ENGINEERING EVALUATION
Safeway Inc.
Plant No. 22812
Application No. 26824

BACKGROUND

Safeway Inc. (Safeway) has applied to obtain a Permit to Operate (PO) for the following equipment:

S-1 Emergency Standby Natural Gas Generator Set
Make: Generac; Model: SG035; Model Year 2001
Power Rating: 56 BHP (35 kW); 0.566 MMBtu/hr

Abated by

A-1 Non-Selective Catalytic Reduction; Nett Technologies TG-102

S-1 is located at 2760 Homestead Road in Santa Clara, CA 95051.

S-1 has been operating without a permit at the above location since March 31, 2002 providing standby power when there is disruption in power service. S-1 is abated by a three-way (oxidation-reduction) catalytic converter, manufactured by Nett Technologies Inc. The catalytic converter reduces exhaust emissions of nitrogen oxides (NOx), carbon monoxide (CO), and precursor organic compounds (POC). The criteria pollutants are briefly discussed on the District's web site at www.baaqmd.gov.

The engine is subject to the attached condition no. 23107.

EMISSIONS CALCULATIONS

The emission factors used to estimate NOx, POC, and CO emissions from S-1 base based on engine manufacturer's abated emissions data. Total hydrocarbons emission rates are assumed to be equal to POC emission rates. The emission factors used to estimate SO_2 and PM_{10} emissions are based on AP 42, Fifth Edition, Volume I, Chapter 3: Stationary Internal Combustion Sources. Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-burn Engines.

The engine will operate during emergency use and for a maximum of 50 hours per year of testing and maintenance. See Table 1.

Table 1. Annual and Daily Criteria Pollutants Emissions from S-1

Pollutant	Emission Factor	E.F. Unit	Max. Daily Emission (lb/day)	Annual Emission (lb/yr)	Annual Emission (TPY)
NOx	0.17	g/BHP-hr	0.503	1.049	0.001
POC	0.06	g/BHP-hr	0.178	0.370	~0.000
CO	1.36	g/BHP-hr	4.026	8.395	0.004
PM10	7.71E-05	lb/MMBtu	0.001	0.003	~0.000
SO2	5.88E-04	lb/MMBtu	0.011	0.022	~0.000

TOXIC RISK SCREENING ANALYSIS

To estimate Toxic Air Contaminants (TACs) emissions from S-1, the higher emission factors of those from EPA AP-42 Table 3.2-2 for natural gas fired 4-stroke lean burn engines and CARB California Air Toxics Emissions Factors (CATEFs) for natural gas fired 4-stroke lean burn engines with less than 650 hp are used. S-1 has a maximum firing rate of 0.566 MMBtu/hr and a maximum rating of 56 hp.

The TAC emission estimates are based on controlled emission factors since S-1 is an abated engine. As shown in Tables 2 and 3 below, no TACs exceed the District's Risk Screening trigger levels from Table 2-5-1 in Regulation 2-5. Therefore, a Health Risk Screening Analysis (HRSA) is not required. (Note: According to the "Proposed BAAQMD Air Toxics NSR Program HRSA Guidelines", an HRSA for the emissions of acrolein will not be conducted.)

