material h Wt. = Mean vehicle	32	tons	
2 Taxiways Material h VMT = Vehicle mile	1300	miles	
2 Taxiways Material h PM10 = 0.0022 x (s	12.1	lbs	
2 Taxiways Concrete TV = Volume of asph	742.1	yd3	
2 Taxiways Concrete T PM10 = 0.037 x V	27.5	lbs	
2 Taxiways Unstabiliz A = Area affected =	0.368	acres	
2 Taxiways Unstabiliz TPCConv = TSP/PM1	0.5	fraction	
2 Taxiways Unstabiliz CE = Control efficie	0.63	fraction	
2 Taxiways Unstabiliz t = year (e.g. 0.65 y	0.25	years	
2 Taxiways Unstabiliz PM10 = 0.38 x A x 1	0	lbs	
2 Taxiways Soil Handl u = Wind speed	5	mph	
2 Taxiways Soil Handl m = Moisture conti	0.25	fraction	
2 Taxiways Soil Handl T = Mass of aggreg:	441.3	tons	
2 Taxiways Soil Handl PM10 = T x 0.35 x 0	9.083	lbs	
3 DemolitorSoil Handl u = Wind speed	5	mph	
3 DemolitorSoil Handl m = Moisture conti	0.25	fraction	
3 DemolitorSoil Handl T = Mass of aggreg:	930	tons	
3 DemolitorSoil Handl PM10 = T x 0.35 x 0	19.1	lbs	
3 DemolitorUnstabiliz A = Area affected =	0.776	acres	
3 DemolitorUnstabiliz TPCConv = TSP/PM1	0.5	fraction	
3 DemolitorUnstabiliz CE = Control efficie	0.63	fraction	
3 DemolitorUnstabiliz t = year (e.g. 0.65 y	0.25	years	
3 DemolitorUnstabiliz PM10 = 0.38 x A x 1	0	lbs	
3 DemolitorMaterial h s = Surface materia	0.043	fraction	
3 DemolitorMaterial h Wt. = Mean vehicle	32	tons	
3 DemolitorMaterial h VMT = Vehicle mile	381.4	miles	
3 DemolitorMaterial h PM10 = 1.5 x [(s/12	10.4	lbs	
3 DemolitorMaterial h sL = Road surface s	0.1	g/m3	
3 DemolitorMaterial h Wt. = Mean vehicle	32	tons	
3 DemolitorMaterial h VMT = Vehicle mile	325	miles	
3 DemolitorMaterial h PM10 = 0.0022 x (s	3.017	lbs	

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ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

- Asphalt drying
- Asphalt storage and batching
- Concrete mixing/batching
- Soil handling
- Unstabilized land and wind erosion
- Material movement (unpaved roads)
- Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

The following equipment are always modeled using diesel emission factors since gasoline-based emission factors are not available:

- Asphalt Deliveries/Ten Wheelers
- Bulldozer
- Concrete Ready Mix Trucks
- Concrete Ready Trucks Mix for Cores
- Concrete Truck
- Crack Filler (Trailer Mounted)
- Delivery of Tanks (3)
- Distributing Tanker
- Dozer
- Dump Truck
- Dump Truck (12 cy)
- Excavator

Excavator for U/G Services/Tanks
Flat Bed or Dump Trucks
Flatbed Truck
Grader
Grout Wheel Truck
Hoist Equipment with 40 Ton Rig
Hydraulic Hammer
Hydroseeder
Line Painting Truck and Sprayer
Material Deliveries
Off-Road Truck
Pickup Truck
Scraper
Seed Truck Spreader
Small Dozer
Survey Crew Trucks
Ten Wheelers
Ten Wheelers- Material Delivery
Tool Truck
Tractor Trailer- Equipment Delivery
Tractor Trailer- Material Delivery
Tractor Trailer- Steel Deliveries
Tractor Trailer- Stone Delivery
Tractor Trailer- Topsoil & Seed
Tractor Trailer- Truck Delivery
Tractor Trailer with Boom Hoist- Curbs Del & Place
Tractor Trailer with Boom Hoist- Delivery
Tractor Trailers- Rebar Deliveries
Tractor Trailers Temp Fac.
Truck for Topsoil & Seed Del&Spread
Water Truck
Excavator with Bucket
Excavator with Hoe Ram

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PHASE I ENVIRONMENTAL DUE DILIGENCE AUDIT**FOR****PARCEL 17 – WETZEL**

**1033 MEADOW BRANCH ROAD
CARROLL COUNTY REGIONAL AIRPORT
WESTMINSTER, CARROLL COUNTY, MARYLAND**



April 18, 2017

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RETTEW Project No. 024552008

<u>TABLE OF CONTENTS</u>	<u>PAGE</u>
1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Limitations and Exemptions	1
1.3 Special Terms and Conditions	2
1.4 Methodologies	2
1.5 User Reliance	2
2.0 SITE DESCRIPTION	3
2.1 Location and Legal Description	3
2.2 Site and Vicinity General Characteristics	3
2.3 Soils and Geology	3
2.4 Current Use - Property	3
2.5 Description of Site Improvements	4
2.6 Current Use – Adjoining Properties	4
3.0 BACKGROUND INFORMATION	4
3.1 Owner Information	4
3.2 Environmental Liens and Use Limitations	4
4.0 RECORDS REVIEW	4
4.1 Title Records	4
4.2 Standard Environmental Record Sources	4
4.3 Regulatory File Review	5
4.4 Aerial Photography	6
5.0 HISTORICAL INFORMATION	7
5.1 Property	7
5.2 Adjoining Properties	8
6.0 SITE RECONNAISSANCE	8
6.1 Methodology and Limiting Conditions	8
6.2 General Site Setting	8
6.3 Exterior Observations	8
6.4 Interior Observations	9
7.0 INTERVIEWS	9
7.1 Property Owners/Tenants	9
7.2 Local Government Officials	9

8.0	FINDINGS.....	9
9.0	PROFESSIONAL OPINION	10
10.0	CONCLUSIONS	10
11.0	SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S).....	11
12.0	DEVIATIONS.....	11
13.0	ADDITIONAL SERVICES	11
14.0	REFERENCES	12

FIGURES

FIGURE 1	SITE LOCATION MAP
FIGURE 2	SITE PLAN

APPENDICES

APPENDIX I	QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS
APPENDIX II	LEGAL DESCRIPTION OF SITE/DEED INFORMATION
APPENDIX III	SITE PHOTOGRAPHS
APPENDIX IV	EDR ENVIRONMENTAL LIEN AND AUL SEARCH
APPENDIX V	EDR RADIUS MAP™ REPORT WITH GEOCHECK®
APPENDIX VI	HISTORIC AERIAL PHOTOGRAPHS
APPENDIX VII	INTERVIEW DOCUMENTATION

1.0 INTRODUCTION

The following report addresses the Phase I Environmental Due Diligence Audit (EDDA) of the 5.1-acre Parcel 17 Wetzel Property (Site), located at 1033 Meadow Branch Road, in the City of Westminster, Carroll County, Maryland. This EDDA was conducted by RETTEW Associates, Inc. in accordance with the requirements of the U.S. Department of Transportation, Federal Aviation Administration (FAA) Order 1050.19B (effective 10/03/07) for Delta Airport Consultants, Inc. (Delta). This Assessment was performed as part of the due diligence requirements of the FAA prior to land acquisition by the Carroll County Regional Airport.

1.1 PURPOSE

The purpose of this Phase I EDDA was to complete a standardized environmental assessment of the Site, with respect to a range of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) contaminants and petroleum products, with the intent of satisfying (for the user) one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser defense. In accordance with the above requirements, the EDDA was conducted in accordance with federal standards and practices as codified in the Code of Federal Regulations (CFR) at 40 CFR Part 312, and in conformance with the scope and limitations in the American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation: E1527-13 (The Standard)*; including the practices that constitute all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice to identify the presence or likely presence of any hazardous substances or petroleum products on the Site under conditions that indicate an existing release, a past release, or a potential threat of release to the Site structures, ground, groundwater, or surface water, as defined in 42 USC §9601(35)(B). These known and/or suspected conditions are termed *recognized environmental conditions* (RECs) and are not intended to include *de minimis* conditions that are not anticipated to represent a risk to public health or the environment as defined by *The Standard*.

1.2 LIMITATIONS AND EXEMPTIONS

Limitations of this Phase I EDDA include, but are not necessarily restricted to, the following:

- Physical appearance and observation of current practices at the Site during a Site reconnaissance;
- Availability of past and present owners for interviews;
- Recall of those interviewed and thoroughness and accuracy of the information provided by them about past and present Site use; and
- Availability of local, state, and federal environmental records.

This report presents the sources, records, and resources available to RETTEW and our opinion about environmental conditions of the Site. This opinion is based on information obtained through the assessment methods described in **Section 1.4**, while recognizing the limitations noted above. Upon receipt of any additional information or data, our opinion may be modified. The user of this document understands that an evaluation of business risk associated with a parcel of real estate may necessitate investigation beyond the scope of practice defined by *The Standard*. Additionally, nothing in this document is intended to provide or constitute legal advice. It is suggested that the user consult appropriate legal counsel for any such advice.

Consistent with *The Standard*, this practice does not purport to address any safety concerns associated with the use of the Site, other than those stipulated by *The Standard* or modified by the client as described herein.

1.3 SPECIAL TERMS AND CONDITIONS

Much of the terminology used in this report is defined in Section 3.0 of *The Standard*; however, a few terms are not defined, or merit specific mention in this report. For the purposes of this report, the term “impact” shall mean the presence of unconfined hazardous substances or petroleum products on the property that may require remediation under applicable law. The term “material threat” is defined by ASTM as a physically observable or obvious threat, which in the opinion of the environmental professional, is threatening and might result in impact to public health or the environment. The term “recognized environmental condition” shall mean the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. This term is not intended to include *de minimis* conditions that are not likely to bring enforcement action if brought to the attention of the appropriate government agency.

For the purposes of this assessment, previous environmental conditions on the property that were identified as a REC in the past but have been addressed to the satisfaction of the applicable regulatory agency, without subjecting the property to any required controls, are not considered a REC within the current regulatory framework and are known as “historical REC” (HREC). A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority through the required controls (e.g. property use restrictions or activity and use limitations [AULs]) is considered a “controlled REC” (CREC).

1.4 METHODOLOGIES

An environmental records search of federal and state records was conducted to identify any recognized or potential RECs at the Site and surrounding area within the radii specified in *The Standard*. Information about the physical characteristics of the Site was obtained through a review of published geologic and soils information. Current Site conditions and practices were observed during a Site reconnaissance during which photographic documentation of the Site was also obtained. Observations of past land uses and development changes at the Site and surrounding area were made through interviews, a review of aerial photography from various flight dates and scales, and a review of historic fire insurance maps.

Consistent with *The Standard*, unless otherwise stated, no physical or subsurface sampling or associated analysis was conducted as part of this work effort.

1.5 USER RELIANCE

This report is intended for the exclusive use of Delta and any partnership, corporation, or other entity that is formed to acquire or hold title to the subject property. Any construction or permanent lender securing financing to the parties listed above may also use the report. Qualifications of the Environmental Professionals involved with this project are included as **Appendix I**.

2.0 SITE DESCRIPTION

The Site consists of the 5.1-acre parcel owned by Kenneth E. Wetzel and Frances E. Wetzel located at 1033 Meadow Branch Road in Westminster, Carroll County, Maryland. To obtain information regarding the physical Site setting, RETTEW completed a review of reasonably ascertainable published information regarding the geologic, hydrogeologic, hydrologic, and topographic characteristics of the Site. Information reviewed included topographic maps, historic aerial photographs, published geologic information, and published soils reports. The following subsections summarize these characteristics.

2.1 LOCATION AND LEGAL DESCRIPTION

The Site consists of the 5.1-acre parcel (Parcel No. 0462) owned by Kenneth E. Wetzel and Frances E. Wetzel. The Site contained a residential dwelling, vacant fields, and woodlands. The Site is located in the City of Westminster, in Carroll County, Maryland, as depicted on the Site Location Map and Site Plan (refer to **Figures 1 and 2**). A legal description of the Site and copy of the current property deed is included in **Appendix II**.

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The Site is located on the New Windsor, Maryland, 7.5-minute quadrangle map at an elevation of approximately 786 feet above mean sea level at Latitude North 39.603991 and Longitude West 77.007762 (**Figure 1**). The Site was bordered to the north by the Parcel 16 Triple M., LLC. Property (woodlands), to the east by the Parcel 18 Triple M., LLC. Property (vacant land), to the south by vacant woodlands, and to the west by woodlands and residential properties. The Site is located on gradually northwest sloping terrain. Regional groundwater in the area of the Site is expected to flow west-southwest to the Monocacy River; however, Site-specific groundwater data was not collected as part of this study.

2.3 SOILS AND GEOLOGY

The predominant soil type mapped on-site by the U.S. Department of Agriculture Natural Resource Conservation Service is described as the Brinklow channery silt loam series (BrC). The Brinklow channery silt loam series is described as moderately sloping, moderately deep, and well drained. Bedrock is typically encountered at depths greater than 28 inches. The permeability of the Brinklow channery silt loam is very low and the available water capacity is low. The runoff potential of the series is medium and depth to seasonally high water table is greater than six feet.

Based on information obtained from the Maryland Geological Survey website, the geology underlying the Site is identified as the Chlorite phyllite “a” component of the Sam’s Creek Formation. The Chlorite phyllite “a” component is described as tan to dark-greenish-blue albite-quartz-muscovite-chlorite phyllite and albite-quartz-muscovite phyllite interbedded with chlorite phyllites and muscovite phyllites. Phyllite “a” may be distinguished from phyllite “b” by the presence of euhedral albite porphyroblasts, commonly about 0.5 mm on a side. Well exposed only along the major stream valleys; weathers readily to a thick, tan, quartzose saprolite that underlies the higher ridges in the eastern part of the quadrangle. Corresponds to the Wissahickon albite phyllite (wap) of Fisher (1978) that crops out west of the Avondale fault.

2.4 CURRENT USE - PROPERTY

The Site currently contains a residential dwelling, vacant fields, and woodlands. A more detailed Site description is provided in **Section 6.0** of this report. Various Site aspects were photographed during the Site reconnaissance and copies of the photographs are included as **Appendix III**.

2.5 DESCRIPTION OF SITE IMPROVEMENTS

Improvements at the Site consists of a single-family residential dwelling.

2.6 CURRENT USE – ADJOINING PROPERTIES

The Site was immediately bordered to the north by the Parcel 16 Triple M., LLC. Property (woodlands), to the east by the Parcel 18 Triple M., LLC. Property (vacant land), to the south by vacant woodlands, and to the west by woodlands and residential properties.

3.0 BACKGROUND INFORMATION

3.1 OWNER INFORMATION

Property deed history identifies the current owners of the property as Kenneth E. Wetzel and Frances E. Wetzel.

3.2 ENVIRONMENTAL LIENS AND USE LIMITATIONS

RETTEW conducted an environmental lien and AUL search of the subject property using online resources. Records of liens are available as part of the case search database on the Maryland government webpage. The search concluded that there are no known environmental liens or activity use limitations (AULs) associated with the Site.

A copy of the environmental lien and AUL search documentation is provided as **Appendix IV**.

4.0 RECORDS REVIEW

4.1 TITLE RECORDS

Historic and current property deeds/titles for the Site were obtained through online resources. Title history information was available for September 2, 1963 through October 26, 1956. A detailed chain-of-ownership is provided in **Appendix II**. According to these records and interviews with the current Site owner, the following owner/prior owners of the Site were identified:

- | | |
|---|-----------------------|
| • Kenneth E. Wetzel and Frances E. Wetzel | 09/02/1971 to Present |
| • Elsie M. Thomas and Margaret R. Marsh | 03/28/1963 |
| • Stanford Hoff and Katharine S. Hoff | 03/28/1963 |
| • Elsie M. Thomas | 02/12/1959 |
| • Robert B. Thomas | 01/25/1957 |
| • Robert B. Thomas and Elsie M. Thomas | 10/26/1956 |

Available deed information is provided in **Appendix II**.

4.2 STANDARD ENVIRONMENTAL RECORD SOURCES

RETTEW contracted with Environmental Data Resources, Inc. (EDR) to review Federal and State environmental database records in accordance with search radii specified by *The Standard*. The databases reviewed were updated in accordance with the American Society of Testing and Materials (ASTM) standards. A copy of the database report is provided as **Appendix V**.

A review of these databases indicated that the Site was not listed in any of the databases searched by EDR.

Seven mapped sites were identified within a one-mile radius of the Site, and those with potential environmental concerns are further detailed below:

- C.J. Miller, LLC, 390 Vision Way Road, 0.272 miles north northwest and downgradient of the Site – Listed in the engineering controls (ENG CONTROLS) and the Maryland national pollutant discharge elimination system (NPDES) databases. Due to the downgradient location and lack of hazardous materials, this facility is not expected to impact the Site.
- Carroll County Airport, 1130 Airport Drive, 0.364 miles east northeast and upgradient of the Site – Listed in the Maryland oil control program (OCPCASES) database as closed in 1992. Due to its regulatory status, this facility is not expected to impact the Site.
- Marada Industries, Inc., 151 Airport Drive, 0.370 miles east northeast and upgradient of the Site – Listed in the OCPCASES, Maryland historic underground storage tanks (HIST UST), United States aeromantic information retrieval system (US AIRS), facility index system (FINDS), and enforcement and compliance history online (ECHO) databases. The facility has a closed OCPCASES in 1994 and a removed UST. This facility is not expected to impact the Site.
- Carroll County Maintenance Center, 1250 Old Meadow Branch Road, 0.372 miles north northeast and upgradient of the Site – Listed in the OCPCASES and NPDES databases. The facility has seven closed OCPCASES and is not expected to impact the Site.
- Carrol County Regional Airport, 200 Airport Drive, 0.410 miles east northeast and upgradient of the Site – Listed in the ENG CONTROLS, OCPCASES, and NPDES databases. The facility has two closed OCPCASES and is not expected to impact the Site.
- Piper Business Campus, 1004 Littlestown Pike, 0.473 miles east southeast and upgradient of the Site – Listed in the OCPCASES database. A closed incident is listed at the facility in 1996. This facility is not expected to impact the Site.
- Airport Barn Recycling Center, 1000 Littlestown Pike, 0.487 miles east southeast and upgradient of the Site – Listed in the OCPCASES database. A closed soil contamination incident is listed at the facility in 1996. This facility is not expected to impact the Site.

Additionally, one unmapped facility was identified in the surrounding region. Upon further research, the unmapped facility is captured by the Maryland State Highway Administration facility and not expected to impact the Site.

4.3 REGULATORY FILE REVIEW

RETTEW contacted the Maryland Department of the Environment (MDE) on April 11, 2017 to obtain information or records regarding environmental concerns associated with the Site through the MDE online Public Information Act (PIA) website. RETTEW also requested environmental files for the Site through the United States Environmental Protection Agency MyProperty online records request on April 6, 2017.

