TITLE V / CLASS I PERMIT REVISION APPLICATION
COMBUSTION TURBINES PROJECT AT
COOLIDGE GENERATING STATION
COOLIDGE, ARIZONA
TITLE V / CLASS I PERMIT NUMBER: V20676.A01

Submitted to:

Pinal County Air Quality Control District
31 N Pinal St Bldg F
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Submitted by:

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1.0 INTRODUCTION

Coolidge Generating Station ("COE") is an existing electric generating facility that is owned and operated by the Salt River Project Agricultural Improvement and Power District ("SRP"). The facility is in the south-central part of Arizona approximately half-way between Phoenix and Tucson in the City of Coolidge at 859 East Randolph Road. The facility consists of twelve (12) simple cycle combustion turbines ("CT") (General Electric ("GE") LM6000PC) and ancillary equipment that produce approximately 575 MW of electricity (SIC code 4911). The facility is operating under the Class I Permit Number V20676.A01 issued on June 29, 2019.

SRP is proposing a project to install sixteen (16) natural gas-fired simple cycle combustion turbines ("CT13" through "CT28") and seven (7) wet surface air coolers ("WSAC1" through "WSAC7") (hereinafter "CT Project" or "Project") at COE. The Project will involve installation of GE LM6000PC combustion turbines or equivalent that will generate approximately 820 MW (combined).[1] In addition, SRP is also requesting changes to some of the permit terms and conditions for the existing units.

COE is in a portion of Pinal County that is designated as attainment or unclassifiable for all criteria pollutants except particulate matter with aerodynamic diameter less than 10 micrometers (PM10). The facility is located in the West Pinal PM10 nonattainment area, which is classified as serious.[2] This facility is currently a "major source" under Arizona Administrative Code (A.A.C.) R18-2-401 for the nonattainment new source review ("NNSR") program, with respect to PM10 only. For the prevention of significant deterioration ("PSD") program, the facility is an existing minor source limited to less than 250 tons per year ("TPY") potential to emit ("PTE") of each regulated NSR pollutant under its Class I Permit. [3] In this application, SRP is first proposing to limit the existing

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[1] GE LM6000PC or its equivalent each with approximately 51.1 MW gross generation capacity at 59 °F ambient temperature at full load at sea level.

[2] 40 CFR § 81.303.

[3] NSR – New Source Review.

CTs to less than 70 TPY of PM10, as a synthetic minor limit for PM10. As a result, the source at which construction is proposed is a minor source for all regulated NSR pollutants. Second, in accordance with R18-2-401(13)(c), SRP is proposing to limit the emissions of each regulated NSR pollutant below the applicable 'major source' threshold for the proposed CT Project. Therefore, the proposed Project will not be subject to review under the NNSR and PSD programs. As explained in subsection 5.1.3, the proposed CT Project requires a Class I Permit significant permit revision under Pinal County Code § 3-2-195. SRP is submitting this permit application to Pinal County Air Quality Control District ("PCAQCD") that addresses the requirements for an application for a Class I Permit revision. Also addressed are New Source Performance Standards ("NSPS") and National Emission Standards for Hazardous Air Pollutants ("NESHAP") requirements that are potentially applicable to the Project.

1.1 Application Organization

The remaining sections of the application are organized as follows:

- **Section 2.0 – Site Information** presents general facility information including name, address, SIC code, permit number, and contact information.
- **Section 3.0 – Project Description** provides a description of the proposed Project scope.
- **Section 4.0 – Project Emissions** presents the methodology used to estimate the Project emissions as well as a summary of results.
- **Section 5.0 – Regulatory Requirements** presents an analysis of air quality permitting requirements and the applicability of federal and Pinal County Code to the Project.
- **Section 6.0 – Permit Terms and Conditions** presents proposed permit terms and conditions to keep the Project below exemption thresholds.
- **Appendix A –Application Forms** contains completed application forms for the Project specific information.
- **Appendix B – Emissions Calculations** contains project emissions calculations.

2.0 SITE IDENTIFYING INFORMATION

Company Name:	Salt River Project Agricultural Improvement and Power District
Company Address:	P.O. Box 52025 PAB359, Phoenix, AZ 85072-2025
Facility Name:	Coolidge Generating Station
Facility Address:	859 East Randolph Road, Coolidge, AZ 85128
Responsible Official:	Maria Roberts, Director, Coolidge Generating Station
Responsible Official Phone:	(602) 236-4328
SIC:	4911 (Electric Services)
Permitting Contact:	Zachary Harbin, Senior Environmental Compliance Engineer (602) 236-5779 zachary.harbin@srpnet.com
Facility Contact:	David Lickteig, Senior Environmental Scientist/Engineer (602) 236-7248 david.lickteig@srpnet.com
Site Class I Permit Number:	V20676.A01
Site Part 70 Permit Date:	June 29, 2019

Figure 2-1 is the aerial map of the area showing the site location for COE.

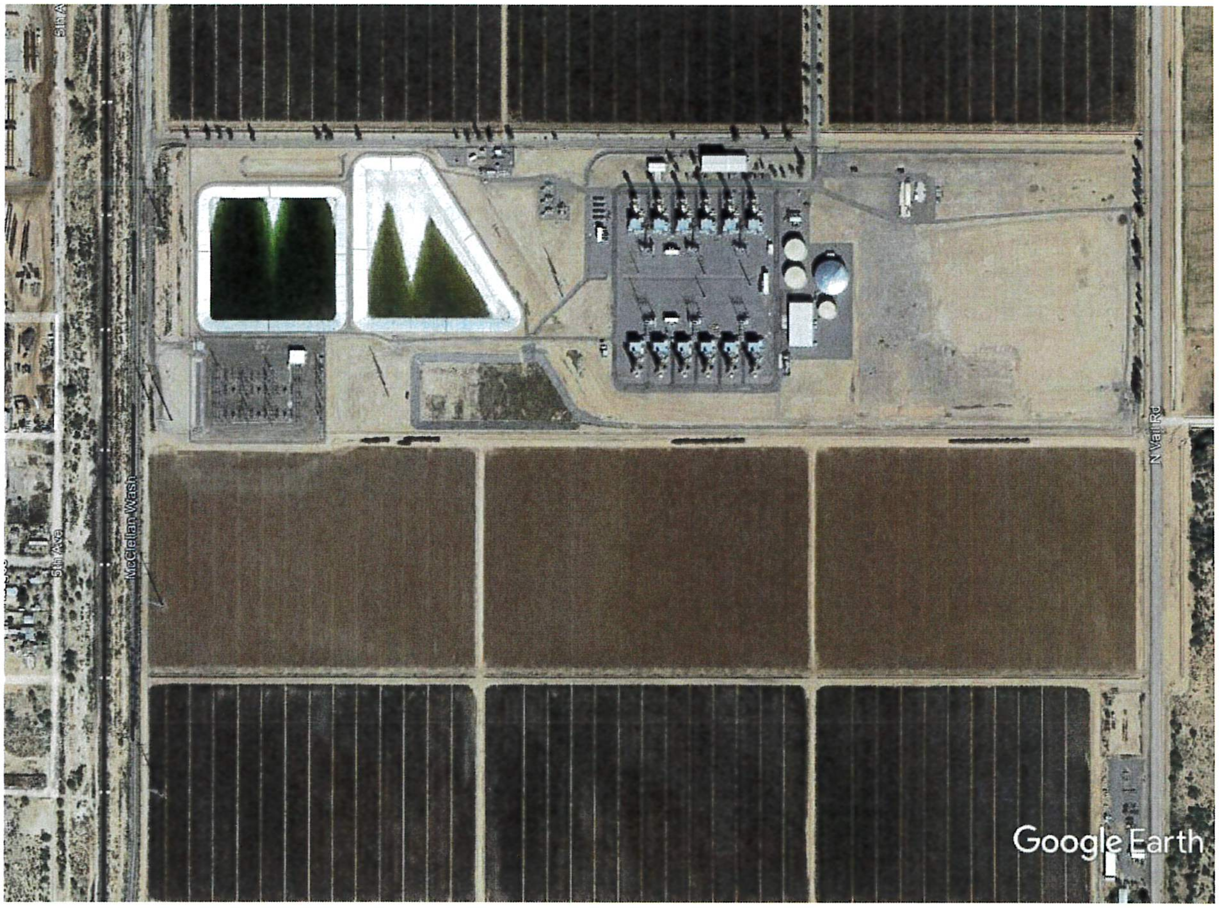

Figure 2-1. Aerial Map of COE Site

3.0 PROJECT DESCRIPTION

SRP is proposing to install ~820 MW generating capacity to provide reliable, immediately dispatchable peaking power. The proposed CT Project involves installation of sixteen (16) natural gas-fired simple cycle combustion turbines to serve peak capacity and allow the integration of renewable resources to the grid. SRP is anticipating the new units to be aero-derivative GE LM6000PC or its equivalent each with approximately 51.1MW gross generation capacity that will generally serve the peak electricity demand.[4]

The proposed CTs will be equipped with inlet chillers to maintain the turbine performance at high ambient temperature. In addition, SRP is proposing to install inlet chillers on the existing CTs. Up to seven (7) wet surface air cooler ("WSAC") units—three to serve the inlet chillers for the existing CTs and four to serve the inlet chillers for the new CTs—will also be installed as part of the project to provide the cooling water for inlet chilling.

3.1 Aeroderivative CTs - General Electric LM6000PC

The aeroderivative GE Model LM6000PC simple cycle combustion turbine will be coupled to an electric generator to produce electric power for supply to the grid. A combustion turbine is an internal combustion system which uses inlet air as a working fluid to produce mechanical power. This combustion turbine technology comprises an air inlet system, two compressor sections, a combustion section, and a turbine section. As the name implies, aeroderivative combustion turbines are based on turbine designs used in the aviation industry. By design this turbine technology is capable of starting and ramping-up to full capacity within 10 minutes. Aeroderivative turbine models are generally specified for use where fast start capability, power demand matching, and relatively lower power outputs are the primary objectives. The air inlet system includes an inlet air heater, inlet air cooler, air filters, and noise silencer that supplies air to the multistage axial compressor. This turbine technology is lightweight, compact, and

[4] MW rating provided by the Manufacturer at sea level at full load.

operates at high compression ratios compared to other turbine technologies. Aeroderivative turbines like those specified for the proposed CT Project operate at a very high compression ratio (typically in excess of 30). The pressure ratio is the ratio of air pressure at the discharge compared to the inlet of the compressor section.

During operation, ambient air is drawn into the compressor section. Once the air is compressed it is heated by the combustion of fuel gas in the combustion section. The combusted gases then expand through the turbine section of the combustion turbine. The pressure differential across the turbine blades caused by this expansion, rotates the shaft of the turbine thus rotating the coupled generator. The rotation of the generator is what produces the power that is supplied to the electrical grid.

Figure 3-1 presents a diagram for the LM6000PC CT. The CT are equipped with inlet air filters which remove dust and particulate matter from the inlet air. During hot weather, the filtered air will also be cooled by passing through an inlet air chiller or evaporative cooling system. During cold weather, the filtered air may be heated by use of a radiative heating system that is part of the anti-icing system. This system utilizes a glycol and water solution as the working fluid that is heated by induction heaters. The filtered air is drawn into the low-pressure compressor section where the air is compressed. The CTs are also equipped with spray intercooling, (SPRINT), which allows for demineralized water to be atomized within the low-pressure compressor. The resulting increase in mass flow allows for higher power output in high ambient conditions. The low-pressure compressor section features fixed inlet guide vanes. The high-pressure section of the compressor uses independently controlled variable stator vanes to optimize air flow to the combustion section. Incorporation of these advanced airflow and cooling technologies help the proposed turbines have lower emission rates, increased fuel efficiency, and minimized unburned hydrocarbon emissions. Water is also injected into the combustion section of the turbine which reduces flame temperatures and thermal formation of nitrogen oxides (NO_X).

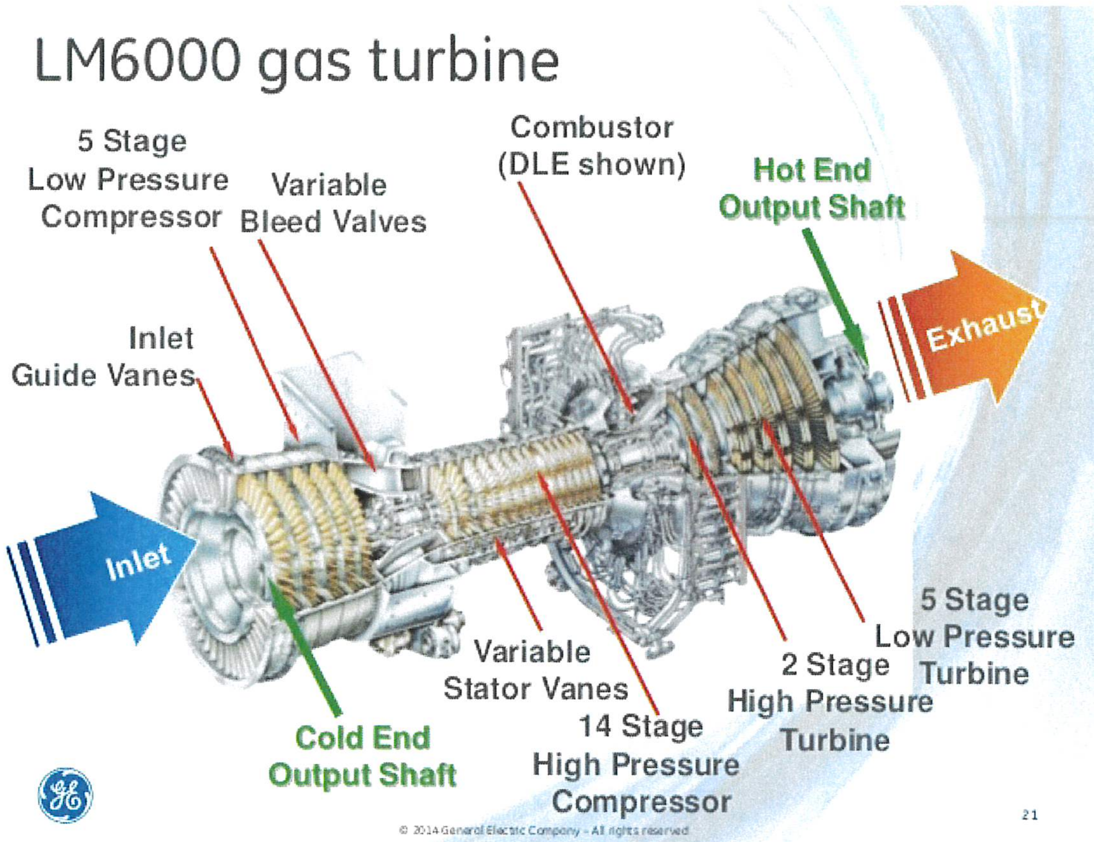

Figure 3-1. Diagram of a GE Model LM6000 Simple Cycle Combustion turbine (*from GE Company*)

The general specifications for these CTs provided by the manufacturer are summarized in Table 3-1. Note that the specifications in this table are for new turbines which have not undergone any performance degradation due to normal operation, and also do not account for efficiency reductions due to post combustion emission control systems.

Table 3-1. General Specifications for the GE LM6000PC Simple Cycle CTs

Parameter	Value
GE Model	LM6000PC (60 Hz)
Number of Units	16
ISO Base Output Power (Gross) at Sea Level	(51.1 MW each)820 MW
Heat Rate ISO Full Load (Net)	8,651 Btu/kW-hr (LHV)
Heat Input Rate Full Load (59 °F ambient)	490 MMBtu/hour (HHV)

The combustion turbine will be enclosed in a metal acoustical enclosure which also contains auxiliary equipment. Each combustion turbine package will be equipped with the following equipment:

- Inlet air filters
- Spray Intercooling (SPRINT)
- Inlet chillier or evaporative cooling
- Anti-icing system
- Metal acoustical enclosure to reduce sound
- Duplex shell and tube lube oil coolers for the combustion turbine and generator
- Annular standard combustor combustion system
- Water injection system for NOx control
- Compressor intercooler system
- Fire detection and protection system
- Hydraulic starting system
- Compressor variable bleed valve vent to prevent compressor surge in off-design operation.

3.2 Combustion Turbine Air Emissions Control Systems

The combustion gases exit the CTs at temperatures ranging from 760 °F to 1,100 °F. To enable the use of selective catalytic reduction (SCR) systems for the proposed turbines, an air injection system is included. This system supplies tempering air to the exhaust of the turbine section to reduce the exhaust gas temperature to around 800 °F at the catalyst inlet. The exhaust gases will then pass through two post combustion air quality control systems: oxidation catalysts for the control of carbon monoxide (CO) and volatile organic compounds (VOC), and high-temperature SCR systems for the control of NO_X emissions.

3.3 Wet Surface Air Coolers

The CT Project will include seven (7) wet surface air coolers ("WSAC") to provide cooling water for the inlet chillers for the existing and new CTs. Heated water/fluid from the inlet chillers to be cooled flows through tube bundles in a closed loop system. Water from the WSAC basin is sprayed downward over the tube surfaces. At the same time, fans induce air flow over the bundles in a co-current direction. The saturated air stream leaving the tube bundles then makes two 90-degree turns into the WSAC fan plenum removing any remaining large water droplets. This type of design allows for minimal water loss due to evaporation when compared to a traditional cooling tower. The project design involves routing water flow from up to four CTs to each of the WSAC for cooling. The maximum recirculation rate (spray rate) for each WSAC is 10,600 gallons per minute (gpm). Each WSAC will be equipped with high-efficiency drift eliminators to minimize the particulate matter emissions from the process from water droplets escaping the atmosphere.

4.0 SITE AND PROJECT EMISSIONS

This section presents a summary of the emission rates of regulated NSR pollutants for the existing operations and presents information about the project emissions increases of regulated NSR pollutants.

4.1 Regulated NSR Pollutants

The regulated NSR pollutants for PSD applicability purposes are particulate matter (PM), particulate matter equal to or less than an aerodynamic diameter of nominally 2.5 µm (PM2.5), NO_X as nitrogen dioxide (NO_2), sulfur dioxide (SO_2), NO_X and VOC as precursors for ozone, and CO.[5] The NNSR program covers particulate matter equal to or less than an aerodynamic diameter of nominally 10 µm (PM10).

4.2 Existing Operations at COE

Condition 4.C of the Class I permit limits emissions from the following existing units to 245 tons per 12-month period for CO, NO_X, VOC, PM10/PM2.5 and SO_2 (separately for each pollutant).

(a) Twelve (12) combustion turbines for normal operation as well as startup and shutdown duration.
(b) One diesel fuel-fired fire pump engine.

As previously noted, in a recent rulemaking, the U.S. EPA classified the West Pinal PM10 nonattainment area as 'serious.'[6] Therefore, as explained in the Major New Source Review Applicability Subsection 5.1.4, under the NNSR program, the 70 tpy

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[5] Per 40 CFR § 52.21(b)(49)(iv) (implemented per delegation agreement with EPA), greenhouse gases (GHGs) are potentially subject to regulation only if the existing stationary source or proposed new stationary source is a major stationary source, as that term is defined at 40 CFR § 52.21(b)(1), based on its PTE for a regulated NSR pollutant other than GHGs. Because neither the existing COE nor the proposed physical change is a major stationary source based on its emissions of non-GHG pollutants, GHGs are not considered subject to regulation for PSD.

[6] 85 Fed. Reg. 37756, June 24, 2020.

major source threshold applies for PM10. As further explained in the same subsection, as part of this application, SRP is requesting a more stringent PM10 emission limit from the existing operations at COE to less than 70 tpy (reduced from 245 tpy). Historical operations of the existing CTs has resulted in actual annual emissions that are far less than 70 tpy. In addition, historical performance testing for the existing CTs has shown PM10 emission rate below 0.005 lb/MMBtu. This emission rate is well below the PM10 emission factor of 0.01 lb/MMBtu used in the initial permitting of these units. Therefore, based on the available operational information for the existing CTs, the proposed PM10 emission limitation of less than 70 tpy is easily achievable and appropriate for this operation to maintain the minor source status of the existing operations at COE for NNSR program. Even though SRP is proposing to install inlet chilling for the existing CTs, no changes are proposed to the existing and proposed emission limitations for regulated NSR pollutants that are taken to avoid NNSR and PSD applicability for the existing emissions units at the COE site.

4.3 Proposed CT Project at COE

As previously noted, the proposed CT Project will be constructed at an existing stationary source that is not a 'major source' under R18-2-401(13): the emissions of all regulated NSR pollutants subject to PSD from the existing emissions units are each limited to 245 tpy and PM10 emissions, which are subject to nonattainment NSR, will be limited to less than 70 tpy as a result of this permit request. Therefore, the proposed CT Project is a physical change at an existing stationary source that is not a major source per R18-2-401(13)(a) or (b). For purposes of determining 'major source' applicability under R18-2-401(13)(c) for PSD and NNSR, the PTE of each regulated NSR pollutant from the proposed CT Project is quantified. The major source determination is made by comparing PTE of each regulated NSR pollutant from the proposed physical change to the applicable 'major source' thresholds under R18-2-401(13)(a) and (b) (depending on the attainment status for a particular criteria pollutant). A summary of the PTE calculations for the equipment proposed under the CT Project is presented below. Detailed emissions calculations are included in Appendix B of this application.

