TECHNICAL REVIEW AND EVALUATION OF APPLICATION FOR AIR QUALITY PERMIT No. 90852

I. INTRODUCTION

This Class I new permit is for the construction and operation of NewLife Forest Products, L.L.C.'s Windfall Sawmill.

A. Company Information

Facility Name: Windfall Sawmill

Mailing Address: 14005 E Old Rte 66 Bellemont, AZ 86015

Facility Location: 14005 E Old Rte 66 Bellemont, AZ 86015, Coconino County

B. Attainment Classification

The facility is located in an area that is in attainment for all criteria pollutants.

II. PROCESS DESCRIPTION

A. Process Equipment

The Windfall Sawmill is capable of producing 135 million board feet (MMBf) per year of kiln dried ponderosa pine dimension lumber. The site also contains an Engineered Wood Products (EWP) plant capable of producing up to 40 MMBf/yr of wood product.

1. Sawmill and Green End Operations Building

Before arriving onsite, logs are processed in the forest and cut to a length of approximately 16'-6". These logs are delivered by truck and stored on-site prior to processing. The logs are fed into two debarkers then any logs not cut to size correctly in the forest are trimmed using a log bucking saw before routing through the sawmill. Logs entering the sawmill are converted into various size green dimension lumber by a variety of saws. Dimension lumber is graded, trimmed, sorted by length and dimension, stacked on sticks, and sent for drying. The product of this process is rough, green dimensional lumber. By-products from this operation include bark, chips, and sawdust.

2. Lumber Drying Kiln

The stacks of rough, green lumber from the sawmill are stacked onto carts, which are then stacked in one of thirteen indirect heat gas fired kilns. The packs of lumber are dried using kilns fueled by natural gas. The heating systems' hot combustion gases are routed through a heat exchanger to heat incoming air to an optimal drying temperature within the kiln. After drying, the rough lumber is sold as unfinished, heat treated lumber, or it is finished in the planer mill or EWP process.

3. Planer Mill

The rough, dry lumber is sent from the lumber kilns to be finished in the planer mill. Each board is passed through a planer to level the surface and finish the board to its final thickness and width. The ends of the board are then trimmed to achieve the final board length. After trimming, each board is graded, stamped, and stacked for shipping. Planer shavings are pneumatically conveyed from the building to the shavings bin. Any rejects or trim from the planing process are routed to a hammer mill where the resultant shavings are pneumatically conveyed to a shaker screen where they are screened and bagged for sale as animal bedding product.

4. EWP Process

Kiln dried, finished lumber is purchased and brought onsite or taken from the kilns and sawed and planed to the desired dimensions before proceeding to the finger jointing, edge gluing, and coating where they are processed into boards or beams. The EWP process uses a cyclone pneumatic system to convey shavings. Shavings are pneumatically conveyed to a storage bin. Rejects and trim are sent to a hammer mill where the resultant shavings are pneumatically conveyed to a shaker screen where they are screened and bagged for sale as animal bedding product.

5. Byproduct Handling

Byproduct wood residue from the sawmill, planer mill, and EWP processes are conveyed to storage and then shipped offsite. Bark from debarking is routed to bark hogging then mechanically conveyed to storage bins. Trim from the sawmill is routed to chippers and mechanically conveyed with other chips produced in the sawmill to the chip storage bin. Sawdust is mechanically conveyed to the sawdust storage bin. Shavings are pneumatically conveyed from the Planer Mill and EWP Process to storage bins. The byproducts are loaded into trucks and transported off site.

B. Control Devices

The Windfall Sawmill controls particulate matter emissions with enclosures and cyclones. The debarker is partially enclosed with shrouding. The sawmill operations are required to be fully enclosed. The facility also uses cyclones at EWP building, Hammermill, and Planer Mill to minimize particulate matter emissions.

