

**STATEMENT OF THE LEGAL AND FACTUAL BASIS FOR THE TERMS
OF THE PROPOSED PERMIT [1203(B)(1)(a)(i)]**

TITLE V FEDERAL PERMIT TO OPERATE
Facility named – Fiber-Care Bath, Inc.

Federal Operating Permit # 42701095

Issue Date: September 18, 2012 through September 18, 2017

Processing Air Quality Engineer:

Roseana Navarro-Brasington

A. Owner/operator Identifying Information:

Owner/Company Name: FIBER-CARE BATH, INC.

Owner Mailing Address: FIBER-CARE BATH, INC
9832 B Yucca Road
Adelanto, CA 92301

Owner/operator Name: FIBER-CARE BATH, INC

Owner/operator Location: 9400 Holly Road
Adelanto, California 92301

Mailing Address: 9832 B Yucca Road
Adelanto, CA 92301

MDAQMD Federal Operating Permit Number: 088201634

MDAQMD Company Number: 0882

MDAQMD Owner/operator Number: 01634

Responsible Official: Tony Drake
Title: General Manager
Phone Number:

Owner/operator "Site" Contacts: Mr. Tom Kirkmeyer
Title: President
Phone Number: 760-246-0019

Owner/operator "Off Site" Contacts: None Provided
Phone Number:

Nature of Business: Manufacturer of Fiberglass bath tubs and showers
SIC Code: 3088/326191 – Plastics Plumbing Fixture Manufacturing

Owner/operator Location: UTM (Km) 458.698E / 3824.972N

STATEMENT OF THE LEGAL AND FACTUAL BASIS FOR THE TERMS OF THE PROPOSED PERMIT [1203(B)(1)(a)(i)]

Title 40 Code of Federal Regulations Part 71 establishes a comprehensive air quality operating permit program under the authority of Title V of the 1990 amendments to the federal Clean Air Act. The air quality operating permit is an enforceable compilation of all of the applicable air pollution requirements that apply to an existing affected air emissions source. The permit is developed via a public process, may contain additional new requirements to improve monitoring of existing requirements, and contains procedural and prohibitory requirements related to the permit program itself. The permit is valid for 5 years and may be renewed. Statutory and Regulatory Authorities: Pursuant MDAQMD Regulation 12, Program - Federal Operating Permits, a.k.a. Title V (Adopted 7/25/94, Amended 02/22/95, Additional Rules adopted 06/28/95, 7/31/95) and 02/05/96 FR 4217 (Interim Approval), in accordance with Rule 221 - *Federal Operating Permit Requirement*, 40 CFR 52.220(c)(216)(i)(A)(2) - 02/05/96 61 FR 4217 of the Clean Air Act of 1990, the Mojave Desert Air Quality Management District issues the permit to Fiber-Care.

The Initial Title V Permit Application was received on December 14, 2009.

This document, the statement of basis, summarizes the legal and factual basis for the permit conditions in the air quality operating permit to be issued to Fiber-Care Bath. (referred to herein as Fiber-Care, facility, source, or permittee). Unlike the air quality operating permit, this document is not legally enforceable. This statement of basis summarizes the emitting processes at the facility, air emissions, the statutory or regulatory provisions that relate to the subject facility, and the steps taken to provide opportunities for public review of the permit. The permittee is obligated to follow the terms of the permit. Any errors or omissions in the summaries provided here do not excuse the permittee from the requirements of the permit.

The District's approach to the Title V program is to issue a single Federal Operating Permit for the entire facility, which satisfies the federal requirement for a permit under Rule 221 [*NOTE: MDAQMD maintains separate Title V and District permits programs*]. All Federal, State and most District only requirements, associated with the emission of air contaminants, are included in the Federal Operating Permit. All documents, which are not readily available to the public, and are necessary to support the permit, are to be included. The District has taken the approach that the following documents are readily available to the public, and therefore, are not included: *Code of Federal Regulations, California Code of Regulations and Health and Safety Code, District Rules and Regulations [both documents are current and appear in the California State Implementation Plan], all test methods, copies of District Authorities to Construct and Permits to Operate [available at the District's office]*.

