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RECEIVED
APR 11 2003
Bureau of Air Monitoring & Mobile Sources

CHROMIUM ELECTROPLATING AND ANODIZING
AIR GENERAL PERMIT NOTIFICATION FORM

Part III. Notification of Intent to Use General permit

Prior to filling out this form, please read the instructions provided at the end of the form. Send completed form to the address listed in the instructions and keep a copy of the form for your files.

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner):
   PERKO, Incorporated
2. Site Name (For example, plant name or number):
3. Hazardous Waste Generator Identification Number:
   FLD 00417677
4. Facility Location:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169
5. Facility Identification Number (DEP Use ONLY - do not fill in): 0251143-001

Responsible Official

6. Name and Title of Responsible Official:
   Name: Fred Perkins Title: President
7. Responsible Official Mailing Address:
   Organization/Firm:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169
8. Responsible Official Telephone Number:
   Telephone: (305) 621-7525 Fax: ( ) -

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager):
   Barry A. Reiter (Consultant)
10. Facility Contact Address:
    Street Address: 110 South Wymore Road
    City: Winter Park County: Orange Zip Code: 32789
11. Facility Contact Telephone Number:
    Telephone: (407) 644-1275 Fax: ( ) -

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

HARD CHROMIUM PLATING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
No Hard Chrome Plating at this Facility				

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[____] Yes [____] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

DECORATIVE AND ANODIZING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of paragraph (5) of Part II:
(**Note:** if your facility contains both hard and decorative plating or anodizing units, you must check each applicable date)

[____] January 25, 1996 [_X_] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[____] The facility will conduct an initial performance test

[_X_] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 1 above.

4. Equipment Monitoring and Recordkeeping Information
Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[_X_]	(b) Equipment inspection and repair	[_X_]
(c) Equipment malfunctions	[____]	(d) Operation and maintenance checklist	[____]
(e) Instrument calibration (used during initial performance test)	[____]	(f) Start-up, shutdown, malfunction plan	[____]
(g) Performance test results	[___]	(h) Equipment monitoring	[_X_]
(i) Excess emissions	[____]	(j) Operating periods	[_X_]
(k) Rectifier capacity	[____]	(l) Fume suppressant records	[____]
(m) Purchase records of wetting agent components	[_X_]		

5. Surrender of Existing DEP Air Permit(s)

Please indicate with an "X" the appropriate selection:

[____] I hereby surrender all existing DEP air permits authorizing operation of the facility indicated in this notification form; the permit number(s) are:

_____.

[_X_] No DEP air permits currently exist for the operation of the facility indicated in this notification form.

Responsible Official Certification

I, the undersigned, am the responsible official, as defined in Part II of this form, of the facility addressed in this notification. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this notification are true, accurate and complete. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described above so as to comply with all terms and conditions of this general permit as set forth in Part II of this notification form.

I will promptly notify the Department of any changes to the information contained in this notification.

FRED PERKINS
Print name of responsible official

PERKO, INC
Signature

4/10/03
Date

305 372 6954

AIR ENGINEERING & TESTING, INC.

March 17, 2003

Ms. Sandy Bowman
Division of Air Resource Management
2600 Blair Stone Road - MS 5510
Tallahassee, Florida 32399-2400
(850) 488-0114

Dear Ms. Bowman:

Thank you for talking with me this morning in reference to my client in Miami.

I have enclosed Attachment One to the document outlining the emissions from my clients facility which were submitted to DERM under an engineering seal. I remain perplexed as to how this facility is a Title V emission unit or if an emission unit, why not a general permit.

I would appreciate any feedback including the applicable citation of rules that would require the facility to be permitted as a full title V emission unit.

Thank you again for your assistance and please feel free to contact me at the number below or on my cell phone at (407) 448-0114.

STYRENE -

Very truly yours,

AIR ENGINEERING & TESTING, INC.

Barry A. Reiter
Principal

Home - 407 314 8621
Cell - 448 0114

2705 West Fairbanks Avenue ♦ Winter Park, Florida 32789
Telephone (407) 644-1275 Fax: (407) 628-5670

Attachment One

Table A

Evaluation of Subpart N Applicability

Subpart N – National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks	Response
63.340 Applicability and designation of sources. **(a)** The affected source to which the provisions of this subpart apply is each chromium electroplating or chromium anodizing tank at facilities performing hard chrome electroplating, decorative chromium electroplating or chromium anodizing.	The PERKO plating operations are classified as decorative chromium electroplating.
(c) Process tanks associated with a chromium electroplating or chromium anodizing processes, but in which neither chromium electroplating nor chromium anodizing is taking place are not subject to the provisions of this subpart.	There are three chromium electroplating tanks at the facility that potentially are subject to the Subpart N rule.
(e)(1) The Administrator has determined, ... that an owner or operator of the following types of operations that are not by themselves major sources and that are not located at major sources, as defined under 40 CFR 70.2, is permanently exempt from Title V permitting requirements for that operation.	Absent the operation of the decorative chromium electroplating at the facility, PERKO would not be a major source as defined in 40 CFR 70.2. [ref: Appendix One, Table B]
(e)(1)(i) Any decorative chromium electroplating operations or chromium anodizing operation that uses fume suppressants as an emission reduction technology	Surfactants are used in the decorative chromium electroplating tanks which act as an emission fume suppressant.
63.341 Definitions and nomenclature *Chemical fume suppressant* means any chemical agent that reduces or suppresses fumes or mists at the surface of an electroplating or anodizing bath; another term for fume suppressant is mist suppressant.	Surfactants meet the definition of a "chemical fume suppressant in § 63.341.

