

### TECHNICAL REVIEW AND EVALUATION OF APPLICATION FOR AIR QUALITY SIGNIFICANT PERMIT REVISION No. 97169 TO OPERATING PERMIT No. 90384

### I. INTRODUCTION

This Class I Significant Permit Revision (SPR) No. 97169 to Operating Permit No. 90384 authorizes the Arizona Public Service (APS), the Permittee, to install and operate 110 Tier 4 diesel engines at the Yucca Power Plant. APS has accepted a 100-hour, 12-month rolling operating limit per engine.

A. Company Information

Facility Name: Yucca Power Plant

Mailing Address: 400 N. 5th St., M.S. 9303, Phoenix, AZ 85004

Facility Location: 7522 S. Somerton Avenue, Yuma, AZ 85364

**B.** Attainment Classification

The Yucca Power Plant is located in Yuma County which is in nonattainment for ozone and  $PM_{10}$ , and attainment for all other criteria pollutants

## **II. REVISION DESCRIPTION**

#### A. Process Equipment

The Yucca Power Plant is jointly owned by the Arizona Public Service Company (APS) and the Imperial Irrigation District (IID). APS is the sole operator of the facility. Currently, the Yucca Power Plant consists of eight electrical generating units, one steam boiler and seven simple-cycle combustion turbines. It operates these units to provide electrical power to the electric grid. This SPR will authorize APS to install and operate 110 Tier 4 diesel engines each rated at 625 kilowatts (kW) to assist with supplying power during peak periods at the Yucca Power Plant. The CI ICEs are leased by a third party. Thus, the facility's responsibility for CI ICEs are limited to when they are onsite. In addition, all of the leased CI ICEs should be certified to tier IV emission standards.

**B.** Control Devices

The engines are certified to Tier 4 emission standards per 40 Code of Federal Regulations (CFR) 60.4201, 60.4204(b) and 1039.101. They are equipped with selective catalytic reduction (SCR) control technology. Exhaust fumes are directed to the SCR system where diesel exhaust fluid is sprayed onto a special catalyst. This initiates a chemical reaction that breaks down nitrogen oxides into nitrogen, water and carbon dioxide. The following table summarizes the diesel exhaust fluid consumptions rates for the proposed engines:

## Table 1: Diesel Exhaust Fluid (DEF) Consumption (gal/hr per Engine)

Percent Load	Standby	Prime
25%	0.73	0.69
50%	1.34	1.28
75%	2.09	2
100%	2.51	2.37

The engines are otherwise designed to meet Tier 4 emission standards. APS will operate them in accordance with the manufacturer's emissions-related work instructions.

C. Process Flow Diagram

The engines will be standalone sources of electricity and not integrated with other generation sources. The following diagram outlines the exhaust flow:



## III. EMISSIONS

The facility's potential to emit (PTE) was calculated primarily using Compilation of Air Pollutant Emissions Factors (AP-42), Section 3.4, for Large Stationary Diesel and All Stationary Dual-fuel Engines. Calculations were based on a 100-hour, 12-month rolling operating limit per engine. Sulfur emission calculations for the engines assumed a maximum sulfur content of 15 ppm in the fuel as required by 40 CFR 60.4207(b). PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>X</sub>, CO, and VOC emission factors were derived from applicable Tier IV emission standards as certified by the manufacturer.

It has the PTE more than the major source thresholds of  $NO_X$ ,  $PM_{10}$ ,  $PM_{2.5}$ , CO and SO<sub>2</sub>. The facility's PTE is provided in Table 2 below:

Pollutant	Previous PTE	Change in PTE	Post PTE	Permitting Exemption Threshold	Significant Thresholds	Minor NSR Triggered?
NO <sub>X</sub>	11,465	+5.07	11,470	20	40	No

 Table 2: Potential to Emit (tpy)

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PM <sub>10</sub>	478	+0.23	478	7.5	15	No
PM <sub>2.5</sub>	234	+0.23	234	5	10	No
СО	737	+26.5	764	50	100	No
$SO_2$	5,312	+0.06	5,312	20	40	No
VOCs	28	+1.44	30	20	40	No
HAPs	23.7	0	23.7	N/A	10 (single)/ 25 (combined)	No

## IV. MINOR NEW SOURCE REVIEW (NSR)

Minor new source review as a "minor NSR modification" is required if any physical change in or change in the method of operation of an emission unit or a stationary source either: (a) increases the potential to emit of a regulated minor NSR pollutant by an amount greater than or equal to the permitting exemption thresholds, or (b) results in emissions of a regulated minor NSR pollutant not previously emitted by such emission unit or stationary source in an amount greater than or equal to the permitting exemption thresholds.

Increases in PTE did not trigger minor NSR as shown above in Table 2 and thus, the facility is not subject to minor NSR requirements.

### V. VOLUNTARILY ACCEPTED EMISSION LIMITATIONS AND STANDARDS

The SPR incorporated the following voluntary emission limitation:

#### **Operational Limit**

As a part of this SPR, APS has accepted a 100-hour operating limit per engine for the 110 Tier 4 diesel engines.

