SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Draft Staff Report
Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities

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EXECUTIVE SUMMARY

South Coast Air Quality Management District (South Coast AQMD) Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (Rule 1135), is an industry-specific rule which applies to electric generating units (i.e. boilers, turbines, engines, etc.) at investor-owned electric utilities, at publicly owned electric utilities, or which have a generation capacity of at least 50 Megawatts of electrical power for distribution in the state or local electrical grid system.

During the 2022 amendment of Rule 1135, stakeholders urged staff to conduct a Best Available Retrofit Control Technology (BARCT) analysis of electric generating units located on Santa Catalina Island emphasizing zero-emission (ZE) technologies. In response to stakeholder comments, staff performed a BARCT analysis with a focus on ZE and near-zero emission technologies to repower Santa Catalina Island.

Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (PAR 1135) will establish oxides of nitrogen (NOx) emission limits for electric generating units located on Santa Catalina Island. PAR 1135 includes monitoring, reporting, and recordkeeping requirements for electric generating units located on Santa Catalina Island. One electricity generating facility with a total of 29 electric generating units is affected by PAR 1135.

The proposed final NOx limit of 6 tpy can be achieved using a combination of Tier 4 Final diesel engines, Santa Catalina Island Near-Zero Emission (NZE) electric generating units, and Santa Catalina Island Zero-Emission (ZE) electric generating units. Staff assumed a combination of 30% ZE, 50% NZE, and 20% diesel internal combustion engines for the purposes of the cost-effectiveness analysis. The proposed final NOx emission limit is estimated to reduce NOx emissions at the electricity generation facility located on Santa Catalina Island by 65.3 tons per year, or 0.18 tons per day. PAR 1135 will partially implement Control Measure for Large Combustion Sources, L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities, of the 2022 Air Quality Management Plan (2022 AQMP).[1]

PAR 1135 was developed through a public process. Six Working Group meetings were held on May 5, 2022, August 4, 2022, November 8, 2022, January 19, 2023, March 27, 2024, and June 13, 2024. Staff also reported on the progress of the BARCT assessment to the South Coast Air Quality Management District Stationary Source Committee on August 19, 2022. In addition, Public Workshops were held on February 22, 2023, and on July 31, 2024. Staff also conducted multiple site visits as part of this rule development process and has met numerous times with facility operators, technology vendors, and interested stakeholders.

[1] South Coast AQMD, 2022 AQMP, http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16

CHAPTER 1: BACKGROUND

INTRODUCTION

Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (PAR 1135) applies to electric generating units at electricity generating facilities that are investor-owned electric utilities, at publicly owned electric utilities, or which have a generation capacity of at least 50 Megawatts (MW) of electrical power for distribution in the state or local electrical grid system. PAR 1135 is needed to update oxides of nitrogen (NOx) emission limits for electricity generating facilities located on Santa Catalina Island to reflect Best Available Retrofit Control Technology (BARCT).

BACKGROUND

The 2022 amendment of South Coast Air Quality Management District (South Coast AQMD) Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (Rule 1135) included a revision to the averaging time for diesel internal combustion engines located on Santa Catalina Island to demonstrate compliance with emission limits. Stakeholders commented that an updated BARCT assessment was warranted due to the change in averaging time and that the BARCT assessment should emphasize zero-emission (ZE) technologies. The adopted resolution directed staff to re-initiate rule development in 2022 that included a revised BARCT assessment for the electric generating units located on Santa Catalina Island with a specific focus on non-diesel alternatives and ZE and near-zero emission (NZE) technologies.

In December 2022, the South Coast AQMD adopted the 2022 Air Quality Management Plan (2022 AQMP)[1] which includes a series of control measures to achieve the 2015 8-hour ozone National Ambient Air Quality Standard. Control Measure for Large Combustion Sources, L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities, of the 2022 AQMP focuses on assessing low NOx and ZE technologies for power generation, and specifically mentions the replacement of existing diesel internal combustion engines with lower-emitting technologies.

REGULATORY BACKGROUND

After a series of NOx rules for utility boilers were adopted in the 1970s, South Coast AQMD Rule 1135.1 – Controlling Emissions of Oxides of Nitrogen from Electric Power Generating Equipment[2] (Rule 1135.1) was adopted in 1980. Rule 1135.1applied to electric utilities with generating system capacity over 500 MW and required the use of least NOx dispatch to minimize NOx emissions. In 1982, the California Superior Court entered a judgment vacating Rule 1135.1, as the result of a lawsuit seeking to rescind Rule 1135.1. The judgement specified a decreasing annual NOx emissions cap until 1990 when a final NOx emissions cap was established.

Rule 1135 was adopted in 1989 and applied to electric power generating steam boiler systems, repowered units, and alternative electricity generating sources. A NOx system-wide average emission limit and a daily NOx emissions cap was established for each utility system. Additionally, Rule 1135 required Emission Control Plans and continuous emissions monitoring systems (CEMS).

Rule 1135 was amended in December 1990 to resolve implementation and enforceability issues raised by the California Air Resources Board (CARB). This amendment included accelerated

[1] South Coast AQMD, 2022 Air Quality Management Plan, http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16

[2] South Coast AQMD, Rule 1135.1, http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1135-1.pdf?sfvrsn=4

retrofit dates for emission controls, unit-by-unit emission limits, modified compliance plan and monitoring requirements, computerized telemetering, and an amended definition of alternative resources. Rule 1135 was amended again in July 1991 to address additional staff recommendations regarding system-wide emission rates, daily emission caps, annual emission caps, oil burning, and cogeneration, along with outstanding issues related to modeling and BARCT analysis. The United States Environmental Protection Agency (U.S. EPA) approved Rule 1135 into the State Implementation Plan on August 11, 1998.

When the REgional Clean Air Incentives Market (RECLAIM) program was adopted in 1993, electricity generating facilities were included in NOx RECLAIM with the exception of electricity generating facilities that were owned and operated by the City of Burbank, City of Glendale, and the City of Pasadena that were allowed to opt-in to the program. The cities of Burbank and Pasadena opted in to RECLAIM, while the City of Glendale remained regulated by command-and-control rules. In response to an increased demand for power generation and delayed installation of controls by electricity generating facilities, in May 2001, the South Coast AQMD Governing Board adopted South Coast AQMD Rule 2009 – Compliance Plan for Power Producing Facilities (Rule 2009),[3] which required installation of BARCT through compliance plans at electricity generating facilities. As a result, much of the equipment at electricity generating facilities was retrofitted or replaced to meet lower NOx emission limits. Diesel internal combustion engines providing power to Santa Catalina Island were not subject to Rule 2009 because the facility did not qualify as a Power Producing Facility because its capacity was less than 50 MW.

In 2018, Rule 1135 was amended to establish BARCT NOx limits which are needed to transition electric generating facilities in the RECLAIM program to a command-and-control regulatory structure and to implement Control Measure CMB-05: Further NOx Reductions from RECLAIM Assessment of the 2016 Air Quality Management Plan (2016 AQMP)[4] and Assembly Bill 617. The 2018 amendment expanded Rule 1135 applicability to all electric generating units at RECLAIM NOx, former RECLAIM NOx, and non-RECLAIM NOx electricity generating facilities. The amendment updated emission limits to reflect current BARCT levels and to provide implementation timeframes for boilers, gas turbines, and internal combustion engines located on Santa Catalina Island. Additionally, the amendment established provisions for monitoring, reporting, and recordkeeping, and exemptions from specific provisions.

Rule 1135 was amended on January 7, 2022, to remove ammonia limits, update provisions for Continuous Emission Monitoring Systems, reference South Coast AQMD Rule 429.2 – Startup and Shutdown Exemption Provisions for Oxides of Nitrogen From Electricity Generating Facilities[5] for startup and shutdown requirements, and revise requirements for diesel internal combustion engines on Santa Catalina Island. Staff was directed to re-initiate rule development to include a revised BARCT assessment for the electric generating units located on Santa Catalina Island with a specific focus on non-diesel alternatives and ZE and NZE technologies.

[3] South Coast AQMD, Rule 2009, http://www.aqmd.gov/docs/default-source/rule-book/reg-xx/rule-2009-compliance-plan-for-power-producing-facilities.pdf?sfvrsn=4

[4] South Coast AQMD, 2016 AQMP, www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15

[5] South Coast AQMD, Rule 429.2, http://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-429-2.pdf?sfvrsn=9

AFFECTED FACILITIES AND EQUIPMENT

The proposed amendments to Rule 1135 impacts one electricity generating facility located on Santa Catalina Island. The electricity generating facility on Santa Catalina Island currently operates six diesel internal combustion engines and 23 microturbines to generate power. Over 90 percent of the power generated at the electricity generating facility on Santa Catalina Island is from diesel internal combustion engines. The diesel internal combustion engines on Santa Catalina Island produce approximately 10 to 70 times more NOx than other electric generating units subject to Rule 1135. The electricity generating facility on Santa Catalina Island produces more than 10 percent of the NOx emissions from all electricity generating facilities in South Coast AQMD while providing less than 0.06% of the power[6]. **Table 1-1** contains the equipment affected by PAR 1135.

Table 1-1: PAR 1135 Affected Equipment

Equipment Type	Rating (MW)	Construction Year	NOx Emissions[7]
Diesel Engine Unit 7	1	1958	97 ppmv (15% O_2, dry)
Diesel Engine Unit 8	1.5	1964	97 ppmv (15% O_2, dry)
Diesel Engine Unit 10	1.125	1968	140 ppmv (15% O_2, dry)
Diesel Engine Unit 12	1.5	1976	82 ppmv (15% O_2, dry)
Diesel Engine Unit 14	1.4	1985	103 ppmv (15% O_2, dry)
Diesel Engine Unit 15	2.8	1995	51 ppmv (15% O_2, dry)
Microturbines (23 units)	1.49	2011	0.07 lb/MW-hr

PUBLIC PROCESS

Development of PAR 1135 was conducted through a public process. Six Working Group meetings were held on May 5, 2022, August 4, 2022, November 8, 2022, January 19, 2023, March 27, 2024, and June 13, 2024. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purpose of the Working Group meetings is to discuss proposed concepts and work through the details of South Coast AQMD's proposal. Staff also reported on the progress of the BARCT assessment to the South Coast AQMD Stationary Source Committee on August 19, 2022. Additionally, Public Workshops were held on February 22, 2023 and on July 31, 2024. The purpose of the Public Workshops is to present the proposed rule language to the general public and stakeholders and to solicit comment. Staff also conducted multiple site visits as part of this rule development process and has met with individual facility operators, technology vendors, and interested stakeholders.

[6] Based on the Final Staff Report for the 2018 amendment to Rule 1135 (9 MWh/15,904 MWh and 0.2 tpd/1.9 tpd)

[7] NOx emissions for diesel engines calculated by using the uncontrolled NOx emissions and control efficiency specified in Southern California Edison's Best Available Control Technology and Alternative Analysis for Pebbly Beach Generating Station (Version 00; Revised April 30, 2021) and NOx emissions for microturbines reflect the emission standard in the California Air Resources Board Distributed Generation Certification Regulation

CHAPTER 2: BARCT ASSESSMENT

INTRODUCTION

South Coast Air Quality Management District (South Coast AQMD) conducted an assessment of Best Available Retrofit Control Technology (BARCT) for electric generating units located on Santa Catalina Island. Staff will reevaluate BARCT for the remaining electricity generating facilities in the future to fully implement Control Measure for Large Combustion Sources, L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities, from the 2022 Air Quality Management Plan (2022 AQMP).[1]

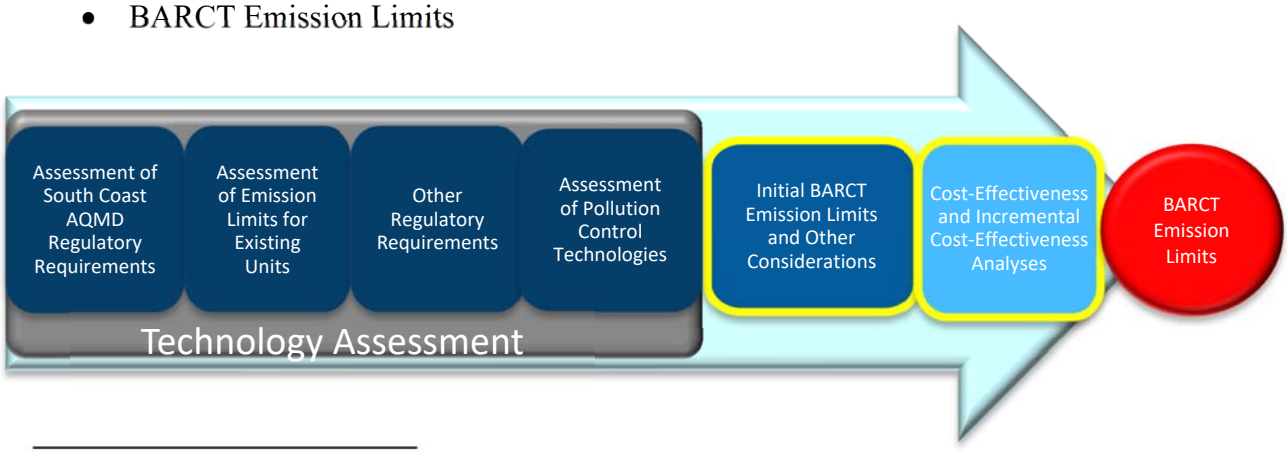
BARCT is defined in the Health and Safety Code Section 40406 as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." Consistent with state law, BARCT emission limits take into consideration environmental impacts, energy impacts, and economic impacts. In addition to oxides of nitrogen (NOx) reductions sought in the proposed amended rule, staff identified potential environmental and energy effects of the proposed rule through the California Environmental Quality Act (CEQA) process. Economic impacts are assessed at the equipment category level by a review of cost-effectiveness and incremental cost-effectives contained in this report and at the macro level as part of the socioeconomic impact assessment contained in a separate report.

BARCT ANALYSIS APPROACH

The BARCT analysis approach follows a series of steps conducted for each equipment category and fuel type. For Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (PAR 1135), internal combustion engines, fuel cells, linear generators, solar photovoltaic (PV) cells, and tidal and current energy harvesting systems were analyzed.

The steps for BARCT analysis consist of:

- Assessment of South Coast AQMD Regulatory Requirements
- Assessment of Emissions Limits for Existing Units
- Other Regulatory Requirements
- Assessment of Pollution Control Technologies
- Initial BARCT Emission Limits and Other Considerations
- Cost-Effectiveness and Incremental Cost-Effectiveness Analyses
- BARCT Emission Limits



[1] South Coast AQMD, 2022 Air Quality Management Plan, http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16

Assessment of South Coast AQMD Regulatory Requirements

As part of the BARCT assessment, staff reviewed existing South Coast AQMD regulatory requirements that affect NOx emissions for electric generating units located on Santa Catalina Island. NOx emissions from electric generating units located on Santa Catalina Island are regulated under South Coast AQMD Rule 1135 – Emissions of Oxides of Nitrogen from Electric Power Generating Systems (Rule 1135) and Regulation XX – Regional Clean Air Incentives Market (RECLAIM) (Regulation XX).

The RECLAIM program limits NOx emissions from electricity generating facilities, but does not limit emissions or establish concentration limits by equipment category or fuel type. However, emissions limits are established at the time of permitting, and permits may include concentration limits for NOx and emissions limits for non-RECLAIM pollutants such as particulate matter. A facility's NOx allocations are diminished over time, requiring facilities to lower emissions or to purchase credits from other facilities that have lowered emissions below their allocations.

Rule 1135 established interim NOx emission limits for the electricity generating facility located on Santa Catalina Island, which includes a 50 tons per year NOx limit by January 1, 2024 and 45 tons per year NOx limit by January 1, 2025 from all electric generating units. Rule 1135 established a 13 ton per year final NOx limit from all electric generating units located on Santa Catalina Island on and after January 1, 2026, with an option for a three-year extension. Rule 1135 also requires new diesel combustion engines located on Santa Catalina Island to meet a 45 parts per million by volume (ppmv) NOx limit at 15% oxygen on a dry basis.

Assessment of Emission Limits for Existing Units

Staff examined the current electric generating units located on Santa Catalina Island to assess emission limits. Permit limits for NOx were identified for all equipment to identify what is already being done in practice.

Six prime power diesel internal combustion engines are located on Santa Catalina Island. Five of these engines were installed more than 39 years ago and one was installed 29 years ago. All units are controlled with selective catalytic reduction. In 2003, the higher emitting units were retrofitted, while the lowest emitting unit was a new installation in 1995. The lowest permitted NOx limit for a diesel engine used for electricity generation in South Coast AQMD is 51 ppmv at 15% oxygen on a dry basis. The details of the diesel internal combustion engines subject to PAR 1135 are listed below in **Table 2-1** below. The NOx permit limit of 6.5 pounds per Megawatt hour (lbs/MW-hr) for the diesel internal combustion engines located on Santa Catalina Island is roughly 100 times higher than the California Air Resources Board (CARB) distributed generation emission standard for NOx at 0.07 lbs/MW-hr required for newly installed electric generating units.[2] PAR 1135's proposed definition of Santa Catalina Island near-zero emission (NZE) electric generating unit is based on CARB's distributed generation emission standard for NOx, which is equivalent to approximately 2.5 ppmv NOx at 15% oxygen on a dry basis.

The electricity generating facility located on Santa Catalina Island also operates 23 propane fired microturbines to supplement the six prime power diesel internal combustion engines. The

[2] CARB, Final Regulation Order – Establish a Distributed Generation Certification Program, https://ww2.arb.ca.gov/sites/default/files/barcu/regact/dg01/finreg.pdf?_ga=2.89974301.708521970.1675193247-969541522.1644423250

microturbines have registrations pursuant to Rule 222 – Filing Requirements for Specific Emission Sources Not Requiring a Written Permit Pursuant to Regulation II. The microturbine registration operating parameters specify that each gas turbine shall be certified with the State of California at the date of manufacture. The California Air Resources Board Distributed Generation Certification Regulation specifies a NOx emission limit of 0.07 lb/MW-hr.

Table 2-1: Prime Diesel Internal Combustion Engines at the Electricity Generating Facility Located on Santa Catalina Island

Unit	Size (HP)	Output (MW)	Install Year	Retrofit Date	Control^	NOx Permit Limit+
10	1575	1.125	1968	2003	SCR	6.5 lbs/Megawatt-hour (MW-hr)~
14	1950	1.4	1985	2003	SCR	6.5 lbs/MW-hr~
8	2150	1.5	1964	2003	SCR	6.5 lbs/MW-hr~
7	1500	1	1958	2003	SCR	6.5 lbs/MW-hr~
12	2200	1.5	1976	2003	SCR	6.5 lbs/MW-hr~
15	3900	2.8	1995	None	SCR	51 ppmv at 15% O_2, dry; 6.5 lbs/MW-hr~

+ Actual NOx concentrations emitted are generally lower than the NOx permit limits
~ Averaged over one calendar year, limit is based on total mass NOx emitted from Units 1 – 6 and microturbines
^ SCR: Selective Catalytic Reduction

The baseline emissions from the six prime power diesel internal combustion engines located on Santa Catalina Island were determined to be 71.3 tons of NOx per year based on Annual Emission Report (AER) data.[3] Emissions from microturbines located on Santa Catalina were not included in the baseline emissions calculation because the current definition of electric generating unit in Rule 1135 does not include microturbines.

Other Regulatory Requirements

As part of the BARCT assessment, staff examined NOx limits for diesel internal combustion engines promulgated by Bay Area Air Quality Management District (BAAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), and San Joaquin Valley Air Pollution Control District (SJVAPCD). **Table 2-2** below notes the NOx limits in the three air districts. The applicable equipment sizes differ by regulation.

[3] Staff established baseline emissions for the electricity generating facility located on Santa Catalina Island by determining the average of emissions from prime power diesel internal combustion engines listed in the AERs for the reporting years of 2017, 2019, and 2021. The AER data for the 2018 reporting year was not available and the AER data or 2020 was not representative due to the COVID-19 pandemic, and therefore were not included.

Table 2-2: Other Air District Emission Standards for Diesel Internal Combustion Engines

Air District	Rule Number	Rule Adoption Date	NOx Limit
BAAQMD	Regulation 9, Rule 8	July 25, 2007	110 ppmv at 15% oxygen
SMAQMD	Rule 412	June 1, 1995	80 ppmv at 15% oxygen
SJVAPCD	Rule 4702	August 18, 2021	U.S. EPA Tier 4[+] or meet certified compression-ignition engine standard[~]

[+] Applies to non-certified compression-ignited engines installed on or before January 1, 2015 (greater than 750 brake horsepower and less than 1,000 annual operating hours) and United States Environmental Protection Agency (U.S. EPA)-certified Tier 1 or Tier 2 compression-ignited engines

[~] Applies to U.S. EPA-certified Tier 3 or Tier 4 compression ignition engines

Assessment of Pollution Control Technologies

As part of the BARCT assessment, staff conducted a technology assessment to evaluate NOx pollution control technologies for electric generating units located on Santa Catalina Island. Staff reviewed scientific literature, vendor information, and strategies utilized in practice. The technologies are presented below and the applicability for use with various electric generating units is noted.

Fuel Cells

A fuel cell is a device capable of producing electrical energy from chemical reactions through the conversion of a fuel, such as hydrogen or propane, and an oxidizing agent, such as oxygen, into electricity. A fuel cell works similarly to a battery and is comprised of two electrodes, an anode and a cathode, surrounding an electrolyte membrane (**Figure 2-1**). A fuel such as hydrogen or propane is supplied to the anode and oxygen enters the cathode. The porous electrolyte membrane only allows positively charged protons to pass through to the cathode. Negatively charged electrons that cannot pass through the electrolyte membrane flow through an external circuit to generate an electric current. Oxygen, protons, and unused electrons combine in the catalytic cathode to produce water and heat as a byproduct of waste.

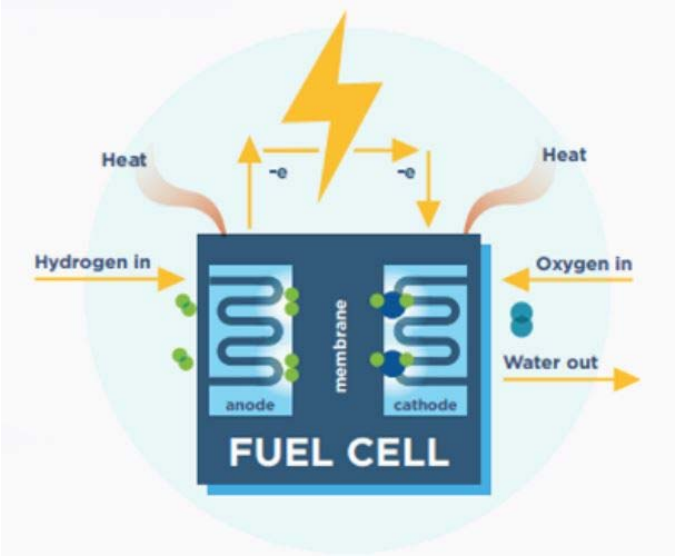


Figure 2-1: Typical Components of a Hydrogen Fuel Cell[4]

Fuel cells are two to three times more efficient than internal combustion engines and provide the flexibility to operate utilizing a variety of fuels such as hydrogen, propane, and biogas. The products of a hydrogen fuel cell are electricity, water, and heat. Alternately, propane fuel cells are expected to produce less than 2.5 ppmv of NOx emissions.[5] Fuel cells can also be combined to form a fuel cell stack in series to yield a higher voltage or in parallel for a higher current and are complementary to other energy technologies such as batteries, solar panels, and wind turbines.

Internal Combustion Engines

Internal combustion engines work by releasing energy through the combustion of a fuel and air mixture. Gasoline or diesel are most commonly used but renewable fuels such as natural gas, propane, or biodiesel may also be utilized. An internal combustion engine consists of two components working together, a fixed cylinder and a piston. Expanding combustion gases within the engine pushes the piston, which in turn rotates the crankshaft. This high-speed motion generates an electric current.

Non-road diesel internal combustion engines contribute considerably to air pollution. To improve air quality, the U.S. EPA developed Tier 4 emission standards for nonroad diesel internal combustion engines to reduce harmful emissions. Replacement with a U.S. EPA Tier 4 Final diesel engine is expected to produce less than 45 ppmv NOx. Replacement with a propane internal combustion engine is expected to produce less than 11 ppmv NOx. Staff also discussed with stakeholders the possibility of propane internal combustion engines meeting a 2.5 ppmv NOx limit with add-on control equipment. However, staff has not received further information regarding this control option.

[4] Fuel Cell & Hydrogen Energy Association, Fuel Cell Basics, https://www.fchea.org/fuelcells

[5] Combined Heath and Power Partnership, Catalog of CHP Technologies, Section 6. Technology Characterization – Fuel Cells, https://www.epa.gov/sites/default/files/2015-07/documents/catalog_of_chp_technologies_section_6._technology_characterization_-_fuel_cells.pdf

Linear Generators

A linear generator works to directly convert linear motion into electricity by compressing a mixture of fuel and air in a center reaction zone. The compression of fuel and air creates a chemical reaction that drives magnets through copper coils in a linear motion. Energy is created from the magnets attached to oscillators, which interact with the copper coils during linear motion to generate electricity (**Figure 2-2)**.