C. Process Flow Diagram

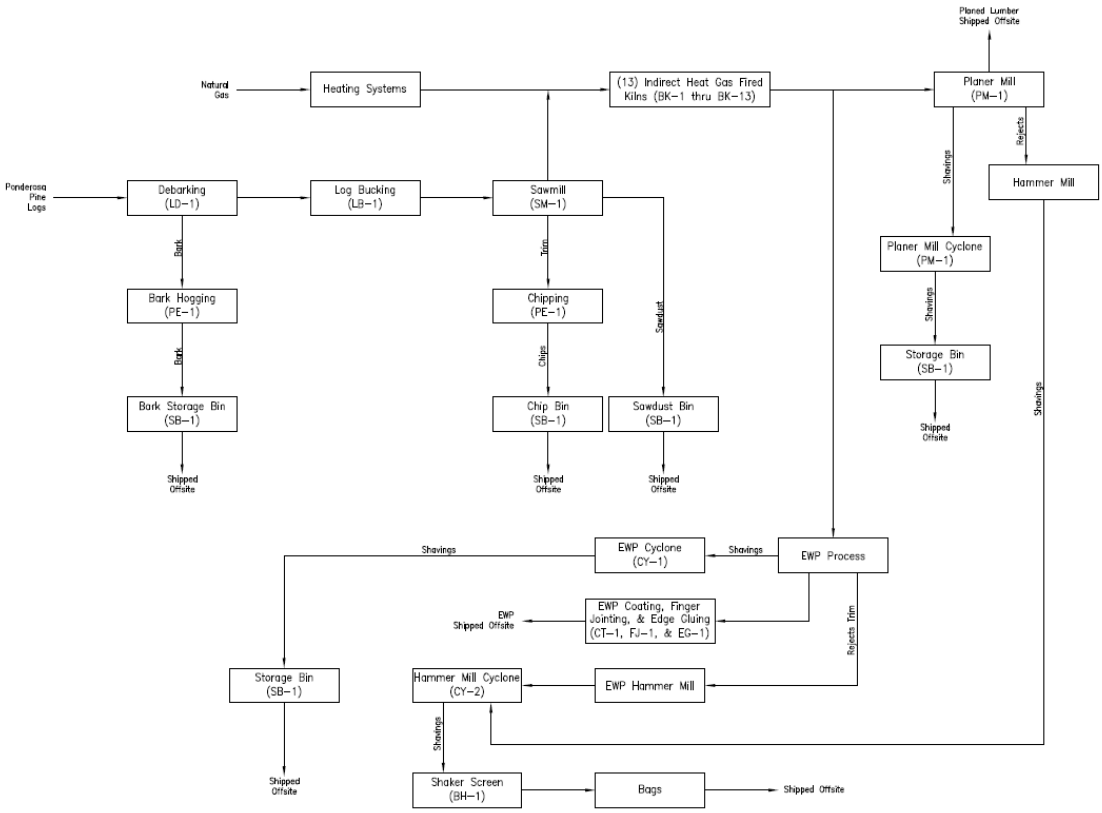

Figure 1: Process Flow Diagram

III. LEARNING SITE EVALUATION

In accordance with ADEQ's Environmental Permits and Approvals near Learning Sites Policy, the Department is required to conduct an evaluation to determine if any nearby learning sites would be adversely impacted by the facility. Learning sites consist of all existing public schools, charter schools and private schools the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ.

The Windfall Sawmill is not within a 2-mile radius of any learning sites. Therefore, the facility is exempt from the learning sites evaluations.

IV. EMISSIONS

The facility's potential to emit were calculated based on emission factors published by U.S. EPA Region 10, "EPA Region 10 Particulate Matter Potential to Emit Emission Factors for Activities at Sawmills, Excluding Boilers, Located in Pacific Northwest Indian Country, May 2014," Texas Commission on Environmental Quality's (TCEQ) 2005 Wood Industry Emission Factors

documentation, The National Council for Air and Stream Improvement, Inc.'s (NCASI) February 2013 Lumber Mill Emission Factors database, AP-42, Section 1.4, Natural Gas Combustion, July 1998, and material characteristics.

The facility has a potential-to-emit (PTE) more than the major source thresholds of volatile organic compounds (VOCs) and the hazardous air pollutant (HAP) methanol. The facility's PTE is provided in Table 1 below:

Table 1: Potential to Emit (tpy)

Pollutant	Point Source Emissions	Fugitive Emissions	Total Emissions	Permitting Exemption Threshold	Minor NSR Triggered?*
NO_X	26.80	0.00	26.80	20	Yes
PM_{10}	11.32	3.79	15.11	7.5	Yes
$PM_{2.5}$	8.26	1.89	10.15	5	Yes
CO	22.51	0.00	22.51	50	No
SO_2	0.16	0.00	0.16	20	No
VOC	174.59	34.55	209.14	20	Yes
Pb	0.000134	0.00	0.000134	0.3	No
Single Greatest HAP: (Methanol)	13.10	0.00	13.10	N/A	N/A
Total HAPs	18.16	0.00	18.16	N/A	N/A
GHG (CO_2e)	32,307.3	0.00	32,307	N/A	N/A

*Minor NSR is only evaluated against point source emissions.

