

Permit to Operate
APPLICATION REVIEW
(Existing Chain-Driven Charbroiler)

Processing Engineer:

Lead Engineer:

Date: June 1, 2016

Facility Name:
Mailing Address:

Contact Name:
Phone:

Project Number:
Permit Number:
Deemed Complete:

I. PROPOSAL

[Facility Name] is applying for a Permit to Operate (PTO) for an existing chain-driven charbroiler. This emission unit was installed on [date installed]. Prior to the March 21, 2002 adoption of Rule 4692 (Commercial Charbroiling), a permit was not required at the time of installation; therefore, this permitting action is due to a loss of exemption and the unit is subject to the provisions of District Rule 2010 (Permits Required). Since the emissions unit lost its exemption due to a change in District Rule 2020 (Exemptions), it is not subject to District Rule 2201 (New and Modified Stationary Source Review Rule) until modified or replaced.

II. APPLICABLE RULES

Rule 2010 Permit Required (December 17, 1992)
Rule 2020 Exemptions (March 21, 2002)
Rule 4101 Visible Emissions (February 17, 2005)
Rule 4102 Nuisance (December 17, 1992)
Rule 4201 Particulate Matter Concentration (December 17, 1992)
Rule 4692 Commercial Charbroiling (March 21, 2002)
Rule 4801 Sulfur Compounds (December 17, 1992)
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA) California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

[Facility Name]
[Facility Number]
[Project Number]

III. PROJECT LOCATION

The project is located at [Street Address] in [City], California.

IV. PROCESS DESCRIPTION

This facility is a food handling and preparation facility that primarily serves the public. A chain-driven charbroiler is a semi-enclosed natural gas-fired cooking device that provides heat to cook food as it moves through the device while resting on the moving, chain-driven grated grill.

V. EQUIPMENT LISTING

[PERMIT UNIT #]: COMMERCIAL CHARBROILER: [BURNER RATING] MMBTU/HR [MANUFACTURER'S NAME] MODEL [MODEL NUMBER], NATURAL GAS-FIRED, CHAIN-DRIVEN.

VI. EMISSION CONTROL TECHNOLOGY EVALUATION

This chain-driven charbroiler's emissions are uncontrolled. The charbroiler will be fired on natural gas fuel.

VII. CALCULATIONS

The following potential to emit calculations are presented to establish historical emissions.

A. Assumptions:

- The charbroiler will be fired on natural gas as fuel (per applicant).
- Worst-case Operating Schedule: 168 hours/week, 52 weeks/year.
- Maximum Burner Rating: [Burner Rating] MMBtu/hr.
- Exhaust Flow Rate of [Flow Rate] cfm.
- F-Factor: 8,578 dscf/MMBtu@ 60 °F (STP) (per District Policy).
- Maximum amount of meat cooked [Pounds Meat] lb/week (per applicant).

B. Emission Factors:

The emission factors for NO_x, and CO are from AP-42 (10/96), Table 1.4-1 for natural gas combustion (burners – 0.3 MMBtu/hr or less). The emission factor for SO_x is from District Policy APR-1720 (Generally Accepted SO_x Emission Factor for Combustion of PUC-quality Natural Gas). The emission factors for NO_x, SO_x and CO are from AP-42 (10/96), Table 1.5-1 for propane combustion (burners – 0.3 MMBtu/hr to 10 MMBtu/hr).

Pollutant	EF _(Natural Gas) (lb/MMBtu)	EF _(Propane) (lb/MMBtu)
NO _x	0.0940	0.155 [§] (14 lb/10 ³ gal)
SO _x	0.00285	0.016 [§] (1.5 lb/10 ³ gal) [§]
PM ₁₀	See Note (1)	
CO	0.0210	0.021 [§] (1.9 lb/10 ³ gal)
VOC (non-methane)	See Note (1)	

(1) The PM₁₀ and VOC emissions from combustion are included within the source-test-based emission factors for meat cooking discussed below.