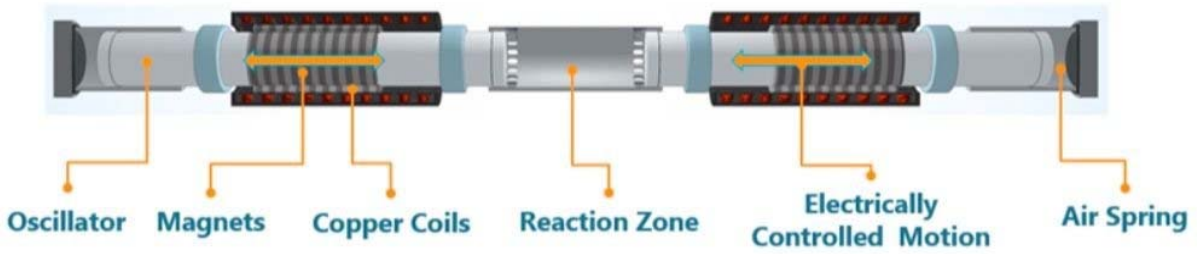


Figure 2-2: Components of a Linear Generator[6]

Linear generators maintain reaction temperatures below levels at which NOx forms, resulting in NZE. Further, linear generators do not require add-on control technologies such as selective catalytic reduction to control NOx emissions and have lower start-up emissions since it is not dependent on a catalyst to reach a destruction temperature. In addition, linear generators utilize a parametric monitoring system to maintain proper combustion to meet energy demands. The parametric monitoring system works by monitoring air and fuel flow to ensure proper air-to-fuel ratio is achieved, which also ensures emissions are under control. Lastly, linear generators also provide the flexibility to operate utilizing various fuels including hydrogen and propane.

Solar Photovoltaic Cells

Solar PV cells generate zero-emission (ZE) electricity by absorbing sunlight and utilizing light energy to create an electrical current. Light consists of photons vibrating at a range of wavelengths, and the wavelengths can be captured by a solar PV cell. Solar PV cells are made of a semiconductor material, typically silicon, that is treated in a way that allows it to interact with photons from sunlight. Sunlight energy absorbed by solar PV cells causes electrons to flow through two layers of silicon to create an electric field (**Figure 2-3**). The electric field forces loosened electrons to flow through in one direction, generating an electric current. Metal plates on each side of the solar PV cell collect those electrons and transfer them to wires where electrons then flow as electricity. Solar PV cells are wired together and installed on top of a substrate such as metal or glass to create solar panels, which are then installed collectively as a group to form a solar power system.

[6] Greentech Media, "Mainspring Energy Lands $150M Deal to Deploy its Linear Generators with NextEra," https://www.greentechmedia.com/articles/read/mainspring-energys-linear-generators-to-roll-out-through-150m-deal-with-nextera

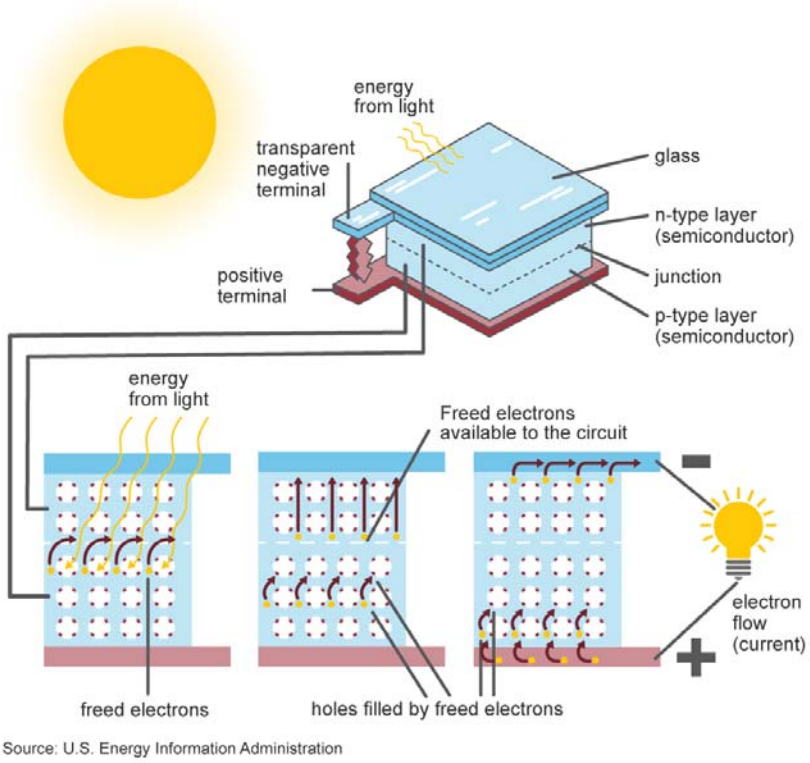


Figure 2-3: Inside a Solar PV Cell[7]

Solar PV cells can supply power through different systems. Through an on-grid system, excess power is produced by solar panels fed to the local utility grid, which can supply power that solar panels are not producing (e.g. at night). Off-grid systems contain solar panels that charge batteries, where electricity is drawn. A hybrid system consists of solar panels connected to the grid and a battery backup to store excess power.

Tidal and Current Energy Harvesting Systems

Tidal and current energy harvesting systems are a renewable ZE technology that generate electricity from tidal streams and ocean currents (**Figure 2-4**). Tidal and current energy harvesting systems generate power by the wing utilizing the hydrodynamic lift force created by the underwater current and the turbine being pulled through the water at a water flow higher than the stream speed. The turbine shaft turns the generator which outputs electricity to the grid via a power cable.

[7] United States Energy Information Administration, Photovoltaics and Electricity, https://www.eia.gov/energyexplained/solar/photovoltaics-and-electricity.php#:~:text=The%20U.S.%20Energy%20Information%20Administration%20%28EIA%29%20estimates%20that,2020%2C%20up%20from%2011%20billion%20kWh%20in%202014

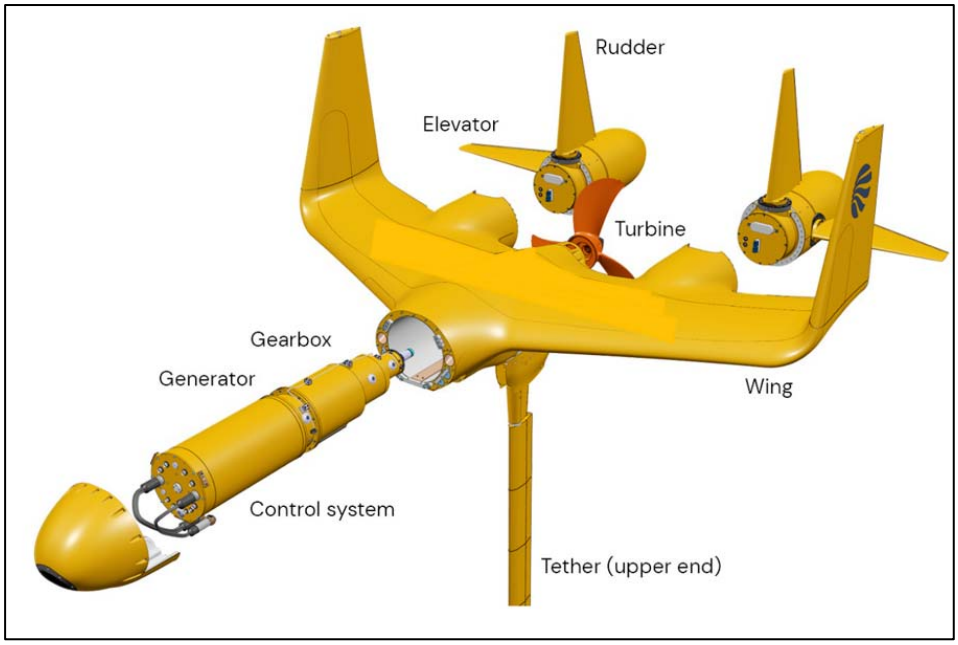


Figure 2-4: Tidal and Current Energy Harvesting System

Senate Bill (SB) 605 (Padilla, Chapter 405, Statutes of 2023) requires the California Energy Commission, in consultation with other state agencies, to evaluate the technological and economic feasibility of deploying wave and tidal energy[8]. Other requirements of SB 605 include identifying suitable sea space for wave and tidal energy projects and identifying monitoring strategies to evaluate impacts to marine and tidal ecosystems.

Other Technologies

Staff also screened other technologies including wind turbines and undersea cables. While staff found technological limitations in this particular case, it is possible in the future that technological advances could overcome the hurdles staff identified.

Initial BARCT Emission Limit and Other Considerations

Staff considered specific repower parameters for the electricity generating facility on Santa Catalina Island throughout the technology assessment process, including electricity demand, space limitations, and fuel storage. Furthermore, challenges for the deployment of ZE and/or NZE technologies were taken into consideration when establishing the BARCT NOx mass emission limit.

Electricity Demand

The electricity generating facility on Santa Catalina Island historically produces approximately 29,000 MW-hr per year of power. The average hourly load is approximately 3.3 Megawatts (MW). In September 2022, the electricity generating facility located on Santa Catalina Island reached a new peak load of 6.3 MW during a heat wave. The historical annual power generation and new peak load was used to determine feasible repower scenarios to establish BARCT.

[8] https://legiscan.com/CA/text/SB605/id/2844364

Space Limitations

A significant challenge for installing ZE and/or NZE technologies at the electricity generating facility located on Santa Catalina Island is limited space (**Figure 2-5**). The estimated available onsite space for ZE and/or NZE technologies is less than 5,000 square feet. The electricity generating facility located on Santa Catalina Island also provides water and gas service, which limits the equipment that could be removed and replaced with ZE and/or NZE equipment on the existing facility footprint. The BARCT analysis assumed that three of the six existing diesel engines that will not be replaced with Tier 4 Final diesel engines and all existing microturbines could be removed to install ZE and/or NZE technologies for power generation (see areas marked in red in **(Figure 2-5)**.

Figure 2-5: Land Availability at the Electricity Generating Facility Located on Santa Catalina Island

A – Microturbine platform
B – Diesel internal combustion engines

Staff analyzed the number of ZE and NZE units that could fit in the existing facility footprint (**Table 2-3**)[9]. Initially, staff anticipated that eight linear generators could fit on the microturbine pad. However, the electricity generating facility on Santa Catalina Island stated that the microturbine pad (location A in Figure 2-5) could likely only accommodate five linear generators due to required ancillary equipment. Staff repeatedly requested information from the electric generating facility located on Santa Catalina Island regarding the number of NZE units that could fit in location B in Figure 2-5, when considering ancillary equipment needed. The electricity generating facility located on Santa Catalina Island stated that they had not analyzed how many NZE units could fit at location B because six diesel engines are necessary to meet electricity demand. Therefore, the estimated number of ZE or NZE units in Table 2-3 does not account for potential ancillary equipment needed, except for linear generators located on the microturbine pad. The electric generating facility located on Santa Catalina Island has since stated plans to install NZE units at location B.

Table 2-3: Estimated Number of ZE or NZE Units Possible in Available Onsite Space

ZE or NZE Technology	Number of Units in Available Onsite Space	Electric Power Output (MW)
Propane Linear Generators	11	2.75
Hydrogen Linear Generators	11	2.75
Propane Fuel Cells	13	5.7
Hydrogen Fuel Cells	4	4

Staff also evaluated the possibility of land acquisition outside of the existing facility footprint to install ZE and/or NZE technologies. Additional land procurement would be necessary for solar PV cells to provide a significant contribution of power generation to Santa Catalina Island. However, land availability on Santa Catalina Island for solar PV cells is limited, as most open land on the island is mountainous and solar energy production is optimal on flat pieces of land. A potential site on Santa Catalina for the installation of solar PV cells, or other ZE and/or NZE technologies, is Middle Ranch (**Figure 2-6**). Middle Ranch is approximately 15 acres, which can accommodate solar PV installations that could provide approximately 30% of historical power generation needed for Santa Catalina Island. Complications in the permitting process and land use plans with external agencies may generate substantial obstacles for the acquisition of additional land. The current land use plan restricts energy facilities from being established on most areas of Santa Catalina Island, including the Middle Ranch site. Modifications to the Santa Catalina Island land use plan would require the revision of existing regulations with external agencies, which could take multiple years.

[9] Staff's analysis assumed that ZE and/or NZE technologies were not stacked, however, some vendors stated that their technology has the capability of being stacked.

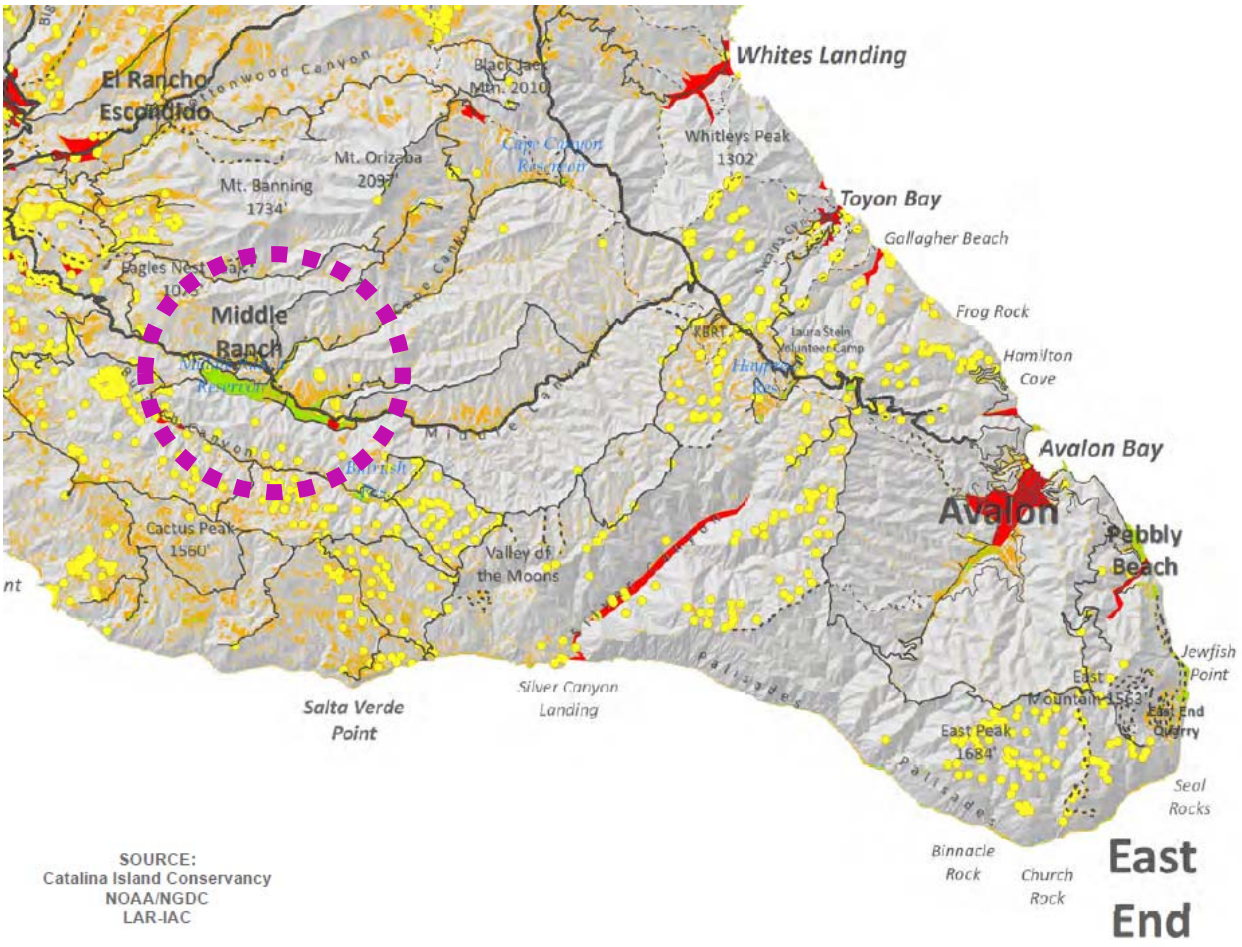


Figure 2-6: Middle Ranch area of Santa Catalina Island[10]

Fuel Storage

Santa Catalina Island does not have fueling infrastructure on the island; all fuel must be brought in by barges. All repower scenarios for the electricity generating facility located on Santa Catalina Island include three diesel internal combustion engines for redundancy because the site already has 30-days of diesel fuel storage. The repower scenarios assume at least 5% power generation (MW-hr per year) from diesel engines in the event that the barge is not running, and fuel cannot be delivered. Staff analyzed fuel deliveries from 2017 to 2021 to Santa Catalina Island and found that the longest time lapse between fuel deliveries was five days and that the barge did not run for a maximum of 14 days in a calendar year (approximately 4% of a calendar year). Staff assumed at least 5% power generation (MW-hr per year) from diesel engines to be conservative. The BARCT analysis assumes that three of the existing diesel engines would be replaced with U.S. EPA Tier 4 Final diesel engines.

Constructing additional fuel storage beyond the existing 30-day supply for diesel and propane storage tanks is limited on the existing facility footprint. If ZE technologies fueled by hydrogen were to be utilized, the electricity generating facility located on Santa Catalina Island would most likely need to expand its existing footprint to accommodate ancillary fuel storage facilities.

[10] Catalina Island Conservancy, GIS Work for Large Solar Project on Island, Accessed: July 21, 2022

Potential land for additional fuel storage was identified at a location adjacent to the electricity generating facility, but outside of the existing facility footprint. After an initial discussion with the landowning company, several unsuccessful attempts for further discussions led staff to determine that acquisition of the land could not be relied upon for the purposes of establishing a BARCT limit.

There are four 30,000-gallon propane storage tanks located at the electricity generating facility located on Santa Catalina Island. However, only three of the propane storage tanks are currently in service due to fire suppression requirements needed to bring the fourth propane storage tank online. Additional water storage for fire suppression is needed to operate the fourth propane storage tank.

Storage tank capacity can fluctuate throughout the year based on seasonal utility demand and gas expansion as temperature rises. Staff requested information from the electricity generating facility located on Santa Catalina Island regarding ambient temperature and daily propane tank percent fill from 2019 to 2023. Based on the data provided, staff found that there was no correlation between temperature and propane tank fill ($R^2 < 0.009$).

The electric generating facility located on Santa Catalina Island stated that a minimum fuel reserve of 25 percent storage tank capacity is required at all times[11]. The average capacity of the propane tanks is 67 percent, but the propane tanks can be filled up to a maximum aggregate capacity of 83 percent. Staff calculated a 2.9 day fuel reserve at average capacity[12]. Since the proposed BARCT limit incorporates 5% diesel engines and 30% ZE technology based on annual power generation (MW-hr per year), existing propane fuel storage was determined to be sufficient. In a scenario where 95% of power is generated using propane, staff calculates a fuel reserve average capacity just below 2 days.

Initial BARCT Emission Limit

Staff projected the number of fuel tanks necessary for ZE and NZE technologies fueled by hydrogen and propane, respectively. **Table 2-4** provides projections of fuel usage and associated fuel tanks delivered based on repower scenarios for the electricity generating facility located on Santa Catalina Island. Staff assumed a maximum capacity of 9,100-gallons (gal) of propane, 1,250-kilograms (kg), or 7,450 gallons of diesel per fuel tank[13]. The electricity generating facility located on Santa Catalina Island utilizes approximately 2 million gallons of diesel and 190,000 gallons of propane annually for power generation, which equates to approximately 300 fuel tanks. The electric generating facility located on Santa Catalina Island also utilizes approximately 650,000 gallons of propane annually for utility service, which equates to approximately 70 fuel tanks.

[11] Between 2019 to 2023, there were 7 days in which the propane tank capacity was below 25 percent

[12] Staff calculated days of propane storage based on three propane storage tanks, a 10-day utility fuel reserve, a 25% fuel reserve minimum, and fuel needed for 65% NZE technology for the proposed BARCT limit

[13] Fuel tank capacity for barge deliveries is included in the Southern California Edison Pebbly Beach Alternatives Study, Revised Final Action Plan (July 14, 2022)

Table 2-4: Hydrogen and Propane Fuel Tanks Estimated for Various Repower Scenarios

	Annual Fuel Requirements	Annual Number of Fuel Tanks
Hydrogen Estimated for 95% ZE Scenario	2,146,200 kg	1,717
Hydrogen Estimated for a 65% ZE Scenario	1,395,030 kg	1,116
Propane Estimated for 95% NZE Scenario	2,860,690 gal	309
Propane Estimated for 65% NZE Scenario	1,859,449 gal	205
Propane Estimated for 50% NZE Scenario	1,915,626 gal	276

Staff determined a 95% ZE scenario to be technologically infeasible due to the number of fuel tanks required for hydrogen fueled ZE technologies. Staff is only aware of one barge that delivers fuel to Santa Catalina Island; the barge makes deliveries Monday through Friday. Based on historical fuel usage at the electricity generating facility on Santa Catalina Island, it is possible to deliver at least two tanks of fuel each day that the barge is operating. Staff assumed that the maximum amount of fuel that could be delivered to the electricity generating facility on Santa Catalina Island is two fuel tanks for 260 days out of the year. Therefore, repower scenarios that required over 448 fuel tanks annually were considered to be technologically infeasible[14]. Staff estimates approximately 1,730 fuel tanks would be required annually for a 95% ZE repower scenario using hydrogen fueled technologies. Additionally, a 95% ZE scenario with a combination of both solar PV cells and hydrogen fueled equipment was determined to be technologically infeasible. Due to limited land availability suitable for solar PV cell installation, staff estimates that a maximum of 30% of power generation for Santa Catalina Island could be provided by solar PV cells. The remaining 65% of ZE hydrogen fueled equipment needed for a 95% ZE scenario is estimated to result in approximately 1,130 fuel tanks annually.

Furthermore, a 95% ZE scenario including hydrogen fueled technologies would likely require ancillary fuel storage facilities outside of the existing facility footprint. After several unsuccessful attempts with the landowning company of a potential fuel storage site, staff determined that acquisition of the land could not be relied upon for the purposes of establishing a BARCT limit. Moreover, even if land for additional fuel storage could be acquired, the hydrogen fuel source would eventually be depleted as there are currently not enough barges to replenish the hydrogen fuel reserves.

[14] Staff's calculations account for the propane tanks that are delivered for utility service

The repower scenario comprised of 95% propane fueled NZE and 5% diesel internal combustion is estimated to result in 309 fuel tanks being delivered annually. This is approximately three percent more fuel tanks being delivered for power generation than current operations.

The repower scenario comprised of 30% ZE, 65% NZE, and 5% diesel internal combustion engines is estimated to result in approximately 220 fuel tanks being delivered annually. The quantity of fuel tanks that would be delivered as a result of a repower scenario comprised of 30% ZE, 65% NZE, and 5% diesel internal combustion engines results in approximately 80 fewer fuel tanks being delivered for power generation than current operations.

The recommendation for the initial BARCT NOx emission limit is based on the technology assessment. A cost-effectiveness analysis, which includes an incremental cost-effectiveness analysis, is then made with cost information provided by stakeholders to further refine the determination for the final BARCT NOx emission limit. Staff proposed an initial BARCT emission limit of 1.6 tons per year NOx for electric generating units located on Santa Catalina Island. The initial BARCT limit is based on a combination of technologies comprising of 30% ZE, 65% NZE, and 5% diesel internal combustion engines for power generation (MW-hr per year) on Santa Catalina Island.

Staff later revised the initial BARCT limit to 1.8 tpy NOx after updating the emission factors used to calculate the final BARCT limit. The emission factors were updated to reflect the U.S. EPA standard for Tier 4 Final engines used in generator sets rated greater than 1200 hp (1.48 lbs/MWhr) and emission standard for Santa Catalina Island Zero-Emission Electric Generating Units defined in PAR 1135 (<0.01 lb/MWhr). The updated emission factors used are conservative, as Tier 4 Final engines can achieve more than 20 percent lower emissions depending on load. Furthermore, Santa Catalina Island Zero-Emission Electric Generating Units are not counted towards emission calculations, as specified in paragraph (e)(4) of PAR 1135.

Cost-Effectiveness and Incremental Cost-Effectiveness Analyses

A complete discussion of cost-effectiveness is provided in Chapter 4: Impact Assessment of this report. The findings are summarized here as part of the BARCT assessment process.

Staff conducted a cost-effectiveness analysis of several repower scenarios utilizing ZE and/or NZE technologies to repower the electricity generating facility located on Santa Catalina Island (**Table 2-5**). Staff evaluated the following technologically feasible repower scenarios based on annual power generation (MW-hr per year): all Tier 4 Final diesel engines; 50% NZE, 50% diesel internal combustion engines; 30% ZE, 50% NZE, 20% diesel internal combustion engines; 95% NZE, 5% diesel internal combustion engines; and 30% NZE, 65% NZE, 5% diesel internal combustion engines.

Table 2-5: Cost-Effectiveness Analysis for Santa Catalina Island Repower Scenarios

	All Tier 4 Final Diesel Engines	50% NZE, 50% Diesel Engines	30% ZE,+ 50% NZE, 20% Diesel Engines	95% NZE, 5% Diesel Engines	30% ZE,+ 65% NZE, 5% Diesel Engines
Net Annual Costs (includes annualized capital and O&M costs)	$2,296,000	$663,000	$2,076,000	$3,060,000	$1,924,000
NOx Emission Reductions (Tons/Year)	49.57	59.92	65.3	69.24	69.5
Cost-Effectiveness ($/Ton of NOx Reduced)	$46,000	$11,000	$32,000	$44,000	$28,000

+ Repower scenario requires the acquisition of land outside of the existing facility footprint

The initial BARCT limit of 1.8 tons per year NOx for the electricity generating facility located on Santa Catalina Island was determined to be cost-effective at less than the 2022 AQMP cost-effectiveness threshold of $325,000 per ton of NOx reduced.

