Maryland Offshore Wind Project

Class I AQRV Assessment Modeling Protocol

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1.0 INTRODUCTION

US Wind, Inc. (US Wind) is developing the Maryland Offshore Wind Project (the Project), an offshore wind energy project of up to approximately 2 gigawatts (GW) of nameplate capacity within OCS-A 0490 (the Lease area), a Lease area of approximately 80,000 acres located approximately 18.5 km (11.5 miles, 10.0 nautical miles [NM]) off the coast of Maryland on the outer continental shelf (OCS). The Project Design Envelope (PDE) includes up to 121 wind turbine generators (WTG), up to four (4) offshore substations (OSS), and one (1) meteorological tower (Met Tower) located in the Lease area. The Project would be interconnected to the onshore electric grid by up to four (4) new 230-275 kV export cables into new onshore substations in Delaware. US Wind is required by the OCS Air Regulations in 40 Code of Federal Regulations (CFR) Part 55.4, to obtain an air permit for the proposed construction and operation and maintenance (O&M) of the Project.

On November 30, 2023, US Wind provided the Maryland Department of the Environment with an updated OCS air quality permit application in support of the OCS air permitting. In accordance with federal Prevention of Significant Deterioration (PSD) regulations, additional Class I impacts must be addressed for projects subject to PSD review.

This Class I AQRV air quality modeling protocol (Protocol) is a supplement to the November 30, 2023 OCS air permit application to address CALPUFF (a multi-layer, multi-species non-steady-state puff dispersion model) long range transport modeling for assessing Class I area Air Quality Related Values (AQRVs). An AQRV is defined as a resource, identified by the Federal Land Manager (FLM) for one or more Federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the FLM for a particular area. This Protocol provides the CALPUFF modeling procedures and data that are proposed for use in the Class I AQRVs assessment.

2.0 PROJECT DESCRIPTION AND EMISSIONS

The pollutant-emitting activities within the wind development area (WDA) are part of a single plan to construct and operate the Project. For Part 55 OCS air permits, the definition of the WDA comprises the WTGs and their foundations, the OSSs and their foundations, and the inter-array cables. In addition to the windfarm components in the WDA, the facility would include vessels when they meet the definition of an OCS source in Part 55 (i.e., when permanently or temporarily attached to the seabed for the purpose of exploring, developing, or producing resources; or physically attached to an OCS facility).

During construction, pollutant-emitting activities from the windfarm include temporary diesel generators (i.e., engines) used to supply power to the OSSs during commissioning, temporary diesel generators associated with powering noise attenuation technologies, and engines on vessels that meet the definition of OCS source. During the O&M phase, pollutant-emitting activities from the windfarm would include engines on vessels that meet the definition of an OCS source, as well as generators on the OSSs.

As required by Section 328 of the Clean Air Act, when a vessel does not meet the definition of an OCS source, the emissions from vessels servicing or associated with any part of an OCS source are included in the potential emissions from the OCS source when the vessel is within 25 NM of the centroid of the source (OCS Area), including while traveling to and from any part of the OCS facility. Emissions from vessels that would support Project construction and O&M when within 25 NM of the centroid are included in the potential emissions of the OCS facility. The Project construction and O&M activities are summarized below.

The construction of the Project is proposed for up to 4 campaigns. Each construction campaign would follow this general sequence:

- Installation of the OSS;
- Offshore export cable installation;
- WTG monopile foundation installation;
- Inter-array cable installation;
- WTG installation; and
- WTG commissioning.

The types of emissions activities included in the construction and O&M phases are described as follows.

Construction emissions would consist of the following activities:

- Vessel transit within the OCS area;
- On-vessel equipment usage including diesel generators;

- Onsite maneuvering at the WTGs and at the OSSs;
- Export and inter-array cable laying within the OCS area; and
- Commissioning activities (e.g., temporary diesel generators).

O&M emissions would consist of the following activities:

- Vessel transit within the OCS area;
- Onsite maneuvering at the WTGs and OSSs; and
- Onsite emergency generators on the OSS.

Potential emissions resulting from the Project fall into two broad categories: 1) direct emissions from the OCS source(s) when regulated as a stationary source and 2) emissions included in the potential emissions of the OCS source. Emissions in the first category occur only during the time when a piece of equipment, an activity, or facility (which may include a vessel) meets the definition of an OCS source.

2.1.1 Annual Emission Summary – Construction, Commissioning, and O&M

Project air emissions during construction, commissioning, and O&M that are subject to permitting under 40 CFR Part 55 are provided in the November 30, 2023 OCS air permit application.

The estimate of the Project's potential air emissions was conducted assuming the use of the maximum design scenario associated with the Projects' PDE to ensure a reasonably conservative estimate of emission rates from the Project. It was conservatively assumed that the PDE could be constructed and operating within a 3 year period. The Project would be constructed in up to four campaigns; therefore, some portions of the wind farm would be under construction while other parts would be operational. Annual construction emissions reflect these overlapping periods by including O&M emissions for WTGs that have been commissioned and are operational while the remainder of the WTGs and OSSs are constructed and commissioned. The overlap of construction, commissioning, and O&M that may occur within years 2 and 3 of the construction and commissioning period is based on assumed construction of 21 WTGs in year 1, 55 WTGs in year 2, and 45 WTGs in year 3. This assumption provides a worst-case annual estimate of emissions as it assumes a condensed construction schedule within a three (3) year period. Table 2-1 provides the annual summary of Project emissions during the construction and O&M periods.

2.2 Project OCS Sources and Modeled Emission Units

2.2.1 OCS Sources

A number of vessels would be required to support activities carried out during the construction and O&M phases of the Project. Specific vessels are required for surveying activities, foundation installation, OSS installation, cable installation, WTG installation, and support activities. The vessels would vary in size and complexity based on their function on the Project. The vessels employed on the Project will be required to comply with applicable USCG and Jones Act regulations for conducting operations in U.S. waters. All foreign flag vessels employed on the Project will, in addition to meeting applicable USCG and Jones Act requirements, be required to meet International Maritime Organization (IMO) and International Marine Contractors Association (IMCA) requirements. The specific vessels selected to perform the required tasks during construction will be dependent upon availability at the commencement of each activity. US Wind will secure vessel supply in advance to prevent any delays to the construction schedule.

The proposed peak year of construction and commissioning, corresponding to the maximum annual potential to emit subject, captures all of the activities that could potentially occur within the 25 NM OCS area. For the peak year of construction, commissioning (including any overlapping O&M), the following activities may be taking place in various areas of the WDA simultaneously:

- Monopile (MP) Foundation Installation;
- Scour protection installation;
- WTG Installation;
- WTG Commissioning;
- OSS Installation;
- OSS Commissioning;
- Inter-Array Cable Installation;
- Offshore Export Cable Installation; and
- Overlapping O&M activities.

O&M phase emissions would consist of the following activities:

- Vessel transit within the OCS area;
- Onsite maneuvering at the WTGs and OSSs; and
- Onsite diesel generators.

Activities would occur throughout the 25 NM OCS area and will be transient. For example, the monopile foundation installation would occur over the course of two days for a specific WTG location. Then, the group of ships responsible for the monopile installation would move to the next WTG position and begin installation of another monopile. For simplification of the modeling given this spatial and temporal uncertainty regarding vessel locations, the CALPUFF Class I modeling will be conducted based on the assumption that these activities occur at the same location for the entire modeled period. Thus, all of the emission sources will be modeled at one single location with the same coordinates. US Wind notes that additional refinement of this approach may be necessary to successfully complete the Class I AQRV assessment.

2.2.2 Modeled Exhaust Stack and Emission Parameters

An emissions inventory for both the construction and O&M phases, including underlying assumptions for engine type and rating, engine use (hours), number of trips, and emission factors, was developed in the OCS air permit application. This emissions inventory was used for the Class II PSD increment and NAAQS analyses and the Class I PSD increment analyses. The Class I AQRV modeling assessment will utilize the emissions and modeling parameters used in preparing the Class I and II PSD increment modeling analysis, which are discussed within the OCS air permit application.

For Class I AQRV visibility impairment modeling, the FLMs require that a maximum 24-hour emission scenario be evaluated for visibility impairment assessments. Maximum 24-hour emission rates were developed for each emissions source as detailed in the OCS air permit application in Table A-42 for PM2.5 and SO_2. A summary showing source 24-hour NO_2, H_2SO_4, and NH_3 parameters and modeled emission rates for both the construction and O&M scenarios is listed in Appendix A.

Consistent with the Class II PSD increment and NAAQS modeling, all of the vessels would not be expected to operate together within a daily period based on need, logistics, and safety. As such, US Wind refined the modeling for these pollutants to only include those vessels and engines that would be expected to operate together over a daily basis. Table A-45 of the OCS air permit application provides a detailed matrix of emission sources and operating scenarios for the 24-hour operating period. The modeled scenarios included the following activities: foundation installation, WTG installation, WTG commissioning, OSS installation, inter-array cable installation, export cable installation, and O&M. This matrix was based on US Wind's determination of the feasibility that a vessel may be in operation simultaneously with another vessel, while taking into consideration need, logistics, and security. For example, multiple towing tugs during WTG installation would not be needed simultaneously as determined by US Wind's construction management team. Oftentimes, US Wind determined that a duplicate vessel type could be excluded from the modeling analysis for daily averaging periods.

Similar to the Class II PSD increment and NAAQS modeling, the Class I AQRV assessments will be based on the initial conservative assumption that all vessels' emissions are located at the Project centroid. The entire construction operation covers hundreds of positions over 10,000s of acres, and will take more than 3 years year to complete. The vessel emissions will be dispersed throughout the WDA. Thus, the initial assumption that all of the annual and daily emissions are located at a single point is highly conservative. In reality, these emission sources will be at that particular location for a short period of time (less than one week) and then will move to other locations resulting in spatially and temporally distributed emissions throughout the construction and O&M periods. US Wind notes that additional refinement of this approach may be necessary to successfully complete the Class I AQRV assessment.

Detailed tables of the proposed annual and daily modeled emission rates and stack parameters are provided in Appendix A.

Table 2-1: Annual Emissions Summary (tons/year)

Year	NO_x	VOC	CO	PM10	PM2.5	SO_2	Pb	HAPs	H_2SO_4	CO_2	CH_4	N_2O	CO_2e
Construction and Commissioning Year 1	248.95	4.48	60.44	8.10	7.85	0.79	0.001	0.53	0.04	16,517.0	0.12	0.78	16,751.1
Operation Year 1	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	0.0	0.00	0.00	0.0
Year 1 Total	**248.95**	**4.48**	**60.44**	**8.10**	**7.85**	**0.79**	**0.001**	**0.53**	**0.04**	**16,517.0**	**0.12**	**0.78**	**16,751.1**
Construction and Commissioning Year 2	611.23	10.93	145.26	19.93	19.32	1.99	0.003	1.29	0.09	39,925.7	0.26	1.90	40,499.4
Operation Year 2	4.35	0.33	4.23	0.11	0.11	0.01	0.000	0.03	0.00	1,158.1	0.01	0.05	1,173.8
Year 2 Total	**615.58**	**11.25**	**149.48**	**20.04**	**19.43**	**2.00**	**0.003**	**1.33**	**0.09**	**41,083.8**	**0.27**	**1.95**	**41,673.3**
Construction and Commissioning Year 3	500.15	8.96	119.27	16.31	15.81	1.63	0.002	1.06	0.07	32,755.4	0.22	1.56	33,225.1
Operation Year 3	15.73	1.19	15.29	0.41	0.41	0.04	0.000	0.12	0.00	4,191.1	0.04	0.19	4,248.1
Year 3 Total	**515.88**	**10.15**	**134.56**	**16.72**	**16.22**	**1.68**	**0.003**	**1.18**	**0.08**	**36,946.5**	**0.26**	**1.75**	**37,473.2**
O&M	**25.05**	**1.89**	**24.34**	**0.66**	**0.65**	**0.07**	**0.000**	**0.18**	**0.00**	**6,672.6**	**0.06**	**0.30**	**6,763.4**

Notes: PM10 and PM2.5 account for both filterable and condensable fractions.

3.0 CLASS I AQRV AIR QUALITY MODELING METHODOLOGY

3.1 Class I AQRV Impacts

The nearest PSD Class I areas to the Project are the Edwin B. Forsythe National Wildlife Refuge (NWR) (the Brigantine Wilderness Area) in New Jersey (126 km), and the Shenandoah National Park (NP) in Virginia (290 km). All other Class I areas are well over 300 km away. Brigantine NWR is managed by the United States Fish and Wildlife Service (USFWS). Shenandoah is managed by the National Park Service (NPS). Note that the majority of the 196,000 acre Shenandoah NP is located well over 300 km away and thus, only the northern portion that is located nearest to the Project within 300 km will be assessed.

CALPUFF modeling will be conducted to assess worst case Project-related impacts to Class I area AQRVs of visibility impairment and deposition of nitrogen (N) and sulfur (S) of relevant air quality indicators at the Brigantine and Shenandoah NP Class I areas. The AQRV analyses will be conducted in accordance with the Federal Land Managers' Air Quality Related Values Work Group - Phase I Report (FLAG 2010).

In addition to assessment of the Brigantine and Shenandoah NP Class I Areas, the NPS requested that assessment of impacts be conducted for one National Seashore (NS) area, the Assateague Island NS. The Assateague Island NS is a barrier island located off coastal Maryland that is designated as a Class II area. CALPUFF modeling will be conducted to evaluate impacts at the Assateague Island NS for N and S deposition and visibility impairment.

Detailed modeling procedures are presented below for the Class I and II area AQRVs assessment. Note that this methodology is consistent with Class I AQRV modeling methodology for other approved offshore wind Projects[1] in USEPA Regions 2 and 3.

