

**ENGINEERING EVALUATION
ALBERTSON'S #7117; PLANT 15614
APPLICATION 08125**

BACKGROUND

Albertson's #7117 submitted this application for an Authority to Construct and Permit to Operate the following equipment:

S-1 Emergency Standby Generator: Natural Gas Engine, General Motors, 4.3L, 75 HP; abated by A-1 Catalytic Converter (Johnson Mathey Bandoto CX2-3)

EMISSIONS

Annual Average Emissions:

- Basis:
- 75 bhp output rating for full-load, standby operation
 - 100 hr/yr operation for testing and maintenance
 - Firing rate of 0.55 MMBtu/hr
 - NOx, VOC, CO and PM10 emission factors as provided by the applicant:

NOx: 1.50 g/hp-hr
VOC: 1.00 g/hp-hr (assume all POC compounds)
CO: 2.00 g/hp-hr
PM10: negligible

SO2 emission factor is from EPA AP-42, Table 3.2-2 (Natural Gas Emission Factors for 4-Stroke Lean-Burn Engines):

SO2: 0.0006 lb/MMBtu

NOx: $(100 \text{ hr/yr})(75 \text{ hp})(1.50 \text{ g/hp-hr})(\text{lb}/454 \text{ g})/(365 \text{ day/yr}) = \mathbf{0.07 \text{ lb/day}}$

POC: $(100 \text{ hr/yr})(75 \text{ hp})(1.00 \text{ g/hp-hr})(\text{lb}/454 \text{ g})/(365 \text{ day/yr}) = \mathbf{0.05 \text{ lb/day}}$

CO: $(100 \text{ hr/yr})(75 \text{ hp})(2.00 \text{ g/hp-hr})(\text{lb}/454 \text{ g})/(365 \text{ day/yr}) = \mathbf{0.09 \text{ lb/day}}$

PM10: $(100 \text{ hr/yr})(75 \text{ hp})(0 \text{ g/hp-hr})(\text{lb}/454 \text{ g})/(365 \text{ day/yr}) = \mathbf{0 \text{ lb/day}}$
and 0 lb/yr

SO2: $(100 \text{ hr/yr})(0.55 \text{ MMBtu/hr})(0.0006 \text{ lb/MMBtu}) / (365 \text{ day/yr}) = \mathbf{0.0001 \text{ lb/day}}$

Daily Emissions:

Daily emissions are calculated to establish whether a source triggers the requirement for BACT (10 lb/highest day total source emissions for any class of pollutants). 24-hr/day operation will be assumed.

NOx: $(24 \text{ hr/day})(75 \text{ hp})(1.50 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = \mathbf{5.95 \text{ lb/day}}$

POC: $(24 \text{ hr/day})(75 \text{ hp})(1.00 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = \mathbf{3.96 \text{ lb/day}}$

CO: $(24 \text{ hr/day})(75 \text{ hp})(2.00 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = \mathbf{7.93 \text{ lb/day}}$

PM10: $(24 \text{ hr/day})(75 \text{ hp})(0 \text{ g/hp-hr})(\text{lb}/454 \text{ g}) = \mathbf{0 \text{ lb/day}}$

SO2: $(24 \text{ hr/day})(0.55 \text{ MMBtu/hr})(0.0006 \text{ lb/MMBtu}) = \mathbf{0.01 \text{ lb/day}}$

PLANT CUMULATIVE INCREASE

	current (ton/yr)	proposed		new total (ton/yr)
		(lb/day)	(ton/yr)	
POC:	0	0.05	0.009	0.009
NOx:	0	0.07	0.012	0.012
SO2:	0	0.0001	negligible	negligible
CO:	0	0.09	0.016	0.016
NPOC:	0	0	0	0
PM10:	0	0	0	0

TOXIC RISK SCREENING ANALYSIS

Estimated toxic pollutant emissions at the exhaust stack are summarized in the table below. The emission factors used in the emissions calculations were provided by AP-42 emission factors.

Basis:

- 100 hr/yr operation for testing and maintenance
- Firing rate of 0.55 MMBtu/hr
- Emission factors from AP-42 Table 3.2-2 (Natural Gas Emission Factors for 4-Stroke Lean-Burn Engines)