The following uncontrolled emission factors for the cooking of meat were obtained from the South Coast Air Quality Management District (SCAQMD) and are based on source test results of similar units:

- EF_{PM10} = 7.42 lb-PM₁₀/10³ lb-Meat Cooked (Uncontrolled)
- EF_{VOC} = 2.27 lb-VOC/10³ lb-Meat Cooked (Uncontrolled)

C. Emissions Calculations:

PM₁₀ and VOC Emissions from Meat Cooking:

$$\begin{aligned}
 PE_{PM10\text{-Meat Cooked (Uncontrolled)}} &= EF_{PM10} \text{ (lb-PM}_{10}\text{/10}^3\text{ lb-Meat Cooked)} \\
 &\quad \times \text{Max. Meat Cooked (lb/week)} \\
 &= (7.42 \text{ lb-PM}_{10}\text{/1000 lb-Meat Cooked}) \times ([XX] \text{ lb/week}) \\
 &= \mathbf{[XX] \text{ lb-PM}_{10}\text{/week}}
 \end{aligned}$$

$$\begin{aligned}
 PE_{VOC\text{-Meat Cooked (Uncontrolled)}} &= EF_{VOC} \text{ (lb-VOC/10}^3\text{ lb-Meat Cooked)} \\
 &\quad \times \text{Max. Meat Cooked (lb/week)} \\
 &= (2.27 \text{ lb-VOC/1000 lb-Meat Cooked}) \times ([XX] \text{ lb/week}) \\
 &= \mathbf{[XX] \text{ lb-VOC/week}}
 \end{aligned}$$

[§] EF = (14 lb/10³ gal) x (1 gal/90,500 Btu) x (1 x 10⁶ Btu/ 1 MMBtu) = 0.155 lb-NO_x/MMBtu.

[§] SO_x = 0.1(S), where S = sulfur content in gr/100 scf = 0.1 (15) = 1.5 lb/1,000 gal. Note: Maximum sulfur content of LPG is 15 gr/100 scf (CRC Handbook of Tables for Applied Engineering Science, 2nd Edition, page 390).

[Facility Name]
 [Facility Number]
 [Project Number]

Emissions from the Combustion of Natural Gas*:

Max. Burner Rating: [Burner Rating] MMBtu/hr
 Operating Hours: 168 hr/week

$$PE_{\text{Natural Gas}} \text{ (lb/day)} = \text{Max. Natural Gas Usage (MMBtu/hr)} \times \text{Emission Factor (lb/MMBtu)} \times 168 \text{ hr/week}$$

Pollutant	EF _(Natural Gas) (lb/MMBtu)	Max Burner Rating (MMBtu/hr)	Hours of Operation (hr/week)	Weekly PE (lb/week)
NO _x	0.0940	[Burner Rating]	168	[XX]
SO _x	0.00285	[Burner Rating]	168	[XX]
PM ₁₀	See Note (1)			N/A
CO	0.0210	[Burner Rating]	168	[XX]
VOC (non-methane)	See Note (1)			N/A

(1) PM₁₀ and VOC emissions from combustion are included within the emission factors for the meat cooked.

Total Emissions from the chain-driven charbroiler:

$$PE_{\text{Total}} = PE_{\text{Meat Cooked}} + PE_{\text{Combustion}}$$

$$\text{Annual PE} = PE_{\text{Total}} \times 52 \text{ weeks/year}$$

Pollutant	PE _{Meat Cooked} (lb/week)	PE _{Combustion} (lb/week)	PE _{Total} (lb/week)	Annual PE (lb/year)
NO _x	---	[XX]	[XX]	[XX]
SO _x	---	[XX]	[XX]	[XX]
PM ₁₀	[XX]	---	[XX]	[XX]
CO	---	[XX]	[XX]	[XX]
VOC	[XX]	---	[XX]	[XX]

* Natural gas is shown here only in calculating emissions of combustion and throughout the rest of the evaluation because propane is rarely used in this class and category of emission units.

VIII. COMPLIANCE

Rule 2010 - Permits Required

Permits are required for this operation per Section 2.0 which states that a permit is required for operation, construction, alteration, or replacement of any source operation "which may emit air contaminants or may reduce the emission of air contaminants." This application satisfies the requirements of this rule.

Rule 2020 - Exemptions

The owner or operator of an emissions unit that was exempt from written permits at the time of installation, which becomes subject to the provisions of Rule 2010 (Permits Required) through loss of exemption, shall submit an application for a Permit to Operate within six months from the March 21, 2002 date of adoption of Rule 4692 (Commercial Charbroiling). This application was received [Received Date], and this complies with the application timeframe requirements of this rule. [or,...and since this does not comply with the application timeframe requirements of this rule, an email has been sent to compliance detailing the apparent violation.]