The USEPA, Region 9 was e-mailed a draft of the proposed permit on July 19, 2012. The USEPA statutory 45-day review period will expire on or about September 4, 2012. The 30-day

Public Notice was published on or about July 19, 2012 and will end thirty days from the date of publication which is on or about August 19, 2012.

I. BACKGROUND:

DESCRIPTION OF FACILITY:

Federal Operating Permit (FOP number: 088201634) is for Fiber-Care Bath, Inc. Fiber-Care Bath, Inc., located at 9832 B Yucca Road, in Adelanto, California. Constructed in 1996, Fiber-Care Bath manufactures fiberglass (reinforce plastic composites) showers and tubs. The manufacturing process is comprised of mold preparation, gel-coat and resin laminations, and finishing under SIC Code 3088 –Plastics Plumbing Fixtures and NACIS Code 326191 - Plastics Plumbing Fixture Manufacturing. The manufacturing process begins with mold preparation. The mold is then moved to a gel-coat station/booth and VOC suppressed gel-coat is applied. The dispensing unit is an internal mix, non-atomized airless unit. The mold, coated with a gel-coat is allowed to cure for approximately twenty minutes. The mold is then moved to booth #2, where 1st lamination is applied using an internal mix, non-atomized airless dispensing unit. The 1st lamination also utilizes a reactive suppressant similar to that used in the gel - coat application. The mold is then moved to booth #3, 2nd lamination is applied. The mold is then move to a pull station where the newly formed part is hydraulically separated from the mold.

Fiber-Care Bath operates under an emissions cap which limits VOC emissions to below the major source threshold. There are no combustion sources located at the facility which are subject to permit requirements. The facility is required to obtain a Title V permit because the potential emissions exceed the major source threshold for a single HAP, styrene.

Pollutant	PTE (tpy)	Major Source Threshold (tpy)
CO	0	100
NO _x	0	25
SO ₂	0	100
PM ₁₀	0	100
PM _{2.5}	0	100
VOC (or ROG)	24.9	25
GHGs	0	100,000
Single HAP	24.9	10
Total HAPs	24.9	25

Rule 1203 (D)(1) outlines Title V Permit content requirements as follows:

II. TITLE V PERMIT CONTENTS [Rule 1203 (D)(1)]:

All Federal Operating Permits shall contain, at a minimum, the following terms, and conditions:

A. Identification of Applicable Requirements:

1. Standard conditions for generally applicable requirements do not list those processes to which they apply as allowed by EPA's White Paper One, page 11, section 4, last sentence of paragraph 2.
2. Minor New Source Review (NSR). This facility has the following four District permits:

S004768	SPRAY BOOTH - TOOLING, BUILDING #1	The booth; spray guns , the compressor, which runs the guns; mixers; and storage areas for the resins as well as solid ingredients for the finished products.
S007459	SPRAY BOOTH - LAMINATION #1, PRODUCTION BUILDING 2	Ventilated Spray Room with exhaust filters, Glass Craft Chopper Spray System, Model LPA2AAC, consisting of Pump, Mixer, and 5 spray guns. This system and associated guns are shared with Permit S011473 and S011478.
S011473	SPRAY BOOTH - LAMINATION #2, PRODUCTION BUILDING 2	Ventilated Spray Room with exhaust filters, Glass Craft Chopper Spray System, Model LPA2AAC, consisting of Pump, Mixer, and 5 spray guns. This system and associated guns are shared with Permit S007459 and S011478.
S011478	SPRAY BOOTH, GEL COAT, PRODUCTION BUILDING 2	Ventilated Spray Room with exhaust filters, Glass Craft Chopper Spray System, Model LPA2AAC, consisting of Pump, Mixer, and 5 spray guns. This system and associated guns are shared with Permit S007459 and S011473

All permit conditions, , are considered applicable federal requirements because those pre-construction review actions resulted from SIP Rule 203 - *Permit to Operate* and SIP Rule 204 - *Permit Conditions*.

