

April 25, 2023

Colorado Department of Public Health & Environment
Air Pollution Control Division
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, CO 80246-1530

via FedEx 7719 8618 1899

**Subject: Synthetic Minor Construction Permit Application to Avoid Major Source Requirements
Plant AIRS ID 014-1368
JP Morgan Chase & Co., Project Sycamore - Broomfield
2701 W. 160th Avenue
Broomfield, CO 80023**

To Whom It May Concern:

JP Morgan Chase & Co. (JPMC) is submitting the enclosed synthetic minor construction permit application to the Colorado Department of Public Health & Environment (CDPHE) Air Pollution Control Division (APCD) for JPMC's Project Sycamore – Broomfield (Facility) located near Broomfield, Colorado in Broomfield County. The synthetic minor construction permit application is being submitted in order to avoid major source permitting requirements.

This synthetic minor construction permit application includes the following:

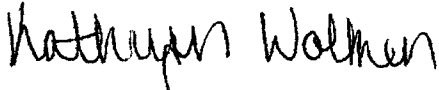
- Attachment A contains a copy of the APEN Filing Fee receipt and the Completeness Checklist Form APCD-100a;
- Attachment B contains Air Pollutant Emission Notices (APENs) Forms APCD-233 and New Source Performance Standards (NSPS) 40 CFR Part 60, Subpart IIII Applicability APEN Addendum Form for Diesel Engines Forms APCD-214;
- Attachment C presents emission rate calculations;
- Attachment D contains the Company Contact Information Form APCD-101;
- Attachment E contains the approved Permit Modeling Determination;
- Attachment F contains the Facility Emissions Inventory Form APCD-102a; and
- Attachment G presents the process description and area map.

Please note Phase 3 construction of generators AIRS Points 003, 004, 010, and 011 has not yet begun. JPMC will make reasonable efforts to release procurement of this next phase of generators during the anticipated synthetic minor permit construction timeframe and will provide prior notification and an extension request to CDPHE if an extension is needed due to unexpected delays.

The application fee was paid online in the amount of \$3,872 (\$242*16) to cover the APEN filing fees. A copy of the receipt is shown in Attachment A.

Thank you in advance for your review and concurrence with this synthetic minor construction permit application. If you have any questions regarding the information presented in this letter and attachments, please do not hesitate to contact me at (720) 472-5231 or via email at kathryn.k.wolken@jpmchase.com.

Sincerely,

A handwritten signature in black ink that reads "Kathryn Wolken". The signature is fluid and cursive, with the first name and last name clearly distinguishable.

Kathryn Wolken
Vice President, Global Real Estate
JP Morgan Chase & Co

CC email:

Geraldine Tan, JPMC
Michael Firmin, JPMC
Denise Campo, JPMC
Rob Tapper, JPMC

ATTACHMENT A

**A COPY OF APEN FILING FEE
CONSTRUCTION PERMIT APPLICATION COMPLETENESS CHECKLIST
FORM APCD-100a**

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.



Non-Oil & Gas Industry
Construction Permit Application Completeness Checklist
Form APCD-100a
Air Pollution Control Division

AMENDED
FORM 100a
APCD
Stationary
Sources

Company Name: JP Morgan Chase & Co.
Source Name: Project Sycamore - Broomfield Plant AIRS ID 014-1368, AIRS Points 001-016
Date: 04/17/2023

Are you requesting a facility wide permit for multiple emissions points? ☒ ☐

In order to have a complete application, the following attachments must be provided, unless stated otherwise.
If application is incomplete, it will be returned to sender and filing fees will not be refunded.

Attachment	Application Element	Attached?
A	APEN Filing Fee(s)	☒
B	Air Pollutant Emission Notice(s) (APENs) - APCD Form Series 200	☒
C	Emissions Calculations and Supporting Documentation	☒
D	Company Contact Information - Form APCD-101 ☐ Check here if there will only be one point of contact (Attachment D not required)	☒
E	Ambient Air Impact Analysis (One of the following MUST be selected in order for the application to be considered complete) ☐ Check here if source is exempt from modeling determination requirements per "Interim Colorado Modeling Guideline for Air Quality Permits" and/or "Permitting Section Addendum to the Modeling Guideline". ☐ Check here if operator submitted a request for modeling determination (Form APCD-114) to the Division's Permit Modeling Unit (PMU) prior to application submittal, and the Division determined that modeling was not required. (Include the version of form APCD-114 that was approved and returned by the PMU.) ☒ Check here if operator submitted a modeling analysis to the Division which was approved by the Division prior to application submittal. (Include form APCD-114, operator's approved modeling analysis, and the PMU Modeling Review Report provided by the Division which documents compliance with the NAAQS and conditions of approval for proposed source.) Per CDPHE APCD guidance see attached approved Modeling Determination. ☐ Check here if operator is submitting a modeling analysis to the Division concurrently with the application submittal, or if the already-submitted modeling analysis has not yet been approved by the Division.	☒
F	Facility Emissions Inventory - Form APCD-102a ☐ Check here if single emissions point source (Attachment F not required)	☒
G	Process description, flow diagram, plot plan of emissions unit and/or facility ☐ Check here if single emissions point source (Attachment G not required)	☒
H	Regulatory Analysis ☒ Check here to request APCD to complete regulatory analysis (Attachment H not required)	☐

Additional attachments

Certain sources may require additional forms. Refer to <https://www.colorado.gov/pacific/cdphe/air/air-permit> to check if any APEN supplement forms are required for your source.