A search conducted on the MDE PIA returned no results for the Site (**Appendix V**). A search conducted on the United States Environmental Protection Agency (EPA) MyProperty returned no results for the Site (**Appendix V**).

4.4 AERIAL PHOTOGRAPHY

Historical aerial photographs were reviewed by RETTEW to characterize Site development through time and to identify features that may be indicative of environmental impact at the Site or the potential for environmental impact. RETTEW obtained and reviewed aerial photographs of the Site and surrounding area from EDR. Aerial photographs of the area were available for the years 1943, 1959, 1961, 1970, 1981, 1987, 1991, 1995, 1998, 2005, 2006, 2007, 2009, and 2011. **Appendix VI** includes aerial photographs of the Site area for the years noted above. **Table 1** summarizes the observations made from the review of these photographs.

Table 1 Review of Aerial Photographs		
Date	Source	Details
1943	USDA	The Site is an agricultural field. The area surrounding the Site consists of agricultural fields, woodlands, and residential properties. A road borders the southeast border of the Site.
1959	USGS	The Site and surrounding areas appear unchanged from the previous photograph, excepting the road bordering the Site is no longer present and tree clearing is apparent northwest of the Site.
1961	USGS	The Site and surrounding areas appear unchanged from the previous photograph.
1970	USGS	The Site appears unchanged from the previous photograph. Residential development is apparent southeast and southwest of the Site. Increased development is apparent northwest of the Site.
1981	USDA	The residential dwelling now appears on the property. The Carroll County Regional airport is now present northeast of the Site. Increased development is apparent northwest of the Site.
1987	USGS	In addition to the residential dwelling, the Site appears partially wooded. Increased development is apparent surrounding the Site, particularly at the airport.
1991	USGS	The Site and surrounding areas appear unchanged from the previous photograph.
1995	USGS/DOQQ	The Site appears wooded. Increased development is apparent surrounding the Site, particularly at the airport.
1998	USGS	The Site and surrounding areas appear unchanged from the previous photograph.
2005	USDA/NAIP	The Site appears unchanged from the previous photograph. Increased development is apparent surrounding the Site.
2006	USDA/NAIP	The Site and the surrounding area appear as they do in the present day.
2007	USDA/NAIP	The Site and the surrounding area appear as they do in the present day.
2009	USDA/NAIP	The Site and the surrounding area appear as they do in the present day.
2011	USDA/NAIP	The Site and the surrounding area appear similar to current day conditions.

The review of historical aerial photographs supports the information obtained through interviews and historic descriptions of the Site.

5.0 HISTORICAL INFORMATION

5.1 PROPERTY

Historic fire insurance (Sanborn®) maps were requested through EDR to ascertain Site and surrounding development over time; however, Sanborn® maps were not available for the Site and surrounding vicinity. The Certified Sanborn® Map Report is included in **Appendix V**.

City directory records were requested through EDR to ascertain Site ownership and uses. City directories were available for the years 1975, 1980, 1985, 1990, 1995, 1999, 2003, 2008, and 2013. **Appendix V** contains the directories for the years noted above. City directory findings are presented in **Table 2**.

Table 2 Review of City Directories		
Date	Source	Resident
1975	Stewart's Criss-Cross Directory	Occupant Unknown
1980	Stewart's Criss-Cross Directory	Wetzel, Kenneth E.
1985	Stewart's Criss-Cross Directory	Wetzel, Kenneth E.
1990	Stewart's Criss-Cross Directory	Wetzel, Kenneth E.
1995	Cole Information Services	Wetzel, Kenneth E.
1999	Cole Information Services	Kenneth Wetzel
2003	Cole Information Services	Kenneth Wetzel
2008	Cole Information Services	Frances Wetzel
2013	Cole Information Services	Melissa Wetzel

Historical topographic maps were requested through EDR to ascertain historical Site uses. Topographic maps were available for the years 1905, 1911, 1943, 1944, 1946, 1953, 1971, 1977, 1979, 2013, and 2014. **Appendix V** contains the maps for the years noted above. Historical topographic map findings are presented in **Table 3**.

Table 3 Review of Historical Topographic Maps		
Date	Map	Details
1905	N/A	The Site is unmapped.
1911	Taneytown, 15 - Minute	The Site is undeveloped. The surrounding areas contain roads and some residences. A road borders the southeast border of the Site.
1943	N/A	The Site is unmapped.
1944	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map.

Table 3
Review of Historical Topographic Maps

1946	Taneytown, 15 - Minute	The Site appears unchanged from the previous map. Development is apparent southeast of the Site.
1953	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map. The Westminster Airport is now present.
1971	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map.
1977, 1979	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map.
2013, 2014	New Windsor, 7.5 - Minute	The Site contains one residential structure and the Carroll County Regional Airport is now present.

The review of city directories and historical topographic maps supports the information obtained through interviews and historic descriptions of the Site.

5.2 ADJOINING PROPERTIES

A detailed investigation into the historical use of the adjoining properties was not part of this scope of work. Observations recorded during this EDDA indicate the surrounding area is made up of mainly woodlands, agricultural fields, and residential properties.

6.0 SITE RECONNAISSANCE

In an effort to determine Site characteristics and ascertain areas of environmental impact or the potential for environmental impact, RETTEW completed a visual reconnaissance of the Site on March 23, 2017. Various Site aspects were photographed during the reconnaissance and copies of the photographs are included as **Appendix III**.

6.1 METHODOLOGY AND LIMITING CONDITIONS

RETTEW completed the Site reconnaissance in accordance with requirements identified in **Section 1.4** of this report.

6.2 GENERAL SITE SETTING

The Site generally consisted of a house and associated residential infrastructure and undeveloped woodlands.

6.3 EXTERIOR OBSERVATIONS

- *General Description of Structures* – A house and a shed were located at the Site.
- *Roads* – No roads were observed on the Site. A driveway to the residential dwelling was present at the Site.
- *Potable Water Supply* – A 300-foot drilled water supply well was located near the southeast corner of the house.
- *Sewage Disposal System* – A septic system was present to the north of the house.
- *Pits, Ponds, or Lagoons* – No evidence of pits, ponds, or lagoons were observed at the Site.

- *Stained Soil or Pavement* – No evidence of stained soil was observed at the Site.
- *Stressed Vegetation* – No stressed vegetation was observed at the Site.
- *Solid Waste* – No solid waste was observed at the Site.
- *Waste Water* – No waste water was observed at the Site.
- *Transformers* – A pad-mounted transformer was observed to the southwest of the house, and appeared to be in good condition. Power is provided to the residence by Pacific Gas and Electric Company.
- *Hazardous Substances and Petroleum Products* – No hazardous substances or petroleum products were observed at the Site. Natural gas is not provided to the Site or the residence.
- *Storage Tanks* – No evidence of USTs such as vent pipes, fill pipes or product dispensers, were observed at the Site.
- *Wetlands* – Neither a wetland determination nor delineation was conducted during this investigation. A review of the National Wetlands Inventory Map information indicated no wetlands are located at the Site. However, the northwest corner of the Site is adjacent to Meadow Branch Big Pipe Creek.

6.4 INTERIOR OBSERVATIONS

- Interior observations of the residential dwelling were not completed during this assessment.

7.0 INTERVIEWS

7.1 PROPERTY OWNERS/TENANTS

On March 23, 2017, RETTEW interviewed Mrs. Melissa Beaghan (daughter of Frances Wetzel). Mrs. Beaghan indicated that she was not aware of any environmental concerns at the property. Mrs. Beaghan indicated that the house has radiant electric heat and there are no storage tanks at the Site. The house is constructed on a concrete slab with no basement. The Site Owner Environmental Questionnaire is included in **Appendix VII**.

7.2 LOCAL GOVERNMENT OFFICIALS

RETTEW attempted to contact the Westminster Volunteer Fire Department on April 4, 2017; however, a response from this department was not received within the timeframe of this report.

RETTEW contacted the Carroll County Health Department via telephone on April 4, 2017 and was directed to the County website to fill out an information request form. The form was forwarded to the MDE for review. A copy of the submitted form is provided in **Appendix VII**. Results from this request are provided in **Section 4.3** of this report.

8.0 FINDINGS

RETTEW has completed a Phase I EDDA of the Site in conformance with the scope and limitations of *The Standard*. The following items summarize the findings of this investigation:

1. The Site consists of a 5.1-acre parcel consisting of a residential dwelling, vacant fields, and woodlands; the Site is owned by Kenneth E. Wetzel and Frances E. Wetzel. The Site was an agricultural field from approximately 1943 to the mid-1970s, at which time it was developed as a residential property.

2. The characteristics of Site topography suggest that surface water draining from the Site flows northwest to Meadow Branch Big Pipe Creek. An intermittent stream is located on the northwest side of the property.
3. No known environmental liens or AULs are associated with the Site.
4. There are reportedly no storage tanks at the Site. The existing dwelling is supplied with electric utilities and is serviced by an on-lot sewage disposal system and private water supply well.
5. A review of state and environmental databases did not indicate the potential for impacts to the Site.
6. A review of National Wetlands Inventory Map information indicated that no wetlands are located at the Site.

9.0 PROFESSIONAL OPINION

The following opinions are presented regarding the above listed findings:

RECs

No RECs, HRECs, or CRECs were identified at the Site.

De minimis Conditions/Noteworthy Items

1. The historic use and potential accumulation of pesticides, herbicides, and/or fungicides for agricultural purposes at the Site is considered a noteworthy item. This condition is not considered a REC as it would not likely be the subject of enforcement action if brought to the attention of regulatory agencies.

10.0 CONCLUSIONS

RETTEW has performed a Phase I EDDA in conformance with the scope and limitations of *The Standard*, of the 5.1-acre Parcel 17 Wetzel Property located in the City of Westminster, Carroll County, Maryland. Any exceptions to, or deletions from, this practice is described in **Section 12.0** of this report. Based on the findings developed through this investigation (**Section 8.0**), this assessment identified no RECs associated with the Site, as described in **Section 9.0**.

11.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

I declare that, to the best of my professional knowledge and belief, I meet the definition of environmental professional as defined in 40 CFR Part 312.10(b); I have the specific qualifications, based on education, training, and experience, to assess a property of the nature, history, and setting of the subject property; and I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Preparer: _____ Devin Black, Geoscientist

Signature: _____ 

Date: _____ April 18, 2017

Environmental Professional (Reviewer): _____ Scott Houser, Project Manager

Signature: _____ 

Date: _____ April 18, 2017

Environmental Professional (Quality Assurance): _____ John B. Stipe, III, CPSS

Signature: _____ 

Date: _____ April 18, 2017

12.0 DEVIATIONS

The existing residential dwelling at the Site was not entered during the Site visit. No other deviations from *The Standard* were included in this assessment.

13.0 ADDITIONAL SERVICES

No additional tasks were completed as part of this work effort.

14.0 REFERENCES

American Society for Testing and Materials International (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation: E1527-13*.

Maryland Geological Survey: <http://www.mgs.md.gov/geology/index.html>. Viewed on March 13, 2017.

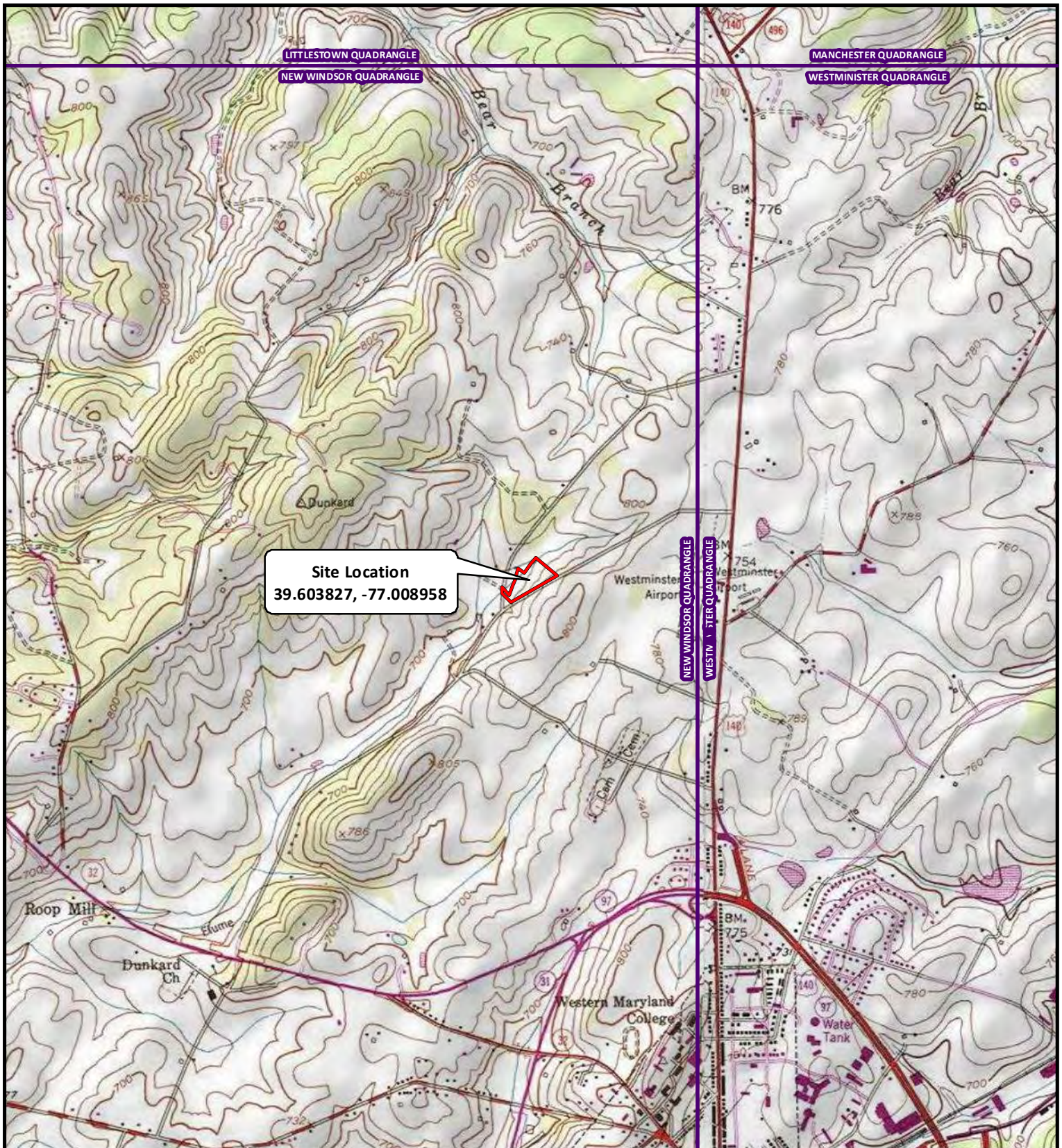
National Wetlands Inventory Map: <https://www.fws.gov/wetlands/data/mapper.HTML>. Viewed on April 7, 2017.

U.S. Department of Agriculture (USDA) Web Soil Survey:
<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Viewed on March 13, 2017.

U.S. Environmental Protection Agency (USEPA), *Standards and Practices for All Appropriate Inquiries; Final Rule*. 40 Code of Federal Regulations (CFR) Part 312. Federal Register Volume 70, Number 210. November 12, 2013.

N:\Shared\Projects\02455\024552008\GS\Parcel 17_Wetzel\Report\Rpt-Parcel 17-04-18-17.docx

FIGURES



Site Boundary

Delta Airport Consultants, Inc.

Carroll County Regional Airport

Parcel 17 - Wetzel

Figure 1 - Site Location Map

Project No. 024552008



0 1,000 2,000
Feet
1 inch = 2,000 feet









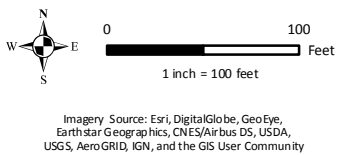
**DELTA AIRPORT
CONSULTANTS, INC.**

RETTEW



Delta Airport Consultants, Inc.
Carroll County Regional Airport
Parcel 17 - Wetzel
Figure 2 - Aerial Basemap
Carroll County, MD
Project No. 024552008

- | | | |
|---|---|--|
|  Septic System |  Intermittent Stream |  Site Boundary |
|  Well |  Road |  Municipal Boundary |



DELTA AIRPORT CONSULTANTS, INC.
RETTEW
4/18/2017
Drawn By: Travis Charlton

PHASE I ENVIRONMENTAL DUE DILIGENCE AUDIT**FOR****PARCEL 18 – TRIPLE M., LLC**

**MEADOW BRANCH ROAD
CARROLL COUNTY REGIONAL AIRPORT
WESTMINSTER, CARROLL COUNTY, MARYLAND**



April 28, 2017

Prepared for:

DELTA AIRPORT CONSULTANTS, INC.

9711 Farrar Court, Suite 100
Richmond, VA 23236

Prepared by:

RETTEW ASSOCIATES, INC.

5031 Richard Lane, Suite 111
Mechanicsburg, Pennsylvania 17055

RETTEW Project No. 024552008

TABLE OF CONTENTS**PAGE**

1.0	INTRODUCTION	1
1.1	Purpose	1
1.2	Limitations and Exemptions	1
1.3	Special Terms and Conditions	2
1.4	Methodologies	2
1.5	User Reliance.....	2
2.0	SITE DESCRIPTION	3
2.1	Location and Legal Description	3
2.2	Site and Vicinity General Characteristics	3
2.3	Soils and Geology.....	3
2.4	Current Use - Property	4
2.5	Description of Site Improvements	4
2.6	Current Use – Adjoining Properties.....	4
3.0	BACKGROUND INFORMATION.....	4
3.1	Owner Information	4
3.2	Environmental Liens and Use Limitations.....	4
4.0	RECORDS REVIEW	5
4.1	Title Records.....	5
4.2	Standard Environmental Record Sources	5
4.3	Regulatory File Review.....	7
4.4	Aerial Photography	7
5.0	HISTORICAL INFORMATION.....	8
5.1	Property	8
5.2	Adjoining Properties	10
6.0	SITE RECONNAISSANCE	10
6.1	Methodology and Limiting Conditions	10
6.2	General Site Setting	10
6.3	Exterior Observations	10
6.4	Interior Observations	11
7.0	INTERVIEWS	11
7.1	Property Owners/Tenants.....	11
7.2	Local Government Officials.....	11

8.0	FINDINGS.....	11
9.0	PROFESSIONAL OPINION	12
10.0	CONCLUSIONS	12
11.0	SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S).....	13
12.0	DEVIATIONS.....	13
13.0	ADDITIONAL SERVICES	13
14.0	REFERENCES	14

FIGURES

FIGURE 1	SITE LOCATION MAP
FIGURE 2	SITE PLAN

APPENDICES

APPENDIX I	QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS
APPENDIX II	LEGAL DESCRIPTION OF SITE/DEED INFORMATION
APPENDIX III	SITE PHOTOGRAPHS
APPENDIX IV	EDR ENVIRONMENTAL LIEN AND AUL SEARCH
APPENDIX V	EDR RADIUS MAP™ REPORT WITH GEOCHECK®
APPENDIX VI	HISTORIC AERIAL PHOTOGRAPHS
APPENDIX VII	INTERVIEW DOCUMENTATION

1.0 INTRODUCTION

The following report addresses the Phase I Environmental Due Diligence Audit (EDDA) of the approximately 19.7-acre Parcel 18 Triple M., LLC property (Site), located at Meadow Branch Road, in the Town of Westminster, Carroll County, Maryland. This EDDA was conducted by RETTEW Associates, Inc. in accordance with the requirements of the U.S. Department of Transportation, Federal Aviation Administration (FAA) Order 1050.19B (effective 10/03/07) for Delta Airport Consultants, Inc. (Delta). This Assessment was performed as part of the due diligence requirements of the FAA prior to land acquisition by the Carroll Country Regional Airport. Based on the findings developed through this investigation (**Section 8.0**), this assessment identified one REC associated with the Site, as described in **Section 9.0**.