3. MDAQMD Definitions of Federal Applicable/Enforceable Requirements:

District Rule 1201 (P): "Federally Enforceable" - Any requirement, condition or other term which is fully enforceable by USEPA pursuant to the provisions of 42 U.S.C. §7413 (Federal Clean Air Act §113) or the public pursuant to the provisions of 42 U.S.C. §7604 (Federal Clean Air Act §304).

District Rule 1201 (G): "Applicable Requirement" - Any of the following requirements, including requirements that have been promulgated or approved by USEPA through rulemaking at the time of permit issuance but have future effective dates, as they apply to a Facility or Permit Unit:

- (a) Any standard or other requirement contained in the applicable implementation plan for the District, and any amendments thereto, approved or promulgated pursuant to the provisions of Title I of the Federal Clean Air Act (42 U.S.C. §§7401-7515).
- (b) Any term or condition of any preconstruction permit issued pursuant to regulations approved or promulgated under Title I of the Federal Clean Air Act (42 U.S.C. §§7401-7515).
- (c) Any standard or other requirement under 42 U.S.C. §§7411, Standards of Performance for New Stationary Sources (Federal Clean Air Act §111); 42 U.S.C. §7412, Hazardous Air Pollutants (Federal Clean Air Act §112); and any regulations promulgated thereunder.
- (d) Any standard or other requirement under Title IV of the Federal Clean Air Act (42 U.S.C. §§7651-7651o) or the regulations promulgated thereunder.
- (e) Any requirements regarding monitoring, analysis, and compliance established pursuant to 42 U.S.C. §7414(a)(3), Record keeping, Inspections, Monitoring and Entry (Federal Clean Air Act §114); 42 U.S.C. §7661c(b), Permit Requirements and Conditions (Federal Clean Air Act §504); and the regulations promulgated thereunder.
- (f) Any standard or other requirement governing Solid Waste Incineration Units under 42 U.S.C. §7429, Solid Waste Combustion (Federal Clean Air Act §129) and the regulations promulgated thereunder.
- (g) Any standard or other requirement for consumer or commercial products under 42 U.S.C. §7511b(e) (Federal Clean Air Act §183) and the regulations promulgated thereunder.

- (h) Any standard or other requirement of the regulations promulgated under Title VI of the Federal Clean Air Act (42 U.S.C. §§7671-7671q) unless the USEPA has determined that such requirement need not be contained in a Federal Operating Permit.
- (i) Any national ambient air quality standard or increment or visibility requirement under part C of Title I of the Federal Clean Air Act (42 U.S.C. §§7401-7515), but only as it would apply to temporary sources pursuant to the provisions of 42 U.S.C. 7661c(e) (Federal Clean Air Act §504(e)).

4. Applicability of Federally Enforceable Requirements

The discussions below address the applicability of federally enforceable requirements. Where a standard has been determined to be applicable to the facility, the requirements of that standard have been included in the Title V Permit.

40 CFR, Parts 60.7, 60.8 and 60.13; Subpart A - New Source Performance Standards, General Provisions: This facility is not subject to the requirements of this subpart because it is not subject to any standard under Part 60—Standards of Performance for New Stationary Sources

40 CFR Part 60 –Standards of Performance for New Stationary Sources (NSPS) Subpart VVV – Standards of Performance for Polymeric Coating of Supporting Substrate Facilities: This facility is not subject to this subpart because it does not meet the definition of a polymeric coating of supporting substrate facility as defined in Subpart VVV §60.741(a).

40 CFR Part 61, Subpart M - National Emission Standard for Asbestos
This facility on an as needed basis is subject to Section 61.145 through 61.147 - standards for the demolition and renovation of asbestos. Historically, the facility has been in compliance with the requirements of these standards. Appropriate conditions will be included on the permit to ensure compliance with these requirements.

40 CFR Part 82 - Protection of Stratospheric Ozone
This facility is in compliance with the requirements of this part. Any servicing of air conditioners is performed by a qualified contracting company. An appropriate condition will be included on the permit to ensure continued compliance with these requirements.