3.1.1 Model Selection

CALPUFF is a Lagrangian modeling system recommended for Class I area air quality impact assessments by the FLM Workgroup. From April 2003 until January 2017, CALPUFF was the EPA's preferred model for assessing NAAQS and/or PSD increments in situations of long-range transport (at distances greater than 50 km) of emissions. With the 2017 revisions to the Guideline on Air Quality Models (Appendix W to 40 CFR Part 51), CALPUFF was delisted as an EPA-preferred model, yet retained as a screening technique for long-range transport assessments for NAAQS and PSD increments. Nevertheless, the CALPUFF modeling system has remained the FLM's preferred model for assessing AQRVs at Class I areas and is proposed for use in this AQRV assessment.

1 https://www.epa.gov/system/files/documents/2024-04/final-ocs-air-permit-for-cvow-c-project-4-9-24.pdf
https://www.federalregister.gov/documents/2024/05/08/2024-10029/issuance-of-outer-continental-shelf-air-permit-for-empire-offshore-wind-llc-notice-of-final-action

CALPUFF is a multi-layer, multi-species non-steady-state puff model that simulates the effects of time and space-varying meteorological conditions on pollution transport, transformation, dispersion and removal through the treatment of air pollutant emissions from sources released as a series of discrete puffs. Each puff is tracked individually by the model until it leaves the modeling domain, and the contribution of each puff to receptor concentrations (or deposition fluxes) is calculated separately and can be used to create individual source impacts, or summed to create total impacts over source groups based on the user's selections. CALPUFF can use three-dimensional meteorological fields developed by the CALMET model based on prognostic meteorological model output (e.g., Weather Research and Forecasting model, or WRF), station meteorological data (surface observations and upper air soundings), or a combination of both (hybrid mode). CALPUFF can also accept prognostic meteorological data that is processed through the EPA Mesoscale Model Interface Program (MMIF). CALPUFF can be applied on scales of tens to hundreds of kilometers. It includes algorithms for sub-grid scale effects (such as terrain impingement), as well as longer range effects (such as pollutant removal due to wet scavenging and dry deposition, chemical transformation, and visibility effects of particulate matter concentrations). CALPUFF is well suited for situations involving complex flows including spatial changes in meteorological fields due to factors such as the presence of complex terrain or the influence of water bodies. CALPUFF can assess plume fumigation (coastal fumigation or inversion break-up conditions), light wind speed or calm wind impacts, or other factors for which a steady-state straight-line modeling approach is not appropriate. CALPUFF can account for the cumulative impact of multiple spatially distributed sources with temporally varying emissions within a large region. CALPUFF can properly model the emissions associated with the construction of an offshore wind farm which vary in space and time.

3.1.2 Model Domain

The modeling domain was defined by the CALMET data, 600 km x 660 km, centered at approximately 39.48°N, 74.18°W which encompass the Project site and the Brigantine and Shenandoah Class I areas and Assateague Island NS Class II area. Because the modeling domains cover such a large region, to account for the curvature of the earth, Lambert Conformal Conic projection coordinates will be used to define source and receptor locations in the domain. A buffer is maintained around the Class I area and the project site to allow for the potential recirculation of emissions. This domain is shown in Figure 3-2. The 12-km grid resolution consistent with the CALMET-WRF simulations will be maintained for the CALPUFF modeling. The parameterization of the CALMET/CALPUFF domain is described below.

<u>CALPUFF Domain LCC Projection Parametrizations</u>
XBTZ (Time Zone): -5, RLAT0: 40.574 N, RLON0: 97.000 W
XLAT: 33.000 N, XLAT2: 45.000 N
NX: 55, NY: 50, NZ: 10
DGRIDKM: 12
ZFACE: 0., 20.0., 40.0, 80.0, 160.0, 320.0, 640.0, 1200.0, 2000.0, 3000.0, 4000.0

XORIGKM: 1620.000, YORIGKM : -114.000

3.1.3 Meteorological Data

The USFWS (Tim Allen - FLM) provided three-dimensional gridded meteorological files for the 3-year period of 2018-2020 for use as input to CALPUFF. The USFWS prepared the files using the MMIF Program that converts prognostic meteorological model output fields to the parameters and formats required for direct input into CALPUFF. Gridded WRF model-derived multi-level meteorological data were processed for CALMET through MMIF. In the vertical dimension, ten layers were defined consistent with the default layers specified by EPA/FLM guidance (layer tops of 20, 40, 80, 160, 320, 640, 1200, 2000, 3000 and 4000 meters).

3.1.4 Class I Receptors

The National Park Service (NPS) provides Class I area receptors for use in Class I area modeling analyses at the following web site: https://irma.nps.gov/DataStore/Reference/Profile/2249830. There are three sections of Brigantine, and 46 receptors are provided for Class I area modeling. A NPS map of Brigantine showing the receptor placement is provided in Figure 3-3. The NPS provides Class I receptor locations in latitude and longitude. The Brigantine receptor locations were converted to Lambert Conformal coordinates for use in CALPUFF consistent with the original WRF projection. The receptor elevations provided in the NPS receptor file will be used in the CALPUFF modeling and provided in Table 3-1.

The NPS FLM provided the Class I area receptors for Shenandoah Class I area and the Assateague Island NS Class II area that are provided in Table 3-2. Figures 3-4 and 3-5 provide location maps of the Shenandoah Class I area and the Assateague Island NS Class II area receptors. As previously discussed, the majority of the 196,000 acre Shenandoah NP is located well over 300 km away and thus, only the northern portion that is located nearest to the Project within 300 km will be assessed as denoted by the receptor location provided by the NPS FLM.

3.1.5 CALPUFF Model Options

The CALPUFF model options corresponding to those specified as defaults in Appendix B of the IWAQM Phase 2 document will be selected. The following options corresponding to the regulatory switch in CALPUFF will be used:

- Gaussian vertical distribution used in the near field
- Partial plume path adjustment
- Transitional plume rise computed
- Model stack tip downwash
- Use MESOPUFF II chemical transformation mechanism
- Model wet removal
- Model dry deposition
- Use Pasquill-Gifford dispersion coefficients for rural areas

- Do not adjust sigma-y and sigma-z for roughness
- Allow partial plume penetration of elevated inversions
- Time-dependent dispersion equations (Heffter) are used to determine sigma-y and sigma-z once the horizontal puff size reaches 550 meters.

Both dry and wet deposition will be modeled. Gaseous phase dry deposition will be modeled for NO_x, HNO_3, and SO_2, while particle deposition will be assumed for NO_3 and SO_4. Emissions of NH_3 will be assumed to remain in the gaseous phase, while particle deposition will be assumed for H_2SO_4. H_2SO_4 will be treated as primary SO_4 emitted. Table 3-3 presents the deposition parameters proposed as input to CALPUFF for each species. Scavenging coefficients will be input to CALPUFF for the wet deposition algorithm. The default values provided in the model will be used for SO_2, SO_4, HNO_3, and NO_3. For the frozen coefficient for NH_3, conservatively, the highest scavenging coefficient provided in CALPUFF will be selected. For the liquid scavenging coefficient, the equation which serves as the basis of the default values in CALPUFF will be used and applied for NH_3.

Chemical transformations of NO_x to nitrates (NO_3) and nitric acid (HNO_3), and SO_2 to sulfate (SO_4) will be evaluated using CALPUFF's MESOPUFF II Chemistry scheme. Chemical transformations will be modeled using the monthly ozone concentrations measured at the Brigantine monitor (New Jersey Department of Environmental Protection ID#340010006) as provided in Table 3-3 for the most recent 3-year period (2021-2023). A CALPUFF monthly ammonia background concentration of 3 ppb will be used. This value is conservative compared to the monthly ammonia values measured at the MD06 (Maryland) monitor where the monthly values are all less than 3 ppb. The MD06 monitor is located south of Brigantine near the Chesapeake Bay in the Blackwater National Wildlife Refuge. This monitor is in a similar setting and therefore is a good choice to represent the Brigantine environment.

3.1.6 Post Processing

3.1.6.1 Visibility

The CALPUFF Modeling System postprocessor, CALPOST, will be used to generate the visibility impacts from the CALPUFF output. CALPOST Version 6.221 which performs the calculations in accordance with the latest EPA/FLM recommendations using the IMPROVE equation for extinction coefficient calculations is proposed for use. The CALPOST parameter MVISBK is set to 8, sub-mode five (M8_MODE = 5), and the background hygroscopic and non-hygroscopic aerosol levels are derived from the annual average natural conditions provided in Table 6 of the FLAG 2010 guidance. When calculating the sulfate and nitrate components of the visibility extinction coefficient, relative humidity adjustment factors will be applied because these aerosols are hygroscopic and the addition of water enhances their scattering efficiencies. The monthly relative humidity adjustment factors from Tables 7-9 in FLAG 2010 for the Brigantine Class I area will be input to the RHFAC array in CALPOST (which are auto-populated for specific Class

I areas in the CALPUFF View software). The visibility threshold for concern is not exceeded if the 98th percentile change in light extinction is less than 5% for each year modeled, when compared to the annual average natural condition value for the Brigantine Class I area. If this analysis indicates the 98th percentile values for change in light extinction are equal to or greater than 5% for any year, then the results will be further analyzed to determine the frequency of the exceedances and the conditions under which the exceedances are predicted.

3.1.6.2 Deposition

Estimates of atmospheric deposition are obtained by selecting the options in CALPUFF to calculate wet and dry fluxes of the pollutants modeled, in units of grams per square meter per second ($g/m^2/s$). Generally, AQRV analyses require values of total deposition (background plus modeled impact) in units of kilograms/hectare/year (kg/ha/yr); therefore, the modeled deposition flux of each oxide of sulfur or nitrogen from CALPUFF must be normalized for the difference in molecular weights using the multipliers as listed in Section 3.3 of the IWAQM Phase 2 Report and summed to yield a total deposition of sulfur and nitrogen. This is accomplished in CALPOST POSTUTIL and converted from the modeled units to assessment units (m^2 to ha and s to yr) using the appropriate scaling factors. FLAG 2010 states for total sulfur (S) deposition, the wet and dry fluxes of sulfur dioxide and sulfate are calculated, normalized by the molecular weight of S, and expressed as total S. For total nitrogen (N) deposition, IWAQM recommends that the wet and dry fluxes of HNO_3 and NO_3 and the dry flux of NO_x be calculated, normalized by the molecular weight of N, and expressed as total N. In addition, the FLMs agree that wet and dry fluxes of ammonium sulfate ($(NH_4)_2SO_4$) and ammonium nitrate (NH_4NO_3) should be calculated, normalized by the molecular weight of N, and added to the estimate of total N. Therefore, total nitrogen deposition is the sum of N contributed by dry and wet fluxes of HNO_3, NO_3, $(NH_4)_2SO_4$, and NH_4NO_3 and the dry flux of NO_x. The NPS and USFWS have introduced and developed the concept of Deposition Analysis Thresholds (DATs) to use as screening level values for the additional modeled amount of sulfur and nitrogen deposition within Class I areas from new or modified PSD sources. A DAT is defined as the additional amount of nitrogen or sulfur deposition within an FLM area, below which estimated impacts from a proposed new or modified source are considered negligible. The DAT established for both nitrogen and sulfur in eastern and western FLM areas and wildernesses is 0.010 and 0.005 kg/ha/yr, respectively.

Default scavenging coefficients for the wet deposition algorithm provided in CALPUFF (see Table 3-4) will be used for SO_2, SO_4, HNO_3, and NO_3.

3.2 Modeling Input Files

Sample CALPUFF input files are provided electronically in Appendix B and are available upon request.

Table 3-1: List of Class I Area Receptors in Brigantine

Receptor ID	Latitude	Longitude	LCC X (km)	LCC Y (km)	Elevation (m)
BRIG_1	39.4375	-74.3625	1913.204	113.852	1
BRIG_2	39.44583	-74.3792	1911.598	114.394	1
BRIG_3	39.44583	-74.3708	1912.287	114.569	1
BRIG_4	39.44583	-74.3625	1912.977	114.745	1
BRIG_5	39.44583	-74.3542	1913.666	114.920	1
BRIG_6	39.44583	-74.3458	1914.356	115.096	1
BRIG_7	39.45417	-74.3625	1912.750	115.638	1
BRIG_8	39.45417	-74.3542	1913.439	115.813	1
BRIG_9	39.45417	-74.3458	1914.129	115.988	1
BRIG_10	39.45417	-74.3375	1914.818	116.164	1
BRIG_11	39.45417	-74.3292	1915.508	116.340	3
BRIG_12	39.4625	-74.3625	1912.523	116.531	1
BRIG_13	39.4625	-74.3542	1913.212	116.706	1
BRIG_14	39.4625	-74.3375	1914.591	117.057	1
BRIG_15	39.4625	-74.3292	1915.280	117.233	1
BRIG_16	39.4625	-74.3208	1915.969	117.408	1
BRIG_17	39.47083	-74.3708	1911.606	117.248	1
BRIG_18	39.47083	-74.3542	1912.985	117.599	0
BRIG_19	39.47083	-74.3375	1914.363	117.950	1
BRIG_20	39.47083	-74.3292	1915.053	118.125	1
BRIG_21	39.47083	-74.3208	1915.742	118.301	1
BRIG_22	39.47917	-74.3792	1910.690	117.966	1
BRIG_23	39.47917	-74.3542	1912.758	118.492	1
BRIG_24	39.47917	-74.3458	1913.447	118.667	1
BRIG_25	39.47917	-74.3375	1914.136	118.843	1
BRIG_26	39.47917	-74.3292	1914.825	119.018	1
BRIG_27	39.47917	-74.3125	1916.203	119.370	1
BRIG_28	39.4875	-74.3208	1915.287	120.087	1
BRIG_29	39.49583	-74.3292	1914.370	120.804	0
BRIG_30	39.49583	-74.3208	1915.059	120.980	0
BRIG_31	39.50417	-74.3042	1916.209	122.224	0
BRIG_32	39.50417	-74.2958	1916.898	122.400	0
BRIG_33	39.52083	-74.4125	1906.799	121.731	1
BRIG_34	39.52083	-74.2792	1917.820	124.537	1
BRIG_35	39.52917	-74.4375	1904.506	122.100	1
BRIG_36	39.52917	-74.4292	1905.195	122.275	1
BRIG_37	39.52917	-74.4208	1905.884	122.449	1
BRIG_38	39.52917	-74.4125	1906.572	122.624	1
BRIG_39	39.52917	-74.2708	1918.281	125.606	1
BRIG_40	39.5375	-74.4375	1904.279	122.993	1
BRIG_41	39.5375	-74.4292	1904.968	123.168	1
BRIG_42	39.5375	-74.4208	1905.657	123.343	1