4.3.1 Potential to Emit of the Proposed Combustion Turbines

In accordance with definition of potential to emit under R18-2-101(110), SRP used the manufacturer's emissions data to estimate PTE of each regulated NSR pollutant for the proposed CTs.[7] For this purpose, we are using the CTs' emissions information for the site conditions at 55 °F ambient temperature, which corresponds to the worst-case emission rates of regulated NSR pollutants. Table 4-1 presents the design parameters for the proposed GE LM6000PC CTs.

Table 4-1. Design Parameters for the Proposed GE LM6000PC

Parameter	Value	Units
Number of units	16	
Maximum heat input (59 °F, 13.97 PSI, full load)	490	MMBtu/hour (HHV)
Number of startups per CT	730	events/year/CT
Startup duration	30	Minutes
Shutdown duration	9	Minutes

The air pollution control systems—SCR and oxidation catalysts—are not operational during the startup and shutdown of the aeroderivative combustion turbines. Water injection is used to reduce NO_X emissions from these CTs. The earlier that water injection can be initiated during the startup process, the lower NOx emissions will be during startup. However, if injection is initiated at very low loads, it can impact flame stability and combustion dynamics, and it may increase CO emissions. These concerns must be carefully balanced when determining when to initiate water injection. SCR and oxidation catalyst systems are not fully functional during periods of startup and shutdown because the exhaust gas temperatures are too low for these systems to function as designed. During a startup, as the CT achieves minimum emissions compliance load ("MECL"), the CT emissions controls reduce the stack emission rates of NOx and CO below the emission rates for normal operation.

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[7] SO_2 emission rate is calculated based on the maximum fuel sulfur content.

For simple cycle CTs, the time required for startup is much shorter than CTs used in combined cycle applications.[8] The aeroderivative CTs are able to achieve full capacity within 10 minutes but the SCR requires a warm-up of up to 20 minutes to achieve optimum temperature for emissions control. Therefore, the unit achieves MECL in 30 minutes and for purposes of this permit application, emissions calculations have been conducted using the full 30 minutes for a startup cycle. The length of time for a normal shutdown, that is, the time from the MECL to the time when the flame out occurs, is normally 9 minutes. Therefore, the normal duration for a startup and a shutdown cycle is 39 minutes. The startup and shutdown annual emissions are calculated using the maximum number of startups and shutdowns cycles per year per aeroderivative CT. Particulate matter, NO_X, CO, and VOC emission rates during startup and shutdown, in terms of pounds per event, were provided by GE.

Maximum emission rates for particulate matter (PM/PM10/PM2.5), NO_X, CO, and VOC were obtained from GE for the 100% load condition, at site elevation, for 59 °F ambient temperature. SO_2 emission factor is calculated from the maximum natural gas fuel sulfur content. Calculations summary for other pollutants such as lead, greenhouse gases etc. are not included here as these are not critical from air permitting applicability standpoint.

Emissions rates specifications for the regulated NSR pollutants for the proposed aeroderivative simple cycle combustion turbines are summarized in Table 4-2.

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[8] In Table 4-3, the startup and shutdown emissions are detailed by event and the maximum annual emissions are also shown. Heating up the heat recovery steam generator (HRSG)and associated steam turbine system in a combined cycle setup requires a slow ramp up of the CT resulting in longer startup and shutdown duration versus a simple cycle CT without a HRSG.

Table 4-2. Emissions Specifications for CTs (GE LM6000PC)

Pollutant	Max Emission Rate for One CT	
	Normal Operation (lbs./hour)	lbs./SU-SD event
PM*	4.4	5.1
PM10	4.4	5.1
PM2.5	4.4	5.1
SO_2	0.5	0.33
NO_X	4.4	18.2
VOC	4.3	2.7
CO	7.6	32.3
* PM conservatively includes both filterable and condensable fractions.		

Table 4-3 below presents the restricted PTE for the proposed CT Project. Restricted PTE is based on the requested limit to keep project emissions below the major source thresholds under R18-2-401(13)(a) and (b).

Table 4-3. PTE for CTs

Regulated NSR Pollutant	Restricted Potential to Emit for One CT (TPY)	Restricted Potential to Emit for Sixteen CTs (TPY)
PM	4.0	63.3
PM10	4.0	63.3
PM2.5	4.0	63.3
SO_2	0.3	4.7
NO_X	8.8	141.5
VOC	3.1	50.2
CO	15.6	249.4

4.3.2 Potential to Emit of the Wet Surface Air Coolers

In a WSAC a small amount of the water is entrained in the induced air flow in the form of liquid phase droplets or mist. Demisters are used at the outlet of the exhaust fans to reduce the amount of water droplets entrained in the air. The water droplets that pass through the demisters and are emitted to the atmosphere are called drift loss. When these droplets evaporate, the dissolved solids in the droplet become particulate matter. Therefore, WSAC are sources of PM, PM10, and PM2.5 emissions.

WSAC particulate matter emissions are calculated based on the circulating water flow rate, the total dissolved solids (TDS) in the circulating water, and the design drift loss according to the following AP-42 equation:

$$E = k * Q * 60 \left[\frac{min}{hour}\right] * 8.345 \left[\frac{lb\ H2O}{gallon}\right] * \left[\frac{CTDS}{10^6}\right] * \left[\frac{DL}{100}\right]$$

Where, E = Particulate matter emissions, pounds per hour
Q = Circulating water flow rate, gallons per minute
CTDS = Circulating water total dissolved solids, ppm
DL = Drift loss, %
k = Particle size multiplier for PM10 and PM2.5[9]

The specifications for the proposed WSAC units are summarized in Table 4-4.

Table 4-4. Specifications for WSAC for Frame CTGs

Parameter	**Value**
Number of WSAC Units	7
Number of Fans	6
Maximum Circulating Water Flow (gpm) per WSAC Unit	10,600
Maximum Total Dissolved Solids (ppm)	5,000
Hours of Operation (same as CTs)	1,000
Design Drift Loss (%)	0.0005%

Table 4-5 presents the calculated PM, PM10, and PM2.5 restricted PTE for the WSAC, using the particle size multipliers developed from the CTDS value.

[9] PM10 and PM2.5 particle size multiplier from "*Calculating Realistic PM10 Emissions from Cooling Towers*"; Reisman & Frisbie (uses EPRI wet droplet size distribution), Environmental Progress, 2002.

Table 4-5. Restricted PTE for Seven WSAC Units

Pollutant	k Particle Size Multiplier	PTE	
		lb/hour	ton/year
PM	1.000	0.93	0.46
PM10	0.30	0.28	0.14
PM2.5	0.002	0.002	0.001

4.3.3 Project Emissions for Proposed CT Project

The project emissions for each regulated NSR pollutant are typically calculated by summing PTE for each of the Project-affected emissions units. In this case, restricted PTE for the proposed CTs (startup – shutdown and normal operation) and the WSAC is based on the proposed emission limit for each regulated NSR pollutant. As shown in Table 4-6 the project emissions increases (based on the restricted PTE) are below the applicable 'major source' thresholds specified under R18-2-401(13)(a) and (b) for all regulated NSR pollutants.

Table 4-6. Comparison of Project Emissions for CT Project with Major Source Thresholds

Pollutant	Restricted Potential to Emit for the CT Project (TPY)	R18-2-401(13)(a) and (b) Major Source Thresholds (TPY)
PM	69.9	250
PM10	69.9	70
PM2.5	69.9	250
SO_2	12.2	250
NO_X	249.5	250
VOC	249.5	250
CO	249.5	250

The proposed CT Project does not result in a new major source for any regulated NSR pollutant. Therefore, the requirements of R18-2-402(C) for a major source are not applicable to the proposed Project.

5.0 REGULATORY COMPLIANCE ANALYSIS

This section of the application documents SRP's review of Pinal County, State, and federal air quality regulations applicable or potentially applicable to the CT Project. Applicability conclusions are summarized by regulatory program. For each applicable regulation, specific requirements are documented.

5.1 County/State Regulations

This analysis is based on the latest version of Pinal County's Air Pollution Control Regulations available from the County's website and applicable A.A.C. Title 18 rules available from the website for Arizona Secretary of State's office. Under the Arizona Revised Statutes ("A.R.S.") 49-402, Arizona Department of Environmental Quality ("ADEQ") has original jurisdiction over "[m]ajor sources in any county that has not received approval from the administrator for new source review under the clean air act and prevention of significant deterioration under the clean air act." As noted in the December 13, 2016 ADEQ submittal, Pinal County nonattainment new source review rules are not approved in the state implementation plan for the area.[10] Specifically, ADEQ permitting regulations apply for major sources that are in Pinal County under a delegation agreement (see excerpt below).

> *The nonattainment area preconstruction permit program for the portions of the Moderate ozone nonattainment area located in Pinal County is administered by the Pinal County Air Quality Control District under a delegation agreement with the Arizona Department of Environmental Quality. Pinal County does not have an approved nonattainment new source review program. Under A.R.S. Section 49-402 A.1., the Arizona Department of Environmental Quality therefore has original jurisdiction over major sources located in the County, and the Department's permitting rules, rather than Pinal County's, apply to these sources.* [pp 4-47]

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[10] See, "*MAG 2017 Eight-Hour Ozone Moderate Area Plan for the Maricopa Nonattainment Area,*" Maricopa Association of Governments, December 2016, available at: https://static.azdeq.gov/aqd/2017_maricopa_o3_mod_pln.pdf (last accessed March 24, 2021).

In the preamble to the 2021 rulemaking for Air Plan Approval, Stationary Sources, New Source Review Updates, the U.S. EPA confirmed the ADEQ jurisdiction and delegation for major sources in Pinal County.[11]

> *The ADEQ has permitting jurisdiction for the following stationary source categories in all areas of Arizona: Smelting of metal ores, coal-fired electric generating stations, petroleum refineries, Portland cement plants, and portable sources. The ADEQ also has permitting jurisdiction for major and minor sources in the following counties: Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Mohave, Navajo, Santa Cruz, Yavapai, and Yuma. Finally, the ADEQ has permitting jurisdiction over major sources in Pinal County (currently delegated to Pinal County Air Quality Control District) and any source in Maricopa, Pima, or Pinal County for which the ADEQ asserts jurisdiction.*

Coolidge Generating Station will be a major source as defined in R18-2-401(13) after the CT Project permitting. Therefore, ADEQ's air permitting regulations are applicable for purposes of the proposed CT Project.[12]

5.1.1 R18-2-334 Minor New Source Review

In accordance with R18-2-334(A)(3), minor new source review permitting requirements are applicable to a modification that would increase the source's potential to emit equal to or greater than the permitting exemption threshold. A comparison of the regulated minor NSR pollutant PTE for the proposed CT project with the Permitting Exemption Thresholds under R18-2-101(101) is provided in Table 5-1.

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[11] 86 Fed. Reg. 31927, June 16, 2021.

[12] It is worth noting that the current Pinal County's Air Pollution Control Regulations for major sources under both PSD and NNSR are identical to ADEQ's regulations, but EPA has not yet approved these Pinal County regulations into the SIP. Pinal County has no SIP-approved NNSR regulations. Pinal County has a previously-SIP-approved PSD program, but this program is inapplicable here because, as discussed above, major sources in Pinal County are subject to ADEQ original jurisdiction.

Table 5-1. Comparison of Project Emissions for CT Project with Permitting Exemption Thresholds

Pollutant	Restricted Potential to Emit for the CT Project (TPY)	R18-2-101(101) Permitting Exemption Thresholds (TPY)	Whether above the exemption threshold?
PM10	69.9	7.5	Yes
PM2.5	69.9	5	Yes
SO_2	12.2	20	No
NO_X	249.5	20	Yes
VOC	249.5	20	Yes
CO	249.5	50	Yes

The restricted PTE of the proposed CT Project exceeds the permitting exemption thresholds for PM10, PM2.5, NO_X, VOC, and CO. Therefore, the minor new source review permitting requirements under this regulation are applicable to the proposed CT Project. Specifically, R18-2-334(C) requires a Class I permit revision involving a minor NSR modification to meet either reasonably available control technology ("RACT") under R18-2-334(C)(1) or an ambient air quality assessment under R18-2-334(C)(2). This application for a Class I permit revision constitutes SRP's application for an approval under this provision.

5.1.1.1 R18-2-334(C)(1) Reasonably Available Control Technology

R18-2-334(C)(1)(b) requires application of RACT as determined by the PCAQCD/ADEQ for each emissions unit with PTE greater than or equal to 20% of the permitting exemption threshold for a regulated minor NSR pollutant. In this case, SRP is conservatively proposing RACT for the CT project as shown in Table 5-2, irrespective of the level of emissions of regulated minor NSR pollutants from the specific project affected emissions units. We reviewed information in the U.S. EPA's RBLC database to determine RACT proposals for the proposed emission units.

Table 5-2. RACT Proposals for Regulated Minor NSR Pollutants for CT Project

Emission Unit	Pollutant	Proposed RACT
Simple Cycle Combustion Turbines	PM10/PM2.5	Good combustion practices Use of clean fuel (natural gas)
	NO_x	Selective catalytic reduction system
	VOC/CO	Oxidation catalyst
Wet Surface Air Coolers	PM10/PM2.5	Drift eliminators

5.1.1.2 R18-2-334(C)(2) Ambient Air Quality Assessment

Even though not specifically required at this time, in accordance with R18-2-334(C)(2)(b), SRP conducted an ambient air quality assessment for the proposed CT Project. A detailed ambient air quality assessment report will be submitted in the near future upon incorporation of any comments/changes from the review of the modeling protocol. This assessment confirms that that the ambient concentrations resulting from the modification combined with the existing concentration of regulated Minor NSR pollutants will not interfere with attainment or maintenance of a national ambient air quality standard ("NAAQS").

5.1.2 R18-2 Article 4 Permit Requirements for New Major Sources and Major Modifications to Existing Major Sources

R18-2-401 through -412 are the NNSR and PSD provisions applicable to new major stationary sources or projects that are major modifications for regulated NSR pollutants. As previously noted, COE is located in the 'West Pinal PM10 Nonattainment Area' as shown in Figure 3-1 below. The area is 'serious' nonattainment for PM10 and attainment or unclassifiable for all other criteria pollutants. The PTE of all regulated NSR pollutants other than PM10 for the existing emissions units at the COE site is limited by the permit below the 250 tpy threshold applicable under R18-2-401(13)(b). In this application, SRP is requesting a permit limit for the PM10 PTE of existing operations below the 70 tons per year threshold applicable under R18-2-401(13)(a). Therefore, COE is an existing stationary source, that is not a 'major source' as defined in the NNSR and PSD regulations at R18-2-401(13).

Changes to existing stationary sources that are not major sources are addressed as follows:

> *"A major source includes a physical change that would occur at a stationary source, not otherwise qualifying under subsection [R18-2-401](13)(a) or (b) as a major source, if the change would constitute a major source by itself."* [R18-2-401(13)(c)]

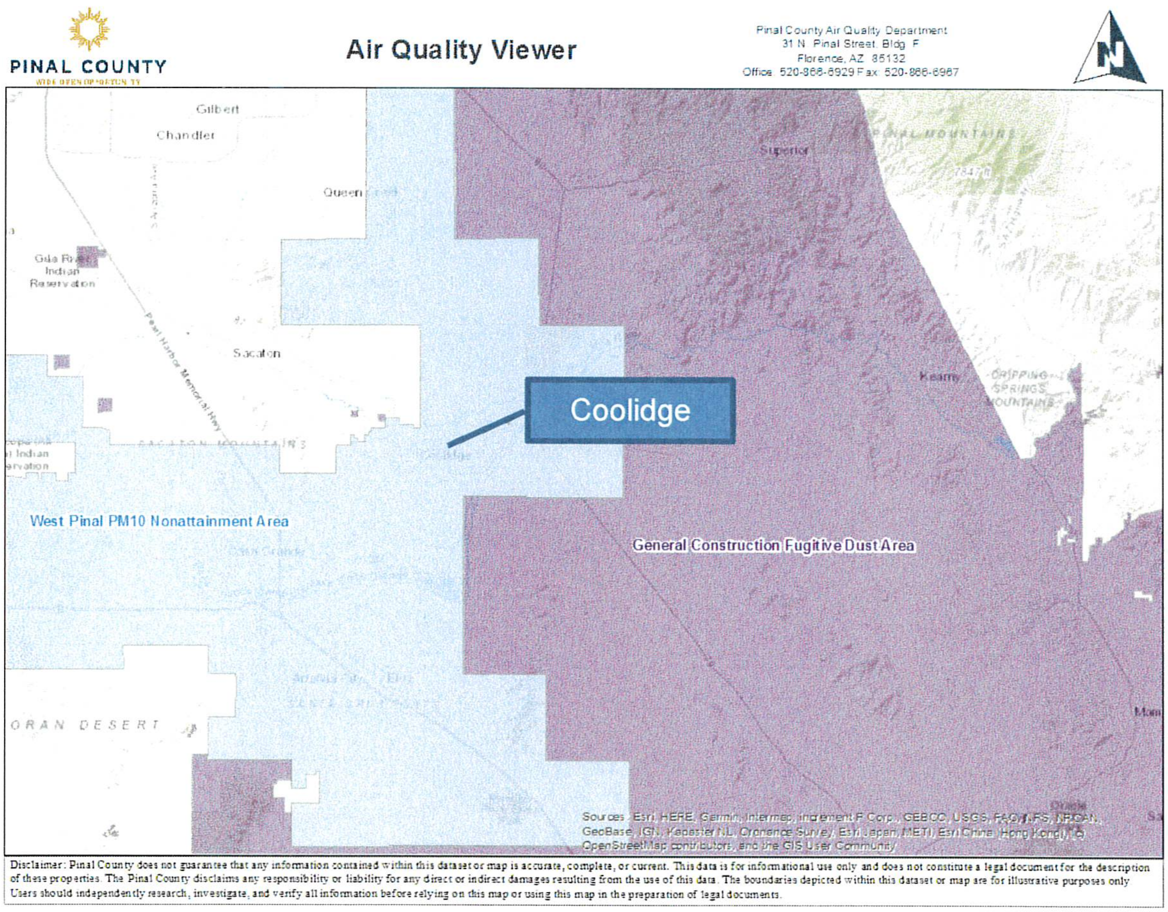

Figure 3-1. Coolidge Generating Station Location in West Pinal PM10 Nonattainment Area

In accordance with R18-2-401(13)(c), SRP evaluated PTE for PM, PM10, PM2.5, SO_2, NO_X, CO, and VOC associated with the proposed CT Project against the major source thresholds under R18-2-401(13)(a) and (b). The results of this analysis are summarized in Table 4-6 and detailed calculations are provided in Appendix B. The proposed CT Project emissions for all regulated NSR pollutants are less than the 'major source' thresholds in R18-2-401(13)(a) and (b). Thus, the proposed CT Project does not constitute a major source and is not subject to the NNSR or PSD permitting requirements.

5.1.3 Code § 3-2-195 Significant Permit Revision to a Class I Permit

In accordance with Pinal County Code § 3-2-190 and R18-2-319(A)(4), any changes that require establishment of a permit term or condition to avoid an otherwise applicable requirement are not considered a minor permit revision and are subject to significant permit revision requirements under Code § 3-2-195 and R18-2-320(A). As explained in Subsection 4.3.3, SRP is requesting enforceable emission limitations to keep the CT Project increase below the major source thresholds under R18-2-401(13)(a) and (b). Therefore, a significant permit revision to the Class I Permit per Code § 3-2-195 and R18-2-320 is required for the proposed CT Project. This document and its attachments fulfill the requirements for an application for a significant permit revision under Code § 3-2-195 and R18-2-320.

In addition to the CT Project, SRP is also proposing additional changes to the existing permit terms and conditions under the Class I Permit V20676.A01 pertaining to the existing emissions units at the COE site. However, these changes do not change the air permitting applicability outlined here. Section 6.0 presents SRP's proposed changes to the existing permit terms and conditions.

5.1.4 Code § 3-7-590 Class I Permit Fees

Per Code § 3-7-590.D.2, an application fee of $1,000 is applicable for an application for a significant permit revision to a Class I permit. A check for the application fee payable to "Pinal County Air Quality Control Department" is attached to this application.