40 CFR Part 63, Subpart WWWW - National Emission Standard for Hazardous Air Pollutants: Reinforced Plastic Composites Production: Fiber-Care Bath is subject to this subpart because it is a major source of HAPs and engages in reinforced plastic composite production [40 CFR 63.5785(a)]. The facility is considered an existing affected source because it was constructed in 1996 [40 CFR §63.5795]. Specifically this facility engages

in the following types of operations regulated under this subpart: open molding –tooling, open molding - non CR/HS and open molding - gel coat.

40 CFR Part 63, Subpart VVVV - National Emission Standard for Hazardous Air Pollutants for Boat Manufacturing: Fiber-Care Bath is not subject to this subpart because they are not a manufacturer of boats and do not engage in any of the activities specified under this subpart (40 CFR §63.5683).

Rule 442 – Usage of Solvents: The use of any VOC containing materials not subject to the VOC limits in Regulation XI is subject to this rule. Appropriate conditions have been incorporated into permit conditions.

Rule 1162 Polyester Resin Operations: Fiber-Care is a polyester resin operation and as such is subject to the provisions of this rule. Appropriate conditions have been incorporated into permit conditions.

B. COMPLIANCE ASSURANCE MONITORING (CAM)

In accordance with the requirements of 40 CFR 64, Compliance Assurance Monitoring (CAM), a review for Cam has been completed. The following three conditions must be met for an emissions unit to be subject to CAM are:

1. emits or has the potential to emit (in the absence of add-on control devices) quantities of one or more regulated air pollutant that exceed major source thresholds,
2. is subject to one or more emissions limitations for the regulated air pollutant(s) for which it is major before control, and
3. uses a control device to achieve compliance with one or more of these emission limitations.

The only control devices are the filters for the spray booths which only control particulates which do not have an uncontrolled PTE above the major source threshold. Therefore, there are no emissions units subject to CAM at this facility.

Unit/Description	Threshold	Emissions Pre-control
S004768 SPRAY BOOTH - TOOLING, BUILDING #1	PM10 - 100 TPY	PM10 - Insignificant
S007459 SPRAY BOOTH - LAMINATION #1, PRODUCTION BUILDING 2	PM10 - 100 TPY	PM10 - Insignificant
S011473 SPRAY BOOTH - LAMINATION #2, PRODUCTION BUILDING 2	PM10 - 100 TPY	PM10 - Insignificant
S011478 SPRAY BOOTH, GEL COAT, PRODUCTION	PM10 - 100 TPY	PM10 - Insignificant

BUILDING 2		
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CAM applies to emission units subject to an emission limit with a pre-control potential to emit greater than the major source threshold defined in Title V (generally, 100 tons per year) and that use a control device to comply with the limit. All units that meet the CAM applicability criteria must be in compliance at permit renewal and may also be required to submit a CAM plan if a significant change is made to the unit prior to renewal. Particulate emissions from the gel coat and chopper guns, are expected to be insignificant and well below the major source threshold of 100 tons per year. PM10 emissions have not been quantified, as EPA AP-42 Chapter 4.4, Polyester Resin Plastic Products Fabrication, does not contain PM10 emission factor for this source category.. Consequently, because the PM10 emissions are below the threshold, the spray booths are not subject to CAM. No other pollutants emitted by the spray booth are both subject to a standard and controlled by a control device, so CAM does not apply to this emission unit for any other pollutants.

- C. Emissions limitations and/or standards, including operational limitations, which assure compliance with all Applicable Requirements and a reference to the origin and authority of each term or condition contained in the Federal Operating Permit: **COMPLETED**

- D. Monitoring requirements including but not limited to: [40 CFR 70.6(a)(1)] [see following] **Various CAPCOA/CARB/EPA Periodic Monitoring Workgroup proposed Periodic Monitoring Requirements were incorporated into the Fiber-Care Bath, Inc. Title V Permit:**
 - (i) All emissions monitoring and analysis methods required by an Applicable Requirement.
 - (ii) Periodic monitoring, testing or record keeping (including test methods sufficient to yield reliable data) to determine compliance with an Applicable Requirement that does not directly require such monitoring.
 - (iii) Necessary requirements concerning use and maintenance of equipment including the installation and maintenance of monitoring equipment.