REC

- The soil and broken asphalt spoil piles from local road and highway infrastructure construction projects are considered a REC, as these stored materials have been brought onto the Site from unknown origins and quality, and represent a potential impact to the ground and/or groundwater.

1.1 PURPOSE

The purpose of this Phase I EDDA was to complete a standardized environmental assessment of the Site, with respect to a range of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) contaminants and petroleum products, with the intent of satisfying (for the user) one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser defense. In accordance with the above requirements, the EDDA was conducted in accordance with federal standards and practices as codified in the Code of Federal Regulations (CFR) at 40 CFR Part 312, and in conformance with the scope and limitations in the American Society for Testing and Materials (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation: E1527-13 (The Standard)*; including the practices that constitute all appropriate inquiries into the previous ownership and uses of the property consistent with good commercial and customary practice to identify the presence or likely presence of any hazardous substances or petroleum products on the Site under conditions that indicate an existing release, a past release, or a potential threat of release to the Site structures, ground, groundwater, or surface water, as defined in 42 USC §9601(35)(B). These known and/or suspected conditions are termed *recognized environmental conditions* (RECs) and are not intended to include *de minimis* conditions that are not anticipated to represent a risk to public health or the environment as defined by *The Standard*.

1.2 LIMITATIONS AND EXEMPTIONS

Limitations of this Phase I EDDA include, but are not necessarily restricted to, the following:

- Physical appearance and observation of current practices at the Site during a Site reconnaissance;
- Availability of past and present owners for interviews;
- Recall of those interviewed and thoroughness and accuracy of the information provided by them about past and present Site use; and
- Availability of local, state, and federal environmental records.

This report presents the sources, records, and resources available to RETTEW and our opinion about environmental conditions of the Site. This opinion is based on information obtained through the assessment methods described in **Section 1.4**, while recognizing the limitations noted above. Upon receipt of any additional information or data, our opinion may be modified. The user of this document

understands that an evaluation of business risk associated with a parcel of real estate may necessitate investigation beyond the scope of practice defined by *The Standard*. Additionally, nothing in this document is intended to provide or constitute legal advice. It is suggested that the user consult appropriate legal counsel for any such advice.

Consistent with *The Standard*, this practice does not purport to address any safety concerns associated with the use of the Site, other than those stipulated by *The Standard* or modified by the client as described herein.

1.3 SPECIAL TERMS AND CONDITIONS

Much of the terminology used in this report is defined in Section 3.0 of *The Standard*; however, a few terms are not defined, or merit specific mention in this report. For the purposes of this report, the term “impact” shall mean the presence of unconfined hazardous substances or petroleum products on the property that may require remediation under applicable law. The term “material threat” is defined by ASTM as a physically observable or obvious threat, which in the opinion of the environmental professional, is threatening and might result in impact to public health or the environment. The term “recognized environmental condition” shall mean the presence or likely presence of any hazardous substance or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. This term is not intended to include *de minimis* conditions that are not likely to bring enforcement action if brought to the attention of the appropriate government agency.

For the purposes of this assessment, previous environmental conditions on the property that were identified as a REC in the past but have been addressed to the satisfaction of the applicable regulatory agency, without subjecting the property to any required controls, are not considered a REC within the current regulatory framework and are known as “historical REC” (HREC). A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority through the required controls (e.g. property use restrictions or activity and use limitations [AULs]) is considered a “controlled REC” (CREC).

1.4 METHODOLOGIES

An environmental records search of federal and state records was conducted to identify any recognized or potential RECs at the Site and surrounding area within the radii specified in *The Standard*. Information about the physical characteristics of the Site was obtained through a review of published geologic and soils information. Current Site conditions and practices were observed during a Site reconnaissance during which photographic documentation of the Site was also obtained. Observations of past land uses and development changes at the Site and surrounding area were made through interviews, a review of aerial photography from various flight dates and scales, and a review of historic fire insurance maps.

Consistent with *The Standard*, unless otherwise stated, no physical or subsurface sampling or associated analysis was conducted as part of this work effort.

1.5 USER RELIANCE

This report is intended for the exclusive use of Delta and any partnership, corporation, or other entity that is formed to acquire or hold title to the subject property. Any construction or permanent lender securing

financing to the parties listed above may also use the report. Qualifications of the Environmental Professionals involved with this project are included as **Appendix I**.

2.0 SITE DESCRIPTION

The Site is composed of an approximately 19.7-acre parcel owned by Triple M., LLC. To obtain information regarding the physical Site setting, RETTEW completed a review of reasonably ascertainable published information regarding the geologic, hydrogeologic, hydrologic, and topographic characteristics of the Site. Information reviewed included topographic maps, historic aerial photographs, published geologic information, and published soils reports. The following subsections summarize these characteristics.

2.1 LOCATION AND LEGAL DESCRIPTION

The Site consists of an approximately 19.7-acre property (Parcel No. 6784 Lot 2) owned by Triple M., LLC. The Site contained vacant land, access roads, a heavy equipment staging area, and soil and broken asphalt spoil piles. The Site is located in the Town of Westminster, Carroll County, Maryland, as depicted on the Site Location Map and Site Plan (refer to **Figures 1 and 2**). A legal description of the Site and copy of the current property deed are included in **Appendix II**.

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The Site is located on the New Windsor, Maryland, 7.5-minute quadrangle map at an elevation of approximately 801 feet above mean sea level at Latitude North 39.602331 and Longitude West 77.008115 (**Figure 1**). The Site was bordered to the north by the Parcel 16 Triple M., LLC property (vacant woodlands) and the Parcel 17 Wetzel Property (woodlands and residence), and Meadow Branch Road, to the east by Meadow Branch Road and the airport, to the south by a driveway and the Parcel 19 DLH Partnership Property (Shelter Systems warehouse), and to the west by the Parcel 17 Wetzel Property (woodlands and residence), Meadow Branch Road, and vacant woodlands. The Site is located on gradually southwest sloping terrain. Regional groundwater in the area of the Site is expected to flow west-southwest to the Monocacy River; however, Site-specific groundwater data was not collected as part of this study.

2.3 SOILS AND GEOLOGY

The predominant soil type mapped on-site by the U.S. Department of Agriculture Natural Resource Conservation Service is described as the Wheaton-Glenelg Complex. The Wheaton-Glenelg Complex is described as gently sloping, very deep, and well drained. The permeability of the complex is moderately high to high and the available water storage is high. The runoff potential of the complex is medium and depth to seasonally high water table is greater than 80 inches.

Based on information obtained from the Maryland Geological Survey website, the geology underlying the Site is identified as the Chlorite Phyllite component of the Sam's Creek formation. The component is described as green to greenish blue chlorite phyllite and contains subordinate amounts of paragonite and muscovite and variable amounts of quartz. Chloritic laminae commonly alternate with white mica-albite-quartz layers up to 5 mm (0.2 inch) thick; most of these layers parallel axial-plain cleavage and must be tectonic in origin, but some may be relict bedding laminations. Locally contains volcanoclastic fragments or amygdaloidal phyllite up to 3 cm (1.2 inches) long in a hematite-chlorite-white mica phyllite matrix. A few rocks contain scattered amygdules filled with quartz, albite, epidote, and chlorite and flattened parallel to the cleavage; corresponds to the Sam's Creek chlorite phyllite (sccp).

2.4 CURRENT USE - PROPERTY

The Site currently contains vacant land, access roads, heavy equipment storage, and soil and broken asphalt spoil piles. A more detailed Site description is provided in **Section 6.0** of this report. Various Site aspects were photographed during the Site reconnaissance and copies of the photographs are included as **Appendix III**.

2.5 DESCRIPTION OF SITE IMPROVEMENTS

There are no Site improvements as the property consists of only vacant land, access roads, heavy equipment storage, and soil and broken asphalt spoil piles.

2.6 CURRENT USE – ADJOINING PROPERTIES

The Site was immediately bordered as follows:

- North – To the north by the Parcel 16 Triple M., LLC property (vacant woodlands) and the Parcel 17 Wetzel Property (woodlands and residence), and Meadow Branch Road;
- East – To the east by Meadow Branch Road and the airport;
- South – To the south by a driveway and the Parcel 19 DLH Partnership Property (Shelter Systems warehouse); and
- West – To the west by the Parcel 17 Wetzel Property (woodlands and residence), Meadow Branch Road, and vacant woodlands.

3.0 BACKGROUND INFORMATION

3.1 OWNER INFORMATION

Property deed history identifies the current owner of the property as Triple M., LLC.

3.2 ENVIRONMENTAL LIENS AND USE LIMITATIONS

RETTEW conducted an environmental lien and AUL search of the subject property using online resources. Records of liens are available as part of the case search database on the Maryland government webpage. The search concluded that there are no known environmental liens or activity use limitations (AULs) associated with the Site. During the deed/title review, a 2002 deed between the County Commissioners of Carroll County and Triple M., LLC., found the following use restrictions:

- A prohibition against the erection of structures or growth of natural objects that would constitute an obstruction to air navigation.
- A prohibition against any activity on the land that would interfere with or be a hazard to the flight of aircraft over the land or to and from the airport or interfere with air navigation and communication facilities serving the airport.
- There is hereby reserved to Carroll County, its successors and assigns, for the use and benefit of the public, a right of flight for passage of aircraft in the airspace above the surface of the premises herein conveyed. This public right of flight shall include the right to cause in said airspace any noise or vibration inherent in the operation of any aircraft used for navigation or flight through said airspace or landing at, taking off from, or operating on the Carroll County Regional Airport.
- An Erosion and Sediment Control Plan shall be prepared and implemented in strict accordance with all local and state requirements to minimize adverse water quality impacts. Further all plans

for the proposed projects shall be reviewed and approved by the local authorities for compliance with all applicable water quality regulations prior to construction.

- A wetlands permit from the U.S. Army Corps of Engineers, and the Maryland Department of Natural Resources, if determined necessary, will be obtained prior to any work to further develop the sites if necessary. A State 401 water quality certification shall be obtained if required for the proposed projects.

Any use of this land shall be land use compatible with the airport. A copy of the environmental lien and AUL search documentation is provided as **Appendix IV**.

4.0 RECORDS REVIEW

4.1 TITLE RECORDS

Historic and current property deeds/titles for the Site were obtained through online resources. Title history information was available for March 31, 1911 through November 14, 2002. A detailed chain-of-ownership is provided in **Appendix II**. According to these records and interviews with the current Site owner, the following owner/prior owners of the Site were identified:

- | | |
|--|------------|
| • Triple M., LLC. | 11/14/2002 |
| • County Commissioners of Carroll County | 03/18/1991 |
| • C. Elmer Fritz | 03/31/1964 |
| • G. Water Fritz and Mary E. Fritz | 03/31/1911 |

Available deed information is provided in **Appendix II**.

4.2 STANDARD ENVIRONMENTAL RECORD SOURCES

RETTEW contracted with Environmental Data Resources, Inc. (EDR) to review Federal and State environmental database records in accordance with search radii specified by *The Standard*. The databases reviewed were updated in accordance with the American Society of Testing and Materials (ASTM) standards. A copy of the database report is provided as **Appendix V**.

A review of these databases indicated that the Site was not listed in any of the databases searched by EDR.

Ten mapped sites were identified within a one-mile radius of the Site, and those with potential environmental concerns are further detailed below:

- C.J. Miller, LLC, 390 Vision Way Road, 0.319 miles north northwest and downgradient of the Site – Listed in the Engineering Controls (ENG CONTROLS), the Maryland National Pollutant Discharge Elimination System (NPDES), and the Above Ground Storage Tank (AST) databases. A 20,000-gallon asphalt emulsion AST, 20,000-gallon heating oil #2 AST, 30,000-gallon asphalt cement AST, and a 30,000-gallon asphalt emulsion AST are present at the facility. Due to the lack of recorded releases, this facility is not expected to impact the Site.
- Carroll County Airport, 1130 Airport Drive, 0.347 miles northeast and downgradient of the Site – Listed in the Maryland Oil Control Program (OCPCASES) database as closed in 1992. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.

- Marada Industries, Inc., 151 Airport Drive, 0.351 miles east and downgradient of the Site – Listed in the OCPCASES, Maryland Historic Underground Storage Tanks (HIST UST), United States Aeromatic Information Retrieval System (US AIRS), Facility Index System (FINDS), and Enforcement and Compliance History Online (ECHO) databases. The facility has a closed OCPCASES in 1994 and a removed UST. Due to its regulatory status and no reported releases associated with the removed UST, this facility is not expected to impact the Site.
- Piper Business Campus, 1004 Littlestown Pike, 0.374 miles east and downgradient of the Site – Listed in the OCPCASES database. A closed incident is listed at the facility in 1996. Due to its closed regulatory status, this facility is not expected to impact the Site.
- Carroll County Maintenance Facility, 1250 Old Meadow Branch Road, 0.378 miles north northeast and downgradient of the Site – Listed in the OCPCASES and NPDES databases. The facility has seven closed OCPCASES. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.
- Airport Barn Recycling Center, 1000 Littlestown Pike, 0.381 miles east southeast and downgradient of the Site – Listed in the OCPCASES database. A closed soil contamination incident is listed at the facility in 1996. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.
- Carroll County Regional Airport, 200 Airport Drive, 0.392 miles northeast and downgradient of the Site – Listed in the ENG CONTROLS, OCPCASES, and NPDES databases. The facility has two closed OCPCASES. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.
- Miller Asphalt Products, Inc., Route 97 and Meadows Branch Road, 0.430 miles east southeast and downgradient of the Site – Listed in the OCPCASES database as closed in February of 2001. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.
- Finch Services, Inc., 1127 Littlestown Pike, 0.439 miles east northeast and downgradient of the Site – Listed in the RCRA small quantity generator (RCRA SQG), OCPCASES, Maryland Underground Storage Tank (UST), HIST UST, FINDS, Maryland financial assurance, NPDES, and ECHO databases. The facility generates small quantities of hazardous materials, has a closed OCPCASES listing in 1994, and has had five USTs removed. Due to its closed regulatory status, downgradient location, and no reported releases associated with the removed USTs, this facility is not expected to impact the Site.
- St. Benjamins Lutheran Church, 700 Kriders Cemetery Road, 0.456 miles south southeast and downgradient of the Site – Listed in the UST and OCPCASES databases. A 1,000-gallon heating oil tank was removed from the facility in October of 2004 and is listed as closed. Due to its closed regulatory status and downgradient location, this facility is not expected to impact the Site.

Additionally, one unmapped facility was identified in the surrounding region. Upon further research this facility is captured by the Maryland State Highway Administration facility. Which is described as follows:

- Maryland State Highway Administration Maintenance Shop, 150 Wyndtryst Drive, greater than ¼ mile southeast and downgradient of the Site – Listed in the Pennsylvania manifest (PA MANIFEST), Resource Conservation and Recovery Act conditionally exempt small quantity generators (RCRA-CESQG), FINDS, ECHO, OCPCASES, NPDES, and UST databases. The facility stores and generates a small amount of hazardous material, and has four OCPCASES documented. Three are closed, and the open case does not involve a release. Six USTs are listed as permanently

out of use. Due to its regulatory status and downgradient location, this facility is not expected to impact the Site.

4.3 REGULATORY FILE REVIEW

RETTEW contacted the Maryland Department of the Environment (MDE) on April 11, 2017 to obtain information or records regarding environmental concerns associated with the Site through the MDE online Public Information Act (PIA) website. RETTEW also requested environmental files for the Site through the United States Environmental Protection Agency MyProperty online records request on April 12, 2017. Responses from these agencies have not been returned within the timeframe of this report.

A search conducted on the MDE PIA returned no results for the Site (**Appendix V**). In addition, a search conducted on the United States Environmental Protection Agency (EPA) MyProperty returned no results for the Site (**Appendix V**).

4.4 AERIAL PHOTOGRAPHY

Historical aerial photographs were reviewed by RETTEW to characterize Site development through time and to identify features that may be indicative of environmental impact at the Site or the potential for environmental impact. RETTEW obtained and reviewed aerial photographs of the Site and surrounding area from EDR. Aerial photographs of the area were available for the years 1943, 1970, 1981, 1987, 1991, 1995, 2005, 2006, 2007, 2009, and 2011. **Appendix VI** includes aerial photographs of the Site area for the years noted above. **Table 1** summarizes the observations made from the review of these photographs.

Table 1		
Review of Aerial Photographs		
Date	Source	Details
1943	USDA	The Site is an agricultural field with five drainage channels and is bordered to the northwest by a road. The area surrounding the Site consists of agricultural fields and residential properties.
1970	USGS	The Site is an agricultural field, two drainage areas are visible, and the road is no longer present. Tree lines are apparent on the northwest and southwest borders of the Site. An asphalt plant is present northwest of the Site. Increased development is apparent surrounding the Site.
1981	USDA	The Site appears unchanged from the previous photograph excepting the two drainages, which are no longer present. The Carroll County Regional Airport is now apparent north of the Site.
1987	USGS	The Site and surrounding areas appear unchanged from the previous photograph.
1991	USGS	The Site and surrounding areas appear unchanged from the previous photograph.
1995	USGS/DOQQ	The Site appears unchanged from the previous photograph. Meadow Branch Road is present northeast and west of the Site. Additional airport development is apparent.
2005	USDA/NAIP	Access roads and soil piles are present at the Site. Increased development is apparent surrounding the Site. The Shelter Systems building is present southeast of the Site.

Table 1 Review of Aerial Photographs		
2006	USDA/NAIP	The Site appears to have been graded or graded with fill. Soil piles are present. A pond is present west of the Site.
2007	USDA/NAIP	The Site is more vegetated than the previous photograph. Soil piles and some vehicles are present. The surrounding areas appear as they do in the present day.
2009	USDA/NAIP	The Site is more vegetated than the previous photograph. The surrounding areas appear as they do in the present day.
2011	USDA/NAIP	The Site is mostly vegetated. Soil piles are not present. The Site differs from the present day as the heavy equipment storage and soil and broken asphalt spoil piles are not yet present in the 2011 aerial photograph.

