DRAFT ENGINEERING EVALUATION

Facility ID No. 203860
Scotty's Market
620 Manuel T Freitas Parkway, San Rafael, CA 94903
Application No. 722593

Background

Scotty's Market is applying for an Authority to Construct (AC) for the following equipment:

S-1 Emergency Standby Natural Gas (NG) Engine
Make: Generac, Model: RG15090, Model Year: 2024
228 BHP, 1.857 MMBtu/hr with integral catalyst

Emissions Calculations

Emission factors for nitrogen oxides (NOx), precursor organic compounds (POC), and carbon monoxide (CO) were obtained from the engine manufacturer. Particulate matter ($PM_{10}/PM_{2.5}$) and sulfur dioxide (SO_2) emission factors are based on AP 42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources, Section 3.2.4.1 Control Techniques for 4-Cycle Rich-Burn Engines and Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines.[1] The engine will operate for emergencies and will be limited to a maximum of 50 hours per year for maintenance and testing.

Table 1. Hourly, Daily, and Annual Emissions from S-1

Pollutant	Unabated Emission Factor (g/hp-hr)	Abatement Efficiency (% w/w)	Hourly Emissions (lb/hr)	Maximum Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Annual Emissions (TPY)
POC	0.08	N/A	0.04	0.96	2.01	0.001
NOx	0.08	N/A	0.04	0.96	2.01	0.001
$PM_{10}/PM_{2.5}$	0.07	N/A	0.04	0.87	1.80	0.001
SO_2	0.00	N/A	0.00	0.03	0.05	0.000
CO	0.75	N/A	0.38	9.04	18.83	0.009

Basis:

- 228 bhp Max Rated Output
- 1769 cf/hr Max fuel use Rate = 1.857 MMBTU/hr
- NOx, POC, and CO emission factors are from the engine manufacturer.
- $PM_{10}/PM_{2.5}$ and SO_2 emission factors are from EPA AP-42, Table 3.2-3 Uncontrolled Emission Factors for 4-Stroke Rich-Burn Engines. The $PM_{10}/PM_{2.5}$ emission factor is the total of filterable and condensable particulates.
- Annual Emissions are based on an annual limit (50 hr/yr) for testing and maintenance.
- Max daily emissions are based on 24 hr/day since no daily limits are imposed on emergency operations.

[1] **SO_2** Emission Factor = 5.88 E-04 lb/MMBtu; calculations assume 100% of fuel sulfur conversion with the content in natural gas = 2000 gr/10^6scf. **$PM_{10}/PM_{2.5}$** fuel input emission factor = 9.50E-03 lb/MMBtu (filterable) + 9.91E-03 lb/MMBtu (condensable) = 1.94E-02 lb/MMBtu; aerodynamic particle diameter =< 1 µm, for the purposes of filterable emissions PM_{10}= $PM_{2.5}$. These emissions are expected to be negligible but included for completeness.

Toxic Risk Screen Analysis

Pursuant to Regulation 2-5-110, a project, including all new or modified sources of toxic air contaminants (TAC) within a 5-year period, is not subject to this rule if the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 "Toxic Air Contaminant Trigger Levels" of this regulation.

The emission factors are from the California Air Toxics Emission Factors (CATEF) and the Compilation of Air Pollutant Emissions Factor: AP-42. CATEF emission factors are preferentially chosen over AP-42 factors. If the AP-42 emission factor is based on the detection limit, the emission factor will equal 1/2 of the AP-42 emission factor.