Send **Complete** Application to: **Colorado Department of Public Health & Environment**
APCD-SS-B1
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
Check box if facility is an existing Title V source: ☐ Send an additional application copy
Check box if refined modeling analysis included: ☐ Send an additional application copy
Check box if application is for major NANSR or PSD permit: ☐ Send eight (8) total application copies
NANSR = Nonattainment Area New Source Review
PSD = Prevention of Significant Deterioration

ATTACHMENT B

**AIR POLLUTANT EMISSION NOTICES (APENS) FORMS APCD-233
NSPS 40 CFR PART 60, SUBPART IIII APPLICABILITY APEN ADDENDUM FORM
FOR DIESEL ENGINES FORM APCD-214**

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.

ATTACHMENT C
EMISSION RATE CALCULATIONS
SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION
PROJECT SYCAMORE - BROOMFIELD
JP MORGAN CHASE & CO.

DIESEL ENGINES - PTE EMISSIONS
JP MORGAN CHASE & CO.
PROJECT SYCAMORE - BROOMFIELD DATA CENTER

AIRS Point Number	Facility Equipment ID	Engine Type	Engine Horsepower Rating (hp)	Annual Operating Hours (hr/yr)	Pollutant	Emission Factors ^a	Units	PTE Emission Rates	
								Hourly ^b (lb/hr)	Annual ^c (T/yr)
001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016	GEN 01, GEN 02, GEN 03, GEN 04, GEN 05, GEN 06, GEN 07, GEN 08, GEN 09, GEN 10, GEN 11, GEN 12, GEN 13, GEN 14, GEN 15, GEN 16	Cummins QSK78-G12	3,705	60	CO	0.0015	lb/hp-hr	5.56	0.17
					NO _x	0.0137	lb/hp-hr	50.76	1.52
					PM	0.00022	lb/hp-hr	0.82	0.02
					PM ₁₀	0.00022	lb/hp-hr	0.82	0.02
					PM _{2.5}	0.00022	lb/hp-hr	0.82	0.02
					SO ₂	0.0000121	lb/hp-hr	0.04	0.001
					VOC	0.00071	lb/hp-hr	2.63	0.08

^a The emission factors for CO, NO_x, PM, PM₁₀, and PM_{2.5} are from the manufacture data sheets. The emission factors for SO₂ and VOC are from AP-42 Section 3.4 Table 3.4-1.

^b An example calculations for hourly CO emissions follow:

$$\text{CO (lb/hr)} = (\text{Engine Horsepower Rating, hp}) * (\text{Emission Factor, lb/hp-hr})$$

$$\text{CO (lb/hr)} = (3,705 \text{ hp}) * (0.0015 \text{ lb/hp-hr})$$

$$= \boxed{5.56 \text{ lb/hr CO}}$$

^c An example calculation for annual CO emissions follows:

$$\text{CO (T/yr)} = (\text{Hourly CO Emission Rate, lb/hr}) * (\text{Annual Operating Hours, hr/yr}) / (2,000 \text{ lb/T})$$

$$\text{CO (T/yr)} = (5.56 \text{ lb/hr}) * (60 \text{ hr/yr}) * (1 \text{ T} / 2,000 \text{ lb})$$