5.1.5 Code § 5-23-1010 Standards of Performance for Stationary Rotating Machinery

In accordance with Code § 5-23-990, requirements of this standard are applicable to the proposed 'stationary gas turbines' under the CT Project. For equipment with heat input less than 4,200 MMBtu per hour, maximum allowable particulate matter emissions are determined using the following equation:

$$E = 1.02*Q^{0.769}$$

Where: E = the maximum allowable particulate emissions rate in pounds-mass per hour
Q = the total heat input of all operating fuel burning units on a plant or premises in MMBtu per hour

In addition, the proposed CTs are not allowed to emit smoke for any period greater than 10 consecutive seconds which exceeds 40% opacity. Visible emissions when starting cold equipment shall be exempt from this requirement for the first 10 minutes.

The proposed CTs will only use natural gas and will follow these standards.

5.1.6 Other County Requirements

There are no changes to the other applicable requirements under County's regulations. These requirements are already listed under the Class I Permit for Coolidge Generating Station.

5.2 Federal Regulations

5.2.1 New Source Performance Standards (40 CFR Part 60; Code Chapter 6)

Some of the federal new source performance standards ("NSPS") requirements are incorporated by reference in Code §6-1-030. Applicability of the NSPS requirements for the proposed units is presented below.

5.2.2 40 CFR Part 60, Subpart A Standards of Performance for Stationary Combustion Turbines

SRP will comply with the applicable requirements under general provisions of 40 CFR Part 60 Subpart A. These will include notifications, compliance testing, monitoring, recordkeeping, and reporting provisions of the rule.

5.2.3 40 CFR Part 60, Subpart KKKK Standards of Performance for Stationary Combustion Turbines

This NSPS Subpart applies to stationary combustion turbines for which construction, modification or reconstruction commences after February 18, 2005. The sixteen (16) proposed natural gas-fired simple cycle stationary combustion turbines meet the affected facility definition under this standard. Therefore, the following NSPS requirements will apply to the proposed CTs under the Project.

(a) Comply with the NO_X emission limit of 25 ppm at 15 percent oxygen (O_2) or 1.2 lb/MWh (for combustion turbine firing natural gas with heat input greater than 50 MMBtu per hour and less than or equal to 850 MMBtu per hour) on a four (4) hour rolling average basis while the unit is operating at greater than or equal to 75% of peak load. (40 CFR § 60.4320 and Table 1, 40 CFR § 60.4350(h))

(b) Comply with the alternate NO_X emission limit of 96 ppm at 15 percent O_2 or 4.7 lb/MWh (for combustion turbine firing natural gas with output greater than 30 MW) on a four (4) hour rolling average basis when combustion turbines are operating at less than 75% of peak load. (40 CFR § 60.4320 and Table 1, 40 CFR § 60.4350(g))

(c) Comply with the SO_2 emission limit of 0.9 pounds per megawatt-hour gross output, or not burn any fuel which contains total potential sulfur emissions in excess of 0.060 lb of SO_2 per MMBtu heat input. (40 CFR § 60.4330)

(d) Compliance requirement – The simple cycle combustion turbines, SCR, and monitoring equipment must be operated and maintained in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown, and malfunctions. (40 CFR § 60.4333)

(e) Option to use a NO_X continuous emissions monitoring system (CEMS). SRP will use the CEMS installed, certified, and operated in accordance with 40 CFR Part 75 Appendix A. (40 CFR §§ 60.4335(b) and 60.4345(a))

(f) The requirement to monitor fuel sulfur for SO_2 monitoring does not apply if potential sulfur emissions expressed as SO_2 are less than 0.060 lb/MMBtu. SRP proposes to use fuel tariff sheet or purchase contract information or representative fuel sampling performed per 40 Part 75 Appendix D to show that fuel sulfur will comply with the applicable limit. (CFR §§ 60.4360 and 60.4365)

(g) SRP proposes to use NO_X CEMS RATA as the initial NO_X performance test. (40 CFR § 60.4405)

(h) No annual performance test is required due to the presence of NO_X CEMS. (40 CFR § 60.4340(b)(1))

(i) Comply with the reporting requirements in 40 CFR § 60.4375 regarding excess emissions and monitor downtime.

5.2.4 40 CFR Part 60, Subpart TTTT Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units

This NSPS applies to carbon dioxide (CO_2) emissions from certain stationary combustion turbines. As specified in 40 CFR § 60.5509(a) of this subpart, the GHG standards included in this subpart apply to any steam generating unit, IGCC, or stationary combustion turbine, all of which are designated as electric generating units (EGUs), that commenced construction after January 8, 2014 or commenced reconstruction after June 18, 2014 and that meets the applicability conditions below:

(1) Has a base load rating greater than 250 MMBtu per hour of fossil fuel (either alone or in combination with any other fuel); and

(2) Serves a generator or generators capable of selling greater than 25 MW of electricity to a utility power distribution system.

The sixteen (16) proposed simple cycle combustion turbines, each have a base load rating greater than 250 MMBtu per hour of fossil fuel and serve generators capable of selling greater than 25 MW of electricity. Therefore, these units are subject to the requirements of this standard.

Per 40 CFR § 60.5520(a), the proposed CTs will be subject to the CO_2 emission standards specified in Table 2 of 40 CFR 60 Subpart TTTT. The proposed units are "non-base load" type as they will combust more than 90% natural gas on a heat input basis (100%), and SRP plans to limit net electric sales for each CT to less than its design efficiency (or 50% whichever is less), multiplied by its potential electric output on a 12-operating month basis or 3-year rolling average basis. Therefore, these units will be subject to the nominal CO_2 limitation of 120 lb per MMBtu on a 12-month rolling average basis (40 CFR § 60.5520, 40 CFR § 60.5525, and Table 2).

In 40 CFR § 60.5520(d), stationary combustion turbines are subject to a heat input-based standard in Table 2 of this subpart that are only permitted to burn one or more uniform fuels, as described in 40 CFR § 60.5520(d)(1), are only subject to the monitoring requirements in 40 CFR § 60.5520(d)(1) as follows:

> *Stationary combustion turbines that are only permitted to burn fuels with a consistent chemical composition (i.e., uniform fuels) that result in a consistent emission rate of 160 lb CO_2/mmBtu or less are not subject to any monitoring or reporting requirements under this subpart. These fuels include, but are not limited to, natural gas, methane, butane, butylene, ethane, ethylene, propane, naphtha, propylene, jet fuel kerosene, No. 1 fuel oil, No. 2 fuel oil, and biodiesel. Stationary combustion turbines qualifying under this paragraph are only required to maintain purchase records for permitted fuels.*

The proposed simple cycle combustion turbines will be permitted to only burn natural gas which is classified as a uniform fuel. Therefore, per 40 CFR § 60.5520(d)(1), the proposed CTs are not subject to any monitoring or reporting requirements under this standard and are only required to maintain purchase records for the permitted fuels.

5.2.5 National Emission Standards for Hazardous Air Pollutants (40 CFR Part 63; Code Chapter 7)

Some of the National Emissions Standards for Hazardous Air Pollutants ("NESHAP") requirements are incorporated by reference in Code §7-1-030. Applicability of the NESHAP requirements for the proposed units is presented below. Source-wide PTE, of single HAPs and combination of HAPs after the proposed project is proposed to be limited to less than 10 tons per year and 25 tons per year, respectively. With this project SRP is requesting to keep the station as an area source under 40 CFR § 63.2 for applicability of NESHAP requirements.

5.2.6 40 CFR Part 63, Subpart YYYY NESHAP for Stationary Combustion Turbines

Coolidge Generating Station is an area source of hazardous air pollutants. Therefore, the requirements of NESHAP 40 CFR Part 63 Subpart YYYY do not apply to this Project.

5.2.7 40 CFR 64 – Compliance Assurance Monitoring

The Compliance Assurance Monitoring ("CAM") program is codified in 40 CFR Part 64. CAM plan requirements apply to any pollutant specific emissions unit with uncontrolled potential emissions above the major source threshold (70 tpy for PM10 or 100 tpy of any other air pollutant) that uses a control device to achieve compliance with an emission limitation or standard. Only the uncontrolled NO_X and CO emissions for the simple cycle combustion turbines will exceed this threshold. SRP is proposing to use continuous emissions monitoring systems ("CEMS") for monitoring of NO_X and CO emissions from the proposed units. We request that the CEMS requirements be included in the Class I permit for COE. Thus, in accordance with 40 CFR § 64.2(b)(1)(vi), CAM plan requirements do not apply for NOx and CO emissions from the proposed units.

5.2.8 Acid Rain Program (40 CFR Part 72 and Code Chapter 3, Article 6)

The federal acid rain program requirements at 40 CFR Part 72 are incorporated by reference in Code §3-6-565(A). Per 40 CFR §72.6(a)(3)(i), a 'utility unit,' that is a 'new unit' is considered an affected unit. Any source that includes such an affected unit shall be an affected source, subject to the requirements of the Acid Rain Program in 40 CFR Part 72. A "utility unit" means a unit owned or operated by a utility that serves a generator in any State that produces electricity for sale. Finally, "Unit" means a fossil fuel-fired combustion device. Because the new simple cycle combustion turbine fire natural gas and produce electricity for sale, these are affected units under the federal Acid Rain Program. SRP will submit an Acid Rain Permit application to EPA and provide a copy to PCAQD.

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6.0 PROPOSED PERMIT TERMS AND CONDITIONS

This section of the application presents proposed permit terms and conditions for the Class I Permit for Coolidge Generating Station.

As provided under Code § 3-1-084 and R18-2-306.01, SRP is proposing the following voluntary emission limitations for the existing and the proposed operations at the COE site to keep below the applicable 'major source' thresholds under R18-2-401(13)(a) and (b).

(A) Revise the existing Condition 4.C.1 as follows for the existing operations at the COE site.

> Operation of the facility, including the number of emission units (CTG's) operating along with the fire pump engine operation, the duration of unit-specific operation, start-up and shut-down events, and the unit-specific loading, shall be limited in combination such that emissions, including the emissions generated during start-up and shutdown events, of any of CO, NO_X, VOC, ~~PM10/~~PM2.5 and SO_2 from the facility shall not exceed a cap of 245 tons per 12-calendar-month period per pollutant **and of PM10 from the facility shall not exceed 69.9 tons per 12-calendar-month period**.

(B) Revise the existing Condition 5.C.1 as follows for the existing CTs at the COE site to include alternative limitations that apply under the NSPS 40 CFR 60 Subpart KKKK per 40 CFR §60.4325.

1. NO_X Emission Limitation NSPS Subpart KKKK [40 CFR §60.4325]

~~No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 25 ppm of nitrogen oxides at 15 percent oxygen or 150 ng/J of useful output.~~

(a) No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 25 ppm of nitrogen oxides at 15%

oxygen or 150 ng/J of useful output while the combustion turbine is operated at greater than or equal to 75% of the peak load.

(b) No gases shall be discharged to the atmosphere from the combustion turbine which contains greater than 96 ppm of nitrogen oxides at 15% oxygen or 590 ng/J of useful output while the combustion turbine is operated at less than 75% of the peak load.

(C) With the addition of alternative NO_X limit of 96 ppm for the existing CTs under Condition 5.C.1, Conditions 5.D.1 and 2 are redundant and should be deleted.

~~1. Definitions~~

~~a. "Start-up" is defined as the 32-minute period following an initiation of fuel flow.~~

~~b. "Shutdown" is defined as the 12-minute period prior to shut-off the fuel supply.~~

~~c. "Malfunction" is defined as any sudden and unavoidable failure of air pollution control equipment, process equipment or a process to operate in a normal and usual manner, but does not include failures that are caused by poor maintenance, careless operation or any other upset condition or equipment breakdown which could have been prevented by the exercise of reasonable care.~~

~~2. Start-up and Shutdown Emissions~~

~~Anytime during the start-up or shutdown of the units, if the NO_X emissions exceed 25 ppm, then in accordance with the definition of excess emissions in Section §6.E.1 of this permit, these excess emissions will be reported monthly to the department (All Modes Report). Although these excess emissions are not considered to be violations of the NO_X emission limit, Permittee shall continue to exercise "good combustion practice" consisting of adherence to standard operating procedure.~~

(D) SRP is proposing changes to Condition 5.H to correct an error in the regulatory citation reference and corrections to the exponent in the particulate matter equations.

1. SIP Limitation [Currently federally enforceable pursuant to ~~PGAQCD~~ **PCAQCD** Reg. 7-3-1.7 (3/31/75) approved as a SIP element at 43 FR 50531 (11/15/78)]

For equipment with a heat input capacity of ~~greater ten but~~ less than 4,000 million Btu per hour, particulate emissions shall not exceed[1]:

~~E = 1.02X-.231~~ $\mathbf{E = 1.02X^{-.231}}$, where E = allowable rate of emissions in lbs per million BTU heat input, and

X = maximum heat input capacity in million BTU per hour.

2. Current Code Limitation (§5-23-1010)

For equipment with a heat input capacity of less than 4,200 million Btu per hour, particulate emissions shall not exceed3:

E = ~~1.02Q0.769~~ $\mathbf{1.02Q^{0.769}}$, where E = maximum emissions in lbs./hr.

Q = maximum heat input of all operating fuel burning units on a plant premises, in million BTU per hour.

(E) Based on the guidance from PCAQCD and testing requirements for similar facilities, SRP requests changes to the performance testing requirements in Condition 6 to require two CTs tested per permit period (5 years), for a representative sampling of all units. Coolidge Generating Station historically operates at 1-2% of the allowed VOC and PM10 emission limits of 245 tons per year for each pollutant. Further for NO_X and CO CEMS are used as the compliance demonstration and therefore only the RATAs are required. For SO_2 gas sampling is used to show compliance. The permit correctly identifies that the RATA is conducted for CO but for NO_X the current permit requires annual performance testing which is not required under Part 60 Subpart KKKK. Proposed changes are shown below

Condition 6.A.1

1. Performance Tests [40 CFR 60.8, Code §§3-1-160 & 3-1-170)

At least once during the 5-year permit term, Permittee shall conduct performance tests for VOCs and PM10. At least two CTs shall be selected for testing and used to represent all of the identical CTs at the facility to

meet this requirement and used for emissions calculations and emissions inventory. Selection of the CTs tested shall be rotated for each subsequent testing. ~~Within one year of the previous performance test but no later than fourteen (14) months of the test,~~ Permittee shall conduct performance tests, using standard test methods specified below, or equivalent methods as approved by the District pursuant to approval of the test plan required below. The tests shall be conducted using standard test methods approved by the EPA (40 CFR Part 60). These tests shall be performed at the maximum practical production rate. The continuous monitoring systems required by this permit shall be in place and operating prior to conducting the performance tests. Each performance tests shall address:

~~a. Nitrogen oxides emissions Ref. Part 60, App. A, Ref. Method 7E or 20.~~
~~b. Carbon monoxide emissions Ref. Part 60, App. A, Ref. Method 10~~
c. Particulate matter emissions (filterable PM10) Ref. Part 60, App. A, Ref. Method
5 or 201A and (condensable PM10) Method 202.
d. Volatile organic compound emissions Ref. Part 60, App. A, Ref. Method 25a
~~e. Opacity Ref. Part 60, App. A, Ref. Method 9, 40 CFR §60.11.~~

Condition 6.A.3

3. Subsequent Performance Testing (Code §3-1-050)
   a. PM Non-NSPS Testing Requirements
      Permittee shall conduct ~~annual~~ testing of turbines for particulate matter using the testing methods listed in Section §6.A.1 of this permit.
   b. CO Non-NSPS Testing Requirements
      Performance testing for carbon monoxide shall be covered under annual Relative Accuracy Test Audits (RATA).
   c. VOC Non-NSPS Testing Requirements
      Permittee shall conduct ~~annual~~ testing of turbines for volatile organic compounds using the testing methods listed in Section §6.A.1 of this permit.

d. NO_X NSPS Testing Requirements [40 CFR Part 60, Subpart KKKK §60.4400]

Performance testing for nitrogen oxides shall be covered under annual Relative Accuracy Test Audits (RATA).

~~Permittee shall conduct subsequent nitrogen oxides performance tests on an annual basis, no more than 14 calendar months following the previous performance test. Test method listed in Section §6.A.1 of this permit shall be used.~~

e. SO_2 NSPS Testing Requirements [40 CFR Part 60, Subpart KKKK, §60.4415]

Permittee shall conduct subsequent sulfur dioxide performance tests on an annual basis, no more than 14 calendar months following the previous performance test. One of the three methodologies described in Section §60.4415 of the Subpart KKKK can be used to conduct the performance tests.

(F) SRP requests deletion to application of the bias adjustment factor under Condition 6.C.1.b for demonstration of compliance with the 245-tons per year synthetic minor limit calculations of the 12-month rolling average. Any adjustments should be applied only to future emissions as required by the Federal regulations (40 CFR Part 75). The application of a bias adjustment factor retroactively would create inconsistencies with reported emissions under the Acid Rain Program and the emissions reported on a semiannual basis as required by Condition 6.H.

1. Compliance with Synthetic Minor Limitations

~~a.~~ To comply with the operational limitations as specified in Section §4.C of this permit, Permittee shall on the 10th day of each month calculate actual 12 month rolling emissions and a 12 month rolling emissions "budget." This emission budget shall be based on the past 10 months of historical emissions data and the amount of emissions (or emissions budget) that could be allowable in the upcoming 2 months (including the current month) without exceeding the 245 tons per year per pollutant synthetic minor limit.

~~b. To the extent the application of the bias adjustment factor as determined under §6.D.4 results in an increase of emissions during the reference period since the previous RATA test, by the 10th of the month following the completion of the latest RATA test, permittee shall correspondingly demonstrate continued continuous compliance with the 245 ton per year synthetic minor limit by recalculating the 12 month rolling average of emissions for each prior month affected by application of the bias adjustment factor.~~

(G) SRP requests the removal of the 30-day rolling average requirement in Condition 6.E.1. COE units are subject to the simple cycle unit without heat recovery requirements described in 40 CFR § 60.4350.g, which only references a 4-hour rolling average requirement.

1. An excess emission is any unit operating period in which the 4-hour ~~or 30-day~~ rolling average NOX emission rate exceeds the applicable emission limit in §60.4320. For the purposes of this subpart, a "4-hour rolling average NOX emission rate" is the arithmetic average of the average NOX emission rate in ppm or ng/J (lb/MWh) measured by the continuous emission monitoring equipment for a given hour and the three unit operating hour average NOX emission rates immediately preceding that unit operating hour. Calculate the rolling average if a valid NOX emission rate is obtained for at least 3 of the 4 hours.

(H) Add the following permit conditions for the sixteen combustion turbines ("CTs") (CT13 through CT28) and seven wet surface air coolers ("WSAC") (WSAC1 through WSAC7) to be permitted under the CT Project.

(1) Emission Limitations

a. The Permittee shall not cause or allow the PM/PM10/PM2.5 emissions from CT13 through CT28 and WSAC1 through WSAC7 more than 69.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

b. The Permittee shall not cause or allow the NO_X emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined total for all emissions units noted here including normal operation and startup/shutdown duration).

c. The Permittee shall not cause or allow the VOC emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

d. The Permittee shall not cause or allow the CO emissions from CT13 through CT28 more than 249.9 tons per 12-month rolling total sum (combined totals for all emissions units noted here including normal operation and startup/shutdown duration).

(2) Compliance Demonstration

a. Within 60-days after achieving maximum production rate of each CT (CT13 through CT28), but no later than 180 days after the initial start-up of the CT, Permittee shall conduct performance tests, using standard test methods approved by the EPA (40 CFR Part 60) specified below, or equivalent methods as approved by the District pursuant to approval of the test plan required below. These tests shall be performed at the maximum practical production rate. The continuous monitoring systems required by this permit shall be operating prior to conducting the performance tests. The performance tests shall address:

   i. Nitrogen oxides emissions: Ref. Part 60, App. A-4, Ref. Method 7E
   ii. Carbon monoxide emissions: Ref. Part 60, App. A-4, Ref. Method 10
   iii. Particulate matter emissions (PM10, PM2.5): Ref. Part 60, App. A-3, Ref. Method 5 and Ref. Part 51 App. M, Ref. Method 202
   iv. Volatile organic compounds emissions: Ref. Part 60, App. A-7, Ref. Method 25a

b. The Permittee shall document the drift specification for the drift eliminators used to control particulate matter emissions from the WSAC units (WSAC1 through WSAC7) from the manufacturer's specification or other engineering information.