BRIG_43	39.5375	-74.4125	1906.346	123.517	1
BRIG_44	39.54583	-74.4375	1904.053	123.886	1
BRIG_45	39.54583	-74.4292	1904.742	124.061	1
BRIG_46	39.54583	-74.4208	1905.430	124.236	1

Table 3-2: List of Provided Receptor Locations in Assateague and Shenandoah

Park	Latitude	Longitude	LCC X (km)	LCC Y (km)	Elevation (m)
ASIS_1	38.31917	-75.098144	1881.774	-21.470	1
ASIS_2	38.212013	-75.149054	1880.307	-34.031	1
ASIS_3	38.102601	-75.190853	1879.655	-46.647	1
ASIS_4	38.003269	-75.263656	1876.103	-58.823	1
ASIS_5	37.915282	-75.329327	1872.841	-69.631	1
SHEN	38.760578	-78.171219	1611.806	-32.950	886

Table 3-3: Average Monthly Ozone Concentrations at Brigantine (ppb)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	29	35	41	43	44	37	41	39	35	34	29	28
2022	31	34	38	41	39	42	44	38	30	30	28	24
2023	25	32	35	40	36	40	41	37	37	29	29	25
Average	**28**	**34**	**38**	**41**	**40**	**40**	**42**	**38**	**34**	**31**	**29**	**26**

Table 3-4: CALPUFF Input Parameters for Deposition

Dry Deposition of Gases

Parameter	SO_2	NO_x	HNO_3	NH_3
Diffusivity (cm^2/s)	0.1509	0.1656	0.1628	0.23
Alpha Star	1000	1	1	1
Reactivity	8	8	18	18
Mesophyll Resistance (s/cm)	0	5	0	0
Henry's Law Coefficient	0.04	3.5	8.0E-8	7.0E-7

Dry Deposition of Particles

Parameter	SO_4	NO_3	PM10	PM2.5
Geometric Mass Mean Diameter (microns)	0.48	0.48	0.48	0.48
Geometric Standard Deviation (microns)	2.0	2.0	2.0	1.5

Additional Dry Deposition Parameters

Reference cuticle resistance (s/cm)	30
Reference ground resistance (s/cm)	10
Reference pollutant reactivity	8
Number of particle-size intervals	9
Vegetation state in unirrigated areas	Active and unstressed

Precipitation Scavenging Coefficients used in CALPUFF

Pollutant	Scavenging Coefficient Liquid (1/sec)	Scavenging Coefficient Frozen (1/sec)
SO_2	3.0 x 10-5	0
SO_4	1.0 x 10-4	3.0 x 10-5
NO_x	0	0
HNO_3	6.0 x 10-5	0
NO_3	1.0 x 10-4	3.0 x 10-5
NH_3	7.9 x 10-5	3.0 x 10-5