$$= \boxed{0.17 \text{ T/yr CO}}$$

TRACTOR ENGINE - ACTUAL ANNUAL EMISSIONS
 JF MORGAN CHASE & CO.
 PROJECT SYCAMORE - BROOMFIELD DATA CENTER

AERS Point Number	Facility Equipment ID	Engine Type	Engine Horsepower Rating (hp)	Actual Annual Operating Hours (hr/yr)	Pollutant	Emission Factors ^a	Units	Emission Rates	
								Hourly ^b (lb/hr)	Annual ^c (T/yr)
001	GEN 01	Cummins QSK78-G12	3,705	8	CO	0.0015	lb/tp-hr	5.56	0.02
					NO _x	0.0137	lb/tp-hr	50.76	0.20
					PM	0.00022	lb/tp-hr	0.82	0.003
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.003
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.003
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0002
					VOC	0.00071	lb/tp-hr	2.63	0.01
002	GEN 02	Cummins QSK78-G12	3,705	7.9	CO	0.0015	lb/tp-hr	5.56	0.02
					NO _x	0.0137	lb/tp-hr	50.76	0.20
					PM	0.00022	lb/tp-hr	0.82	0.003
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.003
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.003
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0002
					VOC	0.00071	lb/tp-hr	2.63	0.01
005	GEN 05	Cummins QSK78-G12	3,705	12.9	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.23
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
006	GEN 06	Cummins QSK78-G12	3,705	12.9	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.23
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
007	GEN 07	Cummins QSK78-G12	3,705	11.9	CO	0.0015	lb/tp-hr	5.56	0.03
					NO _x	0.0137	lb/tp-hr	50.76	0.20
					PM	0.00022	lb/tp-hr	0.82	0.005
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.005
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.005
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0002
					VOC	0.00071	lb/tp-hr	2.63	0.02
008	GEN 08	Cummins QSK78-G12	3,705	12.3	CO	0.0015	lb/tp-hr	5.56	0.03
					NO _x	0.0137	lb/tp-hr	50.76	0.21
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0002
					VOC	0.00071	lb/tp-hr	2.63	0.02
009	GEN 09	Cummins QSK78-G12	3,705	13.1	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.23
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
012	GEN 12	Cummins QSK78-G12	3,705	13.0	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.23
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
013	GEN 13	Cummins QSK78-G12	3,705	13.5	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.24
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
014	GEN 14	Cummins QSK78-G12	3,705	12.4	CO	0.0015	lb/tp-hr	5.56	0.03
					NO _x	0.0137	lb/tp-hr	50.76	0.21
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0002
					VOC	0.00071	lb/tp-hr	2.63	0.02
015	GEN 15	Cummins QSK78-G12	3,705	13.1	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.23
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02
016	GEN 16	Cummins QSK78-G12	3,705	12.7	CO	0.0015	lb/tp-hr	5.56	0.04
					NO _x	0.0137	lb/tp-hr	50.76	0.22
					PM	0.00022	lb/tp-hr	0.82	0.01
					PM ₁₀	0.00022	lb/tp-hr	0.82	0.01
					PM _{2.5}	0.00022	lb/tp-hr	0.82	0.01
					SO ₂	0.0000121	lb/tp-hr	0.04	0.0003
					VOC	0.00071	lb/tp-hr	2.63	0.02

^a The emission factors for CO, NO_x, PM, PM₁₀ and PM_{2.5} are from the manufacturer data sheets. The emission factors for SO₂ and VOC are from AP-42 Section 3.4 Table 3.4-1.

^b An example calculation for hourly CO emissions follows:

$$CO \text{ (lb/hr)} = (\text{Engine Horsepower Rating, hp}) * (\text{Emission Factor, lb/tp-hr})$$

$$CO \text{ (lb/hr)} = 0.705 \text{ hp} * (0.0015 \text{ lb/tp-hr})$$

$$CO \text{ (lb/hr)} = 0.00105$$

^c An example calculation for annual CO emissions follows:

$$CO \text{ (T/yr)} = (\text{Hourly CO Emission Rate, lb/hr}) * (\text{Annual Operating Hours, hr/yr}) / (2,000 \text{ lb/T})$$

$$CO \text{ (T/yr)} = (0.00105 \text{ lb/hr}) * (8,760 \text{ hr/yr}) / (2,000 \text{ lb/T})$$

$$CO \text{ (T/yr)} = 0.0046$$

ATTACHMENT D

COMPANY CONTACT INFORMATION FORM APCD-101

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.



APCD-101
Permit Application
Form
2008

C a C a I a F
er. Septem er 0 200

C a Na **JP Morgan Chase & Co.**

S Na **Project Sycamore - Broomfield, Plant AIRS ID: 014-1368**

P C a 1	Kathryn Wolken		
A	2701 W. 160th Avenue		
	Street		
	Broomfield	CO	80023
	City	State	ip
P N	720-472-5231		
Fa N			
E- a	kathryn.k.wolken@jpmchase.com		

C a 2	Kathryn Wolken		
A	2701 W. 160th Avenue		
	Street		
	Broomfield	CO	80023
	City	State	ip
P N	720-472-5231		
Fa N			
E- a	kathryn.k.wolken@jpmchase.com		

B C a <i>(Permit Fees)³</i>	Kathryn Wolken		
A	2701 W. 160th Avenue		
	Street		
	Broomfield	CO	80023
	City	State	ip
P N	720-472-5231		
Fa N			
E- a	kathryn.k.wolken@jpmchase.com		

B C a <i>(Annual Fees)⁴</i>	Kathryn Wolken		
A	2701 W. 160th Avenue		
	Street		
	Broomfield	CO	80023
	City	State	ip
P N	720-472-5231		
Fa N			
E- a	kathryn.k.wolken@jpmchase.com		

Check how would you like to receive your permit fee in office

Mail ☐ e-mail ☒ a ☐

Footnotes

- 1 The permit contact should be the point of contact for technical information contained in the permit application. This may be a company representative or a consultant.
- 2 The compliance contact should be the point of contact for discussing inspection and compliance at the permitted facility.
- 3 The billing contact Permit fees should be the point of contact that should receive the invoice for fees associated with processing the permit application & issuing the permit. eg. 3 Part A Section .B
The billing contact Annual fees should be the point of contact that should receive the invoices issued on an annual basis for fees associated with actual emissions reported on AP s for the facility. eg. 3 Part A Section .C

ATTACHMENT E

APPROVED PERMIT MODELING DETERMINATION

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.



