

**Draft Engineering Evaluation
Town of Yountville
Application No. 25920
Plant No. 22240**

BACKGROUND

The Town of Yountville has applied for an Authority to Construct and/or Permit to Operate for the following equipment:

**S-1 Emergency Standby Natural Gas Generator with Integral Catalyst
Generac, Model: SG080, Model Year: 2013
127 bhp, 1.076 MMBtu/hr**

The equipment will be located at 6550 Yount Street, Yountville, CA 94559.

The natural gas powered emergency unit (S-1) will provide emergency standby power in the event of a disruption to power service. S-1 is equipped with an air/fuel ratio controller and an exhaust catalyst which are both an integral and permanent part of the source. During an emergency, the generator will operate 24 hours a day until regular electric supply is restored. The engine will operate for a maximum of 50 hours per year for maintenance and testing, as limited by Regulation 9-8-330.3.

The engine is subject to attached condition no. 23107.

EMISSIONS CALCULATIONS

Basis for S-1:

127 bhp output rating

50 hr/yr operation for testing and maintenance

1055 ft³/hour natural gas consumption

1020 BTU/ft³ natural gas heat content

1.076 MMBTU/hr firing rate

The emissions factors used to estimate criteria pollutant emissions from S-1 are based on engine manufacturer emissions data. Total Hydrocarbon emission rates were assumed to be equal to Precursor Organic Compound (POC) emission rates.

Table 1. Annual and daily criteria pollutants from S-1

| Pollutant | Emissions Factor (g/bhp-hr) | Emissions (lb/yr) | Emissions (TPY) | Emissions (lb/day) |
|------------------|--|--------------------------|------------------------|-------------------------------|
| NO _x | 0.76 | 10.6 | 0.005 | 5.1 |
| POC | 0.38 | 5.3 | 0.003 | 2.6 |
| CO | 0.41 | 5.7 | 0.003 | 2.8 |

TOXIC RISK SCREENING

To estimate Hazardous Air Pollutants (HAPs) or Toxic Air Contaminants (TACs) emissions from S-1, the higher emission factors of those from EPA AP-42 Table 3.2-3 for natural gas fired 4-stroke rich burn engines and CARB California Air Toxics Emission Factors (CATEFs) for natural gas fired 4-stroke rich burn engines with less than 650

hp are used. The engine being permitted has a maximum firing rate of 1.076 MMBtu/hr and a maximum rating of 127 bhp.

The HAP emission estimates are based on uncontrolled emission factors for natural gas engines and assume a conservative abatement efficiency of 50% removal of organic HAP compounds. The abatement efficiency assumption is based on the fact that the engine is being permitted with an exhaust catalyst and an air/fuel ratio controller.

As shown in Tables 2 and 3 below, no TACs exceed the District's Risk Screening trigger levels. Therefore, a Health Risk Screening Analysis (HRSA) is not required.