Figure 3-1: Project Location Map

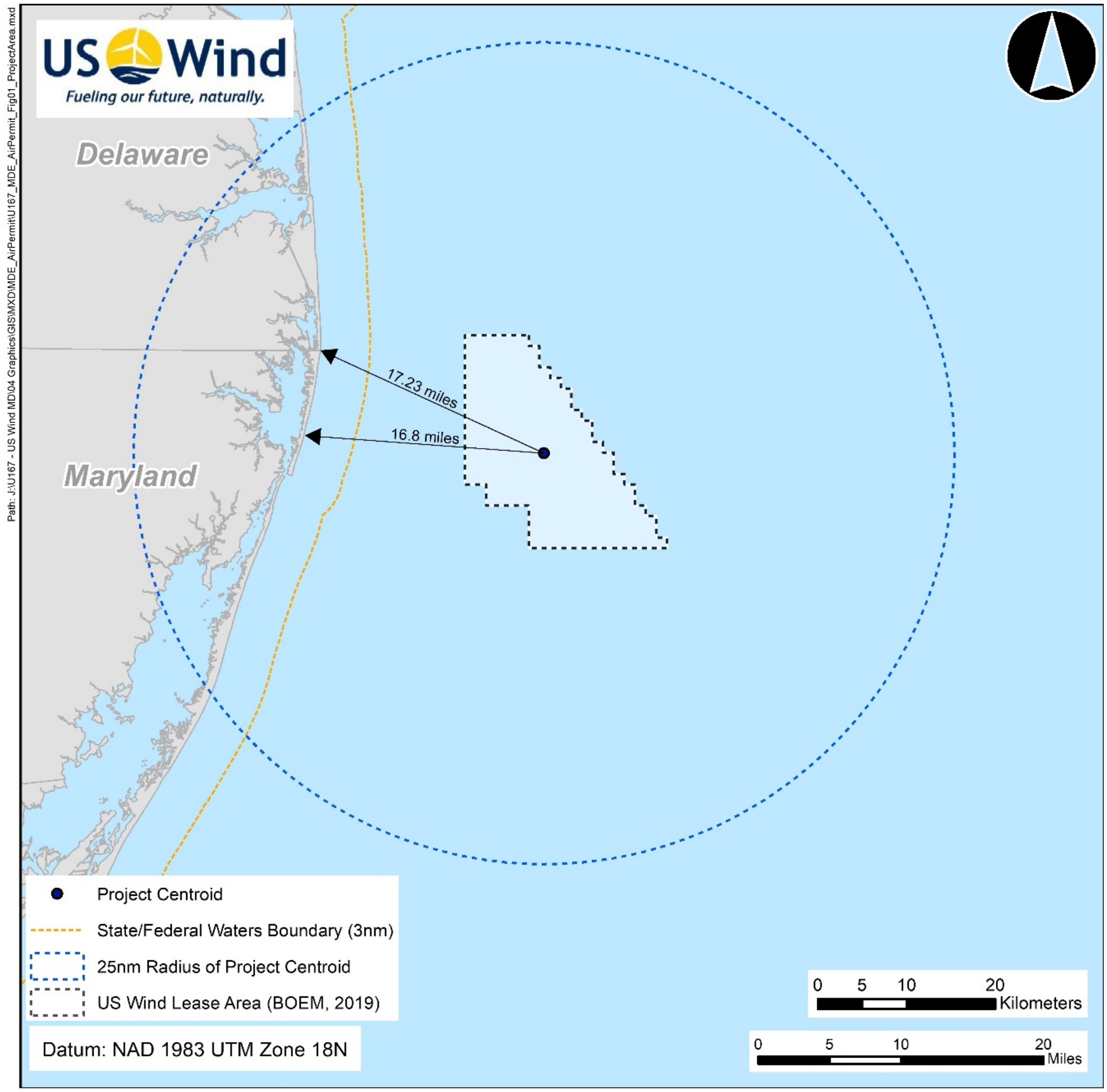


Figure 3-2: Proposed CALPUFF Modeling Domain

Figure 3-3: Receptor Locations for Class I Brigantine Wilderness Area

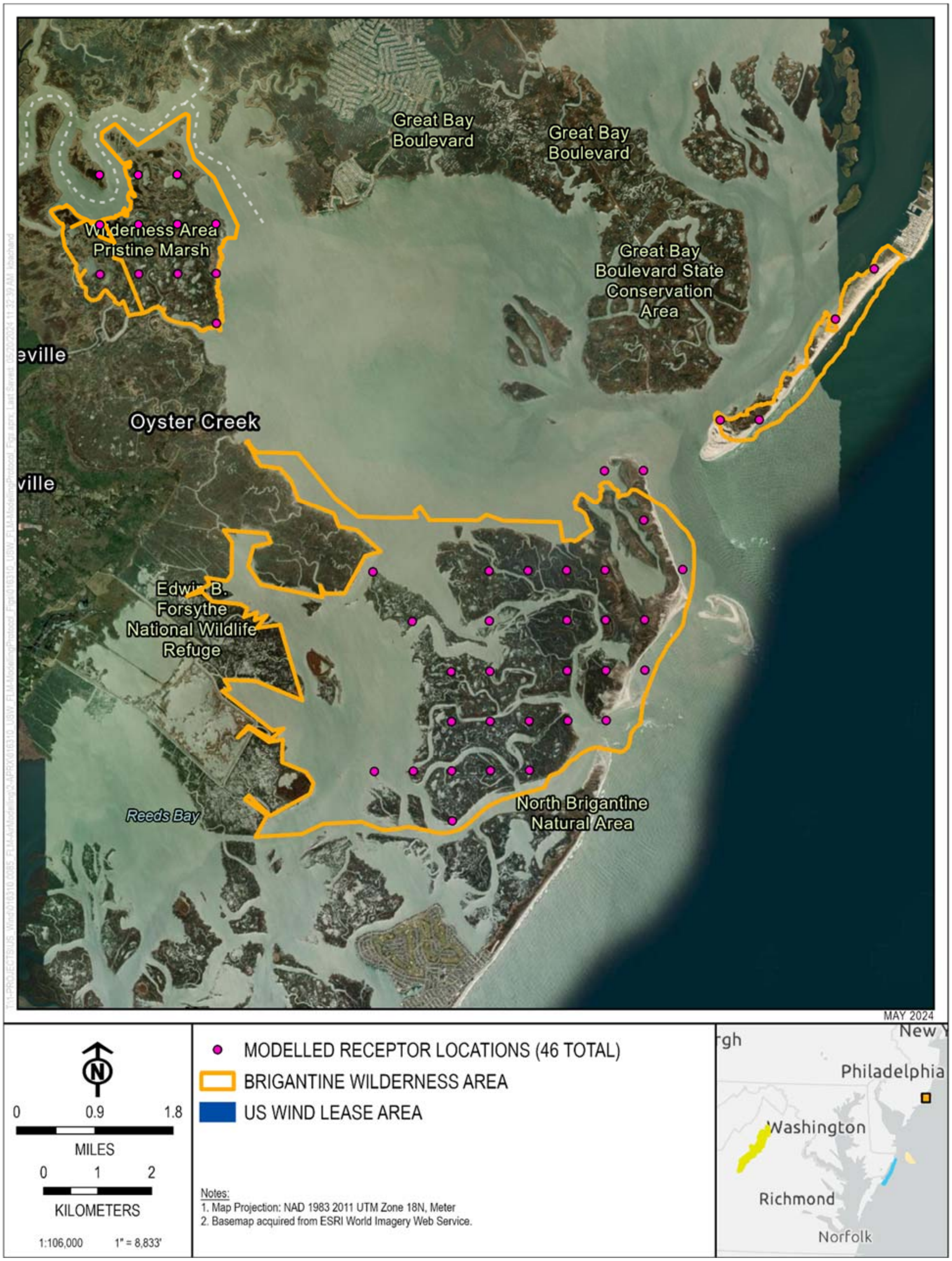


Figure 3-4: Receptor Locations for Class I Shenandoah National Park

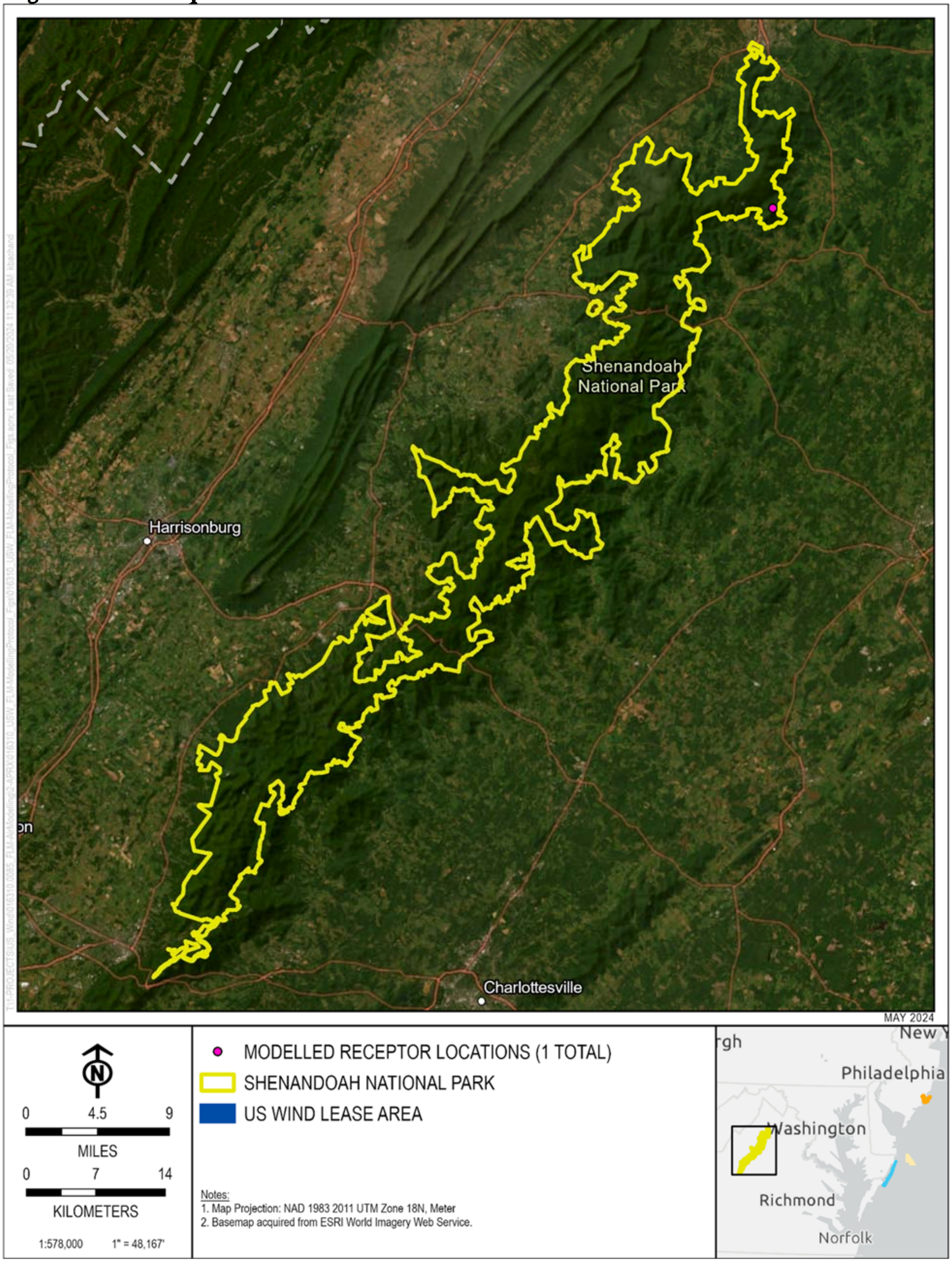
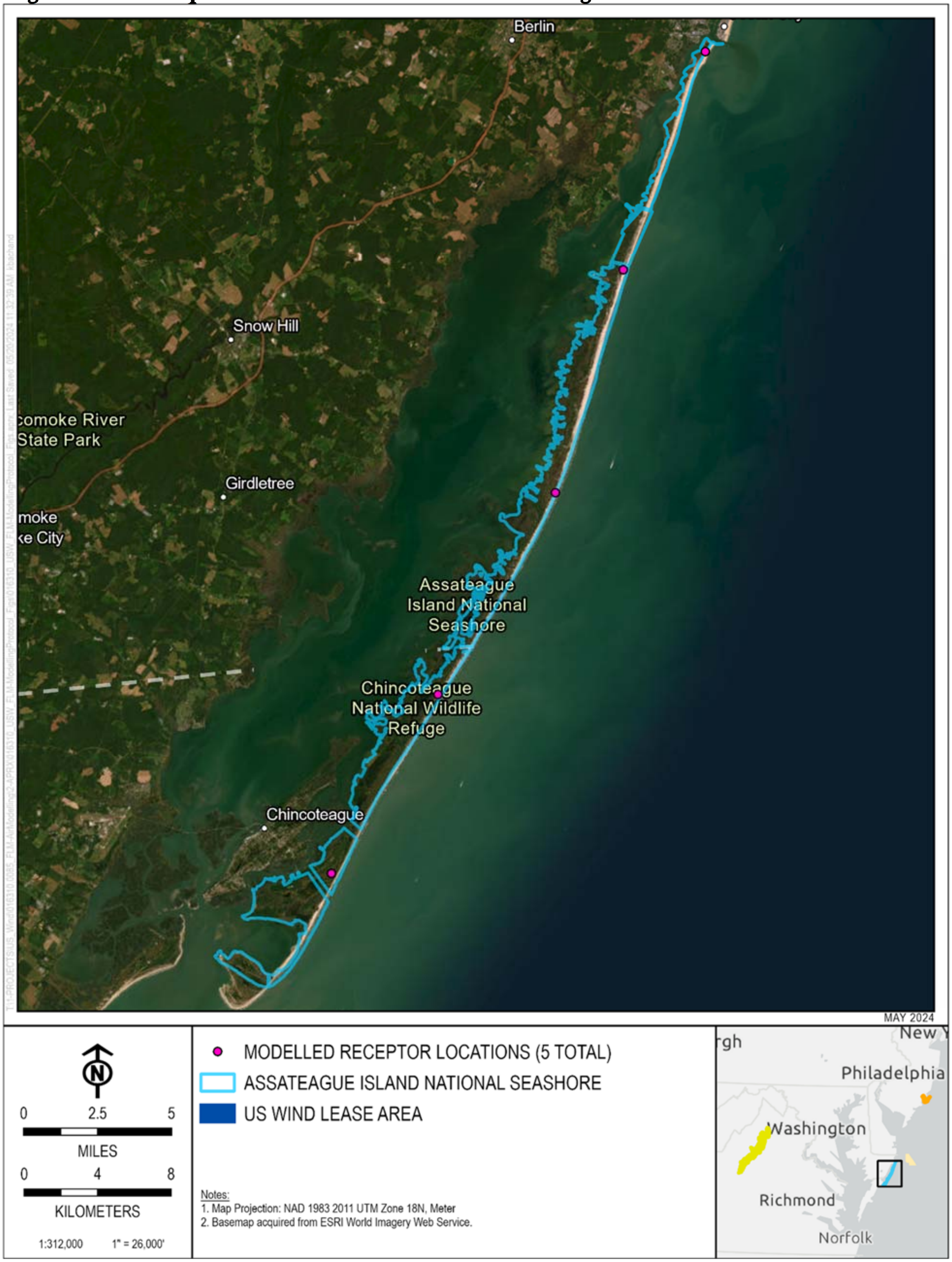


Figure 3-5: Receptor Locations for Class II Assateague NS



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https://www.epa.gov/sites/default/files/2020-10/documents/phase2.pdf

Appendix A
Detailed Emissions and Modeling Parameters

Table A-1

US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol

CALPUFF - Stack Parameters and Emissions - Construction Time Period - Annual Deposition Assessment

Stack Parameters					Modeled Emissions					
Source ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
FV1T1	33.00	1.01	15.91	555.00	5.51E-02	2.27E-05	1.98E-03	1.92E-03	4.94E-04	3.68E-05
FV1M1	33.00	1.01	3.83	555.00	8.24E-01	3.39E-04	2.95E-02	2.87E-02	7.38E-03	5.50E-04
FV1AT1	33.00	1.65	0.26	555.00	6.81E-04	1.90E-08	2.20E-05	2.14E-05	4.13E-07	4.10E-07
FV1AM1	33.00	1.65	0.63	555.00	1.72E-01	4.79E-06	5.56E-03	5.39E-03	1.04E-04	1.03E-04
FV2T1	33.00	1.01	15.91	555.00	3.86E-02	2.30E-06	1.19E-03	1.15E-03	5.00E-05	2.21E-05
FV2M1	33.00	1.01	5.13	555.00	1.33E+00	7.95E-05	4.13E-02	3.99E-02	1.73E-03	7.67E-04
FV2AT1	33.00	1.01	6.77	555.00	2.89E-03	6.89E-08	8.01E-05	7.76E-05	1.50E-06	1.49E-06
FV2AM1	33.00	1.01	6.77	555.00	1.38E+00	3.30E-05	3.83E-02	3.71E-02	7.19E-04	7.13E-04
FV3T1	9.00	0.60	29.82	610.00	1.87E-02	2.98E-06	6.49E-04	6.30E-04	6.49E-05	1.21E-05
FV3M1	9.00	0.60	4.95	610.00	2.86E-01	4.55E-05	9.92E-03	9.62E-03	9.92E-04	1.85E-04
FV3AT1	9.00	0.15	17.71	897.00	4.03E-04	1.10E-08	1.28E-05	1.24E-05	2.40E-07	2.38E-07
FV3AM1	9.00	0.15	17.71	897.00	2.56E-02	6.97E-07	8.10E-04	7.85E-04	1.52E-05	1.51E-05
FV4T1	9.00	0.60	29.82	610.00	4.37E-02	6.96E-06	1.51E-03	1.47E-03	1.51E-04	2.82E-05
FV4M1	9.00	0.60	4.95	610.00	7.90E-02	1.26E-05	2.74E-03	2.66E-03	2.74E-04	5.10E-05
FV4AT1	9.00	0.15	17.71	897.00	9.41E-04	2.57E-08	2.98E-05	2.89E-05	5.59E-07	5.55E-07
FV4AM1	9.00	0.15	17.71	897.00	7.06E-03	1.93E-07	2.24E-04	2.17E-04	4.20E-06	4.16E-06
FV5T1	9.00	0.60	29.82	610.00	4.16E-02	6.63E-06	1.44E-03	1.40E-03	1.44E-04	2.69E-05
FV5M1	9.00	0.60	4.95	610.00	7.53E-02	1.20E-05	2.61E-03	2.53E-03	2.61E-04	4.86E-05
FV5AT1	9.00	0.15	17.71	897.00	8.96E-04	2.45E-08	2.84E-05	2.75E-05	5.32E-07	5.28E-07
FV5AM1	9.00	0.15	17.71	897.00	6.73E-03	1.84E-07	2.13E-04	2.06E-04	4.00E-06	3.96E-06
FV6T1	9.00	0.60	29.82	610.00	3.54E-02	5.63E-06	1.23E-03	1.19E-03	1.23E-04	2.28E-05
FV6M1	9.00	0.60	4.95	610.00	6.40E-02	1.02E-05	2.22E-03	2.15E-03	2.22E-04	4.13E-05
FV6AT1	9.00	0.15	17.71	897.00	7.62E-04	2.08E-08	2.41E-05	2.34E-05	4.53E-07	4.49E-07
FV6AM1	9.00	0.15	17.71	897.00	5.72E-03	1.56E-07	1.81E-04	1.75E-04	3.40E-06	3.37E-06
FV7T1	6.00	0.46	18.36	555.00	1.22E-02	3.67E-07	4.12E-04	3.99E-04	7.98E-06	7.66E-06
FV7M1	6.00	0.46	4.42	555.00	2.25E-02	6.78E-07	7.63E-04	7.38E-04	1.48E-05	1.42E-05
FV7AT1	6.00	0.06	8.86	555.00	1.91E-04	5.07E-09	5.89E-06	5.70E-06	1.10E-07	1.10E-07
FV7AM1	6.00	0.06	8.86	555.00	1.47E-03	3.89E-08	4.52E-05	4.38E-05	8.48E-07	8.41E-07
FV8T1	13.00	0.61	42.66	555.00	3.26E-02	9.82E-07	1.10E-03	1.07E-03	2.14E-05	2.05E-05
FV8M1	13.00	0.61	10.28	555.00	1.79E-01	5.40E-06	6.07E-03	5.87E-03	1.17E-04	1.13E-04
FV8AT1	13.00	0.25	1.77	555.00	2.72E-03	7.22E-08	8.39E-05	8.13E-05	1.57E-06	1.56E-06
FV8AM1	13.00	0.25	11.47	555.00	1.04E-01	2.75E-06	3.19E-03	3.09E-03	5.98E-05	5.93E-05
FV9T1	13.00	0.60	29.82	610.00	1.60E-02	4.82E-07	5.42E-04	5.25E-04	1.05E-05	1.01E-05
FV9M1	13.00	0.60	4.95	610.00	1.37E-01	4.14E-06	4.66E-03	4.51E-03	9.01E-05	8.65E-05
FV9AT1	13.00	0.15	23.06	897.00	4.80E-04	1.27E-08	1.48E-05	1.43E-05	2.77E-07	2.75E-07
FV9AM1	13.00	0.15	23.06	897.00	1.71E-02	4.54E-07	5.27E-04	5.11E-04	9.89E-06	9.81E-06
FV10T1	6.00	0.46	18.36	555.00	6.08E-02	1.83E-06	2.06E-03	1.99E-03	3.99E-05	3.83E-05
FV10M1	6.00	0.46	4.42	555.00	2.70E-02	8.14E-07	9.16E-04	8.86E-04	1.77E-05	1.70E-05
FV10AT1	6.00	0.06	8.86	555.00	9.56E-04	2.54E-08	2.94E-05	2.85E-05	5.52E-07	5.48E-07
FV10AM1	6.00	0.06	8.86	555.00	1.76E-03	4.67E-08	5.43E-05	5.26E-05	1.02E-06	1.01E-06
FV11T1	6.00	0.46	18.36	555.00	6.08E-02	1.83E-06	2.06E-03	1.99E-03	3.99E-05	3.83E-05
FV11M1	6.00	0.46	4.42	555.00	2.70E-02	8.14E-07	9.16E-04	8.86E-04	1.77E-05	1.70E-05
FV11AT1	6.00	0.06	8.86	555.00	9.56E-04	2.54E-08	2.94E-05	2.85E-05	5.52E-07	5.48E-07
FV11AM1	6.00	0.06	8.86	555.00	1.76E-03	4.67E-08	5.43E-05	5.26E-05	1.02E-06	1.01E-06
WV1T1	43.00	1.01	20.37	555.00	2.85E-02	1.70E-06	8.81E-04	8.52E-04	3.69E-05	1.64E-05
WV1AT1	43.00	0.60	11.40	555.00	2.70E-03	6.44E-08	7.47E-05	7.24E-05	1.40E-06	1.39E-06
WV1AM1	43.00	0.60	11.40	555.00	2.07E+00	4.94E-05	5.74E-02	5.56E-02	1.08E-03	1.07E-03
WV2T1	9.00	0.60	29.82	610.00	1.21E-01	1.92E-05	4.18E-03	4.06E-03	4.18E-04	7.79E-05
WV2M1	9.00	0.60	4.95	610.00	2.91E-01	4.63E-05	1.01E-02	9.78E-03	1.01E-03	1.88E-04
WV2AT1	9.00	0.15	17.71	897.00	2.60E-03	7.09E-08	8.23E-05	7.98E-05	1.54E-06	1.53E-06
WV2AM1	9.00	0.15	17.71	897.00	2.60E-02	7.10E-07	8.24E-04	7.98E-04	1.55E-05	1.53E-05

Table A-1

US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol

CALPUFF - Stack Parameters and Emissions - Construction Time Period - Annual Deposition Assessment