Colorado Department of Public Health and Environment

Modeling Review Comments

APCD/TSP/MMEIU Project ID: 520-190730

Review Completed: 11/13/2019

Plant/Site Name: JP Morgan Chase Sycamore Project - Broomfield

Document Reviewed: *Jp Morgan Chase, Project Sycamore, Broomfield Air Dispersion Modeling Report, OCT 2019*

Reviewed by: Bradley Rink

Summary

JP Morgan Chase & Co.
Project Sycamore - Broomfield
October 2019 Modeling Report

Project Summary

Project Sycamore - Broomfield is located at 2701 West 160th Avenue, Broomfield, Colorado 80023 in Broomfield County. JP Morgan Chase (JPMC) proposes to construct and operate sixteen (16) 2,500-kilowatt (kW) diesel-fueled emergency generators. The project has the potential to affect air quality by contributing to ambient air impacts of CO, NOx, PM10/PM2.5 and SO2.

There are NAAQS and CAAQS currently in effect for the following pollutants and averaging periods: CO (1-hr and 8-hr), Pb (3-month rolling average), NO2 (1-hr and annual), PM10 (24-hr), PM2.5 (24-hr and annual), SO2 (1-hr, and 3-hr), and ozone (8-hr). For this permit application, quantitative impact analyses are warranted to demonstrate compliance with the NAAQS/CAAQS for the following pollutants and averaging periods: CO (1-hr and 8-hr), NO2 (1-hr and annual), PM10 (24-hr), PM2.5 (24-hr), and SO2 (1-hr and 3-hr).

On behalf of JPMC a modeling report was submitted by Environmental Resources Management, Inc., (ERM). ERM submitted a final modeling report in October 2019 for these pollutants and averaging intervals:

1hr and 8hr CO,
1hr and annual NO2,
24hr PM10,
1hr and 3hr SO2, and
24hr PM2.5

A Modeling Summary is presented here:

Pollutant	Averaging Interval	Background Concentration (ug/m3)	Maximum Modeled Impact (ug/m3)	Impact with Background (ug/m3)	NAAQS/CAAQS (ug/m3)
CO	1 hr	n/a	1294.4	--	40082

Date Printed: 11/21/2019

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**Air Pollution Control Division / Technical Services Program
Modeling, Meteorology, and Emission Inventory Unit**

Modeling Review Comments

APCD/TSP/MMEIU Project ID: 520-190730

Review Completed: 11/13/2019

Plant/Site Name: JP Morgan Chase Sycamore Project - Broomfield

Document Reviewed: *Jp Morgan Chase, Project Sycamore, Broomfield Air Dispersion Modeling Report, OCT 2019*

Reviewed by: Bradley Rink

CO	8 hr	n/a	330.1	--	10306
PM10	24 hr	60	25.7	85.67	150
NO2	Annual	37.6	1.49	39.12	99.7
NO2	1 hr	Seasonal	--	171.3	188.4
SO2	1 hr	39.3	1.55	40.8	196.6
SO2	3 hr	39.3	66.83	106.1	700
PM2.5	24 hr	22	12.89	34.89	35

Project emission rates were computed based on each engine's potential to emit and a testing and maintenance schedule not to exceed 100 hours per year per engine. CDPHE provided a meteorological data set generated from the Ft. St. Vrain met site, processed with AERMET v19191 for the year 2009. For all modeling demonstrations a conservative background concentration for all pollutants/averaging intervals was provided to ERM by MEIU (background concentrations and seasonal NO2/O3 profiles can be found in Appendix B). The background concentrations provided by MEIU are meant to include contributions from nearby sources. Terrain elevations and hill heights were developed using AERMAP 18081 using Colorado's Elevation Tool and all building downwash effects for all emissions sources were computed using BPIPPRM v04274.

