

<b>SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT</b>  <i>ENGINEERING DIVISION</i>  <b>APPLICATION PROCESSING AND CALCULATIONS</b>	PAGES 5	PAGE 1
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Sundance Spas  
14525 Monte Vista Ave.  
Chino, CA 91710  
ID No.: 123970

**EQUIPMENT DESCRIPTION:**

A/N 476073:  
INTERNAL COMBUSTION ENGINE, JOHN DEERE, 6 CYLINDER,  
TURBOCHARGED/AFTERCOOLED, MODEL NO. 6068HF485T, 315 BHP, DIESEL  
FUELED, DRIVING AN EMERGENCY ELECTRICAL GENERATOR.

A/N 476377: Title V/RECLAIM facility permit revision

**BACKGROUND:**

Sundance Spas submitted application no. 476073 to permit an emergency internal combustion engine (ICE) used to drive an emergency electrical generator. The ICE is also operated for maintenance and testing purposes. The engine holds an active AQMD Certified Equipment Permit under a/n 451077. The engine meets all applicable AQMD Rules & Regulations, including BACT requirements.

Sundance Spas is a Title V facility. An initial Title V permit was issued to this facility on January 20, 2003. Sundance Spas has proposed to revise their Title V permit by adding an emergency internal combustion engine. This permit revision is considered as a “de minimis significant permit revision” to the Title V renewal permit, as described in the Regulation XXX evaluation.

**PROCESS DESCRIPTION:**

Sundance Spas manufacture fiberglass spas. Manufacturing steps include vacuum forming of acrylic shells, spraying fiberglass resins on acrylic shells, drilling, plumbing, spraying foam materials, installing pumps (and other related equipment), pouring of foam materials, trimming, installing stained wood panels, water testing, quality control and packaging.

The ICE is used strictly in emergency situations to power an emergency electrical generator. The ICE is also operated for testing and maintenance purposes and as such, will be restricted to 50 hr/yr. Total annual hours of operation will not exceed 200 hours. Sundance Spas operate up to 24 hr/day, 7 day/wk and 52 wk/yr.

The facility has had no citizen complaints filed in the last two years. However, the applicant was issued a Notice of Violation on 11/17/06 for operating a sampling port uncovered in the ducting

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venting to the regenerative thermal oxidizer. Further, the facility was issued a Notice to Comply on 9/21/2006 requiring the operator to provide a list of all persons from whom the facility acquired VOC containing material, and material safety data sheets for coating used in the dip tank area. The facility provided the requested information and as of their latest inspection made on 9/20/07, they are operating in full compliance.

### **EMISSION CALCULATIONS:**

The engine has been designed to operate below BACT emission rates for emergency diesel-fueled internal combustion engines. (The BACT requirement for SO<sub>x</sub> is using a fuel with a sulfur content no greater than 0.0015% by weight.) The following tabulates the engine's emission rates and BACT emission limits.

<b>Pollutant</b>	<b>Engine Rate (g/bhp-hr)</b>	<b>BACT Limit (g/bhp-hr)</b>
CO	0.37	2.6
NO <sub>x</sub> + HC	2.77	3.0
PM	0.035	0.15
NO <sub>x</sub>	2.72	-
HC	0.04	-

Operating schedule = 1 hr/wk, 5 hrs/month

BHP = 315

1 lb = 454 g

PM10 = PM

Hourly CO emissions =  $0.37 * 1/454 * 315 = 0.26$  lb/hr

Daily CO emissions =  $(0.26 \text{ lb/hr} * 5 \text{ hrs/month}) / 30 \text{ days/month} = 0.043$  lb/day

Hourly NO<sub>x</sub> emissions =  $2.72 * 1/454 * 315 = 1.9$  lb/hr

Daily NO<sub>x</sub> emissions =  $(1.9 \text{ lb/hr} * 5 \text{ hrs/month}) / 30 \text{ days/month} = 0.3$  lb/day

Hourly PM10 emissions =  $0.035 * 1/454 * 315 = 0.02$  lb/hr

Daily PM10 emissions =  $(0.02 \text{ lb/hr} * 5 \text{ hrs/month}) / 30 \text{ days/month} = 0.003$  lb/day

Hourly ROG emissions =  $0.04 * 1/454 * 315 = 0.03$  lb/hr

Daily ROG emissions =  $(0.03 \text{ lb/hr} * 5 \text{ hrs/month}) / 30 \text{ days/month} = 0.005$  lb/day

Hourly SO<sub>x</sub> emissions =  $0.21 \text{ lb/mgal} * 0.0153 \text{ mgal/hr} = 0.0032$  lb/hr

Daily SO<sub>x</sub> emissions =  $(0.0032 \text{ lb/hr} * 5 \text{ hrs/month}) / 30 \text{ days/month} = 0.0005$  lb/day

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### **RISK ASSESSMENT**

A Risk Assessment is required to determine whether or not the proposed project will require public notification per Rule 212. Using the Tier 3 Screening Risk Assessment computer program, emission data related to the combustion of diesel fuel in an internal combustion engine was entered as well as facility/equipment information (residential and commercial receptor distances, stack height, closest meteorological station and operating schedule). The program calculated cancer risks of 0.027 in a million at the nearest residential receptor and 0.00145 in a million at the nearest commercial receptor. The program also calculated acute and chronic health hazard risks and all figures were well below one. Based on the results of the Tier 3 Screening Risk Assessment, it can be concluded that the proposed project will not result in a cancer risk equal or greater than one in a million or an acute/chronic health hazard risk of one. Since the cancer risk is below one in a million, a Rule 212 public notice is not required.

