



Dedicated to protecting and improving the health and environment of the people of Colorado

Laura Pritchard

Crusoe Energy Systems, Inc.

255 Fillmore St

Denver, CO 80206

January 15, 2026

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-001	40.618231, -106.400481	511176	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1673644
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

If you have any questions regarding this letter, please contact me directly at (303) 692-3150.

Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-002	40.618231, -106.400481	511177	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1673653
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

If you have any questions regarding this letter, please contact me directly at (303) 692-3150.

Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-003	40.618231, -106.400481	511178	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1673673
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

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Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-004	40.618231, -106.400481	511179	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1709634
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

If you have any questions regarding this letter, please contact me directly at (303) 692-3150.

Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-005	40.618231, -106.400481	511180	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1709644
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

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Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

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The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-006	40.618231, -106.400481	511181	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1709639
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
Is this engine located at a synthetic minor stationary source of NO _x or CO? (If "yes", see Section V.A of the permit to determine if stack testing is required).	Yes
Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

If you have any questions regarding this letter, please contact me directly at (303) 692-3150.

Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Laura Pritchard
Crusoe Energy Systems, Inc.
255 Fillmore St
Denver, CO 80206

RE: Oil & Gas RICE GP02 General Permit Approval for Package # 511183

Dear Laura Pritchard:

The Colorado Air Pollution Control Division (Division) approves your company's registration of the equipment described below for coverage under general permit GP02 for natural gas fired reciprocating internal combustion engines (RICE) used at oil and gas sources.

Please refer to general permit GP02 and the Dispersion Modeling Section's (DMS) Modeling Review Report submitted with the registration and attached hereto for all applicable requirements, limitations, terms, and conditions. This approval is conditioned upon: 1) The accuracy and completeness of the information you supplied to the Division; 2) Operation of the source in accordance with the information you supplied to the Division; and 3) Operation of the Source in accordance with the required configurations/conditions identified in the summary section of the DMS's Modeling Review Report, which is based on the information you supplied to the Division. Failure to operate the source in accordance with the information supplied, and the resulting Modeling Review Report, may invalidate the permit.

A copy of the general permit may be obtained via the [CDPHE General Air Permits Webpage](#).

The following Table 1 contains identifying information for the engine to which this registration approval applies.

Table 1

Company Name	Stationary Source “Plant” Name	Emissions Point AIRS ID	Stationary Source Location	APEN Document #	APEN Signature Date
Crusoe Energy Systems, Inc.	Ray Ranch North	057-0075-007	40.618231, -106.400481	511182	11/14/2024

The following Table 2 contains specific equipment information and process and emissions limits for the engine to which this registration approval applies.

Table 2

Equipment Information	Engine under GP02 registration
Engine Manufacturer:	Waukesha
Engine Model:	9394 GSI
Engine Serial Number:	1709331
Fuel Consumption Limit (million standard cubic feet per year):	165.56
Tons NOx per year	3.6

Equipment Information	Engine under GP02 registration
Tons CO per year	7.2
Tons VOC per year	0.7
Tons PM ₁₀ per year	2.4

The following Table 3 contains regulatory applicability and stationary source classification determinations for the engine to which this registration applies. These classifications determine, in part, what specific requirements are applicable under the general permit coverage.

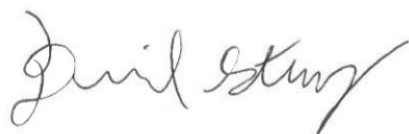
Table 3

Regulation	Determination
This engine subject to New Source Performance Standard (NSPS) Subpart:	JJJJ
This engine subject to Maximum Achievable Control Technology (MACT) area source requirements for subpart:	ZZZZ
Is this engine located at a synthetic minor stationary source for Title V Operating Permit, New Source Review, or MACT requirements?	Yes

Regulation	Determination
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Is this engine located at a synthetic minor stationary source of formaldehyde? (If "yes", see Section V.A of the permit to determine if stack testing is required).	No

If you have any questions regarding this letter, please contact me directly at (303) 692-3150.