V. MINOR NEW SOURCE REVIEW (NSR)

Minor new source review is required if the emissions of a new source have the potential to emit any regulated air pollutant at an amount greater than or equal to the permitting exemption threshold (PET) in Table 1 above.

The facility conducted screen modeling and an ozone technical analysis to demonstrate compliance with minor NSR Requirements. A detailed discussion of the screen modeling analysis can be found in Section X below.

VI. VOLUNTARILY ACCEPTED EMISSION LIMITATIONS AND STANDARDS

The permit contains the following voluntary emission limitations and standards:

To avoid prevention of significant deterioration (PSD) review and keep the facility's potential to emit below 250 tpy of VOCs emitted, the facility has accepted the voluntary limits:

- limit the cumulative lumber dried to 135 million board feet (MMBf) per year on a 12-month rolling total basis for all batch kilns combined; and

- limit coating material used to 238,000 gallons per year on a 12-month rolling total basis at the EWP.

VII. APPLICABLE REGULATIONS

The Windfall Sawmill is subject to National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart DDDD for Plywood and Composite Wood Products Manufacture (PCWP). However, based on 40 Code of Federal Regulations (CFR) 63.2252, for process units not subject to the compliance options or work practice requirements specified in §63.2240 (including, but not limited to, lumber kilns), the facility is not required to comply with the compliance options, work practice requirements, performance testing, monitoring, startup, shutdown, and malfunction (SSM) plans, and recordkeeping or reporting requirements of Subpart DDDD. In addition, the facility is not subject to any other requirements in NESHAP Subpart A, General Provisions, except for the initial notification requirements in §63.9(b). Table 2 identifies other applicable regulations and verification as to why that standard applies. The table also contains a discussion of any regulations the emission unit is exempt from.

Table 2: Applicable Regulations

Unit & year	Control Device	Rule	Discussion
Batch Kilns: BK-1, BK-2, BK-3, BK-4, BK-5, BK-6, BK-7, BK-8, BK-9, BK-10, BK-11, BK-12 and BK-13	N/A	A.A.C. R18-2-724	The lumber drying kilns, BK-1 through BK-13, use natural gas which is burned for the primary purpose of producing hot air or gases and whose products of combustion do not come into direct contact with process materials. Therefore, A.A.C. R18-2-724 applies.
Debarkers, Bucking Saws, Sawmill Chippers, Bark Hog, EWP Plant, Hammer Mill, Storage Bins, Material Handling	Cyclones and Enclosures	A.A.C. R18-2-730	This equipment is not subject to any NSPS or another standard of performance under Article 7. Therefore, this equipment is subject to R18-2-730, standards of performance for unclassified sources.
Fugitive dust sources	Water Trucks, Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.

Unit & year	Control Device	Rule	Discussion
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	These standards are applicable to any spray painting operation.
Demolition/renovation Operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.

VIII. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

Table 3 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit. The table below is intended to provide insight to the public for how the Permittee is required to demonstrate compliance with the emission limits in the permit.

Table 3: Permit No. 90852 Monitoring, Recordkeeping, And Reporting Requirements

Emission Unit	Pollutant / Material	Emission / Material Limit	Monitoring Requirements	Recordkeeping Requirements
Batch Kilns (cumulative)	Lumber Dried Throughput	135 MMBf per year	Record the rolling 12-month total lumber dried for each batch kilns.	Calculate the rolling 12-month total lumber dried for each batch kiln and for all batch kilns cumulatively.
Batch Kilns	PM	15% opacity	Conduct monthly-opacity monitoring of the stacks of all batch kilns subject to state regulations.	
EWP Plant	Coating Material	238,000 gallons per year	Record the rolling 12-month total of coating material used.	Calculate the rolling 12-month total of coating material used. Maintain records of the Safety Data Sheets (SDS) for all adhesives, resins, glues, coating materials, and VOC and Federal HAP containing materials used
Fugitive Dust	PM	40% Opacity	A Method 9 observer is required to conduct a monthly survey of visible emissions.	Record of the dates and types of dust control measures employed, and if applicable, the results of any Method 9 observations, and any corrective action taken to lower the opacity of any excess emissions.
Abrasive Blasting	PM	20% Opacity		Record the date, duration and pollution control measures of any abrasive blasting project.