Table B

Evaluation of Title V Applicability

Title V Trigger 40 CFR 60 FAC 62-200	Emissions
100 TPY for CO NO_x PM_{10} SO_2 VOC	CO - Facility total less than 1.0 TPY NO_x - Facility total less than 0.5 TPY PM_{10} - Facility total less than 1.5 TPY SO_2 - Facility total de minimus VOC - Facility total less than 0.5 TPY
5 TPY for Pb & Pb Compounds	Pb emissions ≅ 115 pounds/year
10 TPY for any HAP	HAP - Facility total less than 1 TPY
Chromium – Subpart N	Cr emissions less than 0.5 pounds/year

Table B-1
Facility CO_x Emissions

Emission Source	Emission Rate		Source Reference
Hot Water Boiler 1		0.001 TPY	2003 Emissions Model [EPA Model based on AP-42]
Hot Water Boiler 2		0.001 TPY	2003 Emissions Model [EPA Model based on AP-42]
Exhaust Hood 1 [Automatic Foundry]	325 #/yr	0.163 TPY	1995 Emissions Inventory [Fugitive Emission]
Exhaust Hood 2 [Zinc Die Cast]	850 #/yr	0.425 TPY	1995 Emissions Inventory [Fugitive Emission]
Exhaust Hood 3 [Manual Foundry]	275 #/yr	0.138 TPY	1995 Emissions Inventory [Fugitive Emission]
Total CO_x Emissions	**0.728 TPY**		

Table B-2
Facility NO_x Emissions

Emission Source	Emission Rate		Source Reference
Hot Water Boiler 1	1.176 #/hr	0.206 TPY	2003 Emissions Model [EPA Model based on AP-42]
Hot Water Boiler 2	1.176 #/hr	0.206 TPY	2003 Emissions Model [EPA Model based on AP-42]
Total NO_x Emissions	**0.206 TPY †**		

† The actual rate in that only one hot water boiler is in operation at any point in time.

Table B-3
Facility VOC Emission Calculation

Given: The largest annual purchase of paint and solvent in the past five years was 109 gallons of material.

Assume: 100% volatilization of material and a material weight of 9 #/gal.

THEN: [a] 109 gallons x 9 #/gal = 981 pounds of VOC

[b] 981 # VOC ÷ 2000 #/ton = **0.4905 TPY** of VOC emissions

Table B-4
Facility PM_{10} Emissions

Emission Source	Emission Rate		Source Reference
	#/yr	TPY	
Cyclone 1	128	0.064	1993/95 Emissions Inventory
Cyclone 2	150	0.075	1993/95 Emissions Inventory
Cyclone 3	210	0.105	1993/95 Emissions Inventory
Cyclone 4	180	0.090	1993/95 Emissions Inventory
Cyclone 5	166	0.083	1993/95 Emissions Inventory
Cyclone 6	220	0.110	1993/95 Emissions Inventory
Cyclone 7	132	0.066	1993/95 Emissions Inventory
Cyclone 8	180	0.090	1993/95 Emissions Inventory
Cyclone 9	60	0.030	1993/95 Emissions Inventory
Cyclone 10	260	0.130	1993/95 Emissions Inventory
Cyclone 11	120	0.060	1993/95 Emissions Inventory
Cyclone 12	88	0.044	1993/95 Emissions Inventory
Cyclone 13	230	0.115	1993/95 Emissions Inventory
Cyclone 14	190	0.095	1993/95 Emissions Inventory
Cyclone 15	162	0.081	1993/95 Emissions Inventory
Exhaust Hood 1	45	0.023	1993/95 Emissions Inventory ‡
Exhaust Hood 2	28	0.014	1993/95 Emissions Inventory ‡
Exhaust Hood 3	70	0.035	1993/95 Emissions Inventory ‡
Hot Water Boiler 1	†	0.001	2003 Emissions Model †
Hot Water Boiler 2	†	0.001	2003 Emissions Model †
Baghouse	90	0.045	1993/95 Emissions Inventory
Sludge Dryer 1	10	0.005	1993/95 Emissions Inventory
Sludge Dryer 2	17.5	0.009	1993/95 Emissions Inventory
Total PM_{10} Emissions	**1.371 TPY**		

† [EPA Model based on AP-42] and only one operates at a time.

‡ Fugitive emissions of which hoods 1 & 3 contain Pb and other particulate.

Table B-5
Facility Pb Emission Calculation

Given: [a] The only area of the facility that contains lead as part of the operations is the foundry which is served by Exhaust Hood 1 and Exhaust Hood 3.
[b] The brass particulate fume is mostly copper.

Assume: Conservatively assume that 100% of the particulate fume is Pb.

Then: The total lead (Pb) emission from Hoods 1 and 3 are less than or equal to 115 pounds
(45 # + 70 # = 115 #)

Table B-6

Facility Cr Emissions Calculation

PERKO Operations

Amp range is 800 to 1200 amps per cycle @ 6 volts
(1000 amp average)
Average Cycle is 5 minutes [of which 0.5 minutes is charged]
Plating Department operates 7 hours/day
Plating Department operates 1250 days/yr

EPA Model Requirements:

MM amp hours @24 volts

Calculate:

Cycles per day

60 minutes ÷ 5 minutes/cycle [Rectifier on 30 seconds pre cycle]	=	12 cycles/hr
12 cycles/hr x 7 hours/day	=	84 cycles/day
7 hours/day x 1000 amps/cycle	=	7,000 amps/day @ 6 volts
7,000 amps/day x 1250 days/yr	=	8,750,000 amps/year