Staff proceeded to conduct incremental cost-effectiveness analyses between each progressively more stringent repower scenario repower scenarios analyzed (**Table 2-6**) and against an all Tier 4 Final diesel engine scenario (**Table 2-7**). Incremental cost-effectiveness is the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option.

Table 2-6: Incremental Cost-Effectiveness of Progressively More Stringent Repower Scenarios

	All Tier 4 Final Diesel Engines versus 50% NZE, 50% Diesel Engines	50% NZE, 50% Diesel Engines versus 30% ZE, 50% NZE, 20% Diesel Engines	30% ZE, 50% NZE, 20% Diesel Engines versus 95% NZE, 5% Diesel Engines	95% NZE, 5% Diesel Engines versus 30% ZE, 65% NZE, 5% Diesel Engines
Incremental Cost-Effectiveness	$(158,000)	$263,000	$250,000	$(4,372,000)

The initial BARCT limit of 1.8 tons per year NOx for the electricity generating facility located on Santa Catalina Island was determined to be incrementally cost-effective at less than $325,000 per ton of NOx reduced.

Emission Limit Recommendation

As noted earlier, BARCT is defined as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." As such and to be consistent with state law, BARCT emission limits take into consideration environmental impacts, energy impacts, and economic impacts. As this facility is very unique being on an island and the only source of power including electricity, water movement, and waste systems, reliable sufficient power is crucial in avoiding blackouts and other public health issues related to polluted water and hazard health from biological waste exposure. When taking into consideration the various factors affecting a reliable energy supply, the final BARCT determination is for 6 tons per year NOx emissions cap. In addition to energy demand, other considerations such as power reliability, transmission, grid stability, space limitations, fuel delivery and storage, and challenges for the deployment of new ZE/NZE technologies were taken into account. The initial BARCT analysis at 1.8 tons per year was based on delivery of 1.5 million gallons of propane per year being delivered to the island and enough storage capacity for 30-days in case of unforeseen circumstances preventing the required daily deliveries by barge while avoiding any loss of power needs on the island. Due to the uncertainty that the delivery can be met all the time and potential lack of storage capacity, a lesser amount of propane delivery was evaluated. Taking into account reliability of delivery and 30-day storage, the reasonably achievable amount of 900,000 gallons of propane per year was considered. This would be an increase from the current delivery of propane but would enable the facility to power near-zero equipment that could generate 50 percent (coupled with 30 percent zero emission equipment) of the demand needed to sufficiently and reliably power all of the island's needs for electricity, water transport, and waste systems, even during peak demand. With the remaining power needed based on the usage of Tier 4 diesel engines, this equates to 6 tons per year of NOx emissions that can be feasibly achieved. In addition, the amount of propane ensures lower emissions while providing sufficient reliable power for critical infrastructure that supports compliance with the rule emission caps and seeks to avoid rule violations.

CHAPTER 3: SUMMARY OF PROPOSALS

INTRODUCTION

DEFINITIONS (Subdivision (c))

EMISSION LIMITS (Subdivision (d))

MONITORING, RECORDKEEPING, AND REPORTING (Subdivision (e))

INTRODUCTION

Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (PAR 1135) establishes nitrogen (NOx) mass emission limits for electric generating units located on Santa Catalina Island, requirements to install Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units, and requirements to remove existing prime power diesel internal combustion engines from service. Additionally, PAR 1135 establishes provisions for monitoring, reporting, and recordkeeping for Santa Catalina Island near-zero-emission (NZE) electric generating units and electric generating units not required to install continuous emissions monitoring systems (CEMS) located on Santa Catalina Island. PAR 1135 also includes updates to remove outdated rule provisions, correct rule references, and other editorial changes.

DEFINITIONS (Subdivision (c))

PAR 1135 adds and modifies definitions to provide clarification New or modified definitions added to PAR 1135 include:

- *ANNUAL NOx MASS EMISSIONS means actual emissions of NOx produced from all electric generating units at an electricity generating facility between January 1st through December 31st.*

  This proposed definition provides clarity that NOx mass emission limits are calculated on a fixed basis per calendar year, rather than on a rolling basis.

- *ELECTRIC GENERATING UNIT means a boiler that generates electric power, a gas turbine that generates electric power with the exception of cogeneration turbines, or equipment that generates electric power and is located on Santa Catalina Island. An electric generating unit does not include emergency internal combustion engines and portable engines registered under the California Air Resources Board Statewide Portable Equipment Registration Program (PERP).*

  The definition was modified to broaden the definition of electric generating units located on Santa Catalina Island. The proposed definition includes all prime power electric generating equipment located on Santa Catalina Island.

- *SANTA CATALINA ISLAND NEAR-ZERO EMISSION (NZE) ELECTRIC GENERATING UNIT means any electric generating unit located on Santa Catalina Island that produces NOx emissions greater than 0.01 pounds per Megawatt-Hour (lb/MW- hr) but less than or equal to 0.07 lb/MW-hr as demonstrated by a South Coast AQMD permit condition or other method determined to be equivalent by the Executive Officer.*

  This proposed definition provides clarity on the rate of emissions considered to be near-zero emission on Santa Catalina Island. Through the permitting process, staff will determine if equipment meets the emission requirements from a manufacturer guarantee, source test, or other approved method.

- *SANTA CATALINA ISLAND ZERO-EMISSION (ZE) ELECTRIC GENERATING UNIT means any electric generating unit located on Santa Catalina Island that produces NOx emissions less than or equal to 0.01 lb/MW-hr as demonstrated by a South Coast AQMD permit condition or other method determined to be equivalent by the Executive Officer.*

This proposed definition provides clarity on the rate of emissions considered to be zero-emission on Santa Catalina Island. The emissions requirement of less than or equal to 0.01 lb/MW-hr NOx for Santa Catalina Island ZE electric generating units is intended to address any potential emissions. However, Santa Catalina Island ZE electric generating units should have emissions of 0 lb/MW-hr NOx, as any equipment that may cause the issuance of air contaminants or may control air contaminants is required to have a permit, except for equipment specified in Rule 219 – Equipment Not Requiring a Written Permit Pursuant to Regulation II.

EMISSION LIMITS (Subdivision (d))

Current South Coast Air Quality Management District (South Coast AQMD) Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities (Rule 1135) subparagraph (d)(2)(A) was deleted to remove the first interim annual oxides of nitrogen (NOx) mass emission limit of 50 tons of NOx by January 1, 2024, as the compliance deadline has passed. It is expected that the electricity generating facility located on Santa Catalina Island can meet the first interim limit of 45 tons per year of NOx by January 1, 2027 by replacing two older diesel engines with Tier 4 Final diesel engines.

Subparagraph (d)(2)(A) prohibits the electricity generating facility located on Santa Catalina Island from installing more than three new diesel internal combustion engines. Furthermore, new diesel internal combustion engines installed cannot exceed a maximum cumulative rating of 5.5 Megawatts (MW) as indicated on the rated power nameplate. The maximum cumulative rating is the sum of the prime power nameplate rating of each new diesel internal combustion engine. The new Tier 4 Final diesel engines proposed to be installed are rated at 1.825 MW each. Staff rounded the maximum cumulative rating for the proposed three Tier 4 Final diesel engines to 5.5 MW for simplicity.

Subparagraph (d)(2)(B) extends the deadline prohibiting the installation of any new diesel internal combustion engine from January 1, 2024 to January 1, 2028. Installation of any new diesel internal combustion must be completed by January 1, 2028. Staff updated this provision due to the failure of the cleanest existing diesel engine's new catalyst block to meet particulate matter emission standards as specified by South Coast AQMD Rule 1470 – Requirements for Stationary Diesel-Fueled Internal Combustion and Other Compression Ignition Engines[1]. It is expected that the electricity generating facility located on Santa Catalina Island can meet the second interim limit of 30 tons per year of NOx by January 1, 2028 by replacing three older diesel engines with Tier 4 Final diesel engines. Due to the existing capacities of fuel storage and limitations to expand fuel storage outside of existing facility footprint, the extension of the prohibition deadline will provide reliability and redundancy in the event barge trips for propane fuel deliveries cannot occur.

Subparagraph (d)(2)(C) will prohibit the installation of any equipment that does not meet the definition of a "Santa Catalina Island Near-Zero-Emission (NZE) Electric Generating Unit" or a "Santa Catalina Island Zero-Emission (ZE) Electric Generating Unit" after January 1, 2028. This provision was added to require the installation of cleaner power generation technologies that were demonstrated to be technologically feasible and cost-effective during the BARCT assessment.

[1] South Coast AQMD, Rule 1470, http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1470.pdf?sfvrsn=8

Subparagraph (d)(2)(D) was also added to ensure that a minimum amount of Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units are installed. Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units will need to provide approximately 75 percent of the power at the electricity generating facility located on Santa Catalina Island to meet the final proposed NOx limit of 6 tons per year (tpy). Throughout the rule development process, the electricity generating facility located on Santa Catalina Island expressed that three Tier 4 Final diesel engines are necessary to provide redundancy during maintenance and unplanned outages. Similarly, backup Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units are necessary to provide sufficient power during maintenance and unplanned outages to meet the final proposed NOx limit as well as minimize the use of diesel engines. Subparagraph (d)(2)(D) requires by January 1, 2030, installation of Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units with a minimum cumulative rating of 1.8 MW as indicated on the rated prime power nameplate. The minimum cumulative rating is the sum of the nameplate rating of each Santa Catalina Island NZE electric generating unit and Santa Catalina Island ZE electric generating unit installed, excluding the highest rated Santa Catalina Island NZE electric generating unit and/or Santa Catalina Island ZE electric generating unit, solar photovoltaic cells, and battery storage. Compliance with subparagraph (d)(2)(D) can be achieved in many ways. For example, installation of three propane engines rated 1.5 MW each would comply with subparagraph (d)(2)(D) because the cumulative rating when subtracting the highest rated Santa Catalina Island NZE electric generating unit is 3.0 MW.[2] However, installation of two propane engines rated 1.5 MW each would not comply with subparagraph (d)(2)(D) because the cumulative rating when subtracting the highest rated Santa Catalina Island NZE electric generating unit is 1.5 MW.

Subparagraph (d)(2)(E) will establish progressively more stringent NOx mass emission limits for the electricity generating facility located on Santa Catalina Island. The final proposed NOx emission limit is 6 tpy. The NOx mass emission limits include emissions from startups, shutdowns, and missing data substitutions.

Subparagraph (d)(2)(F) requires all prime power diesel internal combustion engines for which installation was completed earlier than *[Date of Adoption]* to be removed from service by January 1, 2030. If extensions are granted pursuant to subparagraphs (d)(3)(C) and (d)(5)(C), the compliance date will become six months after any time extension granted. Therefore, all six existing prime power diesel internal combustion engines will be required to be removed from service by January 1, 2030 or six months after time extensions. Removing from service means physically removing the equipment from the facility or altering the equipment in such a way that it cannot be used without new construction activities. The January 1, 2030, compliance deadline in subparagraph (d)(2)(F) aligns with the implementation date of the 13 tpy NOx limit.

Subparagraph (d)(3)(A) requires that by January 1, 2028, the owner or operator conduct a feasibility analysis to determine if the proposed emission limits in clause (d)(2)(E)(iii) can be met by the compliance date. The analysis should identify the electric generating units under consideration, the progress in procuring and installing the electric generating units, a description

[2] Staff assumed that propane engines can meet the proposed Santa Catalina Island NZE Electric Generating Unit standard of 0.07 lb/MW-hr NOx for the subparagraph (d)(2)(D) compliance examples

of how those units would achieve the emission limits, and, if applicable, the length of time of up to three years for an extension to the implementation date.

Subparagraph (d)(3)(B) establishes a requirement that a request for a time extension shall be made available for public review no less than 30 days prior to approval.

Subparagraph (d)(3)(C) provides the criteria for which the Executive Officer will evaluate any extension request for approval.

Similarly, paragraphs (d)(3)(D) through (d)(3)(F) requires that by January 1, 2033, the owner or operator conduct a feasibility analysis to determine if the proposed emission limits in clause (d)(2)(E)(iv) can be met by the compliance date. The same requirements for public review and approval criteria apply.

Subparagraph (d)(5)(A) updates the time extension provision for the electricity generating facility on Santa Catalina Island. PAR 1135 allows the electricity generating facility located on Santa Catalina Island to request up to two time extensions; one time extension for the 13 tpy NOx limit and one time extension for the 6 tpy NOx limit. Each time extension can be approved for up to three years.

Subparagraph (d)(5)(B) establishes a requirement that a request for a time extension shall be made available for public review no less than 30 days prior to approval.

Clause (d)(5)(C)(ii) was updated to specify that the extenuating circumstances that demonstrate the need for a time extension are limited to construction interruptions and/or supply chain disruptions. Examples of such extenuating circumstances include supply chain or permitting issues beyond the control of Southern California Edison.

MONITORING, RECORDKEEPING, AND REPORTING (Subdivision (e))

Paragraphs (e)(1) to (e)(3) clarify that Santa Catalina Island NZE electric generating units rated less than or equal to 0.5 Megawatts (MW) and Santa Catalina Island ZE electric generating units do not require installation of continuous emission monitoring systems (CEMS).

Paragraph (e)(4) establishes a method to calculate NOx emissions from Santa Catalina Island NZE electric generating units rated less than or equal to 0.5 MW located on Santa Catalina Island, as those units will not be required to install CEMS. The NOx emissions calculated from Santa Catalina Island NZE electric generating units rated less than or equal to 0.5 MW are required to be added to the total annual NOx emissions from electricity generating units that have CEMS to demonstrate compliance with emission limits specified in paragraph (d)(2).

Paragraph (e)(5) requires records of all data used to calculate the annual NOx emissions from Santa Catalina Island NZE electric generating units rated less than or equal to 0.5 MW for compliance verification purposes. The data is required to be maintained onsite for a minimum of five years and be made available to the Executive Officer upon request.

Paragraph (e)(6) requires the installation of a non-resettable device to continuously record the megawatt-hours hours for each Santa Catalina Island NZE electric generating unit rated less than or equal to 0.5 MW.

CHAPTER 4: IMPACT ASSESSMENTS

INTRODUCTION

Impact assessments were conducted during the Proposed Amended Rule 1135 – Emissions of Oxides of Nitrogen From Electricity Generating Facilities (PAR 1135) development to assess environmental and socioeconomic implications. Health and Safety Code requirements for cost-effectiveness analysis and incremental cost-effectiveness analysis were evaluated during rule development of PAR 1135. Draft findings and comparative analyses were prepared pursuant to Health and Safety Code Sections 40727 and 40727.2, respectively. An analysis of the potential adverse environmental impacts associated with PAR 1135 has been conducted and a California Environmental Quality Act (CEQA) document has been prepared based on this analysis.

POTENTIALLY IMPACTED FACILITIES

There is one electricity generating facility located on Santa Catalina Island impacted by PAR 1135. The electricity generating facility on Santa Catalina Island currently operates six diesel internal combustion engines and 23 microturbines to generate power. Table 1-1 in Chapter 1 of the staff report contains more detailed information on the equipment affected by PAR 1135.

EMISSION INVENTORY AND EMISSION REDUCTIONS

PAR 1135 will result in emission reductions from the electricity generating facility located on Santa Catalina Island by removing three diesel engines and 23 microturbines and replacing them with Tier 4 Final diesel engines, Santa Catalina Island NZE electric generating units, and Santa Catalina Island ZE electric generating units.

Staff established baseline emissions for the electricity generating facility located on Santa Catalina Island by determining the average of emissions from prime power diesel internal combustion engines listed in the Annual Emission Reports (AERs)[1] for the reporting years of 2017, 2019, and 2021. The baseline emissions from the electricity generating facility located on Santa Catalina Island were determined to be 71.3 tons of oxides of nitrogen (NOx) per year. Emissions data from the 2018 AER reporting year was not included, as emissions data for each diesel internal combustion engine was initially not available. The AER emission data from 2020 was also not included, as emissions were not representative of typical operations due to the COVID-19 pandemic. The electricity generating facility located on Santa Catalina Island later provided the 2018 AER report. However, staff decided to maintain the initial method of calculating baseline emissions, as they are considered representative of typical operations and similar to the emission baseline used in the 2018 amendment to Rule 1135[2].

The proposed final NOx limit of 6 tpy was established to address concerns raised by the operator regarding feasibility and grid stability. The proposed final NOx limit can be achieved using a combination of Tier 4 Final diesel engines, Santa Catalina Island NZE electric generating units, and Santa Catalina Island ZE electric generating units. Staff assumed a combination of 30% ZE, 50% NZE, and 20% diesel internal combustion engines for the purposes of the cost-effectiveness analysis. The proposed limit is estimated to reduce NOx emissions at the electricity generation facility located on Santa Catalina Island by 65.3 tons per year, or 0.18 tons per day. Estimated

[1] South Coast AQMD, Annual Emissions Reporting, http://www.aqmd.gov/home/rules-compliance/compliance/annual-emission-reporting

[2] 2018 amendment to Rule 1135 used an emission baseline of 69 tpy NOx for the electricity generating facility located on Santa Catalina Island

emission reductions were calculated by taking the difference between the baseline emissions from the electricity generating facility located on Santa Catalina Island and the estimated NOx emissions from the repower scenario. Estimated emission reductions for the repower scenario was determined by assigning an estimated percentage of power generation output to each equipment type. Power generation was then calculated (Megawatt hour per year (MW-hr per year)) based on an estimated percentage of equipment output. Annual power generation for each equipment type was then multiplied by various emission factors: 1.48 lbs/MW-hr for Tier 4 Final diesel engines, 0.07 lb/MW-hr for Santa Catalina Island NZE electric generating units, and 0.01lb/MW-hr for Santa Catalina Island ZE electric generating units. Lastly, the estimated NOx emissions from each equipment type were added to calculate the total estimated NOx emissions for the repower scenario.

COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires a cost-effectiveness analysis when establishing BARCT requirements. Staff conducted a cost-effectiveness analysis of the proposed emission limit. The cost-effectiveness of a technology is measured in terms of the cost in dollars per ton of air pollutant reduced. To determine the cost-effectiveness of each assessed repower scenario for Santa Catalina Island, the following calculation was used:

$$\text{Cost-Effectiveness} = \frac{(Annualized\ Capital\ Cost + Annual\ O\&M) - Existing\ Annual\ O\&M}{Estimated\ Annual\ Emissions\ Reductions}$$

The annualized capital cost in the formula above incorporates a Capital Recovery Factor (CRF) of 4% over the life of the equipment. The CRF method calculates the present value of the control costs over the life of the equipment by adding the capital cost to the present value of all annual costs and other periodic costs over the life of the equipment. Equipment life accounts for the monetary payoff of the equipment, not the operational life expectancy. A 20-year equipment life was assumed for repower scenarios with a mix of technologies. Existing annual operation and maintenance (O&M) costs are then subtracted from the cost of the repower scenario. The difference is divided by the estimated annual emission reductions for the repower scenario, resulting in the cost-effectiveness amount in dollars.

The cost-effectiveness amount for each assessed repower scenario was measured against the 2022 Air Quality Management Plan (AQMP)[3] cost-effectiveness threshold of $325,000 per ton of NOx. Therefore, if the cost per ton of emissions reduced is less than the cost-effectiveness threshold of $325,000 per ton of NOx, then the control method is considered to be cost-effective.

Costs were provided by technology vendors and the electricity generating facilities, including the electricity generating facility located on Santa Catalina Island. Capital costs include one-time costs associated with the purchase of equipment, installation, demolition, engineering assessments, labor, and commissioning and testing. Annual operating costs included maintenance and parts, emissions and performance testing, employee and service costs, insurance and permitting, fuel costs (including shipping), hazardous materials handling or treatment, and land lease cost. Values are reported in 2022 dollars. Further, no stranded asset costs were incorporated as the newest diesel

[3] South Coast AQMD, 2022 Air Quality Management Plan, http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16

internal combustion engine on an electricity generating facility located on Santa Catalina Island is over 29-years old and the existing microturbines were provided by South Coast AQMD.

The cost-effectiveness analysis of each technologically feasible repower scenario evaluated for the electricity generating facility located on Santa Catalina Island is listed below in Table 4-1. Several variables impacted the cost-effectiveness of each repower scenario, however, the cost of fuel was the primary factor impacting cost-effectiveness. Although the replacement of five diesel internal combustion engines were below the cost-effectiveness threshold of $325,000 per ton of NOx reduced, it produced the least amount of NOx emission reductions in comparison to the other repower scenarios evaluated. Furthermore, repower scenarios with a mix of technologies (ZE, NZE, and diesel internal combustion engines) were determined to be more cost-effective than the Tier 4 Final diesel engine repower scenario. In fact, the repower scenarios with a mix of technologies were determined to be cost-saving over the life of the equipment when compared to current operations.

Table 4-1: Cost-Effectiveness Analysis of Repower Scenarios on Santa Catalina Island

	All Tier 4 Final Diesel Engines	50% NZE, 50% Diesel Engines	30% ZE, 50% NZE, 20% Diesel Engines	95% NZE, 5% Diesel Engines	30% ZE, 65% NZE, 5% Diesel Engines
Net Annual Costs (includes annualized capital and O&M costs)	$2,296,000	$663,000	$2,076,000	$3,060,000	$1,924,000
NOx Emission Reductions (Tons/Year)	49.57	59.92	65.3	69.34	69.5
Cost-Effectiveness ($/Ton of NOx Reduced)	$46,000	$11,000	$32,000	$44,000	$28,000

INCREMENTAL COST-EFFECTIVENESS

Health and Safety Code Section 40920.6 requires an incremental cost-effectiveness analysis for BARCT rules or emission reduction strategies when there is more than one control option which would achieve the emission reduction objective of the proposed amendments. Incremental cost-effectiveness is the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option.

Incremental cost-effectiveness is calculated as follows:

$$\text{Incremental cost-effectiveness} = \frac{Calt - Cproposed}{Ealt - Eproposed}$$

Where:

$C_{proposed}$ is the present worth value of the proposed control option;
$E_{proposed}$ are the emission reductions of the proposed control option;
C_{alt} is the present worth value of the alternative control option; and
E_{alt} are the emission reductions of the alternative control option

The incremental cost effectiveness measured against each progressively more stringent technologically feasible repower scenario is presented below in Table 4-2.

Table 4-2: Incremental Cost-Effectiveness of Progressively More Stringent Repower Scenarios

	All Tier 4 Final Diesel Engines versus 50% NZE, 50% Diesel Engines	50% NZE, 50% Diesel Engines versus 30% ZE, 50% NZE, 20% Diesel Engines	30% ZE, 50% NZE, 20% Diesel Engines versus 95% NZE, 5% Diesel Engines	95% NZE, 5% Diesel Engines versus 30% ZE, 65% NZE, 5% Diesel Engines
Incremental Cost-Effectiveness	$(158,000)	$263,000	$250,000	$(4,372,000)

RULE ADOPTION RELATIVE TO COST-EFFECTIVENESS

On October 14, 1994, the South Coast AQMD Governing Board adopted a resolution that requires staff to address whether rules being proposed for amendment are considered in the order of cost-effectiveness. The 2022 AQMP ranked, in the order of cost-effectiveness, all of the control measures for which costs were quantified. It is generally recommended that the most cost-effective actions be taken first. Proposed Amended Rule 1135 partially implements Control Measure for Large Combustion Sources, L-CMB-06: NOx Emission Reductions from Electricity Generating Facilities (L-CMB-06). The 2022 AQMP ranked Control Measure L-CMB-06 seventeenth in cost-effectiveness for stationary source control measures for ozone.

SOCIOECONOMIC IMPACT ASSESSMENT

A socioeconomic impact assessment will be prepared and released for public review as a separate document at least 30 days prior to the South Coast AQMD Governing Board Hearing of Proposed Amended Rule 1135, which is scheduled for October 4, 2024 (subject to change).

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to CEQA and South Coast AQMD's Certified Regulatory Program (Public Resources Code Section 21080.5, CEQA Guidelines Section 15251(l); codified in South Coast AQMD Rule 110), the South Coast AQMD, as lead agency for PAR 1135, prepared a Subsequent Environmental Assessment (SEA) for the proposed project. The SEA is a substitute CEQA document prepared pursuant to CEQA Guidelines Section 15252 and in lieu of a Subsequent Environmental Impact Report. The SEA tiers off of the November 2018 Final Mitigated SEA for

the November 2018 amendments to Rule 1135,[4] as allowed by CEQA Guidelines Sections 15152, 15162, and 15385. The Draft SEA was released for a 46-day public review and comment period to provide public agencies and the public an opportunity to obtain, review, and comment on the environmental analysis. Comments made relative to the analysis in the Draft SEA and responses to the comments will be included in the Final SEA.

DRAFT FINDINGS UNDER HEALTH AND SAFETY CODE SECTION 40727

Requirements to Make Findings

Health and Safety Code Section 40727 requires that prior to adopting, amending or repealing a rule or regulation, the South Coast AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the public hearing, and in the staff report.

Necessity

Proposed Amended Rule 1135 is needed to reduce NOx emission limits at the electricity generating facility located on Santa Catalina Island.

Authority

The South Coast AQMD Governing Board has authority to adopt amendments to Proposed Amended Rule 1135 pursuant to the Health and Safety Code Sections 39002, 40000, 40001, 40440, 40702, 40725 through 40728, and 41508.

Clarity

Proposed Amended Rule 1135 is written or displayed so that its meaning can be easily understood by the persons directly affected by it.

Consistency

Proposed Amended Rule 1135 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.

Non-Duplication

Proposed Amended Rule 1135 will not impose the same requirements as any existing state or federal regulations. The proposed amended rule is necessary and proper to execute the powers and duties granted to, and imposed upon, the South Coast AQMD.