Sincerely,



David Storey
Permit Engineer
Oil & Gas Program
Air Pollution Control Division

Company Name: **Crusoe Energy Systems, Inc.**

Facility Name: **Ray Ranch North**

Attachment F

Air Impact Analysis



Storey - CDPHE, David <david.storey@state.co.us>

Re: Crusoe Ray Ranch North Pad Modeling Submittal

7 messages

APCD Modeling Files - CDPHE , CDPHE <cdphe_apcd_modeling_files@state.co.us>

Thu, Oct 30, 2025 at 4:12 PM

To: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>

Cc: "lpritchard@crusoeenergy.com" <lpritchard@crusoeenergy.com>, Kaitlin Meszaros <meszaros@pinyon-env.com>, David Storey - CDPHE <david.storey@state.co.us>

Hello,

It was recently brought to our attention by David, the permit engineer assigned to this project, that the co-located source, Fulcrum Energy - Ray Ranch North 0880 S32 CTB (AIRS ID: 057-0073), may not have been accounted for properly in the modeling analysis completed for this facility. Can you confirm that the sites have completely separate fencelines and that the modeled fenceline presented in this application is still appropriate. At the time Fulcrum Energy - Ray Ranch North 0880 S32 CTB was not requested to be included as a nearby source because it was also a new source and not in our inventory yet. Can you confirm that the Fulcrum Energy - Ray Ranch North 0880 S32 CTB was not included as a nearby source or on-site source in this modeling application.

Given the proximity of the two sources, if the Fulcrum Energy - Ray Ranch North 0880 S32 CTB was not included as a nearby source in the previous modeling we request that updated modeling be provided that includes the Fulcrum Energy - Ray Ranch North 0880 S32 CTB facility as a nearby source. I can provide the necessary nearby source files if this is indeed the case.

Please let me know if you have any questions.

Jenny Turk

Modeling Files Request

Dispersion Modeling Unit

Stationary Sources Program



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Nov 12, 2024 at 12:20 PM APCD Modeling Files - CDPHE , CDPHE <cdphe_apcd_modeling_files@state.co.us> wrote:

Hi All,

The ambient impact analysis completed by Pinyon Environmental and reviewed by the Dispersion Modeling Unit is satisfactory and shows that the proposed project will not cause a modeled violation of the 1-hour NO2 NAAQS, annual NO2 NAAQS, 24-hour PM2.5 NAAQS, annual PM2.5 NAAQS, 24-hour PM10 NAAQS, 1-hour SO2 NAAQS and 3-hour SO2 NAAQS. The model review report has been attached. Final approval is subject to the Permit Engineer's review of emissions, operating schedule, and permit recommendations. Please provide the attached report to the permit engineer assigned to your application. Thank you!

Modeling Files Request

Dispersion Modeling Unit

Stationary Sources Program



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 20, 2024 at 2:14 PM Anthony Der Tatevasion <dertatevasion@pinyon-env.com> wrote:

Good afternoon,

Please find attached the emissions impact assessment for the Crusoe Energy Systems, Inc. Ray Ranch North Pad modeling submittal. Additionally, I'm requesting invitation to the MOVEIt transfer portal to submit the dispersion modeling analysis files.

Thank you,

Anthony Der Tatevasion

Air Quality Specialist



3222 S Vance St Suite 200

Lakewood, CO 80227

P: 303.980.5200 | D: 720.614.5603

E: dertatevasion@pinyon-env.com



asdfrewq

Storey - CDPHE, David <david.storey@state.co.us>

Thu, Nov 6, 2025 at 10:44 AM

To: "APCD Modeling Files - CDPHE , CDPHE" <cdphe_apcd_modeling_files@state.co.us>

Cc: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>, Kaitlin Meszaros <meszaros@pinyon-env.com>, Laura Pritchard <laura.pritchard@nydig.com>

Hello, just looping in Laura's new NYDIG email to this thread for consistency.

Thanks!

[Quoted text hidden]

--

David Storey
Permitting Engineer
Oil and Gas Program
gender pronouns: he/him/his



COLORADO
Air Pollution Control Division
Department of Public Health & Environment

4300 Cherry Creek Drive S., Denver, CO 80246

david.storey@state.co.us | www.colorado.gov/cdphe/apcd

CONFIDENTIALITY NOTICE: The information contained in or attached to this transmission is intended solely for its authorized recipient and may be confidential. If you are not the intended recipient, or responsible for delivering some or all of this information to the intended recipient, you have received this transmission in error. If you have received this communication in error, immediately notify the sender and delete or

properly destroy this transmission, including any attachments.