THEN:

[a] Assume that the rectifier is charged the entire cycle, and
[b] Taking no credit for a 6 volt system

8,750,00amps/year ÷ 1,000,000	=	8.75 MM amps/yr @ 6 volts
From the EPA Model		0.020606 TPY (Model)
0.020606 TPY x 2000 #/ton	=	41.212 #/yr (Unabated)
41.212 #/yr ÷ 8750 hrs/yr	=	0.00471 #/hr (Unabated)

OR

From the EPA Model		0.000206 TPY (Model)
0.000206 TPY x 2000 #/ton	=	**0.412 #/yr (Abated)**
		Scrubber Efficiency is listed at 99%
0.412 #/yr ÷ 8750 hrs/yr	=	**0.0000047 #/hr (Abated)**
		[4.7×10^{-6}]

Air Emissions

Boiler Emissions - Natural Gas

Date: 1/8/03

Company Name:	
Facility Name:	Miami, Dade County, Florida
Equipment Name:	Hot Water Boiler

Enter Maximum Heat Rate, (Btu/hr or Btuh) 200000000

Gas Consumption per Hour (cubic feet per hour) 4200

Calculated using a 1000 Btu/cu ft heating value for natural gas and 100% boiler load.

Enter Number Hours Operated per Year 350

The calculated emissions will be :

Emission Factors listed below are for **Natural Gas Boilers . . . . . Greater Than 100 Million Btuh**

b	c	d	
Pollutant	**Emission Factor**	**Emission Rate**	**Emissions**
	lbs/cu ft gas .0000076	lbs/hr c x cubic feet hour	tons/yr d x hour/2000
Particulate Material - PM_{10}	~~0.00000076~~	~~0.003~~ .632	0.001 .056
Sulfur Dioxide - SO2	0.0000006	0.003	0.000
Nitrogen Oxides - NO_x	0.00028	1.176	0.206
Volitile Organic Compounds - VOC	~~0.00000055~~ .0000055	0.002 .023	0.000 .004
Carbon Monoxide - CO	0.000084	0.353	0.062

Note: This calculation is based on the operation of a single hot water boiler. The PERKO operation has two hot water boilers, one of which is always in a "stand-by" position. The operational control system for the hot water boiler feed to the plating tanks is such that only one boiler is in operation at any point in time.

VOC – Emission Factor $5.5\ \#/10^6 ft^3$ x .0000055 x 4200

$= .0231\ \#/hr \times 350 = 8\ \#/yr$

Chrome Plating

Production Information

Type of Plating: decorative

Amps used: 8.75 million Amp-hours per year

Control Equipment: No Control 0% removal efficiency

Calculate Emissions

Emissions (tons/year)

CO	NOX	PART	PM10	SO2	VO
0.0000	0.0000	0.0431	0.0431	0.0000	0.0000

Chrome (Cr)	Chrome VI (Cr6)
0.020606	0.020606

Return to Calculate Emissions page

Chrome Plating

Production Information

Type of Plating: decorative

Amps used: 8.75 million Amp-hours per year

Control Equipment: Packed tower with mist eliminator 99% removal efficiency

Calculate Emissions

Emissions (tons/year)

CO	NOX	PART	PM10	SO2	VO
0.0000	0.0000	0.0004	0.0004	0.0000	0.0000

Chrome (Cr)	Chrome VI (Cr6)
0.000206	0.000206

Return to Calculate Emissions page

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APR 11 2003
Bureau of Air Monitoring & Mobile Sources

CHROMIUM ELECTROPLATING AND ANODIZING
AIR GENERAL PERMIT NOTIFICATION FORM

Part III. Notification of Intent to Use General permit

Prior to filling out this form, please read the instructions provided at the end of the form. Send completed form to the address listed in the instructions and keep a copy of the form for your files.

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner):
   PERKO, Incorporated
2. Site Name (For example, plant name or number):
3. Hazardous Waste Generator Identification Number:
   FLD 00417677
4. Facility Location:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169
5. Facility Identification Number (DEP Use ONLY - do not fill in): 0251143-001

Responsible Official

6. Name and Title of Responsible Official:
   Name: Fred Perkins Title: President
7. Responsible Official Mailing Address:
   Organization/Firm:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169
8. Responsible Official Telephone Number:
   Telephone: (305) 621-7525 Fax: ( ) -

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager):
   Barry A. Reiter (Consultant)
10. Facility Contact Address:
    Street Address: 110 South Wymore Road
    City: Winter Park County: Orange Zip Code: 32789
11. Facility Contact Telephone Number:
    Telephone: (407) 644-1275 Fax: ( ) -

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

HARD CHROMIUM PLATING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
No Hard Chrome Plating at this Facility				

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[____] Yes [____] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

DECORATIVE AND ANODIZING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of paragraph (5) of Part II:
(**Note:** if your facility contains both hard and decorative plating or anodizing units, you must check each applicable date)

[____] January 25, 1996 [_X_] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[____] The facility will conduct an initial performance test

[_X_] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 1 above.

4. Equipment Monitoring and Recordkeeping Information
Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[_X_]	(b) Equipment inspection and repair	[_X_]
(c) Equipment malfunctions	[____]	(d) Operation and maintenance checklist	[____]
(e) Instrument calibration (used during initial performance test)	[____]	(f) Start-up, shutdown, malfunction plan	[____]
(g) Performance test results	[___]	(h) Equipment monitoring	[_X_]
(i) Excess emissions	[____]	(j) Operating periods	[_X_]
(k) Rectifier capacity	[____]	(l) Fume suppressant records	[____]

(m) Purchase records of wetting agent components [_X_]

5. Surrender of Existing DEP Air Permit(s)

Please indicate with an "X" the appropriate selection:

[____] I hereby surrender all existing DEP air permits authorizing operation of the facility indicated in this notification form; the permit number(s) are:

_____.

[_X_] No DEP air permits currently exist for the operation of the facility indicated in this notification form.