Emission Unit	Pollutant / Material	Emission / Material Limit	Monitoring Requirements	Recordkeeping Requirements
Spray Painting	VOC	20% Opacity Control 96% of the overspray		Maintain records of the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.
Demolition/ Renovation	Asbestos			Maintain records of all asbestos related demolition or renovation projects including the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents

IX. ENVIRONMENTAL JUSTICE ANALYSIS

The EPA (Environmental Protection Agency) defines Environmental Justice (EJ) to include the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and polices. The goal of completing an EJ assessment in permitting is to provide an opportunity for overburdened populations or communities to allow for meaningful participation in the permitting process. Overburdened is used to describe the minority, low-income, tribal and indigenous populations or communities that potentially experience disproportionate environmental harms and risks due to exposures or cumulative impacts or greater vulnerability to environmental hazards.

The EPA developed EJSCREEN, a publicly available tool that uses nationally consistent data, to produce maps and reports detailing environmental and demographic indicators that can be used to evaluate EJ concerns. The EPA selected an 80th percentile threshold for this action to evaluate the potential for EJ concerns in a community, meaning that if the area of interest exceeds the 80th percentile for one or more of the EJ indexes, the EPA considers that area to have a high potential for EJ concerns. The ADEQ mapped the location of the Windfall Sawmill and reviewed a five-mile radius around the facility for potential environmental justice concerns (see Figure 2 below).