Table 2. Toxic Air Contaminant Review for Engine

Compound	Emission Factor (lb/MMBtu)	Basis	Hourly Emission Rate (lb/hr)	Acute Trigger Level (lb/hr)	Annual Emission Rate (lb/yr)	Chronic Trigger Level (lb/yr)	Exceeds Acute or Chronic Trigger Level?
1,1,2,2-Tetrachloroethane	2.53E-05	AP-42	4.7E-05	None	2.3E-03	1.4E+00	no
1,1,2-Trichloroethane	1.53E-05	AP-42	2.8E-05	None	1.4E-03	5.0E+00	no
1,1-Dichloroethane	1.13E-05	AP-42	2.1E-05	None	1.0E-03	5.0E+01	no
1,3-Butadiene	1.02E-04	CATEF	1.8E-04	2.9E-01	9.2E-03	4.8E-01	no
Acetaldehyde	8.66E-04	CATEF	1.6E-03	2.1E-01	7.8E-02	2.9E+01	no
Acrolein	5.36E-04	CATEF	9.7E-04	1.1E-03	4.8E-02	1.4E+01	no
Benzene (no control)	1.87E-03	CATEF	3.4E-03	1.2E-02	1.7E-01	2.9E+00	no
Carbon Tetrachloride	1.77E-05	AP-42	3.3E-05	8.4E-01	1.6E-03	1.9E+00	no
Chlorobenzene	1.29E-05	AP-42	2.4E-05	None	1.2E-03	3.9E+04	no
Chloroform	1.37E-05	AP-42	2.5E-05	6.6E-02	1.3E-03	1.5E+01	no
Ethylbenzene	1.14E-05	CATEF	2.1E-05	None	1.0E-03	3.3E+01	no
Ethylene Dibromide	2.13E-05	AP-42	4.0E-05	None	2.0E-03	1.1E+00	no
Formaldehyde (no control)	2.30E-03	CATEF	4.2E-03	2.4E-02	2.1E-01	1.4E+01	no
Methanol	3.06E-03	AP-42	5.7E-03	1.2E+01	2.8E-01	1.5E+05	no
Methylene Chloride	4.12E-05	AP-42	7.7E-05	6.2E+00	3.8E-03	8.2E+01	no
Naphthalene	7.50E-05	CATEF	1.4E-04	None	6.8E-03	2.4E+00	no
PAH	1.78E-07	CATEF	3.2E-07	None	1.6E-05	3.3E-03	no
Propylene	1.57E-02	CATEF	2.8E-02	None	1.4E+00	1.2E+05	no
Styrene	1.19E-05	AP-42	2.2E-05	9.3E+00	1.1E-03	3.5E+04	no
Toluene	1.05E-03	CATEF	1.9E-03	2.2E+00	9.5E-02	1.6E+04	no
Vinyl Chloride	7.18E-06	AP-42	1.3E-05	8.0E+01	6.7E-04	1.1E+00	no
Xylene (total)	6.45E-04	CATEF	1.2E-03	9.7E+00	5.8E-02	2.7E+04	no

The project does not exceed any acute or chronic trigger level. Therefore, the project is not subject to the requirements of Regulation 2-5-110.

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Best Available Control Technology (BACT)

Pursuant to Regulation 2-2-301, Best Available Control Technology (BACT) shall apply to new or modified sources with a Potential to Emit equal to or greater than 10 lb per highest day of the pollutants in Table 1.

BACT is not triggered for any pollutant since the maximum daily emission of each pollutant does not exceed 10 lb/day.

Plant Cumulative Emissions

Table 3 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-1.

Table 3. Plant Cumulative Emissions Increase, Post 4/5/91

Pollutant	Existing Emissions Post 4/5/91 (ton/yr)	Application Emissions (ton/yr)	Cumulative Emissions (ton/yr)
POC	0.000	0.001	0.001
NOx	0.000	0.001	0.001
$PM_{10}/PM_{2.5}$	0.000	0.001	0.001
SO_2	0.000	0.000	0.000
CO	0.000	0.009	0.009

Offsets

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that has the potential to emit (PTE) more than 10 tons/yr of POC or NOx. The PTE for emergency-use engines will include the hours allowed for test and maintenance, as well as an assumed 100 hours per year for emergencies. Based on the emission calculations in Table 4, offsets are not required for this application.

Table 4. Potential to Emit for Plant 203860

Pollutant	Existing Annual Emissions (ton/yr)	Application Annual Emission (ton/yr)	Facility Annual Emissions (ton/yr)	Offset Requirement (ton/yr)	Offset Required?
POC	0.000	0.003	0.003	10	N
NOx	0.000	0.003	0.003	10	N
$PM_{10}/PM_{2.5}$	0.000	0.003	0.003	100	N
SO2	0.000	0.000	0.000	100	N
CO	0.000	0.028	0.028	-	N

New Source Performance Standards

The New Source Performance Standard (NSPS) in 40 CFR 60, Subpart JJJJ apply because the engine will be installed after January 1, 2011. The engine will comply with the following limits in Table 1 for emergency spark-ignited engines greater than 130 hp:

Pollutant	S-1 Emission Factor	NSPS Standard
NOx	2.0 g/bhp-hr	0.08 g/bhp-hr
CO	4.0 g/bhp-hr	0.75 g/bhp-hr
POC	1.0 g/bhp-hr	0.07 g/bhp-hr