Reference

In amending Rule 1135, the following statutes which the South Coast AQMD hereby implements, interprets or makes specific are referenced: Health and Safety Code Sections 39002, 40000, 40001, 40702, 40440(a), and 40725 through 40728.5.

COMPARATIVE ANALYSIS

Health and Safety Code Section 40727.2 requires a comparative analysis of the proposed amended rule with any Federal or District rules and regulations applicable to the same source. A comparative analysis is presented below in Table 4-3.

[4] South Coast AQMD, 2018. Final Mitigated Subsequent Environmental Assessment (SEA) for Proposed Amended Rule (PAR) 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, SCH No. 2016071006. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2018/par-1135---final-mitigated-sea_with-appendices.pdf

Table 4-3: PAR 1135 Comparative Analysis

Rule Element	PAR 1135	Rule 1110.2	Rule 2009	RECLAIM	40 CFR Part 60 Da	40 CFR Part 60 GG	40 CFR Part 60 KKKK	40 CFR Part 72
Applicability	Boilers, internal combustion engines, and turbines located at investor-owned electric utilities, publicly owned electric utilities, facilities with combined generation capacity of ≥ 50 MW	Gaseous and liquid fueled engine over 50 rated brake horsepower	Facility generating ≥ 50MW and owned or operated by Southern California Edison, Los Angeles Dept. of Water and Power, City of Burbank, City of Glendale, City of Pasadena, or any their successors	Facilities regulated under the NOx RECLAIM program (South Coast AQMD Reg. XX)	Electric utility steam generating units at a facility generating > 73 MW and constructed or modified after 9/18/78	Gas turbines with heat input of ≥ 10 MMBtu/hr constructed or modified before 2/18/2005	Gas turbines with heat input of ≥ 10 MMBtu/hr constructed or modified after 2/18/2005	Facilities regulated under the national sulfur dioxide and nitrogen dioxide air pollution control and emission reductions program
Requirements	Concentration limits: • Boiler: NOx 5 ppmv @ 3% O2 • Combined Cycle Gas Turbine and Associated Duct Burner: NOx 2 ppmv @ 15% O2 • Simple Cycle Gas Turbine: NOx 2.5 ppmv @ 15% O2 Internal Combustion • Engine: NOx 45 ppmv @ 15% O2; CO 250 ppmv @ 15% O2; VOC 30 ppmv @ 15% O2; PM 0.0076 lbs/MMBtu @ 15% O2 NOx mass emission limits for the electricity generating facility located on Santa Catalina Island : • 45 tpy by January 1, 2027 • 30 tpy by January 1, 2028 •13 tpy by January 1, 2030 •6 tpy by January 1, 2035	Existing Internal Combustion Engine: NOx 11 ppmv @ 15% O2; CO 250 ppmv @ 15% O2; VOC 30 ppmv @ 15% O2;	Submit Compliance Plan to demonstrate BARCT by 2003/2004	As determined by Rule 2009	NOx limit: 0.15 lb/MMBtu	NOx limit @ 15% O2: 0.0075*(14.4/Y) +F where Y = manufacture's rated heat input and F = NOx emission allowance for fuel-bound nitrogen	NOx limit for electric generating units (@ 15% O2): •≤ 50 MMBtu/hr – 42 ppm when firing natural gas •50 MMBtu/hr and ≤ 850 MMBtu/hr – 15 ppm when firing natural gas •>850 MBtu/hr – 15 ppm when firing natural gas •≤ 50 MMBtu/hr – 96 ppm when firing other fuel •50 MMBtu/hr and ≤ 850 MMBtu/hr – 74 ppm when firing other fuel •>850 MBtu/hr – 42 ppm when firing natural gas	NOx limits for boilers = 0.40 lb/MMBtu

Rule Element	PAR 1135	Rule 1110.2	Rule 2009	RECLAIM	40 CFR Part 60 Da	40 CFR Part 60 GG	40 CFR Part 60 KKKK	40 CFR Part 72
Reporting	Annual reporting of NOx emissions	Breakdowns, monthly portable engine logs,	None	• Daily electronic reporting for major sources • Quarterly Certification of Emissions Report and Annual Permit Emissions Program for all units	Daily written reports or quarterly electronic reports	Excess emissions and CEMS downtime within 30 days	Excess emissions and CEMS downtime within 30 days; annual performance testing within 60 days	40 CFR 75 requirements for quarterly reports of information and hourly data from CEMS monitors, and calibration
Monitoring	A continuous in-stack NOx monitor for electric generating units that are not zero emission or near-zero emission and rated ≤0.5 MW	A continuous in-stack NOx monitor for engines ≥ 1,000 bhp and operating more than two million bhp-hr per calendar year	None	A continuous in-stack NOx monitor for major sources	A continuous in-stack NOx monitor	A continuous in-stack NOx monitor	A continuous in-stack NOx monitor	A continuous in-stack NOx monitor
Recordkeeping	Performance testing; emission rates; monitoring data; CEMS audits and checks maintained for five years	Source testing or Relative accuracy tests per 40 CFR 70 at least once every two years	None	• < 15-min. data = min. 48 hours; • ≥ 15-min. data = 3 years (5 years if Title V) • Maintenance & emission records, source test reports, RATA reports, audit reports and fuel meter calibration records for Annual Permit Emissions Program = 3 years (5 years if Title V)	Performance testing; emission rates; monitoring data; CEMS audits and checks	Performance testing; emission rates; monitoring data; CEMS audits and checks	Performance testing; emission rates; monitoring data; CEMS audits and checks	Performance testing; emission rates; monitoring data; CEMS audits and checks maintained for three years
Fuel Restrictions	Liquid petroleum fuel limited to Force Majeure natural gas curtailment, readiness testing, and source testing	None	None	None	None	None	None	None

APPENDIX A: Facility Affected by Proposed Amended Rule 1135

Table A-1: Facility Affected by Proposed Amended Rule 1135

Facility ID	Facility Name
4477	Southern California Edison Pebbly Beach Generating Station

APPENDIX B: RESPONSE TO PUBLIC COMMENTS

Comment No. 1 (received as verbal statements during Public Workshop) – Mark Abramowitz, Community Environmental Services

Is Southern California Edison in violation of the 50 tons per year of NOx emission limit in Rule 1135? Has Southern California Edison made a formal request for an extension? The Rule 1135 amendment in 2022 prohibited diesels after January 1, 2024 and proposing to allow diesel engines is backsliding. The proposed rule will result in a four-year delay for installing diesel engines. There is no provision in the proposed rule to eliminate the newly-installed diesel engines. With zero-emission alternatives available, the South Coast AQMD is not complying with federal LAER by allowing diesel engines to be installed. Staff conducted a BARCT assessment but at the request of Southern California Edison, the rule was delayed to allow for a grid stability study. However, the grid stability study did not cover the range of technologies that the BARCT assessment addressed. The results of the grid stability study were predetermined as Southern California Edison has raised objections to inverter-based technology. The proposed rule fails to meet the Board's direction to return immediately with a rule that reflects the BARCT assessment. Staff had proposed to require a limit of 1.6 tons of NOx emitted by 2026, but has reversed itself and now will allow over 70 tons of NOx emitted by 2026. The proposed limit of 6 tons of NOx emitted is triple the BARCT assessment and is inconsistent with Board direction, the 2022 AQMP, and state law to adopt rules that reflect BARCT.

Response to Comment No. 1

No, Southern California Edison is not in violation of the current Rule 1135 limit of 50 tons of NOx per year as that compliance determination would be made at the end of the calendar year. Also, Southern California Edison has not yet made a formal request for an extension of time to comply as the extension option only applies to the 2026 emission limit. The proposed rule will allow additional time for diesel engines to be installed because supply chain issues and permitting delayed the installation of the engines. The rule requires removal of the legacy engines but does not require removal of the newly installed engines as they provide necessary redundancy if fuel supplies are not available for the island. Staff is proposing a NOx limit of 6 tons per year because of feasibility and grid stability concerns, and additional time is allowed to procure and install the diesel engines and other equipment. BARCT requires the consideration of environmental, energy, and economic impacts. The effect of the proposed amendments on grid stability is a proper concern as it is an energy impact.

Comment No. 2 (received as verbal statements during Public Workshop) – Chris Chavez, Coalition of Clean Air

Please explain why Continuous Emission Monitoring System (CEMS) would not be appropriate. Please quantify diesel particulate matter reductions associated with the original proposal and the current proposal. In the future, as technology develops, the rule should be revisited to determine if more emission reductions are available. Catalina should not be the one area that is allowed to not meet the zero-emission statewide mandate. The goal is to deploy zero-emission technology as soon as possible.

Response to Comment No. 2

Currently the rule requires CEMS for all electricity generating equipment as all of the equipment is capable of 1 MW or greater output. Because the NZE and ZE equipment may have lower power output and low emissions, staff is proposing that NZE and ZE equipment with an output equal to or less than 0.5 MW be allowed to determine emissions through the use of emission factors representing maximum emissions allowed. Diesel engines and NZE equipment on Santa Catalina Island with an output of greater than 0.5 MW will be required to monitor emissions with a CEMS.

The current PM2.5 inventory associated with diesel engine use on Santa Catalina Island is 0.43 tons per day. The original proposal would reduce PM2.5 emissions 98.7 percent through the use of Tier IV diesel engines and a projected additional 50 percent reduction from limiting the operation time of the Tier IV diesel engines for an overall reduction of 99.4 percent. The current proposal would also reduce PM2.5 emissions by 98.7 percent through the use of Tier IV engines. However, the operation time would be limited to approximately 20 percent of the current usage meaning the overall PM2.5 reduction would be 99.7 percent.

The feasibility analysis in the proposed rule only dictates the timeline for installation of NZE and ZE technology. There is no preclusion to conducting further BARCT assessments and requiring more stringent emission limits in the future.

Comment No. 3 (received as verbal statements during Public Workshop) – John Chen, Cummins

We are supplying the engines and the engines will result in a massive reduction of PM emissions.

Response to Comment No. 3
Thank you for that information.

Comment No. 4 (received as verbal statements during Public Workshop) – David Pettit, NRDC

What happened to the 2 ton per year BARCT NOx limit originally proposed by staff? How did it change so greatly?

Response to Comment No. 4
Southern California Edison conducted a grid stability study and found that there were uncertainties that they could meet that limit. The volume of fuel delivered and storage capacity are concerns. The proposed limits are achievable.

Comment No. 5 (received as verbal statements during Public Workshop) – Dawn Anaiscourt, Southern California Edison

SCE appreciates fair regulations and does not oppose the proposed limits as they are based on technology evaluated by South Coast AQMD staff with incorporation of grid stability and propane limitations on the island. There is a high level of uncertainty if we can meet the 2030 and 2035 timelines due to supply chain issues, regulatory hurdles, and technology advancements to determine what the best option will be. We appreciate the ability to review the timelines through

the feasibility studies closer to the deadlines. SCE would prefer a five year extension for the feasibility results. Our commitment to the emission reduction goals remains steadfast. SCE would like the time extensions for circumstances beyond their control to apply to all rule deadlines, not just the 2030 and 2035 deadlines. Where there is a time extension granted, any related prohibition should be similarly extended as everything must be done in a coordinated fashion. The requirement to install NZE or ZE equipment should be tied to the date of the last diesel installation. Lastly, the cap of 5.5 MW of diesel engines is unnecessary to meet emission reduction goals and flexibility should be allowed. If the 5.5 MW cap is maintained, it should be specified that it is related to the prime power output of the engines.

Response to Comment No. 5
The proposed rule will incorporate time extensions for extenuating circumstances to all rule deadlines and where a time extension is granted, related prohibitions will also be extended six months after the applicable extension. Staff will also clarify that the 5.5 MW cap applies to prime power output of the engines.

Comment No. 6 (received as verbal statements during Public Workshop) – Mark Abramowitz, Community Environmental Services

The proposed rule does not reflect BARCT which is a minimum requirement and strays from past practice and provisions of the Health and Safety Code. With respect to a 95 percent zero emission scenario, this was requested by the public and found to have a cost-effectiveness at $88,000 per ton of NOx reduced. Weeks later, the 2022 AQMP was adopted with a higher cost-effectiveness threshold and staff then reversed itself claiming that space requirements, back up fuel storage, and lack of barges made it infeasible. However, staff overestimated the space needed for fuel cells by not considering that fuel cells could be stacked. Additionally, more space could become available if storage of diesel fuel was not necessary. Staff also reversed itself on additional land availability for diesel storage based on the lack of responsiveness to a few phone calls. Lastly, based on no new information, staff claims that a lack of barges or more barge trips makes it infeasible which is preposterous. More barges could be made available and with District assistance, zero emission barges could be available. Procurement of a storage site or contracting of a barge should not be considered when determining BARCT. Other zero-emission technologies, such as roof top solar, underwater turbines, and use of electrolyzers have not been fully evaluated. The proposal weakens diesel standards by increasing averaging times, allowing new diesels, and increasing time frame to comply. The proposal should consider increasing costs of diesel and propane. The proposal allows SCE to conduct their own technology assessment which is suboptimal considering their delays and reluctance to reduce emissions. It could easily be decades before the site needs to meet the emission limits. The extension provisions in the rule bypass the public Hearing Board process, does not have the approval criteria that the Hearing Board follows, and places the decision in the hands of staff. The proposed rule conflicts with the requirement that the provisions reflect BARCT, does not backslide, and requires the use of LAER or major source BACT. The assessment does not indicate what type of hydrogen is being used.

Response to Comment No. 6
Staff did conduct a BARCT assessment which is included as Chapter 2 of this document. The proposed emission limit reflects a compromise to address grid stability and feasibility concerns of

Southern California Edison. Staff did evaluate a 95 percent zero emission scenario but found it technologically infeasible because of space requirements. Hydrogen fuel has a very low energy density. To store 30-days of fuel reserve, the storage tank would be much larger than could be accommodated on site. Land outside the site footprint is extremely limited by the topography of the island and the reluctance of the Catalina Island Conservancy to allow further development. A possible site identified for possible fuel storage was covered in a mudslide and the owner was not interested in selling or leasing.

Many zero emission technologies were identified and evaluated in the BARCT assessment. The proposed emission limit incorporates the use of 30 percent zero emission technology. The proposal is technology neutral allowing the facility to determine which technology is most suitable as long as the emission limits are met.

The proposal does allow additional time beyond the current rule provision to install new diesel engines. Procurement and installation has been delayed by supply chain and permitting issues. Not allowing the installation of new diesel engines would mean the continued use of engines that have significantly higher NOx and PM emissions until some other technology was installed which would likely occur even later than the timelines in the proposal.

The Socioeconomic Impact Assessment will consider future diesel and propane costs when evaluating the proposal.

The proposal allows SCE to conduct a feasibility analysis to determine if more time is needed to install NZE and ZE equipment. The proposal does not include a technology assessment conducted by Southern California Edison or South Coast AQMD. If feasibility and extenuating circumstances extensions are utilized, the final emission compliance date could extend out to 2041. Similar extension provisions are currently included in Rule 1135 and approvals are limited by the criteria established in the rule.

The establishment of LAER or major source BACT is outside the scope of this rule and has an independent process.

The type of hydrogen used was not evaluated as it would not impact NOx emissions.

Comment Letter A: Anthony Hernandez, Southern California Edison

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL™ Company

July 3, 2024

Mr. Michael Krause
Assistant Deputy Executive Officer
Planning, Rule Development and Implementation
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
Email: MKrause@aqmd.gov

SUBJECT: Proposed Amendments to Rule 1135 - Emissions of Oxides of Nitrogen from Electricity Generating Facilities

Dear Mr. Krause:

Southern California Edison (SCE) appreciates South Coast Air Quality Management District's (SCAQMD) reopening of Rule 1135 to address issues relating to SCE's Pebbly Beach Generating Station (PBGS) on Santa Catalina Island (Catalina). SCE remains committed to working with the SCAQMD on a viable pathway toward a cleaner energy future at PBGS, with plans to increase reliance on near-zero-emission (NZE) and zero-emission (ZE) technology for power generation on the island. I write to provide SCE's comments on the Pre-Preliminary Draft version of Proposed Amended Rule 1135 released on June 13, 2024. According to that draft, an amended Rule 1135 would include the following emission limits and deadlines[1]:

A-1

Table 1. *Proposed Emission Reduction Targets and Deadlines*

Compliance Deadline	Proposed NOx Limit (tons per year (TPY))
1/1/2027	45
1/1/2028	30
1/1/2030	13
1/1/2035	6

A-2

The timeline in Table 1 is extremely ambitious and would require overcoming a multitude of challenges to achieve the necessary nitrogen oxide (NOx) emission reductions by the proposed deadlines, especially the latter two limits set to take effect in 2030 and 2035. SCE is committed to working to achieve these limits while addressing the underlying challenges, in partnership with the SCAQMD. Several of these challenges are due to the island's unique geography and its isolated

[1] The targets were also discussed at the SCAQMD Working Group meeting held on June 13, 2024 (*see* slide 10: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1135/par-1135_wgm-6-final.pdf?sfvrsn=6).

grid. The following discussion underscores the critical nature of the challenges ahead for achievement of future emissions limits, particularly for 2030 and 2035. It is therefore imperative that the Amended Rule 1135 include provisions that ensure that SCE and the SCAQMD conduct thorough technology assessments nearer in time to both the 2030 and 2035 compliance deadlines to ascertain the feasibility of meeting the proposed limits. These assessments will determine whether the deadlines can be met and whether they represent Best Available Retrofit Control Technology (BARCT) at those future dates. Furthermore, they may trigger additional rule development, if necessary. Along with the technology assessments, the Amended Rule should provide appropriate provisions for modifying/extending any of the deadlines listed in Table 1 for compliance where needed, based either on the outcome of the technology assessments or other factors outside SCE's control. Incorporating these modifications into the Pre-Preliminary Draft of the Proposed Amended Rule 1135 will ensure a sustainable framework within the Rule to achieve ongoing emissions reductions from PBGS for Catalina Island.

A-3

Specifically, SCE recommends the following additions/modifications to the Pre-Preliminary Draft:

- Five-year extensions and rule development initiation provisions like those in Section d(3)(B) should be added to allow sufficient technology maturation and adoption if the results of the technology assessments deem the 13 TPY and/or 6 TPY limits infeasible. A-4
- Separate technology assessments are needed for both the 13 TPY and 6 TPY limits. A-5
- The maximum time extension (for matters outside of SCE's control) should be increased from two years to up to five years. A-6
- The ability to request time extensions is needed for all emission limits and should be available for ALL extenuating circumstances outside of SCE's control (not only for construction and supply chain disruptions). A-7
- The minimum 2 megawatt (MW) cumulative rating is unnecessarily restrictive and should be removed. A-8
- Remove inclusion of emissions derived from "missing data procedures" (MDP) during period of unexpected Continuous Emissions Monitoring System (CEMS) downtime and allow SCE to use alternative emissions calculations. A-9
- Remove the requirement to remove diesel-fueled internal combustion engines (ICE) installed prior to final rule adoption by January 1, 2030. A-10

I. Pathways to Achieve Emission Targets

The challenges SCE and the SCAQMD must address when determining the feasibility of meeting the proposed limits by the specified deadlines include, but are not limited to, the following:

- PBGS would need to completely overhaul the current power generation profile within a compacted schedule to meet all emission limit deadlines.
- Grid stability must be constantly maintained to reliably serve Catalina residents and visitors with life-critical utilities.

A-11

- Inherent operational and grid stability limitations of inverter-based NZE/ZE technologies need to be overcome.
- Considering the unique island challenges and constraints referenced above, the optimization of Catalina's propane fuel for electric generation will depend on the resolution of SCE's current and future gas GRC proposals, and collaboration with key island stakeholders to protect public safety.
- Achieving 30% annual ZE energy generation remains highly speculative at present due to limited land availability and its impact on grid stability.
- SCE prefers to first secure cost recovery authorization from the California Public Utilities Commission, which can take significant time, before committing to required expenditures in equipment and construction costs.
- The proposed emission limits do not account for projected load growth, which can vary greatly depending on the future electrification plans on Catalina.

A-11 (Cont.)

SCE remains steadfast in its commitment to emissions reduction and clean energy. We wholeheartedly share the SCAQMD's urgency in reducing NOx emissions promptly. Assessing the feasibility of the proposed limits and deadlines requires consideration of multiple complex factors and is constrained by SCE's responsibility to ensure reliable and affordable utilities for Catalina residents and visitors. This section describes the potential pathways to achieve the proposed emission limits by the specified deadlines and includes sample generation scenarios at each target level (Table 2).

The feasibility of achieving the proposed emission limits of 13 TPY and 6 TPY is still highly speculative at present, as explained below. Therefore, SCE requests (as described in Section 2 below) that the rule provide compliance flexibility should the limits be deemed infeasible and not representative of BARCT upon completion of the proposed technology assessments, and/or in the event of other circumstances outside of SCE's control.

A-12

Table 2. *Potential Generation Profiles to Achieve Emission Limit Targets*

Facility Emissions	Deadline	Unit	Fuel Consumption (gal)	Output[2] (MWh)	Generation Distribution (%)	Projected NOx Emissions (TPY)
45 TPY	1/1/2027	New Diesel T4Fs	1,605,730	22,163	72%	16.4
		Older Diesel ICEs	674,252	7,571	25%	28.2
		Microturbines	208,689	1,053	3%	0.3
		Total	**2,488,671**	**30,787**	**100%**	**45**
30 TPY	1/1/2028	New Diesel T4Fs	1,958,207	27,028	88%	20.0
		Older Diesel ICEs	240,972	2,706	9%	10.1
		Microturbines	208,689	1,053	3%	0.3
		Total	**2,407,868**	**30,787**	**100%**	**30**
13 TPY	1/1/2030	New Diesel T4Fs	1,207,137	16,313	52%	12.0
		NZE	1,500,000	14,771	48%	0.5
		Total	**2,707,137**	**31,084**	**100%**	**13**
6 TPY	1/1/2035	New Diesel T4Fs	495,721	6,988	22%	5.2
		NZE	1,500,000	14,771	48%	0.5
		ZE	N/A	9,325	30%	0.0
		Total	**1,995,721**	**31,084**	**100%**	**6**

A-12 (Cont.)

[2] Generation output and corresponding emissions do not account for future load growth, which is expected to significantly increase over time.

A. A compacted schedule is required to meet emission reduction deadlines.

To achieve the proposed emissions limits by the required deadlines, SCE must undertake an extensive overhaul of the PBGS generation portfolio. Over the next decade, the facility will be in a constant state of flux, with various stages of planning and construction to incorporate the new generation assets. This leaves little room for delays in the supply chain or issues arising from the construction process. All existing generation assets, including the propane-fired microturbines and the six legacy diesel internal combustion engines (ICE), must be phased out to meet the proposed emission limits. These challenges are amplified by the need to provide uninterrupted life-critical utilities to Catalina residents and visitors, amidst rapid technological evolution.

To achieve the proposed 45 TPY NOx emission limit by 2027, SCE must replace at least two of its six existing diesel generators. SCE proposed starting with the replacement of Units 8 and 10 because those have the highest NOx emissions per MWh. SCE submitted the application for permits to replace these engines on April 20, 2021 with U.S. EPA Tier 4 Final-certified (T4F) units and is working diligently with SCAQMD staff to obtain the required Permit to Construct (PTC).[3] If the SCAQMD issues the PTC by December 2024, SCE anticipates completing the replacement of Units 8 and 10 by the end of 2026. Once the two new T4F units are online, SCE will use them as the new baseload units. This will reduce NOx emissions to 45 TPY, a substantial improvement compared to SCE's 2021-2023 NOx emissions range of 60 to 70 TPY. The execution plan is outlined in Figure 1 below.

SCE will procure and replace the third T4F unit (to replace Unit 15) after the SCAQMD issues the PTC. Once installed and operational, this third new T4F unit is expected to reduce facility-wide NOx emissions to 30 TPY. This estimate is based on the grid stability study's conclusion that nearly 90% of the load can be shifted to the three new T4F engines, as shown in Table 2 above. If the SCAQMD issues the PTC by December 2024 and no significant supply chain issues are encountered, it may be possible to complete the third engine replacement by the end of 2027 and fully optimizing all three new generators in 2028, as outlined in Figure 2. If the PTC is not issued within these timeframes, or there are other delays outside of SCE's control, SCE may need to request an extension of the compliance deadlines for the 45 TPY and/or the 30 TPY emission limit.

A-12 (Cont.)

Reducing emissions to 13 TPY and 6 TPY will be much more challenging than the first two stages because it will require a significant increase in use of NZE/ZE technologies, the feasibility of which remains speculative at this time (due to land scarcity and grid stability concerns). Significant changes to PBGS's current generation portfolio would be needed. Immediate challenges to making those changes include project construction/installation timelines, propane fuel constraints, and meeting grid stability requirements.

A-13

[3] This permit application also covers the replacement of Unit 15, which is described below. SCE has already procured the T4F units to replace Units 8 and 10, but not 15.

Because Catalina's isolated grid lacks any connections to the mainland, all facility upgrades must be performed in a specific sequence that ensures sufficient uninterrupted generation to satisfy the island's electrical demand constantly. To meet the 13 TPY limit, SCE would need to retire the aging propane-fired microturbines, replace them with new NZE technology, and increase propane use to at least 1.5 million gallons annually for electricity generation.[4] One generation configuration that could potentially meet the proposed limit is shown in Table 2. On average, SCE's current microturbines (load-following inverter-based resources) produce approximately 3% of the island's annual power production. However, at any given time, the island's electrical demand and online generation resources at PBGS determine the maximum contribution from the microturbines and is specifically related to maintaining grid stability. In contrast, use of propane-fired internal combustion engines (ICE), a more mature technology, could potentially help overcome the lack of grid stability provided by IBRs. Because of the grid stability limitations with IBRs, SCE believes that modeling emissions estimates using propane-fired ICE (instead of IBRs) is a more realistic approach to meet the SCAQMD's proposed NZE emissions limit of 0.07 lbs/MWh.