The review of historical aerial photographs supports the information obtained through interviews and historic descriptions of the Site.

5.0 HISTORICAL INFORMATION

5.1 PROPERTY

Historic fire insurance (Sanborn®) maps were requested through EDR to ascertain Site and surrounding development over time; however, Sanborn® maps were not available for the Site and surrounding vicinity. The Certified Sanborn® Map Report is included in **Appendix V**.

City directory records were requested through EDR to ascertain Site ownership and uses. City directories were available for the years 1975, 1980, 1985, 1990, 1995, 1999, 2003, 2008, and 2013. **Appendix V** contains the directories for the years noted above. City directory findings are presented in **Table 2**. A physical address is not assigned to the Site; however, the following table summarizes the occupants of Meadow Branch Road in the vicinity of the Site.

Table 2 Review of City Directories		
Date	Source	Resident
1975	Stewart's Criss-Cross Directory	Private residents, a church, and a blacktop plant (approximately 0.3 miles north northeast of the Site)
1980	Stewart's Criss-Cross Directory	Private residents and a blacktop plant and stone company (approximately 0.3 miles north northeast of the Site)
1985	Stewart's Criss-Cross Directory	Private residents, a blacktop plant (approximately 0.3 miles north northeast of the Site), and the Carroll County Maintenance Facility (approximately 0.6 miles north northwest of the Site)
1990	Stewart's Criss-Cross Directory	Private residents, a blacktop plant (approximately 0.3 miles north northeast of the Site), and the Carroll County Maintenance Facility (approximately 0.6 miles north northwest of the Site)
1995	Cole Information Services	Private residents, a stone company (approximately 0.3 miles north northeast of the Site), and the Carroll County Maintenance Facility (approximately 0.6 miles north northwest of the Site)

Table 2 Review of City Directories		
1999	Cole Information Services	Private residents and the Carroll County Maintenance Facility (approximately 0.6 miles north northwest of the Site)
2003	Cole Information Services	Private residents
2008	Cole Information Services	Private residents, Shelter Systems limited (adjacent), and Lafarge Mid Atlantic LLC/Redland Genstar Facility (approximately 0.6 miles north northwest of the Site)
2013	Cole Information Services	Private residents and Shelter Systems Corp of Maryland, Shelter Systems Limited

Historical topographic maps were requested through EDR to ascertain historical Site uses. Topographic maps were available for the years 1905, 1911, 1943, 1944, 1946, 1953, 1971, 1977, 1979, 2013, and 2014. **Appendix V** contains the maps for the years noted above. Historical topographic map findings are presented in **Table 3**.

Table 3 Review of Historical Topographic Maps		
Date	Map	Details
1905	N/A	The Site is unmapped.
1911	Taneytown, 15 - Minute	The Site is undeveloped and bordered by roads to the northwest and southwest. The surrounding areas contain roads and some residences.
1943	N/A	The Site is unmapped.
1944	New Windsor, 7.5 - Minute	The Site is undeveloped and bordered by a road to the northwest. Additional development is apparent.
1946	Taneytown, 15 - Minute	The Site appears unchanged from the previous map.
1953	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map. The Westminster Airport is now present east of the Site.
1971	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map.
1977, 1979	New Windsor, 7.5 - Minute	The Site appears unchanged from the previous map.
2013, 2014	New Windsor, 7.5 - Minute	The Site appears unchanged from the 1977/1979 map. The road to the northwest is no longer present. Meadow Branch Road is now apparent.

The review of city directories and historical topographic maps supports the information obtained through interviews and historic descriptions of the Site.

5.2 ADJOINING PROPERTIES

A detailed investigation into the historical use of the adjoining properties was not part of this scope of work. Observations recorded during this EDDA indicate the surrounding area is made up of mainly agricultural fields, woodlands, and residential and commercial/light industrial properties.

6.0 SITE RECONNAISSANCE

In an effort to determine Site characteristics and ascertain areas of environmental impact or the potential for environmental impact, RETTEW completed a visual reconnaissance of the Site on April 11, 2017. Various Site aspects were photographed during the reconnaissance and copies of the photographs are included as **Appendix III**.

6.1 METHODOLOGY AND LIMITING CONDITIONS

RETTEW completed the Site reconnaissance in accordance with requirements identified in **Section 1.4** of this report.

6.2 GENERAL SITE SETTING

The Site generally consisted of vacant land, access roads, heavy equipment storage, and soil and broken asphalt spoil piles.

6.3 EXTERIOR OBSERVATIONS

- *General Description of Structures* – There were no structures observed on the Site.
- *Roads* – Access roads are present at the Site. Meadow Branch Road borders the northern border of the Site.
- *Potable Water Supply* – No wells were located on the Site.
- *Sewage Disposal System* – No evidence of septic systems, cesspools, or sewage disposal systems were observed at the Site.
- *Pits, Ponds, or Lagoons* – No evidence of pits, ponds, or lagoons were observed at or adjacent to the Site.
- *Stained Soil or Pavement* – No evidence of stained soil was observed at the Site. Broken asphalt spoil piles were observed at the Site.
- *Stressed Vegetation* – Stressed vegetation due to equipment operation was observed near the spoil piles at the Site.
- *Solid Waste* – No solid waste was observed at the Site.
- *Waste Water* – No waste water was observed at the Site.
- *Transformers* – No transformers were observed at the Site.
- *Hazardous Substances and Petroleum Products* – No hazardous substances or petroleum products were observed at the Site. However, large earth-moving equipment was stored on and adjacent to the access roads.
- *Storage Tanks* – No evidence of USTs such as vent pipes, fill pipes or product dispensers, were observed at the Site. No above ground storage tanks (ASTs) were observed at the Site.

- *Wetlands* – Neither a wetland determination nor delineation was conducted during this investigation. A review of the National Wetlands Inventory Map information indicated no wetlands are present at the Site.

6.4 INTERIOR OBSERVATIONS

- No structures were observed on the Site.

7.0 INTERVIEWS

7.1 PROPERTY OWNERS/TENANTS

On April 11, 2017, RETTEW interviewed Mr. Billy Miller (Triple M., LLC.). Mr. Miller indicated that he was not aware of any environmental concerns at the property, and that the property previously contained agricultural fields. Mr. Miller indicated that the soil and broken asphalt spoil piles are from local road and highway infrastructure construction projects. The Site Owner Environmental Questionnaire is included in **Appendix VII**.

7.2 LOCAL GOVERNMENT OFFICIALS

RETTEW attempted to contact the Westminster Volunteer Fire Department on April 4, 2017; however, a response from this department was not received within the timeframe of this report.

RETTEW contacted the Carroll County Health Department via telephone on April 4, 2017 and was directed to the County website to fill out an information request form. The form was forwarded to the MDE for review. A copy of the submitted form is provided in **Appendix VII**. Results from this request are provided in **Section 4.3** of this report.

8.0 FINDINGS

RETTEW has completed a Phase I EDDA of the Site in conformance with the scope and limitations of *The Standard*. The following items summarize the findings of this investigation:

1. The Site consists of an approximately 19.7-acre area of vacant land, access roads, and soil and broken asphalt spoil piles; the Site is owned by Triple M., LLC. The Site was an agricultural field from approximately 1943 to the late 1990s or early 2000s.
2. The characteristics of Site topography suggest that surface water draining from the Site flows west to Meadow Branch Big Pipe Creek.
3. No known environmental liens are associated with the Site. During the deed/title review, a 2002 deed between the County Commissioners of Carroll County and Triple M., LLC., found the following use restrictions:
 - A prohibition against the erection of structures or growth of natural objects that would constitute an obstruction to air navigation.
 - A prohibition against any activity on the land that would interfere with or be a hazard to the flight of aircraft over the land or to and from the airport or interfere with air navigation and communication facilities serving the airport.
 - There is hereby reserved to Carroll County, its successors and assigns, for the use and benefit of the public, a right of flight for passage of aircraft in the airspace above the surface of the premises herein conveyed. This public right of flight shall include the right to cause in said airspace any noise or vibration inherent in the operation of any

aircraft used for navigation or flight through said airspace or landing at, taking off from, or operating on the Carroll County Regional Airport.

- An Erosion and Sediment Control Plan shall be prepared and implemented in strict accordance with all local and state requirements to minimize adverse water quality impacts. Further, all plans for the proposed projects shall be reviewed and approved by the local authorities for compliance with all applicable water quality regulations prior to construction.
 - A wetland permit from the U.S. Army Corps of Engineers, and the Maryland Department of Natural Resources, if determined necessary, will be obtained prior to any work to further develop the sites if necessary. A State 401 water quality certification shall be obtained if required for the proposed projects.
 - Any use of this land shall be land use compatible with the airport.
4. A review of state and environmental databases did not indicate the potential for impacts to the Site.
 5. A review of the National Wetlands Inventory Map information indicated no wetlands are located at the Site.
 6. Heavy equipment and soil and broken asphalt spoil piles were observed at the Site.

9.0 PROFESSIONAL OPINION

The following opinions are presented regarding the above listed findings:

REC

- The soil and broken asphalt spoil piles from local road and highway infrastructure construction projects are considered a REC, as these stored materials have been brought onto the Site from unknown origins and quality, and represent a potential impact to the ground and/or groundwater.

No HRECs or CRECs were identified at the Site.

De minimis Conditions/Noteworthy Items

- The historic use and potential accumulation of pesticides, herbicides, and/or fungicides for agricultural purposes at the Site is considered a noteworthy item. This condition is not considered a REC as it would not likely be the subject of enforcement action if brought to the attention of regulatory agencies.
- The presence of heavy equipment at the Site is considered a *de minimis* condition due to the potential for a limited release of diesel fuel or hydraulic fluid to the ground surface.

10.0 CONCLUSIONS

RETTEW has performed a Phase I EDDA in conformance with the scope and limitations of *The Standard*, of the approximately 19.7-acre Parcel 18 Triple M., LLC property located in the Town of Westminster, Carroll County, Maryland. Any exceptions to, or deletions from, this practice are described in **Section 12.0** of this report. Based on the findings developed through this investigation (**Section 8.0**), this assessment identified one REC associated with the Site, as described in **Section 9.0**.

11.0 SIGNATURE(S) OF ENVIRONMENTAL PROFESSIONAL(S)

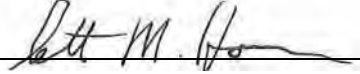
I declare that, to the best of my professional knowledge and belief, I meet the definition of environmental professional as defined in 40 CFR Part 312.10(b); I have the specific qualifications, based on education, training, and experience, to assess a property of the nature, history, and setting of the subject property; and I have developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Preparer: _____ Devin Black, Geoscientist

Signature: _____ 

Date: _____ April 28, 2017

Environmental Professional (Reviewer): _____ Scott Houser, Project Manager

Signature: _____ 

Date: _____ April 28, 2017

Environmental Professional (Quality Assurance): _____ John B. Stipe, III, CPSS

Signature: _____ 

Date: _____ April 28, 2017

12.0 DEVIATIONS

No deviations from *The Standard* were included in this assessment.

13.0 ADDITIONAL SERVICES

No additional tasks were completed as part of this work effort.

14.0 REFERENCES

American Society for Testing and Materials International (ASTM) *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation: E1527-13*.

Maryland Geological Survey: <http://www.mgs.md.gov/geology/index.html>. Viewed on March 13, 2017.

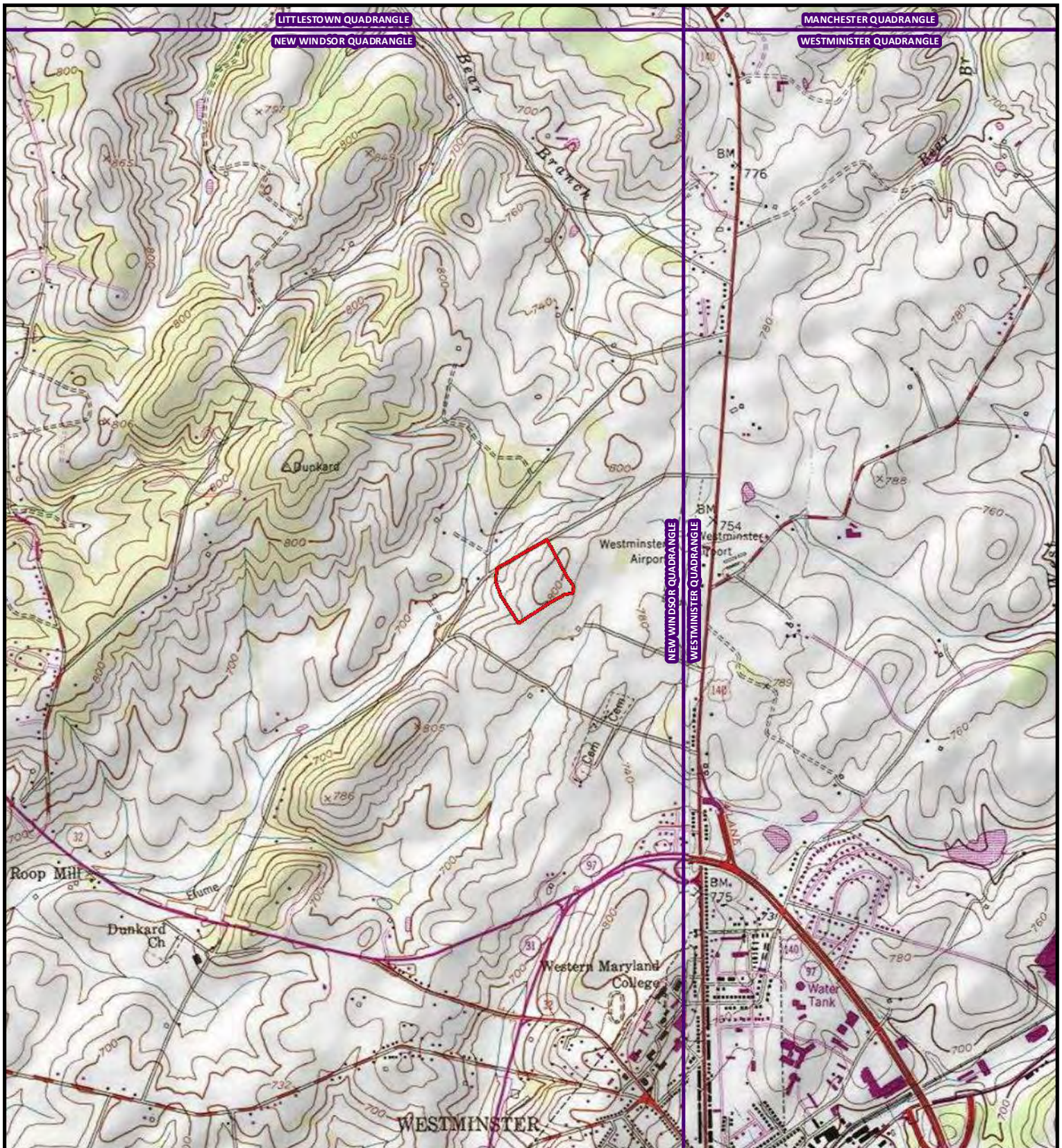
National Wetlands Inventory Map: <https://www.fws.gov/wetlands/data/mapper.HTML>. Viewed on April 18, 2017.

U.S. Department of Agriculture (USDA) Web Soil Survey:
<https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Viewed on March 13, 2017.

U.S. Environmental Protection Agency (USEPA), *Standards and Practices for All Appropriate Inquiries; Final Rule*. 40 Code of Federal Regulations (CFR) Part 312. Federal Register Volume 70, Number 210. November 12, 2013.

N:\Shared\Projects\02455\024552008\GS\Parcel 18_Triple M\Report\Rpt-Parcel 18-04-28-17.docx

FIGURES



Site Boundary

Delta Airport Consultants, Inc.

Carroll County Regional Airport

Parcel 18 - Triple M, LLC

Figure 1 - Site Location Map

Project No. 024552008



0 1,000 2,000
Feet
1 inch = 2,000 feet



**DELTA AIRPORT
CONSULTANTS, INC.**

RETTEW

Town of Westminster, Carroll County, MD
New Windsor, MD USGS 7.5' Topographic Quadrangle

4/25/2017

Service Layer Credits: Copyright © 2013
National Geographic Society, I-cubed

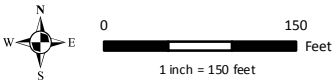
N:\Shared\Projects\02455\024552008\GIS\Map Docs\Phase 1 ESA\024552008_Carroll County Regional Airport_Figure1_Topo_8x11.mxd



Delta Airport Consultants, Inc.
Carroll County Regional Airport
Parcel 18 - Triple M., LLC
Figure 2 - Site Plan
Town of Westminster, Carroll County, MD
Project No. 024552008

— Road
 Site Boundary

Municipal Boundary



Imagery Source: Esri, DigitalGlobe, GeoEye,
Earthstar Geographics, CNES/Airbus DS, USDA,
USGS, AeroGRID, IGN, and the GIS User Community

DELTA AIRPORT
CONSULTANTS, INC.
RETTEW

4/25/2017

Drawn By:
Travis Charlton

Janet O'Meara, Bureau Chief
Bureau of Resource Management
410-386-2712
Fax: 410-386-2924
Toll Free 1-888-302-8978
www.carrollcountymd.gov



Department of
Land and Resource Management
Carroll County Government
225 North Center Street-
Westminster, Maryland 21157
MD Relay Service 7-1-1/1-800-735-2258 (TTY)

June 23, 2022

CLSI
439 East Main Street
Westminster, Maryland 21157

RECEIVED
JUN 29 2022

BY:

2009139H
JZ BEW
MR

Re: **GRO-21-0013 Meadow Branch Road realignment**

To Whom it May Concern:

I have reviewed the plans submitted June 2, 2022 for the above referenced project.

Forest Conservation: (Approved)

The forest conservation plan is approved.

If you have any questions, contact me at (410) 386-2133, Monday through Friday between 8:00 a.m. and 5:00 p.m.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jonathan Bowman", is written over a horizontal line.