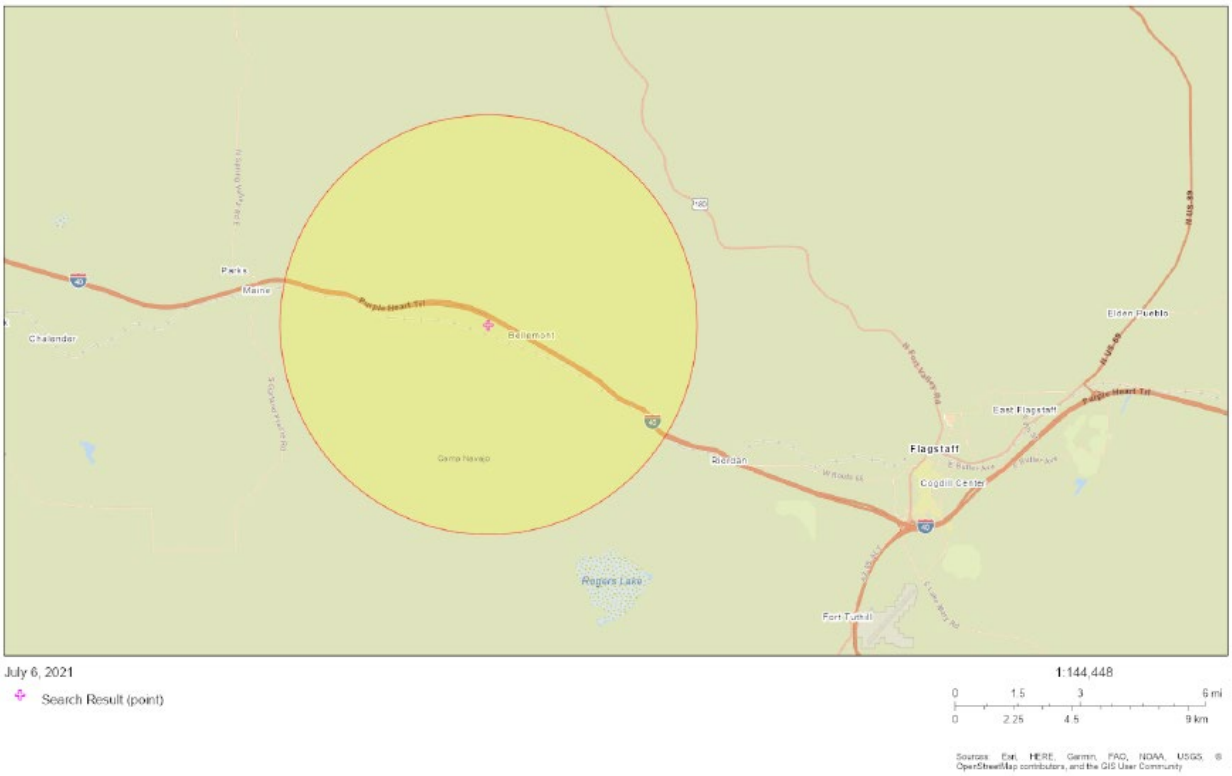

Figure 2: Five-mile radius of the Windfall Sawmill's location

A. Demographics

ADEQ relied on data from the EPA EJ Screen tool to assess the demographics of the communities near the initial location for this proposed facility. The EJSCREEN report shows that the Demographic Indicators; Minority Population, Low Income Population,

Linguistically Isolated Population, Population with Less Than High School Education, Population over 64 years of age, and Population Under 5 years of age, are all below the 80th percentile threshold.

B. Summary of Air Quality

All air quality related environmental indicators within a 5-miles radius of the facility were below the 80th percentile for both Arizona and the USA averages. Additionally, air quality dispersion modeling for NO_X and an ozone technical analysis to determine if emissions from the Windfall Sawmill will contribute to a NAAQS exceedance for NO_X and a complete review of the air quality analysis can be found in Section X below. Based on the modeling analysis results, ADEQ has determined that the issuance of the Air Quality Permit for the Windfall Sawmill will not interfere with attainment of the NAAQS, and will not have an adverse impact on the community.

C. Conclusion

ADEQ concludes that the protections afforded by Arizona Revised Statutes (A.R.S.) § 49-426, which is imposed through the permit, ensure that the public health and environment in Arizona are protected and that the public notice and comment opportunities afforded to the community on this new permit application satisfy the public participation component of the EPA EJ Guidance. The dispersion modeling and technical analysis conducted further concludes that the Windfall Sawmill demonstrates compliance with the NAAQS and that the emissions from the facility will not result in any significant environmental or public health impacts.

X. AMBIENT AIR IMPACT ANALYSIS

This section summarizes the ADEQ's findings regarding the ambient assessment submitted by NLFP in support of its air quality class I permit application for the construction and operation of a sawmill facility at Bellemont, Arizona. Because the facility's PTE (excluding fugitive emissions) is greater than the permitting exemption threshold for PM_{10}, $PM_{2.5}$, NOx and VOC, these pollutants trigger the minor NSR review. Under the minor NSR program, the Permittee must address minor NSR requirements by conducting a National Ambient Air Quality Standards (NAAQS) modeling exercise or a Reasonable Available Control Technology (RACT) analysis. NLFP elected to conduct a RACT analysis and regulatory dispersion modeling to demonstrate that the proposed project's emissions will not interfere with attainment and maintenance of NAAQS for NO_2 based on the ADEQ's discretion. Additionally, NLFP performed an analysis to address potential ozone (O_3) impacts from the proposed project's precursor (VOC and NO_X) emissions.

ADEQ reviewed the ambient air impact analysis following the EPA's Guideline on Air Quality Models (40 CFR Part 51 Appendix W)1 and ADEQ's Modeling Guidelines for Arizona Air Permits (hereafter "ADEQ Guidelines").[2]

1 https://www.epa.gov/sites/production/files/2020-09/documents/appw_17.pdf
2 https://static.azdeq.gov/aqd/modeling_guidance_2019.pdf

A. Model Selection

NLFP used the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) model for the ambient impact analysis. AERMOD is the EPA-preferred regulatory model for estimating impacts at receptors located in simple terrain and complex terrain (within 50 km of a source) due to emissions from industrial sources. AERMOD consists of three major components: AERMAP, used to process terrain data and develop elevations for receptors; AERMET, used to process the meteorological data; and AERMOD, used to estimate the ambient pollutant concentrations. NLFP used the latest version of AERMOD (Version 21112) for the modeling analysis.

B. Source Inputs

1. Sources of Emissions and Modeled Emission Rates

The NOx emission sources are 13 batch kilns. The maximum hourly emission rates for the kilns were modeled.