A-13 (Cont.)

To maintain reliable power continuously, the incorporation of NZE technology must occur in the following sequence to provide sufficient backup generation to the three new T4F diesel generators. The installation of the first NZE unit will provide sufficient generation capacity to allow ceasing operations and the eventual removal of the older, less-efficient backup non-T4F engines (Units 7, 12, and 14), which is a critical step in meeting the 13 TPY limit. Once the older units have been removed, SCE anticipates there may be sufficient space for a second NZE unit, which is necessary not only for adequate resource redundancy but to also allow increasing propane use to achieve further emission reductions. This must be carefully planned to accommodate the tight space constraints at PBGS. Figure 3 below depicts a projected timeline and task list for NZE installation that would be meet the 13 TPY limit by 2030.

If the SCAQMD issues a PTC for two propane-fired NZE generators to SCE by June 2027 and if SCE can (eventually) feasibly increase propane supply to 1.5 million gallons annually for power generation, it may be possible to meet the 13 TPY limit by 2032 if all conditions noted above occur as outlined (*see* Figure 3 below). SCE recognizes that the SCAQMD would prefer to accelerate the NZE installation process to bring the emission target forward to 2030. If electricity generation from 1.5 million gallons of propane annually proves to be feasible, SCE would be amenable to this target date provided the SCAQMD can shorten the permitting process to fewer than 24 months and with the assumption that no other circumstances beyond SCE's control (e.g., supply chain limitations) delay SCE from procuring and installing the NZE equipment. This must be addressed in the technology assessments that SCE recommends including in the rule.

A-14

[4] By this time, SCE would already have replaced Units 8, 10, and 15 with new T4F units to meet the 30 TPY limit by January 1, 2028.

Figure 1. *Projected Schedule for Replacement of Units 8 and 10*

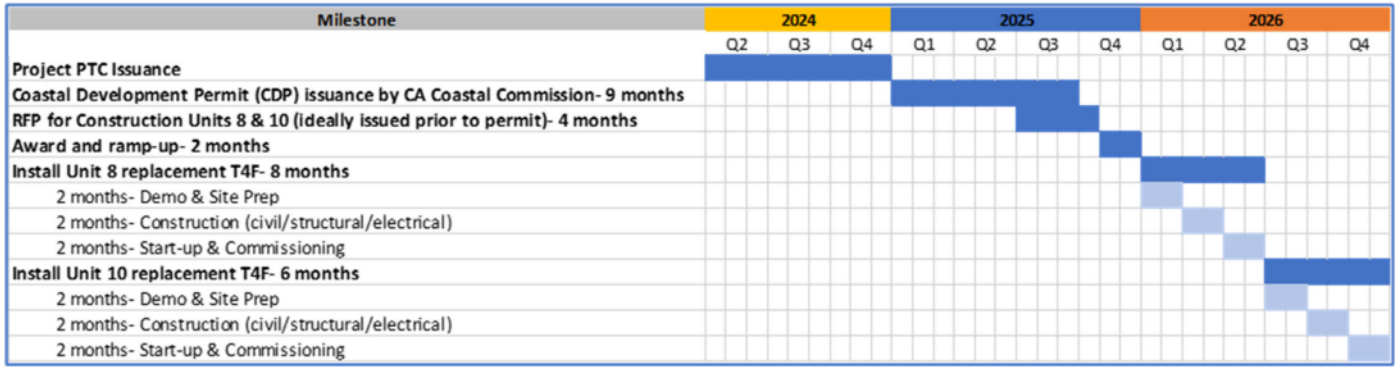
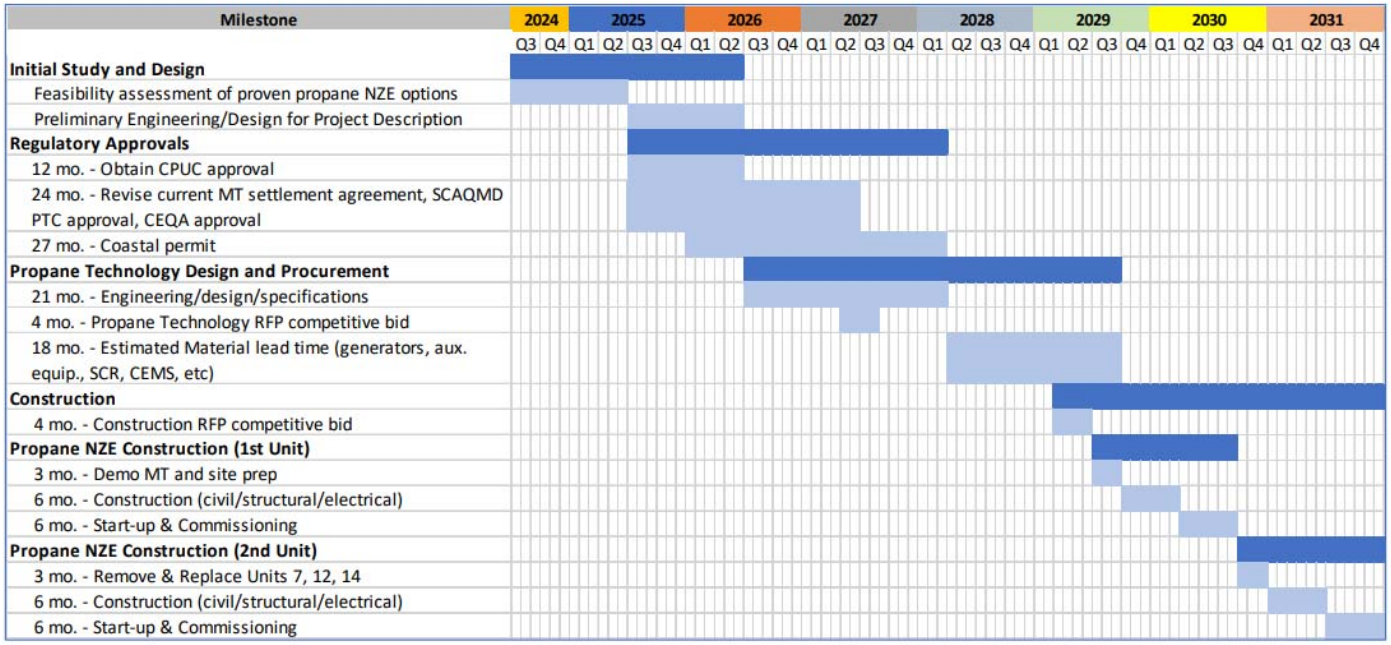


Figure 2. *Projected Schedule for Replacement of Unit 15*

A-14 (Cont.)

Figure 3. *Projected Timeline for NZE Installation*



A-14 (Cont.)

B. Further study is needed to determine whether Catalina's grid can accommodate increased NZE/ZE technology.

SCE has been grappling with the complexity of identifying a feasible generation configuration that would incorporate sufficient NZE/ZE technology to meet both the proposed emission limits and pass grid stability requirements, both currently and in the foreseeable future. As the exclusive provider of electricity, water, and gas for Catalina, SCE bears the responsibility of ensuring safe and reliable utility service to the island. Because Catalina's electrical distribution system is self-contained and isolated with no connections to the mainland's system, all electrical, water, and gas utility operations are entirely dependent on PBGS's electric power production. Given these circumstances, the electrical system's stability is of paramount importance for maintaining reliability. SCE and its consultants continue to study how NZE/ZE generation can successfully be integrated into the grid. Once there is a commercially available ZE/NZE product available, SCE's consultants will use manufacturer-specific technical details to model the product's contribution to grid stability, which must be a central element of the SCAQMD's feasibility assessment. SCE would greatly appreciate the SCAQMD's assistance in encouraging manufacturers to share this information with SCE once it becomes available.

In a small, isolated electrical system like Catalina, one factor critical to grid stability is whether generation resources can provide enough "short-circuit current." Without it, a grid's protective devices cannot function properly when a fault occurs, leading to outages. On the mainland, a myriad of generation sources can contribute short circuit current to the system. However, on Catalina, this safety net is missing. With its isolated generation portfolio and very long distribution circuits, the margin between normal condition load-serving current and short-circuit current is already at the lower end of the allowable range. Replacement of the traditional generation at PBGS with IBRs will further reduce this margin. To protect the island from compromised fault conditions, studies are needed to determine the maximum penetration of IBRs that can be accommodated before significant changes are made. Unlike traditional generation sources that can typically produce instantaneous short-circuit values of around 600% of the full-load rating of the machine, IBRs are commonly limited to values in the range of 120-150% of the inverter rating.[5]

A-15

In an electrical system during normal conditions, current flows from the generation source toward the load (the end user). Equipment is sized to ensure it can accommodate the amount of current flow under normal conditions and protective devices are installed along the path that can detect and isolate a portion of the path when a fault occurs. When a fault occurs, the amount of current flowing to the fault usually exceeds the amount of current during normal conditions. Protective devices (specifically those that operate on overcurrent) are set to operate only during fault

[5] Hadavi, S., Virtual Synchronous Generator Versus Synchronous Condensers: An Electromagnetic Transient Simulation-based Comparison, February 2022, Section 3.1 (pg. 11), available at https://cse.cigre.org/cse-n024/virtual-synchronous-generator-versus-synchronous-condensers-an-electromagnetic-transient-simulation-based-comparison.html.

conditions when the current flowing through them exceeds a certain value and for a certain duration. This value must be greater than the amount of current that flows during normal conditions or the protective device may be unable to distinguish between normal and fault conditions. This may cause the protective device to operate when it should not, causing a nuisance outage. Failing to clear a fault can result in a short circuit, with consequences far more serious than nuisance (including injury/death, fire, and equipment damage). The system operator must ensure that the difference between normal condition current flow and short-circuit current flow is large enough so that when a fault occurs, the protective device has the clear signal to operate and clear the fault quickly.

In an electrical system with traditional generation, the amount of steady state short-circuit current is commonly several times higher than the current that flows under normal conditions. These conditions allow protective devices to operate as intended without concern; however, with an increase in the penetration of IBRs (offsetting traditional generation), the steady state short-circuit current during a fault declines. Likewise, as the distance increases between the generation resources and where a fault occurs, the short-circuit current declines.

A protection coordination study evaluates all the protection devices on a section of a system such as a distribution circuit, or in this case, the entire Catalina electrical system. Each device is sized based on its location relative to the current passing through it under both normal conditions and fault conditions. Each device upstream from the fault (i.e., from the fault back toward the source of power) is coordinated with the others to minimize the number of customers affected. If the nearest device upstream from a fault is unable to detect the fault condition, it cannot clear it, so the next upstream device is now responsible to clear it. The fault will persist until an upstream device eventually detects and clears the fault. This increased fault duration presents a significant risk. The proper operation and coordination of a protection system is critical; it would be unacceptable if only a portion of the devices could operate properly. Thus, any proposed generation portfolio for Catalina that would produce inadequate short-circuit current and would result in improper operation of protective should be dismissed.

Maintaining grid stability will be paramount for maintaining the safety and reliability of Catalina's isolated grid as PBGS increases reliance on NZE/ZE technology for power generation. In studying ways to increase propane use and minimize emissions, SCE initially focused on replacing the aging microturbines with propane-fueled IBR technology. However, because IBRs produce significantly less short-circuit current during faults than ICE resources, and because they produce far less power per square foot of space required, SCE is now evaluating propane-fueled ICEs (i.e., reciprocating generators). SCE expects the performance of the propane-fueled ICEs to exceed that of any IBRs in both areas of consideration. However, there are still inherent limitations of propane ICEs which will need to be evaluated.

A-15 (Cont.)

C. SCE will continue to evaluate the feasibility of propane reciprocating engines.

Because IBRs inherently produce low values of short-circuit current during faults and have relatively low power output per square foot of space required, SCE is now conducting a

A-16

comprehensive evaluation of propane ICEs (reciprocating engines). The grid stability performance of propane ICEs is expected to exceed that of IBRs. One propane ICE manufacturer has asserted to SCE that its equipment could meet the NZE emissions limit of 0.07 lbs/MWh provided a selective catalytic reduction (SCR) is used, although no written guarantee has been provided. SCE continues to explore the options with the manufacturer (and will continue to seek other manufacturers).

Propane ICEs have inherent operational conditions and limitations that could pose challenges for reliable operation on an isolated grid like Catalina's. Because propane has a significantly higher fuel density than natural gas, it cannot be directly injected into the engine cylinders and must be conditioned before delivery into the combustion chamber. Furthermore, propane spark ignition otto-cycle engines have a slower response than the compression ignition diesel-cycle engines. This means that propane engines do not adjust to load increases reductions as readily as diesel engines. If the generators are unable to adjust quickly enough to follow the load demand, a mismatch between generation and load occurs, leading to grid instability and the potential for a collapse of the grid resulting in a blackout. Therefore, it is important to consider that propane ICEs may not be a reliable generation source to provide baseload power, and diesel generators may be necessary to provide baseload and stability to the grid. In other words, it might prove necessary to always maintain some amount of diesel generation online at a minimum load to provide support for propane ICEs.

A-16 (Cont.)

Although propane ICEs have significant limitations at this time to overcome for isolated grid integration, SCE believes that they are a viable option if the manufacturer can provide an emissions guarantee to meet the SCAQMD's proposed NZE emission limit. SCE will continue to explore this option.

D. Limitations on propane supply can potentially restrict NZE generation.

As shown in Table 2, SCE would have to incorporate NZE technology in a short time and increase annual propane usage for electricity generation to approximately 1.5 million gallons to meet the 13 TPY NOx emission target. Currently, SCE uses approximately 250,000 gallons of propane in a normal year for electricity generation (in years when the battery is unavailable, such as 2023, consumption is around 330,000 gallons). SCE's primary commitment is our obligation to ensure safe and reliable operations at Catalina. In addition, SCE is obligated to serve Catalina with critical utilities and must prioritize distribution of propane to gas customers at all times. Although SCE is resolute in its commitment to increasing propane-based electricity generation at PBGS to meet the necessary emission targets, these commitments to Catalina remain the highest priority. Therefore, the process of increasing propane deliveries up to the proposed volume will need to be vetted with all island stakeholders.

A-17

The City of Avalon's Fire Chief has expressed concerns with increasing propane throughput and cited the limited resources and personnel at Catalina in dealing with potential emergencies as an

underlying factor for these concerns. During subsequent meetings, the Fire Chief has communicated that the City of Avalon Fire Department would be comfortable increasing the propane deliveries to a maximum of three times per week. SCE is currently conducting an independent and comprehensive risk-analysis-based approach to help determine future propane delivery capabilities to PBGS. Preliminary estimates indicate that the maximum average number of propane deliveries is three per week, which is significantly below the estimated 1.5 million gallons for power generation needed to reach the proposed 13 TPY NOx limit. As previously mentioned, SCE must prioritize distribution of propane to gas customers at all times (approximately 650,000 gallons per year). Considering the unique island challenges and constraints referenced above, the optimization of Catalina's propane fuel for electric generation will depend on the resolution of SCE's current and future gas GRC proposals, and collaboration with key island stakeholders to protect public safety. If the necessary deliveries of propane cannot be achieved, the future BARCT assessments must reflect this. SCE is finalizing a detailed report and expects to share it with the SCAQMD in the next few weeks.

A-17 (Cont.)

E. No ZE option that can achieve 30% annual generation output (given Catalina's unique constraints) has been identified.

SCE has been diligently exploring options to maximize annual ZE generation from sources such as solar and wind. While SCE has not yet found a ZE option that can provide up to 30% of the island's annual generation output using the available land while also ensuring grid stability, it remains dedicated to this pursuit. SCE will work closely with the SCAQMD to evaluate and determine the appropriate ZE implementation timeframe through a feasibility study as technology matures and other implementation hurdles are overcome.

In a demonstration of its commitment to ZE, SCE launched the Catalina All-Source request for offers (RFO) on December 21, 2022. This RFO sought third-party bids for eligible renewable resources, standalone and paired energy storage, and demand response solutions, among other preferred resources. As an investor-owned utility, SCE adheres to the California Public Utilities Commission (CPUC)-approved least-cost best-fit resource selection framework, which is overseen by the CPUC and an independent evaluator for fairness, transparency, and compliance with stated RFO goals. The bid submission period closed on January 5, 2024, and SCE is currently in the process of assessing the bids. This multi-year process has not yet yielded any offers upon which SCE could rely to achieve 30% annual generation output from ZE resources. Unless and until there are sufficient options for developers to build solar PV projects on Catalina that can account for 30% of annual generation output, SCE will not be able to meet the 6 TPY limit. At this point, concluding that SCE can achieve at least 30% annual generation output with ZE is highly speculative, and thus, the SCAQMD's BARCT scenario is neither achievable nor appropriate on the proposed timeline. Current circumstances underscore the importance of future technology assessments to determine BARCT and corresponding compliance timing as compliance deadlines in the Amended Rule approach.

A-18

F. Securing cost recovery from the CPUC.

Investor-owned utilities like SCE pay for projects by petitioning the CPUC for approval for reimbursement, typically prior to any expenditures (a process known as "cost recovery"). In its General Rate Case (GRC) proceeding, a utility projects the next four years' worth of planned capital and maintenance spending. Sometimes, the utility uses a standalone application for certain projects. SCE had originally included the Catalina Repower project costs in its 2021 GRC request. The CPUC's Decision for the 2021 GRC ordered SCE to instead file a separate petition for recovery, which SCE did in October 2021. SCE and the two intervening parties (TURN and Cal Advocates) reached a settlement agreement[6] that was approved in 2022. To seek cost recovery of the new PBGS units, SCE will follow the process outlined in that settlement agreement (which is summarized below):[7]

Figure 4

Catalina Repower Project – Approval Phases and Cost Recovery Mechanism

Catalina Repower Project	Approval Process	Forum for Cost Recovery
Phase IA: Units 8 and 10 replacement with two new U.S. EPA Tier-4 Final Certified	Tier 2 Advice Letter	SCE proposes cost recovery of Catalina Repower Memorandum Account costs via Tier 3 Advice Letter.
Phase IB: Unit 15 replacement, retirement, or retrofitting	Tier 2 Advice Letter	Catalina Repower Memorandum Account in future cost recovery proceeding.
Phase 2: Clean Energy, All-Source RFO	Power purchase agreements with third parties secured through the Clean Energy All Source RFO will be approved via SCE's Energy Resource Recovery Account (ERRA) Review Application. If SCE needs any non-zero emissions generation (including utility owned generation), SCE must seek approval via an application.	Cost recovery for power purchase agreements with third parties secured through the Clean Energy All Source RFO will be secured via ERRA. Cost recovery for any non-zero emissions generation (including utility owned generation) will be secured via an application.

A-19

As indicated above, in its GRC, SCE proposed that the Commission approve cost recovery for the new Units 8 and 10 via a Tier 3 Advice Letter (instead of including it in a subsequent GRC proceeding).

[6] The April 2022 settlement agreement between TURN, SCE and Cal Advocates created a process for SCE to seek cost recovery of future clean-energy projects on Catalina. It is attached to the November 2022 order granting the parties' request to approve the settlement agreement and terminate the proceeding.

[7] *See* CPUC D.22-11-007, Decision Approving All-Party Settlement Agreement and Making Additional Findings, at § D(6) (Nov. 4, 2022) (available at https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=498295641).

G. The proposed emission limits do not account for future load growth.

SCAQMD's proposed emission limits are based on historical load for Catalina and do not account for projected load growth. The emission limits being proposed must account for the island's future load growth and failing to do so will adversely impact SCE's ability to meet the emission limits if electric consumption increases considerably. Therefore, SCE requests this be considered in the future technology assessments. It is important that any load growth forecast considers the potential adoption of electric marine vessels and harbor craft and potential electrification of Catalina resident's appliances and vehicles, which could significantly increase load growth in addition to reducing emissions for the air basin.

Load forecasting is inherently challenging, especially in the later years of a long-term horizon. The accuracy of the load forecast used to calculate future emissions is critical to understanding what emission values are achievable while ensuring grid stability. This reinforces the criticality of performing technology assessments with the most current load forecast then-available, prior to the 13 TPY and 6 TPY limits becoming effective to determine if the proposed limits will need to be adjusted and/or their timing extended. SCE strongly supports using the most current forecast at the time of the technology assessments to ensure the highest level of accuracy when determining feasibility of the proposed limits.

A-20

In summary, SCE remains committed to achieving the proposed NOx emission targets outlined in the Pre-Preliminary Draft. However, the ability to meet those limits, particularly13 TPY and 6 TPY, is highly speculative at this time due to the multitude of challenges described in this section. For these reasons, SCE is providing comments to the Pre-Preliminary Draft in the next section of this letter to ensure there is sufficient compliance flexibility available. This flexibility is critical because SCE cannot abrogate its duty to provide life-critical utilities to Catalina residents and visitors. Shutting down PBGS operations to remain compliant with limits deemed unattainable is not a viable option.

II. SCE Comments on Pre-Preliminary Draft Rule Language

As presented above in Section I, there are numerous challenges that must be overcome to achieve compliance with the proposed limits in the Pre-Preliminary Draft. There is much uncertainty at this time on whether the latter two limits of 13 TPY and 6 TPY can be feasibly met by the proposed deadlines, and for this reason it is critical for the SCAQMD to provide sufficient flexibility in the rule language to provide relief if the limits are deemed infeasible upon completion of the proposed technology assessments, or due to other circumstances beyond SCE's control. SCE urges the SCAQMD to apply the revisions presented below.

A-21

A. The language describing the proposed technology assessment should provide necessary relief if the limits are deemed infeasible.

Figure 5. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(3)*

(3) Technology Assessments for Electric Generating Units Located on Santa Catalina Island

By January 1, 2028, the Executive Officer shall conduct a technology assessment and report to the Governing Board if the NOx emission limits in clauses (d)(2)(E)(iii) and (d)(2)(E)(iv) represent BARCT.

(A) If the Executive Officer determines that the NOx emission limits specified in clauses (d)(2)(E)(iii) and (d)(2)(E)(iv) represent BARCT, the owner or operator of an electricity generating facility located on Santa Catalina Island shall meet the NOx limits specified in clauses (d)(2)(E)(iii) and (d)(2)(E)(iv) by the applicable compliance dates.

(B) If the technology assessment specified in this paragraph demonstrates that more stringent BARCT requirements are applicable, the Executive Officer shall initiate rule development for the implementation schedule of the more stringent BARCT requirements within six months after the technology assessment.

A-22

Proposed Section (d)(3) would require a technology assessment by January 1, 2028 to determine whether the 13 TPY and 6 TPY limits are feasible and represent BARCT. If the assessment supports a stricter BARCT requirement, the SCAQMD would be required to initiate rule development to achieve it. However, there is no provision for relaxing the 13 TPY and 6 TPY limits or adjusting their timing if the technology assessment demonstrates they are infeasible and therefore do not represent BARCT in 2030 and 2035, respectively. Such a provision is critical and must be added; given the substantial potential impacts and need for a clear and sustainable framework in the rule, the SCAQMD must provide for more than the default relief (seeking a variance before the Hearing Board). Specifically, SCE recommends the rule include a five-year extension of the proposed 13 TPY and 6 TPY limit deadlines if a technology assessment finds the limits do not represent BARCT, to allow for technology maturation and adoption. SCE believes a five-year period is appropriate to allow for such advancement and reassessment.

Furthermore, the rule should incorporate two separate technology assessments: one each for the 13 TPY and 6 TPY NOx limits. A separate technology assessment is critical for the final BARCT limit of 6 TPY due to the highly speculative nature of meeting the proposed limit at the present time, even if and when the 13 TPY limit is met. As previously described, meeting the final BARCT limit would require a complete overhaul of PBGS's current generation profile within an extremely compressed timeline. In addition, meeting the limit would require increasing the available land as

well as development of ZE technology that can provide up to 30 percent of total generation output while maintaining grid stability. Finally, performing an additional assessment closer to the final 6 TPY deadline will ensure an accurate load forecast has been accounted for in understanding the limit's feasibility. SCE remains committed to meeting the proposed 2035 deadline, but an additional separate technology assessment for the 6 TPY limit (to be completed by January 1, 2033) should be added to the proposed rule language to ensure feasibility has been evaluated based on updated future conditions and technology.

SCE's Proposed Revisions

SCE respectfully requests that the SCAQMD revise the draft proposed rule as follows. SCE's proposed modifications to the June 13, 2024 language are shown in **bold underlined** text and deletions are shown in ~~**bold strikethrough**~~ text:

(d) (3) Technology Assessments for Electric Generating Units Located on Santa Catalina Island

(A) By January 1, 2028, the Executive Officer shall conduct a technology assessment **(including assessment of technology availability and island-specific grid stability factors)** and report to the Governing Board if the NOx emission limit**s** in clause**s** (d)(2)(E)(iii) ~~**and (d)(2)(E)(iv)**~~ represent**s** BARCT.

(i) ~~**(A)**~~ If the Executive Officer determines that the NOx emission limit**s** specified in clause**s** (d)(2)(E)(iii) ~~**and (d)(2)(E)(iv)**~~ represent**s** BARCT, the owner or operator of an electricity generating facility located on Santa Catalina Island shall meet the NOx limit**s** specified in clauses (d)(2)(E)(iii) ~~**and (d)(2)(E)(iv)**~~ by the applicable compliance date**s**.

(ii) ~~**(B)**~~ If the technology assessment specified in this paragraph demonstrates that more stringent BARCT requirements are applicable, the Executive Officer shall initiate rule development for the implementation schedule of the more stringent BARCT requirements within six months after the technology assessment.