Jonathan Bowman
Bureau of Resource Management

cc: Bureau of Development Review
File



SHEET INDEX

LEGEND

- BENCHMARK LOCATION
- BORING LOCATION (APPROX)
- PROPOSED SPOT ELEVATION
- EXISTING STRUCTURE NUMBER
- PROPOSED STRUCTURE NUMBER
- EXISTING DROP INLET
- PROPOSED DROP INLET
- EXISTING ENDWALL/HEADWALL/WINGWALL
- PROPOSED ENDWALL/HEADWALL/WINGWALL
- EXISTING STORM MANHOLE
- PROPOSED STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING FIRE HYDRANT
- EXISTING WATER METER
- EXISTING WATER VALVE
- EXISTING DOUBLE-SWING GATE
- EXISTING PEDESTRIAN GATE
- EXISTING ROADWAY SIGN
- PROPOSED ROADWAY SIGN
- EXISTING POLE (LIGHTED)
- EXISTING POLE (NON-LIGHTED)
- EXISTING TREE
- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- CTV EXISTING CABLE TV LINE
- UGE EXISTING UNDERGROUND ELECTRICAL LINE
- EXISTING FENCE
- FO EXISTING FIBER OPTIC LINE
- FLOODPLAIN BOUNDARY
- GAS EXISTING GAS LINE
- EXISTING GUARDRAIL
- NET TRACT
- NET TRACT LINE
- EXISTING AIRPORT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- EASEMENT LINE
- SAN EXISTING SANITARY SEWER LINE
- STREAM
- UGT EXISTING UNDERGROUND TELEPHONE LINE
- EXISTING TREE LINE
- W EXISTING WATER LINE
- WBL PROPOSED WETLANDS BUFFER
- PROPOSED ASPHALT PAVEMENT
- PAVEMENT REMOVAL
- LeB (C/D) SOIL TYPES
- WbB (B)
- CZasc KARST LINES
- CZescop
- 1 PLOT SAMPLE
- VSB VARIABLE STREAM BUFFER

SCALE: 1"=100' FEET

<div><div><div>Engineers • Surveyors</div><div>CLSI</div><div>Land Planning & Environmental Consultants</div></div><div>439 East Main Street Westminster, MD 21157-5539 (410) 848-1730 FAX (410) 848-1791</div></div>	<div><div></div><div>DELTA AIRPORT CONSULTANTS, INC.</div><div>3544 North Progress Avenue, Suite 200 • Harrisburg, Pennsylvania 17110 phone: (717) 652-8700 • fax: (717) 652-8371 • www.deltairport.com</div></div>	<div>PRELIMINARY DESIGN REVIEW SUBMISSION - DO NOT USE FOR CONSTRUCTION</div> <div>Louis Lumley MDNR Qualified Professional of Forestry</div>	<div>RELOCATE MEADOW BRANCH ROAD</div> <div>OVERALL FOREST STAND DELINEATION</div> <div>CARROLL COUNTY REGIONAL AIRPORT</div>	<div>AIP NO. 3-24-0028-031-2019</div> <div>DRAWN BY: SAK</div> <div>DESIGNED BY: JTZ</div> <div>SCALE: 1" = 100'</div> <div>DATE: MARCH, 2022</div>	<div>JOB NO. 18011</div> <div>SHEET 38 OF 40</div>
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NO 3450' MEAD COORDINATE SYSTEM

SHEET INDEX

LEGEND

- BENCHMARK LOCATION
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- EXISTING STORM DRAIN
- PROPOSED STORM DRAIN
- EXISTING CABLE TV LINE
- EXISTING UNDERGROUND ELECTRICAL LINE
- EXISTING FENCE
- PROPOSED SUPER SILT FENCE
- EXISTING FIBER OPTIC LINE
- EXISTING GAS LINE
- EXISTING GUARDRAIL
- LOD - LIMITS OF DISTURBANCE
- NET TRACT - NET TRACT LINE
- EXISTING AIRPORT PROPERTY LINE
- PROPOSED RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING SANITARY SEWER LINE
- STREAM
- EXISTING UNDERGROUND TELEPHONE LINE
- EXISTING TREE LINE
- EXISTING WATER LINE
- PROPOSED ASPHALT PAVEMENT
- PAVEMENT REMOVAL
- PROPOSED FOREST CLEARING
- SOIL TYPES
- KARST LINES
- FOREST RETENTION FENCE & SIGN
- VARIABLE STREAM BUFFER

100 0 100 200
SCALE: 1"=100' FEET

					 <p>439 East Main Street Westminster, MD 21157-5539 (410) 848-1790 FAX (410) 848-1791</p>	 <p>3544 North Progress Avenue, Suite 200 • Harrisburg, Pennsylvania 17110 phone: (717) 652-8700 • fax: (717) 652-8371 • www.deltairport.com</p>	PRELIMINARY DESIGN REVIEW SUBMISSION - DO NOT USE FOR CONSTRUCTION	Laura Lumis MDNR Qualified Professional of Forestry	RELOCATE MEADOW BRANCH ROAD	AIP NO. 3-24-0028-031-2019	JOB NO. 18011			
											OVERALL FOREST CONSERVATION PLAN	DRAWN BY: SAK	SHEET 39 OF 40	
												DESIGNED BY: JTZ		
											CARROLL COUNTY REGIONAL AIRPORT	SCALE: 1" = 100'	DATE: MARCH, 2022	

FOREST STAND DELINEATION NARRATIVE

Introduction:
On November 09, 2020 a forest stand delineation was conducted off Meadow Branch Road in Westminster MD. The conditions were GO'F and sunny. The site contains 2.28 acres of forest. There are residential lots around the site with Carroll County Airport across Meadow Branch Road. Shelter Systems Limited and Miller Asphalt Products Inc are also adjacent to the site. One priority III stand was identified on site.

Methodology:
A total of two 1/20th acre sample plots were surveyed. Information was collected on the plot's canopy cover, understory cover, herbaceous cover, basal area and species present. Any standing dead trees and invasive species were also noted. All data was recorded on the State Forest Conservation Technical Manuals Forest Sampling Data Worksheet and summarized on the State Forest Conservation Technical Manuals Forest Stand Summary Worksheet.
Forest Stands Surveyed:
Stand A: Oak & Maple
Stand A is 2.56 acres and predominantly oak and maple species. There is a significant amount of bamboo between the stand and the adjoining residential lots. The basal area of the stand was 60 sqft/acre. The size of dominate trees ranged from 6" to 20". The stand had 58% canopy cover and approximately seven tree species per acre. The understory was comprised of bamboo; the understory covered 2% of the stand. Herbaceous species covered 7% of the stand and included poison ivy, Japanese stilt grass, and wine berry.

Condition:
The stand is in fair condition. Currently invasives cover 13% of the site, including Japanese stilt grass. There was no evidence of pests or diseases.

Function:
This stand serves some wildlife value. Deer tracks were seen on stand, but there was no evidence of grazing. Activity on the site suggest the neighboring children use the stand for recreational purposes.

VARIABLE STREAM BUFFER

TRANSECT	% SLOPE	BUFFER EXTENSION	MINIMUM BUFFER	WETLAND WIDTH	25% STEEP SLOPE OR >	TOTAL BUFFER
T1	13.5	27.0	50	0	16	(93') 100
T2	17.5	35.0	50	0	16	101
T3	8.0	16.0	50	0	20	86
T4	4.0	8.0	50	0	0	58
T5	7.5	15.0	50	0	3	68
T6	9.5	19.0	50	0	0	69

* EXTENDED TO TOP OF 25% SLOPES

PROTECTION FENCE & SIGNS

FOREST CONSERVATION PROTECTION FENCE SIGN DETAIL: FENCE & WATER RESOURCE PROTECTION FENCE (TOTALS): Forest Retention Area Fence: Reforestation/Afforestation Fence: Isolated Specimen Tree Fence: Water Resource Protection Fence: Total Fence:		756 L.F. 756 L.F. 756 L.F. 756 L.F. 756 L.F.
SIGNS: FOREST RETENTION AREA: REFORESTATION AREA: SPECIMEN TREE: WATER RESOURCE PROTECTION SIGNS: TOTAL SIGNS:		8 0 0 8 8
NOTE: This estimate for bond purposes only. Contractor is responsible to confirm or provide own estimate for bidding purposes.		

SOILS CHART (NCRS WEB SOIL SURVEY)				
SOIL SERIES	SYMBOL	ERODIBLE (k-factor)	HYDRIC	DRAINAGE CLASS
BRINKLOW	BtC, BtD	0.2	NO	C
GLENVILLE	GtB	0.37	NO	C/D
URBAN	UrB	N/A	NO	B
WHEATON	WhB	0.37	NO	B

NET TRACT TABULATION

GROSS TRACT (LIMIT OF DISTURBANCE):	20.82 ACRES
- LIMIT OF DISTURBANCE FROM OTHER PLANS:	4.07 ACRES
- 100 YR FLOODPLAIN:	0.00 ACRES
NET TRACT:	16.75 ACRES

SPECIMEN TREE CHART					
No.	DBH	COMMON NAME	Botanical Name	CONDITION	CRZ RETENTION
1	33"	SILVER MAPLE	Acer saccharinum	FAIR	33' REMOVE
2	34"	NORTHERN RED OAK	Quercus rubra	FAIR	34' REMOVE
3	33"	BLACK CHERRY	Prunus serotina	POOR	33' REMOVE

FOREST CONSERVATION NARRATIVE

The site is the proposed location for the relocation of Meadow Branch Road in Westminster. 2.56 acres of priority III forest exists on site. Forest clearing is due to site grading in and the construction of the road. The site is in the Double Pipe Creek watershed (02140304). A 4.07 acre portion of our limit of disturbance was accounted for in the forestry plan approved on 01/09/2001 (T-02-01). Our net tract is the limit of disturbance minus this area. Three specimen trees exist on site and will be cleared to accommodate grading for the new road. 2.56 acres of mitigation will be provided at an off site forest bank.

FOREST CONSERVATION WORKSHEET

Zone: Industrial	
Input Data: A. Proposed Forest Area Removed:	2.66 Ac.
Required Reforestation = All forest area removed is to be reforested/afforested at a ratio of one acre planted for every acre of portion thereof removed.	
Afforestation Calculation: B. Total Net Tract Area:	16.75 Ac.
C. Threshold Required (15%):	2.51 Ac.
D. Existing Forest Area: Minus Forest Cleared: Plus Reforestation:	2.66 Ac. 2.66 Ac. 2.66 Ac.
E. C minus D:	2.51 - 2.66 = -0.15 Ac.
(If C minus D > 0, this is required of afforestation. If C minus D < 0, no afforestation is required.)	
No afforestation is required. 2.66 Acres of reforestation is required. 2.66 Acres of mitigation will occur off-site	

FOREST CONSERVATION NOTES

- Plan prepared by C.L.S.I.
- Attachment of signs or any other object, to trees is prohibited.
- No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed in conservation areas.
- Retention Forest signs and specimen tree signs to be posted as noted on plan sheet.
- All protective devices must be in place prior to any grading which includes Retention Forest Signs, Specimen tree signs and fencing.
- Pre-Construction meeting: Before any disturbance, the developer, contractor or project manager and local inspector shall attend. Temporary parking, stockpile, staging and fueling area will be shown to all personnel.
- Any changes made to the Forest Conservation Plan due to On-Site conditions shall be made in consultation with a Representative of the Bureau of Resource Management.
- No burial of discarded materials will occur on-site within the forest conservation areas or planting areas.
- No open burning within 100 feet of a wooded area.
- Forest retention areas will be placed within a forest conservation easement in perpetuity and conveyed to Carroll County.

WATER RESOURCE
PROTECTION SIGN - DETAIL



WATER RESOURCE
PROTECTION AREA

This area is being maintained to protect and enhance water quality.

Clean Water
For Your Future

Carroll County Government

PLACED APPROXIMATELY EVERY 100 FT.

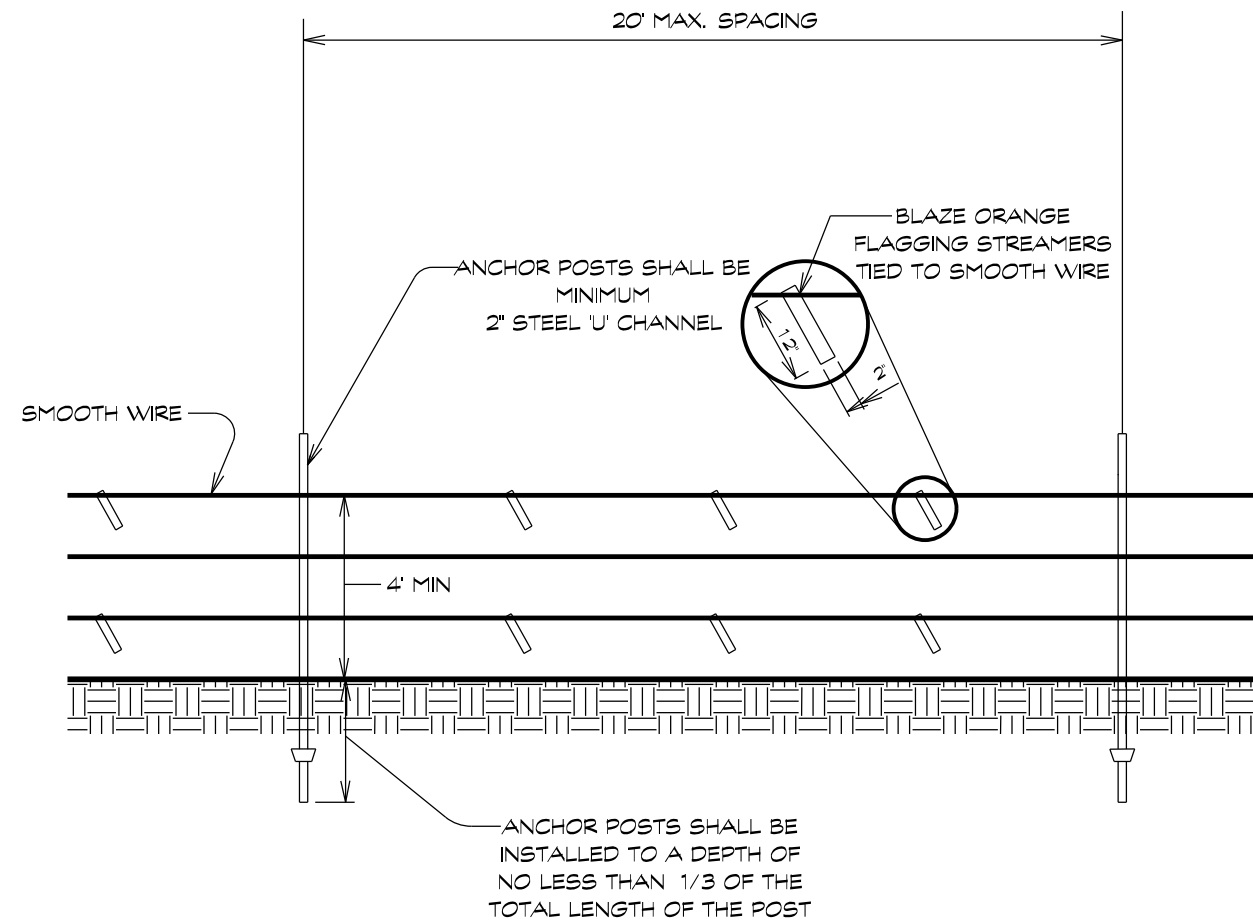
FOREST
RETENTION
AREA

MACHINERY, DUMPING
OR STORAGE OF
ANY MATERIALS IS
PROHIBITED

VIOLATORS ARE SUBJECT TO
FINES AS IMPOSED BY THE
MARYLAND FOREST
CONSERVATION ACT OF
1991

PLACED APPROXIMATELY EVERY 100 FT.

FOREST PROTECTION FENCE
TWO OR THREE STRAND
SMOOTH WIRE



- NOTES:
- FOREST PROTECTION DEVICE ONLY
 - RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS
 - BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE
 - AVOID ROOT DAMAGE WHEN PLACING ANCHOR POSTS.
 - SMOOTH WIRE SHOULD BE SECURELY ATTACHED TO POSTS.
 - DEVICE SHOULD BE PROPERLY MAINTAINED DURING CONSTRUCTION.
 - PROTECTIVE SIGNS ARE ALSO RECOMMENDED.

GENERAL NOTES

- OWNER: COUNTY COMMISSIONERS OF CARROLL COUNTY MARYLAND
DEED REFERENCE: LIBER 9332 FOLIO 292
- THE OUTLINE SHOWN HEREON IS BASED ON A FIELD SURVEY PERFORMED BY CLSI
- TOPOGRAPHY SHOWN HEREON IS BASED ON CARROLL COUNTY TOPOGRAPHY
- SITE IS ZONED AS INDUSTRIAL
- TOTAL AREA OF SITE: 70.3 AC

ENVIRONMENTAL SITE NOTES

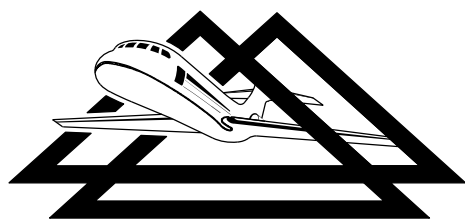
- WATERSHED DRAINAGE BASIN: DOUBLE PIPE CREEK
WATERSHED NO. 02140304
- SOILS SHOWN ARE FROM USDA NCRS WEB SOIL SURVEY.
- NO RARE, THREATENED OR ENDANGERED PLANT, ANIMAL SPECIES OR HABITAT WERE OBSERVED DURING THE SITE VISIT OR HAVE BEEN RECORDED BY MDNR.
- NO FEMA FLOODPLAIN IS ON SITE.

FOREST CONSERVATION DETAIL

SCALE: HORIZ.: 1" = 30'
VERT.: 1" = 5'



439 East Main Street Westminster, MD 21157-5539
(410) 848-1730 FAX (410) 848-1791



3544 North Progress Avenue, Suite 200 • Harrisburg, Pennsylvania 17110
phone: (717) 652-8700 • fax: (717) 652-8371 • www.deltairport.com

**DELTA AIRPORT
CONSULTANTS, INC.**

PRELIMINARY DESIGN REVIEW
SUBMISSION - DO NOT USE
FOR CONSTRUCTION

Laura Lumley
MDNR Qualified Professional
of Forestry

RELOCATE MEADOW BRANCH ROAD

FOREST STAND DELINEATION &
CONSERVATION PLAN
NOTES & DETAILS

CARROLL COUNTY REGIONAL AIRPORT

AIP NO.
3-24-0028-031-2019

DRAWN BY:
SAK

DESIGNED BY:
JTZ

SCALE:

DATE:
MARCH, 2022

JOB NO.
18011

SHEET
OF
40

40

Mary Ashburn Pearson

From: Bowman, Jonathan <jbowman@carrollcountymd.gov>
Sent: Thursday, October 12, 2023 9:08 AM
To: Mary Ashburn Pearson
Cc: Roy G. Lewis; Adam D. Switzer; Myers, Mark; Burdine, Eric
Subject: RE: Carroll County Airport - FSD and FCP

Ms. Ashburn,
I am amenable to the preparation and submittal of the FSD/FCP during the design phase.

Jonathan Bowman
Carroll County Bureau of Resource Management
410-386-2133

From: Mary Ashburn Pearson <mapearson@deltaairport.com>
Sent: Wednesday, October 11, 2023 9:23 AM
To: Bowman, Jonathan <jbowman@carrollcountymd.gov>
Cc: Roy G. Lewis <RLewis@deltaairport.com>; Adam D. Switzer <aswitzer@deltaairport.com>; Myers, Mark <mlmyers@carrollcountymd.gov>
Subject: Carroll County Airport - FSD and FCP

This message originated outside of Carroll County Government. Use caution when opening attachments, clicking links or responding to requests for information.