(3) Instrumental Emissions Monitoring Requirements– Nitrogen Oxides & Carbon Monoxide

a. The Permittee shall install, calibrate, maintain, and operate continuous emissions monitoring systems on CT13 through CT28, and record the output of each system, for measuring nitrogen oxides and carbon monoxide emissions to the atmosphere during startup and shutdown events and the normal operation of the combustion turbines. Monitoring equipment required under this subsection shall be installed and operated in accordance with a plan submitted to the District by the permittee.

b. On a calendar-month basis, Permittee shall generate a record of cumulative actual nitrogen oxides and carbon monoxide emissions from CT13 through CT28 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual nitrogen oxide and carbon monoxide emissions limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______

(4) Monitoring Requirements – Particulate Matter

a. The Permittee shall install, calibrate, maintain, and operate a continuous monitoring system on CT13 through CT28, and record the output of the system, for measuring the amount of fuel used. Monitoring equipment required under this subsection shall be installed and operated in accord pursuant to a plan submitted to the District by the permittee.

b. The Permittee shall maintain records of number of startups for CT13 through CT28 pursuant to a plan submitted to the District by the permittee.
c. Except as provided below, the following PM/PM10/PM2.5 emission factors have been approved by the Control Officer and shall be used to calculate emissions from CT13 through CT28: 0.009 pounds per MMBtu heat input for non-startup periods, 5.1 pounds per shutdown and startup event (combined). For each simple-cycle combustion turbine, once initial performance testing has been performed per Condition ___, the highest PM/PM10/PM2.5 emission factor for non-startup periods for such simple-cycle combustion turbine (expressed in pounds per MMBtu heat input) shall be used until superseded by the results of subsequent performance testing.
d. The Permittee shall install, calibrate, maintain, and operate a monitoring system on WSAC1 through WSAC7, and record the output of the system, for measuring the amount of recirculation water used in the system. Monitoring equipment required under this subsection shall be installed and operated in accord pursuant to a plan submitted to the District by the permittee.
e. Once per quarter, the Permittee shall measure conductivity (as surrogate for TDS) or TDS for recirculation water for WSAC1 through WSAC7 pursuant to a plan submitted to the District by the permittee.
f. Monthly PM/PM10/PM2.5 emissions calculations:
    i. The Permittee shall calculate the quantity of emissions monthly during normal operation for PM/PM10/PM2.5 by multiplying the aggregate fuel flows/heat input for CT13 through CT28 by the corresponding PM/PM10/PM2.5 emission factors established per Condition ___.c above.
    ii. The permittee shall calculate the quantity of emissions monthly for startup and shutdown events for PM/PM10/PM2.5 by multiplying the number of events for CT13 through CT28 by the

corresponding PM/PM10/PM2.5 emission factor established per Condition ___.c above.

iii. The permittee shall calculate the quantity of emissions monthly for WSAC1 through WSAC16 by using the following equation.

$$E = k * Q * 60\left[\frac{min}{hour}\right] * 8.345\left[lb\frac{H2O}{gallon}\right] * \left[\frac{CTDS}{10^6}\right] * \left[\frac{DL}{100}\right]$$

Where, E = Particulate matter emissions, pounds per hour
Q = Circulating water flow rate, gallons per minute
CTDS = Circulating water total dissolved solids, ppm
DL = Drift loss, %
k = Particle size multiplier for PM10 and PM2.5[13]

g. On a calendar-month basis, Permittee shall generate a record of cumulative actual PM/PM10/PM2.5 emissions from CT13 through CT28 and WSAC1 through WSAC7 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual PM/PM10/PM2.5 emissions limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______.

(5) Monitoring Requirements – Volatile Organic Compound

a. Except as provided below, the following VOC emission factors have been approved by the Control Officer and shall be used to calculate emissions from CT13 through CT28: 0.009 pounds per MMBtu heat input for non-startup periods, 2.7 pounds per shutdown and startup

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[13] PM10 and PM2.5 particle size multiplier from "*Calculating Realistic PM10 Emissions from Cooling Towers*"; Reisman & Frisbie (uses EPRI wet droplet size distribution), Environmental Progress, 2002.

event (combined). For each simple-cycle combustion turbine, once initial performance testing has been performed per Condition ___, the highest VOC emission factor for non-startup periods for such simple-cycle combustion turbine (expressed in pounds per MMBtu heat input) shall be used until superseded by the results of subsequent performance testing.

b. Monthly VOC emissions calculations:
   i. The Permittee shall calculate the quantity of emissions monthly during normal operation for VOC by multiplying the aggregate fuel flows/heat input for CT13 through CT28 by the corresponding VOC emission factors established per Condition ___.c above.
   ii. The permittee shall calculate the quantity of emissions monthly for startup and shutdown events for VOC by multiplying the number of events for CT13 through CT28 by the corresponding VOC emission factor established per Condition ___.c above.

c. On a calendar-month basis, Permittee shall generate a record of cumulative actual VOC emissions from CT13 through CT28 emitted for the previous month and for the preceding 12- months and shall compare that total to the annual VOC emission limitations imposed under Condition ____. The Permittee shall maintain a record of those monthly total calculations, and monthly conclusion regarding compliance with the emission limitations under ______.

APPENDIX A

CLASS I PERMIT REVISION APPLICATION FORMS

Pinal County Air Quality Control District

P.O. Box 987 – Florence, AZ 85132 P-(520) 866-6929 F-(520) 866-6967

PINAL COUNTY
WIDE OPEN OPPORTUNITY

Permit Application

(As required by A.R.S. §49-480, and Chapter 3, Article I, Pinal County Air Quality Control District Code of Regulations)

1. Permit to be issued to: Salt River Project Agricultural Improvement and Power District
(Name and legal status (e.g. corporation or proprietorship) or organization that is to receive permit)

2. Mailing Address: P.O. Box 52025 PAB 359
City: Phoenix State: Arizona Zip: 85072-2025
Billing Address (if different from above):
City: State: Zip:

3. Plant Name (if different from above): Coolidge Generating Station

4. Name(s) of Owner or Operator: Salt River Project Agricultural Improvement and Power District
Phone:

5. Plant/Site Manager: Maria Roberts Phone: (602) 236-4328 Fax:

6. Contact Person: Zachary J Harbrin Phone: (602) 236-5779 Fax:
Email Address: Zachary.Harbin@srpnet.com

7. Equipment/Plant Location or Proposed Location Address: 859 East Randolph Road
City: Coolidge Zip: 85128 Parcel #: 503-34-015B
Section/Township/Range:
Latitude/Longitude: 32.55.01N, 111.30.15W Elevation: 1443

8. General Nature of Business: Electric generation
Standard Industrial Classification Code: 4911

9. Type of Organization

- ☐ Corporation State of Incorporation:
- ☐ Arizona Limited Liability
- ☐ Government Entity Government Facility Code:
- ☐ Individual Owner
- ☐ Partnership
- ☑ Other (Specify): Agricultural Improvement District / Political Subdivision of the State of Arizona

10. Permit Application Basis: (Check all that apply)

- [ ] New Source
- [x] Permit Revision
- [ ] Administrative Change
- [ ] Renewal of Existing Permit
- [ ] Portable Source
- [ ] General Permit
- [ ] Permit Transfer

For renewal or modification, include existing permit number: V20676.A01

Date of Commencement of Construction or Modification: Planned for February 2022

Is any of the equipment to be leased to another individual or entity? ☐ Yes ☑ No

11. If necessary to preserve this source's status as a less-than-major source, the undersigned agrees that the permit or this source ***SHOULD*** ☑ ***SHOULD NOT*** ☐ include Federally Enforceable Provisions in accord with Code §3-1-084.

12. The undersigned states and certifies that, based on information and belief formed after reasonable inquiry, the statements and information in this document and supporting materials are true, accurate and complete. To the extent that this application pertains to an assignment of an existing permit, the undersigned further agrees to comply with and accept each and every obligation associated with that existing permit. *Knowingly presenting a false certification constitutes a criminal offense under A.R.S. §13-2704.*

13. The undersigned applicant states that he/she currently has, or at the time construction and/or operation begins will have, legal authority to enter upon and use the premises upon which this source will be operated.

14. Attach a description of the process to be permitted or revised including a list of equipment, capacities, MSDS sheets and anticipated production or throughput.

15. For new sources, an application filing deposit fee must be included with the application.

Maria Roberts

Signature of Responsible Official of Organization

Maria Roberts

Typed or Printed Name of Signer

Director, Coolidge Generating Station

Official Title of Signer

8/27/2021

Date

APPENDIX B

EMISSIONS CALCULATIONS

SRP Coolidge Generating Station

Table 1: Operating Scenario Inputs

Coolidge Generating Station Expansion Operating Parameters

Simple Cycle Aero	GE LM6000PC			
Number of Units	16			
Annual operations per turbine	1,000	Hours/year		
Annual utilization factor	11%			
SU/SD events, per GT	730	Number/year		Two per day
Start Duration	30	minutes		
Shutdown Duration	9	minutes		
Natural Gas (HHV)	1,015	Btu/cf		
Natural Gas (LHV)	914	Btu/cf		
Sulfur concentration in NG	0.25	gr/100 cf	0.001	lb of SO2/MMBtu
Annual average from fuel specification				
Lead Emission Factor	4.93E-07	lb/MMBtu		

Lead (Pb) emission factor is from the U.S. EPA's Compilation of Air Pollutant Emission

Table 2: Greenhouse Gas Emissions Factors

		CO2 (1)	CH4 (2)	N2O (3)	SF6 (4)		kg =	2.2046 lb
Natural Gas (kg/MMBtu)		53.06	0.001	0.0001	NA			
GWP		1	25	298	22800			
Natural Gas CO2e=	117.10 lb/MMBtu							
Natural Gas CO2=	116.98 lb/MMBtu							

Notes:
1. 40 CFR 98, Table C-1 (revised 11/29/13).
2. 40 CFR 98, Table C-2 (revised 11/29/13).
3. 40 CFR 98, Table A-1 (revised 11/29/13).
4. Sulfur hexafluoride (SF6) will be used as an insulating medium in circuit breakers.
The IEC standard for SF6 leakage is less than 0.5%; the NEMA leakage standard for new circuit breakers is 0.1%. A maximum leakage rate of 0.5% per year is assumed.

Table 3: GE LM6000PC Aero Simple Cycle Unit Performance Normal Operation

Output	49.5 MW															
Ambient Conditions																
Ambient Temperature	°F		10	10	10	59	59	59	59	59	59	102	102	102	102	102	102
Ambient Pressure	psia	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968	13.968
Ambient Relative Humidity	%	60	60	60	60	60	60	60	60	60	20	20	20	20	20	20
Gas Turbine																
GT Fuel Type		Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas
Number of Gas Turbines operating per Block		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
GT load fraction	-	100%	75%	50%	100%	75%	50%	100%	75%	50%	100%	75%	50%	100%	75%	50%
Evap Cooler status		Off	Off	Off	On	On	On	Off	Off	Off	On	On	On	Off	Off	Off
SPRINT status		Off	Off	Off	On	On	Off	Off	Off	Off	On	On	Off	Off	Off	Off
Gas turbine water injection flow rate	klb/h	21.3	14.5	9.1	19	12	9.9	19.7	13.7	8.8	15.8	9.9	8.7	12.3	9.1	6.4
Plant Performance (not guaranteed)																
GT power (per GT)	kW	48269	36202	24135	49029	36772	24515	41985	31488	20992	45221	33916	22611	25507	19130	12753
GT Heat Cons (HHV)	MMBtu/h	471.3	376.1	285.2	489.8	385.8	288.4	424.3	341.4	263.1	456	363	274.2	298.2	250.6	205.8
SCR Exit Emissions (per unit)																
NOx Volume fraction, dry, at 15 % O2	ppm	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NOx mass flow rate (as NO2)	lb/h	4.3	3.4	2.6	4.4	3.5	2.6	3.8	3.1	2.4	4.1	3.3	2.5	2.7	2.3	1.9
CO Volume fraction, dry, at 15 % O2	ppm	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
CO mass flow rate	lb/h	7.3	5.8	4.4	7.6	6	4.5	6.5	5.3	4.1	7	5.6	4.2	4.6	3.9	3.2
VOC Volume fraction, dry, at 15 % O2	ppm	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
VOC mass flow rate (as methane)	lb/h	4.2	3.3	2.5	4.3	3.4	2.6	3.8	3	2.3	4	3.2	2.4	2.6	2.2	1.8
NH3 Volume fraction, dry, at 15 % O2	ppm	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
NH3 mass flow rate	lb/h	3.2	2.5	1.9	3.3	2.6	1.9	2.8	2.3	1.8	3.1	2.4	1.8	2	1.7	1.4
Total Particulates	lb/h	4.18	4.14	4.11	4.19	4.15	4.11	4.16	4.13	4.1	4.17	4.14	4.11	4.11	4.1	4.08
Stack CO2 mass flow rate, including Pe	lb/h	57,900	46,300	35,100	60,200	47,400	35,500	52,200	42,000	32,400	56,100	44,700	33,800	36,900	30,900	25,400

Table 4: GE LM6000PC Aero Simple Cycle Unit Performance Startup and Shutdown

Event	Duration (min)	Heat Input (MMBTU - HHV)	NOx (lb)	CO (lb)	VOC (lb)	PM/PM10 /PM2.5 (lb)
Startup	30	199.6	14.3	15.7	1.8	4.1
Shutdown	9	33.7	3.9	16.6	0.9	1

Table 5: GE LM6000PC Aero Simple Cycle Unit Emissions

Operating Parameters	Operation (Hours/year)	Heat Input* (MMBtu/hr)	
SC GT Operation	1,000	490	

For simple cycle units SU&SD hours are in addition to the capacity factor

	SU&SD	
SC GT Operating Scenarios (events/year)	730	
SC GT Heat Input* for minimum load (MMBtu)	200	represents heat input for MECL for partial hour

Pollutants	One SC GT Emissions** Max Hourly (lb/hour)	Annual (tons/year)	Emissions SU&SD (tons/year)	Emissions Total for One CT (tons/year)
NOx	4.4	2.2	6.6	8.8
CO	7.6	3.8	11.8	15.6
VOC	4.3	2.2	1.0	3.1
SO2***	0.5	0.2	0.05	0.3
PM	4.2	2.1	1.9	4.0
PM10	4.2	2.1	1.9	4.0
PM2.5	4.2	2.1	1.9	4.0
H2SO4****	0.05	0.02	0.00	0.0
Lead	2.41E-04	0.000	0.000	0.0
CO2	57,295	28,647	5,539	34,187
CO2e	57,356	28,678	5,545	34,223

**Heat input in HHV representing maximum for cold ambient temperature case.*

***NOx, CO, VOC, PM/PM10/PM2.5 annual emissions based on the short term emission rate for 59 °F ambient temperature case.*

****SO_2 emission factor of 0.001 lb/MMBtu based on combustion of pipeline quality natural gas and assuming a maximum S concentration of 0.25 gr/100 cf.*

*****The sulfuric acid mist emissions are estimated as 10% of the SO_2 emissions.*

SRP Coolidge Generating Station

Table 6: Wet Surface Air Coolers Emissions

k Particle Size Multiplier*		
PM	PM10	PM2.5
100%	29.97%	0.18%

	WSAC	Q per Unit**	Q (total)	C_{TDS}	%DL	Emissions (lb/hour) (total)			Emissions (TPY) (total)***		
	Number	gal/min	gal/min	ppm	%	PM	PM10	PM2.5	PM	PM10	PM2.5
WSAC Six cells per WSAC	7	10,600	74,200	5,000	0.0005%	0.93	0.28	0.002	0.46	0.14	0.001

*PM10 and PM2.5 particle size multiplier from "Calculating Realistic PM10 Emissions from Cooling Towers"; Reisman & Frisbie (uses EPRI wet droplet size distribution).
**Q per WSAC engineering estimate.
*** Annual emissions based on the 1,000 hours per year for each unit.

WSAC PM emissions are calculated based on the maximum circulating water flow rate, the design total dissolved solids (TDS) for the circulating

E = $Q \times k \times (60\ \text{min/hr})\ (8.345\ \text{lb water/gal}) \times (C_{TDS}/1{,}000{,}000) \times (DL/100)$

Where, E = Particulate matter emissions, pounds per hour
Q = Maximum circulating water flow rate, gallons per minute
C_{TDS} = Circulating water total dissolved solids, parts per million (ppm)
k = Particle Size Multiplier

SRP Coolidge Generating Station

Table 7: Emissions Summary

Coolidge Generating Station Summary of Emissions for All Units under the Expansion

	Number	Model
Simple Cycle Aero:	16	LM6000PC
Total Capacity:	792	MW

	Potential to Emit (tons/year)					
	Simple Cycle Turbines		WSAC	Total	PSD/NNSR MSS	
Pollutants	Normal	SU&SD			(tons/year)	Over MSS?
NOx	35.2	106.3		141.5	250	No
CO	60.8	188.6		249.4	250	No
VOC	34.4	15.8		50.2	250	No
SO2	3.9	0.8		4.7	250	No
PM	33.5	29.8	0.5	63.8	250	No
PM10	33.5	29.8	0.1	63.4	70	No
PM2.5	33.5	29.8	0.0	63.3	250	No
H2SO4	0.39	0.08		0.47	250	No
Lead	0.0019	3.73E-04		0.00	250	No
CO2	458,359	88,631		546,990	NA	
CO2e	458,845	88,725		547,569	NA	

AIR DISPERSION MODELING
FOR THE PROPOSED EXPANSION
OF THE
COOLIDGE GENERATING STATION

Prepared for:
Salt River Project Agricultural Improvement and Power District
1521 N. Mill Avenue
Tempe, Arizona 85281

Prepared by:
RTP Environmental Associates, Inc.
304-A West Millbrook Road
Raleigh, North Carolina 27609

September 2021

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the proposed expansion of the Coolidge Generating Station (Coolidge) owned and operated by the Salt River Project Agricultural Improvement and Power District (SRP) in Pinal County, Arizona.

The analysis evaluated emissions of each criteria pollutant that triggered minor New Source Review (NSR) as defined in R18-2-302 of the Arizona Administrative Code (AAC). The project will trigger minor NSR for all criteria pollutants except lead (Pb) and sulfur dioxide (SO_2). The criteria pollutant analysis was conducted to ensure that the proposed project will not cause or contribute to air pollution in violation of a National Ambient Air Quality Standard (NAAQS). Since the SRP Coolidge facility is located in an area of Pinal County which is classified as non-attainment for particulate matter with an aerodynamic diameter of less than 10 microns (PM10), the modeling analysis addressed the Arizona Department of Environmental Quality's (ADEQ) procedures for modeling demonstrations for both attainment and nonattainment pollutants.

The analysis conforms with the modeling procedures outlined in the U.S. Environmental Protection Agency's (EPA) Guideline on Air Quality Models[1] (Guideline), the ADEQ's Air Dispersion Modeling Guidelines for Arizona Air Quality Permits,[2] and associated EPA modeling policy and guidance. The modeling analysis also conforms with the modeling protocol submitted to the Pinal County Air Quality Control District (PCAQCD) on August 24, 2021. The PCAQCD subsequently requested revisions which have been addressed herein.

2.0 PROJECT DESCRIPTION

The proposed Coolidge expansion project involves the construction and operation of 16 new simple cycle aeroderivative combustion turbine generators (CTGs). In addition, the project includes addition of 7 wet surface air coolers (WSACs) for both the existing and the new CTGs. The project will result in potential emissions of carbon monoxide (CO), nitrogen oxides (NOx), volatile organic compounds (VOC), particulate matter with an aerodynamic diameter of less than 2.5 microns (PM2.5), and PM10 that are in excess of the minor NSR thresholds in R18-2-101(101). These pollutants are therefore subject to minor NSR review and were also conservatively evaluated for ambient impacts from the project using the air quality modeling analysis.[a]

[a] The proposed project is not subject to major NSR for any regulated NSR pollutant.

3.0 SITE DESCRIPTION

The Coolidge Generating Station is located in the City of Coolidge in Pinal County, approximately 16 kilometers (10 miles) southwest of Florence, Arizona. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 452,860 meters east and 3,642,300 meters north (UTM Zone 12, NAD 83). SRP currently operates 12 simple-cycle CTGs at this location. Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location.

The facility is approximately 427m (1400ft) above mean sea level. The portion of Pinal County where the facility is located is classified as attainment or unclassified for all criteria pollutants other than PM10, for which the area is classified as nonattainment.