2. Source Configurations and Source Types

NLFP modeled the emissions from vents as pseudo-point sources. The default kiln volumetric flow rate of 12,500 acfm and the default exhaust gas temperature of 212 F were used. The diameters for pseudo-point sources were based on site-specific venting areas for kilns while the gas exit velocities were estimated based on the default kiln volumetric flow rate and the venting areas.

3. Off-site (nearby) Sources

The EPA recommends that all nearby sources, that are not adequately represented by background ambient monitoring data, should be explicitly modeled as part of the NAAQS analysis. There are no off-site stationary sources near the proposed project. The impacts due to vehicular traffic emissions from Interstate 40 are represented by background ambient monitoring data as discussed in G.

C. Meteorological Data

1. Meteorological Data Selection

For regulatory dispersion modeling analyses, 5 years of National Weather Service (NWS) station meteorological data, or at least 1 year of site-specific meteorological data, or at least 3 years of prognostic meteorological data should be used.

NLFP utilized 5 years of the meteorological data collected at Flagstaff Pulliam Airport for the dispersion modeling analysis. ADEQ determined that the meteorological data collected from the Flagstaff Pulliam Airport generally characterize the transport and dispersion conditions in the project area.

2. Meteorological Data Processing

ADEQ provided NLFP the pre-processed meteorological files for the period of 2016 to 2020. ADEQ used the AERMET meteorological preprocessor (version 21112) to process the five-years of surface data collected from Flagstaff Pulliam Airport along with concurrent upper air radiosonde data obtained from the Flagstaff NWS radiosonde station. ADEQ also used the EPA's AERSURFACE tool (version 20060) to calculate surface characteristic parameters (albedo, Bowen ration and surface roughness) required by AERMET.

D. Ambient Air Boundary and Receptor Network

NLFP used the facility fenceline as the ambient air boundary for modeling purposes. Following ADEQ Guidelines, NLFP set up a receptor network to determine areas of maximum predicted concentrations. The grid spacing utilized for the receptors are as follows: ambient area boundary set at 25 m intervals; the grid extends 1.2 km each direction with 100 m spacing; 5.2 km each direction with 500 m spacing; 20.2 km each direction with 1,000 m spacing; and 50.2 km each direction with 2,500 m spacing. NLFP used the AERMAP terrain processor (version AERMAP - Version 18081) to process the National Elevation Data (NED) to generate the receptor elevations and hill heights.

E. Land Use Classification

The rural/urban classification of an area is determined by either the dominance of a specific land use or by population data in the study area. The land-use procedure specifies that the land-use within a three-kilometer radius of the source should be determined using the typing scheme developed by Auer.[3] NLFP utilized the default, rural dispersion coefficient for the modeling analysis.

F. Building Downwash Effects

NLFP evaluated building downwash effects based on building and source locations and dimensions, and the EPA's Building Profile Input Program Plume Rise Model Enhancements (BPIP-PRME).

G. Background Concentration

Background concentrations should be representative of regional air quality in the vicinity of a facility. Typically, background concentrations should be determined based on the air quality data collected in the vicinity of the proposed project site. However, if there are no monitors located in the vicinity of the project, a "regional site" may be used to determine background concentrations. Per Appendix W Section 8.3.2 b, a regional site is "*one that*

3 Auer, A.H. 1978. Correlation of Land Use and Cover with Meteorological Anomalies, Journal of Applied Meteorology, 17:636-643.

is located away from the area of interest but is impacted by similar or adequately representative sources."

There are very limited NO_2 monitoring sites in Arizona and all monitoring sites are currently located in the Phoenix/Tucson metropolitan area. ADEQ may allow Permittee to use a data set obtained from other states if the data set is believed to be more representative. NLFP elected to use the monitoring data collected from Hurricane, Utah (AQS Site ID 49-053-0007) to best represent the background concentrations for the proposed project area. As vehicular traffic emissions are the major contributor to the background concentration for NO_2, ADEQ reviewed the traffic volumes of roadways in both the project area and the NO_2 monitoring area. ADEQ found that the traffic volume in State Street, Hurricane (where the NO_2 monitor is located) was slightly higher than the traffic volume in I-40 Bellemont Segment (where the proposed project is located). Therefore, ADEQ concurred with NLFP that the monitoring data from the Utah monitor provide a reasonable or somewhat conservative estimate for the background concentration in the project area.