### **RULE ANALYSIS**

Rule 212: Public notification is not necessary because: (1) there will not be an emission increase, (2) the facility is not located within 1,000 feet of a public school and (3) there will not be a cancer risk equal or greater than one in a million.

Rule 401: With proper maintenance and operation, this equipment is expected to operate in compliance with this rule.

Rule 402: With proper maintenance and operation, this equipment is not expected to create a nuisance.

RULE 404: The total PM concentration discharged from the ICE will not exceed the allowable limit found in this rule. The total PM concentration discharged from the ICE is 0.0015 gr/ft<sup>3</sup>, based on an exhaust flow of 1510 ft<sup>3</sup>/min. The maximum PM concentration at 1589 ft<sup>3</sup>/min is 0.158 gr/ft<sup>3</sup>. Total PM concentration is calculated as follows:

$$\text{PM concentration} = (0.02 \text{ lb/hr})(7000 \text{ gr/lb})(\text{hr}/60 \text{ min})(\text{min}/1510 \text{ ft}^3) = 0.0015 \text{ gr/ft}^3$$

Rule 431.2: Sundance Spas uses a diesel fuel in which the sulfur content does not exceed 15 ppm by weight (0.0015% by weight). Compliance is achieved.

Rule 1303(a): The engine is designed and manufactured to operate under specific BACT emission limits based on the size of the engine. The engine's emission rates and corresponding BACT emission limits are tabulated in the EMISSIONS CALCULATIONS section. Compliance with BACT is achieved.

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Rules 1303(b)(1) & 1303(b)(2): Per Rule 1304(a)(4), emergency ICEs are exempt from modeling and emission offsets requirements.

Rule 1303(b)(4): The facility is expected to be in full compliance with all applicable rules and regulations of the District.

Rule 1401: Per Rule 1401(g)(1)(F), emergency ICEs are exempt from the requirements of this rule.

RULE 1470: The ICE is expected to operate in compliance with the requirements of this rule. The ICE is located approximately 5,100 feet to the nearest school. It will be operated using CARB-approved diesel fuel. It is designed to emit PM emissions at a rate of 0.035 g/bhp-hr. The operating hours for maintenance and testing will be limited to 50 hours per year or less. Per Rule 1470(c)(2)(C), the ICE must meet emissions criteria contained in Title 13, CCR section 2423. The emission limits for this ICE are listed below along with maximum emissions.

	NMHC+NO <sub>x</sub> (g/kw-hr)	CO (g/kw-hr)	PM (g/kw-hr)
Rule Limit	6.6	3.5	0.2
Engine Emission Rates	2.77	0.37	0.035

**REGULATION XXX:**

This facility is not in the RECLAIM program. The proposed project is considered as a “de minimis significant permit revision” to the Title V permit for this facility.

Rule 3000(b)(6) defines a “de minimis significant permit revision” as any Title V permit revision where the cumulative emission increases of non-RECLAIM pollutants or hazardous air pollutants (HAPs) from these permit revisions during the term of the permit are not greater than any of the following emission threshold levels:

Air Contaminant	Daily Maximum (lb/day)
HAP	30
VOC	30
NO <sub>x</sub>	40
PM <sub>10</sub>	30
SO <sub>x</sub>	60
CO	220

To determine if a project is considered as a “de minimis significant permit revision” for non-RECLAIM pollutants or HAPs, emission increases for non-RECLAIM pollutants or HAPs resulting from all permit revisions that are made after the issuance of the Title V renewal permit shall be accumulated and compared to the above threshold levels. This proposed project is the 1<sup>st</sup>

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permit revision to the Title V renewal permit issued to this facility on January 20, 2008. The following table summarizes the cumulative emission increases resulting from all permit revisions since the Title V renewal permit was issued:

<b>Revision</b>	<b>HAP</b>	<b>VOC</b>	<b>NOx</b>	<b>PM<sub>10</sub></b>	<b>SOx</b>	<b>CO</b>
1 <sup>st</sup> Permit Revision; addition of an internal combustion engine	0	0	0	0	0	0
Cumulative Total	0	0	0	0	0	0
Maximum Daily	30	30	40	30	60	220

Since the cumulative emission increases resulting from all permit revisions are not greater than any of the emission threshold levels, this proposed project is considered as a “de minimis significant permit revision” for non-RECLAIM pollutants or HAPs.

### **RECOMMENDATION**

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a “de minimis significant permit revision”, it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.