Stack Parameters					Modeled Emissions						
Source ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
WV3T1	9.00	0.60	29.82	610.00	1.17E-01	1.86E-05	4.04E-03	3.92E-03	4.04E-04	7.52E-05
WV3M1	9.00	0.60	4.95	610.00	2.81E-01	4.47E-05	9.74E-03	9.45E-03	9.74E-04	1.81E-04
WV3AT1	9.00	0.15	17.71	897.00	2.51E-03	6.85E-08	7.95E-05	7.70E-05	1.49E-06	1.48E-06
WV3AM1	9.00	0.15	17.71	897.00	2.51E-02	6.85E-07	7.96E-04	7.71E-04	1.49E-05	1.48E-05
WV4T1	9.00	0.60	29.82	610.00	3.33E-02	5.30E-06	1.15E-03	1.12E-03	1.15E-04	2.15E-05
WV4M1	9.00	0.60	4.95	610.00	1.34E+00	2.13E-04	4.64E-02	4.50E-02	4.64E-03	8.64E-04
WV4AT1	9.00	0.15	17.71	897.00	7.17E-04	1.96E-08	2.27E-05	2.20E-05	4.26E-07	4.23E-07
WV4AM1	9.00	0.15	17.71	897.00	1.20E-01	3.26E-06	3.79E-03	3.67E-03	7.10E-05	7.05E-05
CV1T1	6.00	0.46	18.36	555.00	7.75E-02	2.33E-06	2.63E-03	2.54E-03	5.08E-05	4.88E-05
CV1M1	6.00	0.46	4.42	555.00	1.77E-01	5.33E-06	5.99E-03	5.80E-03	1.16E-04	1.11E-04
CV1AT1	6.00	0.06	8.86	555.00	1.22E-03	3.23E-08	3.75E-05	3.63E-05	7.03E-07	6.97E-07
CV1AM1	6.00	0.06	8.86	555.00	1.15E-02	3.06E-07	3.55E-04	3.44E-04	6.66E-06	6.60E-06
CV2T1	6.00	0.46	18.36	555.00	7.66E-02	2.31E-06	2.60E-03	2.51E-03	5.03E-05	4.82E-05
CV2M1	6.00	0.46	4.42	555.00	1.75E-01	5.27E-06	5.93E-03	5.74E-03	1.15E-04	1.10E-04
CV2AT1	6.00	0.06	8.86	555.00	1.20E-03	3.19E-08	3.71E-05	3.59E-05	6.95E-07	6.90E-07
CV2AM1	6.00	0.06	8.86	555.00	1.14E-02	3.03E-07	3.51E-04	3.40E-04	6.59E-06	6.53E-06
CV3T1	6.00	0.46	18.36	555.00	4.48E-02	1.35E-06	1.52E-03	1.47E-03	2.94E-05	2.82E-05
CV3M1	6.00	0.46	4.42	555.00	1.04E-01	3.14E-06	3.53E-03	3.42E-03	6.84E-05	6.57E-05
CV3AT1	6.00	0.06	8.86	555.00	7.04E-04	1.87E-08	2.17E-05	2.10E-05	4.07E-07	4.03E-07
CV3AM1	6.00	0.06	8.86	555.00	6.80E-03	1.80E-07	2.09E-04	2.03E-04	3.93E-06	3.90E-06
OV1T1	33.00	1.01	15.91	555.00	3.86E-02	2.30E-06	1.19E-03	1.15E-03	5.00E-05	2.21E-05
OV1M1	33.00	1.01	5.13	555.00	2.19E-01	1.30E-05	6.76E-03	6.54E-03	2.83E-04	1.26E-04
OV1AT1	33.00	1.01	5.18	555.00	2.89E-03	6.89E-08	8.01E-05	7.76E-05	1.50E-06	1.49E-06
OV1AM1	33.00	1.01	8.63	555.00	2.27E-01	5.41E-06	6.28E-03	6.08E-03	1.18E-04	1.17E-04
OV2T1	9.00	0.60	29.82	610.00	8.32E-03	1.33E-06	2.89E-04	2.80E-04	2.89E-05	5.37E-06
OV2M1	9.00	0.60	4.95	610.00	9.37E-02	1.49E-05	3.25E-03	3.15E-03	3.25E-04	6.05E-05
OV2AT1	9.00	0.15	17.71	897.00	1.79E-04	4.89E-09	5.68E-06	5.50E-06	1.06E-07	1.06E-07
OV2AM1	9.00	0.15	17.71	897.00	8.37E-03	2.28E-07	2.65E-04	2.57E-04	4.97E-06	4.93E-06
OV3T1	9.00	0.60	29.82	610.00	8.32E-03	1.33E-06	2.89E-04	2.80E-04	2.89E-05	5.37E-06
OV3M1	9.00	0.60	4.95	610.00	6.69E-02	1.07E-05	2.32E-03	2.25E-03	2.32E-04	4.32E-05
OV3AT1	9.00	0.15	23.06	897.00	2.33E-04	6.37E-09	7.40E-06	7.16E-06	1.39E-07	1.38E-07
OV3AM1	9.00	0.15	23.06	897.00	7.79E-03	2.12E-07	2.47E-04	2.39E-04	4.63E-06	4.59E-06
OV4T1	13.00	0.61	42.66	555.00	1.04E-02	3.14E-07	3.53E-04	3.42E-04	6.84E-06	6.56E-06
OV4M1	13.00	0.61	10.28	555.00	1.68E-02	5.05E-07	5.68E-04	5.50E-04	1.10E-05	1.06E-05
OV4AT1	13.00	0.25	1.77	555.00	8.71E-04	2.31E-08	2.68E-05	2.60E-05	5.03E-07	4.99E-07
OV4AM1	13.00	0.25	11.47	555.00	9.68E-03	2.57E-07	2.98E-04	2.89E-04	5.59E-06	5.55E-06
OV5T1	13.00	0.60	29.82	610.00	3.94E-03	1.19E-07	1.33E-04	1.29E-04	2.58E-06	2.48E-06
OV5M1	13.00	0.60	4.95	610.00	6.33E-03	1.91E-07	2.14E-04	2.08E-04	4.15E-06	3.99E-06
OV5AT1	13.00	0.15	23.06	897.00	2.40E-04	6.37E-09	7.40E-06	7.16E-06	1.39E-07	1.38E-07
OV5AM1	13.00	0.15	23.06	897.00	1.60E-03	4.25E-08	4.93E-05	4.78E-05	9.25E-07	9.18E-07
OV6T1	9.00	0.60	29.82	610.00	8.32E-03	1.33E-06	2.89E-04	2.80E-04	2.89E-05	5.37E-06
OV6M1	9.00	0.60	4.95	610.00	2.68E-02	4.26E-06	9.28E-04	9.00E-04	9.28E-05	1.73E-05
OV6AT1	9.00	0.15	17.71	897.00	1.79E-04	4.89E-09	5.68E-06	5.50E-06	1.06E-07	1.06E-07
OV6AM1	9.00	0.15	17.71	897.00	2.39E-03	6.53E-08	7.58E-05	7.34E-05	1.42E-06	1.41E-06
OV7T1	6.00	0.46	18.36	555.00	1.18E-02	3.56E-07	4.00E-04	3.87E-04	7.74E-06	7.43E-06
OV7M1	6.00	0.46	4.42	555.00	6.83E-02	2.06E-06	2.31E-03	2.24E-03	4.48E-05	4.30E-05
OV7AT1	6.00	0.06	8.86	555.00	2.42E-04	6.41E-09	7.44E-06	7.21E-06	1.39E-07	1.38E-07
OV7AM1	6.00	0.06	8.86	555.00	5.80E-03	1.54E-07	1.79E-04	1.73E-04	3.35E-06	3.32E-06
OV8T1	43.00	0.60	27.59	879.00	1.88E-02	1.12E-06	5.81E-04	5.62E-04	2.44E-05	1.08E-05
OV8M1	43.00	0.60	6.65	879.00	7.34E-02	4.37E-06	2.27E-03	2.19E-03	9.51E-05	4.21E-05
OV8AT1	43.00	0.20	44.51	750.00	4.77E-03	1.14E-07	1.32E-04	1.28E-04	2.48E-06	2.46E-06

Table A-1

US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol

CALPUFF - Stack Parameters and Emissions - Construction Time Period - Annual Deposition Assessment

Stack Parameters					Modeled Emissions					
Source ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
OV8AM1	43.00	0.20	44.51	750.00	7.73E-02	1.84E-06	2.14E-03	2.08E-03	4.02E-05	3.98E-05
OD1	53.00	0.10	105.60	844.00	7.61E-03	5.94E-06	5.71E-04	5.71E-04	1.29E-04	1.10E-05
IV1T1	28.00	0.33	83.66	555.00	2.55E-02	1.05E-05	9.15E-04	8.88E-04	2.29E-04	1.71E-05
IV1M1	28.00	0.33	20.16	555.00	4.49E-01	1.85E-04	1.61E-02	1.56E-02	4.02E-03	3.00E-04
IV1AT1	28.00	0.33	42.83	555.00	5.99E-03	1.67E-07	1.94E-04	1.88E-04	3.63E-06	3.60E-06
IV1AM1	28.00	0.33	42.83	555.00	4.37E-01	1.22E-05	1.41E-02	1.37E-02	2.65E-04	2.63E-04
IV2T1	16.00	0.33	38.51	555.00	2.75E-03	4.38E-07	9.54E-05	9.25E-05	9.54E-06	1.78E-06
IV2M1	16.00	0.33	9.28	555.00	1.21E-02	1.93E-06	4.19E-04	4.07E-04	4.19E-05	7.81E-06
IV2AT1	16.00	0.15	9.46	555.00	2.31E-04	6.30E-09	7.32E-06	7.09E-06	1.37E-07	1.36E-07
IV2AM1	16.00	0.15	9.46	555.00	4.21E-03	1.15E-07	1.33E-04	1.29E-04	2.50E-06	2.48E-06
IV3T1	6.00	0.46	18.36	555.00	6.40E-02	1.93E-06	2.17E-03	2.10E-03	4.20E-05	4.03E-05
IV3M1	6.00	0.46	4.42	555.00	1.42E-01	4.28E-06	4.82E-03	4.66E-03	9.33E-05	8.95E-05
IV3AT1	6.00	0.06	8.86	555.00	1.01E-03	2.67E-08	3.10E-05	3.00E-05	5.81E-07	5.76E-07
IV3AM1	6.00	0.06	8.86	555.00	9.27E-03	2.46E-07	2.86E-04	2.77E-04	5.35E-06	5.31E-06
IV4T1	6.00	0.46	18.36	555.00	6.40E-02	1.93E-06	2.17E-03	2.10E-03	4.20E-05	4.03E-05
IV4M1	6.00	0.46	4.42	555.00	1.42E-01	4.28E-06	4.82E-03	4.66E-03	9.33E-05	8.95E-05
IV4AT1	6.00	0.06	8.86	555.00	1.01E-03	2.67E-08	3.10E-05	3.00E-05	5.81E-07	5.76E-07
IV4AM1	6.00	0.06	8.86	555.00	9.27E-03	2.46E-07	2.86E-04	2.77E-04	5.35E-06	5.31E-06
IV5T1	43.00	0.67	32.33	555.00	2.55E-02	1.05E-05	9.15E-04	8.88E-04	2.29E-04	1.71E-05
IV5M1	43.00	0.67	7.79	555.00	1.28E+00	5.27E-04	4.59E-02	4.45E-02	1.15E-02	8.55E-04
IV5AT1	43.00	0.67	10.28	555.00	1.73E-03	4.83E-08	5.60E-05	5.43E-05	1.05E-06	1.04E-06
IV5AM1	43.00	0.67	10.28	555.00	6.00E-01	1.67E-05	1.94E-02	1.88E-02	3.64E-04	3.61E-04
IV6T1	6.00	0.46	18.36	555.00	3.95E-03	1.19E-07	1.34E-04	1.30E-04	2.59E-06	2.49E-06
IV6M1	6.00	0.46	4.42	555.00	2.84E-02	8.57E-07	9.64E-04	9.33E-04	1.87E-05	1.79E-05
IV6AT1	6.00	0.06	8.86	555.00	6.21E-05	1.65E-09	1.91E-06	1.85E-06	3.59E-08	3.56E-08
IV6AM1	6.00	0.06	8.86	555.00	1.85E-03	4.92E-08	5.71E-05	5.53E-05	1.07E-06	1.06E-06
ECV1T1	28.00	0.33	83.66	555.00	8.51E-03	3.50E-06	3.05E-04	2.96E-04	7.63E-05	5.68E-06
ECV1M1	28.00	0.33	20.16	555.00	4.14E-01	1.70E-04	1.48E-02	1.44E-02	3.70E-03	2.76E-04
ECV1AT1	28.00	0.33	42.83	555.00	2.00E-03	5.56E-08	6.46E-05	6.26E-05	1.21E-06	1.20E-06
ECV1AM1	28.00	0.33	42.83	555.00	4.02E-01	1.12E-05	1.30E-02	1.26E-02	2.44E-04	2.42E-04
ECV2T1	16.00	0.33	38.51	555.00	5.49E-03	2.26E-06	1.97E-04	1.91E-04	4.91E-05	3.66E-06
ECV2M1	16.00	0.33	9.28	555.00	4.23E-02	1.74E-05	1.52E-03	1.47E-03	3.79E-04	2.82E-05
ECV2AT1	16.00	0.15	9.46	555.00	4.52E-04	1.26E-08	1.46E-05	1.42E-05	2.74E-07	2.72E-07
ECV2AM1	16.00	0.15	9.46	555.00	1.45E-02	4.03E-07	4.68E-04	4.54E-04	8.78E-06	8.71E-06
ECV3T1	43.00	0.67	32.33	555.00	2.55E-02	1.05E-05	9.15E-04	8.88E-04	2.29E-04	1.71E-05
ECV3M1	43.00	0.67	7.79	555.00	1.18E+00	4.86E-04	4.23E-02	4.11E-02	1.06E-02	7.89E-04
ECV3AT1	43.00	0.67	10.28	555.00	1.73E-03	4.83E-08	5.60E-05	5.43E-05	1.05E-06	1.04E-06
ECV3AM1	43.00	0.67	10.28	555.00	5.54E-01	1.54E-05	1.79E-02	1.74E-02	3.36E-04	3.34E-04
ECV4T1	43.00	0.60	27.59	879.00	1.88E-02	1.12E-06	5.81E-04	5.62E-04	2.44E-05	1.08E-05
ECV4AT1	43.00	0.20	44.51	750.00	4.77E-03	1.14E-07	1.32E-04	1.28E-04	2.48E-06	2.46E-06
ECV4AM1	43.00	0.20	44.51	750.00	9.62E-02	2.30E-06	2.67E-03	2.58E-03	5.00E-05	4.96E-05
ECV5T1	7.60	0.20	60.18	664.00	1.23E-03	3.79E-07	4.25E-05	4.13E-05	8.25E-06	7.92E-07
ECV5M1	7.60	0.20	14.50	664.00	1.50E-02	4.60E-06	5.16E-04	5.01E-04	1.00E-04	9.62E-06
ECV5AT1	7.60	0.15	13.31	712.00	2.28E-04	6.15E-09	7.14E-06	6.92E-06	1.34E-07	1.33E-07
ECV5AM1	7.60	0.15	13.31	712.00	1.15E-02	3.10E-07	3.60E-04	3.49E-04	6.75E-06	6.69E-06
ECV6T1	16.00	0.33	38.51	555.00	3.41E-02	1.40E-05	1.22E-03	1.19E-03	3.06E-04	2.28E-05
ECV6M1	16.00	0.33	9.28	555.00	2.96E-02	1.22E-05	1.06E-03	1.03E-03	2.65E-04	1.98E-05
ECV6AT1	16.00	0.15	9.46	555.00	2.81E-03	7.84E-08	9.11E-05	8.82E-05	1.71E-06	1.69E-06
ECV6AM1	16.00	0.15	9.46	555.00	1.01E-02	2.82E-07	3.28E-04	3.18E-04	6.15E-06	6.10E-06
OMV1T1	33.00	1.01	15.91	555.00	2.17E-03	8.92E-07	7.77E-05	7.54E-05	1.94E-05	1.45E-06
OMV1M1	33.00	1.01	3.83	555.00	9.48E-04	3.90E-07	3.39E-05	3.30E-05	8.49E-06	6.33E-07

Table A-1

US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol

CALPUFF - Stack Parameters and Emissions - Construction Time Period - Annual Deposition Assessment

Stack Parameters					Modeled Emissions					
Source ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
OMV1AT1	33.00	1.65	0.26	555.00	2.68E-05	7.46E-10	8.66E-07	8.39E-07	1.62E-08	1.61E-08
OMV1AM1	33.00	1.65	0.63	555.00	1.98E-04	5.50E-09	6.39E-06	6.19E-06	1.20E-07	1.19E-07
OMV2T1	6.00	0.46	18.36	555.00	1.63E-03	4.91E-08	5.52E-05	5.35E-05	1.07E-06	1.03E-06
OMV2M1	6.00	0.46	4.42	555.00	1.45E-04	4.36E-09	4.91E-06	4.75E-06	9.50E-08	9.12E-08
OMV2AT1	6.00	0.06	8.86	555.00	2.56E-05	6.79E-10	7.89E-07	7.64E-07	1.48E-08	1.47E-08
OMV2AM1	6.00	0.06	8.86	555.00	9.44E-06	2.50E-10	2.91E-07	2.82E-07	5.45E-09	5.41E-09
OMV3T1	43.00	0.60	27.59	879.00	1.79E-03	1.07E-07	5.55E-05	5.37E-05	2.33E-06	1.03E-06
OMV3AT1	43.00	0.20	44.51	750.00	4.56E-04	1.09E-08	1.26E-05	1.22E-05	2.37E-07	2.35E-07
OMV3AM1	43.00	0.20	44.51	750.00	5.98E-03	1.43E-07	1.66E-04	1.61E-04	3.11E-06	3.08E-06
OMV4T1	7.60	0.20	60.18	664.00	7.85E-04	2.41E-07	2.71E-05	2.63E-05	5.25E-06	5.04E-07
OMV4M1	7.60	0.20	14.50	664.00	3.27E-04	1.00E-07	1.13E-05	1.09E-05	2.19E-06	2.10E-07
OMV4AT1	7.60	0.15	13.31	712.00	1.45E-04	3.91E-09	4.54E-06	4.40E-06	8.52E-08	8.45E-08
OMV4AM1	7.60	0.15	13.31	712.00	2.51E-04	6.76E-09	7.85E-06	7.61E-06	1.47E-07	1.46E-07
OMV5T1	7.60	0.20	60.18	664.00	4.90E-04	1.51E-07	1.69E-05	1.64E-05	3.28E-06	3.15E-07
OMV5M1	7.60	0.20	14.50	664.00	4.08E-04	1.26E-07	1.41E-05	1.37E-05	2.73E-06	2.62E-07
OMV5AT1	7.60	0.15	13.31	712.00	9.06E-05	2.45E-09	2.84E-06	2.75E-06	5.32E-08	5.28E-08
OMV5AM1	7.60	0.15	13.31	712.00	3.13E-04	8.45E-09	9.81E-06	9.51E-06	1.84E-07	1.83E-07
OMV6T1	6.00	0.46	18.36	555.00	5.85E-03	8.96E-07	1.30E-04	1.30E-04	1.95E-05	2.50E-06
OMV6M1	6.00	0.46	4.42	555.00	1.30E-02	1.99E-06	2.89E-04	2.89E-04	4.33E-05	5.55E-06
OMV6AT1	6.00	0.06	8.86	555.00	2.61E-04	1.24E-08	6.75E-06	6.75E-06	2.70E-07	1.30E-07
OMV6AM1	6.00	0.06	8.86	555.00	2.40E-03	1.14E-07	6.22E-05	6.22E-05	2.49E-06	1.19E-06
OMV7T1	6.00	0.46	18.36	555.00	5.85E-03	8.96E-07	1.30E-04	1.30E-04	1.95E-05	2.50E-06
OMV7M1	6.00	0.46	4.42	555.00	1.30E-02	1.99E-06	2.89E-04	2.89E-04	4.33E-05	5.55E-06
OMV7AT1	6.00	0.06	8.86	555.00	2.61E-04	1.24E-08	6.75E-06	6.75E-06	2.70E-07	1.30E-07
OMV7AM1	6.00	0.06	8.86	555.00	2.40E-03	1.14E-07	6.22E-05	6.22E-05	2.49E-06	1.19E-06
OMV8T1	6.00	0.46	18.36	555.00	5.85E-03	8.96E-07	1.30E-04	1.30E-04	1.95E-05	2.50E-06
OMV8M1	6.00	0.46	4.42	555.00	1.30E-02	1.99E-06	2.89E-04	2.89E-04	4.33E-05	5.55E-06
OMV8AT1	6.00	0.06	8.86	555.00	2.61E-04	1.24E-08	6.75E-06	6.75E-06	2.70E-07	1.30E-07
OMV8AM1	6.00	0.06	8.86	555.00	2.40E-03	1.14E-07	6.22E-05	6.22E-05	2.49E-06	1.19E-06
OMV9T1	6.00	0.46	18.36	555.00	5.85E-03	8.96E-07	1.30E-04	1.30E-04	1.95E-05	2.50E-06
OMV9M1	6.00	0.46	4.42	555.00	1.30E-02	1.99E-06	2.89E-04	2.89E-04	4.33E-05	5.55E-06
OMV9AT1	6.00	0.06	8.86	555.00	2.61E-04	1.24E-08	6.75E-06	6.75E-06	2.70E-07	1.30E-07
OMV9AM1	6.00	0.06	8.86	555.00	2.40E-03	1.14E-07	6.22E-05	6.22E-05	2.49E-06	1.19E-06
OMV10T1	6.00	0.46	18.36	555.00	2.04E-02	6.14E-07	6.90E-04	6.68E-04	1.34E-05	1.28E-05
OMV10M1	6.00	0.46	4.42	555.00	7.24E-04	2.18E-08	2.45E-05	2.37E-05	4.75E-07	4.56E-07
OMV10AT1	6.00	0.06	8.86	555.00	3.20E-04	8.49E-09	9.86E-06	9.55E-06	1.85E-07	1.83E-07
OMV10AM1	6.00	0.06	8.86	555.00	4.72E-05	1.25E-09	1.45E-06	1.41E-06	2.73E-08	2.70E-08
OMD1	53.00	0.10	105.60	844.00	1.32E-03	1.03E-06	9.91E-05	9.91E-05	2.25E-05	1.90E-06

Note: Refer to OCS Air Permit Application Section 5.5 for more detailed analysis and description.

Table A-2

US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol

CALPUFF - Stack Parameters and Emissions - Annual Operations and Maintenance for Deposition Assessment

Stack Parameters					Modeled Emissions					
Source ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
OMV1T1	33.00	1.01	15.91	555.00	1.25E-02	5.14E-06	4.47E-04	4.34E-04	1.12E-04	8.34E-06
OMV1M1	33.00	1.01	3.83	555.00	5.46E-03	2.25E-06	1.96E-04	1.90E-04	4.89E-05	3.65E-06
OMV1AT1	33.00	1.65	0.26	555.00	1.54E-04	4.30E-09	4.99E-06	4.84E-06	9.36E-08	9.29E-08
OMV1AM1	33.00	1.65	0.63	555.00	1.14E-03	3.17E-08	3.68E-05	3.57E-05	6.90E-07	6.85E-07
OMV2T1	6.00	0.46	18.36	555.00	9.39E-03	2.83E-07	3.18E-04	3.08E-04	6.16E-06	5.91E-06
OMV2M1	6.00	0.46	4.42	555.00	8.35E-04	2.51E-08	2.83E-05	2.74E-05	5.47E-07	5.25E-07
OMV2AT1	6.00	0.06	8.86	555.00	1.48E-04	3.91E-09	4.54E-06	4.40E-06	8.52E-08	8.45E-08
OMV2AM1	6.00	0.06	8.86	555.00	5.44E-05	1.44E-09	1.68E-06	1.62E-06	3.14E-08	3.12E-08
OMV3T1	43.00	0.60	27.59	879.00	1.03E-02	6.16E-07	3.20E-04	3.09E-04	1.34E-05	5.94E-06
OMV3AT1	43.00	0.20	44.51	750.00	2.62E-03	6.26E-08	7.27E-05	7.04E-05	1.36E-06	1.35E-06
OMV3AM1	43.00	0.20	44.51	750.00	3.45E-02	8.22E-07	9.55E-04	9.25E-04	1.79E-05	1.78E-05
OMV4T1	7.60	0.20	60.18	664.00	4.52E-03	1.39E-06	1.56E-04	1.51E-04	3.03E-05	2.91E-06
OMV4M1	7.60	0.20	14.50	664.00	1.88E-03	5.79E-07	6.49E-05	6.30E-05	1.26E-05	1.21E-06
OMV4AT1	7.60	0.15	13.31	712.00	8.35E-04	2.25E-08	2.62E-05	2.54E-05	4.91E-07	4.87E-07
OMV4AM1	7.60	0.15	13.31	712.00	1.44E-03	3.90E-08	4.52E-05	4.38E-05	8.48E-07	8.41E-07
OMV5T1	7.60	0.20	60.18	664.00	2.83E-03	8.69E-07	9.74E-05	9.46E-05	1.89E-05	1.82E-06
OMV5M1	7.60	0.20	14.50	664.00	2.35E-03	7.24E-07	8.11E-05	7.88E-05	1.58E-05	1.51E-06
OMV5AT1	7.60	0.15	13.31	712.00	5.22E-04	1.41E-08	1.64E-05	1.59E-05	3.07E-07	3.04E-07
OMV5AM1	7.60	0.15	13.31	712.00	1.80E-03	4.87E-08	5.65E-05	5.48E-05	1.06E-06	1.05E-06
OMV6T1	6.00	0.46	18.36	555.00	3.37E-02	5.16E-06	7.49E-04	7.49E-04	1.12E-04	1.44E-05
OMV6M1	6.00	0.46	4.42	555.00	7.49E-02	1.15E-05	1.66E-03	1.66E-03	2.50E-04	3.20E-05
OMV6AT1	6.00	0.06	8.86	555.00	1.50E-03	7.14E-08	3.89E-05	3.89E-05	1.56E-06	7.46E-07
OMV6AM1	6.00	0.06	8.86	555.00	1.39E-02	6.58E-07	3.58E-04	3.58E-04	1.43E-05	6.88E-06
OMV7T1	6.00	0.46	18.36	555.00	3.37E-02	5.16E-06	7.49E-04	7.49E-04	1.12E-04	1.44E-05
OMV7M1	6.00	0.46	4.42	555.00	7.49E-02	1.15E-05	1.66E-03	1.66E-03	2.50E-04	3.20E-05
OMV7AT1	6.00	0.06	8.86	555.00	1.50E-03	7.14E-08	3.89E-05	3.89E-05	1.56E-06	7.46E-07
OMV7AM1	6.00	0.06	8.86	555.00	1.39E-02	6.58E-07	3.58E-04	3.58E-04	1.43E-05	6.88E-06
OMV8T1	6.00	0.46	18.36	555.00	3.37E-02	5.16E-06	7.49E-04	7.49E-04	1.12E-04	1.44E-05
OMV8M1	6.00	0.46	4.42	555.00	7.49E-02	1.15E-05	1.66E-03	1.66E-03	2.50E-04	3.20E-05
OMV8AT1	6.00	0.06	8.86	555.00	1.50E-03	7.14E-08	3.89E-05	3.89E-05	1.56E-06	7.46E-07
OMV8AM1	6.00	0.06	8.86	555.00	1.39E-02	6.58E-07	3.58E-04	3.58E-04	1.43E-05	6.88E-06
OMV9T1	6.00	0.46	18.36	555.00	3.37E-02	5.16E-06	7.49E-04	7.49E-04	1.12E-04	1.44E-05
OMV9M1	6.00	0.46	4.42	555.00	7.49E-02	1.15E-05	1.66E-03	1.66E-03	2.50E-04	3.20E-05
OMV9AT1	6.00	0.06	8.86	555.00	1.50E-03	7.14E-08	3.89E-05	3.89E-05	1.56E-06	7.46E-07
OMV9AM1	6.00	0.06	8.86	555.00	1.39E-02	6.58E-07	3.58E-04	3.58E-04	1.43E-05	6.88E-06
OMV10T1	6.00	0.46	18.36	555.00	1.17E-01	3.54E-06	3.98E-03	3.85E-03	7.70E-05	7.39E-05
OMV10M1	6.00	0.46	4.42	555.00	4.17E-03	1.26E-07	1.41E-04	1.37E-04	2.74E-06	2.63E-06
OMV10AT1	6.00	0.06	8.86	555.00	1.84E-03	4.89E-08	5.68E-05	5.50E-05	1.07E-06	1.06E-06
OMV10AM1	6.00	0.06	8.86	555.00	2.72E-04	7.21E-09	8.38E-06	8.12E-06	1.57E-07	1.56E-07
OMD1	53.00	0.10	105.60	844.00	7.61E-03	5.94E-06	5.71E-04	5.71E-04	1.29E-04	1.10E-05

Note: Refer to OCS Air Permit Application Section 5.5 for more detailed analysis and description.