As the information above shows, S-1 is in compliance with these NSPS emission requirements.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

This engine will be operated at a hazardous air pollutant (HAP) area source. Therefore, the engine will be subject to the Reciprocating Internal Combustion Engine (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 63, Subpart ZZZZ) because it is a new source and installed after 2007. A new RICE at an area source that is subject to 40 CFR Part 60, Subpart JJJJ, has no further requirements under 40 CFR Part 63, Subpart ZZZZ pursuant to 40 CFR Part 63.6590(c). Therefore, S-1 complies with the NESHAP by meeting the requirements under 40 CFR Part 60, Subpart JJJJ.

Statement of Compliance

The owner/operator of S-1 shall comply with Regulation 6, Rule 1 (*Particulate Matter and Visible Emissions Standards*) and Regulation 9-1-301 (*Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations*). From Regulation 9-1-301, the ground level concentrations of SO_2 will not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours.

S-1 is an emergency standby generator; from Regulation 9, Rule 8 (*NOx and CO from Stationary Internal Combustion Engines*), Section 110.5 (*Emergency Standby Engines*), S-1 is exempt from the requirements of Regulations 9-8-301 (*Emission Limits on Fossil Derived Fuel Gas*), 9-8-302 (*Emission Limits on Waste Derived Fuel Gas*), 9-8-303 (*Emissions Limits – Delayed Compliance, Existing Spark-Ignited Engines, 51 to 250 bhp or Model Year 1996 or Later*), 9-8-304 (*Emission Limits – Compression-Ignited Engines*), 9-8-305 (*Emission Limits – Delayed Compliance, Existing Compression-Ignited Engines, Model Year 1996 or Later*), 9-8-501 (*Initial Demonstration of Compliance*) and 9-8-503 (*Quarterly Demonstration of Compliance*).

Allowable operating hours and the corresponding record keeping in Regulations 9-8-330 (*Emergency Standby Engines, Hours of Operation*) or Regulation 9-8-331 (Essential Public Service, Hours of Operation) and 9-8-530 (*Emergency Standby Engines, Monitoring and Recordkeeping*) will be included in the Permit Conditions below.

The project is considered to be ministerial under the District's CEQA regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emissions factors and therefore is not discretionary as defined by CEQA. (Permit Handbook Chapter 2.3.2)

Public Notification (Regulation 2-1-412)

Because this equipment will be located within 1,000 feet of Montessori de Terra Linda, the project is subject to the public notification requirements of Regulation 2-1-412 due to the increase in emissions from the project.

A public notice will be sent to all parents of students of the above mentioned school(s) and all residents within 1,000 feet of the facility. There will be a 30-day public comment period.

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Permit Conditions

Permit Condition # 23107 for S-1

1. Operating time for reliability related activities is limited to 50 hours per year per engine. (Basis: Regulation 9-8-330.3)
2. The owner/operator shall operate the stationary emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability related activities (maintenance and other testing but excluding emission testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, state, or Federal emission limits is not limited. (Basis: Regulation 9-8-330)
3. The owner/operator shall operate each emergency standby engine(s) only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained. (Basis: Regulation 9-8-530)
4. The owner/operator shall not operate the natural gas fired engine unless it is abated with an integral or add-on three-way catalyst, or other approved abatement device. (Basis: Cumulative Increase)
5. Records: The owner/operator shall maintain the following monthly records in a District approved log for at least 24 months from the date of entry (60 months if the facility has been issued a Title V Major Facility Review Permit or a Synthetic Minor Operating Permit). Log entries shall be retained on site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
    a. Hours of operation for reliability related activities (maintenance and testing).
    b. Hours of operation for emission testing.
    c. Hours of operation (emergency).
    d. For each emergency, the nature of the emergency condition.
    e. Fuel usage or operating hours for engine.
    (Basis: Regulations 9-8-502 and 9-8-530)

Recommendation

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality-related regulations. The preliminary recommendation is to issue an Authority to Construct/Permit to Operate for the equipment listed below. However, the proposed source will be located within 1,000 feet of at least one school, which triggers the public notification requirements of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

S-1 Emergency Standby Natural Gas (NG) Engine
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228 BHP, 1.857 MMBtu/hr with integral catalyst

Prepared By: Liana Solis, Air Quality Specialist II May 7, 2025

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