- E. Record keeping requirements, where applicable, including but not limited to: [see following] **All COMPLETED**
 - (i) Records of required monitoring information including dates and times of sampling, operating conditions at the time of sampling, date of analysis, analytical techniques and methods, the person or company performing the analysis, and the results of the analysis.
 - (ii) The retention of all records for a period of at least five (5) years from the date of monitoring.

- F. Reporting requirements, where applicable, including but not limited to: [see following] **All COMPLETED**
 - (i) Submittal of any required monitoring reports at least every six (6) months.
 - (ii) Prompt reporting of all deviations from permit requirements including those attributable to breakdown conditions. Prompt reporting shall be determined in compliance with District Rule 430.

- G. Various Standardized Provisions and/or Conditions: [see following] **ALL COMPLETED**
- (i) A severability clause.
 - (ii) A provision, which states that the permit holder shall comply with all conditions of the Federal Operating Permit. Any noncompliance constitutes a violation of the Federal Clean Air Act and is grounds for enforcement action; the termination, revocation and reissuance, or modification of the Federal Operating Permit; and/or grounds for denial of a renewal application.
 - (iii) A provision which states that the need to halt or reduce activity to maintain compliance with the provisions of the Federal Operating Permit, or for any other reason, is not a defense in an enforcement action.
 - (iv) A provisions, which states that the Federal Operating Permit may be modified, revoked, reopened, reissued or terminated for cause.
 - (v) A provision which states that the filing of an application for modification; a request for revocation and re-issuance, or termination; or notifications of planned changes, or anticipated noncompliance does not stay any condition of the Federal Operating Permit.
 - (vi) A provision, which states that the permit does not convey any property rights of any sort, or any exclusive privilege.
 - (vii) A provision which states that the Permit holder shall furnish to the District, within a reasonable time as specified by the District, any information that the District may request in writing to determine whether cause exists for modifying, revoking and reissuing, terminating or determining compliance with the Federal Operating Permit.
 - (viii) A provision, which states that the Permit holder shall, upon request, furnish to the District copies of records required to be kept pursuant to conditions of the Federal Operating Permit.
 - (ix) A provision requiring the payment of annual permit renewal fees and other applicable fees as prescribed in District Rule 312.
 - (x) A provision stating that no permit revision shall be required under any approved economic incentives, marketable permits, emissions trading or other similar programs provided for in the permit.
 - (xi) Terms and conditions, if applicable, for reasonably anticipated operating scenarios identified by the Facility in its application which require the Facility, contemporaneously with making the change from one operating scenario to another, to record in a log at the Facility a record of the scenario under which it is operating; and ensure that each alternative operating scenario meets all Applicable Requirements.
 - (xii) Terms and conditions, if requested by the applicant, for the trading of emissions increases and decreases within the Facility to the extent any Applicable Requirements allow for such trading without case-by-case approval. Such terms conditions shall include all terms and conditions to determine compliance with all Applicable Requirements; and meet all Applicable Requirements.

- H. Compliance Conditions: [see following] **All COMPLETED**
- (i) Inspection and entry requirements which require that the Permit Holder allow an authorized representative of the District to enter upon the Permit holder's premises, at reasonable times.
 - (ii) Provisions which allow an authorized representative of the District to have access to and copy any records that must be kept under conditions of the Federal Operating Permit.
 - (iii) Provisions, which allow an authorized representative of the District to inspect any Permit Unit, equipment, practice, or operation regulated or required under the Federal Operating Permit.
 - (iv) Provisions which allow an authorized representative of the District to sample or monitor substances or parameters for the purpose of assuring compliance with the Federal Operating Permits or with any Applicable Requirement.
 - (v) A Compliance Plan.
 - (vi) A restatement, if applicable, of the requirement that the Permit holder submit progress reports at least semiannually pursuant to a schedule of compliance. Such progress reports shall comply with the provisions of District Rule 1201(I)(3)(iii).
 - (vii) Certification requirements including the frequency of submission, not less than annually, for Compliance Certifications.
 - (viii) Requirements that methods for monitoring compliance be included in the Compliance Certifications.
 - (ix) Requirements that all Compliance Certifications be contemporaneously submitted to USEPA.
 - (x) Any additional certification requirements as specified in 42 U.S.C §7414(a)(3), Recordkeeping Inspections Monitoring and Entry (Federal Clean Air Act §114(a)(3)) and 42 U.S.C. §7661c(b), Permit Requirements and Conditions (Federal Clean Air Act §503(b)) or in regulations promulgated thereunder.
- I. Fugitive Emissions: **COMPLETED**
- (i) Fugitive emissions shall be included in the permit and permit conditions in the same manner as stack emissions.