(iii) If the technology assessment(s) specified in this paragraph demonstrates that the NOx emission limit in clause (d)(2)(E)(iii) does not represent BARCT, the implementation schedule for paragraph (d)(2)(E)(iii) shall be automatically extended by five years and the Executive Officer may, if deemed necessary, initiate rule development for the implementation schedule of less stringent BARCT requirements within six months after the technology assessment.

(B) By January 1, 2033, the Executive Officer shall conduct a technology assessment (including assessment of technology availability and island-specific grid stability factors) and report to the Governing Board if the NOx emission limits in clause (d)(2)(E)(iv) represents BARCT.

A-22 (Cont.)

(i) If the Executive Officer determines that the NOx emission limit specified in clause (d)(2)(E)(iv) represents BARCT, the owner or operator of an electricity generating facility located on Santa Catalina Island shall meet the NOx limits specified in clause (d)(2)(E)(iv) by the applicable compliance dates.

(ii) If the technology assessment specified in this paragraph demonstrates that more stringent BARCT requirements are applicable, the Executive Officer shall initiate rule development for the implementation schedule of the more stringent BARCT requirements within six months after the technology assessment.

(iii) If the technology assessment specified in this paragraph demonstrates that the NOx emission limit in clause (d)(2)(E)(iv) does not represent BARCT, the implementation schedule for paragraph (d)(2)(E)(iv) shall be automatically extended by five years and the Executive Officer may, if deemed necessary, initiate rule development for the implementation schedule of less stringent BARCT requirements within six months after the technology assessment.

A-22 (Cont.)

B. The NZE/ZE combined rating requirement unnecessarily constrains SCE's ability to achieve the required emission limits.

Figure 6. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(D)*

(D) Install Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units by January 1, 2030 with a minimum cumulative rating of 2 MW, excluding:

(i) The highest rated Santa Catalina Island NZE electric generating unit and/or Santa Catalina Island ZE electric generating unit;

(ii) Solar photovoltaic cells; and

(iii) Battery storage;

A-23

Proposed Section (d)(2)(D) would require installation of NZE/ZE electric generating units with a minimum cumulative rating of 2 MW at PBGS (excluding the highest-rated NZE/ZE electric generating unit, solar photovoltaic cells, and battery storage). SCE believes the cumulative rating requirement unnecessarily restricts its ability to achieve the required emission limits. The selection of NZE/ZE will be primarily driven by the need in meeting the proposed emission limits, while taking into consideration the space constraints at PBGS and the multiple variables described previously including the critical need of maintaining grid stability on Catalina's isolated grid. In the hypothetical case that only two 1.8 MW NZE units could be deployed within the limited PBGS footprint, compliance with the proposed emission limits can be achieved by baseloading both units

to operate simultaneously during high demand periods, if grid stability can be maintained while doing so. However, SCE would not be able to meet the minimum rating requirement (which has no independent benefit once the emission limit is met).

The SCAQMD's Energy Policy[8] states that it is the Governing Board's long-standing policy to be technology neutral and that any form of energy will be allowed in meeting the specified emission limits. By imposing a minimum rating requirement for specific technologies at PBGS, the SCAQMD would be flouting this policy. A rating requirement is irrelevant in this case because the emission limits are what ultimately drive compliance. SCE believes the proposed emission limits are sufficient to drive the reduction targets the SCAQMD is seeking to achieve. Providing flexibility for SCE to strategize and determine the right technology mixture without unnecessary hurdles would afford SCE the optimal foundation for meeting the proposed targets.

SCE's Proposed Revisions

SCE respectfully requests that the SCAQMD revise the draft proposed rule as follows. SCE's proposed modifications to the June 13, 2024 language are shown in **bold underlined** text and deletions are shown in ~~**bold strikethrough**~~ text:

A-23 (Cont.)

Section (d)(2)(D):

> (D) Install Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units by January 1, 2030. ~~**with a minimum cumulative rating of 2 MW, excluding**~~:
>
> ~~**(i) The highest rated Santa Catalina Island NZE electric generating unit and/or Santa Catalina Island ZE electric generating unit;**~~
>
> ~~**(ii) Solar photovoltaic cells; and**~~
>
> ~~**(iii) Battery storage;**~~

[8] South Coast AQMD, AQMD Air Quality-Related Energy Policy, available at https://www.aqmd.gov/docs/default-source/planning/Greenhouse-Gases/board-approved-energy-policy-090911.pdf?sfvrsn=6

C. The proposed time extension should be modified to provide critical and appropriate compliance flexibility.

Figure 7. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(5)(A)*

(45) Time Extension

(A) The owner or operator of an electricity generating facility on Santa Catalina Island may submit a request to the Executive Officer for a time extension of up to ~~three~~two years to meet the mass emission ~~limit~~limits specified in ~~subparagraph (d)(2)(D)~~ clauses (d)(2)(E)(iii) and (d)(2)(E)(iv) provided the owner or operator:

(i) Submits the request to the Executive Officer at least 365 days before the compliance ~~deadline~~deadlines specified in ~~subparagraph (d)(2)(D)~~ clauses (d)(2)(E)(iii) and (d)(2)(E)(iv); and

(ii) The request includes:

(~~A~~I) Identification of the electric generating units for which a time extension is needed;

(~~B~~II) The reason(s) a time extension is needed;

(~~C~~III) Progress of replacing or retrofitting the electric generating units;

(~~D~~IV) A description of the technology or technologies that will be used to achieve the mass emission limit; and

(~~E~~V) The length of time requested.

A-24

Proposed Section (d)(5)(A) includes time extensions of up to two years to meet the mass emission limits of 13 TPY and 6 TPY by 2030 and 2035, respectively. The extension should be expanded to include all limits being proposed under Table 2 of PAR 1135(d)(2)(E), as well as including a potential extension of the diesel ICE ban proposed under PAR 1135(d)(2)(B) and PAR 1135(d)(2)(C) if needed, to address any delays in the construction/procurement timeline or regulatory approvals, including issuance of the required PTC, that are outside of SCE's control. As set forth in Section I of this letter, SCE faces challenges of executing a compacted schedule to install the two T4F engines currently in storage, in addition to procurement of the third T4F engine to replace Unit 15. The procurement of the third engine will begin after the expected issuance of the PTC by the end of this calendar year. Extenuating circumstances outside of SCE's control could cause potential delays in achieving any of the limits in Table 2, and time extensions would provide critical compliance relief as needed.

The maximum extension time frame should be increased from two years to up to five years. The previous rule language allowed an extension for up to three years. Compliance with the latter two proposed NOx limits remains speculative at this time; it will require grid stability improvements of NZE/ZE technologies, significant increases in propane use for power generation, acquisition of numerous agency/stakeholder approvals, among other things, as described in Section I. All these factors can potentially lead to the need for an extension with a longer time frame than the currently proposed two years. The extension would only be granted at the SCAQMD's discretion, so SCE would need to clearly justify the length of any extension requests.

Figure 8. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(5)(B)*

(45) (B) (i) The owner or operator prepared the request for a time extension in compliance with subparagraph (d)(45)(A); and

(ii) The owner or operator provided sufficient details identifying the reason(s) a time extension is needed that demonstrates to the Executive Officer that there are extenuating circumstances due to unforeseen construction interruptions and/or supply chain disruptions that necessitate additional time to complete implementation. ~~Such a demonstration may include, but is not limited to, providing detailed schedules, engineering designs, construction plans, land acquisition contracts, permit applications, and purchase orders.~~

(C) If the Executive Officer approves the request for a time extension, the owner or operator shall pay a mitigation fee within 30 days of the date of approval. The mitigation fee shall be $100,000/year, or any portion of a year, after the compliance date specified in ~~subparagraph (d)(2)(D)~~ clauses (d)(2)(E)(iii) and (d)(2)(E)(iv).

A-24 (Cont.)

Proposed Section (d)(5)(B) would narrowly limit the circumstances in which an extension may be granted to unforeseen construction interruptions and/or supply chain disruptions. However, there are a multitude of extenuating circumstances beyond SCE's control that could arise which would require an extension besides construction and supply chain disruptions, such as permitting delays. The currently operative Rule 1135 properly provides a broader, non-exclusive list of examples issues that can form the basis of an extension request:

Figure 9. *Current Rule 1135: Section (d)(4)(B)(i)*

(d)	(4)	(B)	(i)	The owner or operator prepared the request for a time extension in compliance with subparagraph (d)(4)(A); and
			(ii)	The owner or operator provided sufficient details identifying the reason(s) a time extension is needed that demonstrates to the Executive Officer that there are extenuating circumstances that necessitate additional time to complete implementation. Such a demonstration may include, but is not limited to, providing detailed schedules, engineering designs, construction plans, land acquisition contracts, permit applications, and purchase orders.
		(C)		If the Executive Officer approves the request for a time extension, the owner or operator shall pay a mitigation fee within 30 days of the date of approval. The mitigation fee shall be $100,000/year, or any portion of a year, after the compliance date specified in subparagraph (d)(2)(D).

Instead of the new proposed draft language, SCE recommends the SCAQMD retain the existing language from the current rule section (d)(4)(B)(ii) which contains a non-exclusive list of circumstances outside SCE's control. [9] As commented previously in Subsection A, the proposed language does not allow the SCAQMD to initiate rule development for scenarios where the 13 TPY and 6 TPY limits are deemed infeasible upon completion of the technology assessment. If the SCAQMD does not initiate rule development to either increase the NOx limit or move the implementation deadline to a later date based on the results of the technology assessment, it is critical for the SCAQMD to allow extensions to provide compliance relief for other extenuating circumstances outside SCE's control.

A-24 (Cont.)

SCE's Proposed Revisions

SCE respectfully requests that the SCAQMD revise the draft proposed rule as follows. SCE's proposed modifications to the June 13, 2024 language are shown in **bold underlined** text and deletions are shown in ~~**bold strikethrough**~~ text:

(d) (5) Time Extension

(A) The owner or operator of an electricity generating facility on Santa Catalina Island may submit a request to the Executive Officer for a time extension of up to **five** ~~**two**~~ years to meet the mass emission limits specified in **Table 2 of clause (d)(2)(E) or the prohibition in clause (d)(2)(B)** ~~**clauses (d)(2)(E)(iii) and (d)(2)(E)(iv),**~~ provided the owner or operator:

[9] The current version of Rule 1135 is available at https://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1135.pdf?sfvrsn=4.

(i) Submits the request to the Executive Officer at least 365 days before the compliance deadlines specified in **Table 2 of** clause~~s~~ **(d)(2)(E) and/or clause (d)(2)(B)** ~~**(d)(2)(E)(iii) and (d)(2)(E)(iv)**~~; and

(ii) The request includes:

(I) Identification of the electric generating units for which a time extension is needed;

(II) The reason(s) a time extension is needed;

(III) Progress of replacing or retrofitting the electric generating units;

(IV) A description of the technology or technologies that will be used to achieve the mass emission limit; and

(V) The length of time requested.

A-24 (Cont.)

(B) The Executive Officer will approve or disapprove the request for a time extension. Approval or disapproval will be based on the following criteria:

(i) The owner or operator prepared the request for a time extension in compliance with subparagraph (d)(5)(A); and

(ii) The owner or operator provided sufficient details identifying the reason(s) a time extension is needed that demonstrates to the Executive Officer that there are extenuating circumstances **that necessitate additional time to complete implementation.** ~~**due to unforeseen construction interruptions and/or supply chain disruptions that necessitate additional time to complete implementation.**~~ **Such a demonstration may include, but is not limited to, providing detailed schedules, engineering designs, construction plans, land acquisition contracts, permit applications, and purchase orders.**

D. The requirement to include emissions derived from missing data substitution for CEMS monitoring when determining compliance with annual limits should be removed.

Figure 9. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(E)*

(~~C~~E)	~~By January 1, 2025, meet a~~Meet the annual NOx mass emission ~~limit~~limits specified in Table 2: Emission Limits for Electric Generating Units Located on Santa Catalina Island ~~from~~for all electric generating units ~~of 45 tons of NOx annually~~, including mass emissions from startups and shutdowns, and missing data substitutions pursuant to South Coast AQMD Rule 218.3 – Continuous Emission Monitoring System: Performance Specifications (Rule 218.3) and South Coast AQMD Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions (Rule 2012); and

A-25

Proposed Section (d)(2)(E) would require inclusion of emissions derived from "missing data" procedures (MDP) during periods of unexpected CEMS downtime to be included when determining compliance with the annual emissions limit. SCE recommends removal of this requirement. MDP substitutions are unduly punitive and artificially elevate NOx emissions -- sometimes to the extent that the MDP-substituted emissions for a portion of the year exceed the total annual actual emissions for the facility. For example, a CEMS unit could be accurately recording emissions but a late Remote Terminal Unit (RTU) transmission to the SCAQMD could trigger substitute data, which would not be reflective of the facility's "true" emissions. Especially in the case of late RTU transmissions, SCE believes that actual CEMS data should be used in determining compliance.

This will be especially significant as the facility limit is lowered. SCE agrees these emissions should be counted in other circumstances (e.g., annual emissions reports and associated fees), but not toward the rule's annual compliance determination. There is simply not much leeway at these lower limits to incorporate artificially high substitute data. Instead, SCE recommends an "alternative emissions calculation" method that would require SCAQMD approval prior to quantification for determining compliance with the annual emissions limit. SCE believes this would be more representative of actual emissions and would provide sufficient safeguards within the context of the more stringent limits proposed in this rule.

E. Requiring the removal of legacy ICEs is premature and unnecessary.

Figure 10. *Pre-Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(F)*

(~~DF~~)	~~On and after January 1, 2026, meet a mass emission limit from all electric generating units of 13 tons of NOx annually, including mass emissions from startups and shutdowns.~~ Remove all prime power diesel internal combustion engines for which installation was completed earlier than [*Date of Adoption*] from service by January 1, 2030.

Proposed Section (d)(2)(F) would require the removal, by January 1, 2030, of prime power diesel ICE units that were installed prior to the Rule 1135 amendment adoption. SCE opposes this requirement. The eventual removal of the engines should be ultimately determined by SCE's rigorous grid stability analyses and our ability to introduce NZE/ZE technology into PBGS's generation profile. Our commitment to grid stability and safety is unwavering. We are actively exploring innovative solutions to transition towards cleaner energy sources while ensuring that SCE can continue to provide life-critical utilities safely. SCE anticipates meeting the proposed 13 TPY and 6 TPY emission limits would require minimal operation of diesel ICE and that their removal may be needed to allow sufficient space for the NZE/ZE units. However, until appropriate models are commercially available and validated through SCE grid stability analyses, requiring removal of the existing ICEs is unnecessarily restrictive. SCE requests that Proposed Section (d)(2)(F) be stricken from the Amended Rule.

A-26

SCE's Proposed Revisions

SCE respectfully requests that the SCAQMD revise the draft proposed rule as follows. SCE's proposed modifications to the June 13, 2024 language are shown in **bold underlined** text and deletions are shown in ~~**bold strikethrough**~~ text:

~~**(d)(2)(F) Remove all prime power diesel internal combustion engines for which installation was completed earlier than *[Date of Adoption]* from service by January 1, 2030.**~~

III. Conclusion

SCE is committed to finding a solution that balances reducing PBGS's emissions footprint with the need to provide uninterrupted life-critical utilities to Catalina. We see these challenges not just as obstacles but as opportunities for us to innovate and find solutions together. SCE is aligned with the SCAQMD's emission reduction goals but we will need to work closely together to overcome a multitude of challenges to meet the proposed limits by the proposed deadlines. For that reason,

A-27

the final rule must provide relief from the proposed limits if the technology assessment(s) finds them to be unreasonable and therefore not BARCT.

SCE appreciates the SCAQMD's substantial efforts to amend Rule 1135 and the opportunity to collaborate with the SCAQMD to bring alternative, cleaner power generation solutions to Catalina. Please feel free to contact Yung Chung, Senior Air Quality Advisor, with any questions or concerns at (626) 613-2821 or Yung.Chung@sce.com.

A-27 (Cont.)

Sincerely,

DocuSigned by:
Anthony Hernandez
0E235977344E47B...

Anthony Hernandez, SCE
Director of Catalina Operations & Strategy
Southern California Edison

CC: Michael Morris, SCAQMD
Isabelle Shine, SCAQMD
Yung Chung, SCE
Bethmarie Quiambao, SCE

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Envelope Summary Events	Status	Timestamps
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Certified Delivered	Security Checked	7/3/2024 3:27:01 PM
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Response to Comment A-1
Staff appreciates Southern California Edison's commitment to working on a viable pathway toward a cleaner energy future at the Pebbly Beach Generating Station.

Response to Comment A-2
Staff has included consideration of the island's unique geography, isolated grid, grid stability, lack of fueling infrastructure, space constraints, the need to remain fully operable during equipment replacement, and the critical role Pebbly Beach Generating Station has on the well-being of the Santa Catalina Island community. Those considerations are incorporated into the BARCT assessment, the final proposed emission limits, and the provisions allowing additional flexibility.

Response to Comment A-3
Feasibility analyses are included for the 2030 and 2035 emission limits. The feasibility analyses will be conducted two years before the implementation dates (2028 and 2033 respectively) and will identify the electric generating units under consideration, the progress in procuring and installing the electric generating units, a description of how those units would achieve the emission limits, and, if applicable, the length of time of up to three years for an extension to the implementation date. The owner or operator will conduct the feasibility analyses to determine if the proposed emission limits in clause (d)(2)(E)(iv) can be met by the compliance date. The feasibility analyses will not determine if the limits represent BARCT.

Response to Comment A-4
See Response to Comment No. A-3. Extension may be granted for up to three years but does not include rule development initiation provisions.

Response to Comment A-5
See Response to Comment No. A-3. Separate feasibility analyses are included for both the 13 tpy and 6 tpy limits to allow additional time up to three years to meet the proposed limits.

Response to Comment A-6
The maximum time extension for extenuating circumstances has been extended from two years to three years and is applicable to all compliance dates.

Response to Comment A-7
The extenuating circumstances that demonstrate the need for a time extension are limited to unforeseen construction interruptions and/or supply chain disruptions. The variance process to provide relief from South Coast AQMD regulations is available to address extenuating circumstances beyond those reasons provided in the proposed rule.

Response to Comment A-8
A minimum 1.8 MW cumulative prime power output backup provision was added to ensure that a minimum amount of Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units are installed. Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units will need to provide approximately 75 percent of the power at the electricity generating facility located on Santa Catalina Island to meet the final proposed NOx limit of 6 tons per year (tpy). Throughout the rule development

process, it was expressed that three Tier 4 Final diesel engines are necessary to provide redundancy during maintenance and unplanned outages. Similarly, backup Santa Catalina Island NZE electric generating units and/or Santa Catalina Island ZE electric generating units are necessary to provide sufficient power during maintenance and unplanned outages to meet the final proposed NOx limit as well as minimize the use of diesel engines.

Response to Comment A-9
The proposed rule includes other approved missing data substitutions as approved by the Executive Officer.

Response to Comment A-10
Removal of the legacy engines installed prior to the adoption date of the rule is necessary due to the space constraints of the facility. Without removal of the engines, there is insufficient space to install cleaner energy equipment. Space limitations are a significant challenge for installing ZE and/or NZE technologies and was taken into consideration during the BARCT assessment. The BARCT analysis assumed that three of the six existing diesel engines that will not be replaced with Tier 4 Final diesel engines and all existing microturbines could be removed to install ZE and/or NZE technologies for power generation. If the legacy engines are not removed, then the space available is the microturbine pad which would reduce the space available to half or less.

Response to Comment A-11
See Response to Comment A-2. Staff acknowledges the challenges when determining the feasibility of meeting the proposed limits. Staff agrees that there is a need to overhaul the current power generation profile that relies on diesel engines installed in the previous century. Grid stability must be maintained when examining modern technologies to provide life-critical utilities. The proposed facility-wide emission caps provide added flexibility for Southern California Edison to determine which technologies best suit the situation. The proposed rule is technology neutral and does not specify technologies to be installed. The proposed emission limits account for the maximum peak load with population growth. Further load growth could be met with NZE and ZE technologies. South Coast AQMD does not consider securing cost recovery authorization from the California Public Utilities Commission to be a sufficient reason for delay.

Response to Comment A-12
Staff appreciates the sample generation scenarios provided to achieve the proposed emission limits by the specified deadlines. The proposed rule provides the opportunity for Southern California Edison to conduct feasibility analyses to determine if the specified deadlines can be achieved. Time extensions are available in the event of extenuating circumstances such as supply chain issues, permit delays, or construction interruptions. However, the feasibility analyses and extensions do not review the BARCT assessment or the proposed emission limits.

Response to Comment A-13
Staff agrees that reducing emissions to 13 TPY and 6 TPY may present challenges and has provided opportunities to request additional time to meet the proposed limits through feasibility analyses and extensions for extenuating circumstances to address construction/installation timelines and grid stability requirements. The very limited current use (approximately 3 percent of power generation) of aged microturbines provide an ideal opportunity to begin installation of NZE

equipment, in parallel with the installation of new diesel engines. The proposed emissions limits are technology and Southern California Edison is free to pursue propane-fired internal combustion engines to meet NZE requirements.

Response to Comment A-14
Staff agrees that the removal of legacy engines must occur sequentially with the installation of NZE technology. Staff disagrees that it would take five years from permit issuance to install NZE technology. As noted earlier, the microturbines could easily be removed with minimal impact on power generation. The space made available could accommodate NZE equipment without removing a legacy diesel engine. With the installation of NZE equipment on the microturbine pad, it would facilitate the removal of the legacy diesel engines as more power output is readily available. See Response to Comment A-3 and A-12 with respect to feasibility analyses and time extensions.

Response to Comment A-15
Southern California Edison conducted a grid stability analysis as part of the BARCT assessment and found NZE and ZE technologies that were stable.[1] Staff disagrees that there are not commercially available ZE/NZE products available. Staff is aware of the challenges of providing power to Santa Catalina Island and has included provisions in the proposed rule to accommodate these challenges (see Response to Comment A-2). Operating power grids with high levels of inverter based resources have already been demonstrated on King Island in Australia, El Hierro in Spain, Kaua'I in Hawaii, and Maui in Hawaii[2]. The most comparable to Santa Catalina Island is El Hierro with a daily peak of 7 MW and a valley of 4 MW. Inverter based resources provide 100 percent of instantaneous power and 80 percent of overall power.[3] The proposed rule is technology neutral and does not require the use of inverter based resources. However, it is clear that high levels of inverter based resources have been demonstrated on island grids and are commercially available.

Response to Comment A-16
The proposed rule is technology neutral and the use of propane fueled ZE/NZE equipment is allowed. The proposed emission limit would enable the facility to maintain some amount (approximately 20 percent) of power generation through the use of diesel engines to provide support for propane fueled ZE/NZE equipment and/or inverter based resources.

Response to Comment A-17
The proposed emission limit includes continued use of propane for gas customers. Staff evaluated the number of barge trips and propane storage capacity. Because diesel deliveries are reduced as propane deliveries increase, the total number of barge trips are similar. The current propane storage capacity is sufficient to supply both the gas customers and the increased fuel for ZE/NZE

1 Southern California Edison, Catalina Island Final Grid Stability Study, 09/29/2023 https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1135/sce-to-scaqmd-with-final-grid-stability-sudy-(9-29-23).pdf?sfvrsn=16

2 National Renewable Energy Laboratory, Introduction to Grid Forming Inverters, June 2024 https://www.nrel.gov/docs/fy24osti/90256.pdf

3 N.Taveira, J. Palomares, E. Quitman, ENERCON GmbH, The Hybrid Power Plant in El Hierro Island: Facts and Challenges from the Wind Farm Perspective https://hybridpowersystems.org/wp-content/uploads/sites/9/2018/05/1_3_TENE18_046_paper_Taveira_Nuno.pdf

equipment. Staff requested guidance from the City of Avalon Fire Department regarding propane fuel storage and fuel delivery. The City of Avalon Fire Department was clear that additional fuel storage was not possible due to National Fire Protection Association standards. However, the fire department has not stated any disapproval of increase propane deliveries.[4]

Response to Comment A-18
The proposed rule is technology neutral and does not require the use of ZE equipment. However, staff has identified several ZE technologies, including solar and fuel cells, that could be utilized to provide power. Southern California Edison's grid stability study determined that 30 percent of power could be supplied with solar successfully. There continue to be challenges to procure land and addressing land use concerns for solar power generation. The use of fuel cells would not have those challenges, are stackable, and could easily fit in the footprint of the PBGS site. Southern California Edison is open to continue to pursue technologies in a process consistent with California Public Utilities Commission for procurement but delays in securing cost recovery authorization from the California Public Utilities Commission is not a sufficient reason for delay.

Response to Comment A-19
Southern California Edison is open to continue to pursue technologies in a process consistent with California Public Utilities Commission for procurement but delays in securing cost recovery authorization from the California Public Utilities Commission is not a sufficient reason for delay.

Response to Comment A-20
The proposed emission limits will accommodate projected load growth associated with population growth. If and when load growth associated with electric marine vessels and harbor craft, and electrification of residential appliances and vehicles occurs, a future BARCT assessment can occur within the rule development framework. See Response to Comment A-3.

Response to Comment A-21
Staff appreciates Southern California Edison's comments on proposed rule language and commitment to working on a viable pathway toward a cleaner energy future at the Pebbly Beach Generating Station.

Response to Comment A-22
See Response to Comment A-3, A-4, and A-5.

Response to Comment A-23
See Response to Comment A-8.

Response to Comment A-24
See Response to Comment A-6 and A-7.

Response to Comment A-25
See Response to Comment A-9.