Rule 4101 - Visible Emissions

Per Section 5.0, no person shall discharge into the atmosphere emissions of any air contaminant aggregating more than 3 minutes in any hour, which is dark or darker than Ringelmann 1 (20% opacity). Visible emissions in excess of the limit are not expected, based on similar operations, and annual compliance inspections will confirm the expected compliance.

Rule 4102 - Nuisance

The charbroiler has existed since [Date Installed] and is not known to have a history of nuisance problems. Continued compliance is therefore expected. This project will not result in an increase in permitted emissions therefore a Health Risk Assessment is not required pursuant to District Policy APR 1905 (3/2/01).

Rule 4201 - Particulate Matter Concentration

Section 3.0 requires emissions of dust, fumes, or particulate matter not to exceed 0.1 grain per cubic foot of gas at dry standard conditions. The PM emission concentration will be calculated based on the following parameters:

PM ₁₀ -to-PM Ratio:	= 50% PM ₁₀ /PM
PM ₁₀ Emission Rate	= [XXX] lb-PM ₁₀ /week
Exhaust Flow Rate	= [XXX] cfm
Worst-case Operating Schedule	= 10,080 min/week

$$\begin{aligned}
 \text{PM Concentration} &= \frac{\begin{matrix} \text{[Facility Name]} \\ \text{[Facility Number]} \\ \text{[Project Number]} \end{matrix} (\text{PM}_{10} \text{ Emission Rate}) \times (7,000 \text{ gr/lb})}{(\text{Exh Flow Rate}) \times (10,080 \text{ min/wk}) \times (0.50 \text{ PM}_{10}/\text{PM})} \\
 &= \frac{([\text{XXX}] \text{ lb-PM}_{10}/\text{week}) \times (7,000 \text{ gr/lb})}{([\text{XXX}] \text{ cfm}) \times (10,080 \text{ min/wk}) \times (0.50 \text{ PM}_{10}/\text{PM})}
 \end{aligned}$$

PM Concentration = [XXX] gr/scf

The above calculated actual grain loading is well below the allowable emissions level. It can be safely assumed that under dry conditions emissions will not exceed the allowable 0.1 gr/dscf. Therefore, compliance with this rule is expected.

Rule 4692 – Commercial Charbroiling

(Remove all sets of conditions that don't apply)

For < 875 lbs/week:

For all charbroilers installed before March 21, 2003, which cook 875 pounds of meat or less per week, no emissions control is required. The following requirements apply:

- 1.) The amount of meat cooked in this chain-driven charbroiler shall not exceed 875 pounds per week. [District Rule 4692] N
- 2.) Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. These records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

For > 875 lbs/week and Source Test Results show < 1 lb/day for each criteria pollutant:

For all charbroilers installed before March 21, 2003, which cook more than 875 pounds of meat per week, and is source testing to be exempt from Rule 4692. The following requirements apply:

- 1.) The amount of meat cooked in this chain-driven charbroiler shall not exceed [XXX] pounds per week. [District Rule 4692] N

[Facility Name]

[Facility Number]

[Project Number]

- 2.) Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. Records of all source test results shall be maintained. All records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

For > 875 lbs/week: *(This section is no longer applicable, deadlines have passed.)*

For all charbroilers installed before March 21, 2003, which cook more than 875 pounds of meat per week, an emissions control is required. The following requirements apply:

- 1) An application for Authority to Construct for the installation of the emissions control device shall be submitted to the District no later than December 20, 2002. [District Rules 2010 and 4692] N
- 2) An Authority to Construct permit shall be obtained prior to installation of an emission control device. [District Rules 2010 and 4692] N
- 3) The charbroiler shall not operate after March 21, 2003, unless an emissions control device has been installed in accordance with Rule 4692. [District Rule 4692] N
- 4) Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. These records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

These conditions will be included on the Permit to Operate. Compliance is expected.

Rule 4801 - Sulfur Compounds

Section 3.1 prohibits emissions of sulfur compounds as SO₂ in excess of 0.2% by volume (2,000 ppmv).