The ambient impact analyses submitted by the applicant and verified by the MEIU show that the permitted facility does not cause or contribute to a modeled violation of the following NAAQS/CAAQS: 1 hr CO, 8 hr CO, Annual NO2, 1hr NO2, 24 hr PM10, 1 hr SO2, 3 hr SO2, Annual PM2.5 and 24 hr PM2.5. This demonstration is valid under the following configuration (recommended permit conditions):

- 1) Hours of Operations. JPMC Broomfield must restrict the hours for maintenance and testing to no more than 100 hours per year per engine.
- 2) At most any six engines per bank from both banks - 12 engines total (see Figure A-1, Appendix A for the layout of engine locations) can operate for up to 12 hours per day from 7 a.m. to 7 p.m.
- 3) At most two of any of the 16 engines can operate 24 hours per day as long as no other testing and maintenance is being performed on any other engine, subject to the 100 hours per year restriction.
- 4) Any/All of the 16 engines can operate up to any of the possible 24 contiguous four hour intervals per day as long as no other testing and maintenance is being performed, subject to the 100 hour per year restriction.
- 5) Fencing and Preclusion of Public Access: Impacts were estimated at ambient air receptors only (i.e., an ambient air boundary and fencing was assumed in the modeling). The permit should contain a condition that for

Date Printed: 11/21/2019

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Air Pollution Control Division / Technical Services Program
Modeling, Meteorology, and Emission Inventory Unit

Modeling Review Comments

APCD/TSP/MMEIU Project ID: 520-190730

Review Completed: 11/13/2019

Plant/Site Name: JP Morgan Chase Sycamore Project - Broomfield

Document Reviewed: *Jp Morgan Chase, Project Sycamore, Broomfield Air Dispersion Modeling Report, OCT 2019*

Reviewed by: Bradley Rink

the duration of the permit effectiveness, the source operator shall maintain continuous fencing along the boundary depicted in Figure A-1, Appendix A of this modeling report. Public access to these areas shall be precluded.

6) Stack Heights: Modeled impacts were estimated assuming the stack heights indicated as release heights in Tables A-1, Appendix A of this modeling report. The permit should contain a condition that the stack heights are as identified in this table.

7) Layout of Sources, Buildings and Roads: Modeled impacts were estimated assuming that the location of the sources, buildings and roads within the facility correspond to the layout depicted in Figure A-1 of Appendix A of this modeling report. The permit should contain a condition that the facility should be constructed with the layout depicted in Appendix A.

CO results

Significance modeling was performed using regulatory default options and each engine's maximum potential hourly emissions, all engines operating every hour of every day (24/7). Regarding both the 1hr and 8 hr averaging intervals there were no modeled impacts in excess of the SILs (2000 ug/m³ and 500 ug/m³, respectively). MEIU can conclude that this project will not cause or contribute to a violation of the 1hr or 8hr CC NAAQS.

PM10 Results

Significance modeling was performed using regulatory default options and each engine's maximum potential hourly emissions, all engines operating 24/7. There were 110 modeled impacts in excess of the PM10 SIL (5 ug/m³), the maximum being 25.67 ug/m³. The background concentration (estimated to include impacts of nearby sources) of 60 ug/m³ was added to each of these significant impacts. There were no results in excess of the PM10 24hr NAAQS (150 ug/m³). MEIU can conclude that this project will not cause or contribute to a violation of the 24hr PM10 NAAQS.

NO2 Results

NO2 Annual modeling was performed using regulatory default options and each engine's maximum hourly emissions scaled to the requested testing and maintenance schedule of 100 hours per year. The initial run indicated that there were 10 instances of an estimated impact greater than the NO2 annual SIL of 1 ug/m³, the maximum being 1.49 ug/m³. A conservative background value of 20 ppb (37.63 ug/m³) was applied to these results. None of the resulting values were in excess of the annual NO2 NAAQS (53 ppb or 99.7 ug/m³). MEIU can conclude that this project will not cause or contribute to a violation of the annual NO2 NAAQS.

NO2 1hr significance modeling was accomplished using OLM and regulatory default options. In regards to the

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Air Pollution Control Division / Technical Services Program
Modeling, Meteorology, and Emission Inventory Unit

Modeling Review Comments

APCD/TSP/MMEIU Project ID: 520-190730

Review Completed: 11/13/2019

Plant/Site Name: JP Morgan Chase Sycamore Project - Broomfield

Document Reviewed: *Jp Morgan Chase, Project Sycamore, Broomfield Air Dispersion Modeling Report, OCT 2019*

Reviewed by: Bradley Rink

emission rates the March 2011 EPA memo provides directions regarding NO₂ short term emission rates of emergency generators. Stating that, "...modeling analysis could be based on assuming continuous operation at the average hourly rate"; regarding this project that would imply an hourly emission rate derived from maximum hourly PTE multiplied by an annualized hours of operation per year, or 100/8760. The initial significant run found that there would be a number of impacts in excess of the SIL (7.5 ug/m³). The cumulative modeling was formulated using OLM, a seasonal O₃/hourly profile provided by MEIU, a NO₂/NO_x in stack ratio approved by Stationary Sources, and a seasonal/hourly NO₂ background concentration meant to include impacts from nearby sources. The maximum impact from the cumulative model was 171.3 g/m³; the 1hr NO₂ NAAQS is 188 ug/m³ (100 ppb). MEIU can conclude that this project will not cause or contribute to a violation of the 1hr NO₂ NAAQS.

