SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL DISTRICT

Guideline for Expedited Application Review (GEAR) #20
Existing Chain-Driven Charbroilers

Approved by: _____Signed_____ Date : May 31, 2016
Arnaud Marjollet
Director of Permit Services

Purpose: To outline the procedures for expedited processing of Permit to Operate applications for existing chain-driven charbroilers used in commercial charbroiling operations. These procedures will apply to processing of applications received over the counter or through the mail.

I. Applicability

This policy applies to chain-driven charbroilers used in commercial charbroiling operations that meet the following conditions:

A. Were installed prior to March 21, 2002; and
B. Have not been issued a Permit to Operate.

II. Permit Application and Supplementary Forms

The applicant must complete an application for a Permit to Operate anda supplemental application for Chain-Driven Charbroiler Operations, and provide satisfactory documentation of the installation date.

Applicants filing for a Permit to Operate must supply the District with any documentation necessary to identify the installation date and estimate emissions, including, but not limited to, records of the amount of meat cooked and the burner rating or maximum fuel usage. The operator may be subject to enforcement action for any period of operation without a Permit to Operate; therefore, applications for Permit to Operate for such chain-driven charbroilers installed prior to March 21, 2002 shall be submitted.

III. Background

Prior to March 21, 2002, chain-driven charbroilers used in restaurant operations were deemed “sources of minor significance” by the Air Pollution Control Officer and were exempt from permit requirements. On March 21, 2002, Rule 4692 was adopted after a series of District and industry workshops. Chain-driven charbroilers are no longer deemed “sources of minor significance” and are no longer permit exempt. Other commercial restaurant cooking equipment, including but not limited to non-chain-driven charbroilers, may be subject to

future rule provisions, but are not currently subject to Rule 4692 or permitting requirements. Carl's Jr.®, Burger King® and Red Robbin, International® are the only known major fast food restaurants to currently utilize chain-driven charbroilers.

IV. Priority Processing

Applications processed under this policy will be automatically expedited if a complete application, a complete supplemental form, and an application filing fee for each charbroiler unit is submitted.

In order to meet the expedited timeframe, the engineer assigned for preliminary review will be automatically assigned to process the final review. The application review and the in-house PTO will be submitted to the supervisor or manager for review.

Final action on all projects will occur within one week after the submittal of the complete application.

V. Application Review

In order to standardize the application reviews for this source category, the application review GEAR 20.doc (as found on the AIRnet, under Policies/GEARs) will be used as a template. The document is based on a typical existing chain-driven charbroiler. The following pages are a hard copy version of this standard review. This hard copy version for the GEAR Policy manual includes a copy of the required supplemental application form (Attachment I) and the standard PTO conditions (Attachment II).

The use of this standard Application Review will ensure that the proposed project complies with all applicable prohibitory rules including Rule 4692.

A Best Available Control Technology (BACT) analysis is not required because this unit is not subject to Rule 2201.

Health Risk Assessment (HRA) is not required since there can be no increase in toxic emissions associated with this project.

Applications processed using this standardized review should be processed within 14 days of the project being deemed complete.

VI. Equipment Description

To ensure uniformity, the following example of a standard description will be used:

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

VII. Permits Required

An In-house PTO is required due to a loss of exemption. District Rule 2020 (Exemptions), Section 9.0 (Compliance Schedules) provides that any equipment which was exempt at the time of installation and becomes subject to Rule 2010 (Permits Required) through loss of exemption shall not be subject to Rule 2201 (New and Modified Stationary Source Review) (NSR) until the equipment is modified. Therefore, chain-driven charbroilers used in commercial charbroiling operations that can be documented to have been installed prior to March 21, 2002 qualify for Permit to Operate without being subject to Rule 2201 (NSR).
A
B.

VIII. Health Risk Assessment

Pursuant to the District's Risk Management Policy for Permitting New and Modified Sources (APR 1905, 3/2/01), for any sources with increases in toxic air emissions, the health risks resulting from such projects must be evaluated. Applications for In-house PTO are for an existing emissions unit with no increase in toxic air emissions; therefore, a health risk analysis is not required.

IX. Permit to Operate Conditions

To ensure uniformity, a standard set of conditions will be used as a base for all applications (See Attachment II).