From Section VII.B of this evaluation, SO_x emissions when firing on natural gas (PUC quality) are calculated based on an emission factor of 0.00285 lb-SO_x/MMBtu.

$$\begin{aligned} \text{lb-SO}_x/\text{exhaust vol.} &= (\text{lb-SO}_x/\text{MMBtu}) \div (\text{F factor}) \\ &= (0.00285 \text{ lb-SO}_x/\text{MMBtu}) \div (8,578 \text{ dscf/MMBtu}) \\ &= 3.32 \times 10^{-7} \text{ lb-SO}_x/\text{dscf} \end{aligned}$$

[Facility Name]
[Facility Number]
[Project Number]

Volume SO_x/exhaust vol. = nRT/P ,

where n = moles SO_x = $(3.32 \times 10^{-7} \text{ lb-SO}_x/\text{dscf}) \div (64 \text{ lb-SO}_2/\text{lb-mol})$
= $5.0 \times 10^{-9} \text{ lb-mol/dscf}$
 R = Universal gas constant = 10.73 psi-ft³/lb-mol-°R
 T = 60°F standard temperature = 520° Rankine, and
 P = Standard atmospheric pressure = 14.7 psi

Volume SO₂/exhaust vol. = $(5.0 \times 10^{-9}) \times (10.73) \times (520^\circ\text{R}) \div (14.7 \text{ psi})$
= $2.0 \times 10^{-6} \text{ dscf/dscf exhaust}$
= 2.0 ppmv << 2,000 ppmv

Compliance of this rule is expected.

California Health & Safety Code 42301.6 (School Notice)

Reference project location and its proximity to a school and state whether or not school notice is required for this project.

Example (a): (For a Non-School Notice project - > 1,000 feet.)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

Example (b): (For a Non-School Notice project – no increase in emissions)

The District has verified that this site is located within 1,000 feet of a school. However, pursuant to California Health and Safety Code 42301.6, since this project will not result in an increase in emissions, a school notice is not required.

Example (c): (For a School Notice project.)

The District has verified that this site is located within 1,000 feet of the following school:

School Name: [Name]
Address: [Address]

Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is required.

Prior to the issuance of the ATC for this equipment, notices will be provided to the parents/guardians of all students of the affected school, and will be sent to all residents within 1,000 ft of the site.

[If there is no school w/in ¼ mile of the emissions increase, include the following discussion, otherwise delete]:

[Facility Name]
[Facility Number]
[Project Number]

The District has verified that there are no additional schools within ¼ mile of the emission source.

[If there is a school w/in ¼ mile of the emissions increase, include the following discussion, otherwise delete]:

Since a school notice has been triggered (due to the above-listed school within 1,000 of the emission source), notices will also be provided to the parents/guardians of all students from all school sites within ¼ mile of the emission source. The following schools(s) are within ¼ mile of the emission source:

School Name: [Name]
Address: [Address]
(add additional schools if necessary)

(Note: Refer to FYI - 71 for guidance on how to process a School Notice project.)

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that the project qualifies for ministerial approval under the District's Guideline for Expedited Application Review (GEAR). Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which a public agency exercises only ministerial approval. Therefore, the District finds that this project is exempt from the provisions of CEQA.

[Facility Name]
[Facility Number]
[Project Number]

Indemnification Agreement/Letter of Credit Determination

According to District Policy APR 2010 (CEQA Implementation Policy), when the District is the Lead or Responsible Agency for CEQA purposes, an indemnification agreement and/or a letter of credit may be required. The decision to require an indemnity agreement and/or a letter of credit are based on a case-by-case analysis of a particular project's potential for litigation risk, which in turn may be based on a project's potential to generate public concern, its potential for significant impacts, and the project proponent's ability to pay for the costs of litigation without a letter of credit, among other factors.

As described above, the project requires only ministerial approval, and is exempt from the provisions of CEQA. As such, an Indemnification Agreement or a Letter of Credit will not be required for this project in the absence of expressed public concern.

IX. RECOMMENDATION

Issue in-house PTO [Permit Number] with the conditions listed on the attached draft Permit to Operate.

X. BILLING

The billing for this operation is based on the burner rating in KBtu/hr.

PERMIT NUMBER	FEE SCHEDULE	FEE DESCRIPTION	ANNUAL FEE
[Permit Number]	3020-2-A	[XX] KBTU/HR	\$74

ATTACHMENT I

Supplemental Form

**San Joaquin Valley Unified Air Pollution Control District
Supplemental Application Form**

CHAIN-DRIVEN CHARBROILER OPERATIONS

This form must be accompanied by a completed Application for Authority to Construct and Permit to Operate form.