Table 2. TAC Emissions from S-1, based on AP-42

Compound		E.F.	E.F. Unit	Abated Emissions (lb/hr)[1]	Acute Trigger Level (lb/hr)	HRSA Triggered? (Y/N)	Abated Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRSA Triggered? (Y/N)
1,1,2,2-Tetrachloroethane	<	4.00E-05	lb/MMBtu	1.13E-05	None	NO	5.66E-04	1.9E+00	NO
1,1,2-Trichloroethane	<	3.18E-05	lb/MMBtu	9.00E-06	None	NO	4.50E-04	6.6E+00	NO
1,1-Dichloroethane	<	2.36E-05	lb/MMBtu	6.68E-06	None	NO	3.34E-04	6.6E+01	NO
1,2,3-Trimethylbenzene		2.30E-05	lb/MMBtu	6.51E-06	None	NO	3.26E-04	None	NO
1,2,4-Trimethylbenzene		1.43E-05	lb/MMBtu	4.05E-06	None	NO	2.02E-04	None	NO
1,2-Dichloroethane	<	2.36E-05	lb/MMBtu	6.68E-06	None	NO	3.34E-04	5.3E+00	NO
1,2-Dichloropropane	<	2.69E-05	lb/MMBtu	7.61E-06	None	NO	3.81E-04	None	NO
1,3,5-Trimethylbenzene		3.38E-05	lb/MMBtu	9.57E-06	None	NO	4.78E-04	None	NO
1,3-Butadiene		2.67E-04	lb/MMBtu	7.56E-05	None	NO	3.78E-03	6.3E-01	NO
1,3-Dichloropropene	<	2.64E-05	lb/MMBtu	7.47E-06	None	NO	3.74E-04	None	NO
2-Methylnaphthalene		3.32E-05	lb/MMBtu	9.40E-06	None	NO	4.70E-04	None	NO
2,2,4-Trimethylpentane		2.50E-04	lb/MMBtu	7.08E-05	None	NO	3.54E-03	None	NO
Acenaphthene		1.25E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Acenaphthylene		5.53E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Acetaldehyde		8.36E-03	lb/MMBtu	CATEF		NO	CATEF		NO
Acrolein		5.14E-03	lb/MMBtu	CATEF		NO	CATEF		NO
Benzene		4.40E-04	lb/MMBtu	CATEF		NO	CATEF		NO
Benzo(b)fluoranthene		1.66E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Benzo(e)pyrene		4.15E-07	lb/MMBtu	1.17E-07	None	NO	5.87E-06	None	NO
Benzo(g,h,i)perylene		4.14E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Biphenyl		2.12E-04	lb/MMBtu	6.00E-05	None	NO	3.00E-03	None	NO
Butane		5.41E-04	lb/MMBtu	1.53E-04	None	NO	7.66E-03	None	NO
Butyr/Isobutyraldehyde		1.01E-04	lb/MMBtu	2.86E-05	None	NO	1.43E-03	None	NO
Carbon Tetrachloride	<	3.67E-05	lb/MMBtu	1.04E-05	4.2E+00	NO	5.19E-04	2.5E+00	NO
Chlorobenzene	<	3.04E-05	lb/MMBtu	8.60E-06	None	NO	4.30E-04	3.9E+04	NO
Chloroethane		1.87E-06	lb/MMBtu	5.29E-07	None	NO	2.65E-05	1.2E+06	NO
Chloroform	<	2.85E-05	lb/MMBtu	8.07E-06	3.3E-01	NO	4.03E-04	2.0E+01	NO
Chrysene		6.93E-07	lb/MMBtu	CATEF		NO	CATEF		NO
Cyclopentane		2.27E-04	lb/MMBtu	6.43E-05	None	NO	3.21E-03	None	NO
Ethane		1.05E-01	lb/MMBtu	2.97E-02	None	NO	1.49E+00	None	NO

Ethyl Benzene		3.97E-05	lb/MMBtu	1.12E-05	None	NO	5.62E-04	4.3E+01	NO
Ethylene Dibromide	<	4.43E-05	lb/MMBtu	1.25E-05	None	NO	6.27E-04	1.5E+00	NO
Fluoranthene		1.11E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Fluorene		5.67E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Formaldehyde		5.28E-02	lb/MMBtu	CATEF		NO	CATEF		NO
Methanol		2.50E-03	lb/MMBtu	7.08E-04	6.2E+01	NO	3.54E-02	1.5E+05	NO
Methylcyclohexane		1.23E-03	lb/MMBtu	3.48E-04	None	NO	1.74E-02	None	NO
Methylene Chloride		2.00E-05	lb/MMBtu	5.66E-06	3.1E+01	NO	2.83E-04	1.1E+02	NO
n-Hexane		1.11E-03	lb/MMBtu	3.14E-04	None	NO	1.57E-02	2.7E+05	NO
n-Nonane		1.10E-04	lb/MMBtu	3.11E-05	None	NO	1.56E-03	None	NO
n-Octane		3.51E-04	lb/MMBtu	9.94E-05	None	NO	4.97E-03	None	NO
n-Pentane		2.60E-03	lb/MMBtu	7.36E-04	None	NO	3.68E-02	None	NO
Naphthalene		7.44E-05	lb/MMBtu	CATEF		NO	CATEF		NO
PAH		2.69E-05	lb/MMBtu	CATEF		NO	CATEF		NO
Phenanthrene		1.04E-05	lb/MMBtu	CATEF		NO	CATEF		NO
Phenol		2.40E-05	lb/MMBtu	6.79E-06	1.3E+01	NO	3.40E-04	7.7E+03	NO
Propane		4.19E-02	lb/MMBtu	1.19E-02	None	NO	5.93E-01	None	NO
Pyrene		1.36E-06	lb/MMBtu	CATEF		NO	CATEF		NO
Styrene	<	2.36E-05	lb/MMBtu	6.68E-06	4.6E+01	NO	3.34E-04	3.5E+04	NO
Tetrachloroethane		2.48E-06	lb/MMBtu	7.02E-07	None	NO	3.51E-05	1.9E+00	NO
Toluene		4.08E-04	lb/MMBtu	CATEF		NO	CATEF		NO
Vinyl Chloride		1.49E-05	lb/MMBtu	4.22E-06	4.0E+02	NO	2.11E-04	1.4E+00	NO
Xylene		1.84E-04	lb/MMBtu	5.21E-05	4.9E+01	NO	2.60E-03	2.7E+04	NO

