

DOCKETED

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ENGINEERING EVALUATION

Microsoft Corporation

Plant: 19686

Application: 24737

BACKGROUND

Microsoft Corporation has applied for a change of conditions to its Permit to Operate (PO) in order to limit emissions to assure health risks are below AB 2588 significance levels for the following equipment:

- S - 1 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R11 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 2 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R12 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 3 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P1 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 4 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P2 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 5 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P3 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 6 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P4 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 7 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P5 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 8 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P6 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in C2240098 no train
- S - 9 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P7 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 10 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P8 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 11 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R21 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 12 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R22 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 13 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R11 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 14 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R12 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 15 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P1 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in

- S - 16 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P2 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 17 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P3 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 18 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P4 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 19 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P5 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 20 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P6 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 21 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P7 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 22 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P8 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 23 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R21 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 24 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R22 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 25 Stationary Standby Generator Set Standby Diesel engine, 3058 hp, EPA# AMDDL95.4XTR, MTU Detroit
- S - 26 Stationary Standby Generator Set Standby Diesel engine, 3058 hp, EPA# AMDDL95.4XTR, MTU Detroit

located at 2045 Lafayette St. Santa Clara, California 95050. This application is considered an alteration. There is no new equipment or physical change to the method of operation of the existing equipment.

EMISSION CALCULATIONS

There will be no increase in emissions as a result of this application.

CUMULATIVE EMISSIONS

There will be no increase in emissions as a result of this application.

TOXIC RISK SCREENING ANALYSIS

Currently permitted emissions at P# 19686 result in unacceptable health risks under both District Rule 2-5 New Source Review of Toxic Air Contaminants and California H & SC §44300 Air Toxics "Hot Spots" Information and Assessment Act of 1987. Emissions from emergency operations under both the District and State programs do not fall under HRA requirements. A facility-wide Health Risk Assessment (HRA) was conducted for all the existing permitted standby engines in order to determine allowable hours of operation for reliability testing to assure that project cancer risk is not more than 10.0 in a million and the chronic hazard index is not more than 1. To achieve acceptable health risk the applicant will accept annual, 60-calendar month and time of day operating limits. Per the

attached memo dated 10/25/12 from Jane Lundquist, Results of Health Risk Screening Analysis for Microsoft Data Center, Santa Clara, the maximally exposed industrial and residential receptors are shown on Tables 1 and 2 below.

Receptor	Exposure Conc., $\mu\text{g}/\text{m}^3$	Breathing Rate, L/kg-day	Exposure Duration Adjustment ₁	Inhalation Dose ² mg/kg-day	Inhalation Cancer Potency Factor (mg/kg-day) ⁻¹	CRAF	Maximum Cancer Risk ³ in a million
Residential	0.0038	302	0.96	1.1 E-6	1.1	1.7	2.1
Worker 8am to 4pm	0.0371	447	0.54	8.9 E-6	1.1	1.0	9.8
Worker 4pm to 12am	0.0378	447	0.54	9.1 E-6	1.1	1.0	10.0
Worker 12am to 8am	0.0143	447	0.54	3.4 E-6	1.1	1.0	3.8

Receptor	Exposure Concentration, $\mu\text{g}/\text{m}^3$	Reference Exposure Level, $\mu\text{g}/\text{m}^3$	Maximum Chronic Hazard Index
Residential	0.0038	5.0	0.0008
Worker 8 am to 4 pm	0.0371	5.0	0.007
Worker 4 pm to 12 am	0.0378	5.0	0.008
Worker 12 am to 8am	0.0143	5.0	0.003

Tables 3 and 4 below summarize the maximum allowable hours of reliability-related testing for each of the S-1 through S-24 diesel engines, and S-25 and S-26 diesel engines respectively that will result in a maximum health risks shown in Tables 1 and 2 above.

Per Year	Per 60-Calendar Month	Per 60-Calendar Month During the Period Between		
		8 am and 4 pm	4 pm and 12am	12 am and 8 am
20	66	27	27	12

Per Year	Per Year During the Period Between*		
	8 am and 4 pm	4 pm and 12am	12 am and 8 am
20	13	13	13

STATEMENT OF COMPLIANCE

These engines are expected to be in compliance with the local, state and federal requirements governing all aspects of their operation. Areas of compliance are listed below.