H. One - Hour NO_2 Modeling Methodology

Per Appendix W Section 4.2.3.4-d, the EPA recommends three-tiered approach for 1-hour NO_2 modeling. NLFP used Tier 2 Ambient Ratio Method (ARM2) with default ambient NO_2/NO_X ratios (a minimum ratio of 0.5 and a maximum of 0.9).

I. NO_2 Modeling Results

Table 4 summaries the modeled results for NO_2 from the modeling methodology. Representative background concentrations were added to modeled impacts and the total concentrations were then compared to the NAAQS. As shown in Table 4, emissions from the proposed project will not cause or contribute to a violation of the NAAQS for NO_2 under the operational limits/conditions as proposed in the draft permit. The AERMOD modeling analysis also revealed that the modeled design concentrations occurred within or near the ambient air boundary (fenceline).

Table 4: Modeled Results for NO_2

Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Ambient Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
1-hour	113.07	52.68	165.75	188.6
Annual	8.34	5.64	13.98	100

J. Ozone Impact Analysis

Per Appendix W Section 5.3.2 and Section 5.4.2, the EPA recommends a two-tiered demonstration approach for addressing single-source impacts on ozone. The first tier involves use of technically credible relationships between precursor emissions and a source's impacts. The second tier involves application of more sophisticated case-specific chemical transport models (e.g., photochemical grid models). In general, the case for using a full quantitative chemical transport model is rare.

One of the first-tier demonstration tools is Model Emissions Rates for Precursors (MERPs). The MERPs can be described as an emission rate of a precursor that is expected to result in a change in ambient ozone that would be less than a specific air quality concentration threshold such as a significant impact level (SIL). If the emission rates of precursors for a proposed source are less than MERPs, it is concluded that the proposed source will not cause or contribute to a violation of the NAAQS for ozone. For the 8-hour ozone NAAQS, the EPA recommends a SIL value of 1.0 parts per billion (ppb).

Based on this critical threshold of 1 ppb, the EPA investigated single source impacts on ozone from some hypothetical sources and provided most conservative illustrative MERP values for VOCs and NOx. The most conservative illustrative MERPs for VOCs and NOx in Coconino County are 18,982 tpy and 204 tpy, respectively. The potential to emit (PTE) for VOCs and NOx due to the proposed project are approximately 209 tpy and 27 tpy, respectively, which are significantly lower than the most conservative illustrative MERPs. Therefore, it is concluded that the proposed project will not interfere with the attainment and maintenance of the NAAQS for ozone.

XI. LIST OF ABBREVIATIONS

A.A.C. ..... Arizona Administrative Code
ADEQ ..... Arizona Department of Environmental Quality
AERMOD ..... AMS/EPA Regulatory Model
AERMET ..... AERMOD Meteorological Preprocessor
AMS ..... American Meteorological Society
AQD ..... Air Quality Division
AQRV ..... Air Quality Related Values
ARM ..... Ambient Ratio Method
A.R.S. ..... Arizona Revised Statutes
CFR ..... Code of Federal Regulations
CH_4 ..... Methane
CO ..... Carbon Monoxide
CO_2 ..... Carbon Dioxide
CO_2e ..... CO_2 equivalent basis
EPA ..... Environmental Protection Agency
ft ..... Feet
GHG ..... Greenhouse Gases
HAP ..... Hazardous Air Pollutant
HHV ..... Higher Heating Value
NAAQS ..... National Ambient Air Quality Standard
NO_X ..... Nitrogen Oxides
NO_2 ..... Nitrogen Dioxide
N_2O ..... Nitrous Oxide
NSPS ..... New Source Performance Standards
MERP ..... Modeled Emission Rates for Precursors
MMBf ..... Million Board Feet
O_3 ..... Ozone
Pb ..... Lead
PM ..... Particulate Matter
PM10 ..... Particulate Matter less than 10 µm nominal aerodynamic diameter
PM2.5 ..... Particulate Matter less than 2.5 µm nominal aerodynamic diameter
PSD ..... Prevention of Significant Deterioration
PTE ..... Potential to Emit
SIA ..... Significant Impact Area
SIL ..... Significant Impact Level
SO_2 ..... Sulfur Dioxide Significant Impact Levels
TPY ..... Tons per Year
VOC ..... Volatile Organic Compound
yr ..... Year