Responsible Official Certification

I, the undersigned, am the responsible official, as defined in Part II of this form, of the facility addressed in this notification. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this notification are true, accurate and complete. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described above so as to comply with all terms and conditions of this general permit as set forth in Part II of this notification form.

I will promptly notify the Department of any changes to the information contained in this notification.

Fred Perkins
Print name of responsible official

Perko, inc
Signature

4/10/03
Date

PERKO, INC.
Shaping the Wave of Excellence®

RECEIVED
MAY 09 2003
Bureau of Air Monitoring
& Mobile Sources

May 8, 2003

To: Mr. Bruce Thomas
F.D.E.P. Division of Air

Dear Bruce:

In the absence of Mr. Fred Perkins, I hereby request that the Perko, Incorporated application for a General Title V Permit be withdrawn. Perko will immediately reevaluate the boilers and resubmit an application in the immediate future.

Thank you for your attention to this matter, and be assured we will contact you next week.

Very truly yours,

PERKO, INC.

Jeni Bedran, Jr.
Treasurer

"Energy Wise" to Stay on gas per derm

If Title V then gone

Permitted by DERM, Renewed Annually - MSP & multiple source Permit

MIAMI-DADE COUNTY, FLORIDA

MIAMI-DADE DERM

May 7, 2003 Inspected every 6 months, never said to go Title - Derm does inspections every 6 months

ENVIRONMENTAL RESOURCES MANAGEMENT
AIR QUALITY MANAGEMENT DIVISION
33 S W 2nd AVENUE
SUITE 900
MIAMI, FLORIDA 33130-1540
TELEPHONE: (305) 372-6925
FAX: (305) 372-6954

Mr. Bruce Thomas
Engineer II
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Subject: Permitting requirements for the Perko, Inc. facility located at 16490 NW 13 Avenue, Miami, FL 33169

Dear Mr. Thomas,

Thank you for forwarding a copy of Perko Marine's notification to operate under a Title V Chromium Electroplating General Permit, along with the supporting documentation for our review. After reviewing DERM's file for Perko, including inspection reports, and the above mentioned documentation, DERM is concerned that the emissions from other operations at the facility will not meet the definition of insignificant under Rule 62-213.430(6)(b)3; therefore the facility may not qualify to operate under a Title V General Permit. The following is a list of concerns:

1. Based on Perko's documentation, potential NO_x emissions from boiler operations are 5.15 TPY.
2. While CO emissions were documented for foundry operations (exhaust hood #1-3), none were shown for NO_x. Since the current emission rates provided to FDEP for foundry operations are the same as those in DERM's files, DERM anticipates that potential NO_x emissions from foundry operations will be 11.39 TPY.
3. No documentation provided to indicate potential emissions of ~~styrene~~ Diam from the facility's injection molding process. MAKE plastic cylinder 4"x6" ~~Water~~ Sightglass Leave in water strainer
4. No documentation provided to indicate potential emissions, including HAP from Di-cast and Foundry Operations. Di Cast is Zinc (Boat latches)
5. No documentation provided to indicate potential emissions, including HAP from chemical binders in casting/molding operations. - mostly acrylics (glue mixed w/sand) called "corebutts" 3-4% binder, the rest sand (water based acrylic emulsion)

Electric Foundry

Styrene is a pellet & is heated

Electric heat

In consideration of the above concerns, unless Perko can demonstrate that their emissions are indeed below significant thresholds, it is recommended that they be required to submit a full Title V application.

all gas allocated to boiler for determining ~~emission~~ emissions

Sincerely

Mallika Muthiah

Mallika Muthiah, Chief
Air Facilities Section

Zone 2 Pot has gas flame & has 1 DAY

MIAMI-DADE COUNTY, FLORIDA

MIAMI-DADE

DERM

ENVIRONMENTAL RESOURCES MANAGEMENT
AIR QUALITY MANAGEMENT DIVISION
33 S.W. 2nd AVENUE
SUITE 900
MIAMI, FLORIDA 33130-1540
TELEPHONE: (305) 372-6925
FAX: (305) 372-6954

May 7, 2003

Mr. Bruce Thomas
Engineer II
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Subject: Permitting requirements for the Perko, Inc. facility located at 16490 NW 13 Avenue, Miami, FL 33169

Dear Mr. Thomas,

Thank you for forwarding a copy of Perko Marine's notification to operate under a Title V Chromium Electroplating General Permit, along with the supporting documentation for our review. After reviewing DERM's file for Perko, including inspection reports, and the above mentioned documentation, DERM is concerned that the emissions from other operations at the facility will not meet the definition of insignificant under Rule 62-213.430(6)(b)3; therefore the facility may not qualify to operate under a Title V General Permit. The following is a list of concerns:

1. Based on Perko's documentation, potential NO_x emissions from boiler operations are 5.15 TPY.
2. While CO emissions were documented for foundry operations (exhaust hood #1-3), none were shown for NO_x. Since the current emission rates provided to FDEP for foundry operations are the same as those in DERM's files, DERM anticipates that potential NO_x emissions from foundry operations will be 11.39 TPY.
3. No documentation provided to indicate potential emissions of styrene from the facility's injection molding process.
4. No documentation provided to indicate potential emissions, including HAP from Di-cast and Foundry Operations.
5. No documentation provided to indicate potential emissions, including HAP from chemical binders in casting/molding operations.