Public Nuisance

From Regulation 1-301, no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or the public; or which endangers the comfort, repose, health or safety of any such persons or the public, or which causes, or has a natural tendency to cause, injury or damage to business or property. The exhaust from these engines should not cause a public nuisance.

Particular Matter and Visible Emissions

The engines are subject to the limitations of Regulation 6-1-303 (*Ringelmann No. 2 Limitation*). Regulation 6, Rule 1, Section 303 states that a person shall not emit for a period or periods aggregating more than three minutes in any hour, a visible emission that is as dark or darker than No. 2 on the Ringelmann Chart, or of such opacity as to obscure an observer's view to an equivalent or greater degree, nor shall said emission, as perceived by an opacity sensing device in good working order, where such device is required by District Regulations, be equal to or greater than 40% opacity. These engines are not expected to produce visible emissions or fallout in violation of this regulation; and will be assumed to be in compliance with Regulation 6.

Ground Level Concentration of Sulfur Oxides

The engines are also subject to the SO₂ limitations of Regulation 9-1-301 (*Limitation on Ground Level Concentrations of Sulfur Dioxide*), Regulation 9-1-302 (*General Emission Limitation*) and 9-1-304 (*Fuel-Burning*). From Regulation 9-1-301, the ground level concentrations of SO₂ will not exceed 0.5 ppm continuously for 3 consecutive minutes or 0.25 ppm averaged over 60 consecutive minutes, or 0.05 ppm averaged over 24 hours. Per Regulation 9, Rule 1, Section 302, a person shall not emit from any source a gas stream containing sulfur dioxide in excess of 300 ppm (dry). Regulation 9, Rule 1, Section 304, states that a person shall not burn any liquid fuel having sulfur content in excess of 0.5% by weight. Compliance with both Regulations 9-1-302 and 9-1-304 is likely since California law mandates using diesel fuel with a 0.015% (by weight) sulfur.

Regulation 9 Rule 8

The engine is also subject to Regulation 9-8 "NOx and CO from Stationary Internal Combustion Engines." Per Regulation 9-8-110.5, this source is not subject to the requirements of Regulations 9-8-301 (*Emission Limits on Fossil Derived Fuel Gas*), 9-8-302 (*Emission Limits on Waster Derived Fuel Gas*), 9-8-304 (*Emission Limits on Compression Ignited Engines*), 9-8-501 (*Initial Demonstration of Compliance*), 9-8-502 (*Record Keeping*), and 9-8-503 (*Quarterly Demonstration of Compliance*).

The engine is exempt from Regulation 9-8-502 however; it is subject to the monitoring and recordkeeping procedures described in Regulation 9-8-530 (*Emergency Standby Engines, Monitoring and Recordkeeping*). The requirements of this Regulation are included in the permit conditions.

PERMIT CONDITIONS

Annual operation limit:

Currently engines S-1 through S-24 are subject to standard permit condition #22820 (each engine limited to 20 hours operation per year for reliability testing). Engines S-25 and S-25 are subject to standard permit condition #22850 (a limit per engine of 50 hours of operation per year). Conditions #22820 and #22850 will be deleted and all 26 engines will be subject to new condition condition #25449.

COND# 25449 -----

1. The owner/operator shall operate each engine for reliability-related testing no more than 20 hours per year.

[Basis: Title 17, California Code of Regulations, Section 93115, ATCM for Stationary CI Engines]

- a. Each engine S1 through S24 shall not be

operated more than 66 hours for reliability-related testing per consecutive 60-calendar month period, with the the following limitations:

- 1) no more than 27 hours of operation between the hours of 8 am and 4 pm per consecutive 60-calendar month period, and
- 2) no more than 27 hours of operation between the hours of 4 pm and 12 am per consecutive 60-calendar month period, and
- 3) no more than 12 hours of operation between the hours of 12 am and 8 am per consecutive 60-calendar month period.
[Basis: Health Risk Screening Assessment]

The reliability-related testing limits for each source S1-S24 are summarized below.