Johnathan,

As a follow-up to our phone discussion this morning, my firm is preparing the Supplemental Environmental Assessment (SEA) for the runway replacement program for the Carroll County Regional Airport (DMW).

As part of the project, approximately 105 acres of trees must be removed/trimmed to ensure that the airspace associated with the existing and future runways remains clear. This is an FAA requirement.

The scope of work for the SEA notes that a Forest Stand Delineation and a Forest Conservation Plan are to be prepared during the subsequent design and permitting phase, which we hope to kick off in federal fiscal year 2024. Once those are prepared, we would submit them to your office and coordinate the necessary mitigations to comply with the Forest Conservation Act.

This email is to document that the preparation of the FSD/FCP during the design phase (instead of during the environmental phase) is acceptable to your office.

Thank you,

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAairport.COM

Please note that e-mail and any attachments sent to and from this address may be subject to the Maryland Public Information Act and unless otherwise privileged, must be disclosed to third parties.

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)					Date Of Land Evaluation Request				
Name of Project					Federal Agency Involved				
Proposed Land Use					County and State				
PART II (To be completed by NRCS)					Date Request Received By NRCS		Person Completing Form:		
Does the site contain Prime, Unique, Statewide or Local Important Farmland? (If no, the FPPA does not apply - do not complete additional parts of this form)					YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size	
Major Crop(s)		Farmable Land In Govt. Jurisdiction Acres: %			Amount of Farmland As Defined in FPPA Acres: %				
Name of Land Evaluation System Used		Name of State or Local Site Assessment System			Date Land Evaluation Returned by NRCS				
PART III (To be completed by Federal Agency)					Alternative Site Rating				
					Site A	Site B	Site C	Site D	
A. Total Acres To Be Converted Directly									
B. Total Acres To Be Converted Indirectly									
C. Total Acres In Site									
PART IV (To be completed by NRCS) Land Evaluation Information									
A. Total Acres Prime And Unique Farmland									
B. Total Acres Statewide Important or Local Important Farmland									
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted									
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value									
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)									
PART VI (To be completed by Federal Agency) Site Assessment Criteria (Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)					Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use					(15)				
2. Perimeter In Non-urban Use					(10)				
3. Percent Of Site Being Farmed					(20)				
4. Protection Provided By State and Local Government					(20)				
5. Distance From Urban Built-up Area					(15)				
6. Distance To Urban Support Services					(15)				
7. Size Of Present Farm Unit Compared To Average					(10)				
8. Creation Of Non-farmable Farmland					(10)				
9. Availability Of Farm Support Services					(5)				
10. On-Farm Investments					(20)				
11. Effects Of Conversion On Farm Support Services					(10)				
12. Compatibility With Existing Agricultural Use					(10)				
TOTAL SITE ASSESSMENT POINTS					160				
PART VII (To be completed by Federal Agency)									
Relative Value Of Farmland (From Part V)					100				
Total Site Assessment (From Part VI above or local site assessment)					160				
TOTAL POINTS (Total of above 2 lines)					260				
Site Selected:		Date Of Selection			Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>				
Reason For Selection:									
Name of Federal agency representative completing this form:								Date:	

(See Instructions on reverse side)

Form AD-1006 (03-02)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

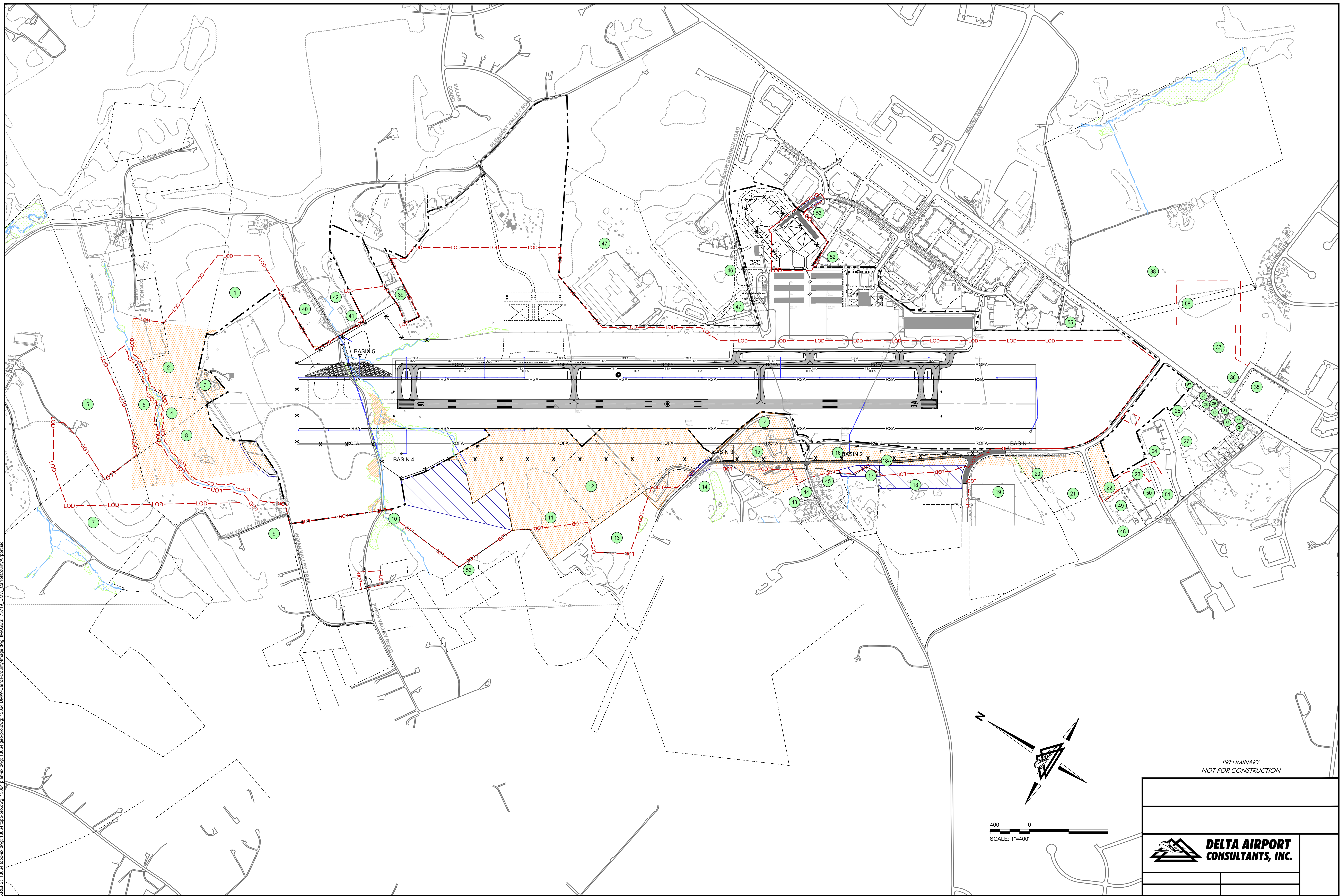
Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.



PRELIMINARY
NOT FOR CONSTRUCTION



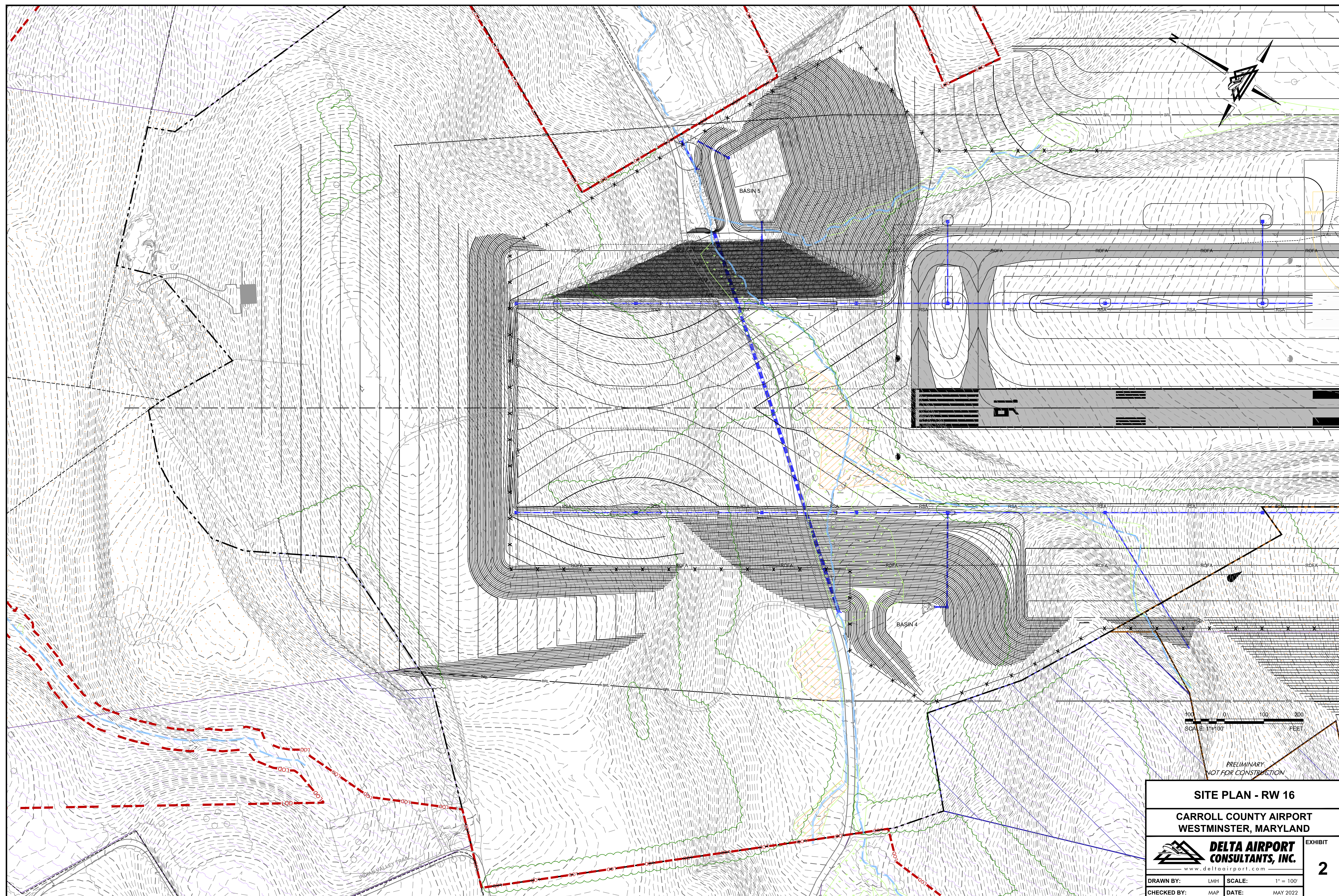
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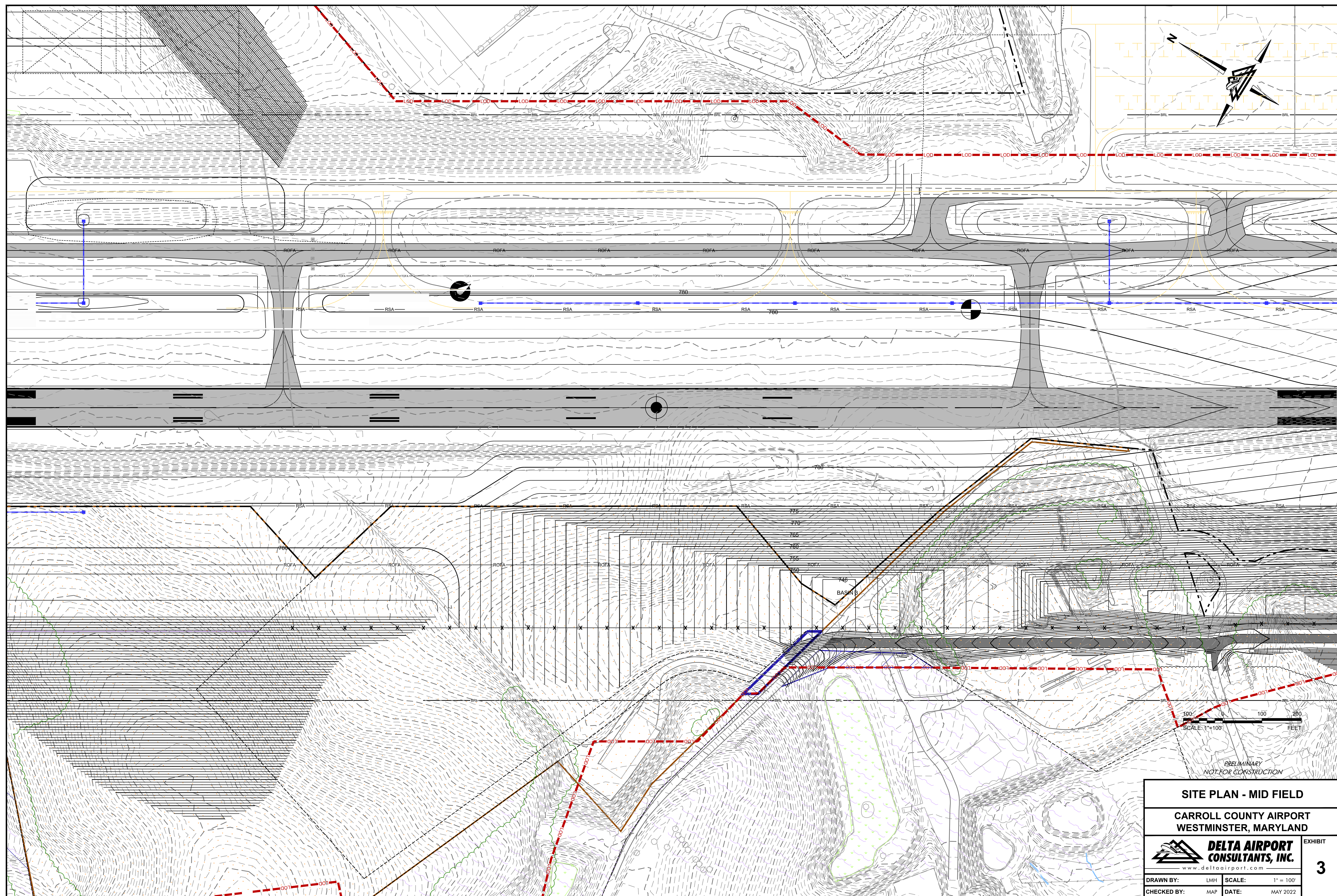


SCALE: 1"=400'



DRAWING: 21051 - Project Development 1.dwg LAYOUT: L1
 XREFS: 13064 top-ex.dwg; 13064 top-pro.dwg; 13064 plan-ex.dwg; 13064 geo-pro.dwg; 13064 DMV-Carroll-County-Image.dwg IMAGES: 73719, DAW, Carroll-County-Airport.sld-