SO₂ Results

Significance modeling for 1hr SO₂ was performed using the regulatory default options and short term emission rates derived in the same manner as with the 1hr NO₂ demonstration; i.e. the maximum hourly potential to emit multiplied by an annualized hours of operation per year. There were no modeled impacts in excess of the SO₂ 1hr SIL (4 ug/m³). MEIU can conclude that this project will not cause or contribute to a violation of the 1hr SO₂ NAAQS of 196.6 ug/m³ (75 ppb).

Significance modeling for 3hr SO₂ was performed using the regulatory default options and short term maximum PTE emission rates. The maximum estimated impact was 66.83 ug/m³, which is greater than the 3 hr SO₂ SIL of 25 ug/m³. A conservative background of 15 ppb (39.26 ug/m³) was added to the results for NAAQS comparison. The maximum result of 106.1 ug/m³ is well below the 3 hr SO₂ CAAQS of 700 ug/m³. MEIU can conclude that this project will not cause or contribute to a violation of the 3hr SO₂ CAAQS.

PM_{2.5} Results

PM_{2.5} 24hr significance modeling was accomplished using regulatory default options and maximum hourly PTE. There were multiple modeled impacts in excess of the PM_{2.5} 24 hr SIL (1.2 ug/m³). Therefore cumulative modeling was required.

Three specific and mutually exclusive operating scenarios were defined to demonstrate compliance with the 24 hr PM_{2.5} NAAQS. They are characterized under 'Other Modeling Data', below.

Cumulative Assessment

Each scenario was tested using an expanded 100m grid, the maximum estimated impact was 12.8 ug/m³. Adding conservative background of 22 ug/m³ to this result indicates that no scenario will cause or contribute to a PM_{2.5} 24 hr NAAQS violation.

Review Checklist

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Plant/Site Name: JP Morgan Chase Sycamore Project - Broomfield

Document Reviewed: *Jp Morgan Chase, Project Sycamore, Broomfield Air Dispersion Modeling Report, OCT 2019*

Reviewed by: Bradley Rink

1. Topographic Map with Site and Receptor Locations

Satisfactory

Received with applicant submittal April 2019, included in Appendix A, Table A-1 of this modeling report.

2. Plant/Site Plot Plan

Satisfactory

Received with applicant submittal April 2019, included in Appendix A, Table A-1 of this modeling report.

3. Building Dimension Data

Satisfactory

Received with applicant submittal April 2019, included in Appendix B of this modeling report.

4. Determination of Fenceline

Satisfactory

Received with applicant submittal April 2019, included in Appendix A, Table A-1 of this modeling report.

5. Identification of Nearby Nonattainment Areas

Satisfactory

The site is located in Broomfield, CO, within the ozone nonattainment area.

6. Identification of Pollutants/Averaging Periods to Model

Satisfactory

The pollutants and averaging intervals modeled are summarized in this table:

Pollutant	Averaging Interval
CO	1 hr
CO	8 hr
NO2	1 hr
NO2	Annual
PM10	24 hr
SO2	1 hr
SO2	3 hr
PM2.5	24 hr

7. On-Site NAAQS/Non-Criteria Pollutant Emission Inventory

Satisfactory

The project is comprised of installing 16 identical generators to operate as backup power

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sources if line power is lost. Project emissions are summarized here:

Pollutant	Maximum Proposed Emission Rate (tpy)
CO	6.21
NOX	40.64
PM2.5	0.65
PM10	0.65
SO2	0.65
VOC	0.85

8. On-Site PSD Increment Emission Inventory

Not Applicable

A preliminary determination in June 1998 from the Colorado Attorney General's office suggests that rulemaking would be necessary before compliance with PSD increments is a requirement of permit issuance for minor sources and minor modifications. Therefore, increment consumption from minor source growth is assessed only during the modeling process for new sources and modifications subject to PSD rules and during periodic increment studies.

9. Off-Site NAAQS/Non-Criteria Pollutant Emission Inventory

Satisfactory

For all modeled pollutants/averaging intervals a conservative background concentration was provided the applicant by MEIU. This approach was taken as the facility under consideration is within the Denver-Metro area and the use of a nearby source inventory would include an excessively high number of nearby sources, modeling would be impractical. The background concentrations are provided in Appendix B of this modeling report.

10. Off-Site PSD Increment Emission Inventory

Not Applicable

A preliminary determination in June 1998 from the Colorado Attorney General's office suggests that rulemaking would be necessary before compliance with PSD increments is a requirement of permit issuance for minor sources and minor modifications. Therefore, increment consumption from minor source growth is assessed only during the modeling process for new sources and modifications subject to PSD rules and during periodic increment studies.