Hours Per Year: 20

Hours per 60-Calendar Month Period

Total: 66

8am - 4pm: 27

4pm - 12am: 27

12am - 8am: 12

- b. Each engine S25 and S26 shall be operated for reliability-related testing per consecutive 12-calendar month period with the following limitations:
 - 1) no more than 13 hours of operation between the hours of 8 am and 4 pm, and
 - 2) no more than 13 hours of operation between the hours of 4 pm and 12 am, and
 - 3) no more than 13 hours of operation between the hours of 12 am and 8 am.
[Basis: Health Risk Screening Assessment]

The reliability-related testing limits for sources S25 and S26 are summarized below.

Hours per Year

Total: 20

8 am - 4 pm: 13

4 pm - 12 am: 13

12 am - 8 am: 13

2. The owner/operator shall operate each emergency standby engine only for the following purposes: to mitigate emergency conditions, for emission testing to demonstrate compliance with a District, State or Federal emission limit, or for reliability-related activities (maintenance and other testing, but excluding emission

testing). Operating while mitigating emergency conditions or while emission testing to show compliance with District, State or Federal emission limits is not limited.

[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

3. The owner/operator shall operate each emergency standby engine only when a non-resettable totalizing meter (with a minimum display capability of 9,999 hours) that measures the hours of operation for the engine is installed, operated and properly maintained.

[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

4. Records: The owner/operator shall maintain the following monthly records for each engine in a District-approved log for at least 72 months from the date of entry. Log entries shall be retained on-site, either at a central location or at the engine's location, and made immediately available to the District staff upon request.
 - a. Hours of operation for reliability-related activities (maintenance and testing):
 - b. Hours of operation for emission testing to show compliance with emission limits.
 - c. Hours of operation (emergency).
 - d. For each emergency, the nature of the emergency condition.
 - e. Fuel usage for each engine(s).
 - f. The date, start time and end time for each event and activity listed above in parts 4a through 4c.
 - g. The monthly sum of the hours of operation for reliability-related activities during each of the shifts from 8am to 4pm, 4pm to 12am, 12am to 8am and
 - 1) for S1 through S24, a monthly-rolling 60-calendar month period total for each shift
 - 2) for S25 and S26, a monthly-rolling 12-calendar month period total for each shift [Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines]

5. At School and Near-School Operation: If the emergency standby engine is located on school grounds or within 500 feet of any school grounds, the following requirements shall

apply: The owner/operator shall not operate each stationary emergency standby diesel-fueled engine for non-emergency use, including maintenance and testing, during the following periods:

- a. Whenever there is a school sponsored activity (if the engine is located on school grounds)
- b. Between 7:30 a.m. and 3:30 p.m. on days when school is in session.

"School" or "School Grounds" means any public or private school used for the purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in a private home(s). "School" or "School Grounds" includes any building or structure, playground, athletic field, or other areas of school property but does not include unimproved school property.

[Basis: Title 17, California Code of Regulations, section 93115, ATCM for Stationary CI Engines.]

Particulate traps

Engines S-25 and S-6 are equipped with particulate filters and are subject to condition #24861 specifying proper operation and maintenance. There will be no change to this condition.

RECOMMENDATION

Grant a change of permit conditions to Microsoft Corporation Plant #19686 for the following sources:

- S - 1 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R11 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 2 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R12 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 3 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P1 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 4 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P2 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 5 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P3 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 6 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P4 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 7 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P5 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in

- S - 8 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P6 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in C2240098 no train.
- S - 9 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P7 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 10 Emergency Genset, Diesel, 2935 hp, BY1 Hitec P8 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 11 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R21 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 12 Emergency Genset, Diesel, 2935 hp, BY1 Hitec R22 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 13 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R11 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 14 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R12 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 15 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P1 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 16 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P2 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 17 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P3 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 18 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P4 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 19 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P5 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 20 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P6 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 21 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P7 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 22 Emergency Genset, Diesel, 2935 hp, BY2 Hitec P8 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 23 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R21 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 24 Emergency Genset, Diesel, 2935 hp, BY2 Hitec R22 Standby Diesel engine, 2935 hp, Detroit Diesel, 3966 cu in
- S - 25 Stationary Standby Generator Set Standby Diesel engine, 3058 hp, EPA# AMDDL95.4XTR, MTU Detroit

S - 26 Stationary Standby Generator Set Standby Diesel engine, 3058 hp, EPA# AMDDL95.4XTR,
MTU Detroit

By: 
Janet Stromberg
Supervising Air Quality Engineer
Engineering Division

Date: 1/17/13