III. CONCLUSIONS AND RECOMMENDATION:

In conclusion, the proposed *Fiber-Care Bath, Inc. Title V Permit issuance* has been found to satisfy all of the requirements of District Rule 221, Rule 312, Regulation XII Rules, and the District's Title V Permit Program requirements.

Therefore, it is recommended that this Title V - Federal Operating Permit be Issued to satisfy those requirements on September 18, 2012 for the period September 18, 2012 through September 18, 2017.

The proposed Fiber-Care Bath, Inc. Title V Permit & the proposed Statement of Basis documents were e-mailed on July 19, 2012 to U.S. EPA Region 9.

Roseana Navarro-Brasington
Air Quality Engineer

July 19, 2012

APPENDIX "A"

DISTRICT / SIP RULE COMPLIANCE DEMONSTRATIONS:

- A. Rule 406: Owner/Operator shall not discharge into the atmosphere from this facility, from any single source of emissions whatsoever, Sulfur compounds, which would exist as a liquid or gas at standard conditions, calculated as sulfur dioxide (SO₂) greater than or equal to 500 ppm by volume.

[40 CFR 70.6 (a)(1) - Periodic Monitoring Requirements] (for Periodic Monitoring Requirements, see: Part II, section A, condition 22; Part III, section C, conditions 11 and 22; Part V, section C, condition 4; Part V, section D, condition 3; Part V, section I, condition 3)

[Rule 406 - Specific Contaminants; Version in SIP = 07/25/77, 40 CFR 52.220(c)(42)(xiii)(A) - 12/21/78 43 FR 52489, Subpart (a) only; Current Rule Version = 02/20/79]

Rule 406 specifies standard conditions, but not dry. Standard conditions for Rule 406 will be calculated as wet.

Calculate the SO₂ concentration in the diesel fueled IC engine exhaust gas using the following assumptions/calculations:

1. Maximum sulfur content of the diesel fuel is by permit condition: 0.05 % by weight.
2. Specific gravity of diesel fuel is 0.84: weight of one gallon of diesel fuel is: 8.33 lb/gal x 0.84 = 7 lb/gal.
3. Heating value of diesel fuel from U.S. EPA AP-42, Section 3.3: 19,300 Btu/lb.
4. Gallons of fuel required for 10⁶ Btu: 1 lb/19,300 Btu = x lb/ 10⁶ Btu: x = 51.8 lb: (51.8 lb)(1 gal/7 lb) = 7.4 gallons per 10⁶ Btu.
5. Pounds of sulfur per 10⁶ Btu (7.4 gallons): (7.4 gal)(7 lb/gal)(0.0005) = 0.0259 pounds.
6. Mols of sulfur per 10⁶ Btu: 0.0259 lb/ 32 lb/mol = 8.09 x 10⁻⁴ mols.
7. Volume of SO₂ produced; assuming that one mol of sulfur produces one mol of SO₂; 8.09 x 10⁻⁴ mols of SO₂ are produced per 10⁶ Btu of diesel burned: (385 ft³ / mol)(8.09 x 10⁻⁴ mols) = 0.312 ft³: (385 ft³/mol is at 68 degrees Fahrenheit).
8. From 40 CFR 60, Appendix A, Method 19 the F_w factor for diesel is 10,320 wscf / 10⁶ Btu (68 degrees Fahrenheit, 0 % excess O₂). Rule 406 specifies the SO₂ concentration at standard conditions, wet, not dry.