[4] Southern California Edison, SUBJECT: Proposed Amendments to Rule 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, January 3, 2024 https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1135/202401_sce-pbgs-propane-availability.pdf?sfvrsn=6

Response to Comment A-26
See Response to Comment A-10.

Response to Comment A-27
Staff appreciates Southern California Edison's commitment to working on a viable pathway toward a cleaner energy future at the Pebbly Beach Generating Station. See Response to Comment A-3.

Comment Letter B: Mark Abramowitz, Community Environmental Services

Thank you for the opportunity to comment on the proposed amendments to PAR 1135, relating to emissions from power production on Catalina Island.

Currently, the Pebbly Beach Generating Station emits more than 10% of all NOx in the District for power production, and is also subject to provisions of an Order for Abatement by the District's Hearing Board, due to violations of the District's toxics rules. It is also upwind of virtually the entire District.

After public concerns about the failure of proposed amendments to proposed amended Rule 1135 to reflect required Best Available Retrofit Control Technology (BARCT) requirements, the last rule amendment was adopted in 2022, with three important provisions, not including those that weakened the requirements for Catalina island.

First, after January of this year, no new diesels were allowed. That date has passed, and District rules no longer allow permits for new diesel engines at the site for power production. Yet District staff has now proposed going back in time and allowing new diesel engines when alternatives are available. This backsliding appears inconsistent with the subsequently adopted AQMP, as well as anti-backsliding requirements. And a one year delay in adopting a new rule will result in a four year delay in eliminating the installation of new diesel engines on Catalina Island. This raises a real question of whether the rule should remain as is.

Lastly, it is of great concern that in the face of zero emission technologies that can replace diesel engines, the District seems to be indicating that it will violate its responsibility to ensure that federal LAER and state major source BACT requirements are met in issuing any permits. Compliance with these requirement will result in zero emission technology engines instead of diesel engines.

B-1

Second, staff was to return to the Board ASAP after performing an updated BARCT assessment focusing on zero emission and near-zero emission technologies.

This BARCT analysis was performed, and completed over a year ago. Indeed, staff's analysis was consistent with the prior public comments that there were feasible zero emission technologies. District staff workshopped and was ready to return to the Board with new amendments reflecting BARCT. These amendments would have resulted in massive emission reductions of diesel particulate matter and NOx at the site.

But at the request of Southern California Edison, the rule was delayed so that Edison could perform a grid stability assessment. The request appears to have been just a delaying or avoidance tactic, as the assessment performed didn't even consider the range of options focusing on zero emission technologies that the BARCT analysis was to address. There was additional delay as Edison performed a further limited assessment.

And because zero emission technologies can rely on what are called "inverter-based" technologies (which are used in microgrids), the results of their analysis was pre-determined, as Edison has raised objections to relying on inverter-based technologies. Indeed, Edison has asked for, and the California Public Utilities Commission has declined, a request by Edison to make findings along these lines.

Edison has continued to oppose rule requirements that reflect BARCT, and have sought to delay the District's progress to meet air quality standards through the use of zero emission technologies. Their demands have reflected this, and raise the question of why the District has cowed to Edison demands for the District to insert themselves into the area of grid stability, which is under purview of the Public Utilities Commission, and not the District. Further, the

B-2

analysis was prepared by Edison's own consultant, reflecting assumptions in which the PUC is apparently in disagreement.

This may be the first District rule ever where an unwilling source has been given the key to write their own technology assessment. This is particularly suboptimal given the source's track record in delay and refusal to reduce emissions. Under staff's proposal, it could be decades before the site actually meets today's BARCT.

As a result, the District's action fails to meet the Board's direction to return ASAP with a rule recommendation that reflects the new BARCT analysis.

B-2 (Cont.)

Third, the Pebbly Beach Generating Station was to reduce emissions to 13 tons per year by 2026, with an extension if that limit was not feasible. Subsequently though, staff determined that indeed that limit was feasible, and further proposed an even more stringent limit of 1.6 tons per year by 2026. After opposition by Edison, District staff has now reversed itself, and proposes allowing over 70 tons by 2026, despite the fact that the District's analysis indicates that BARCT is less that 2 tons per year.

The impact of that change is staggering, and is equivalent to the emission reductions achieved by the sum total of many rules put together.

The ultimate emissions limit in the staff proposal, 6 tons per year, remains more than triple that of its BARCT analysis, inconsistent with board direction, the adopted AQMP, district EJ policies, the District energy policy, and state law requirements to adopt rules that reflect BARCT.

B-3

Even with staff's proposed BARCT limit, there remain further feasible emission reductions that are addressed below.

BARCT Analysis

Despite initial reluctance to seriously consider zero emission technologies for use on Catalina Island, staff is to be complimented on the outstanding work in carrying out the BARCT analysis. We wish that their work had been taken more seriously in proposing new amendments. Instead, the proposed amendments take us backwards.

We do however, have some concerns about the BARCT analysis, particularly where the conclusions stray from past practice, the provisions of the California Health and Safety Code, and where staff reversed itself in determining the feasibility of zero emission mixes.

B-4

95% Zero Emission Scenario

The revised BARCT analysis was performed after requests from the public that the District better assess recent improvements in zero emission technology. A 95% zero emission scenario was assessed by District staff in furtherance of that objective.

At the November, 2022 working group meeting that reviewed the District's BARCT analysis, staff found that a 95% zero emission scenario was feasible, but at a cost of $88,000/ton NOx reduced, it was not cost-effective.

Weeks later, the District adopted the 2022 AQMP, which changed the review threshold for cost-effectiveness from $59,000/ton to $325,000/ton NOx reduced.

B-5

Based on no new significant material information, by the next working group meeting the District claimed that a 95% zero emission scenario was not feasible, even though it may be cost-effective.

B-5 (Cont.)

Fuel cell option

In evaluating this scenario, the District looked at fuel cells as a way to meet the possible 95% zero emission, since this was an example raised by the public. In its new characterization of the 95% scenario, the District claimed that space requirements, back-up fuel storage requirements, and lack of barges now made a 95% scenario infeasible.

Clearly the Pebbly Beach site is space constrained. However, the staff analysis likely misstated the physical space requirements for fuel cells by as much as 100% or more. Staff acknowledged in the staff report that fuel cell manufacturers have indicated that their fuel cells can be stacked, but the space analysis performed by the District did not assume any stacking. Further, a more aggressive analysis which assumed that zero emission technologies (and not diesel) would be used for emergency backup could have eliminated space taken up by storage of diesel fuel, further reducing any space constraints.

The District also then claimed that there was insufficient space for backup fuel storage. Having previously identified a possible possible site for backup fuel storage, the District reversed itself based on just a few attempted calls to the landowner. Identification of storage space or the interest of a landowner in selling or leasing space at an unspecified price would normally be something that would not fall to the District in doing a BARCT analysis, nor should their disinterest in discussing this with District staff be something that should turn a feasible option into infeasible.

B-6

In this context, staff has also addressed as barriers land use and permitting issues, and the obstacles they may create. This is true about many District rules, and an unwilling permit holder can be creative in foot-dragging, as Edison has done. But the District needs to look at what steps have been taken by Edison to aggressively seek these approvals. And what amount of their significant advocacy resources that they have brought to bear to seek these approvals compared to the efforts and resources that they have spent to avoid BARCT requirements. The District should not imagine problems where they don't exist, and count on Edison to be diligent. And as described below, these speculative factors are wisely not included by the legislature in the factors for determining BARCT.

Lastly, the District, based on no new information, claims that a lack of barges for more barge trips makes the 95% option infeasible. This is a preposterous claim, and one that is also inappropriate for a BARCT analysis.

There are many companies that make and/or operate barges. These barges transport trucks that carry the fuel. Currently this is done to transport the diesel fuel to the Island. There are some that believe that they could not only provide barges to transport additional fuel to the Island, but with District assistance, would be willing to demonstrate a **zero emission barge** to do so, and **replace the diesel barge** that currently transports fuel to the Island. This would have to be done with District assistance.

B-7

Further, the District's position seems to undermine the basis of the AQMP, which provides for using zero emission technologies, including electrification. Using a lack of barges as a reason to find a zero emission option infeasible is akin to saying that the AQMP is infeasible because

all of the infrastructure to power zero emission sources is not in place. And in this case, it is really up to the source to arrange for a fuel supply chain.

In addition, in making these last two factors a part of the BARCT analysis appears inconsistent with state law. As the District points out, BARCT is defined in Health & Safety Code Section 40406 as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." Neither procurement of a storage site nor contracting a barge, nor speculative land use barriers fall under the "environmental, energy, and economic impacts" that the District may take account of. In fact, these may fall under "economic" but the District has assigned no economic cost to these factors.

B-7 (Cont.)

Other Zero Emission Options

Staff also performed analysis of other zero emission technologies, though on a smaller scale. And after seeing staff move to options that didn't make full use of zero emission technologies, other options were submitted to the District, including that of taking a distributed energy approach using rooftop solar in order to eliminate the need for diesel engines, underwater zero emission turbines and the use of electrolyzers to produce limited amounts of backup fuel. Data has been submitted to the District, but has not been fully evaluated. Many of the zero emission options can be mixed, and provide a myriad of potential options for zero emission power production on Catalina Island.

The use of all or some of these options are essential to implement the AQMP and provide needed basin emission reductions, yet the District is moving in the opposite direction from the "zero emission" focus of the AQMP. The AQMP specifically calls out (as mentioned in the staff report, replacement of existing diesels. Having just weakened the diesel emission standards in Rule 1135 by increasing emission averaging times, and then proposing to continue to allow new diesels, increased time frames to comply and reducing feasible reduction goals, the District is going backward. We can't go back. The rule should reflect a zero emission cap by some compliance date.

B-8

Additional Comments

Update of emission factors - Staff has proposed to update the emission factors. We believe that this would be inappropriate, and specifically not conservative since the staff report indicates that the engines can achieve 20% lower emissions, Given that the limits are so flexible over time, there is adequate ability to have a BARCT limit that represents what can be achieved. In fact, state BARCT requirements mandate this.

B-9

Cost-effectiveness calculation - Staff should describe more fully how the cost-effectiveness calculations have changed since November, 2022 when eliminating diesel engines was found to save money due to the high cost of maintaining diesel engines.

B-10

And since fuel costs drive any long term cost analysis, the District should provide more information on it's assumptions for the future costs of diesel, hydrogen (renewable), propane, natural gas, etc.

B-11

Further, a cost-effectiveness calculation or and especially an incremental cost-effectiveness analysis seems inappropriate and completely subjective when applied to limits that don't

B-12

reflect BARCT, rely on a speculative mix of technologies, and is an emissions cap rather than a comparison of different technologies as anticipated by the legislature.

B-12 (Cont.)

Circumvention of legislature-adopted Hearing Board process/special treatment - Furthermore, staff's proposal bypasses and circumvents the existing public and more transparent Hearing Board process, and instead, is handled by staff. And the criteria for approval of extensions do not match that that the independent Hearing Board is required to make for all other sources. Indeed, this source, representing over 10% of power plant emission in the basin, is getting special treatment.

B-13

Findings under Health and Safety Code Section 40727 - The District proposes to include a finding that 'Proposed Amended Rule 1135 is in harmony with and not in conflict with or contradictory to, existing statutes, court decisions, or state or federal regulations.' We believe that the Board would not be able to make this finding since the proposed rule conflict requirement that the rule reflect BARCT, violates anti-backsliding requirement, and fails to require the use of LAER and/or major source BACT.

B-14

Diesel limitations - Specific limits should be placed on diesel usage to match staff assumptions. If the intent is for the diesel to be used for emergency backup only, the rule should place this limitation on their use.

B-15

There has already been a lengthy delay, and now staff is proposing to give Edison an additional eight years to me meet a significantly less stringent standard that will be much easier to meet.

B-16

Response to Comment B-1
The proposed rule amendment allows more time for diesel engines to be installed but also requires further emission reductions beyond the current emission limits. Additional time for diesel installation is due to supply chain issues and permitting delays. Assuming the feasibility analyses conclude that the 13 tpy and 6 tpy NOx limits are achievable by the proposed implementation dates, there will still be approximately 172 tons of NOx emission reductions foregone between 2024 to 2029 when comparing PAR 1135 to current Rule 1135.

The diesel engines have been evaluated pursuant to federal Lowest Achievable Emission Rate (LAER) and state Best Available Control Technology (BACT) guidelines. It is incorrect to state that LAER and BACT requires zero emission technology.

Response to Comment B-2
A BARCT assessment was conducted and when presented it was noted that the grid stability study was pending. While the grid stability study did not fully analyze the possible scenarios staff requested, the grid stability study eventually did show that use of ZE/NZE equipment would result in a stable grid. The emission reductions in the proposed rule will result in a 92 percent reduction in NOx emissions and 99.7 percent reduction in PM emissions. While Southern California Edison has raised concerns with inverter based resources, the grid stability study showed use of inverter based resources would result in a stable grid. Use of inverter based resources to provide the majority of power has been successfully demonstrated on island grids including King Island in Australia, El Hierro in Spain, Kaua'I in Hawaii, and Maui in Hawaii. A feasibility analysis will be allowed to allow for more time to meet the proposed limits but a technology assessment is not included in the proposed rule (see Response to Comment 6.). Under staff's proposal, the final emission limit of 6 tons per year of NOx emissions could be delayed until 2041 if the feasibility analysis and time extension provisions are utilized.

Response to Comment B-3
Staff found that both the 13 ton per year and 6 ton per year emission limits are feasible in the future. Assuming the feasibility analyses conclude that the 13 tpy and 6 tpy NOx limits are achievable by the proposed implementation dates, there will still be approximately 172 tons of NOx emission reductions foregone between 2024 to 2029 when comparing PAR 1135 to current Rule 1135. Staff did conduct a BARCT assessment which is included as Chapter 2 of this document. The proposed emission limit reflects a compromise to address grid stability and feasibility concerns of Southern California Edison.

Response to Comment B-4
A BARCT assessment is included in Chapter 2 of this report which complies with past practice and the California Health and Safety Code.

Response to Comment B-5
The BARCT assessment included a review of a 95 percent zero emission standard. The scenario was found not to be technically feasible due to large amount of land needed for hydrogen fuel storage. The cost-effectiveness of the scenario is irrelevant since the scenario is not technically feasible.

Response to Comment B-6
Propane-fired fuel cells are considered an available option to meet the proposed emission limits. The technology is stackable as noted by the commenter. Current propane storage could accommodate less than three days of power generation without fuel deliveries. Such a short timeframe would jeopardize critical energy needs. A review of the past five years has shown that fuel deliveries are regularly interrupted for several days at a time. Staff agrees that a 30-day fuel storage is needed to ensure continued power generation in case fuel deliveries are interrupted by weather or other calamity. Further fuel storage outside the facility is limited (see Response to Comment 6).

Response to Comment B-7
While the BARCT assessment noted the number of barge trips to meet the various scenarios, it is the limited fuel storage that makes the 95 percent zero emission standard infeasible. BARCT is defined in the Health and Safety Code, section 40406, as "an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source." Storage space of fuel is limiting the maximum degree of reduction achievable. The BARCT limit correctly considers the needs of the island to have stable and continuous power. Both of these factors are relevant to the proposed limit's effect on grid stability, which is an energy impact that is properly considered in determining BARCT.

Response to Comment B-8
Staff did evaluate multiple zero emission technologies. While solar was identified as an option that could provide 30 percent of power on Santa Catalina Island, the proposed rule is technology neutral and does not specify any specific technology use. Other of the myriad of ZE/NZE technologies not identified could be utilized to meet the proposed emission limits which integrate 30 percent zero emission technology in the BARCT assessment consistent with the 2022 AQMP. A 100% zero-emission limit was determined to be unfeasible at the current time. If technological advances in the future allow for further adoption of zero emission technologies, rule development can be initiated to incorporate the advancements.

Response to Comment B-9
Staff updated the emission factors to account for negligible emissions from zero emission technologies. The change in emission factors results in 0.00055 ton per day (1.1 pounds per day) of emission increase over the original BARCT assessment.

Response to Comment B-10
The change of cost-effectiveness is due to the addition of land lease costs for solar. Specifics cannot be provided because of the confidential nature of the costs and that the proposed rule impacts only one facility. Staff is unable to aggregate costs as is normally done when multiple facilities are impacted by a proposed rule.

Response to Comment B-11
Staff used current fuel prices for diesel and propane. Natural gas is not available on the island and would not provide additional benefit over propane. Hydrogen cost was not included because

sufficient storage space is unavailable. The Socioeconomic Impact Assessment will evaluate future diesel and propane costs.

Response to Comment B-12
Cost-effectiveness was calculated for the BARCT assessment and the final emission limit. Both were found to be cost-effective and incrementally cost-effective.

Response to Comment B-13
The Hearing Board process is utilized when facilities seek relief from rule requirements. Numerous rules, including the current version of Rule 1135, have provisions and exemptions to avoid non-compliance necessitating the Hearing Board process.

Response to Comment B-14
See Response to Comment B-1 and B-3.

Response to Comment B-15
Emission limits constrain the use of diesel engines. The proposed limit envisions the diesel engines as backup, not as emergency use only. Emergency use is limited to 200 hours per year. Historical barge records indicate that fuel delivery is unavailable between five and fourteen days per year which would exceed the 200 hour per year emergency limit.

Response to Comment B-16
See Response to Comment B-1

Comment Letter C: Anthony Hernandez, Southern California Edison

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL™ Company

August 14, 2024

Mr. Michael Krause
Assistant Deputy Executive Officer
Planning, Rule Development and Implementation
South Coast Air Quality Management District
21865 Copley Drive
Diamond Bar, CA 91765
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SUBJECT: Proposed Amendments to Rule 1135 - Emissions of Oxides of Nitrogen from Electricity Generating Facilities

Dear Mr. Krause:

Southern California Edison (SCE) appreciates South Coast Air Quality Management District's (SCAQMD) reopening of Rule 1135 to address issues relating to SCE's Pebbly Beach Generating Station (PBGS) on Santa Catalina Island (Catalina). SCE remains committed to working with the SCAQMD on a viable pathway toward a cleaner energy future at PBGS, with plans to increase reliance on near-zero-emission (NZE) and zero-emission (ZE) power generation technology. This letter provides SCE's comments on the Preliminary Draft version of Proposed Amended Rule (PAR) 1135 released on July 19, 2024. All comments stem from the high degree of uncertainty at present in meeting the proposed emission limit targets, and SCE is requesting these revisions to provide sufficient safeguards and flexibility. This is critical since SCE cannot abrogate its duty to provide life-critical utilities to Catalina residents and visitors to achieve compliance if the requirements under the proposed rule prove to be unattainable.

C-1

I. SCE Comments on Pre-Preliminary Draft Rule Language

SCE remains committed to meeting SCAQMD's clean air objectives and will apply its best efforts to meet the proposed deadlines and emission limits. As previously outlined in our July 3, 2024 comment letter, there are a multitude of challenges to overcome and much uncertainty at this time on whether the latter two limits of 13 and 6 tons per year (TPY) can be feasibly met by the proposed deadlines. For these reasons, it is critical for the rule to provide sufficient flexibility and safeguards to provide relief if meeting the limits and requirements in the rule are deemed infeasible by their respective deadlines.

C-2

SCE urges the SCAQMD to adopt the following suggested revisions:

1. Proposed revisions to the time extension language under Section (d)(5):
   a. Allow time extensions of up to three years for all limits under Table 2 of Proposed Section (d)(2)(E).
   b. The extension language should include the prohibitions and deadlines under Proposed Sections (d)(2)(B), (d)(2)(C), (d)(2)(D), and (d)(2)(F).
   c. Allow time extensions of up to five years.
2. Remove the 5.5 MW maximum cumulative rating cap for new diesel internal combustion engines.
3. Remove the requirement to include emissions derived from missing data substitution for CEMS monitoring when determining compliance with annual limits.

C-3

C-4

C-5

C-6

C-7

A. Proposed time extension language revisions

Figure 1. *Preliminary Draft Proposed Amended Rule 1135: Section (d)(5)*

(45) Time Extension

(A) The owner or operator of an electricity generating facility on Santa Catalina Island may submit a request to the Executive Officer for a time extension of up to three years to meet the mass emission ~~limit~~limits specified in ~~subparagraph (d)(2)(D)~~ clauses (d)(2)(E)(iii) and (d)(2)(E)(iv) and extended pursuant to paragraph (d)(3) provided the owner or operator:

C-8

Proposed Section (d)(5)(A) allows a request for a time extension of up to three years to meet the mass emission limits of 13 TPY and 6 TPY by 2030 and 2035, respectively. This extension provision should be expanded to include all limits being proposed under Table 2 of Proposed Section (d)(2)(E) to address any delays in the construction/procurement timeline or regulatory approvals, including issuance of the required PTC, that are outside SCE's control. SCE faces the challenge of executing a compacted schedule to install the two U.S. EPA-certified Tier 4 Final (T4F) engines currently in storage, in addition to procuring the third T4F engine to replace Unit 15. The procurement of the third engine will begin after the expected issuance of the PTC by the end of 2024, after the rule is amended. Extenuating circumstances outside SCE's control could cause potential delays in achieving any of the limits in Table 2, and time extensions would provide the critical compliance relief needed while holding SCE responsible for continuing to work toward meeting the limit when it becomes feasible. If time extensions are granted, any related prohibitions should be similarly extended, as everything must be done in a sequential and coordinated manner.

The extension language in the proposed rule should include the prohibitions and deadlines under Proposed Sections (d)(2)(B), (d)(2)(C), (d)(2)(D), and (d)(2)(F).

In addition, the language under Proposed Section (d)(5) links the time extension language to the feasibility studies under Proposed Section (d)(3). Any extensions granted under this section of the rule should be independent of the feasibility study results and additional to any time extensions granted under Proposed Section (d)(3). SCE requests revisions to the language to remove or clarify references to Proposed Section (d)(3).

Compliance with the latter two proposed NOx limits remains highly speculative at this time; it will require grid stability improvements of NZE/ZE technologies, significant increases in propane use for power generation, viable ZE projects capable of achieving at least 30% annual generation output,[1] acquisition of numerous agency/stakeholder approvals, etc. All these factors can potentially lead to the need for an extension with a longer time than the currently proposed three-year maximum (even considering the additional three years potentially provided by the feasibility assessments). SCE therefore requests the SCAQMD consider making the time extension provided by this provision up to five years.

SCE's Proposed Revisions

SCE respectfully requests that the SCAQMD revise the draft proposed rule as shown below and consider extending it from three to five years. SCE's proposed modifications to the July 19, 2024 language are shown in **bold underlined** text and deletions are shown in ~~**bold strikethrough**~~ text:

Proposed Section (d)(5)(A):

(A) In addition to any time extensions granted pursuant to clause (d)(3), the owner or operator of an electricity generating facility on Santa Catalina Island may submit a request to the Executive Officer for a time extension of up to three years to meet the mass emission limits specified in clauses **(d)(2)(E)(i), (d)(2)(E)(ii),** (d)(2)(E)(iii), and (d)(2)(E)(iv) **and the requirements in clauses (d)(2)(B), (d)(2)(C), (d)(2)(D), and (d)(2)(F)** ~~**extended pursuant to paragraph (d)(3)**~~ provided the owner or operator:

(i) Submits the request to the Executive Officer at least 365 days before the compliance deadlines specified in subparagraph (d)(2)(D) clauses **(d)(2)(E)(i), (d)(2)(E)(ii),** (d)(2)(E)(iii), and (d)(2)(E)(iv) **and the requirements in clauses (d)(2)(B), (d)(2)(C), (d)(2)(D), and (d)(2)(F)** and extended pursuant to paragraph (d)(3); and

C-8 (Cont.)

[1] SCE launched the Catalina All-Source request for offers (RFO) on December 21, 2022. This RFO sought third-party bids for eligible renewable resources, standalone and paired energy storage, and demand response solutions, among other preferred resources. Because none of the bids submitted met the minimum requirements, SCE did not accept any.

B. Any removal of legacy ICEs should be coordinated with and contingent upon other actions, with deadlines extended as necessary.

Figure 2. *Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(F)*

(~~DF~~)	~~On and after January 1, 2026, meet a mass emission limit from all electric generating units of 13 tons of NOx annually, including mass emissions from startups and shutdowns.~~ Remove all prime power diesel internal combustion engines for which installation was completed earlier than [*Date of Adoption*] from service by January 1, 2030 or six months after any time extensions provided pursuant to subparagraphs (d)(3)(C) or (d)(5)(C).

Proposed Section (d)(2)(F) would require the removal, by January 1, 2030, of prime power diesel internal combustion engine (ICE) units that were installed prior to adoption of the amended Rule 1135. SCE appreciates the added potential extension language linked to the feasibility studies. The timing of the eventual removal of the engines should be determined as part of SCE's rigorous grid stability analyses and depend on our ability to introduce NZE/ZE technology into PBGS's generation profile. Our commitment to grid stability and safety is unwavering. We are actively exploring innovative solutions to transition towards cleaner energy sources while continuing to provide life-critical utilities safely. SCE's current analysis shows that meeting the proposed 13 TPY and 6 TPY emission limits would require minimal operation of diesel ICE and that their removal may be needed to allow sufficient space for the NZE/ZE units. However, until appropriate models are commercially available and validated through SCE grid stability analyses, requiring removal of the existing ICEs is premature and may not account for the practical implications on grid stability needs.

Thus, any rule language requiring the removal of legacy diesel engines must be clearly coordinated with and contingent upon the successful installation and operation of NZE and ZE technology that will adequately compensate for the back-up reliability that the legacy engines provide. Without this necessary coordination, the rule risks becoming inconsistent during the implementation phase.