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

Note: Natural Gas Engine Equipped with Catalytic Converter with vendor guarantee of 95% reduction in Organics Emissions.
As a conservative estimate for organic air toxic compounds it assumed that the Catalytic Converter will have a 50% reduction in Air Toxic Organic Emissions.

Table 3. TAC Emissions from S-1, based on CATEFs

Substance	E.F. Mean	E.F. Unit	Abated Emissions (lb/hr)	Acute Trigger Level (lb/hr)	HRSA Triggered? (Y/N)	Abated Emissions (lb/yr)	Chronic Trigger Level (lb/yr)	HRSA Triggered? (Y/N)	PAH PEF	PAH Equivalents
Acenaphthene	7.17E-04	lb/MMcf	1.99E-07	None	NO	9.95E-06	None	NO		
Acenaphthylene	7.59E-03	lb/MMcf	2.11E-06	None	NO	1.05E-04	None	NO		
Acetaldehyde	3.99E+00	lb/MMcf	1.11E-03	1.0E+00	NO	5.54E-02	3.8E+01	NO		
Acrolein	1.63E+00	lb/MMcf	4.52E-04	5.5E-03	NO	2.26E-02	1.4E+01	NO		
Anthracene	2.56E-04	lb/MMcf	7.10E-08	None	NO	3.55E-06	None	NO		
Benzene	1.21E+00	lb/MMcf	3.36E-04	2.9E+00	NO	1.68E-02	3.8E+00	NO		
Benzo(a)anthracene	7.78E-05	lb/MMcf	2.16E-08	None	NO	1.08E-06	None	NO		
Benzo(a)pyrene	3.55E-05	lb/MMcf	9.85E-09	None	NO	4.93E-07	None	NO	1.0	4.93E-07
Benzo(b)fluoranthene	3.27E-04	lb/MMcf	9.07E-08	None	NO	4.54E-06	None	NO	0.1	4.54E-07
Benzo(g,h,i)perylene	1.03E-04	lb/MMcf	2.86E-08	None	NO	1.43E-06	None	NO		
Benzo(k)fluoranthene	5.30E-04	lb/MMcf	1.47E-07	None	NO	7.35E-06	None	NO	0.1	7.35E-07
Chrysene	9.64E-05	lb/MMcf	2.68E-08	None	NO	1.34E-06	None	NO	0.01	1.34E-08
Dibenz(a,h)anthracene	1.09E-05	lb/MMcf	3.02E-09	None	NO	1.51E-07	None	NO	1.05	1.59E-07
Fluoranthene	2.50E-04	lb/MMcf	6.94E-08	None	NO	3.47E-06	None	NO		