SITE PLAN - MID FIELD

**CARROLL COUNTY AIRPORT
WESTMINSTER, MARYLAND**



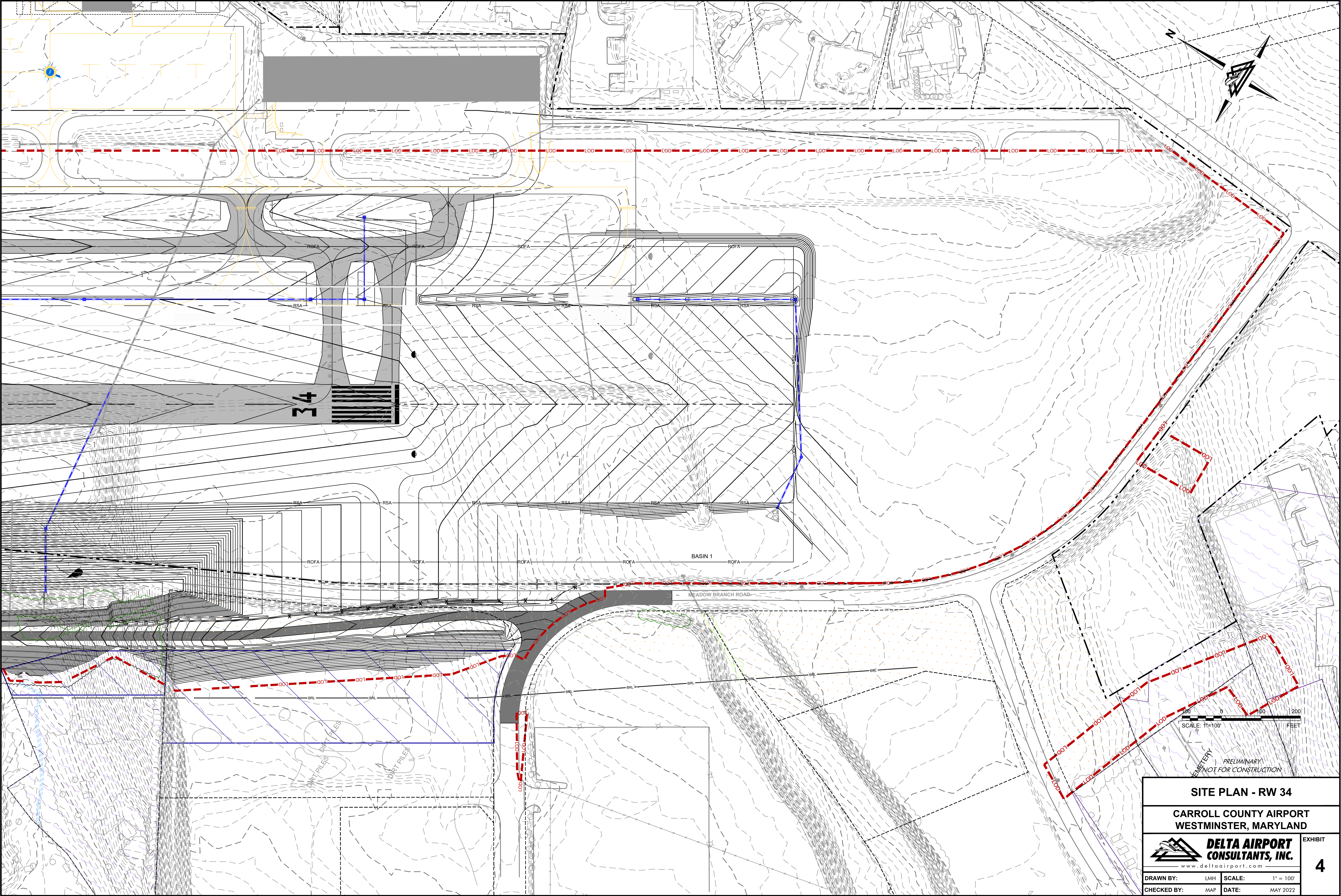
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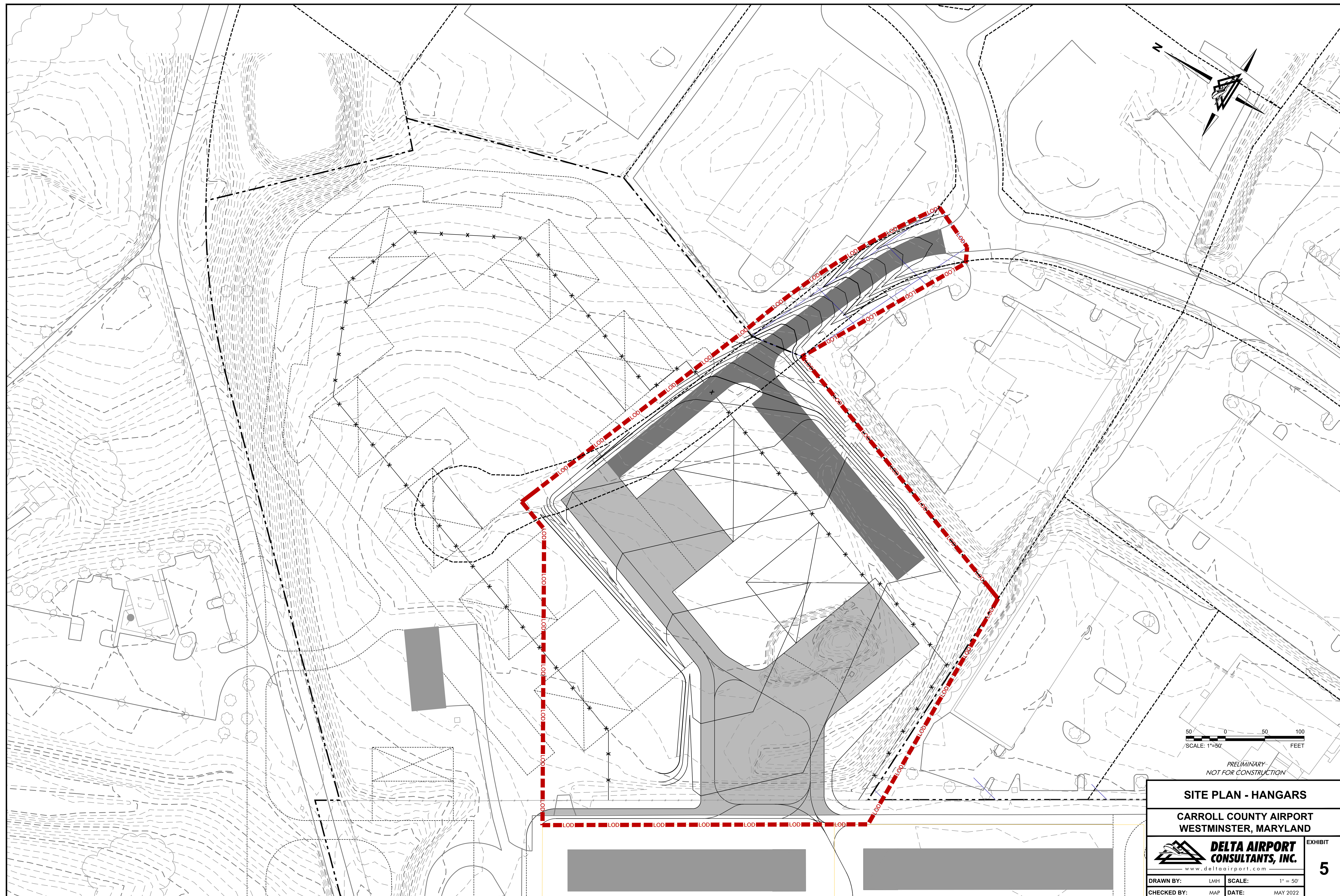
DRAWN BY:	LMH	SCALE:	1" = 10'
CHECKED BY:	MAP	DATE:	MAY 202

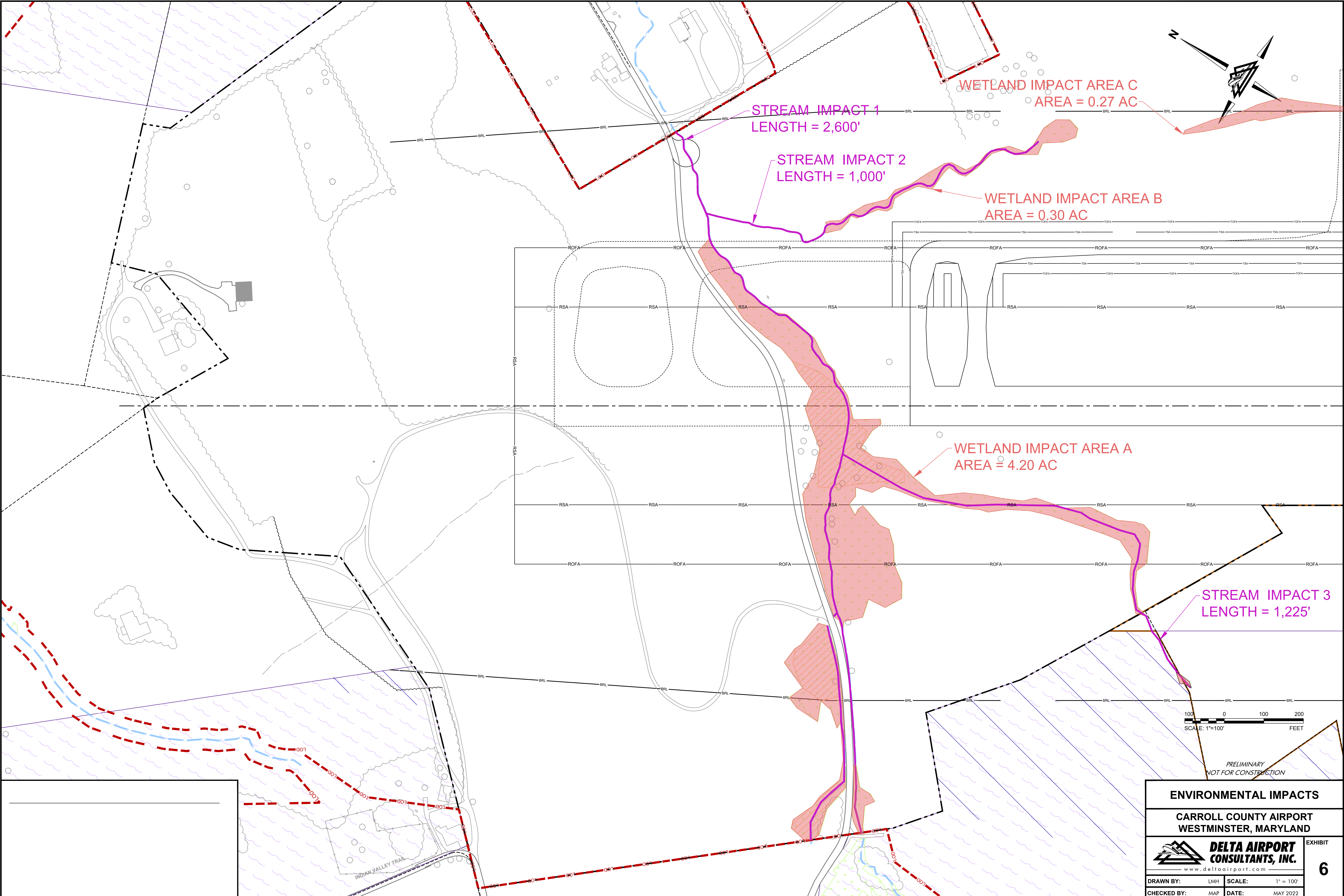
	EXHIBIT
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3



SITE PLAN - RW 34		
CARROLL COUNTY AIRPORT WESTMINSTER, MARYLAND		
 DELTA AIRPORT CONSULTANTS, INC. <small>www.deltaairport.com</small>		EXHIBIT 4
DRAWN BY: LMH	SCALE: 1" = 100'	
CHECKED BY: MAP	DATE: MAY 2022	





ENVIRONMENTAL IMPACTS			
CARROLL COUNTY AIRPORT WESTMINSTER, MARYLAND			
 DELTA AIRPORT CONSULTANTS, INC. www.deltaairport.com			EXHIBIT 6
DRAWN BY:	LWH	SCALE:	1" = 100'
CHECKED BY:	MAP	DATE:	MAY 2022



May 26, 2022

Memorandum

To: Distribution List- via Email Only

From: Mary Ashburn Pearson, AICP
Delta Airport Consultants, Inc.

Reference: Carroll County Regional Airport, Supplemental Environmental Assessment
Agency Coordination Letter- Invitation to Comment

In 2009, the Commissioners of Carroll County, Maryland, Owner and Operator of the Carroll County Regional Airport (DMW), completed an Environmental Assessment (EA) for a runway replacement program and on-airfield development.

Due to revisions to the proposed development plan (Proposed Action), Supplemental Environmental Assessments (SEA) were prepared for the project in 2018 and 2020. Since 2020, the proposed project has been refined to include additional areas of grading, adjusted locations of proposed development items (for example, the location of proposed cul-de-sacs), and other changes which are outlined in Table 1 and in the attached Exhibits 1 and 2. The County has retained Delta Airport Consultants, Inc. to prepare a Supplemental EA to reflect these 2022 refinements. The Supplemental EA is to be prepared consistent with the guidelines of the National Environmental Policy Act (NEPA) and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

Agency coordination was conducted during preparation of the previous EA/SEAs. You are included on the distribution list for this agency scoping memo because you, or your agency, were contacted during the previous environmental review efforts.

The purpose of this letter is to invite interested and involved parties to comment on items for the applicant to consider during the 2022 Supplemental EA process.

Due to funding and regulatory restrictions, the runway replacement project is to be conducted in phases, with the first phase being the relocation of Meadow Branch Road, which proposed for 2022. Subsequent phases include the construction of the replacement runway and associated parallel taxiway, obstruction (tree) removal and grading on airport and adjoining parcels to protect airspace, and the construction of hangars on-airport as demand dictates.

Table 1

2009 EA	2018 Supplement	2020 Supplement	2022 Supplement
Construct replacement RW, 6,400' x 100'	Construct replacement RW, 5,500' x 100'	No Change	No Change
Construct full length TW, 6,400' x 50'	Construct full TW, 5,500' x 35'	No Change	No Change
Install Cat. I ILS	See Note 1	No Change	No Change
Acquire 101± acres of fee-simple land	Acquire 185± acres of fee-simple land	No Change	Acquire 109± acres of fee-simple land
Acquire 33± acres of avigation easements	Acquire 312± acres of avigation easements	No Change	Acquire 245± acres of avigation easements
Acquire grading easement, amount unnamed	Acquire 19± acres of grading easements	Acquire an additional 0.14± acre of grading easement on Parcel 19	Acquire 15± acres of grading easements (total)
Remove obstructions on 70± acres	Remove obstructions on 63± acres	No Change	Remove obstructions on 105± acres
Realign Meadow Branch Road	Realign Meadow Branch Road	No Change	Road alignment refined during preliminary design
Construct 4 conventional hangars and 7 T-hangars w/ auto parking	Construct 2 conventional hangars w/ auto parking, and no T-hangars	No Change	No Change
Relocate fuel farm	See Note 1	No Change	No Change
Remove 4,000-feet of Pinch Valley Road (Cul-de-sac Pinch Valley Road)	Same as 2009	No Change	Eastern cul-de-sac location moved on airport
Install perimeter/security fence	Same as 2009	No Change	No Change
Relocate three residences and three businesses	Relocate three residences and <u>two</u> businesses and possibly a private swimming pool	No Change	Relocate <u>two</u> residences and two businesses and possibly a private swimming pool
Relocate AWOS to temporary location	Not included	Not included	Included in 2022 review
Acquire Line-of-Sight Easement for Meadow Branch Road (Parcel 45)	Not included	Not included	Included in 2022 review
Additional On-Airport Grading	No Change	Additional on-airport grading	No Change



Existing Land Use

DMW is an operating, general aviation airport located on approximately 420 acres in Carroll County, Maryland. The topography of the area immediately surrounding the airport consists of rolling hills with gentle to steep slopes. Topography ranges between 700 and 800 feet above mean sea level (MSL). The airport is situated at 789 MSL. The Airport property borders the northwest boundary of the City of Westminster. The Airport property is zoned AG (Agricultural) and IR (Industrial); the surrounding parcels are zoned AG, IR, Conservation, and Residential. The appropriate property interest acquisitions (including fee simple acquisition and aviation easements) are to be secured on the off-airport properties before construction or obstruction removal can begin.

Select Environmental Analysis

Wetlands and Streams

A wetland delineation was conducted during the 2018 SEA which identified approximately 17 acres of wetlands and 18,088 linear feet (LF) of streams within the study area.

The 2018 SEA estimated that there will be 4.11 acres of impacts to wetlands impacts to 3,660 linear feet (LF) of streams due to grading and construction associated with the replacement runway. The 2022 SEA, which includes expanded areas of grading, estimates impacts to approximately 4.8 acres of wetlands and 5,400 LF of stream. A Joint Permit Application is to be submitted to the USACE and MDE during the design and permitting phase for the runway replacement effort.

Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website identified the Indiana Bat, Northern Long-eared Bat, and the Monarch Butterfly as species which may be present within the project area. The Monarch Butterfly is a newly-added species which was not identified during the 2018 and 2020 SEAs. Coordination with USFWS is to be conducted regarding these species during the 2022 SEA; previously conducted coordination is described below:

Indiana Bat

The United States Fish and Wildlife Service (USFWS) has identified the Indiana Bat as a protected species which could be found in the project area. Coordination with USFWS was conducted during the 2018 SEA and has been maintained as the design effort has progressed, with the chosen mitigation method to adhere to a time-of-year restriction for tree clearing to avoid potential impacts to the bat.



Bog Turtle

Phase 1, Phase II and Phase III (trapping) Bog Turtle Habitat Assessments were completed during the 2009 EA; no bog turtles were found. Based on Maryland Department of Natural Resources (DNR) direction, a Phase 1 Bog Turtle Habitat Assessment was conducted during the 2018 SEA effort which identified several wetland areas which could be suitable habitat for the Bog Turtle but did not find any turtles. During the 2018 SEA, Maryland DNR directed that a trapping effort be conducted on these wetland areas during the design and permitting phase of the project during the May 1-June 15 trapping window.

Maryland Forest Conservation Act

A Forest Stand Delineation (FSD) and report was prepared during the 2009 EA and was submitted to the Carroll County Bureau of Resource Management for review and concurrence. An updated FSD, Forest Conservation Plan (FCP) and associated local coordination should be conducted during the project design phase and is not included in this SEA scope of work.

Historic and Cultural Resources

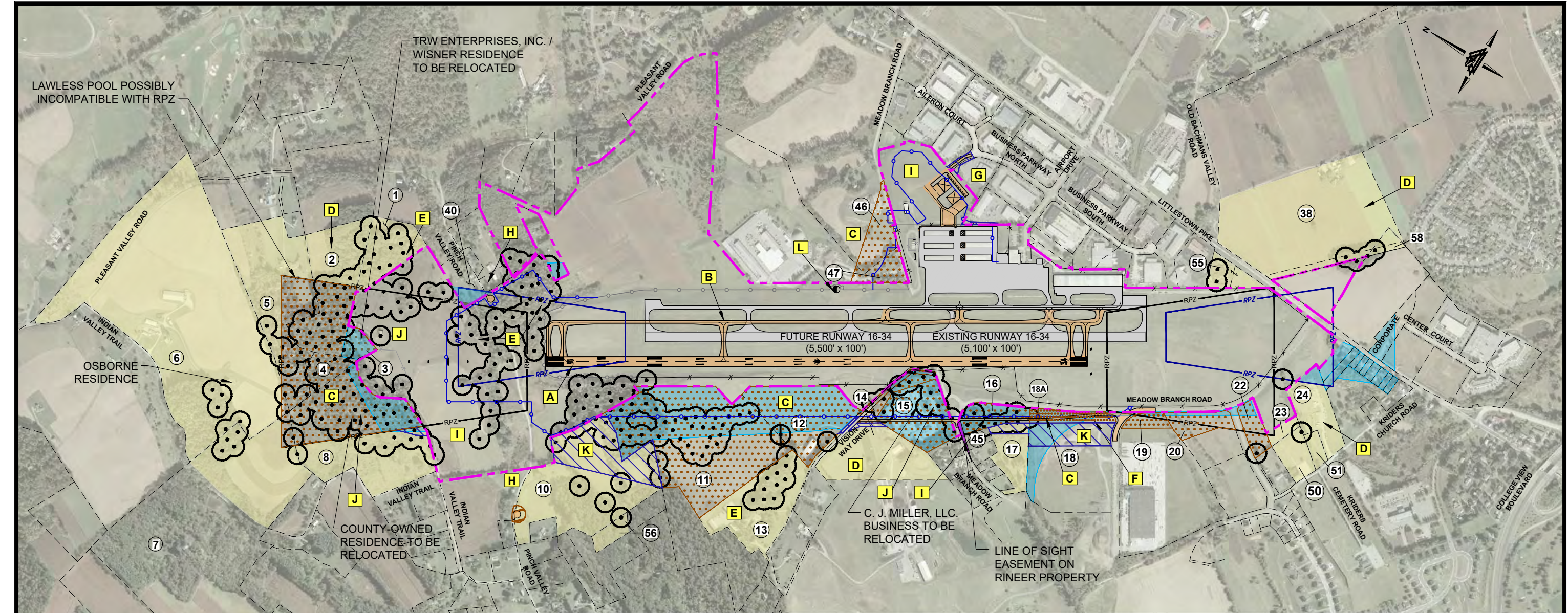
Phase 1 and Phase II Cultural Resources surveys were conducted during the 2009 EA. Coordination with the Maryland Historical Trust (MHT) was conducted during the 2009 EA, 2018 SEA, and 2020 SEA, with "no affect" determinations. Coordination is to be conducted during this 2022 effort to keep the MHT up to date on the refined project development plan.

Please send all comments to the address below or to mapearson@deltaairport.com no later than June 27, 2022.

Ms. Mary Ashburn Pearson, AICP
Delta Airport Consultants, Inc.
2700 Polo Parkway
Richmond, VA 23113

If you have any questions or need further information, please do not hesitate to contact me.

Thank you for your time and input!