In consideration of the above concerns, unless Perko can demonstrate that their emissions are indeed below significant thresholds, it is recommended that they be required to submit a full Title V application.

Sincerely

Mallika Muthiah

Mallika Muthiah, Chief
Air Facilities Section

RECEIVED TO: Bruce Thomas

MAR 25 2003

MIAMI-DADE COUNTY, FLORIDA

MIAMI-DADE

Bureau of Air Monitoring & Mobile Sources

DERM

February 28, 2003

ENVIRONMENTAL RESOURCES MANAGEMENT
AIR QUALITY MANAGEMENT DIVISION
33 S.W. 2nd AVENUE
SUITE 900
MIAMI, FLORIDA 33130-1540
TELEPHONE: (305) 372-6925
FAX: (305) 372-6954

Mr. Fred Perkins
PERKO, Incorporated
16490 NW 13 Avenue
Miami, FL 33169

CERTIFIED MAIL 7000 0600 0027 7978 7161
RETURN RECEIPT REQUESTED

Subject: Title V Air Operation Permit Requirement for PERKO, Inc., located at 16490 NW 13 Avenue, Miami, Florida 33169.
Submittal Dated January 14, 2003 from Mr. Barry A. Reiter on behalf of PERKO, Inc.

Dear Mr. Perkins:

Please be advised that DERM staff reviewed the referenced submittal and determined that your facility will require a Title V Air Operation Permit for its operation.

Mr. Barry Reiter has stated in the referenced letter that PERKO, Inc. does not meet any of the threshold limits that require a Title V permit. In the Attachment One of the submittal, Mr. Reiter quoted amendments to 40 CFR 63 Subpart N (National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks) as verification of why PERKO does not need a Title V permit. However, these federal amendments are superceded by more stringent state Title V permitting requirements.

After careful review of the amendment to 40 CFR 63 Subpart N, and consultation with the Florida Department of Environmental Protection (FDEP) staff, it has been determined that in the State of Florida, facilities such as yours, which are subject to the National Emission Standards for Hazardous Air Pollutants with requirements other than recordkeeping and reporting, must to obtain a Title V permit.

The FDEP has created Title V General Permits for facilities that are subject to NESHAP requirements but do not emit major amounts of hazardous air pollutants. However, a facility may only use a General Permit if they have only one type of air pollution source that requires permitting. So, even though the FDEP has created a Title V General Permit for Chromium Electroplating and Anodizing sources, your facility is not eligible to use it because of the operation of other significant sources of air pollution which require operation permits. Therefore, since your facility is a Title V source by being subject to NESHAP requirements other than recordkeeping and reporting, and you are unable to use a Title V General Permit, you must obtain a regular Title V permit for operation of your air pollution sources.

Therefore, you are hereby advised to submit a Title V Air Operation Permit Application (DEP Form No. 62-210.900(1)) for PERKO, Inc. on or before March 31, 2003. Be advised that failure to submit the said application by the deadline may result in your case being prepared for enforcement action. If you have any questions regarding this letter, please contact Rick Garcia or myself at (305) 372-6925.

Sincerely,

Mallika Muthiah

Mallika Muthiah, P.E., Chief
Air Facilities Section

Copy: Mr. Barry A. Reiter, Principal, Air Engineering & Testing, Inc.,
2705 West Fairbanks Avenue, Winter Park, FL 32789

MIAMI-DADE COUNTY, FLORIDA

MIAMI-DADE

DERM

ENVIRONMENTAL RESOURCES MANAGEMENT
AIR QUALITY MANAGEMENT DIVISION
33 S W. 2nd AVENUE
SUITE 900
MIAMI, FLORIDA 33130-1540
TELEPHONE: (305) 372-6925
FAX: (305) 372-6954

May 7, 2003

Mr. Bruce Thomas
Engineer II
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399

Subject: Permitting requirements for the Perko, Inc. facility located at 16490 NW 13 Avenue, Miami, FL 33169

Dear Mr. Thomas,

Thank you for forwarding a copy of Perko Marine's notification to operate under a Title V Chromium Electroplating General Permit, along with the supporting documentation for our review. After reviewing DERM's file for Perko, including inspection reports, and the above mentioned documentation, DERM is concerned that the emissions from other operations at the facility will not meet the definition of insignificant under Rule 62-213.430(6)(b)3; therefore the facility may not qualify to operate under a Title V General Permit. The following is a list of concerns:

1. Based on Perko's documentation, potential NO_x emissions from boiler operations are 5.15 TPY.
2. While CO emissions were documented for foundry operations (exhaust hood #1-3), none were shown for NO_x. Since the current emission rates provided to FDEP for foundry operations are the same as those in DERM's files, DERM anticipates that potential NO_x emissions from foundry operations will be 11.39 TPY.
3. No documentation provided to indicate potential emissions of styrene from the facility's injection molding process.
4. No documentation provided to indicate potential emissions, including HAP from Di-cast and Foundry Operations.
5. No documentation provided to indicate potential emissions, including HAP from chemical binders in casting/molding operations.

In consideration of the above concerns, unless Perko can demonstrate that their emissions are indeed below significant thresholds, it is recommended that they be required to submit a full Title V application.