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11. Background Concentration(s)

☐ Satisfactory

Background pollutant concentrations were provided by MEIU to the contractor. The background values and seasonal profiles can be found in Appendix B of this modeling report.

12. Selection of Model(s)

☐ Satisfactory

All appropriate models were used - AERMOD v19191, AERMAP v18081, BPIPPRM v04274.

13. Selection of Modeling Parameters

☐ Satisfactory

Model defaults were chosen for all pollutant/averaging intervals with the exception of the 1 hr NO₂ demonstration. MEIU approved of the use of OLM and provided a seasonal/hourly NO_x and O₃ profile. The stationary source program approved the use of an ISR of 0.1.

14. Receptor Network

☐ Satisfactory

The receptor grid was comprised as:
Every 50 m along the facility fence line,
Every 100 m from the fenceline extending to 1.5km,
Every 250 m from 1.5km to 3km, and
Every 500 m from 3km to 26km.

15. Treatment of Atmospheric Chemistry (NO_x conversion)

☐ Satisfactory

The applicant submitted the 1hr NO₂ analysis using the non-default OLM option. For the use of this option in AERMOD, the applicant used an ozone background concentration profile based on the 90th percentile value by season and hour of day from data from CDPHE's Weld County Tower monitoring site for the period including 2012, 2013, and 2014; this profile was provided by the MEIU. The In stack NO₂/NO_x ratio used in the modeling was approved by stationary sources. The seasonal NO₂ profile provided by MEIU was developed using data from CDPHE's La Casa monitoring site, based on 2015, 2016, and 2017 data.

16. Standard Temperature Pressure Corrections

☐ Not Applicable

STP corrections are no longer required for permit modeling in Colorado.

17. Meteorological Data for Model(s)

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Satisfactory

Meteorological data for the project was provided by MEIU and processed using AERMET v19191. The data was comprised of one year of data (2009) from the Ft. St. Vrain met site. The meteorological determination is including in Appendix B of this report

18. Other Modeling Data

Satisfactory

There were three operating scenarios including in the modeling for the 24 hr PM2.5 demonstration.

Scenario 1: Any six engines from the West bank (GEN01-GEN08) AND ANY six engines from the East bank (GEN09 - GEN16) for a total of 12 engines may operate over the entire interval from 7 a.m. to 7 p.m.

Scenario 2: Any two engines can operate any hour of any day as long as no other testing/maintenance is being performed.

Scenario 3: All sixteen engines may operate for four consecutive hours for any contiguous four hour period of any day.

19. Modeling Input/Output Files Provided Electronically

Satisfactory

All files downloaded from a 'OneDrive' account established by consultant and stored locally.

20. Comparison of Impacts with Significance Levels

Satisfactory

NAAQS/CAAQS Significance Analysis

Pollutant	Averaging Period	AERMOD Predicted	SIL (ug/m3)
		Concentration (ug/m3)	
CO	1 hr	1294.5	2000
CO	8 hr	330.0	500
NO2	1 hr	96.7	7.5
NO2	Annual	1.5	1.0
PM10	24 hr	25.7	5
PM2.5	24 hr	25.7	1.2
SO2	1 hr	1.6	4.0
SO2	3 hr	67	25

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21. Comparison of Impacts with Class I 24hr 1ug/m3 Rule

Not Applicable

The permitted facility is not subject to PSD requirements.

22. Compliance with "75% of Applicable Increment" Rule

Not Applicable

The permitted facility is not subject to PSD requirements.

23. Selection of Geographic Area for Full Impact Analysis

Satisfactory

The geographic area for the cumulative impacts were essentially the same as for the significant impacts. However, the grid was refined. It included the 50 m fenceline spacing but used only 100m spacing beyond that to include the entire area of significance (area encompassing all significant receptors)

24. Compliance with Class I PSD Increments

Not Applicable

The permitted facility is not subject to PSD requirements.

25. Compliance with Class II PSD Increments

Not Applicable

The permitted facility is not subject to PSD requirements.

26. Compliance with NAAQS and State Standards

Satisfactory

A Modeling Summary is presented here:

Pollutant	Averaging Interval	Maximum Back Conc. (ug/m3)	Modeled Impact (ug/m3)	Impact with Background (ug/m3)	NAAQS/CAAQS (ug/m3)
CO	1 hr	n/a	1294.4	--	40082
CO	8 hr	n/a	330.1	--	10306
PM10	24 hr	60	25.7	85.67	150
NO2	Annual	37.6	1.49	39.12	99.7
NO2	1 hr	Seasonal	--	171.3	188.4
SO2	1 hr	39.3	1.55	40.8	196.6
SO2	3 hr	39.3	66.83	106.1	700
PM2.5	24 hr	22	12.89	34.89	35

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27. Compliance with Non-Criteria Pollutant Thresholds

☐ Not Applicable

Not applicable.