PERMIT TO BE ISSUED TO:
LOCATION WHERE THE EQUIPMENT WILL BE OPERATED:

PROCESS DESCRIPTION

Product Data	Maximum Amount of Meat Cooked: _____ (pounds/day) _____ (pounds/week) _____ (pounds/year)
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EQUIPMENT DESCRIPTION

Charbroiler Data	Manufacturer: _____		Model: _____		
	Chain-Driver HP Rating: _____			hp	
	Type of Fuel:	Natural Gas []	LPG/Propane []	Other: _____	
	Charbroiler Burner:	Burner Rating: _____	MMBtu/hr	Qty of Fuel: _____	therm/month
	Number of Fans:	Fan(s) Motor HP Rating: _____	hp	Exhaust Flow Rate: _____	cfm
	Stack Diameter: _____			ft	Stack Height: _____
Control Type	[] Catalytic Oxidizer				
	[] Scrubber (include manufacturer's specification sheets)				
	[] Other: _____				
	Manufacturer: _____		Model: _____		

ADDITIONAL INFORMATION

1. **Operating Schedule:** _____ Hours per day _____ Days per week _____ Weeks per year
2. **Nearest Receptor:**
 Distance to nearest Residence _____ feet (Examples of Residences includes apartments, houses, etc.)
 Distance to nearest Business _____ feet (Examples of Businesses includes office buildings, factories, etc.)
3. Is a rain cap (not a flapper) present on exhaust stack? [] Yes [] No
 Direction of exhaust from structure or device: [] Vertical [] Horizontal
4. **Facility Location:** [] Urban (area of dense population) [] Rural (area of sparse population)
5. **Describe any air pollution control equipment or technologies, including control efficiencies, not mentioned above on a separate sheet and submit it along with this form.**

ATTACHMENT II

Permit to Operate
Conditions

STANDARD PERMIT CONDITIONS

- {98} No air contaminant shall be released into the atmosphere, which causes a public nuisance. [District Rule 4102] N
- {15} No air contaminant shall be discharged into the atmosphere for a period or periods aggregating more than three minutes in any one hour which is as dark as, or darker than, Ringelmann 1 or 20% opacity. [District Rule 4101] N
- {14} Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] N

SPECIFIC PERMIT CONDITIONS

For < 875 lbs/week:

- {1873} The amount of meat cooked in this chain-driven charbroiler shall not exceed 875 pounds per week. [District Rule 4692] N
- {1874} Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. These records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

For > 875 lbs/week and Source Test Results show < 1 lb/day for each criteria pollutant:

- {1875} The amount of meat cooked in this chain-driven charbroiler shall not exceed [XXX] pounds per week. [District Rule 4692] N
- {1876} Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. Records of all source test results shall be maintained. All records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

For > 875 lbs/week ***(This section is no longer applicable, deadlines have passed.)***

- {1877} An application for Authority to Construct for the installation of the emissions control device shall be submitted to the District no later than December 20, 2002. [District Rules 2010 and 4692] N

- {1878} An Authority to Construct permit shall be obtained prior to installation of an emission control device. [District Rules 2010 and 4692] N
- {1879} The charbroiler shall not operate after March 21, 2003, unless an emissions control device has been installed in accordance with Rule 4692. [District Rule 4692] N
- {1880} Weekly records shall be maintained of the amount of meat cooked. Monthly records shall be maintained of the amount of meat purchased. These records shall be retained on the restaurant premises for a period of at least five years and shall be made available for District inspection upon request. [District Rules 1081 and 4692] N

BIBLIOGRAPHY

Rules and Regulations		
Rule Number	Title	Last Updated
District Rule 2010	Permits Required	12/17/1992
District Rule 2020	Exemptions	12/20/2007
District Rule 4101	Visible Emissions	02/17/2005
District Rule 4102	Nuisance	12/17/1992
District Rule 4201	Particulate Matter Concentration	12/17/1992
District Rule 4692	Commercial Charbroiling	03/21/2002
District Rule 4801	Sulfur Compounds	12/17/1992

Miscellaneous		
Item	Title	Last Updated
Supplemental Form	Supplemental Application Form for Chain-Driven Charbroiler Operations	07/02
General Conditions	General Condition #s 14, 15, 98, and 1873-1880	10/02

Reference Materials		
Source Name	Title	Last Updated
UCR CE-CERT Final Report and Source Tests	Further Development of Emission Test Methods and Development of Emission Factors for Various Commercial Cooking Operations (SCAQMD Contract No. 96027)	07/1997