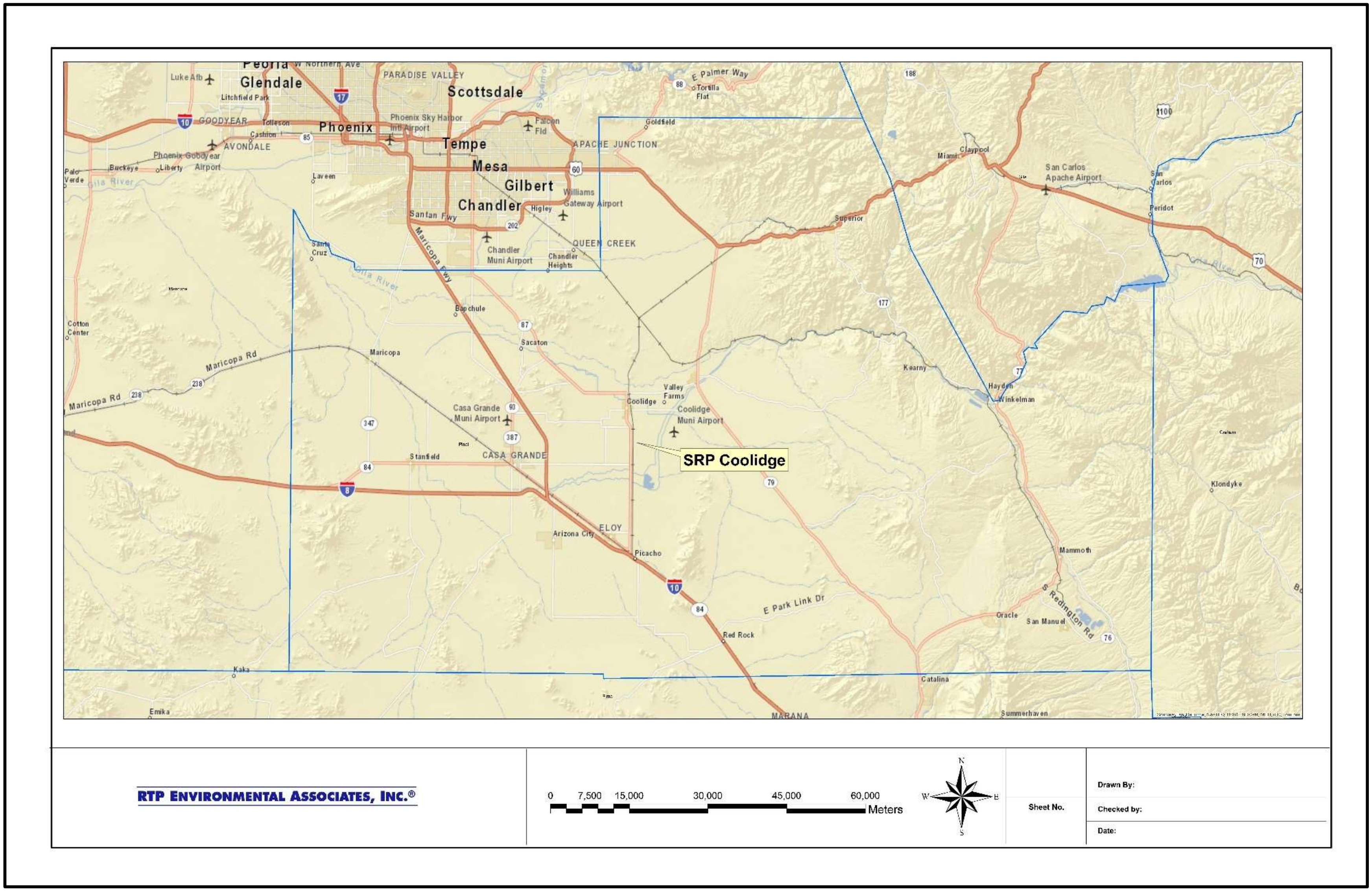


Figure 1. General Location of the SRP Coolidge Generating Station

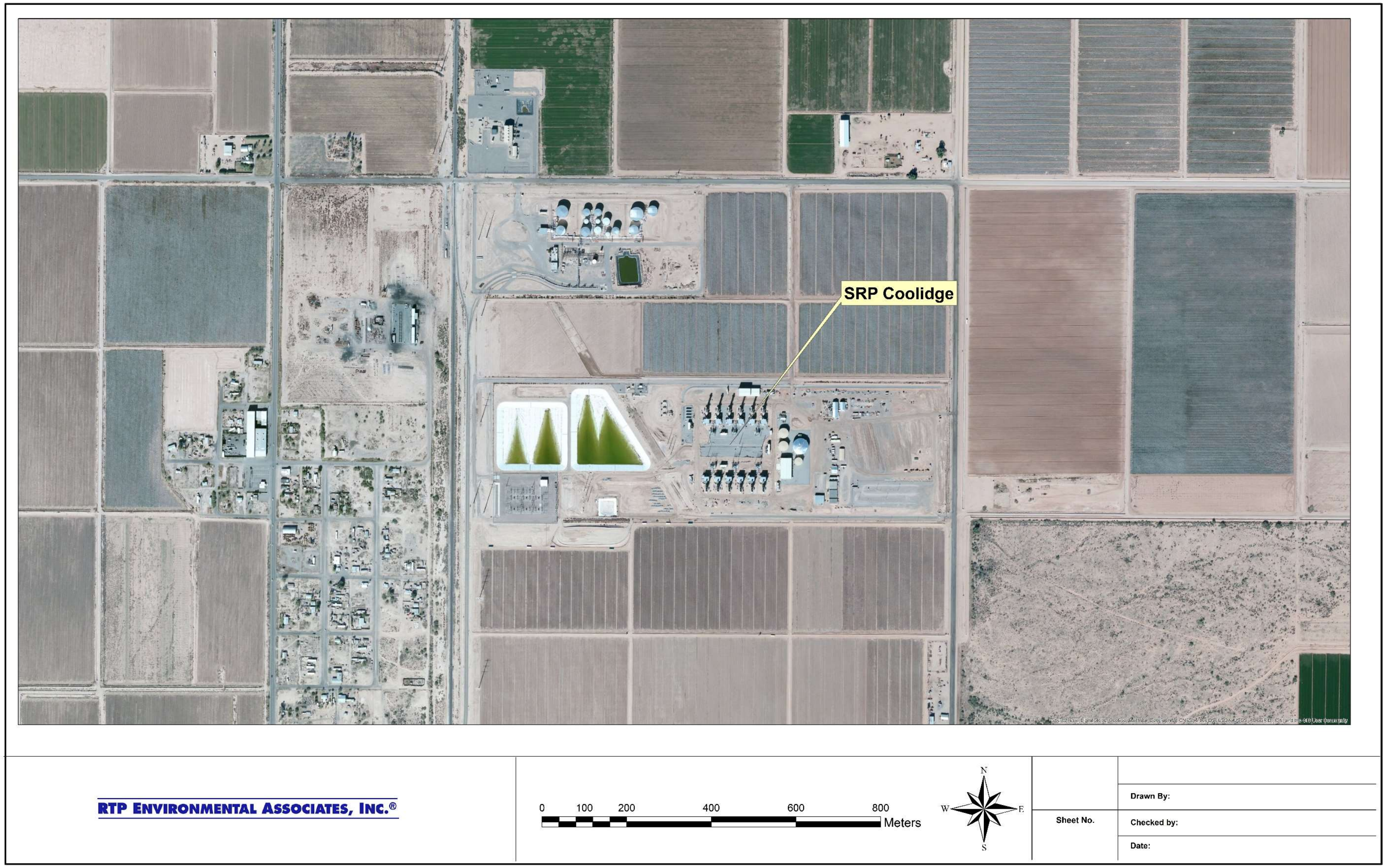


Figure 2. Specific Location of the SRP Coolidge Generating Station

4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 21112) was used to conduct the modeling analyses. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principles for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the most appropriate model for calculating ambient concentrations near the facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the Guideline.

Oris Solution's BEEST Graphical User Interface (GUI) was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, there is no need for a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W.

4.2 Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. The use of rural dispersion coefficients is supported by the

Land Use Procedure consistent with subsection 7.2.1.1.b.i of the Guideline and Section 5.1 of the AERMOD Implementation Guide. The USGS 2016 National Land Cover Data ("NLCD") within 3km of the site were converted to Auer 1978 land use types and evaluated.[3] It was determined that the land use in the vicinity of the facility is predominantly rural as defined by Auer (less than 50% of the area is classified as urban - Figure 3). Only the red and dark red regions in Figure 3 (NLCD categories 23 and 24) are considered urban. The potential for urban heat island effects, which are regional in character, was considered and determined not to be of concern.

4.3 Source Data

Source Characterization

Point Sources

Only point sources required evaluation. The existing turbines currently vent, and the new turbines will vent, to stacks with a well defined opening. The turbines were therefore modeled as point sources in AERMOD. The WSACs were also modeled as point sources. Each cell was modeled as a separate source. All source locations were based upon a NAD83, UTM Zone 12 projection. Attachment A provides the modeling input data.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice (GEP) stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for stacks to be constructed in excess of 65m. Procedures used were in accordance with those described in the EPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)4. GEP formula stack height, as defined in §3-1-177(B) of the PCAQCD Regulations, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from facility plot plans and aerial photos. The structure locations and

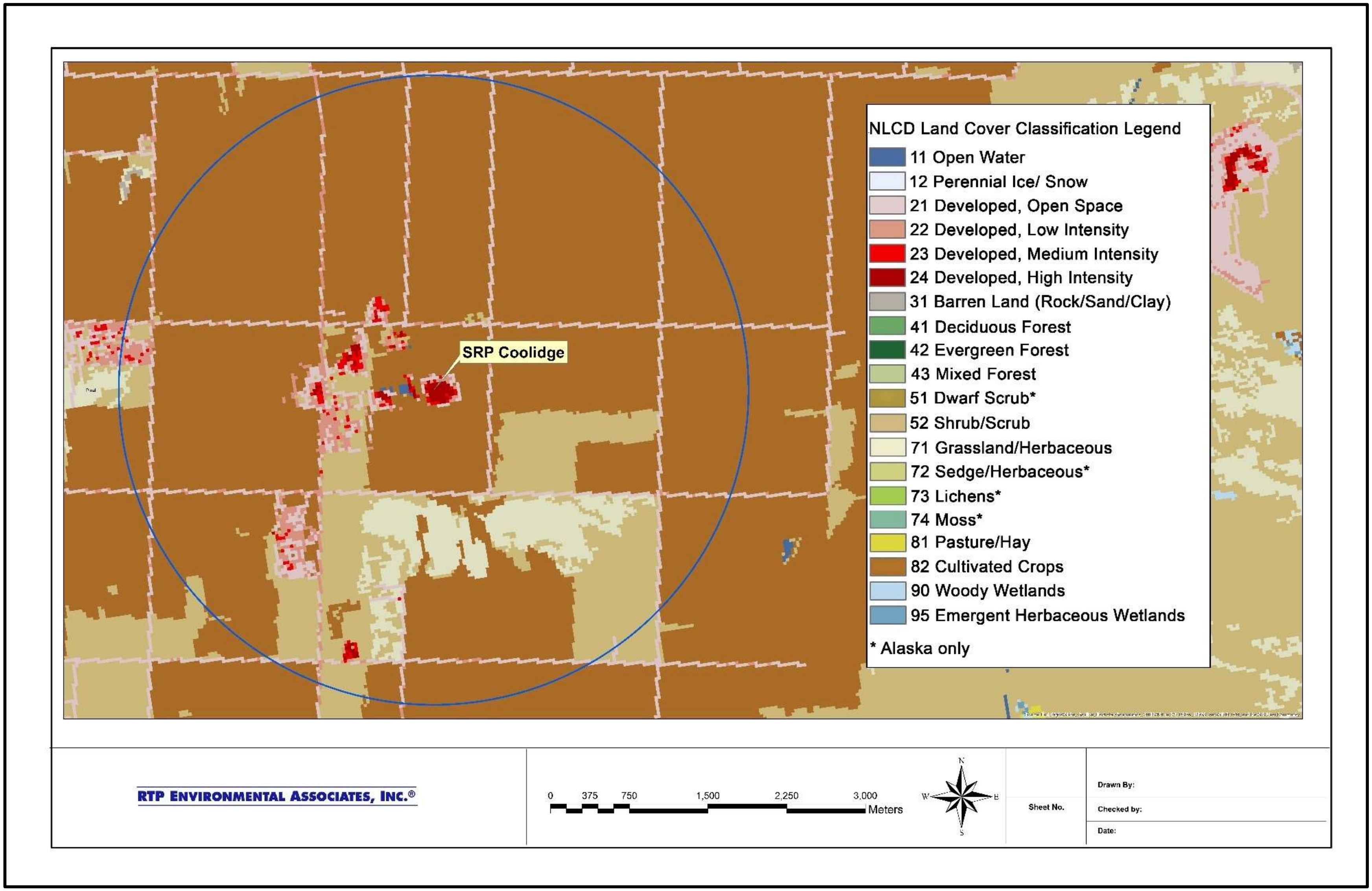


Figure 3. Land Use within Three Kilometers (3km Radius Shown)

heights were input to the EPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The proposed configuration of the facility is shown in Figure 4.

4.4 Monitored Background Data

Pursuant to ADEQ's Modeling Guidelines, background pollutant concentrations must be included in NAAQS analyses for both Prevention of Significant Deterioration (PSD) and non-PSD (minor NSR) applications. In general, the background concentrations are intended to account for sources not explicitly included in the modeling. The background concentrations are added to the modeled concentrations to assess NAAQS compliance.

The project requires modeling to assess NAAQS compliance for all regulated pollutants except SO_2 and lead. Even though the SRP Coolidge facility is in an area classified as nonattainment for PM10, the ADEQ's Modeling Guidelines allow for a facility to model facility-wide emissions and add the model results to representative background concentrations to demonstrate concentrations below the NAAQS. Background data are therefore needed for PM10, PM2.5, NO_2, CO and ozone.

There are existing ambient monitors within 100 miles of the facility (Figure 5). Existing monitoring data have been evaluated in relation to the criteria provided in EPA's Ambient Monitoring Guidelines[5] as being representative of the SRP Coolidge site.

Monitor Location

All proposed monitors, with the exception of Alamo Lake, are within 80 kilometers of the SRP facility. None of the selected monitors are subject to influence of any major, localized industry. All monitors therefore provide an adequate representation of the air quality in the vicinity of the SRP site.

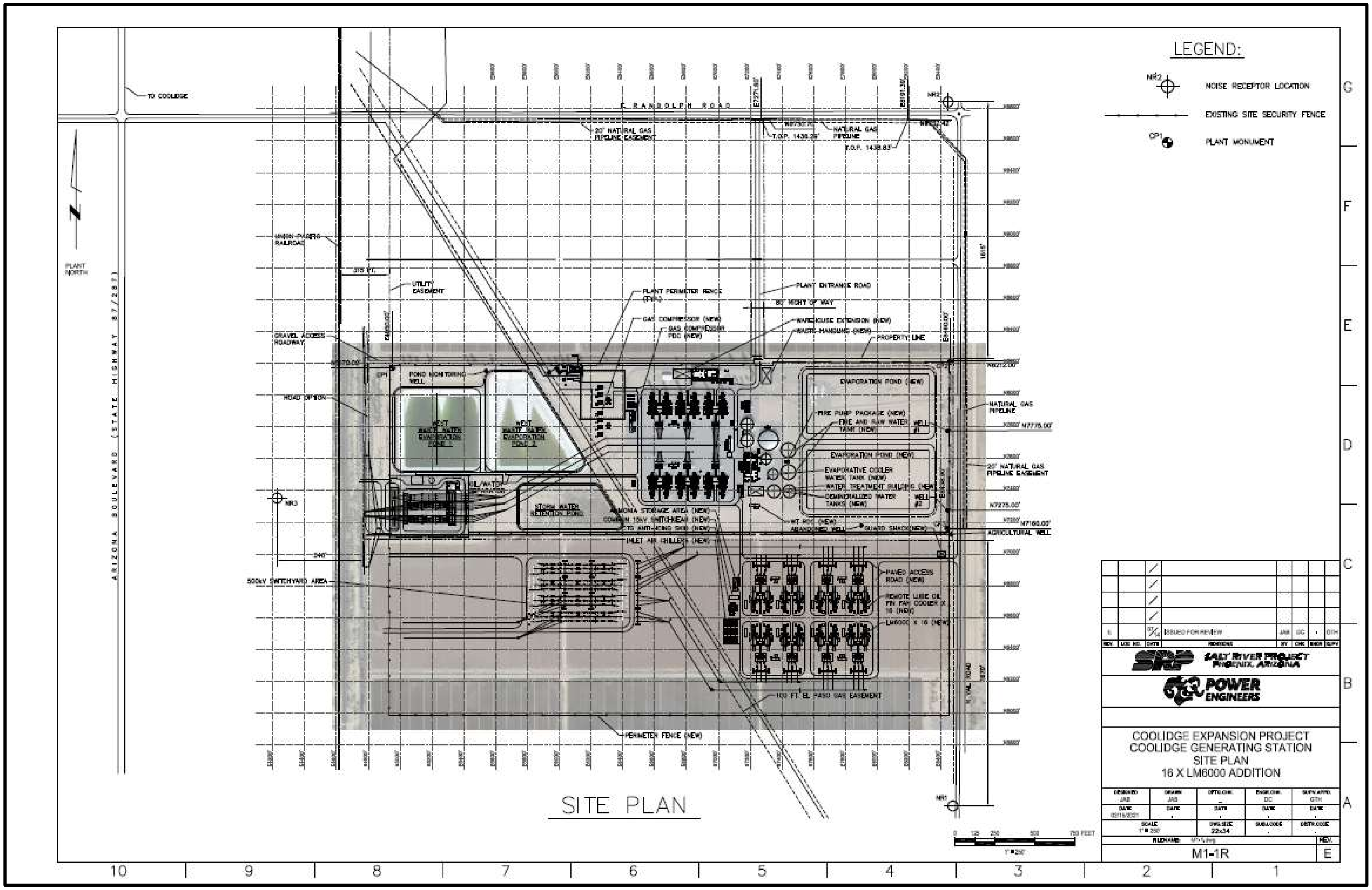


Figure 4. Preliminary SRP Coolidge Plot Plan

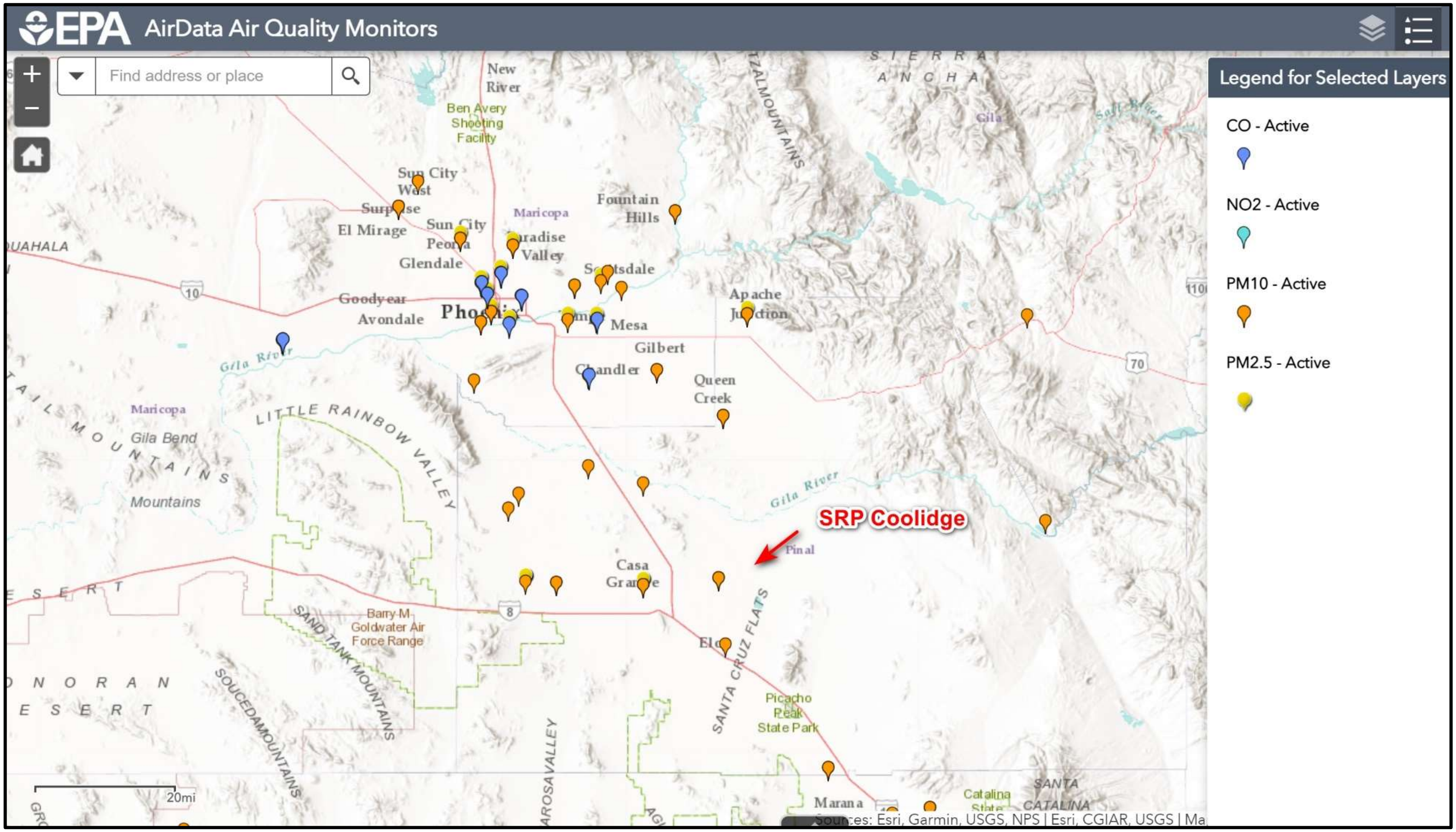


Figure 5. Ambient Monitors in the Vicinity of the SRP Coolidge Facility

There are very few active NO_2 monitors in Arizona and nearly all monitoring sites are located in the Phoenix/Tucson metropolitan areas. SRP has elected to conservatively include the annual NO_2 concentrations as measured in Tucson. While the climatology and topography of these metropolitan areas are representative of the SRP Coolidge location, the Tucson monitor is more influenced by localized emissions from vehicles. The annual NO_2 concentrations at Tucson are therefore likely higher than would be expected at the more rural Coolidge location. Use of the Tucson data should therefore be a conservatively high representation of the upper bound of annual NO_2 concentrations experienced at Coolidge.