For purposes of this calculation, excess air from the combustion process will not be considered in calculating the SO₂ concentration & is the most conservative assumption:

Concentration of SO₂ at zero percent oxygen:

$$0.312 \text{ ft}^3 / (0.010320 \times 10^6 \text{ wscf}) = 30.2 \text{ ppmv}$$

Conclusion: Diesel fueled IC Engine exhaust SO₂ concentration of 30.2 ppmv complies with Rule 406 SO₂ limit of 500 ppmv.

It is assumed that the SO₂ concentration in natural gas fueled IC engine exhaust gas will be conservatively less than that demonstrated above for diesel combustion:

Calculate the CO concentration in boiler exhaust gas using the following assumptions/calculations:

1. Based on U.S. EPA AP-42; Section 1.4, Table 1.4-2, lists the CO emission factor for natural gas combustion in boilers to be 35 lb CO per 10⁶ ft³ of natural gas burned. Assume 1000 Btu / ft³ of natural gas.
2. From 40 CFR 60 Appendix A, Method 19, the F_d factor for natural gas is 8710 dscf / 10⁶ Btu (68 degrees Fahrenheit). Rule 407 specifies the CO concentration on a dry basis.
3. For the purposes of this calculation, excess air will not be considered in calculating the CO concentration (most conservative):

Cubic feet of CO produced per 10⁶ ft³ of natural gas burned:
(35 lb) (1 lb mol / 28 lb) (385 ft³ / mol) = 481 ft³ CO (385 ft³ / mol at 68 degrees Fahrenheit)

Dry cubic feet of combustion gas formed from 10⁶ ft³ of natural gas burned:
(10⁶ ft³ gas) (1000 Btu / ft³) (8710 dscf / 10⁶ Btu) = 8,710,000 dscf

CO concentration = 481 ft³ / 8.71 10⁶ ft³ = 55.2 ppm (most conservative)

Conclusion: Boiler exhaust CO concentration of 55.2 ppmv complies with Rule 407 CO limit of 2000 ppmv.

- B.** Rule 409: Owner/Operator shall not discharge into the atmosphere from this facility from the burning of fuel, combustion contaminants exceeding 0.23 gram per cubic meter (0.1 grain per cubic foot) of gas calculated to 12 percent of carbon dioxide (CO₂) at standard conditions averaged over a minimum of 25 consecutive minutes.
[Rule 409 - *Combustion Contaminants*; Version in SIP = CARB Ex. Order G-73, 40 CFR 52.220(c)(39)(ii)(C) - 09/08/78 43 FR 40011; Current Rule Version = 07/25/77]

Calculate the Total Particulate Concentration in the diesel fueled IC engine exhaust gas using the following assumptions/calculations:

1. Based on U.S. EPA AP-42, Section 3.4, Table 3.4-5, the emission factor for total particulate is 0.0697 lb/10⁶ Btu. (= 487.9 grains/10⁶ Btu)
2. From 40 CFR 60, Appendix A, Method 19 the F_w factor for diesel is 10,320 wscf/10⁶ Btu (68 degrees Fahrenheit, 0 % excess O₂). Rule 409 specifies the Particulate concentration at standard conditions, wet, not dry.

For purposes of this calculation, excess air from the combustion process will not be considered in calculating the Particulate concentration & is the most conservative assumption:

Concentration of Particulate at zero percent oxygen:

$$(487.9 \text{ grains}/10^6 \text{ Btu}) / (10,320 \text{ wscf}/10^6 \text{ Btu}) = 0.047 \text{ grain}/\text{ft}^3$$

Conclusion: Diesel fueled IC Engine exhaust Total Particulate concentration of 0.047 grain per cubic foot complies with Rule 409 limit of 0.1 grain per cubic foot.

It is assumed that the Total Particulate concentration in natural gas fueled IC engine exhaust gas will be conservatively less than that demonstrated above for diesel combustion: