

DIVISION OF AIR QUALITY
July 27, 2021

MEMORANDUM

TO: Leo Governale, Environmental Engineer, WSRO
Davis Murphy, Permit Coordinator, WSRO

FROM: Nancy Jones, Meteorologist, Air Quality Analysis Branch (AQAB)

THROUGH: Tom Anderson, AQAB Supervisor, AQAB

SUBJECT: Review of Dispersion Modeling Carolina Sunrock, LLC - Burlington North
Burlington, Caswell County, North Carolina Facility ID: 1700016

I have reviewed the dispersion modeling analysis, received July 1, 2021, for the Carolina Sunrock Burlington North Facility in Burlington, Caswell County, NC. It is an update to the original modeling that was received on September 23, 2019. The modeling was submitted as part of an application for a new hot mix asphalt plant and a concrete batch plant. The purpose for modeling was to demonstrate compliance with guidelines specified in 15A NCAC 2D .1104 for Toxic Air Pollutants (TAPs) emitted in excess of the Toxic Permitting Emission Rates (TPERs) listed in 15A NCAC 2Q .0711. The modeling adequately demonstrates compliance, on a source-by-source basis, for all toxics modeled.

Five air toxics, arsenic, benzene, formaldehyde, mercury and nickel were evaluated using AERMOD (v18081) with the 2014-2018 Danville, VA surface and Greensboro upper air meteorological data. Direction-specific building dimensions, determined using EPA's BPIP-Prime program (04274), were used as input to the model for building wake effect determination. Release parameters and emission rates are attached. Receptors were spaced 50 meters apart along the property line with a nested grid extending out to 7,500 meters. Release parameters and emission rates are attached.

Maximum Modeled Toxics Impacts
Carolina Sunrock – Burlington North Facility, Caswell County, NC

Pollutant	Averaging Period	Max. Conc. ($\mu\text{g}/\text{m}^3$)	AAL ($\mu\text{g}/\text{m}^3$)	% of AAL
Arsenic	Annual	1.1E-4	0.0021	5 %
Benzene	Annual	1.15E-2	0.12	10 %
Formaldehyde	1-hr	5.29	150	4 %
Mercury	24-hr	1.27E-3	0.6	<1 %
Nickel	24-hr	3.05E-2	6.0	1 %

This compliance demonstration assumes the source parameters and pollutant emission rates used in the dispersion modeling analysis are correct.

cc: Tom Anderson
Nancy Jones

Point Source ID	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temp.	Exit Velocity	Stack Diameter	Arsenic	Benzene	Form.	Mercury	Nickel
	(m)	(m)	(m)	(ft)	(°F)	(fps)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
CD1	650207.9	4013087	201	46	240	96.49	3.08	1.40E-04	9.75E-02	7.75E-01	6.50E-04	1.58E-02
H1	650203.8	4013069	202	9	325	0.03	0.98	4.80E-06	2.36E-05	4.11E-04	3.60E-06	3.60E-06
H2	650190.2	4013088	200	15	325	0.03	0.20	4.40E-06	2.16E-05	3.77E-04	3.30E-06	3.30E-06
HMASILO1	650187.6	4013062	201	65	68	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO2	650189.4	4013058	201	65	68	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO3	650185.7	4013065	201	65	68	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO4	650184	4013069	201	65	68	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
HMASILO5	650191.1	4013055	201	65	68	0.03	0.98	0.00E+00	1.95E-04	4.20E-03	0.00E+00	0.00E+00
CD2	650222.3	4013030	203	40	68	79.99	1.51	6.59E-05	0.00E+00	0.00E+00	0.00E+00	1.92E-04

Volume Source ID	Easting (X)	Northing (Y)	Base Elevation	Release Height	Init. Hor. Dimen.	Init. Vert. Dimen.	Arsenic	Benzene	Form.	Mercury	Nickel
	(m)	(m)	(m)	(ft)	(ft)	(ft)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
HMALO1	650187.6	4013062	201	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO2	650189.4	4013058	201	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO3	650185.7	4013065	201	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO4	650184	4013069	201	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00
HMALO5	650191.1	4013055	201	12	0.49	5.58	0.00E+00	1.08E-04	1.83E-04	0.00E+00	0.00E+00