Table 2. HAP EMISSIONS ESTIMATES BASED ON AP-42 TABLE 3.2-3

| Compound | AP-42 EF (lb/MMBTU) | Assumed Abatement Efficiency (%) | Emissions (lb/hr) | Trigger Level (lb/hr) | HRSA Triggered? (Yes/No) | Emissions (lb/year) | Chronic Trigger Level (lb/yr) | HRSA Triggered? (Yes/No) |
|----------------------------|---------------------|----------------------------------|-------------------|-----------------------|--------------------------|---------------------|-------------------------------|--------------------------|
| 1,1,2,2-Tetrachloroethane | 2.53E-05 | 50 | 1.36E-05 | None | No | 6.81E-04 | 1.90E+00 | No |
| 1,1,2-Trichloroethane | 1.53E-05 | 50 | 8.23E-06 | None | No | 4.12E-04 | 6.60E+00 | No |
| 1,1-Dichloroethane | 1.13E-05 | 50 | 6.08E-06 | None | No | 3.04E-04 | 6.60E+01 | No |
| 1,2-Dichloroethane | 1.13E-05 | 50 | 6.08E-06 | None | No | 3.04E-04 | None | No |
| 1,2-Dichloropropane | 1.30E-05 | 50 | 6.99E-06 | None | No | 3.50E-04 | None | No |
| 1,3-Butadiene ¹ | 6.63E-04 | 50 | 3.57E-04 | None | No | 1.78E-02 | 5.30E+00 | No |
| 1,3-Dichloropropene | 1.27E-05 | 50 | 6.83E-06 | None | No | 3.42E-04 | None | No |
| Butyr/Isobutyraldehyde | 4.86E-05 | 50 | 2.61E-05 | None | No | 1.31E-03 | None | No |
| Carbon Tetrachloride | 1.77E-05 | 50 | 9.52E-06 | 4.20E+00 | No | 4.76E-04 | 2.50E+00 | No |
| Chlorobenzene | 1.29E-05 | 50 | 6.94E-06 | None | No | 3.47E-04 | 3.90E+04 | No |
| Chloroform | 1.37E-05 | 50 | 7.37E-06 | 3.30E-01 | No | 3.69E-04 | 2.00E+01 | No |
| Ethane | 7.04E-02 | 50 | 3.79E-02 | None | No | 1.89E+00 | None | No |
| Ethylbenzene | 2.48E-05 | 50 | 1.33E-05 | None | No | 6.67E-04 | 4.30E+01 | No |
| Ethylene Dibromide | 2.13E-05 | 50 | 1.15E-05 | None | No | 5.73E-04 | 1.50E+00 | No |
| Methanol | 3.06E-03 | 50 | 1.65E-03 | 6.20E+01 | No | 8.23E-02 | 1.50E+05 | No |
| Methylene Chloride | 4.12E-05 | 50 | 2.22E-05 | 3.10E+01 | No | 1.11E-03 | 1.10E+02 | No |
| PAH or derivative* | 1.41E-04 | 50 | 7.59E-05 | -- | Yes | 3.79E-03 | -- | Yes |
| Styrene | 1.19E-05 | 50 | 6.40E-06 | 4.60E+01 | No | 3.20E-04 | 3.50E+04 | No |
| Vinyl Chloride | 7.18E-06 | 50 | 3.86E-06 | 4.00E+02 | No | 1.93E-04 | 1.40E+00 | No |
| Xylene | 1.95E-04 | 50 | 1.05E-04 | 4.90E+01 | No | 5.25E-03 | 2.70E+04 | No |

¹ CATEFs are used when AP-42 EFs are less conservative (lower) than CATEFs.