In addition, SRP has elected to use the ADEQ recommended 26.3 $\mu g/m^3$ 1-hour background NO_2 concentration from Alamo Lake (see the ADEQ Modeling Guidance at Section 7.1.4 as updated based upon the September 7, 2021 email from PCAQCD to SRP). The ADEQ recommends this value for areas where local anthropogenic NOx sources are negligible. As previously stated, the Coolidge location is in a rural area, about midway between Phoenix and Tucson, in an area devoid of any significant localized NOx industrial sources or heavy vehicular traffic. The Alamo Lake data should therefore adequately represent concentrations at the SRP location.

Data Quality

The existing ambient monitors were established and air quality data were collected as part of EPA's ambient air quality monitoring network. Federal regulations at 40 CFR Part 58, Appendix A, require that these data meet quality assurance (QA) requirements. The existing ambient air quality data also meet the data quality requirements of Section 2.4.2 of the Monitoring Guidelines. The QA requirements for monitoring criteria pollutants at PSD sites are very similar to the QA requirements for monitoring sites for NAAQS compliance. The proposed monitoring data meet the data quality criterion.

Currentness of Data

The Monitoring Guidelines suggest that air quality monitoring data used to meet PSD data requirements should be "collected in the 3-year period preceding the permit application."[6] All data presented herein, with the exception of PM10, are current and meet this criterion. The PM10 monitor in Coolidge ceased operation at the end of 2019. Therefore, the most recent three-year period covers the 2017-2019 timeframe. These data, however, should still be representative of the concentrations in the Coolidge area. This is the closest monitor to the SRP site and there has been no significant residential or industrial growth in the area since 2019 that would significantly influence current PM10 concentrations in the area. The population in Pinal County decreased by approximately 37,000 in 2020 as compared to 2019.[7] Additionally, review of a list of issued air permits in Pinal County in 2019 and 2020 indicates that there were only two minor permit revisions, one at the Cactus Landfill in Florence and one at the Frito-Lay facility in Casa Grande. The only significant permit revision occurred at the SRP Desert Basin facility which is in excess of 15 miles from Coolidge.

The Coolidge monitor sampling frequency of once every six days is consistent with 40 CFR § 58.12(e). Among monitoring sites satisfying the requirements of 40 CFR part 58, sampling frequency is not a pertinent factor listed in the Monitoring Guidelines as a factor to be considered in evaluating whether the proposed monitoring data are representative. The background values are shown in Table 1.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR §50.1(e) and §1-3-140 of the PCAQCD Regulations. Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access.

The receptor grid consisted of four Cartesian grids and receptors spaced at 25m intervals along the facility fenceline (or process area boundary) (Figure 6). The first Cartesian grid extended to approximately 3km from the fence in all directions.

Table 1. Ambient Background Values (2018-2020)

Pollutant	Average	Background Value (µg/m^3)	NAAQS (µg/m^3)	Design Concentration	Monitor Name	Site ID
NO_2	Annual	15.5 (8.2ppb)	100 (53ppb)	Maximum of annual average from three years	Tucson	04-019-1028
	1-hr	26.3 (14.1ppb)	188 (100ppb)	Recently recommended ADEQ value.	Alamo Lake	Alamo Lake
CO	1-hr	1040 (0.91ppm)	40,000 (35ppm)	Highest concentration from past three years	Tucson	04-019-1028
	8-hr	812 (0.71ppm)	10,000 (9ppm)	Highest concentration from past three years		
Ozone	8-hr	137 (0.07 ppm)	137 (0.07 ppm)	Annual 4th high daily max 8-hr average from three years	Casa Grande	04-021-3003
PM2.5	Annual	7.19	12	Three year annual average	Casa Grande	04-021-3003
	24-hr	18.2	35	Average of the 98% 24hr values over three years		
PM10	24-hr	96.0	150	Three year average (2017-19) of 2nd high values.	Coolidge	04-021-3004

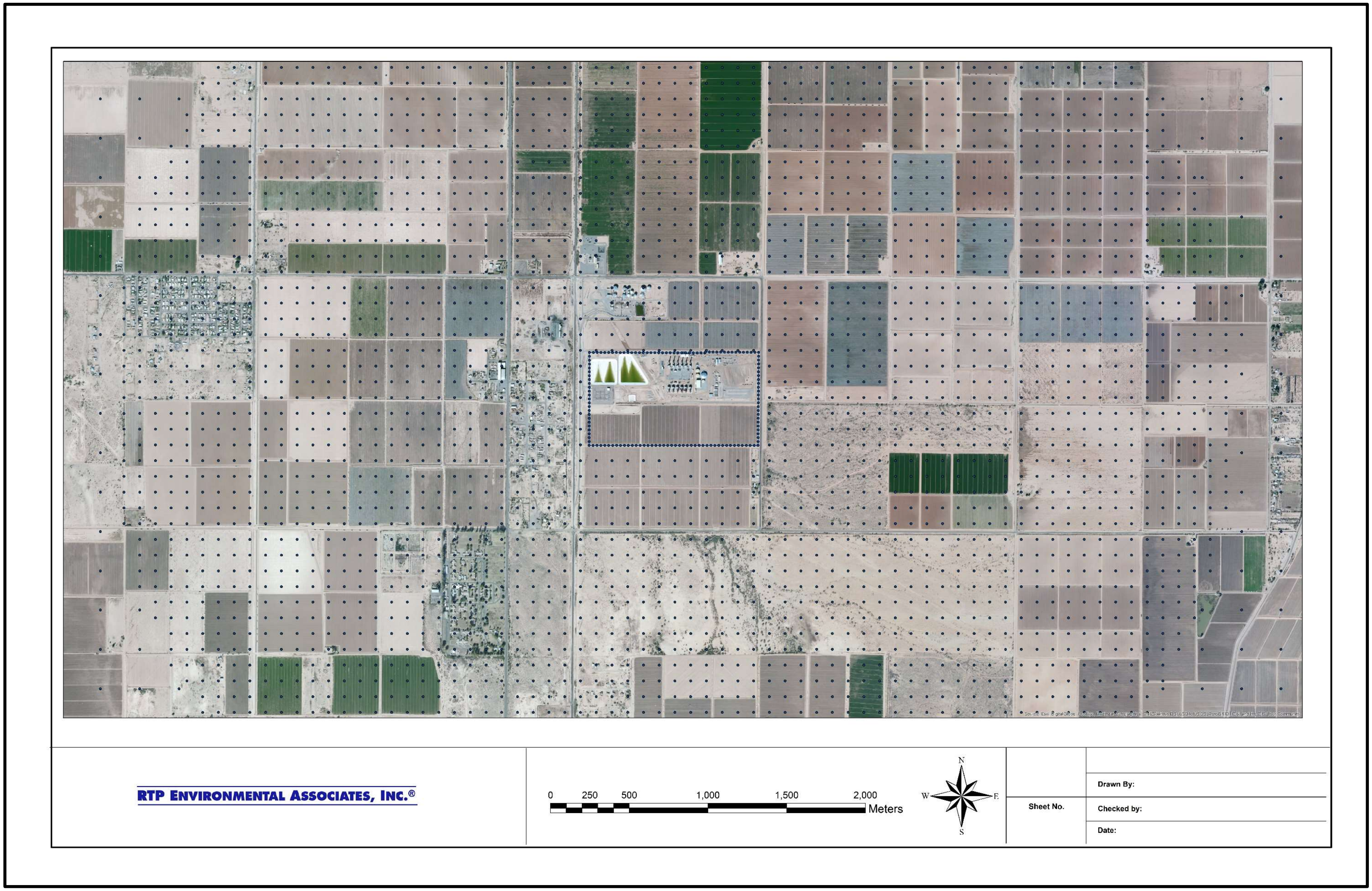


Figure 6. SRP Coolidge Near-field Receptor Grid

Receptors in this region were spaced at 100m intervals. The second Cartesian grid extended from 3km to 7.5km from the fenceline. Receptor spacing in this region was 250m. A third Cartesian grid was employed that extended from 7.5km to 10km from the fenceline. Receptor spacing in this region was 500m. A fourth grid extended from 10 to 25km with a spacing of 1000m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. Maximum impacts outside of the 3km grid, as were seen in the mountainous regions to the northwest and southeast, were refined to 100m. Additionally, impacts in excess of 90% of a standard were resolved to 25m.

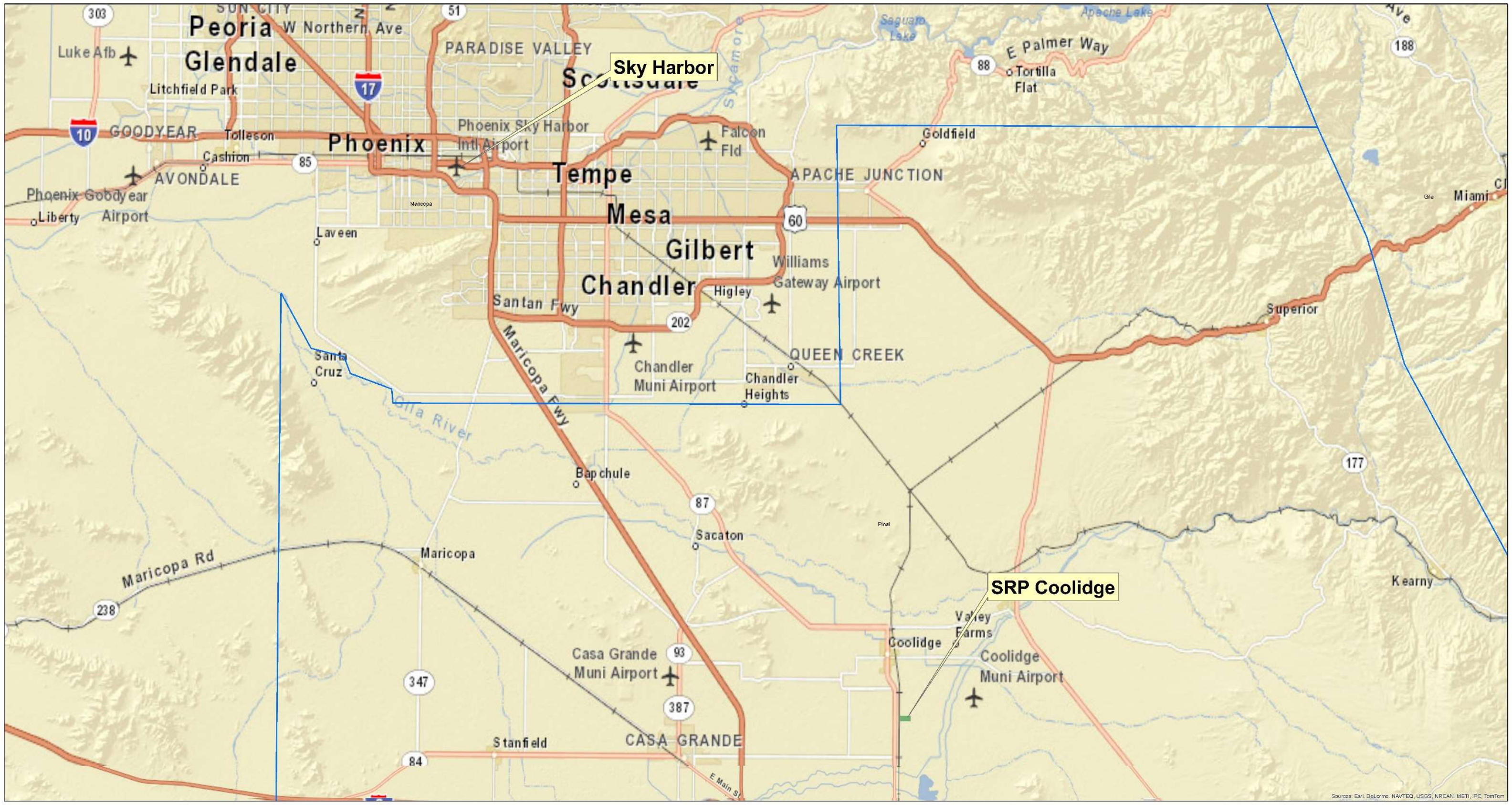
The SRP Coolidge facility is located in southern Arizona. There is terrain in the vicinity of the facility which exceeds stack top elevation. Receptor elevations and hill height

scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS 1 arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 12 projection.

4.6 Meteorological Data

The 2014-2018, 5-year sequential hourly surface meteorological data collected at the Phoenix Sky Harbor International Airport (WBAN 23183) and upper air data from Tucson (WBAN 23160) were used in the analysis. These data were processed by ADEQ using AERMET version 19191. To address issues with model overprediction due to underprediction of the surface friction velocity (u*) during light wind, stable conditions, EPA integrated the ADJ_U* option into the AERMET processor. ADEQ used the ADJ_U* option in processing the data. ADEQ also employed 1-minute data using the AERMINUTE processor with a 0.5 m/sec wind speed threshold to minimize the number of calm wind conditions encountered when using Automated Surface Observing System (ASOS) data.

There are four criteria in the Guideline for assessing whether meteorological data are representative of the study area. These criteria include: 1) proximity of the meteorological station to the area under consideration, 2) the complexity of the terrain, 3) the exposure of the meteorolgical site, and 4) the period of time during which the data are collected. The Sky Harbor data have been evaluated relative to these criteria and determined to be representative of the Coolidge study area. Sky Harbor is located approximately 75km to the northwest of the SRP facility as shown in Figure 7. There are no significant terrain features between the two sites that would affect wind direction and thus significantly alter the dispersion patterns experienced at each location. The Sky Harbor tower is also free of any obstructions as it was established as a National Weather Service 1St Order Station that must meet specific site and exposure standards. In addition, the most current five year dataset as provided by the ADEQ was employed. As a result, the Phoenix data adequately represent the meteorological conditions experienced at the SRP Coolidge site. The 2014-2018 windrose is provided in Figure 8.

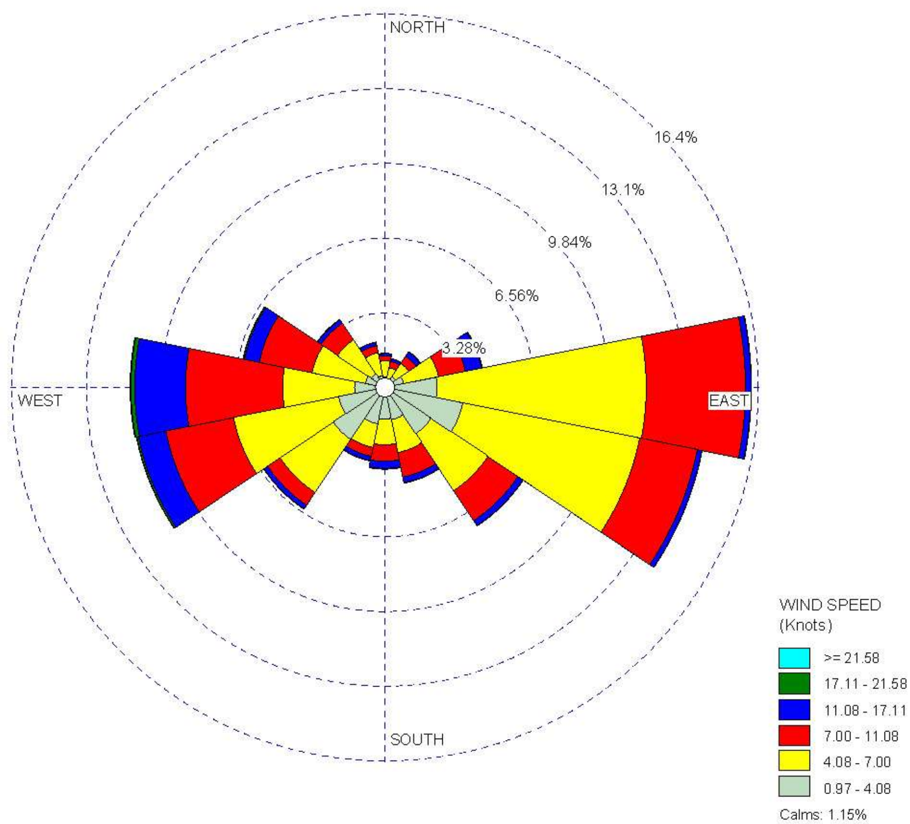


RTP ENVIRONMENTAL ASSOCIATES, INC.®

0 5,000 10,000 20,000 30,000 40,000 Meters	N W E S	Sheet No.	Drawn By:
			Checked by:
			Date:

Figure 7. Location of the Phoenix Sky Harbor Airport Relative to the SRP Coolidge Facility

WIND ROSE PLOT:	DISPLAY:
Phoenix **2014-2018**	**Wind Speed** **Direction (blowing from)**



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2014 - 00:00 **End Date: 12/31/2018 - 23:59**	**RTP Environmental**	
		MODELER: **David Keen**	RTP ENVIRONMENTAL ASSOCIATES, INC.®
	CALM WINDS: **1.15%**	TOTAL COUNT: **43573 hrs.**	
	AVG. WIND SPEED: **6.27 Knots**	DATE: **3/31/2021**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Figure 8. Phoenix Sky Harbor Windrose (2014-2018)

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

All criteria pollutants with emissions in excess of the minor NSR threshold were evaluated for NAAQS compliance. These pollutants include: NO_2, CO, PM2.5, PM10 and VOC (ozone).

5.2 Load/Operating Conditions and Facility Design

The turbine emission rates and stack parameters vary with the numerous combinations of operating load and ambient temperature. A load screening analysis was therefore performed to determine the operating conditions that result in the highest modeled impacts. Rather than model each of the potential combination of operating load and ambient temperature, a simplified, conservative analysis was performed by modeling the "worst-case" stack temperature and flow rate for multiple load conditions using the minimum value of flow and temperature at each load. For example, the turbine vendor provided stack gas conditions (i.e., gas release temperature and velocity) for five different ambient temperatures ranging from 10 to 102F for each of five operating scenarios (i.e., 100%, 75%, 50% load and start-up/shut-down). To simplify the analysis, the lowest gas exit temperature and velocity across the five different ambient conditions was modeled for each of the four operating scenarios. Because emissions are generally directly related to heat input rates, the emissions used for the four operating scenarios were be normalized based on the relative heat input at these four scenarions loads. Peak emission rates for the CTGs represent the maximum hour that includes startup for the first 30 minutes and normal operation for the remaining 30 minutes. Attachment A provides all load condition input values and the modeled parameters.

5.3 Significant Impact Analysis

The criteria pollutant air quality analysis, to demonstrate that the project will not cause or contribute to a NAAQS exceedance, was conducted in two phases: an initial or significant impact analysis, and a refined analysis if necessary. In the significant impacts analysis, the calculated maximum impacts were determined for each pollutant. These impacts were used to determine the net change in air quality resulting from the proposed project. Five years of Phoenix meteorological data were modeled. Maximum modeled concentrations were compared to the pollutant-specific significant impact levels for all pollutants and averaging times.

Pollutants with impacts that exceed the significant impact levels, as listed in Table 2, were evaluated for NAAQS compliance in a refined analysis

Pursuant to the ADEQ Modeling Guidelines, unlike methods used in NAAQS analyses for PSD permit applications, inclusion of regional or nearby sources under the minor NSR program is typically not required. However, SRP has conservatively included the adjacent Steel Girder, LLC/Stinger Bridge & Iron facility ("Stinger Welding") as a nearby source. The Stinger facility is located less than 0.5 km to the northwest of the SRP Coolidge facility. Given the proximity of the Stinger facility to the SRP Coolidge facility, it is possible that impacts from this source may not be adequately represented in the regional background concentrations. In the refined analysis, impacts from the SRP Coolidge facility and the nearby Stinger Welding facility were added to the regional background concentrations presented in Table 1. The resultant total concentrations were compared to the NAAQS.

The Western Emulsions facility is also located in close proximity to SRP (0.5km to the north). However, this facility only emits VOC and should not appreciably influence localized ozone concentrations in the vicinity of the SRP Coolidge facility.

5.4 Refined Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the NAAQS was conducted. A refined analysis was conducted to determine compliance with the NAAQS only for pollutants modeled as having significant impacts in the initial analysis. The five-year Phoenix meteorological dataset is again used in this analysis.