28. Determination of Pre-/Post-Monitoring Requirements

☐ Not Applicable

The permitted facility is not subject to PSD requirements

29. Visibility Impairment and AQRV Analyses

☐ Not Applicable

The permitted facility is not subject to PSD requirements

30. Anticipated Growth/Soils/Vegetation Analyses

☐ Not Applicable

The permitted facility is not subject to PSD requirements

31. Compliance with Regulations in Affected Adjacent States

☐ Not Applicable

The permitted facility is not subject to PSD requirements

32. Risk Assessment

☐ Not Applicable

Risk assessments and review of impacts from hazardous air pollutants are not performed on a routine basis and are only performed when a specific request is made by the Stationary Sources Program. SSP did not request a risk assessment for this modification

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Reviewed by: Bradley Rink

Access to data, notes, and files:

All information necessary to form the basis of the air quality compliance demonstration is transmitted to the permit reviewer for inclusion in the permit file.

In some cases, the Technical Services Program retains ambient air monitoring and modeling data, ambient monitoring and modeling plans and reports, electronic modeling input/output files, and other files. These files may contain documents that are considered to be part of a deliberative process.

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Air Pollution Control Division / Technical Services Program
Modeling, Meteorology, and Emission Inventory Unit

ATTACHMENT F

FACILITY WIDE EMISSIONS INVENTORY FORM APCD-102a

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.



Company Name: J.P. MORGAN CHASE & CO.

Source Name: PROJECT SYCAMORE - BROOMFIELD DATA CENTER PLANT AIRS ID 014-1368; AIRS POINTS 001-016 EMERGENCY GENERATOR ENGINES

Source AIRS ID: Plant AIRS ID: 014-1368; AIRS Points 001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, and 016

				Uncontrolled Potential to Emit (PTE)																	Controlled Potential to Emit (PTE)																
				Criteria (TPY)						HAPs (lb/yr)						Criteria (TPY)						HAPs (lb/yr)															
AHS ID	Permit No.	Description		TSP	PM10	PM2.5	PUG TSP	PUG PM10	PUG PM2.5	SO2	NOx	VOC	CO	Resusp.	Toluene	EB	Xylene	a-Hex	HCHO	TSP	PM10	PM2.5	PUG TSP	PUG PM10	PUG PM2.5	SO2	NOx	VOC	CO	Resusp.	Toluene	EB	Xylene	a-Hex	HCHO		
001	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
002	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
003	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
004	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
005	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
006	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
007	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
008	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
009	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
010	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
011	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
012	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
013	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
014	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
015	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
016	18880781	Onr	(1) 3.765 hp Cummins diesel fire engine, model QSK78-G12	0.02	0.02	0.02				0.001	0.01	0.06	0.17																								
Permitted Sources Subtotal				6.3	6.3	6.3	0.0	0.0	0.0	6.3	24.3	1.3	2.7	0	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	
AFEN Only - Permit Exempt Sources																																					

Footnotes:

2. This form should be completed to include both existing sources and all proposed new or modifications to existing emissions sources
 3. If the emissions source is new then enter "proposed" under the Permit No. and AERS ID; da a column
 4. Add and/or replace HAPS and other Non-Criteria Reportable Pollutants as necessary. HAP abbreviations include:
- | | |
|-----------------------------------|------------------|
| EB = Ethylbenzene | Acro = Acrolein |
| FBHQ = Formaldehyde | n-Hex = n-Hexane |
| 224-TriP = 2,2,4-Trimethylpentane | Meth = Methanol |
| Acetal = Acetaldehyde | |
4. APEN Exempt/Insignificant Sources; should be included when warranted.

ATTACHMENT G

PROCESS DESCRIPTION AND AREA MAP

SYNTHETIC MINOR CONSTRUCTION PERMIT APPLICATION

PROJECT SYCAMORE - BROOMFIELD

JP MORGAN CHASE & CO.

ATTACHMENT G

Process Description

JP Morgan Chase & Co.'s Project Sycamore – Broomfield Data Center (Facility), Plant AIRS ID 014-1368, primarily engages in providing on-site management and operation of computer systems and/or data processing systems. The Facility's emergency generators (AIRS Point IDs: 001 through 016) are used to produce power for critical networks or equipment when electric power from the local utility is interrupted or during prolonged power outages. Figure 1-1 is an area map showing the location of the emergency generators and the surrounding area.



JP Morgan Chase & Co.
Broomfield Data Center
Synthetic Minor Construction Permit
Application

Project No. JPM001-0206725-23004417



Apex Companies, LLC

2121 Midway Rd, Ste 100
Carrollton, TX 75006
Phone: (469) 365-1100

www.apexcompanies.com

FIGURE 1

Area Map

Service Layer Credits:

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS

Modified 4/17/2023 by BMiller NAD 1983 UTM Zone 13N Coordinate System, Grid Listed in Meters