Sincerely

Mallika Muthiah

Mallika Muthiah, Chief
Air Facilities Section

BARRY
Reiter
407-448-0114

.040(1)(b)
42-4 exemption
specific —
Gendie

ASOP
TBD 06740

RECEIVED
APR 11 2003
Bureau of Air Monitoring & Mobile Sources

CHROMIUM ELECTROPLATING AND ANODIZING
AIR GENERAL PERMIT NOTIFICATION FORM

Part III. Notification of Intent to Use General permit

Prior to filling out this form, please read the instructions provided at the end of the form. Send completed form to the address listed in the instructions and keep a copy of the form for your files.

Facility Name and Location

1. Facility Owner/Company Name (Name of corporation, agency, or individual owner):
   PERKO, Incorporated

2. Site Name (For example, plant name or number):

3. Hazardous Waste Generator Identification Number:
   FLD 00417677

4. Facility Location:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169

5. Facility Identification Number (DEP Use ONLY – do not fill in):
   0251143-001

Responsible Official

6. Name and Title of Responsible Official:
   Name: Fred Perkins Title: President

7. Responsible Official Mailing Address:
   Organization/Firm:
   Street Address: 16490 N.W. 13th Avenue
   City: Miami County: Dade Zip Code: 33169

8. Responsible Official Telephone Number:
   Telephone: (305) 621-7525 Fax: ( ) -

Facility Contact (If different from Responsible Official)

9. Name and Title of Facility Contact (For example, plant manager):
   Barry A. Reiter (Consultant)

10. Facility Contact Address:
    Street Address: 110 South Wymore Road
    City: Winter Park County: Orange Zip Code: 32789

11. Facility Contact Telephone Number:
    Telephone: (407) 644-1275 Fax: ( ) -

Facility Information

1.a. Provide the information below for each hard electroplating machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

HARD CHROMIUM PLATING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
No Hard Chrome Plating at this Facility				

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

a = 0.03 mg/dscm
b = 0.015 mg/dscm
c = alternative standard for multiple tanks under common control

Is the facility's cumulative potential rectifier capacity greater than 60 million ampere-hours per year?

[ ] Yes [ ] No

1.b. Provide the information below for each decorative electroplating or anodizing machine at the facility. Indicate the type of machine, the date of its purchase, and the date the control device was installed, if applicable.

DECORATIVE AND ANODIZING TANKS

DATE PURCHASED	UNIT CLASS (circle one)	DATE CNTRL DEVICE INSTALLED	CONTROL DEVICE (see key)	APPLICABLE STANDARD (see key)
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y
Jan 1978	Existing	Jan 1978	PBS/CMP	Y

Key for Control Device Type

PBS = packed-bed scrubber
CMP = composite mesh pad
PBS/CMP = packed-bed scrubber and composite mesh pad
FS = fume suppressant only
FS/WA = fume suppressant with a wetting agent
FM = fiber-bed mist eliminator
WA = wetting agent

Applicable Standard Key

x = 0.01 mg/dscm
y = 45 dynes/cm
z = records of bath components (trivalent Cr tanks only)
c = alternative standard for multiple tanks under common control

2. Indicate the date by which the facility must meet the requirements of paragraph (5) of Part II:
(**Note:** if your facility contains both hard and decorative plating or anodizing units, you must check each applicable date)

[____] January 25, 1996 [_X_] January 25, 1997

3. Indicate how the facility will fulfill the compliance demonstration:

[____] The facility will conduct an initial performance test

[_X_] The facility will use a wetting agent to reduce emissions and will meet the existing surface tension limit in No. 1 above.

4. Equipment Monitoring and Recordkeeping Information
Check all logs which are required to be kept on-site in accordance with the requirements of this general permit:

(a) Equipment maintenance	[_X_]	(b) Equipment inspection and repair	[_X_]
(c) Equipment malfunctions	[____]	(d) Operation and maintenance checklist	[____]
(e) Instrument calibration (used during initial performance test)	[____]	(f) Start-up, shutdown, malfunction plan	[____]
(g) Performance test results	[___]	(h) Equipment monitoring	[_X_]
(i) Excess emissions	[____]	(j) Operating periods	[_X_]
(k) Rectifier capacity	[____]	(l) Fume suppressant records	[____]
(m) Purchase records of wetting agent components	[_X_]		

5. Surrender of Existing DEP Air Permit(s)

Please indicate with an "X" the appropriate selection:

[____] I hereby surrender all existing DEP air permits authorizing operation of the facility indicated in this notification form; the permit number(s) are:

_____.

[_**X**_] No DEP air permits currently exist for the operation of the facility indicated in this notification form.

Responsible Official Certification

I, the undersigned, am the responsible official, as defined in Part II of this form, of the facility addressed in this notification. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this notification are true, accurate and complete. Further, I agree to operate and maintain the air pollutant emissions units and air pollution control equipment described above so as to comply with all terms and conditions of this general permit as set forth in Part II of this notification form.

I will promptly notify the Department of any changes to the information contained in this notification.

FRED PERKINS

Print name of responsible official

PERKO, INC.

Signature

4/10/03

Date

305 372 6954

AIR ENGINEERING & TESTING, INC.

March 17, 2003

Ms. Sandy Bowman
Division of Air Resource Management
2600 Blair Stone Road - MS 5510
Tallahassee, Florida 32399-2400
(850) 488-0114

Dear Ms. Bowman:

Thank you for talking with me this morning in reference to my client in Miami.

I have enclosed Attachment One to the document outlining the emissions from my clients facility which were submitted to DERM under an engineering seal. I remain perplexed as to how this facility is a Title V emission unit or if an emission unit, why not a general permit.