DRAWING: 21051-Exhibit1-Proposed-Action-with-Aerial-1.mxd LAYOUT: L1 (2)

ENVIRONMENTAL ASSESSMENT ITEMS

- A** CONSTRUCT REPLACEMENT RUNWAY
- B** CONSTRUCT FULL-LENGTH TAXIWAY
- C** ACQUIRE 109± ACRES FEE SIMPLE
- D** ACQUIRE 245± ACRES AVIGATION EASEMENTS
- E** REMOVE OBSTRUCTIONS ON 105± ACRES
- F** REALIGN MEADOW BRANCH ROAD
- G** CONSTRUCT 2 HANGARS AND AUTOMOBILE PARKING
- H** CUL-DE-SAC PINCH VALLEY ROAD
- I** INSTALL PERIMETER / SECURITY FENCE
- J** RELOCATE 2 RESIDENCES, 2 BUSINESSES, POSSIBLY 1 SWIMMING POOL
- K** ACQUIRE 15± ACRES GRADING EASEMENT
- L** RELOCATE AWOS TO TEMPORARY LOCATION

PROPOSED PROPERTY INTEREST ACQUISITIONS					
PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	ACREAGE		
			FEE SIMPLE	AVIGATION EASEMENT	GRADING EASEMENT
1	30 / 589	MILLER	0.1±	6.7±	
2	30 / 20	ABDELMOMIN	7.4±	7.6±	
3	30 / 394	WISNER, THOMAS ROBERT	1.7±		
4	30 / 276	PATTERSON	2.8±		
5	30 / 482	LAWLESS	7.6±	13.9±	
6	30 / 573	OSBORNE	0.3±	79.1±	
7	30 / 258	CRONE/ TANSILL	0.1±	17.3±	
8	30 / 35	COMMISSIONERS OF CARROLL COUNTY	13.8±	14.3±	0.4±
10	30 / 161	MILLER	0.4±	26.0±	9.4±
11	38 / 676	JRP VISION, LLC	33.2±		
12	38 / 676	JRP VISION, LLC	12.7±		
13	38 / 676	JRP VISION, LLC	0.3±	13.4±	0.1±
14	38 / 798	JRP VISION, LLC	1.7±	11.9±	
15	38 / 197	COMMISSIONERS OF CARROLL COUNTY	8.4±		
16	38 / 759	COMMISSIONERS OF CARROLL COUNTY	3.4±		
17	38/462	COMMISSIONERS OF CARROLL COUNTY	0.1±	4.9±	0.9±
18A	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	2.5±		
18	114 / 6784	TRIPLE M. LLC, JACOBS RIDGE LLC			4.5±

PROPOSED PROPERTY INTEREST ACQUISITIONS				
PARCEL (ID)	MAP/ PARCEL	PROPERTY OWNER	ACREAGE	
			FEE SIMPLE	AVIGATION EASEMENT
19	114 / 6784	DLH, LLP		0.3±
20	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	3.1±	
22	114 / 6784	COMMISSIONERS OF CARROLL COUNTY	2.5±	
23	38 / 661	BENJAMIN KRIDER'S UNITED CHURCH OF CHRIST	0.1±	1.0±
24	38 / 646	CARROLL COUNTY ARC		5.3±
38	39 / 312	FROCK		33.9±
40	30 / 501	SHAUN JAMES/ ELIZABETH HILL	0.1±	
45	38 / 462	RINEER - LINE OF SIGHT EASEMENT		
46	30 / 36	COMMISSIONERS OF CARROLL COUNTY	4.3±	
47	38 / 600	COMMISSIONERS OF CARROLL COUNTY	2.7±	
50	38 / 817	BENJAMIN'S REFORMED CHURCH OF CARROLL COUNTY		3.2±
51	38 / 646	COMMISSIONERS OF CARROLL COUNTY		1.2±
55	114 / 6801	KBTC INC.		1.7±
56	38 / 555	KLEIN/ KALETA		1.6±
58	39 / 774	COMMISSIONERS OF CARROLL COUNTY		2.0±

OBSTRUCTION REMOVAL
EXISTING = 25± ACRES
PROPOSED = 80± ACRES

LEGEND		
DESCRIPTION	EXISTING	PROPOSED
AIRPORT PROPERTY		NA
ADJACENT PARCEL LINE		NA
FENCE		
RUNWAY PROTECTION ZONE (RPZ)		
AVIGATION EASEMENT		
GRADING EASEMENT	NA	
LAND ACQUISITION	NA	
LIMITS OF OBSTRUCTIONS		SAME
LINE OF SIGHT EASEMENT	NA	
AWOS		

1000 0 1000 2000
SCALE: 1"=1000' FEET

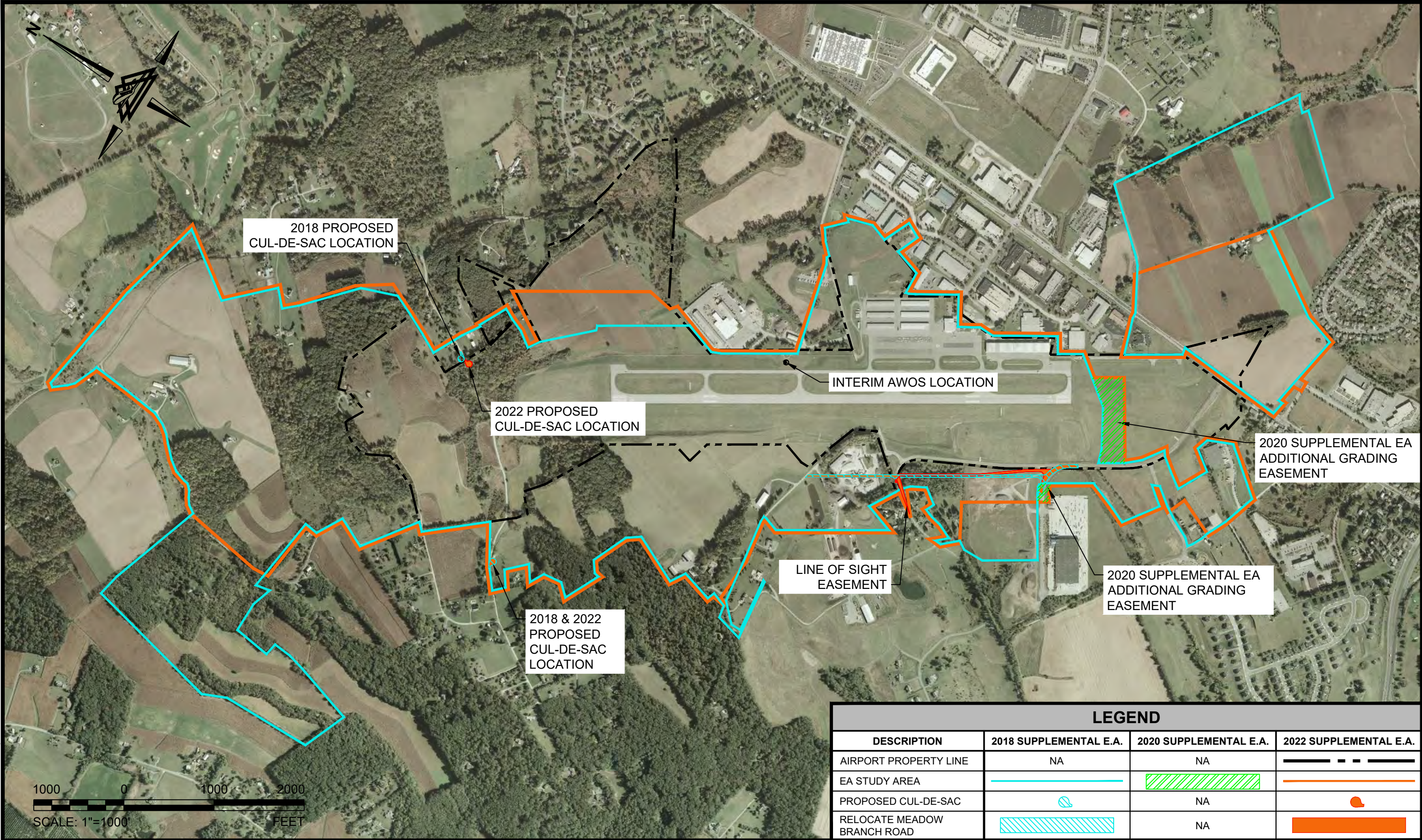


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ALL PROJECT INCLUDE PROPOSED ACTION 2022 SUPPLEMENTAL EA
CARROLL COUNTY REGIONAL AIRPORT

DRAWN BY: LMH CHECKED BY: MAP SCALE: 1"=1000' DATE: APRIL 2022

EXHIBIT
1



LEGEND			
DESCRIPTION	2018 SUPPLEMENTAL E.A.	2020 SUPPLEMENTAL E.A.	2022 SUPPLEMENTAL E.A.
AIRPORT PROPERTY LINE	NA	NA	---
EA STUDY AREA	—	▨	—
PROPOSED CUL-DE-SAC	⦿	NA	●
RELOCATE MEADOW BRANCH ROAD	▨	NA	▨

COMPARISON OF STUDY AREAS
CARROLL COUNTY REGIONAL AIRPORT

EXHIBIT
21

DRAWN BY: NYB CHECKED BY: MAP SCALE: 1" = 1000' DATE: MARCH 2022

DRAWING: 21051-ext-EA Comparison.lnh.dwg LAYOUT: L1



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Mary Ashburn Pearson

From: Mary Ashburn Pearson
Sent: Friday, June 24, 2022 1:04 PM
To: 'Lori Byrne -DNR-'
Cc: Cheryl A. Rodriguez
Subject: Environmental Review Request
Attachments: 21051 DMW agency coordination memo.pdf; RE: Carroll County Regional Airport

Categories: Filed by Newforma

Hello Lori-

The Carroll County Regional Airport (DMW) is proposing a runway replacement project and our firm is preparing a Supplemental Environmental Assessment (EA) for the project. This is the same project that your office reviewed and provided comment on in the 2016 time frame (see email attached).

FAA regulations require that a Supplemental EA be prepared due to some scope changes to the initial project. The first attachment, the Agency Coordination Memo, describes this in more detail.

We are requesting a review by your office of state-protected species which may be in the project area.

If you have questions or need additional information, just let us know.

Thank you!

Mary Ashburn

Mary Ashburn Pearson, AICP
Project Manager
DELTA AIRPORT CONSULTANTS, INC.
P. 804.955.4556 | WWW.DELTAIRPORT.COM



Larry Hogan, Governor
Boyd Rutherford, Lt. Governor
Jeannie Haddaway-Riccio, Secretary
Allan Fisher, Deputy Secretary

August 15, 2022

Ms. Mary Ashburn Pearson
Delta Airport Consultants, Inc.
9711 Farrar Court
Suite 100
Richmond, Virginia 23236

RE: Environmental Review for Carroll County Regional Airport, Supplemental EA, Carroll County, Maryland.

Dear Ms. Pearson:

The Wildlife and Heritage Service has no official records for State or Federal listed, candidate, proposed, or rare plant or animal species within the project area shown on the map provided. As a result, we have no specific concerns regarding potential impacts to such species or recommendations for protection measures at this time. If the project changes in the future such that the limits of proposed disturbance or overall site boundaries are modified, please provide us with revised project maps and we will provide you with an updated evaluation.

Thank you for allowing us the opportunity to review this project. If you should have any further questions regarding this information, please contact me at lori.byrne@maryland.gov or at (410) 260-8573.

Sincerely,

Lori A. Byrne,
Environmental Review Coordinator
Wildlife and Heritage Service
MD Dept. of Natural Resources

ER# 2022.1007.cl

Mary Ashburn Pearson

From: Joshua Tiralla -MDE- <joshua.tiralla@maryland.gov>
Sent: Friday, December 1, 2023 5:01 PM
To: Mary Ashburn Pearson
Cc: Cheryl A. Rodriguez
Subject: Re: Carroll County airport wetlands

Hi Mary, please see the responses in red. Have a great weekend!

-FAA has requested that we ask MDE whether the isolated wetlands on the airfield would be “jurisdictional.” Given that the MDE currently regulates isolated wetlands, we believe that FAA is looking for MDE’s opinion on whether the USACE would take jurisdiction over isolated wetlands going forward. You may not be able to answer this with confidence given that MDE is not privy to USACE’s current or future guidance regarding isolated wetlands.

Officially I would say any questions regarding USACE jurisdiction should be referred to USACE. The USACE definition and MDE definition of isolated nontidal wetlands are not exactly the same (USACE definition is much broader). That said, USACE doesn’t regulate nontidal wetlands they consider isolated.

-FAA has requested that we confirm with the MDE who may issue the permit for this runway work, once we get into the design and permitting phase. From our research during the 2018 SEA, based on the number of acres being impacted (at the time, 4.11 acres), the USACE would regulate the project. Can you comment on this today or would that decision be made during the permitting phase?

MDSPGP-6 Category thresholds can vary by activity type. Assuming we are talking about 4.11 acres of permanent nontidal wetland impacts that are regulated by USACE, the project wouldn’t qualify for the MDSPGP and would need to be issued as an Individual Permit by USACE separately from the Permit issued by MDE. The official MDSPGP categorization would occur when the JPA is submitted.

-Our understanding pre-Sackett is that the USACE regulates the placement of fill material in wetlands and streams while the MDE regulates any disturbance (including the clearing of vegetation) in wetlands, 25-foot wetland buffers, streams, and the 100-year floodplain. MDE also regulates the conversion of forested (PFO) and scrub-shrub (PSS) wetlands to emergent (PEM) wetlands. Conversely, the USACE does not regulate conversion activities if the stumps/root wads are left in place and movement of dirt does not occur. Post-Sackett, we anticipate that USACE will no longer regulate whatever is determined to be an isolated wetland, or ephemeral streams. MDE also does not regulate ephemeral streams under its current program. Is this correct to you based on your understanding of both agency’s programs?

In general, this is my understanding. Again, officially I would say any questions regarding USACE jurisdiction should be referred to USACE. Just for clarification - USACE didn’t regulate isolated wetlands pre-Sackett. My understanding is that post-Sackett there will be a more narrow definition of the adjacent wetlands that are regulated by USACE. Also I haven’t heard anything definitive stating that ephemeral streams will no longer be regulated by USACE, but that is typically what is expected.

-FAA has requested that we confirm with MDE on what sort of mitigation you may require. We already discussed MDE’s preferred mitigation methods this morning which we documented in our email. It appears that based on the amount of impacts, the two mitigation methods available would be either wetland banking or PRM, as the in-lieu program is only available for smaller programs. We understand that forested wetland impacts are usually mitigated at a 2:1 ratio while impacts to emergent wetlands and conversion are mitigated at a 1:1 ratio.

Agreed. Please note MDE requires higher replacement ratios if the wetland being impacted is designated as a nontidal wetland of special State concern (2:1 for emergent and 3:1 for forested).

Josh Tiralla

Natural Resources Planner
Water & Science Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230
joshua.tiralla@maryland.gov
410-537-3558 (O)
[Website](#) | [Facebook](#) | [Twitter](#)

Click here to complete a three question [customer experience survey](#).

On Fri, Dec 1, 2023 at 2:27 PM Mary Ashburn Pearson <mapearson@deltaairport.com> wrote:

Josh,

A few more questions, if we may:

-FAA has requested that we ask MDE whether the isolated wetlands on the airfield would be “jurisdictional.” Given that the MDE currently regulates isolated wetlands, we believe that FAA is looking for MDE’s opinion on whether the USACE would take jurisdiction over isolated wetlands going forward. You may not be able to answer this with confidence given that MDE is not privy to USACE’s current or future guidance regarding isolated wetlands.

-FAA has requested that we confirm with the MDE who may issue the permit for this runway work, once we get into the design and permitting phase. From our research during the 2018 SEA, based on the number of acres being impacted (at the time, 4.11 acres), the USACE would regulate the project. Can you comment on this today or would that decision be made during the permitting phase?

-Our understanding pre-Sackett is that the USACE regulates the placement of fill material in wetlands and streams while the MDE regulates any disturbance (including the clearing of vegetation) in wetlands, 25-foot wetland buffers, streams, and the 100-year floodplain. MDE also regulates the conversion of forested (PFO) and scrub-shrub (PSS) wetlands to emergent (PEM) wetlands. Conversely, the USACE does not regulate conversion activities if the stumps/root wads are left in place and movement of dirt does not occur. Post-Sackett, we anticipate that USACE will no longer regulate whatever is determined to be an isolated wetland, or ephemeral streams. MDE also does not regulate ephemeral streams under its current program. Is this correct to you based on your understanding of both agency’s programs?

-FAA has requested that we confirm with MDE on what sort of mitigation you may require. We already discussed MDE’s preferred mitigation methods this morning which we documented in our email. It appears that based on the amount of impacts, the two mitigation methods available would be either wetland banking or PRM, as the in-lieu program is only available for smaller programs. We understand that forested wetland impacts are usually mitigated at a 2:1 ratio while impacts to emergent wetlands and conversion are mitigated at a 1:1 ratio.

We appreciate your time!

Mary Ashburn

Mary Ashburn Pearson, AICP

Project Manager

DELTA AIRPORT CONSULTANTS, INC.

P. 804.955.4556 | WWW.DELTAairport.COM

From: Joshua Tiralla -MDE- <joshua.tiralla@maryland.gov>
Sent: Friday, December 1, 2023 10:13 AM
To: Mary Ashburn Pearson <mapearson@deltaairport.com>
Cc: Cheryl A. Rodriguez <CRodriguez@deltaairport.com>
Subject: Re: Carroll County airport wetlands

Hi Mary,

Your summary is accurate. The Supreme Court's decision in Sackett v EPA does not change MDE jurisdiction over waters of the State, nor does it change MDE's mitigation requirements. I would recommend contacting the USACE Baltimore District Regulatory Program if you would like information on how the ruling impacted the definition of waters of the US, and subsequently altered federal jurisdiction,

Regards,

Josh

Josh Tiralla

Natural Resources Planner
Water & Science Administration
Maryland Department of the Environment
1800 Washington Boulevard
Baltimore, Maryland 21230
joshua.tiralla@maryland.gov
410-537-3558 (O)
[Website](#) | [Facebook](#) | [Twitter](#)

Click here to complete a three question [customer experience survey](#).

On Fri, Dec 1, 2023 at 9:49 AM Mary Ashburn Pearson <mapearson@deltaairport.com> wrote:

Josh,

Thank you for your time on the phone this morning discussing potential impacts of the recent “Sackett” decision on MDE’s wetlands jurisdiction. I understand that the decision impacts wetlands jurisdiction on the federal level, but does not change MDE’s jurisdiction, including MDE’s regulation of isolated wetlands. I also understand there are no changes to state mitigation programs/requirements stemming from the Sackett decision. Mitigation preference by MDE continues to be wetland banking / PRM / in-lieu fee (although the in-lieu program is available only to small projects, less than 10,000-sf of impacts). Also great news that there are additional wetland banking options in the airport’s HUC code that weren’t available when we finalized the 2018 EA!

Thanks so much,

Mary Ashburn

Mary Ashburn Pearson, AICP

Project Manager

DELTA AIRPORT CONSULTANTS, INC.

P. 804.955.4556 | WWW.DELTAAIRPORT.COM

[Click here](#) to complete a three question customer experience survey.

[Click here](#) to complete a three question customer experience survey.