Fluorene	4.60E-04	lb/MMcf	1.28E-07	None	NO	6.38E-06	None	NO		
Formaldehyde	2.87E+01	lb/MMcf	7.96E-03	1.2E-01	NO	3.98E-01	1.8E+01	NO		
Indeno(1,2,3-cd)pyrene	1.20E-04	lb/MMcf	3.33E-08	None	NO	1.67E-06	None	NO	0.1	1.67E-07
Naphthalene	1.22E-01	lb/MMcf	3.39E-05	None	NO	1.69E-03	3.2E+00	NO		
Phenanthrene	8.93E-04	lb/MMcf	2.48E-07	None	NO	1.24E-05	None	NO		
Propylene	1.87E+01	lb/MMcf	5.19E-03	None	NO	2.59E-01	1.2E+05	NO		
Pyrene	1.23E-04	lb/MMcf	3.41E-08	None	NO	1.71E-06	None	NO		
Toluene	4.12E-01	lb/MMcf	1.14E-04	8.2E+01	NO	5.72E-03	1.2E+04	NO		
Xylene (m,p)	8.63E-02	lb/MMcf	2.39E-05	4.9E+01	NO	1.20E-03	2.7E+04	NO		
Xylene (o)	4.94E-02	lb/MMcf	1.37E-05	4.9E+01	NO	6.85E-04	2.7E+04	NO		
PAH Equivalents as Benzo(a)pyrene							6.9E-03	NO		2.02E-06

PLANT CUMULATIVE INCREASE

Safeway at 2760 Homestead Road, Santa Clara, CA 95051 is a new facility. Therefore, the District's database does not contain information on the existing emissions at the plant. Table 4 summarizes the cumulative increase in criteria pollutant emissions that will result at Plant No. 22812 from the operation of S-1.

Table 4. Cumulative Increase Post 4/5/91 in tons/year

Pollutant	Existing	New	Cumulative
NOx	0.000	0.001	0.001
CO	0.000	0.004	0.004

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, NOx, CO, SO_2, or PM_{10}.

Based on the emission calculations above, BACT is not triggered for any pollutants since the maximum daily emission of each pollutant does not exceed 10 lb/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 NOx.

Safeway at 2760 Homestead Road, Santa Clara, CA 95051 is a new facility. The plant does not have any pre 4/5/91 cumulative increase, so Table 4 also represents the total (pre and post 4/5/91) cumulative increase for Plant No. 22812.

Based on the emissions shown in Table 4, offsets are not required for this application.

NSPS

The emergency engine (S-1) is subject to 40 CFR 60, Subpart JJJJ, Standards of Performance for Stationary Spark Ignition (SI) Internal Combustion Engines (ICEs) because it was manufactured after June 12, 2006 and has a maximum engine power greater than 25 hp, as required by Section 60.4230(a)(4)(iv).

Section 60.4233(d) states owners and operators of stationary SI ICEs with a maximum engine power greater than 25 hp and less than 100 hp (except gasoline and rich burn engines that use LPG) shall comply with the emission standards in Table 1 to this subpart for their stationary SI ICEs.

For emergency engines that are greater than 25 hp and less than 130 hp, the emission standards are:

NOx: 10 g/hp-hr
POC: N/A
CO: 387 g/hp-hr

According to engine manufacturer's emissions data, S-1 complies with the above emission standards.

NESHAP

S-1 is subject to the emission or operating limitations in 40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. 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 part 60 subpart JJJJ, for spark ignition engines. S-1 is in compliance with the requirements of 40 CFR part 60 subpart JJJJ, as shown in the "NSPS" section of this evaluation.

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 SO_2 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 (*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 – 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)

PSD does not apply.

The facility is less than 1,000 feet from the nearest school and is therefore subject to the public notification requirements of Regulation 2-1-412. A public notice was prepared and sent to all addresses within 1,000 feet of the natural gas generator set and parents and guardians of students of the following school(s):

St. Justin Elementary School
2655 Homestead Road,
Santa Clara, CA 95051

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 sources will be located within 1,000 feet of at least one school, which triggers the public notification requirements of Regulation 2-1-412. 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 a Permit to Operate for the following sources:

S-1 Emergency Standby Natural Gas Generator Set
Make: Generac; Model: SG035; Model Year 2001
Power Rating: 56 BHP (35 kW); 0.566 MMBtu/hr

Abated by

A-1 Non-Selective Catalytic Reduction; Nett Technologies TG-102

Prepared by: _____ **Date:** _____

Ying Yu, Air Quality Technician