I would appreciate any feedback including the applicable citation of rules that would require the facility to be permitted as a full title V emission unit.

Thank you again for your assistance and please feel free to contact me at the number below or on my cell phone at (407) 448-0114.

STYRENE -

Very truly yours,

AIR ENGINEERING & TESTING, INC.

Barry A. Reiter
Principal

Home - 407 814 8621
Cell - 448 0114

2705 West Fairbanks Avenue ♦ Winter Park, Florida 32789
Telephone (407) 644-1275 Fax: (407) 628-5670

Attachment One

Table A

Evaluation of Subpart N Applicability

Subpart N – National Emission Standards for Chromium Emissions from Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks	Response
63.340 Applicability and designation of sources. **(a)** The affected source to which the provisions of this subpart apply is each chromium electroplating or chromium anodizing tank at facilities performing hard chrome electroplating, decorative chromium electroplating or chromium anodizing.	The PERKO plating operations are classified as decorative chromium electroplating.
(c) Process tanks associated with a chromium electroplating or chromium anodizing processes, but in which neither chromium electroplating nor chromium anodizing is taking place are not subject to the provisions of this subpart.	There are three chromium electroplating tanks at the facility that potentially are subject to the Subpart N rule.
(e)(1) The Administrator has determined, ... that an owner or operator of the following types of operations that are not by themselves major sources and that are not located at major sources, as defined under 40 CFR 70.2, is permanently exempt from Title V permitting requirements for that operation.	Absent the operation of the decorative chromium electroplating at the facility, PERKO would not be a major source as defined in 40 CFR 70.2. [ref: Appendix One, Table B]
(e)(1)(i) Any decorative chromium electroplating operations or chromium anodizing operation that uses fume suppressants as an emission reduction technology	Surfactants are used in the decorative chromium electroplating tanks which act as an emission fume suppressant.
63.341 Definitions and nomenclature *Chemical fume suppressant* means any chemical agent that reduces or suppresses fumes or mists at the surface of an electroplating or anodizing bath; another term for fume suppressant is mist suppressant.	Surfactants meet the definition of a "chemical fume suppressant in § 63.341.

Table B

Evaluation of Title V Applicability

Title V Trigger 40 CFR 60 FAC 62-200	Emissions
100 TPY for CO NO_x PM_{10} SO_2 VOC	CO - Facility total less than 1.0 TPY NO_x - Facility total less than 0.5 TPY PM_{10} - Facility total less than 1.5 TPY SO_2 - Facility total de minimus VOC - Facility total less than 0.5 TPY
5 TPY for Pb & Pb Compounds	Pb emissions ≅ 115 pounds/year
10 TPY for any HAP	HAP - Facility total less than 1 TPY
Chromium – Subpart N	Cr emissions less than 0.5 pounds/year

Table B-1
Facility CO_x Emissions

Emission Source	Emission Rate		Source Reference
Hot Water Boiler 1		0.001 TPY	2003 Emissions Model [EPA Model based on AP-42]
Hot Water Boiler 2		0.001 TPY	2003 Emissions Model [EPA Model based on AP-42]
Exhaust Hood 1 [Automatic Foundry]	325 #/yr	0.163 TPY	1995 Emissions Inventory [Fugitive Emission]
Exhaust Hood 2 [Zinc Die Cast]	850 #/yr	0.425 TPY	1995 Emissions Inventory [Fugitive Emission]
Exhaust Hood 3 [Manual Foundry]	275 #/yr	0.138 TPY	1995 Emissions Inventory [Fugitive Emission]
Total CO_x Emissions	**0.728 TPY**		

Table B-2
Facility NO_x Emissions

Emission Source	Emission Rate		Source Reference
Hot Water Boiler 1	1.176 #/hr	0.206 TPY ✓	2003 Emissions Model [EPA Model based on AP-42]
Hot Water Boiler 2	1.176 #/hr	0.206 TPY ✓	2003 Emissions Model [EPA Model based on AP-42]
Total NO_x Emissions	**0.206 TPY †**		

† The actual rate in that only one hot water boiler is in operation at any point in time.

Table B-3
Facility VOC Emission Calculation

Given: The largest annual purchase of paint and solvent in the past five years was 109 gallons of material.

Assume: 100% volatilization of material and a material weight of 9 #/gal.

THEN: [a] 109 gallons x 9 #/gal = 981 pounds of VOC

[b] 981 # VOC ÷ 2000 #/ton = **0.4905 TPY** of VOC emissions

Table B-4
Facility PM_{10} Emissions

Emission Source	Emission Rate		Source Reference
	#/yr	TPY	
Cyclone 1	128	0.064	1993/95 Emissions Inventory
Cyclone 2	150	0.075	1993/95 Emissions Inventory
Cyclone 3	210	0.105	1993/95 Emissions Inventory
Cyclone 4	180	0.090	1993/95 Emissions Inventory
Cyclone 5	166	0.083	1993/95 Emissions Inventory
Cyclone 6	220	0.110	1993/95 Emissions Inventory
Cyclone 7	132	0.066	1993/95 Emissions Inventory
Cyclone 8	180	0.090	1993/95 Emissions Inventory
Cyclone 9	60	0.030	1993/95 Emissions Inventory
Cyclone 10	260	0.130	1993/95 Emissions Inventory
Cyclone 11	120	0.060	1993/95 Emissions Inventory
Cyclone 12	88	0.044	1993/95 Emissions Inventory
Cyclone 13	230	0.115	1993/95 Emissions Inventory
Cyclone 14	190	0.095	1993/95 Emissions Inventory
Cyclone 15	162	0.081	1993/95 Emissions Inventory
Exhaust Hood 1	45	0.023	1993/95 Emissions Inventory ‡
Exhaust Hood 2	28	0.014	1993/95 Emissions Inventory ‡
Exhaust Hood 3	70	0.035	1993/95 Emissions Inventory ‡
Hot Water Boiler 1	†	0.001	2003 Emissions Model †
Hot Water Boiler 2	†	0.001	2003 Emissions Model †
Baghouse	90	0.045	1993/95 Emissions Inventory
Sludge Dryer 1	10	0.005	1993/95 Emissions Inventory
Sludge Dryer 2	17.5	0.009	1993/95 Emissions Inventory
Total PM_{10} Emissions	**1.371 TPY**		