Table 2. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels (μg/m^3)[a]
PM2.5	24-hour	1.2
	Annual	0.2
PM10	25-hour	5
NO_2	1-hour	7.5[b]
	Annual	1.0
CO	1-hour	2,000
	8-hour	500
Ozone	8-hour	1 ppb

[a] Unless otherwise noted, significance levels are codified at § 3-1-030 of the PCAQCD Regulations.
[b] There is no 1-hr NO_2 significance level promulgated in the federal or PCAQCD regulations. An interim 1-hr NO_2 significance level of 4 ppb (7.5 μg/m^3) will be used as the 1-hr NO_2 significance level.

The modeled design concentrations were added to the monitored values presented in Table 1 to assess compliance with the NAAQS. The form of the design concentration and the NAAQS are shown in Table 3.

5.5 NO_2 Analyses

Following EPA guidance, the NO_2 modeling analyses used the recommended three tier screening approach. Initially, Tier 1 was employed with the conservative assumption that 100% of the available NOx converts to NO_2. Since the NO_2 impacts under this assumption exceeded the SILs, the Tier 2 (Ambient Ratio Method, or ARM2) was employed with the EPA recommended minimum and maximum ambient NO2/NOx ratios of 0.5 and 0.9, respectively. Tier 3, which accounts for the chemical reactions that convert NOx to NO_2 in the presence of ozone, was not employed.

5.6 Secondary PM2.5 Analyses

On February 10, 2020, the EPA issued draft guidance for assessing ozone and fine particulate matter modeling.[8] The guidance addresses both primary and secondary PM2.5 impacts. Primary PM2.5 impacts refer to the impacts due to direct emissions of PM2.5. Secondary impacts refer to the PM2.5 impacts attributable to nitrates and sulfates formed due to precursor NO_2 and SO_2 emissions. The EPA outlines four cases

Table 3. Modeled Design Concentration and NAAQS

Pollutant	Averaging Time	Modeled Design Concentration (μg/m^3)	Ambient Air Quality Standards (μg/m^3)[a]	
			Primary	Secondary
PM2.5	24-hour	Highest of multi-year averages of the 98th percentile of the annual distribution of 24-hour concentrations predicted each year at each receptor	35	35
	Annual	Highest of multi-year averages of annual concentrations at each receptor	12	15
PM10	24-hour	Highest, sixth highest 24-hour modeled concentration that occurred at each receptor over that five-year period	150	
NO_2	1-hour	Highest of multi-year averages of the 98th percentile of the annual distribution of maximum daily 1-hour concentrations predicted each year at each receptor	188	--
	Annual	Highest modeled concentration over the entire receptor network	100	100
CO	1-hour	Highest, second highest concentrations over the entire receptor network for each year modeled	40,000	--
	8-hour	Highest, second highest concentrations over the entire receptor network for each year modeled	10,000	--

[a] 40 CFR part 50.

for assessing the primary and secondary PM2.5 impacts. The appropriate case to use depends on the magnitude of direct PM2.5 and precursor NO_2 and SO_2 emissions. Case 1 is applicable if the emissions increase of both direct PM2.5 and secondary NO_2 and SO_2 emissions are below the PSD significant emission rates (SER). Case 2 is applicable if the direct PM2.5 emissions increase is greater than the SER and the NOx and/or SO2 emissions increase is less than the respective SER. Case 3 is applicable if both the direct PM2.5 and NOx and/or SO_2 emissions are greater than the SER. Case 4 is applicable to direct PM2.5 emissions of less than the SER and NOx and/or SO_2 emissions in excess of the SER. While Case 2 is technically not applicable to the Coolidge expansion project because the PM2.5 emissions increase is less than the SER, SRP modeled the direct PM2.5 emissions and compared the results to the significant impact levels. Secondary PM2.5 impacts were not assessed since precursor NO_2 and SO_2 emissions are less than the SER.

5.7 Ozone Analysis

Currently, there are no regulatory photochemical models available to evaluate smaller spatial scales or single-source impacts on ozone concentrations. Since ozone is formed from precursor pollutants, assessment of ambient ozone impacts is typically conducted on a regional basis using resource-intensive models, such as the EPA's Community Multiscale Air Quality (CMAQ) model. However, sources subject to PSD review are required to conduct a source impact analysis and demonstrate that a proposed source will not cause or contribute to a violation of any NAAQS or applicable increment. Qualitative ozone analyses typically have been performed in recent PSD applications to evaluate whether ozone precursor emissions (NO_X and VOC) will significantly impact regional ozone formation.

While VOC and NOx emissions increases associated with the project are less than the PSD SERs, the project's ozone precursor emissions were evaluated under the EPA's Modeled Emission Rates for Precursors (MERPs) guidance to demonstrate that the Project will not result in quantifiable ozone formation. SRP has evaluated Source No.

4007 from Gila County under the EPA's ozone MERPs guidance. Since the proposed VOC and NOx emissions increase from the SRP project are less than the MERP values for source 4007, SRP concludes that the proposed Coolidge expansion project will not cause or contribute to a violation of the NAAQS for ozone. No additional ozone impacts analysis was therefore conducted.

5.8 Modeling for HAPs Sources – Learning Sites Policy

ADEQ has established the Learning Sites Policy to ensure that children at learning sites are protected from criteria air pollutants as well as hazardous air pollutants (HAPs). Learning sites consist of all existing public schools, charter schools, and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board. Any facility located within 2 miles of a learning site is subject to the policy and must submit a modeling analysis to demonstrate compliance with the NAAQS and acute/chronic ambient air concentrations for listed air toxics. The closest schools to the SRP Coolidge facility are the Mary C O'Brien Elementary School and the West Elementary School. Both schools are located in excess of 4 miles from the SRP Coolidge facility. Therefore, no additional modeling was conducted pursuant to the Learning Sites Policy.

6.0 MODEL RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are provided electronically.

6.1 Load Analysis Results

The results of the load analysis can be found in Attachment B. The startup load condition was found to cause the highest impacts for all turbines for all averaging periods. The emissions and stack parameters associated with this load condition were therefore conservatively used in the remainder of the analysis. The startup emissions were not excluded from the significant impact or 1-hr NO_2 NAAQS demonstration.

6.2 Significant Impact Analysis Results

The project resulted in significant impacts for PM10, PM2.5, and NO_2 (Table 4). Based upon the results of the significant impacts analysis, a cumulative analysis was conducted to assess compliance with the NAAQS.

Table 4. Significant Impact Analysis Results

Pollutant	Avg Period	Maximum Modeled Impact - (µg/m³)	PSD Significant Impact Level (µg/m³)	Maximum Distance to a Significant Impact (km)
NO_2	1-hr	71.3	7.5	25
	Annual	2.25	1.0	1.4
CO	1-hr	116	2,000	NA
	8-hr	45.8	500	NA
PM2.5	24-hr	4.37	1.2	21.1
	Annual	0.85	0.20	15.9
PM10	24-hr	5.62	5	0.79
SO_2	1-hr	2.40	7.8	NA
	3-hr	1.49	25	NA

NA- not applicable. Pollutant impact less than the SIL.

6.3 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the NO_2, PM10 and PM2.5 NAAQS. The adjacent Stinger Welding facility was included in the model and background concentrations were added to the model results to assess compliance. Evaluation of compliance with the 1-hr NO_2 NAAQS was based on the 98th percentile of the annual distribution of daily maximum 1-hour concentrations. Evaluation of compliance with the 24-hr PM2.5 NAAQS was based on the 98th percentile of the annual distribution of maximum 24-hour concentrations. Compliance with the PM10 24-hr standard was based upon the sixth highest value over the five-year meteorological period. Annual PM2.5 NAAQS compliance was evaluated based upon the average of the five-year modeled annual concentrations.

The results of the NAAQS analysis are presented in Table 5. As can be seen, the model demonstrates compliance. Summary model output can be found in Attachment B.

Table 5. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)	Background Concentration (μg/m^3)	Total Concentration (μg/m^3)	Standard (μg/m^3)
NO_2	1-hour	104	26.3	130	188
	Annual	3.70	15.5	19.2	100
PM2.5	24-hour	3.69	18.2	21.9	35
	Annual	1.78	7.19	8.97	12
PM10	24-hour	41.1	96.0	137	150

ATTACHMENT A
MODEL INPUT DATA

Load Screen Analysis Input for GE LM6000PC Aeroderivative Combustion Turbines with SCR and Oxidation Catalyst

1. Stack Conditions

Simple Cycle Units			Ambient	Inlet		Stack Temp (F)			Stack Velocity (ft/s)		
Condition	Category	Model	Temp (F)	Conditioning	Load -->	100%	75%	50%	100%	75%	50%
GEA-1	Aero	LMS6000PC	10	No		767	712	656	112.00	96.00	80.00
GEA-2	Aero	LMS6000PC	59	Yes		780	777	745	120.00	97.00	82.00
GEA-3	Aero	LMS6000PC	59	No		780	780	750	109.00	91.00	76.00
GEA-4	Aero	LMS6000PC	102	Yes		780	780	780	116.00	96.00	79.00
GEA-5	Aero	LMS6000PC	102	No		780	780	780	87.00	76.00	67.00

Startup represents average for the duration of unit startup.

2. Emission Rates

	Ambient	Inlet		PM(f+c) (lb/hr)				NOx (lb/hr)				CO (lb/hr)			
Condition	Temp (F)	Conditioning	Load -->	100%	75%	50%	Startup	100%	75%	50%	Startup	100%	75%	50%	Shutdown
GEA-1	10	No		4.18	4.14	4.11	6.19	4.30	3.40	2.60	16.45	7.30	5.80	4.40	22.81
GEA-2	59	Yes		4.19	4.15	4.11	6.20	4.40	3.50	2.60	16.50	7.60	6.00	4.50	23.06
GEA-3	59	No		4.16	4.13	4.10	6.18	3.80	3.10	2.40	16.20	6.50	5.30	4.10	22.13
GEA-4	102	Yes		4.17	4.14	4.11	6.19	4.10	3.30	2.50	16.35	7.00	5.60	4.20	22.55
GEA-5	102	No		4.11	4.00	4.08	6.16	2.70	2.30	1.90	15.65	4.60	3.90	3.20	20.51

For startup PM and NOx, use the GE information for startup plus 30 min of normal operation max load hourly emissions for that temperature condition.
For CO shutdown was worst case. Used 51 min of normal CO peak hourly emissions plust shutdown emission rate.

condition	emission ratios relative to 100% load										
GEA-1	0.99	0.98	1.48	1.00	0.79	0.60	3.83	1.00	0.79	0.60	3.12
GEA-2	0.99	0.98	1.48	2.00	0.80	0.59	3.75	2.00	0.79	0.59	3.03
GEA-3	0.99	0.99	1.49	3.00	0.82	0.63	4.26	3.00	0.82	0.63	3.40
GEA-4	0.99	0.99	1.48	4.00	0.80	0.61	3.99	4.00	0.80	0.60	3.22
GEA-5	0.97	0.99	1.50	5.00	0.85	0.70	5.80	5.00	0.85	0.70	4.46
max	0.99	0.99	1.50	1.00	0.85	0.70	5.80	1.00	0.85	0.70	4.46
min	0.97	0.98	1.48	1.00	0.79	0.59	3.75	1.00	0.79	0.59	3.03
avg	0.99	0.99	1.49	1.00	0.81	0.63	4.32	1.00	0.81	0.62	3.45

Rather than model each of the 20 combinations of stack and ambient temperatures and loads for each turbine load condition, a simplified yet conservative analysis was performed by modeling “worst-case” stack temperatures and flow rates over ambient temperatures for each load. The the minimum stack gas temperature and velocity and maximum emission rate across the ambient conditions were modeled for each load. Because emissions are directly related to heat input rates, the emissions used for the three load scenarios were normalized to values of 1.0, 0.85, 0.70, and 5.8 based on the relative heat input at these four loads (100%, 75%, 50% and startup).

Modeled Load Parameters

Source ID	Source Description	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Unit (lb/hr)
GE_100	GE LM6000 100% Load	767	87.0	11	1.00
GE_75	GE LM6000 75% Load	712	76.0	11	0.85
GE_50	GE LM6000 50% Load	656	67.0	11	0.70
GE_SU	GE LM6000 Startup	656	67.0	11	5.80

SRP Coolidge Turbine Load/Ambient Temp. Screening Model Input (NAD83, Zone 12)
Updated (5-27-21)

Source ID	Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Unit (lb/hr)
GE_100	GE LM6000 100% Load	453173.75	3641882.99	1444.5	85	767.0	87.0	11	1.00
GE_75	GE LM6000 75% Load	453173.75	3641882.99	1444.5	85	712.0	76.0	11	0.85
GE_50	GE LM6000 50% Load	453173.75	3641882.99	1444.5	85	656.0	67.0	11	0.70
GE_SU	GE LM6000 Startup	453173.75	3641882.99	1444.5	85	656.0	67.0	11	5.80

Load conditions are reflective of worst case (lowest) temperature and velocity and worst case emission rate (highest) for each turbine across all ambient conditions.

SRP Coolidge Model Input (NAD83, Zone 12)
Updated (7-26-21)

Source ID		Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
GE1	DEFAULT	Existing GE LM6000 Turbine 1	452862.09	3642324.87	1442.5	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE2	DEFAULT	Existing GE LM6000 Turbine 2	452888.79	3642324.58	1442.6	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE3	DEFAULT	Existing GE LM6000 Turbine 3	452915.97	3642324.44	1442.6	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE4	DEFAULT	Existing GE LM6000 Turbine 4	452942.88	3642324.44	1442.8	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE5	DEFAULT	Existing GE LM6000 Turbine 5	452969.78	3642324.58	1442.9	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE6	DEFAULT	Existing GE LM6000 Turbine 6	452996.68	3642324.30	1443.2	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE7	DEFAULT	Existing GE LM6000 Turbine 7	452861.28	3642133.99	1443.8	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE8	DEFAULT	Existing GE LM6000 Turbine 8	452888.17	3642133.99	1443.9	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE9	DEFAULT	Existing GE LM6000 Turbine 9	452915.06	3642133.99	1444.0	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE10	DEFAULT	Existing GE LM6000 Turbine 10	452942.53	3642133.99	1444.3	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE11	DEFAULT	Existing GE LM6000 Turbine 11	452968.83	3642133.99	1444.5	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE12	DEFAULT	Existing GE LM6000 Turbine 12	452995.72	3642133.41	1444.7	85.0	853.4	110.0	10.5	33.0	33.0	7.0	7.0	63.0	7.0	7.0
GE13	DEFAULT	Proposed GE LM6000 Turbine 1	453046.11	3641911.65	1446.0	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE14	DEFAULT	Proposed GE LM6000 Turbine 2	453075.57	3641911.00	1446.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE15	DEFAULT	Proposed GE LM6000 Turbine 3	453105.74	3641910.65	1446.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE16	DEFAULT	Proposed GE LM6000 Turbine 4	453135.17	3641909.87	1446.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE17	DEFAULT	Proposed GE LM6000 Turbine 5	453174.32	3641908.93	1446.7	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE18	DEFAULT	Proposed GE LM6000 Turbine 6	453203.14	3641909.50	1447.0	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE19	DEFAULT	Proposed GE LM6000 Turbine 7	453233.68	3641908.64	1447.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE20	DEFAULT	Proposed GE LM6000 Turbine 8	453263.08	3641908.35	1447.8	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE21	DEFAULT	Proposed GE LM6000 Turbine 9	453045.52	3641885.01	1446.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE22	DEFAULT	Proposed GE LM6000 Turbine 10	453074.91	3641884.14	1446.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE23	DEFAULT	Proposed GE LM6000 Turbine 11	453105.22	3641884.02	1446.4	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE24	DEFAULT	Proposed GE LM6000 Turbine 12	453134.84	3641883.57	1446.5	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE25	DEFAULT	Proposed GE LM6000 Turbine 13	453173.75	3641882.99	1446.9	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE26	DEFAULT	Proposed GE LM6000 Turbine 14	453202.85	3641882.41	1447.3	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE27	DEFAULT	Proposed GE LM6000 Turbine 15	453233.40	3641881.84	1447.7	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
GE28	DEFAULT	Proposed GE LM6000 Turbine 16	453262.90	3641881.46	1448.1	85.0	656.0	67.0	11.0	16.5	16.5	6.2	6.2	23.1	0.5	0.5
CT1_CELL1	DEFAULT	Proposed Cooling Tower	452784.29	3642198.70	1443.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL2	DEFAULT	Proposed Cooling Tower	452800.48	3642198.57	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL3	DEFAULT	Proposed Cooling Tower	452792.13	3642198.32	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL4	DEFAULT	Proposed Cooling Tower	452806.91	3642198.32	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL5	DEFAULT	Proposed Cooling Tower	452814.49	3642198.45	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT1_CELL6	DEFAULT	Proposed Cooling Tower	452821.43	3642198.06	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL1	DEFAULT	Proposed Cooling Tower	452783.87	3642181.46	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL2	DEFAULT	Proposed Cooling Tower	452791.82	3642181.27	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL3	DEFAULT	Proposed Cooling Tower	452800.49	3642181.21	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL4	DEFAULT	Proposed Cooling Tower	452806.76	3642181.08	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0

Source ID		Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (ft)	Stack Height (ft)	Temp. (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
CT2_CELL5	DEFAULT	Proposed Cooling Tower	452814.66	3642180.82	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT2_CELL6	DEFAULT	Proposed Cooling Tower	452821.64	3642180.62	1443.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL1	DEFAULT	Proposed Cooling Tower	453079.27	3642293.06	1443.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL2	DEFAULT	Proposed Cooling Tower	453092.41	3642293.25	1444.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL3	DEFAULT	Proposed Cooling Tower	453086.41	3642292.87	1443.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL4	DEFAULT	Proposed Cooling Tower	453115.32	3642292.87	1444.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL5	DEFAULT	Proposed Cooling Tower	453107.06	3642292.69	1444.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT3_CELL6	DEFAULT	Proposed Cooling Tower	453100.30	3642292.31	1444.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641883.61	1449.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641883.77	1449.5	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641883.77	1449.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641874.43	1450.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641874.18	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT4_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641874.49	1449.7	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641858.61	1449.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641858.77	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641858.77	1449.7	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641849.43	1450.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641849.18	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT5_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641849.49	1450.1	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641833.61	1449.6	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641833.77	1450.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641833.77	1449.8	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641824.43	1450.5	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641824.18	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT6_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641824.49	1450.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL1	DEFAULT	Proposed Cooling Tower	452989.35	3641808.61	1449.9	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL2	DEFAULT	Proposed Cooling Tower	453000.49	3641808.77	1450.2	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL3	DEFAULT	Proposed Cooling Tower	453012.39	3641808.77	1450.0	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL4	DEFAULT	Proposed Cooling Tower	452989.50	3641799.43	1450.6	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL5	DEFAULT	Proposed Cooling Tower	453000.64	3641799.18	1450.4	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0
CT7_CELL6	DEFAULT	Proposed Cooling Tower	453012.39	3641799.49	1450.3	43.1	89.0	7.0	13.5	0.0	0.0	3.33E-05	6.67E-03	0.0	0.0	0.0

SRP Coolidge Off-Site Source Input Data - (NAD83, Zone 12)

Model Source No.	Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation (ft)	Release Height (ft)	Horizontal Dimension - Sigma Y (ft)	Vertical Dimension - Sigma Z (ft)	Emissions (lb/hr)						
									NO2 (lb/hr)	NOx (lb/hr)	PM2.5 (lb/hr)	PM10 (lb/hr)	CO (lb/hr)	SO2 (lb/hr)	SOx (lb/hr)
71	STING	Stinger Welding	452145.00	3642683.00	1440.2	35.0	85.4	32.6	1.44E-01	1.44E-01	1.39E-01	1.39E+00	3.20E-02	8.00E-03	8.00E-03

Stinger Welding is a minor source. Short term emission rates were calculated from actual emissions from 2018-19. 2500 hr/yr operation was assumed.

Annual emissions were not provided for PM2.5. PM2.5 emissions were assumed equal to 10% of PM10 emissions based upon AP-41, Table 13.2.6-1.

Stinger Welding Volume Source Parameter Calculation

		Source Dimensions					Initial Dispersion Coefficients		
Source ID	Source Description	Length (ft)	Width (ft)	Square Root of Area (ft)	Structure Height/Vertical Dimension (ft)	Release Height (ft)	Initial Horizontal Dimension s_Y (ft)	Initial Vertical Dimension s_Z (ft)	Note
STING	Stinger Welding	600.00	225.00	367.42	70.00	35.00	85.45	32.56	Elevated source on or adjacent to building

Sigma Y values calculated as the square root of the area, or average length of side, divided by 4.3 (Table 3-1 of AERMOD Manual for Single Volume Source).

Sigma Z values for surface based sources calculated as the initial vertical dimension of source divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Sigma Z values for elevated sources on or adjacent to a building calculated as the building height divided by 2.15 (Table 3-1 of AERMOD Manual for Elevated Source on or Adjacent to Building).