Table A-3
US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol
Calpuff - Stack Parameters and Emissions - Class I AQRV Visibilty Assessment

Stack Parameters and Operations					Maximum Hourly Emissions						Maximum Daily Emissions					
AERMOD ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)	NOx (g/s)	H_2SO_4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
FV2T1	33.00	1.01	15.91	555.00	5.20E+01	3.10E-03	1.61E+00	1.56E+00	6.74E-02	2.99E-02	4.34E+00	2.58E-04	1.34E-01	1.30E-01	5.62E-03	2.49E-03
FV2M1	33.00	1.01	5.13	555.00	6.27E+00	3.73E-04	1.94E-01	1.88E-01	8.13E-03	3.60E-03	6.27E+00	3.73E-04	1.94E-01	1.88E-01	8.13E-03	3.60E-03
FV2AT1	33.00	1.01	6.77	555.00	3.90E+00	9.30E-05	1.08E-01	1.05E-01	2.03E-03	2.01E-03	3.25E-01	7.75E-06	9.00E-03	8.72E-03	1.69E-04	1.67E-04
FV2AM1	33.00	1.01	6.77	555.00	6.50E+00	1.55E-04	1.80E-01	1.74E-01	3.38E-03	3.35E-03	6.50E+00	1.55E-04	1.80E-01	1.74E-01	3.38E-03	3.35E-03
FV3T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
FV3M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	1.34E+00	2.14E-04	4.66E-02	4.52E-02	4.66E-03	8.67E-04
FV3AT1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.00E-02	5.46E-07	6.34E-04	6.14E-04	1.19E-05	1.18E-05
FV3AM1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	1.20E-01	3.28E-06	3.80E-03	3.68E-03	7.13E-05	7.07E-05
FV4T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
FV4M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	2.02E+00	3.21E-04	6.99E-02	6.77E-02	6.99E-03	1.30E-03
FV4AT1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.00E-02	5.46E-07	6.34E-04	6.14E-04	1.19E-05	1.18E-05
FV4AM1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	1.80E-01	4.91E-06	5.70E-03	5.53E-03	1.07E-04	1.06E-04
FV8T1	13.00	0.61	42.66	555.00	1.40E+01	4.21E-04	4.73E-01	4.58E-01	9.16E-03	8.79E-03	1.16E+00	3.51E-05	3.94E-02	3.82E-02	7.63E-04	7.33E-04
FV8M1	13.00	0.61	10.28	555.00	3.37E+00	1.01E-04	1.14E-01	1.10E-01	2.21E-03	2.12E-03	8.41E-01	2.53E-05	2.85E-02	2.76E-02	5.52E-04	5.30E-04
FV8AT1	13.00	0.25	1.77	555.00	1.17E+00	3.09E-05	3.59E-02	3.48E-02	6.74E-04	6.68E-04	9.72E-02	2.58E-06	2.99E-03	2.90E-03	5.61E-05	5.57E-05
FV8AM1	13.00	0.25	11.47	555.00	1.94E+00	5.16E-05	5.99E-02	5.80E-02	1.12E-03	1.11E-03	4.86E-01	1.29E-05	1.50E-02	1.45E-02	2.81E-04	2.78E-04
FV9T1	13.00	0.60	29.82	610.00	1.07E+01	3.23E-04	3.63E-01	3.51E-01	7.03E-03	6.75E-03	8.93E-01	2.69E-05	3.03E-02	2.93E-02	5.86E-04	5.62E-04
FV9M1	13.00	0.60	4.95	610.00	2.58E+00	7.78E-05	8.75E-02	8.47E-02	1.69E-03	1.63E-03	6.46E-01	1.94E-05	2.19E-02	2.12E-02	4.23E-04	4.06E-04
FV9AT1	13.00	0.15	23.06	897.00	3.22E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	2.68E-02	7.11E-07	8.25E-04	8.00E-04	1.55E-05	1.54E-05
FV9AM1	13.00	0.15	23.06	897.00	3.22E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	8.04E-02	2.13E-06	2.48E-03	2.40E-03	4.64E-05	4.61E-05
FV10T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
FV10M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	1.90E-01	5.73E-06	6.45E-03	6.24E-03	1.25E-04	1.20E-04
FV10AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
FV10AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	1.24E-02	3.29E-07	3.82E-04	3.70E-04	7.17E-06	7.11E-06
FV11T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
FV11M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	1.90E-01	5.73E-06	6.45E-03	6.24E-03	1.25E-04	1.20E-04
FV11AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
FV11AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	1.24E-02	3.29E-07	3.82E-04	3.70E-04	7.17E-06	7.11E-06
WV1T1	43.00	1.01	20.37	555.00	2.64E+01	1.57E-03	8.15E-01	7.89E-01	3.42E-02	1.51E-02	2.20E+00	1.31E-04	6.79E-02	6.57E-02	2.85E-03	1.26E-03
WV1M1	43.00	1.01	2.41	555.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
WV1AT1	43.00	0.60	11.40	555.00	2.49E+00	5.95E-05	6.91E-02	6.70E-02	1.30E-03	1.29E-03	2.08E-01	4.96E-06	5.76E-03	5.58E-03	1.08E-04	1.07E-04
WV1AM1	43.00	0.60	11.40	555.00	4.16E+00	9.92E-05	1.15E-01	1.12E-01	2.16E-03	2.14E-03	4.16E+00	9.92E-05	1.15E-01	1.12E-01	2.16E-03	2.14E-03
WV2T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
WV2M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03
WV2AT1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.00E-02	5.46E-07	6.34E-04	6.14E-04	1.19E-05	1.18E-05
WV2AM1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04
WV4T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
WV4M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03
WV4AT1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.00E-02	5.46E-07	6.34E-04	6.14E-04	1.19E-05	1.18E-05
WV4AM1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04
CV1T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
CV1M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	3.81E-01	1.15E-05	1.29E-02	1.25E-02	2.50E-04	2.40E-04
CV1AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
CV1AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	2.48E-02	6.58E-07	7.64E-04	7.41E-04	1.43E-05	1.42E-05
CV2T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
CV2M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	3.81E-01	1.15E-05	1.29E-02	1.25E-02	2.50E-04	2.40E-04
CV2AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
CV2AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	2.48E-02	6.58E-07	7.64E-04	7.41E-04	1.43E-05	1.42E-05
CV3T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
CV3M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	3.81E-01	1.15E-05	1.29E-02	1.25E-02	2.50E-04	2.40E-04

Table A-3
US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol
Calpuff - Stack Parameters and Emissions - Class I AQRV Visibilty Assessment

Stack Parameters and Operations					Maximum Hourly Emissions						Maximum Daily Emissions					
AERMOD ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)	NOx (g/s)	H_2SO_4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
CV3AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
CV3AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	2.48E-02	6.58E-07	7.64E-04	7.41E-04	1.43E-05	1.42E-05
OV1T1	33.00	1.01	15.91	555.00	5.20E+01	3.10E-03	1.61E+00	1.56E+00	6.74E-02	2.99E-02	4.34E+00	2.58E-04	1.34E-01	1.30E-01	5.62E-03	2.49E-03
OV1M1	33.00	1.01	5.13	555.00	6.27E+00	3.73E-04	1.94E-01	1.88E-01	8.13E-03	3.60E-03	6.27E+00	3.73E-04	1.94E-01	1.88E-01	8.13E-03	3.60E-03
OV1AT1	33.00	1.01	5.18	555.00	3.90E+00	9.30E-05	1.08E-01	1.05E-01	2.03E-03	2.01E-03	3.25E-01	7.75E-06	9.00E-03	8.72E-03	1.69E-04	1.67E-04
OV1AM1	33.00	1.01	8.63	555.00	6.50E+00	1.55E-04	1.80E-01	1.74E-01	3.38E-03	3.35E-03	6.50E+00	1.55E-04	1.80E-01	1.74E-01	3.38E-03	3.35E-03
OV2T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
OV2M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03
OV2AT1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.00E-02	5.46E-07	6.34E-04	6.14E-04	1.19E-05	1.18E-05
OV2AM1	9.00	0.15	17.71	897.00	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04	2.40E-01	6.55E-06	7.61E-03	7.37E-03	1.43E-04	1.41E-04
OV3T1	9.00	0.60	29.82	610.00	1.12E+01	1.78E-03	3.87E-01	3.75E-01	3.87E-02	7.20E-03	9.29E-01	1.48E-04	3.22E-02	3.12E-02	3.22E-03	6.00E-04
OV3M1	9.00	0.60	4.95	610.00	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03	2.69E+00	4.28E-04	9.31E-02	9.03E-02	9.31E-03	1.73E-03
OV3AT1	9.00	0.15	23.06	897.00	3.13E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	2.61E-02	7.11E-07	8.25E-04	8.00E-04	1.55E-05	1.54E-05
OV3AM1	9.00	0.15	23.06	897.00	3.13E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	3.13E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04
OV4T1	13.00	0.61	42.66	555.00	1.40E+01	4.21E-04	4.73E-01	4.58E-01	9.16E-03	8.79E-03	1.16E+00	3.51E-05	3.94E-02	3.82E-02	7.63E-04	7.33E-04
OV4M1	13.00	0.61	10.28	555.00	3.37E+00	1.01E-04	1.14E-01	1.10E-01	2.21E-03	2.12E-03	1.68E+00	5.07E-05	5.70E-02	5.52E-02	1.10E-03	1.06E-03
OV4AT1	13.00	0.25	1.77	555.00	1.17E+00	3.09E-05	3.59E-02	3.48E-02	6.74E-04	6.68E-04	9.72E-02	2.58E-06	2.99E-03	2.90E-03	5.61E-05	5.57E-05
OV4AM1	13.00	0.25	11.47	555.00	1.94E+00	5.16E-05	5.99E-02	5.80E-02	1.12E-03	1.11E-03	9.72E-01	2.58E-05	2.99E-02	2.90E-02	5.61E-04	5.57E-04
OV5T1	13.00	0.60	29.82	610.00	5.27E+00	1.59E-04	1.79E-01	1.73E-01	3.46E-03	3.32E-03	4.39E-01	1.32E-05	1.49E-02	1.44E-02	2.88E-04	2.77E-04
OV5M1	13.00	0.60	4.95	610.00	1.27E+00	3.83E-05	4.31E-02	4.17E-02	8.33E-04	8.00E-04	6.35E-01	1.91E-05	2.15E-02	2.08E-02	4.17E-04	4.00E-04
OV5AT1	13.00	0.15	23.06	897.00	3.22E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	2.68E-02	7.11E-07	8.25E-04	8.00E-04	1.55E-05	1.54E-05
OV5AM1	13.00	0.15	23.06	897.00	3.22E-01	8.53E-06	9.91E-03	9.60E-03	1.86E-04	1.84E-04	1.61E-01	4.27E-06	4.95E-03	4.80E-03	9.29E-05	9.21E-05
OV7T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
OV7M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04
OV7AT1	6.00	0.06	8.86	555.00	6.46E-02	1.71E-06	1.99E-03	1.93E-03	3.73E-05	3.70E-05	5.39E-03	1.43E-07	1.66E-04	1.61E-04	3.11E-06	3.09E-06
OV7AM1	6.00	0.06	8.86	555.00	6.46E-02	1.71E-06	1.99E-03	1.93E-03	3.73E-05	3.70E-05	6.46E-02	1.71E-06	1.99E-03	1.93E-03	3.73E-05	3.70E-05
OV8T1	43.00	0.60	27.59	879.00	1.09E+01	6.47E-04	3.36E-01	3.25E-01	1.41E-02	6.24E-03	9.06E-01	5.39E-05	2.80E-02	2.71E-02	1.17E-03	5.20E-04
OV8M1	43.00	0.60	6.65	879.00	2.62E+00	1.56E-04	8.09E-02	7.83E-02	3.39E-03	1.50E-03	1.09E-01	6.50E-06	3.37E-03	3.26E-03	1.41E-04	6.27E-05
OV8AT1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	2.30E-01	5.49E-06	6.37E-03	6.17E-03	1.19E-04	1.18E-04
OV8AM1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	1.15E-01	2.74E-06	3.19E-03	3.09E-03	5.97E-05	5.92E-05
OD1	53.00	0.10	105.60	844.00	6.67E-02	5.21E-05	5.00E-03	5.00E-03	1.13E-03	9.60E-05	6.67E-02	5.21E-05	5.00E-03	5.00E-03	1.13E-03	9.60E-05
IV1T1	28.00	0.33	83.66	555.00	1.15E+01	4.73E-03	4.12E-01	3.99E-01	1.03E-01	7.67E-03	9.57E-01	3.94E-04	3.43E-02	3.33E-02	8.57E-03	6.39E-04
IV1M1	28.00	0.33	20.16	555.00	2.77E+00	1.14E-03	9.92E-02	9.63E-02	2.48E-02	1.85E-03	2.77E+00	1.14E-03	9.92E-02	9.63E-02	2.48E-02	1.85E-03
IV1AT1	28.00	0.33	42.83	555.00	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03	2.24E-01	6.25E-06	7.26E-03	7.03E-03	1.36E-04	1.35E-04
IV1AM1	28.00	0.33	42.83	555.00	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03
IV2T1	16.00	0.33	38.51	555.00	3.54E+00	5.63E-04	1.23E-01	1.19E-01	1.23E-02	2.28E-03	2.95E-01	4.69E-05	1.02E-02	9.90E-03	1.02E-03	1.90E-04
IV2M1	16.00	0.33	9.28	555.00	8.52E-01	1.36E-04	2.95E-02	2.86E-02	2.95E-03	5.50E-04	4.26E-01	6.78E-05	1.48E-02	1.43E-02	1.48E-03	2.75E-04
IV2AT1	16.00	0.15	9.46	555.00	2.97E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	2.47E-02	6.75E-07	7.84E-04	7.59E-04	1.47E-05	1.46E-05
IV2AM1	16.00	0.15	9.46	555.00	2.97E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	1.48E-01	4.05E-06	4.70E-03	4.55E-03	8.82E-05	8.74E-05
IV3T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
IV3M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	3.81E-01	1.15E-05	1.29E-02	1.25E-02	2.50E-04	2.40E-04
IV3AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
IV3AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	2.48E-02	6.58E-07	7.64E-04	7.41E-04	1.43E-05	1.42E-05
IV4T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
IV4M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	3.81E-01	1.15E-05	1.29E-02	1.25E-02	2.50E-04	2.40E-04
IV4AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
IV4AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	2.48E-02	6.58E-07	7.64E-04	7.41E-04	1.43E-05	1.42E-05
IV5T1	43.00	0.67	32.33	555.00	3.28E+01	1.35E-02	1.18E+00	1.14E+00	2.94E-01	2.19E-02	2.73E+00	1.13E-03	9.80E-02	9.51E-02	2.45E-02	1.83E-03
IV5M1	43.00	0.67	7.79	555.00	7.91E+00	3.25E-03	2.83E-01	2.75E-01	7.08E-02	5.28E-03	7.91E+00	3.25E-03	2.83E-01	2.75E-01	7.08E-02	5.28E-03
IV5AT1	43.00	0.67	10.28	555.00	2.23E+00	6.20E-05	7.20E-02	6.98E-02	1.35E-03	1.34E-03	1.85E-01	5.17E-06	6.00E-03	5.81E-03	1.13E-04	1.12E-04