#### VI. APPLICABLE REGULATIONS

Table 3 identifies 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 3: Applicable Regulations**

Unit & Year	<b>Control Device</b>	Rule	Discussion
Mobile Tier 4 Engines (2021)	SCR	40 CFR NSPS Part 60 Subpart IIII	"New Source Performance Standards for Stationary Compression Ignition (CI) Reciprocating Internal Combustion Engines" are applicable because these engines were constructed after 2007 and have a displacement of less than 30 liters per cylinder.

#### VII. PREVIOUS PERMIT REVISIONS AND CONDITIONS

# Changes to Current Renewal

Table 4 addresses the changes made to the sections and conditions from Permit No. 90384:

### **Table 4: Previous Permit Conditions**

Section	D	Determination		Commonto	
No.	Added	Revised	Deleted	Comments	
Att. "B" Section III	X			Engines Subject to New Source Performance Standards for Stationary Compression Ignition (CI) Reciprocating Internal Combustion Engines: Added	

# VIII. MONITORING, RECORDKEEPING, AND REPORTING REQUIREMENTS

Table 5 contains an inclusive but not an exhaustive list of the monitoring, recordkeeping and reporting requirements prescribed by the air quality permit for the equipment added during this SPR. 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.

Emission Unit	Pollutant	Emission Limit	Monitoring Requirements	Recordkeeping Requirements	Reporting Requirements
Power Block	СО	3.5 g/kW-hr		Keep records of	
Mobile Tier IV	NO <sub>x</sub>	0.67 g/kW-hr	N/A	the operation of the engine	Submit an initial
Engines (110)	РМ	0.03 g/kW-hr		through the non-resettable	notification
	VOC	0.19 g/kW-hr		hour meter	

#### Table 5: Permit Revision No. 97169

### IX. COMPLIANCE ASSURANCE MONITORING (CAM)

The CAM rule applies to pollutant-specific emission units (PSEU) at a major Title V source if the unit meets all of the following criteria:

- A. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
- **B**. The unit uses a control device to achieve compliance with the emission limit or standard; and
- C. The unit has "potential pre-control device emissions" of the applicable regulated air pollutant equal to or greater than 100% of the amount (tons/year) required for a source to be classified as a major source. "Potential pre-control device emissions" means potential to emit (PTE, as defined in Title V) except emissions reductions achieved by the applicable control device are not taken into account.

The emission units are subject to an emission limit for  $NO_x$  and use SCR as a control device. However, they are not considered PSEUs because the potential pre-control device emissions are less then major source thresholds. Therefore, none of the emission units proposed as part of this significant permit revision are considered PSEUs and a CAM analysis is not required.

## X. ENVIRONMENTAL JUSTICE ANALYSIS

The Environmental Protection Agency (EPA) 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 significant permit revision does not allow or permit any significant increases in emissions.

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 90th percentile threshold for this action to evaluate the potential for EJ concerns in a community, meaning that if the area of interest exceeds the 90th 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 Yucca Power Plant and reviewed a five-mile radius around the facility for potential environmental justice concerns (see Figure 3 below).



#### A. Demographics

The 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, and Population Under 5 years of age, and Population over 64 years of age, are all below the 90th percentile threshold. ADEQ posts a notice in two newspapers of general circulation within the surrounding community, as well as publishes the notice electronically to ensure that the community has ample opportunity to provide comments on the draft documents prior to a final permitting decision.

### **B.** Summary of Air Quality

All air quality related environmental indicators within a five mile radius of the facility were below the 90th percentile for both Arizona and the USA averages. ADEQ has determined that the issuance of the significant permit revision will not have an adverse impact on the community.

# C. Conclusion

The 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.

# 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
APS	Arizona Public Service
AQRV	Air Quality Related Values
ARM	Ambient Ratio Method
A.R.S.	Arizona Revised Statutes
BACT	Best Available Control Technology
Btu/ft <sup>3</sup>	British Thermal Units per Cubic Foot
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CH4	Methane
со	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	CO <sub>2</sub> equivalent basis
DEF	Diesel Exhaust Fluid
EPA	Environmental Protection Agency
FERC	Federal Energy Regulatory Commission
FLM	Federal Land Manager
°F	degrees Fahrenheit
ft	Feet
g	Gram
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
HHV	Higher Heating Value
hp	Horsepower
hr	Hour
IC	Internal Combustion
IID	Imperial Irrigation District
kW	Kilowatt
MW	Megawatts
NAAQS	National Ambient Air Quality Standard
NO <sub>X</sub>	Nitrogen Oxides
NO <sub>2</sub>	Nitrogen Dioxide
N <sub>2</sub> O	Nitrous Oxide
NSPS	New Source Performance Standards
O <sub>3</sub>	Ozone

РЬ	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
psia	
PTE	Potential to Emit
sec	Seconds
SF <sub>6</sub>	
SIA	Significant Impact Area
SIL	Significant Impact Level
SO <sub>2</sub>	
SCR	Selective Catalytic Reduction
TPY	
VOC	Volatile Organic Compound
yr	Year