Similarly, any requirement to install only ZE and NZE technology after January 1, 2028 and any ban on installation of diesel engines after the same date should be coordinated together *and* conditioned upon the successful installation and operation of the initial three diesel engines that are required for reliability on the island. Where one provision deadline is extended, the others should be extended as well. SCE highlights the importance of the rule language providing the ability to extend the prohibitions and deadlines under Proposed Section (d)(2).

C-9

C. 5.5 MW maximum cumulative rating for new diesel internal combustion engines

Figure 3. *Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(A)*

(2) Electric Generating Units Located on Santa Catalina Island

The owner or operator of an electricity generating facility located on Santa Catalina Island with ~~diesel internal combustion engines~~ electric generating units shall:

(A) ~~By January 1, 2024, meet a mass emission limit from all electric generating units of 50 tons of NOx annually, including mass emissions from startups and shutdowns;~~Not install more than three new diesel internal combustion engines with a maximum cumulative rating of 5.5 MW;

Figure 4. *Preliminary Draft Staff Report: Page 3-2*

Subparagraph (d)(2)(A) prohibits the electricity generating facility located on Santa Catalina Island from installing more than three new diesel internal combustion engines. Furthermore, new diesel internal combustion engines installed cannot exceed a maximum cumulative rating of 5.5 MW. The maximum cumulative rating is the sum of the name plate rating of each new diesel internal combustion engine. The new Tier 4 Final diesel engines proposed to be installed are rated at 1.825 Megawatts (MW) each. Staff rounded the maximum cumulative rating for the proposed three Tier 4 final diesel engines to 5.5 MW for simplicity.

C-10

SCE understands the goal of Rule 1135 is to meet the proposed emission limits and thereby achieve the necessary NOx reductions to help meet the SCAQMD's cleaner air vision for PBGS. A MW cap on diesel installations is not necessary to meet those NOx reduction goals. The precise way SCE reaches the emissions targets should be driven by grid stability and resource adequacy needs. These restrictions are not needed to meet the rule's emission reduction objectives and are burdensome. SCE recommends that the language be removed from the proposed rule.

If the language is not removed from the proposed rule, it and the staff report should be revised to clearly specify that the 5.5 MW figure is based on the rated prime power nameplate for the installed engines. The 1.825 MW rating that the SCAQMD used to derive the 5.5 MW is based on the rated prime power nameplate, so this specification should be clear in the staff report (which does not differentiate between standby and prime power ratings). SCE respectfully requests that SCAQMD specify in the staff report that this rating is based off the prime power rating (consistent with the previously submitted permit application).

D. The requirement to include emissions derived from missing data substitution for CEMS monitoring when determining compliance with annual limits should be removed.

Figure 9. *Preliminary Draft Proposed Amended Rule 1135: Section (d)(2)(E)*

(~~C~~E)	~~By January 1, 2025, meet a~~Meet the annual NOx mass emission ~~limit~~limits specified in Table 2: Emission Limits for Electric Generating Units Located on Santa Catalina Island ~~from~~for all electric generating units ~~of 45 tons of NOx annually~~, including mass emissions from startups and shutdowns, and missing data substitutions pursuant to South Coast AQMD Rule 218.3 – Continuous Emission Monitoring System: Performance Specifications (Rule 218.3) and South Coast AQMD Rule 2012 – Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Nitrogen (NOx) Emissions (Rule 2012); and

Proposed Section (d)(2)(E) would require inclusion of emissions derived from "missing data" procedures (MDP) during periods of unexpected downtime of the continuous emission monitoring system (CEMS) to be included when determining compliance with the annual emissions limit. SCE recommends removal of this requirement. MDP substitutions are unduly punitive and artificially elevate NOx emissions -- sometimes to the extent that the MDP-substituted emissions for a portion of the year exceed the total annual actual emissions for the facility. For example, a CEMS unit could be accurately recording emissions but a late Remote Terminal Unit (RTU) transmission to the SCAQMD could trigger substitute data, which would not be reflective of the facility's "true" emissions. Especially in the case of late RTU transmissions, SCE believes that actual CEMS data should be used in determining compliance.

C-11

This will be especially significant as the facility limit is lowered. SCE agrees these emissions should be counted in other circumstances (e.g., annual emissions reports and associated fees), but not toward the rule's annual compliance determination. There is simply not much leeway at these lower limits to incorporate artificially high substitute data. Instead, SCE recommends an "alternative emissions calculation" method that would require SCAQMD approval prior to quantification for determining compliance with the annual emissions limit. SCE believes this would better represent actual emissions and would provide sufficient safeguards within the context of the more stringent limits proposed in this rule.

II. Conclusion

SCE is committed to finding a solution that balances reducing PBGS's emissions footprint with the need to provide reliable and resilient life-critical utilities to Catalina. Meeting the proposed 13 and 6 TPY NOx emission limits under PAR 1135 will require a complete overhaul of all power generation assets currently being utilized at PBGS within an extremely accelerated period, while maintaining grid stability and our obligations to Catalina residents. SCE remains committed to overcoming the challenges needed to meet these limits, but sufficient safeguards and flexibility are required within the final rule language to provide the greatest opportunity for success. SCE cannot abrogate its duty to provide life-critical utilities to Catalina residents and visitors to achieve compliance if the proposed rule's requirements are unattainable.

SCE appreciates the SCAQMD's substantial efforts to amend Rule 1135 and the opportunity to collaborate with the SCAQMD to bring alternative, cleaner power generation solutions to Catalina. Please feel free to contact Yung Chung, Senior Air Quality Advisor, with any questions or concerns at (626) 613-2821 or Yung.Chung@sce.com.

C-12

Sincerely,

DocuSigned by:
Anthony Hernandez
0E235977344E47B...

Anthony Hernandez, SCE
Director of Catalina Operations & Strategy
Southern California Edison

cc: Michael Morris, SCAQMD
Isabelle Shine, SCAQMD
Yung Chung, SCE
Bethmarie Quiambao, SCE

Attachments

A – SCE's PAR 1135 Comment Letter (July 3, 2024)

See Comment Letter A above for SCE's PAR 1135 Comment Letter (July 3, 2024)

Response to Comment C-1
See Response to Comment A-1 and A-2.

Response to Comment C-2
Thank you for providing additional comments to the previous comment letter on July 3, 2024 which is included above as Comment Letter A and contains staff's responses.

Response to Comment C-3
See Response to Comment A-3 and A-4.

Response to Comment C-4
The extension language includes prohibitions and deadlines under paragraphs (d)(2)(B), (d)(2)(C), (d)(2)(D), and (d)(2)(F).

Response to Comment C-5
Staff believes time extensions of up to five years would be excessive. With the proposed time extensions and feasibility analyses, the proposed rule already allows compliance implementation dates to be delayed by up to 18 years. The request would add eight more years allowing for compliance implementation dates to be delayed by up to 26 years.

Response to Comment C-6
The new Tier 4 Final diesel engines proposed to be installed by Southern California Edison are rated at 1.825 Megawatts (MW) prime power output each. Staff rounded the maximum cumulative rating for the proposed three Tier 4 Final diesel engines to 5.5 MW for simplicity. Southern California Edison has indicated that the three proposed engines can provide 90 percent or more of the power needed for Santa Catalina Island. Having the ability to install larger engines would increase NOx and PM emissions beyond what is necessary to provide adequate power.

Response to Comment C-7
See Response to Comment A-9.

Response to Comment C-8
See Response to Comment A-3, A-4, C-4, and C-5. The linkage of the time extension in paragraph (d)(5) to the feasibility analysis in paragraph means that time extension can be requested after any additional time is allowed for feasibility concerns. Therefore, linking the two paragraphs means that if both are utilized, the compliance implementation date can be delayed by up to six years.

Response to Comment C-9
The proposed rule language delays the removal of the legacy engines up to six months after any time extension is provided pursuant to subparagraphs (d)(3)(C) or (d)(5)(C). See also Response to Comment A-10.

Response to Comment C-10
See Response to Comment C-6. The proposed rule language has been clarified to specify that the rating is based on the rated prime power nameplate as requested.

Response to Comment C-11
See Response to Comment C-7.

Response to Comment C-12
See Response to Comment A-1 and A-2.

Comment Letter D, Jesse Marquez, Coalition for a Safe Environment (et al.)

Coalition For A Safe Environment Community Dreams
EMERGE
The Wilmington Wire
United Wilmington Youth Foundation
Organización de Servicios Comunitarios Familiares
Citizens For A Better Wilmington
San Pedro Peninsula Homeowners United
NAACP- San Pedro-Wilmington Branch # 1069
West Long Beach Association
Latinos In Action
Friends of the Air, Earth and Water California Kids IAQ
California Communities Against Toxics
St. Philomena Church Social Justice Committee
California Safe Schools

August 15, 2024

Stationary Source Committee
South Coast AQMD
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Re: Proposed Amendments PAR 1135
Su: Public Comment Submittal Opposing Rule 1135

Dear Stationary Source Committee:

The Coalition For A Safe Environment et al community organizations submit our public comments opposing Rule 1135 due to the numerous unacceptable proposed changes.

It appears that AQMD senior management is interfering with AQMD Staff Rule 1135 progress by allowing Southern California Edison to not comply with all requirements of Rule1135 such as by-passing Best Available Retrofit Control Technology (BARCT) requirements, not taking any enforcement actions and allowing SCE to continually delay compliance by accepting requests for additional studies.

D-1

We ask for the following:

1. We want AQMD to identify all applicable California and Federal laws, executive orders, acts, policies, regulations, rules and program requirements. D-2
2. We want AQMD to include all applicable California and Federal laws, executive orders, acts, policies, regulations, rules and program requirements in PAR 1135. D-3
3. We do not want any exemptions, waivers, variances or dismissal of any existing Rule 1135 requirements, penalties or fines for Southern California Edison's (SCE) failure to comply with any regulatory requirements. D-4
4. We do not accept any compliance deadlines extensions from the existing Rule 1135. D-5
5. We do not accept any weakening of the existing Rule 1135 emission limits by increasing the limit. D-6
6. We want AQMD to identify and require BARCT to be incorporated in all areas applicable in the PAR1135. D-7
7. We want AQMD to identify and require Zero Emissions Technology to be incorporated in the SCE facility in PAR1135. There are Zero Emission Technologies to replace over 90% of all equipment and power sources. Alternative Green Power is currently available and includes Solar Power, Ocean Wave, Wind Turbine and Green Hydrogen Fuel Cell Power. D-8
8. We want AQMD to prepare and include an Environmental Justice Compliance Assessment. D-9
9. We want AQMD to add an additional Public Meeting to include outreach to Environmental Justice and Disadvantaged Communities. D-10

Current SCE Non-Compliance Legal Requirements: D-11

1. SCAQMD Rule 1135

a. (d) Emissions
(1) Emission Limits for Boilers and Gas Turbines

On and after January 1, 2024, the owner or operator of an electricity generating facility shall not operate a boiler or gas turbine in a manner that exceeds the NOx emission limits listed in Table 1: Emission Limits for Boilers and Gas Turbines, where:

b. (d) Emissions
(2) Electric Generating Units Located on Santa Catalina Island

The owner or operator of an electricity generating facilitating facility located on Santa Catalina Island with diesel internal combustion engines shall:

(A) By January 1, 2024, meet a mass emission limit from all electric generating units of 50 tons of NOX annually, including mass emissions from startups and shutdowns.

(B) Not install any new diesel internal combustion engines after January 1, 2024.

(C) By January 1, 2025, meet a mass emission limit from all electric generating units of 45 tons of NOx annually, including mass emissions from startups and shutdowns;

(D) On and after January 1, 2026, meet a mass emission limit from all electric generating units of 13 tons of NOx annually, including mass emissions from startups and shutdowns

D-10 (Cont.)

2. CARB - California Health and Safety Code, HSC § 40406 (2023)

40406. As used in this chapter, "best available retrofit control technology" means an emission limitation that is based on the maximum degree of reduction achievable, taking into account environmental, energy, and economic impacts by each class or category of source.

D-11

3. CARB - California Assembly Bill 617 (AB 617)

(1) Existing law requires the State Air Resources Board to make available on its Internet Web site data concerning the emissions of greenhouse gases, criteria air pollutants, and toxic air contaminants, as specified.

This bill would require the state board to develop a uniform statewide system of annual reporting of emissions of criteria air pollutants and toxic air contaminants for use by certain categories of stationary sources. The bill would require those stationary sources to report their annual emissions of criteria air pollutants and toxic air contaminants, as specified.

(2) Existing law generally designates air pollution control and air quality management districts with the primary responsibility for the control of air pollution from all sources other than vehicular sources. Existing law authorizes the state board or an air district to require the owner or the operator of an air pollution emission source to take any action that the state board or the air district determines to be reasonable for the determination of the amount of air pollution emissions from that source.

This bill would require the state board, by October 1, 2018, to prepare a monitoring plan regarding technologies for monitoring criteria air pollutants and toxic air contaminants and the need for and benefits of additional community air monitoring systems, as defined. The bill would require the state board to select, based on the monitoring plan, the highest priority locations in the state for the deployment of community air monitoring systems. The bill would require an air district containing a selected location, by July 1, 2019, to deploy a system in the selected location. The bill would authorize the air district to require a stationary source that emits air pollutants in, or that materially affect, the selected location to deploy a fence-line monitoring system, as defined, or other specified real-time, on-site monitoring. The bill would authorize the state board, by January 1, 2020, and annually thereafter, to select additional locations for the deployment of the systems. The bill would require air districts that have deployed a system to provide to the state board air quality data produced by the system. By increasing the duties of air districts, this bill would impose a state-mandated local program. The bill would require the state board to publish the data on its Internet Web site.

This bill would require the state board, by October 1, 2018, to prepare and update, at least once every 5 years, a statewide strategy to reduce emissions of toxic air

D-12

contaminants and criteria pollutants in communities affected by a high cumulative exposure burden. The bill would require the state board to select locations around the state for the preparation of community emissions reduction programs, and to provide grants to community-based organizations for technical assistance and to support community participation in the programs. The bill would require an air district containing a selected location, within one year of the state board's selection, to adopt a community emissions reduction program. By increasing the duties of air districts, this bill would impose a state-mandated local program.

(3) Existing law requires air districts, prior to adopting rules to meet the requirement for best available retrofit control technology or for a specified feasible measure, to take specified actions, including, among others, identifying one or more potential control options that achieve the emissions reduction objectives for the rule. Existing law also authorizes a district to establish its own best available retrofit control technology requirement based upon the consideration of specified factors.

This bill would require a district that is in nonattainment for one or more air pollutants to adopt an expedited schedule for the implementation of best available retrofit control technology, as specified. The bill would require the schedule to apply to each industrial source that, as of January 1, 2017, was subject to a specified market-based compliance mechanism and give highest priority to those permitted units that have not modified emissions-related permit conditions for the greatest period of time.

This bill would require the state board to establish and maintain a statewide clearinghouse that identifies the best available control technology, best available retrofit control technology for criteria air pollutants, and related technologies for the control of toxic air contaminants.

(4) Existing law establishes maximum criminal and civil penalties for any person, as defined, for violations of air pollution laws from nonvehicular sources. Existing law generally establishes the maximum criminal and civil penalties at $1,000, unless otherwise specified.

This bill would increase the maximum for the generally applicable criminal and civil penalties under these provisions to $5,000. The bill would annually adjust maximum penalties for violations of these laws based on the California Consumer Price Index.

D-12 (Cont.)

4. CARB - California Assembly Bill 32 (AB 32) - California Health and Safety Code, HSC § 38500 (2006)

38501. The Legislature finds and declares all of the following:

(a) Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

(b) Global warming will have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry. It will also increase the strain on electricity supplies necessary to meet the demand for summer air-conditioning in the hottest parts of the state.

D-13

(c) California has long been a national and international leader on energy conservation and environmental stewardship efforts, including the areas of air quality protections, energy efficiency requirements, renewable energy standards, natural resource conservation, and greenhouse gas emission standards for passenger vehicles. The program established by this division will continue this tradition of environmental leadership by placing California at the forefront of national and international efforts to reduce emissions of greenhouse gases.

(d) National and international actions are necessary to fully address the issue of global warming. However, action taken by California to reduce emissions of greenhouse gases will have far-reaching effects by encouraging other states, the federal government, and other countries to act.

(e) By exercising a global leadership role, California will also position its economy, technology centers, financial institutions, and businesses to benefit from national and international efforts to reduce emissions of greenhouse gases. More importantly, investing in the development of innovative and pioneering technologies will assist California in achieving the 2020 statewide limit on emissions of greenhouse gases established by this division and will provide an opportunity for the state to take a global economic and technological leadership role in reducing emissions of greenhouse gases.

(f) It is the intent of the Legislature that the State Air Resources Board coordinate with state agencies, as well as consult with the environmental justice community, industry sectors, business groups, academic institutions, environmental organizations, and other stakeholders in implementing this division.

(g) It is the intent of the Legislature that the State Air Resources Board consult with the Public Utilities Commission in the development of emissions reduction measures, including limits on emissions of greenhouse gases applied to electricity and natural gas providers regulated by the Public Utilities Commission in order to ensure that electricity and natural gas providers are not required to meet duplicative or inconsistent regulatory requirements.

(h) It is the intent of the Legislature that the State Air Resources Board design emissions reduction measures to meet the statewide emissions limits for greenhouse gases established pursuant to this division in a manner that minimizes costs and maximizes benefits for California's economy, improves and modernizes California's energy infrastructure and maintains electric system reliability, maximizes additional environmental and economic co-benefits for California, and complements the state's efforts to improve air quality.

(i) It is the intent of the Legislature that the Climate Action Team established by the Governor to coordinate the efforts set forth under Executive Order S-3-05 continue its role in coordinating overall climate policy.

D-13 (Cont.)

5. CARB - California Senate Bill 100 (SB 100) - Public Utilities Code

SECTION 1. This act shall be known as The 100 Percent Clean Energy Act of 2018.

(b) The Legislature finds and declares that the Public Utilities Commission, State Energy Resources Conservation and Development Commission, and State Air Resources Board should plan for 100 percent of total retail sales of electricity in California to come from eligible renewable energy resources and zero-carbon resources by December 31, 2045.

D-14

(c) It is the intent of the Legislature in enacting this act to extend and expand policies established pursuant to the California Renewables Portfolio Standard Program (Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1 of the Public Utilities Code), and to codify the policies established pursuant to Section 454.53 of the Public Utilities Code, and that both be incorporated in long-term planning.

SEC. 2. Section 399.11 of the Public Utilities Code is amended to read:

399.11. The Legislature finds and declares all of the following:

(a) In order to attain a target of generating 20 percent of total retail sales of electricity in California from eligible renewable energy resources by December 31, 2013, 33 percent by December 31, 2020, 50 percent by December 31, 2026, and 60 percent by December 31, 2030, it is the intent of the Legislature that the commission and the Energy Commission implement the California Renewables Portfolio Standard Program described in this article.

(b) Achieving the renewables portfolio standard through the procurement of various electricity products from eligible renewable energy resources is intended to provide unique benefits to California, including all of the following, each of which independently justifies the program:

(1) Displacing fossil fuel consumption within the state.

(2) Adding new electrical generating facilities in the transmission network within the WECC service area.

(3) Reducing air pollution, particularly criteria pollutant emissions and toxic air contaminants, in the state.

(4) Meeting the state's climate change goals by reducing emissions of greenhouse gases associated with electrical generation.

(5) Promoting stable retail rates for electric service.

(6) Meeting the state's need for a diversified and balanced energy generation portfolio.

(7) Assisting with meeting the state's resource adequacy requirements.

(8) Contributing to the safe and reliable operation of the electrical grid, including providing predictable electrical supply, voltage support, lower line losses, and congestion relief.

(9) Implementing the state's transmission and land use planning activities related to development of eligible renewable energy resources.

(c) The California Renewables Portfolio Standard Program is intended to complement the Renewable Energy Resources Program administered by the Energy Commission and established pursuant to Chapter 8.6 (commencing with Section 25740) of Division 15 of the Public Resources Code.

(d) New and modified electric transmission facilities may be necessary to facilitate the state achieving its renewables portfolio standard targets.

(e) (1) Supplying electricity to California end-use customers that is generated by eligible renewable energy resources is necessary to improve California's air quality

D-14 (Cont.)

and public health, particularly in disadvantaged communities identified pursuant to Section 39711 of the Health and Safety Code, and the commission shall ensure rates are just and reasonable, and are not significantly affected by the procurement requirements of this article.

D-14 (Cont.)

The Coalition For A Safe Environment et al community organizations respectfully file these Public Comments on behalf of our members, organization affiliations, the public and request that all issues identified and requests be accepted and included in the PAR 1153.

D-15

Jesse N. Marquez is the designated contact person for all community organizations for all future correspondence, information, questions, hearings and meetings. All community organizations reserve their rights to participate in all future meetings, discussion, actions, mediation and negotiations.

Respectfully Submitted,

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EMERGE

Martha Cota
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Latinos In Action

Anabell Romero Chavez
Wilmington Improvement Network
Board Member

Valerie Contreras
Vice President
Citizens For A Better Wilmington

Joe R. Gatlin
Vice President
NAACP- San Pedro-Wilmington Branch #1069

Modesta Pulido
Chairperson
St. Philomena Social Justice Ministry

Jane Williams
Executive Director
California Communities Against Toxics

Robina Suwal
Executive Director
California Safe Schools

Kathleen Woodfield
Board Member
San Pedro Peninsula Homeowners United

Rosalie Preston
President
Friends of the Air, Earth and Water

Theral Golden
Treasurer
West Long Beach Association

Robert A. Trani, Jr.
Founder
United Wilmington Youth Foundation

Response to Comment D-1
See Response to Comment 1, 4, 5, B-1, and B-4.

Response to Comment D-2
The Comparative Analysis presented in Table 4-3 of this report includes Federal or District rules and regulations applicable to the same source.

Response to Comment D-3
It would be duplicative to include all applicable laws, orders, etc. within PAR 1135. Those legal requirements remain enforceable even if not included within PAR 1135.

Response to Comment D-4
The proposed rule has no impact on the existing Rule 1135 until the proposed rule is adopted at which time the existing Rule 1135 will no longer be applicable. Penalties or fines for failure to comply with the existing Rule 1135 requirements is outside the scope of rule development.

Response to Comment D-5
See Response to Comment 1, 5, A-3 through A-7, A-14, A-18, A-19, B-1, B-2, C-4, C-5, and C-8.

Response to Comment D-6
The proposed emission limits are lower than the limits in the existing Rule 1135. Please see Response to Comment 1 and B-3.

Response to Comment D-7
Please see Response to Comment 4,6, B-2 through B-4, and B-7.

Response to Comment D-8
Please see Response to Comment 6, B-2, B-5, and B-8.

Response to Comment D-9
There are environment justice and cumulative impact draft policies and guidance documents that are under deliberation but have not been finalized. Pursuant to CEQA and South Coast AQMD's Certified Regulatory Program (Public Resources Code Section 21080.5, CEQA Guidelines Section 15251(l); codified in South Coast AQMD Rule 110), the South Coast AQMD, as lead agency for PAR 1135, prepared a Subsequent Environmental Assessment (SEA) for the proposed project. The SEA is a substitute CEQA document prepared pursuant to CEQA Guidelines Section 15252 and in lieu of a Subsequent Environmental Impact Report. The SEA tiers off of the November 2018 Final Mitigated SEA for the November 2018 amendments to Rule 1135,[5] as allowed by CEQA Guidelines Sections 15152, 15162, and 15385. The Draft SEA was released for a 46-day public review and comment period to provide public agencies and the public an opportunity to obtain,

[5] South Coast AQMD, 2018. Final Mitigated Subsequent Environmental Assessment (SEA) for Proposed Amended Rule (PAR) 1135 – Emissions of Oxides of Nitrogen from Electricity Generating Facilities, SCH No. 2016071006. http://www.aqmd.gov/docs/default-source/ceqa/documents/aqmd-projects/2018/par-1135---final-mitigated-sea_with-appendices.pdf

review, and comment on the environmental analysis. Comments made relative to the analysis in the Draft SEA and responses to the comments will be included in the Final SEA.

Response to Comment D-10
Development of PAR 1135 was conducted through a public process. Six Working Group meetings were held on May 5, 2022, August 4, 2022, November 8, 2022, January 19, 2023, March 27, 2024, and June 13, 2024. The Working Group is composed of representatives from businesses, environmental groups, public agencies, and consultants. The purpose of the Working Group meetings is to discuss proposed concepts and work through the details of South Coast AQMD's proposal. Staff also reported on the progress of the BARCT assessment to the South Coast AQMD Stationary Source Committee on August 19, 2022. Additionally, a Public Workshop was held on February 22, 2023 and another one was held on July 31, 2024. The purpose of the Public Workshop is to present the proposed rule language to the general public and stakeholders and to solicit comment. Staff also conducted multiple site visits as part of this rule development process and has met with individual facility operators, technology vendors, and interested stakeholders. No further working group meetings or public workshops are planned.

Response to Comment D-11
Please see Response to Comment 1.

Response to Comment D-12
South Coast AQMD determines BARCT. Southern California Edison cannot be in non-compliance with BARCT.

Response to Comment D-13
California Air Resources Board and air districts, including South Coast AQMD, implement California Assembly Bill AB 617 (AB 617). Southern California Edison cannot be in non-compliance with AB 617.

Response to Comment D-14
California Air Resources Board is tasked with implementing California Assembly Bill 32 (AB 32). Southern California Edison cannot be in non-compliance with AB 32.

Response to Comment D-15
California Energy Commission is tasked with implementing California Senate Bill 100 (SB 100). Southern California Edison cannot be in non-compliance with SB 100.

Response to Comment D-16
Thank you for your comments regarding PAR 1135. Your comments and staff's responses to your comments are included in this report.