X. Updates

This GEAR will be updated as necessary to accommodate any changes in prohibitory rules, changes in BACT Clearinghouse, or any other necessary changes.

The attached bibliography lists items that are referenced in this GEAR. Changes to the listed items may necessitate revisions to this document. Additionally, alterations to this policy may trigger changes to some of the listed items.

The updates will be made following the "GEAR Revision" policy, when adopted.

APPLICATION REVIEW

FOR

EXISTING CHAIN-DRIVEN CHARBROILERS

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

Processing Engineer:
Lead Engineer:
Date:

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

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 SOx 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[ξ] (14 lb/10^3 gal)
SO_X	0.00285	0.016[ξ] (1.5 lb/10^3 gal)[ς]
PM_{10}	See Note (1)	
CO	0.0210	0.021[ξ] (1.9 lb/10^3 gal)
VOC (non-methane)	See Note (1)	

(1) The PM_{10} 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-PM_{10}/10^3 lb-Meat Cooked (Uncontrolled)
- EF_{VOC} = 2.27 lb-VOC/10^3 lb-Meat Cooked (Uncontrolled)

C. Emissions Calculations:

<u>PM_{10} and VOC Emissions from Meat Cooking</u>:

$PE_{PM10\text{-}Meat\ Cooked\ (Uncontrolled)}$ = EF_{PM10} (lb-PM_{10}/10^3 lb-Meat Cooked)
× Max. Meat Cooked (lb/week)
= (7.42 lb-PM_{10}/1000 lb-Meat Cooked) × ([XX] lb/week)
= **[XX] lb-PM_{10}/week**

$PE_{VOC\text{-}Meat\ Cooked\ (Uncontrolled)}$ = EF_{VOC} (lb-VOC/10^3 lb-Meat Cooked)
× Max. Meat Cooked (lb/week)
= (2.27 lb-VOC/1000 lb-Meat Cooked) × ([XX] lb/week)
= **[XX] lb-VOC/week**

[ξ] EF = (14 lb/10^3 gal) x (1 gal/90,500 Btu) x (1 x 10^6 Btu/ 1 MMBtu)= 0.155 lb-NO_X/MMBtu.

[ς] SOx = 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

$PE_{Natural\ Gas}$ (lb/day) = Max. Natural Gas Usage (MMBtu/hr) × Emission Factor (lb/MMBtu) x 168 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) PM_{10} and VOC emissions from combustion are included within the emission factors for the meat cooked.

Total Emissions from the chain-driven charbroiler:

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

Annual PE = PE_{Total} x 52 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

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

$$\text{PM Concentration} = \frac{(PM_{10}\text{ Emission Rate}) \times (7{,}000\text{ gr/lb})}{(\text{Exh Flow Rate}) \times (10{,}080\text{ min/wk}) \times (0.50\ PM_{10}/PM)}$$

$$= \frac{([XXX]\text{ lb-}PM_{10}/\text{week}) \times (7{,}000\text{ gr/lb})}{([XXX]\text{ cfm}) \times (10{,}080\text{ min/wk}) \times (0.50\ PM_{10}/PM)}$$

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

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 SO_2 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.

lb-SO_X/exhaust vol. = (lb-SO_X/MMBtu) ÷ (F factor)
= (0.00285 lb-SO_X/MMBtu) ÷ (8,578 dscf/MMBtu)
= 3.32×10^{-7} lb-SO_X/dscf

Volume SO_x/exhaust vol. = nRT/P,

where n = moles SO_x = (3.32 × 10^{-7} lb-SO_x/dscf) ÷ (64 lb-SO_2/lb-mol)
= 5.0 × 10^{-9} lb-mol/dscf
R = Universal gas constant = 10.73 psi-ft^3/lb-mol-°R
T = 60°F standard temperature = 520° Rankine, and
P = Standard atmospheric pressure = 14.7 psi

Volume SO_2/exhaust vol. = (5.0 × 10^{-9}) × (10.73) × (520°R) ÷ (14.7 psi)
= 2.0 × 10^{-6} dscf/dscf exhaust
= 2.0 ppmv << 2,000 ppmv

Compliance of this rule is expected.

California Environmental Quality Act (CEQA)

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.

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)

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: ft	
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

{14} 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

{15} 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