† [EPA Model based on AP-42] and only one operates at a time.

‡ Fugitive emissions of which hoods 1 & 3 contain Pb and other particulate.

Table B-5
Facility Pb Emission Calculation

Given: [a] The only area of the facility that contains lead as part of the operations is the foundry which is served by Exhaust Hood 1 and Exhaust Hood 3.

[b] The brass particulate fume is mostly copper.

Assume: Conservatively assume that 100% of the particulate fume is Pb.

Then: The total lead (Pb) emission from Hoods 1 and 3 are less than or equal to 115 pounds

(45 # + 70 # = 115 #)

Table B-6

Facility Cr Emissions Calculation

PERKO Operations

Amp range is 800 to 1200 amps per cycle @ 6 volts
(1000 amp average)
Average Cycle is 5 minutes [of which 0.5 minutes is charged]
Plating Department operates 7 hours/day
Plating Department operates 1250 days/yr

EPA Model Requirements:

MM amp hours @24 volts

Calculate:

Cycles per day
60 minutes ÷ 5 minutes/cycle = 12 cycles/hr
[Rectifier on 30 seconds pre cycle]
12 cycles/hr x 7 hours/day = 84 cycles/day

7 hours/day x 1000 amps/cycle = 7,000 amps/day @ 6 volts

7,000 amps/day x 1250 days/yr = 8,750,000 amps/year

THEN:

[a] Assume that the rectifier is charged the entire cycle, and
[b] Taking no credit for a 6 volt system

8,750,00amps/year ÷ 1,000,000 = 8.75 MM amps/yr @ 6 volts

From the EPA Model 0.020606 TPY (Model)
0.020606 TPY x 2000 #/ton = 41.212 #/yr (Unabated)
41.212 #/yr ÷ 8750 hrs/yr = 0.00471 #/hr (Unabated)

OR

From the EPA Model 0.000206 TPY (Model)
0.000206 TPY x 2000 #/ton = **0.412 #/yr (Abated)**
Scrubber Efficiency is listed at 99%
0.412 #/yr ÷ 8750 hrs/yr = **0.0000047 #/hr (Abated)**
[4.7×10^{-6}]

Air Emissions

Boiler Emissions - Natural Gas

Date: 1/8/03

Company Name:	
Facility Name:	Miami, Dade County, Florida
Equipment Name:	Hot Water Boiler

Enter Maximum Heat Rate, (Btu/hr or Btuh) 200000000

Gas Consumption per Hour (cubic feet per hour) 4200

Calculated using a 1000 Btu/cu ft heating value for natural gas and 100% boiler load.

Enter Number Hours Operated per Year 350

The calculated emissions will be :

Emission Factors listed below are for **Natural Gas Boilers . . . . . Greater Than 100 Million Btuh**

b	c	d	
Pollutant	**Emission Factor**	**Emission Rate**	**Emissions**
	lbs/cu ft gas .0000076	lbs/hr c x cubic feet hour	tons/yr d x hour/2000
Particulate Material - PM_{10}	~~0.00000076~~	~~0.003~~ .032	0.001 .0056
Sulfur Dioxide - SO2	0.0000006	0.003	0.000
Nitrogen Oxides - NO_x	0.00028	1.176	0.206
Volitile Organic Compounds - VOC	~~0.00000055~~ .0000055	0.002 .023	0.000 .004
Carbon Monoxide - CO	0.000084	0.353	0.062

Note: This calculation is based on the operation of a single hot water boiler. The PERKO operation has two hot water boilers, one of which is always in a "stand-by" position. The operational control system for the hot water boiler feed to the plating tanks is such that only one boiler is in operation at any point in time.

VOC – Emission Factor $5.5\ lb/10^6\ ft^3 \times .000055 \times 4200$

$= .0231\ lb/hr \times 350 = 8\ lb/yr$

Chrome Plating

Production Information

Type of Plating: decorative

Amps used: 8.75 million Amp-hours per year

Control Equipment: No Control, 0% removal efficiency

Calculate Emissions

Emissions (tons/year)

CO	NOX	PART	PM10	SO2	VO
0.0000	0.0000	0.0431	0.0431	0.0000	0.0000

Chrome (Cr)	Chrome VI (Cr6)
0.020606	0.020606

Return to Calculate Emissions page

Chrome Plating

Production Information

Type of Plating: decorative

Amps used: 8.75 million Amp-hours per year

Control Equipment: Packed tower with mist eliminator, 99% removal efficiency

Calculate Emissions

Emissions (tons/year)

CO	NOX	PART	PM10	SO2	VO
0.0000	0.0000	0.0004	0.0004	0.0000	0.0000

Chrome (Cr)	Chrome VI (Cr6)
0.000206	0.000206

Return to Calculate Emissions page

Marcelo Barros
305 372 6954