Table 3. HAP Emission Estimates Based on CATEF Emission Factors

| Substance | E.F. lb/MMcf | Abatement Efficiency (%) | Abated Emission (lb/hr) | Acute Trigger Level (lb/hr) | HRSA Triggered? (Yes/No) | Abated Emissions (lb/yr) | Chronic Trigger Level (lb/yr) | HRSA Triggered? (Yes/No) | PAH PEF | PAH Equivalents |
|--------------------------------------|-----------------|--------------------------------|-------------------------------|--------------------------------------|--------------------------------|--------------------------------|--|--------------------------------|------------|--------------------|
| 1,3-Butadiene | 1.04E-01 | 50 | 5.32E-05 | None | No | 2.66E-03 | 1.10E+00 | No | | |
| Acenaphthene | 1.94E-03 | 50 | 9.89E-07 | None | No | 4.95E-05 | None | No | | |
| Acenaphthylene | 1.45E-02 | 50 | 7.38E-06 | None | No | 3.69E-04 | None | No | | |
| Acetaldehyde | 8.83E-01 | 50 | 4.50E-04 | None | No | 2.25E-02 | 6.40E+01 | No | | |
| Acrolein | 5.47E-01 | 50 | 2.79E-04 | 4.20E-04 | No | 1.40E-02 | 2.30E+00 | No | | |
| Anthracene | 1.84E-03 | 50 | 9.37E-07 | None | No | 4.69E-05 | None | No | | |
| Benzene | 1.91E+00 | 50 | 9.73E-04 | 2.90E+00 | No | 4.87E-02 | 6.40E+00 | No | | |
| Benzo(a)anthracene | 2.94E-04 | 50 | 1.50E-07 | None | No | 7.49E-06 | None | No | | |
| Benzo(a)pyrene | 1.15E-04 | 50 | 5.85E-08 | None | No | 2.93E-06 | 1.10E-02 | No | 1.0 | 2.93E-06 |
| Benzo(b)fluoranthene | 2.37E-04 | 50 | 1.21E-07 | None | No | 6.05E-06 | None | No | 0.1 | 6.05E-07 |
| Benzo(g,h,i)perylene | 1.95E-04 | 50 | 9.93E-08 | None | No | 4.97E-06 | None | No | | |
| Benzo(k)fluoranthene | 1.03E-04 | 50 | 5.25E-08 | None | No | 2.62E-06 | None | No | 0.1 | 2.62E-07 |
| Chrysene | 3.10E-04 | 50 | 1.58E-07 | None | No | 7.92E-06 | None | No | 0.01 | 7.92E-08 |
| Dibenz(a,h)anthracene | 1.25E-05 | 50 | 6.38E-09 | None | No | 3.19E-07 | None | No | 1.05 | 3.35E-07 |
| Ethylbenzene | 1.16E-02 | 50 | 5.93E-06 | None | No | 2.96E-04 | 7.70E+04 | No | | |
| Fluoranthene | 9.95E-04 | 50 | 5.08E-07 | None | No | 2.54E-05 | None | No | | |
| Fluorene | 6.91E-03 | 50 | 3.53E-06 | 5.30E-01 | No | 1.76E-04 | 5.00E+02 | No | | |
| Formaldehyde | 2.35E+00 | 50 | 1.20E-03 | 2.10E-01 | No | 5.99E-02 | 3.00E+01 | No | | |
| Indeno(1,2,3-cd)pyrene | 1.69E-04 | 50 | 8.63E-08 | None | No | 4.31E-06 | None | No | 0.1 | 4.31E-07 |
| Naphthalene | 7.65E-02 | 50 | 3.90E-05 | None | No | 1.95E-03 | None | No | | |
| Phenanthrene | 7.07E-03 | 50 | 3.61E-06 | None | No | 1.80E-04 | None | No | | |
| Propylene | 1.60E+01 | 50 | 8.17E-03 | None | No | 4.09E-01 | 1.20E+05 | No | | |
| Pyrene | 1.79E-03 | 50 | 9.13E-07 | None | No | 4.57E-05 | None | No | | |
| Toluene | 1.07E+00 | 50 | 5.45E-04 | 8.20E+01 | No | 2.72E-02 | 1.20E+04 | No | | |
| Xylene (m,p) | 4.41E-01 | 50 | 2.25E-04 | 4.90E+01 | No | 1.12E-02 | 2.70E+04 | No | | |
| Xylene (o) | 2.17E-01 | 50 | 1.11E-04 | 4.90E+01 | No | 5.53E-03 | 2.70E+04 | No | | |
| Xylene (Total) | 6.02E-02 | 50 | 3.07E-05 | 4.90E+01 | No | 1.53E-03 | 2.70E+04 | No | | |
| PAH Equivalents as Benzo(a)pyrene | | | | None | No | | 6.90E-03 | No | | 4.64E-06 |

PLANT CUMULATIVE EMISSIONS

S-1 located at “6550 Yount Street, Yountville, CA 94559” is a new facility. Therefore, there are no existing emissions at the plant. Table 4 summarizes the cumulative increase in criteria pollutant emissions that will result from the operation of S-1.

Table 4. Cumulative increase in tons/year

| Pollutant | Existing | New | Total |
|------------------|-----------------|------------|--------------|
| NO _x | 0.000 | 0.005 | 0.005 |
| POC | 0.000 | 0.003 | 0.003 |
| CO | 0.000 | 0.003 | 0.003 |

BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, CO, SO₂ or PM₁₀.