Table A-3
US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol
Calpuff - Stack Parameters and Emissions - Class I AQRV Visibilty Assessment

Stack Parameters and Operations					Maximum Hourly Emissions						Maximum Daily Emissions					
AERMOD ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)	NOx (g/s)	H_2SO_4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
IV5AM1	43.00	0.67	10.28	555.00	3.71E+00	1.03E-04	1.20E-01	1.16E-01	2.25E-03	2.23E-03	3.71E+00	1.03E-04	1.20E-01	1.16E-01	2.25E-03	2.23E-03
IV6T1	6.00	0.46	18.36	555.00	3.16E+00	9.52E-05	1.07E-01	1.04E-01	2.07E-03	1.99E-03	2.63E-01	7.93E-06	8.92E-03	8.63E-03	1.73E-04	1.66E-04
IV6M1	6.00	0.46	4.42	555.00	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04	7.61E-01	2.29E-05	2.58E-02	2.50E-02	4.99E-04	4.79E-04
IV6AT1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.14E-03	1.10E-07	1.27E-04	1.23E-04	2.39E-06	2.37E-06
IV6AM1	6.00	0.06	8.86	555.00	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05	4.96E-02	1.32E-06	1.53E-03	1.48E-03	2.87E-05	2.84E-05
ECV1T1	28.00	0.33	83.66	555.00	1.15E+01	4.73E-03	4.12E-01	3.99E-01	1.03E-01	7.67E-03	9.57E-01	3.94E-04	3.43E-02	3.33E-02	8.57E-03	6.39E-04
ECV1M1	28.00	0.33	20.16	555.00	2.77E+00	1.14E-03	9.92E-02	9.63E-02	2.48E-02	1.85E-03	2.77E+00	1.14E-03	9.92E-02	9.63E-02	2.48E-02	1.85E-03
ECV1AT1	28.00	0.33	42.83	555.00	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03	2.24E-01	6.25E-06	7.26E-03	7.03E-03	1.36E-04	1.35E-04
ECV1AM1	28.00	0.33	42.83	555.00	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03	2.69E+00	7.50E-05	8.71E-02	8.44E-02	1.63E-03	1.62E-03
ECV2T1	16.00	0.33	38.51	555.00	3.52E+00	1.45E-03	1.26E-01	1.23E-01	3.16E-02	2.35E-03	2.94E-01	1.21E-04	1.05E-02	1.02E-02	2.63E-03	1.96E-04
ECV2M1	16.00	0.33	9.28	555.00	8.49E-01	3.49E-04	3.04E-02	2.95E-02	7.61E-03	5.67E-04	8.49E-01	3.49E-04	3.04E-02	2.95E-02	7.61E-03	5.67E-04
ECV2AT1	16.00	0.15	9.46	555.00	2.91E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	2.42E-02	6.75E-07	7.84E-04	7.59E-04	1.47E-05	1.46E-05
ECV2AM1	16.00	0.15	9.46	555.00	2.91E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	2.91E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04
ECV3T1	43.00	0.67	32.33	555.00	3.28E+01	1.35E-02	1.18E+00	1.14E+00	2.94E-01	2.19E-02	2.73E+00	1.13E-03	9.80E-02	9.51E-02	2.45E-02	1.83E-03
ECV3M1	43.00	0.67	7.79	555.00	7.91E+00	3.25E-03	2.83E-01	2.75E-01	7.08E-02	5.28E-03	7.91E+00	3.25E-03	2.83E-01	2.75E-01	7.08E-02	5.28E-03
ECV3AT1	43.00	0.67	10.28	555.00	2.23E+00	6.20E-05	7.20E-02	6.98E-02	1.35E-03	1.34E-03	1.85E-01	5.17E-06	6.00E-03	5.81E-03	1.13E-04	1.12E-04
ECV3AM1	43.00	0.67	10.28	555.00	3.71E+00	1.03E-04	1.20E-01	1.16E-01	2.25E-03	2.23E-03	3.71E+00	1.03E-04	1.20E-01	1.16E-01	2.25E-03	2.23E-03
ECV4T1	43.00	0.60	27.59	879.00	1.09E+01	6.47E-04	3.36E-01	3.25E-01	1.41E-02	6.24E-03	9.06E-01	5.39E-05	2.80E-02	2.71E-02	1.17E-03	5.20E-04
ECV4M1	43.00	0.60	6.65	879.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ECV4AT1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	2.30E-01	5.49E-06	6.37E-03	6.17E-03	1.19E-04	1.18E-04
ECV4AM1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	1.38E+00	3.29E-05	3.82E-02	3.70E-02	7.17E-04	7.11E-04
ECV5T1	7.60	0.20	60.18	664.00	1.78E+00	5.48E-04	6.15E-02	5.96E-02	1.19E-02	1.15E-03	1.49E-01	4.57E-05	5.12E-03	4.97E-03	9.94E-04	9.54E-05
ECV5M1	7.60	0.20	14.50	664.00	4.29E-01	1.32E-04	1.48E-02	1.44E-02	2.87E-03	2.76E-04	2.15E-01	6.60E-05	7.40E-03	7.19E-03	1.44E-03	1.38E-04
ECV5AT1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	2.74E-02	7.41E-07	8.60E-04	8.33E-04	1.61E-05	1.60E-05
ECV5AM1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	1.65E-01	4.44E-06	5.16E-03	5.00E-03	9.68E-05	9.60E-05
ECV6T1	16.00	0.33	38.51	555.00	3.52E+00	1.45E-03	1.26E-01	1.23E-01	3.16E-02	2.35E-03	2.94E-01	1.21E-04	1.05E-02	1.02E-02	2.63E-03	1.96E-04
ECV6M1	16.00	0.33	9.28	555.00	8.49E-01	3.49E-04	3.04E-02	2.95E-02	7.61E-03	5.67E-04	4.25E-01	1.75E-04	1.52E-02	1.48E-02	3.80E-03	2.84E-04
ECV6AT1	16.00	0.15	9.46	555.00	2.91E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	2.42E-02	6.75E-07	7.84E-04	7.59E-04	1.47E-05	1.46E-05
ECV6AM1	16.00	0.15	9.46	555.00	2.91E-01	8.10E-06	9.40E-03	9.11E-03	1.76E-04	1.75E-04	1.45E-01	4.05E-06	4.70E-03	4.55E-03	8.82E-05	8.74E-05
OMV1T1	33.00	1.01	15.91	555.00	2.95E+01	1.22E-02	1.06E+00	1.03E+00	2.65E-01	1.97E-02	2.46E+00	1.01E-03	8.82E-02	8.56E-02	2.20E-02	1.64E-03
OMV1M1	33.00	1.01	3.83	555.00	7.12E+00	2.93E-03	2.55E-01	2.48E-01	6.38E-02	4.75E-03	7.12E+00	2.93E-03	2.55E-01	2.48E-01	6.38E-02	4.75E-03
OMV1AT1	33.00	1.65	0.26	555.00	3.65E-01	1.02E-05	1.18E-02	1.14E-02	2.21E-04	2.20E-04	3.04E-02	8.47E-07	9.84E-04	9.53E-04	1.85E-05	1.83E-05
OMV1AM1	33.00	1.65	0.63	555.00	1.48E+00	4.13E-05	4.80E-02	4.65E-02	9.00E-04	8.93E-04	1.48E+00	4.13E-05	4.80E-02	4.65E-02	9.00E-04	8.93E-04
OMV3T1	43.00	0.60	27.59	879.00	1.09E+01	6.47E-04	3.36E-01	3.25E-01	1.41E-02	6.24E-03	9.06E-01	5.39E-05	2.80E-02	2.71E-02	1.17E-03	5.20E-04
OMV3M1	43.00	0.60	6.65	879.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
OMV3AT1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	2.30E-01	5.49E-06	6.37E-03	6.17E-03	1.19E-04	1.18E-04
OMV3AM1	43.00	0.20	44.51	750.00	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03	2.76E+00	6.58E-05	7.64E-02	7.41E-02	1.43E-03	1.42E-03
OMV4T1	7.60	0.20	60.18	664.00	1.78E+00	5.48E-04	6.15E-02	5.96E-02	1.19E-02	1.15E-03	1.49E-01	4.57E-05	5.12E-03	4.97E-03	9.94E-04	9.54E-05
OMV4M1	7.60	0.20	14.50	664.00	4.29E-01	1.32E-04	1.48E-02	1.44E-02	2.87E-03	2.76E-04	4.29E-01	1.32E-04	1.48E-02	1.44E-02	2.87E-03	2.76E-04
OMV4AT1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	2.74E-02	7.41E-07	8.60E-04	8.33E-04	1.61E-05	1.60E-05
OMV4AM1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04
OMV5T1	7.60	0.20	60.18	664.00	1.78E+00	5.48E-04	6.15E-02	5.96E-02	1.19E-02	1.15E-03	1.49E-01	4.57E-05	5.12E-03	4.97E-03	9.94E-04	9.54E-05
OMV5M1	7.60	0.20	14.50	664.00	4.29E-01	1.32E-04	1.48E-02	1.44E-02	2.87E-03	2.76E-04	4.29E-01	1.32E-04	1.48E-02	1.44E-02	2.87E-03	2.76E-04
OMV5AT1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	2.74E-02	7.41E-07	8.60E-04	8.33E-04	1.61E-05	1.60E-05
OMV5AM1	7.60	0.15	13.31	712.00	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04	3.29E-01	8.89E-06	1.03E-02	1.00E-02	1.94E-04	1.92E-04
OMV6T1	6.00	0.46	18.36	555.00	6.22E-01	9.52E-05	1.38E-02	1.38E-02	2.07E-03	2.65E-04	5.18E-02	7.93E-06	1.15E-03	1.15E-03	1.73E-04	2.21E-05
OMV6M1	6.00	0.46	4.42	555.00	1.50E-01	2.29E-05	3.33E-03	3.33E-03	4.99E-04	6.39E-05	1.50E-01	2.29E-05	3.33E-03	3.33E-03	4.99E-04	6.39E-05
OMV6AT1	6.00	0.06	8.86	555.00	2.77E-02	1.32E-06	7.17E-04	7.17E-04	2.87E-05	1.38E-05	2.31E-03	1.10E-07	5.97E-05	5.97E-05	2.39E-06	1.15E-06
OMV6AM1	6.00	0.06	8.86	555.00	2.77E-02	1.32E-06	7.17E-04	7.17E-04	2.87E-05	1.38E-05	2.77E-02	1.32E-06	7.17E-04	7.17E-04	2.87E-05	1.38E-05

Table A-3
US Wind, Inc. - Maryland Offshore Wind Project - Class I AQRV Modeling Protocol
Calpuff - Stack Parameters and Emissions - Class I AQRV Visibilty Assessment

Stack Parameters and Operations					Maximum Hourly Emissions						Maximum Daily Emissions					
AERMOD ID	Stack Height (m)	Stack Diameter (m)	Stack Exit Velocity (m/s)	Stack Exit Temperature (K)	NOx (g/s)	H2SO4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)	NOx (g/s)	H_2SO_4 (g/s)	PM10 (g/s)	PM2.5 (g/s)	SO2 (g/s)	NH3 (g/s)
OMD1	53.00	0.10	105.60	844.00	6.67E-02	5.21E-05	5.00E-03	5.00E-03	1.13E-03	9.60E-05	6.67E-02	5.21E-05	5.00E-03	5.00E-03	1.13E-03	9.60E-05

Note: Refer to OCS Air Permit Application Section 5.5 for more detailed analysis and description.

Appendix B
Sample CALPUFF Input Files
(Available Electronically by Request)