Sigma Z values for elevated sources not on or adjacent to a building calculated as the initial vertical dimension of source divided by 4.3 (Table 3-1 of AERMOD Manual for Elevated Source Not on or Adjacent to Building).

Release height equal to center of volume, or 1/2 vertical dimension.

ATTACHMENT B
MODEL RESULTS

SRP Coolidge Load Analysis Results (8-10-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time		Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.26639	465264.13	3635389.44	587.87	784.3		0	17110923	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.2557	466364.13	3636089.44	593.36	784.3		0	15112321	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.25465	438372.54	3646971.38	583.36	688.35		0	14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.25134	438272.54	3650071.38	594.49	836.73		0	16012201	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_100	1ST	0.24083	438672.54	3647971.38	574.36	688.35		0	18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.22092	438472.54	3646871.38	566.28	688.35		0	14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.22074	466364.13	3636189.44	579.47	784.3		0	17061323	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21871	438472.54	3646871.38	566.28	688.35		0	15110804	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21846	438672.54	3647971.38	574.36	688.35		0	18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_50	1ST	0.21736	453800	3641900	443.74	443.74		0	16031202	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.24761	465264.13	3635489.44	584.15	784.3		0	17110923	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23826	438372.54	3646971.38	583.36	688.35		0	14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23742	438672.54	3647971.38	574.38	688.35		0	18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.23705	464964.13	3631689.44	580.38	733.94		0	15012724	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_75	1ST	0.22793	437172.54	3650371.38	588.61	836.73		0	16012201	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.83046	438472.54	3646871.38	566.28	688.35		0	14120518	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.82903	466364.13	3636189.44	579.47	784.3		0	17061323	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.81214	438472.54	3646871.38	566.28	688.35		0	15110804	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.81011	438672.54	3647971.38	574.36	688.35		0	18022106	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	1-HR	GE_SU	1ST	1.80096	453800	3641900	443.74	443.74		0	16031202	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.04146	453700	3641900	443.46	443.46		0	18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.04086	453700	3642000	443.5	443.5		0	17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.0408	453600	3642200	443.07	443.07		0	16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.03853	452679.24	3641720.18	440.45	440.45		0	14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_100	1ST	0.03675	453700	3641900	443.46	443.46		0	15070224	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03852	453600	3641900	443.08	443.08		0	18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03711	453600	3642200	443.07	443.07		0	16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03701	453700	3642000	443.5	443.5		0	17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03453	452679.24	3641720.18	440.45	440.45		0	14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_50	1ST	0.03412	453600	3641800	443.07	443.07		0	15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.04073	453600	3641900	443.08	443.08		0	18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03968	453700	3642000	443.5	443.5		0	17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03963	453600	3642200	443.07	443.07		0	16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03723	452679.24	3641720.18	440.45	440.45		0	14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_75	1ST	0.03585	453600	3641800	443.07	443.07		0	15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.31918	453600	3641900	443.08	443.08		0	18071924	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.30751	453600	3642200	443.07	443.07		0	16042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.30662	453700	3642000	443.5	443.5		0	17042524	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.28614	452679.24	3641720.18	440.45	440.45		0	14051424	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	24-HR	GE_SU	1ST	0.28269	453600	3641800	443.07	443.07		0	15062624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.15189	438272.54	3650071.38	594.49	836.73		0	16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13836	453700	3641800	443.46	443.46		0	18072612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13806	452600	3641700	440.36	440.36		0	15030612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.13752	437072.54	3650371.38	586.39	836.73		0	14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_100	1ST	0.12979	452700	3641600	440.66	440.66		0	17030215	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.13056	438272.54	3649671.38	566.65	836.73		0	16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12573	438572.54	3647271.38	560.49	688.35		0	15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12264	452700	3641700	440.51	440.51		0	18101912	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.12219	438172.54	3649571.38	565.77	836.73		0	14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_50	1ST	0.11819	452679.24	3641720.18	440.45	440.45		0	17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.1423	438272.54	3649671.38	566.65	836.73		0	16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.13397	438572.54	3647271.38	560.49	688.35		0	15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.13323	453700	3641800	443.46	443.46		0	18072612	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.12912	438172.54	3649571.38	565.77	836.73		0	14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_75	1ST	0.12514	452679.24	3641720.18	440.45	440.45		0	17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.08178	438272.54	3649671.38	566.65	836.73		0	16012203	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.04178	438572.54	3647271.38	560.49	688.35		0	15112624	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.01613	452700	3641700	440.51	440.51		0	18101912	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	3-HR	GE_SU	1ST	1.01247	438172.54	3649571.38	565.77	836.73		0	14103024	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	3-HR	GE_SU	1ST	0.97929	452679.24	3641720.18	440.45	440.45		0	17121012	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10218	453700	3641800	443.46	443.46		0	18072616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10158	452700	3641700	440.51	440.51		0	15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.10123	453600	3642200	443.07	443.07		0	16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.09668	453700	3642000	443.5	443.5		0	17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_100	1ST	0.08904	452654.27	3641720.46	440.4	440.4		0	14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.09302	452700	3641700	440.51	440.51		0	18012916	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.091	452700	3641700	440.51	440.51		0	15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.09042	453600	3642200	443.07	443.07		0	16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.08636	453700	3642000	443.5	443.5		0	17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_50	1ST	0.07762	452679.24	3641720.18	440.45	440.45		0	14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.0989	453700	3641800	443.46	443.46		0	18072616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09824	452700	3641700	440.51	440.51		0	15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09752	453600	3642200	443.07	443.07		0	16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.09326	453700	3642000	443.5	443.5		0	17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_75	1ST	0.0846	452679.24	3641720.18	440.45	440.45		0	14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.77077	452700	3641700	440.51	440.51		0	18012916	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.75403	452700	3641700	440.51	440.51		0	15030616	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.7492	453600	3642200	443.07	443.07		0	16042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.71555	453700	3642000	443.5	443.5		0	17042516	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	8-HR	GE_SU	1ST	0.64313	452679.24	3641720.18	440.45	440.45		0	14051416	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00745	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00663	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00643	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.0063	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_100	1ST	0.00624	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00683	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.0061	453600	3641900	443.08	443.08		0	1 YEARS	MET	4	4	16990

AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00596	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.0059	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_50	1ST	0.00578	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00727	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00647	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.0063	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00621	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_75	1ST	0.00611	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2017_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.0566	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2016_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.05052	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2014_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04936	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2018_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04889	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990
AERMOD 21112	Coolidge Load_2015_Unit.SUM	UNIT	ANNUAL	GE_SU	1ST	0.04788	453600	3641900	443.08	443.08	0	1 YEARS	MET	4	4	16990

SRP Coolidge Load Analysis Results (8-10-21)

Load Level	Average	Group	Rank	Conc
100%	1-HR	GE_100	1ST	0.2664
75%	1-HR	GE_75	1ST	0.2476
50%	1-HR	GE_50	1ST	0.2209
Startup	1-HR	GE_SU	1ST	**1.8305**
100%	3-HR	GE_100	1ST	0.1519
75%	3-HR	GE_75	1ST	0.1423
50%	3-HR	GE_50	1ST	0.1306
Startup	3-HR	GE_SU	1ST	**1.0818**
100%	8-HR	GE_100	1ST	0.1022
75%	8-HR	GE_75	1ST	0.0989
50%	8-HR	GE_50	1ST	0.0930
Startup	8-HR	GE_SU	1ST	**0.7708**
100%	24-HR	GE_100	1ST	0.0415
75%	24-HR	GE_75	1ST	0.0407
50%	24-HR	GE_50	1ST	0.0385
Startup	24-HR	GE_SU	1ST	**0.3192**
100%	Annual	GE_100	1ST	0.0075
75%	Annual	GE_75	1ST	0.0073
50%	Annual	GE_50	1ST	0.0068
Startup	Annual	GE_SU	1ST	**0.0566**

The Start up/Shut down condition was determined to cause the worst-case impacts for each turbine type.

SRP Coolidge Significant Impact Analysis Results (8-11-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time		Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge SIL_2014_CO.SUM	CO	1-HR	ALL	1ST	116.09323	438472.54	3646871.38	566.28	688.35		0	14120518	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	115.95658	466364.13	3636189.44	579.47	784.3		0	17061323	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	115.33147	438672.54	3647971.38	574.36	688.35		0	18022106	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_CO.SUM	CO	1-HR	ALL	1ST	115.0185	438472.54	3646871.38	566.28	688.35		0	15110804	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	108.88881	438172.54	3650071.38	570.56	836.73		0	16012201	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	45.79764	452600	3641700	440.36	440.36		0	18012916	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_CO.SUM	CO	8-HR	ALL	1ST	45.31919	452654.27	3641720.46	440.4	440.4		0	15030616	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	43.85941	453600	3642000	443.26	443.26		0	17042516	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	43.50053	453600	3642200	443.07	443.07		0	16042516	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_CO.SUM	CO	8-HR	ALL	1ST	38.25696	452604.33	3641721	440.35	440.35		0	14051416	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_NO2.SUM	NO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	71.26288	438672.54	3647971.38	574.36	688.35		0	5 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_NOX.SUM	NO2	ANNUAL	ALL	1ST	2.25251	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_NOX.SUM	NO2	ANNUAL	ALL	1ST	2.02127	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.96894	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.95513	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_NOX.SUM	NO2	ANNUAL	ALL	1ST	1.92618	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_PM10.SUM	PM10	24-HR	ALL	1ST	5.6199	453600	3641900	443.08	443.08		0	18071924	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2017_PM10.SUM	PM10	24-HR	ALL	1ST	5.18403	453600	3642000	443.26	443.26		0	17042524	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2016_PM10.SUM	PM10	24-HR	ALL	1ST	4.99847	453600	3642200	443.07	443.07		0	16042524	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2015_PM10.SUM	PM10	24-HR	ALL	1ST	4.84005	453600	3641900	443.08	443.08		0	15070224	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014_PM10.SUM	PM10	24-HR	ALL	1ST	4.78997	452629.3	3641720.73	440.37	440.37		0	14051424	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2017_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.99454	453600	3641900	443.08	443.08		0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2016_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.8918	453600	3641900	443.08	443.08		0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.87315	453600	3641900	443.08	443.08		0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.87299	453600	3641900	443.08	443.08		0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2015_PM10.SUM	PM10	ANNUAL	ALL	1ST	0.8554	453600	3641900	443.08	443.08		0	1 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_PM25.SUM	PM25	1ST-HIGHEST 24-HR	ALL	1ST	4.36657	453700	3641900	443.46	443.46		0	5 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_PM25.SUM	PM25	ANNUAL	ALL	1ST	0.84563	453600	3641900	443.08	443.08		0	5 YEARS	MET	58	1	16990
AERMOD 21112	Coolidge SIL_2014-2018_SO2.SUM	SO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	2.39942	438672.54	3647971.38	574.36	688.35		0	5 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	24-HR	ALL	1ST	0.44227	453600	3641900	443.08	443.08		0	18071924	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	24-HR	ALL	1ST	0.4054	453600	3642000	443.26	443.26		0	17042524	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	24-HR	ALL	1ST	0.39802	453600	3642200	443.07	443.07		0	16042524	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	24-HR	ALL	1ST	0.38111	453600	3641800	443.07	443.07		0	15062624	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	24-HR	ALL	1ST	0.37303	452629.3	3641720.73	440.37	440.37		0	14051424	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	3-HR	ALL	1ST	1.48812	438272.54	3649671.38	566.65	836.73		0	16012203	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	3-HR	ALL	1ST	1.42927	438572.54	3647271.38	560.49	688.35		0	15112624	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	3-HR	ALL	1ST	1.38924	438172.54	3649571.38	565.77	836.73		0	14103024	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	3-HR	ALL	1ST	1.31764	453700	3641800	443.46	443.46		0	18072612	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	3-HR	ALL	1ST	1.23016	452629.3	3641720.73	440.37	440.37		0	17121012	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2017_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.07584	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2016_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06806	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2014_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06629	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2018_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06583	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990
AERMOD 21112	Coolidge SIL_2015_SOX.SUM	SO2	ANNUAL	ALL	1ST	0.06485	453600	3641900	443.08	443.08		0	1 YEARS	MET	16	1	16990

SRP Coolidge Significant Impact Analysis Results (8-11-21)

Pollutant	Average	Source Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL	Distance to Significance (km)
NO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	71.26	7.5	950%	25
NO2	ANNUAL	ALL	1ST	2.25	1.0	225%	1.4
CO	1-HR	ALL	1ST	116.09	2000	6%	NA
CO	8-HR	ALL	1ST	45.80	500	9%	NA
PM25	1ST-HIGHEST 24-HR	ALL	1ST	4.37	1.2	364%	21.1
PM25	ANNUAL	ALL	1ST	0.85	0.2	423%	15.9
PM10	24-HR	ALL	1ST	5.62	5.0	112%	0.79
PM10	ANNUAL	ALL	1ST	0.99	1.0	99%	NA
SO2	1ST-HIGHEST MAX DAILY 1-HR	ALL	1ST	2.40	7.8	31%	NA
SO2	3-HR	ALL	1ST	1.49	25	6%	NA
SO2	24-HR	ALL	1ST	0.44	5.0	9%	NA
SO2	ANNUAL	ALL	1ST	0.08	1.0	8%	NA

ARM2 with minimum and maximum ambient ratios of 0.5 and 0.9, respectively for NOx to NO2 conversion.

The PM2.5 modeled concentration includes a secondary contribution (see attached MERPs calculation).

The area is non-attainment for PM10. However, PM10 was modeled and compared to the SILS and NAAQS.

Modeled emissions and stack parameters for existing units are from the 2008 Coolidge application. Emission rates reflect worst case startup/shut down rates.

SRP Coolidge NAAQS Analysis Results (8-11-21)

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	ALL	1ST	103.59537	438672.54	3647971.38	574.36	688.35	0	5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	SRP	1ST	103.59223	438672.54	3647971.38	574.36	688.35	0	5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_NO2.SUM	NO2	8TH-HIGHEST MAX DAILY 1-HR	STING	1ST	11.30507	452200	3642700	439.19	439.19	0	5 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.69701	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.34896	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.19732	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.13801	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	ALL	1ST	3.07895	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.69138	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.34238	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.19185	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.13245	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	SRP	1ST	3.07358	453600	3642000	443.26	443.26	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2018_NOX.SUM	NO2	ANNUAL	STING	1ST	1.27025	452200	3642700	439.19	439.19	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2017_NOX.SUM	NO2	ANNUAL	STING	1ST	1.25215	452200	3642700	439.19	439.19	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014_NOX.SUM	NO2	ANNUAL	STING	1ST	1.19651	452200	3642700	439.19	439.19	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2016_NOX.SUM	NO2	ANNUAL	STING	1ST	1.15419	452200	3642700	439.19	439.19	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2015_NOX.SUM	NO2	ANNUAL	STING	1ST	1.134	452200	3642700	439.19	439.19	0	1 YEARS	MET	29	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	ALL	6TH	41.05397	452200	3642700	439.19	439.19	0	15111324	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	SRP	6TH	4.90295	453700	3641900	443.46	443.46	0	17070324	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	24-HR	STING	6TH	40.97719	452200	3642700	439.19	439.19	0	15110724	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	ALL	1ST	13.39957	452200	3642700	439.19	439.19	0	5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	SRP	1ST	1.12668	453600	3642000	443.26	443.26	0	5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM10.SUM	PM10	ANNUAL	STING	1ST	12.88563	452200	3642700	439.19	439.19	0	5 YEARS	MET	71	3	17062
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	ALL	1ST	3.6882	453700	3641900	443.46	443.46	0	5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	SRP	1ST	3.68026	453700	3641900	443.46	443.46	0	5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	8TH-HIGHEST 24-HR	STING	1ST	3.12347	452200	3642700	439.19	439.19	0	5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	ALL	1ST	1.77668	452200	3642700	439.19	439.19	0	5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	SRP	1ST	1.12668	453600	3642000	443.26	443.26	0	5 YEARS	MET	71	3	16990
AERMOD 21112	Coolidge NAAQS_2014-2018_PM25.SUM	PM25	ANNUAL	STING	1ST	1.28856	452200	3642700	439.19	439.19	0	5 YEARS	MET	71	3	16990

SRP Coolidge NAAQS Analysis Results (8-11-21)

Pollutant	Average	Source Group	Rank	Model Conc. (ug/m3)	Background (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	%Standard	Comment
NO2	8TH-HIGHEST MAX DAILY 1-HR	ALL	1ST	103.60	20.00	123.60	188	66%	
NO2	ANNUAL	ALL	1ST	3.70	15.69	19.38	100	19%	
PM25	8TH-HIGHEST 24-HR	ALL	1ST	3.69	21.00	24.69	35	71%	24-hr secondary PM2.5 contribution < 0.01 ug/m3
PM25	8TH-HIGHEST 24-HR	SRP	1ST	3.68	21.00	24.68	35	71%	
PM25	8TH-HIGHEST 24-HR	STING	1ST	3.12	21.00	24.13	35	69%	
PM25	ANNUAL	ALL	1ST	1.78	8.10	9.88	12	82%	Annual secondary PM2.5 contribution < 0.01 ug/m3
PM25	ANNUAL	SRP	1ST	1.13	8.10	9.23	12	77%	
PM25	ANNUAL	STING	1ST	1.29	8.10	9.39	12	78%	
PM10	24-HR	ALL	6TH	41.05	96.00	137.05	150	91%	Max impact occurs inside Stinger Welding fence.
PM10	24-HR	STING	6TH	40.98	96.00	136.98	150	91%	

ARM2 with minimum and maximum ambient ratios of 0.5 and 0.9, respectively for NOx to NO2 conversion.
The PM2.5 modeled concentration includes a secondary contribution (see attached MERPs calculation).
The area is non-attainment for PM10. However, PM10 was modeled and compared to the SILS and NAAQS.
Modeled emission are from the 2008 Coolidge application and represent startup/shut down rates. Stack parameters were also obtained from the 2008 application.
NO2 background values are the 2018-19 design values from Tucson (AQS No. 4-19-1028).
PM10 bacground values were calculated from the 2017-19 monitor in Coolidge (AQS No. 4-21-3004) which demonstates attainment.
PM2.5 background values are the 2018-19 design values from Orange Grove (AQS No. 4-19-0011).
"ALL" source group represents all 28 turbines at Coolidge and nearby Stinger Welding.

MERPS Calculation

Secondary PM2.5 Calculation (Use Source 4007, Gila Co, AZ - 500 TPY, 10m Release)

Precursor	Modeled Emissions of Hypothetical Source (MER) (TPY)	Release Height of Hypothetical Source (m)	Project Emissions (TPY)	Max 24-hr Impact of Hypothetical Source (MIHS) (ug/m3)	Max Annual Impact of Hypothetical Source (MIHS) (ug/m3)	24-hr Project Impact (ug/m3)	Annual Project Impact (ug/m3)
NOx	500	10	141.50	0.011	0.001	0.003	0.0003
SO2	500	10	4.70	0.035	0.002	0.000	0.0000
					Total	**0.003**	**0.0003**

Project Impact = max impact hypothetical source divided by emissions of hypo source multiplied by the project emissions

Example 24hr NOx:

0.011 ug/m3 divided by 500 TPY times 141.5 TPY = 0.003 ug/m3

Ozone Impact Calculation (Use Source 4007, Gila Co, AZ - 500 TPY, 10m Release)

Precursor	Modeled Emissions of Hypothetical Source (MER) (TPY)	Release Height of Hypothetical Source (m)	Project Emissions (TPY)	Max 8-hr Impact of Hypothetical Source (MIHS) (ppb)	Calculated 8-hr Project Impact (ppb)	
NOx	500	10	141.5	1.226	0.35	
VOC	500	10	50.2	0.025	0.003	
				Total	**0.35**	Ozone SIL = 1.0 ppb

Project Impact = max impact hypothetical source divided by emissions of hypo source multiplied by the project emissions

Example 8hr NOx:

1.226 ppb divided by 500 TPY times 141.5 TPY = 0.35 ppb

REFERENCES

1. Guideline on Air Quality Models, Appendix W of 40 CFR Part 51, U.S. Environmental Protection Agency, 2017).

2 . Air Dispersion Modeling Guidelines for Arizona Air Quality Permits, Air Quality Permit Section, Arizona Department of Environmental Quality, November 1, 2019.

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

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. Ambient Monitoring Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, EPA, May 1987.

6. Monitoring Guidelines at p. 9.

7. United States Census Bureau, population in 2019 was 462,789. https://www.census.gov/quickfacts/fact/table/pinalcountyarizona/PST045219.

Pinal County, population in 2020 was 425,264. https://www.pinalcountyaz.gov/News/Pages/Article.aspx?myID=1632
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8. U.S. EPA, DRAFT Guidance for Ozone and Fine Particulate Matter Permit Modeling, February 10, 2020.