Compound	AP-42 Factor (lbs/MMBtu)	IC Engine Emissions		BAAQMD Trigger (lbs/yr)
		(lb/day)	(lb/yr)	
1,1,2,2-Tetra chloroethane	4.00E-05	negligible	.002	3.3E+00
1,1,2-Trichloroethane	3.18E-05	negligible	.002	12.00
1,1-Dichloroethane	2.36E-05	negligible	.001	120.00
1,3-Butadiene	.0003	.002	.016	1.1E+00
Acetaldehyde	.0084	.001	.462	72.00
Acrolein	.0051	.001	.281	3.9E+00
Benzene	.0004	negligible	.022	6.7E+00
Benzo(b)fluoranthene	1.66E-07	negligible	negligible	4.4E-02
Benzo(e)pyrene	4.15E-07	negligible	negligible	4.4E-02
Carbon Tetrachloride	3.67E-05	negligible	.002	4.6E+00
Chlorobenzene	3.04E-05	negligible	.002	14,000
Chloroform	2.85E-05	negligible	.002	36.00
Ethylene Dibromide	4.43E-05	negligible	.002	2.7E+00
Formaldehyde	.0528	.008	2.90	33.00
Methanol	.0025	.001	.137	120,000
Methylene Chloride	2.00E-05	negligible	.001	190.00
n-Hexane	.0011	negligible	.060	83,000
Naphthalene	.0001	negligible	.006	270
Phenol	2.40E-05	negligible	.001	8,700
Styrene	2.36E-05	negligible	.001	140,000
Toluene	.0004	negligible	.022	39,000
Vinyl Chloride	1.49E-05	negligible	.001	2.5E+00
Xylene	.0002	negligible	.011	58,000

As can be seen, no compound listed in Table above exceeds toxic trigger levels. Hence, toxic risk screening analysis is **not** required.

BACT

BACT is not triggered as maximum daily emissions for each criteria pollutant do not exceed 10 lbs/day as calculated on page 1 (Daily Emissions).

OFFSETS

Offsets are not required because permitted POC and NO_x emissions are each expected to be less than 15 ton/yr.

STATEMENT OF COMPLIANCE

S-1 will be operated as an emergency standby engine and therefore is not subject to the emission rate limits in Regulation 9, Rule 8 ("NO_x and CO from Stationary Internal Combustion Engines"). S-1 is subject to the monitoring and record keeping requirements of Regulation 9-8-530 and the SO₂ limitations of 9-1-301 (ground-level concentration) and 9-1-304 (0.5% by weight in fuel). Regulation 9-8-530 requirements are incorporated into the proposed permit conditions. Compliance with Regulation 9-1 is very likely since natural gas has negligible sulfur content. Like all combustion sources, S-1 is subject to Regulation 6 ("Particulate and Visible Emissions"). This engine is not expected to produce visible emissions or fallout in violation of this regulation and will be assumed to be in compliance with Regulation 6 pending a regular inspection.

This application is considered to be ministerial under the District's 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 emission factors in accordance with Permit Handbook Chapter 2.3.

S-1 is located within 1,000 feet of the nearest public school (Steinbeck Middle School) and hence the project to permit the Emergency Standby Generator is subject to the public notification requirements contained in Regulation 2-1-412.

PSD, NSPS and NESHAPS are not triggered.

PERMIT CONDITIONS

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CONDITIONS FOR S-1

1. The owner/operator of emergency generator S-1 shall use only PUC quality natural gas. [Basis: Cumulative Increase]
2. A well-maintained A-1, catalytic converter shall abate S-1 generator at all times that it is in use. [Basis: Cumulative Increase]
3. The owner/operator of S-1 shall only operate this engine to mitigate emergency conditions or for reliability-related activities. Operation for reliability-related activities shall not exceed 100 hours in any calendar year. Operation while mitigating emergency conditions is unlimited. [Basis: Regulation 9-8-330, Cumulative Increase]

"Emergency Conditions" is defined as any of the following:
[Basis: Regulation 9-8-231]

- a. Loss of regular natural gas supply
- b. Failure of regular electric power supply
- c. Flood mitigation
- d. Sewage overflow mitigation
- e. Fire
- f. Failure of a primary motor, but only for such time as needed to repair or replace the primary motor

“Reliability-related activities” is defined as any of the following: [Basis: Regulation 9-8-232]

- a. Operation of an emergency standby engine to test its ability to perform for an emergency use, or
 - b. Operation of an emergency standby engine during maintenance of a primary motor
4. The owner/operator of S-1 shall provide this engine with either: [Basis: Regulation 9-8-530]
- a. a non-resettable totalizing meter that measures the hours of operation for the engine, OR
 - b. a non-resettable fuel usage meter (0.55 MMBtu of natural gas shall be assumed to be equivalent to 1 hour of reliability-related operation)
5. The owner/operator of S-1 shall maintain the following monthly records. These records shall be kept in a District-approved log for at least 2 years and shall be made available for District inspection upon request:
[Basis: Regulations 9-8-530, 1-441]
- a. Total hours of operation
 - b. Hours of operation under emergency conditions and a description of the nature of each emergency condition
 - c. Fuel usage

RECOMMENDATION

Waive Authority to Construct and issue a Permit to Operate to Albertson’s #7117 for:

S-1 Emergency Standby Generator: Natural Gas Engine, General Motors, 4.3L, 75 HP; abated by A-1 Catalytic Converter (Johnson Mathey Bandoto CX2-3)

By: _____
Sanjeev Kamboj
Air Quality Engineer II

Date: _____