Based on the emission displayed above, BACT is not triggered for any pollutant since the maximum daily emission of each pollutant does not exceed 10 lbs/day.

OFFSETS

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits more than 10 tons/yr of POC or NO_x. Based on the emissions displayed in Table 4, offsets are not required for this application.

NEW SOURCE PERFORMANCE STANDARDS (NSPS)

S-1 is subject to 40 CFR 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition (SI) Internal Combustion Engines (ICEs), Section 60.4230(a)(4)(iv) because the engine is an emergency engine which was manufactured after January 1, 2009 and has a maximum power greater than 25 hp.

Determining Emissions Standards

Section 60.4233(e) states owners and operators of stationary SI ICEs with a maximum engine power greater than or equal to 100 hp (except gasoline and rich burn engines that use LPG) must comply with emission standards in Table 1 to this subpart for their emergency stationary SI ICE.

From Table 1 for emergency engines between 25 hp and 130 hp, the emission standards are:

NO_x: 10 g/hp-hr

CO: 387 g/hp-hr

VOC: N/A

S-1 complies with the above emissions standards.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAP)

S-1 is subject to 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE). Per 40 CFR 63.6590(c)(1), a new or reconstructed stationary RICE located at an area source must meet the requirements of 40 CFR 60, Subpart JJJJ. As stated above in the NSPS section, S-1 meets the emissions requirements of 40 CFR 60, Subpart JJJJ.

STATEMENT OF COMPLIANCE

The owner/operator of S-1 shall comply with Regulation 6-1 (*Particulate Matter – General Requirements*) and Regulation 9-1-301 (*Inorganic Gaseous Pollutants: Sulfur Dioxide for Limitations on Ground Level Concentrations*). Pursuant to Regulation 9-1-301, the ground level concentrations of SO₂ shall 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. Per Regulation 9-8 (*NO_x 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 – Spark-Ignited Engines Powered by Fossil Derived Fuels), 9-8-302 (Emission Limits – Spark-Ignited Engines Powered by Waste Derived Fuels), 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 (50 hours/yr) and the corresponding recordkeeping requirements in Regulations 9-8-330.3 (Emergency Standby Engines, Hours of Operation) and 530 (Emergency Standby and Low Usage 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)

This facility is located within 1,000 feet from the nearest school (listed below) and therefore is subject to public notification requirements of Regulation 2-1-412. A public notice was prepared and will be sent to the parents or guardians of children enrolled in any school within one-quarter mile of the source and to each address within a radius of 1,000 feet of the source.

Yountville Elementary
6554 Yount Street
Yountville, CA 94599

PSD does not apply.

PERMIT CONDITIONS

COND# 23107 -----

1. The owner or operator shall operate the stationary emergency standby engine only to mitigate emergency conditions or for reliability-related activities (maintenance and testing). Operating while mitigating emergency conditions and while emission testing to show compliance with this part is unlimited. Operating for reliability-related activities are limited to 50 hours per year.(Basis: Emergency Standby Engines, Hours of Operation Regulation 9-8-330)
2. The Owner/Operator shall equip the emergency standby engine(s) with: a non-resettable totalizing meter that measures hours of operation or fuel usage.(Basis: Emergency Standby Engines, Monitoring and Record keeping 9-8-530)
3. The Owner/Operator shall not operate unless the natural gas fired engine is abated with a

Catalytic Converter/Silencer Unit (Basis: Cumulative Increase)

- 4. 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. 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 (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: Emergency Standby Engines, Monitoring and Recordkeeping 9-8-530)

End of Conditions

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 for the equipment listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirements of District Regulation 2-1-412.6. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on issuance of an Authority to Construct for the following source:

**S-1 Emergency Standby Natural Gas Generator
Generac, Model: SG080, Model Year: 2013
127 bhp, 1.076 MMBtu/hr**

By: _____
Simrun Dhoot
Air Quality Engineer

Date: _____