Laura Pritchard <Laura.Pritchard@nydig.com>

Mon, Nov 17, 2025 at 1:28 PM

To: "jennifer.turk@state.co.us" <jennifer.turk@state.co.us>

Cc: Kaitlin Meszaros <meszaros@pinyon-env.com>, Anthony Der Tatevasion <dertatevasion@pinyon-env.com>, "Storey - CDPHE, David" <david.storey@state.co.us>

Looks like not everyone could receive the email due to attachment sizes so I will have to send the attachments separately.

Thanks,

Laura Pritchard

Environmental Specialist

MOBILE 970 749 8615

EMAIL laura.pritchard@nydig.com



ONE VANDERBILT AVENUE, 65TH FL, NEW YORK, NY 10017

From: Laura Pritchard <Laura.Pritchard@nydig.com>

Date: Monday, November 17, 2025 at 1:24 PM

To: jennifer.turk@state.co.us <jennifer.turk@state.co.us>

Cc: Storey - CDPHE, David <david.storey@state.co.us>, Kaitlin Meszaros <meszaros@pinyon-env.com>, dertatevasion@pinyon-env.com <dertatevasion@pinyon-env.com>

Subject: FW: [EXTERNAL] Re: Crusoe Ray Ranch North Pad Modeling Submittal

Hi Jenny,

I can confirm that the modeled fence line is still appropriate. I've reviewed our records and the correspondence with the Permit Modeling Unit, which I've attached for reference.

To recap the timeline:

- On August 1, 2024, on behalf of Crusoe/NYDIG Pinyon Environmental submitted a Nearby Source Inventory request. On August 7, 2024, CDPHE confirmed that no nearby sources were required for inclusion in the cumulative runs.
- During the completeness review, CDPHE requested clarification on the ambient boundary for this co-located site. In accordance with CDPHE's guidance, NYDIG's designated area considered the co-lease land situation and did not include the portion of the land leased and operated by the separate entity (i.e., Fulcrum). Additionally, we made it clear in our report that

NYDIG would maintain complete and exclusive operational control over the NYDIG Designated Area at the Facility. CDPHE reviewed this and confirmed the approach was acceptable.

- On November 12, 2024, the Dispersion Modeling Unit completed its full review and approved the ambient impact analysis, confirming that the project does not cause modeled NAAQS exceedances.
- The Fulcrum Ray Ranch North facility was not in the Division's inventory at the time of the inventory request, completeness review, or modeling approval, and CDPHE did not identify it as a required nearby source.

Re-opening approved modeling each time a new source is permitted, especially when that source did not exist in the inventory at the time, could set a challenging precedent. Typically, new or modified sources are evaluated against existing permitted sources, not the other way around.

Given the above, we want to make sure we fully understand the basis for revisiting an already-approved modeling analysis due to a source that was not in inventory at the time of review. Can you please clarify the regulatory or policy basis for requiring updated modeling under these circumstances?

Best,
Laura Pritchard
Environmental Specialist

MOBILE 970 749 8615

EMAIL laura.pritchard@nydig.com



ONE VANDERBILT AVENUE, 65TH FL, NEW YORK, NY 10017

From: Kaitlin Meszaros <meszaros@pinyon-env.com>

Date: Friday, October 31, 2025 at 2:19 PM

To: Laura Pritchard <Laura.Pritchard@nydig.com>

Subject: FW: [EXTERNAL] Re: Crusoe Ray Ranch North Pad Modeling Submittal

Hi Jenny,

Hi Laura,

I can't remember if I forwarded this to you yesterday with the others from CDPHE. Modeling wants us to include the emissions from the Ray Ranch Pad because it's now in their inventory. When we submitted our request for nearby sources when doing the modeling back in October 2024, CDPHE did not give us any nearby sources and we even included receptors on the pad to account for the fact this is a co-located facility. We can get this additional data for the model as CDPHE is alluding to, and modify the model, but want to check with you first especially if you have questions or want to push back on this request.

[Quoted text hidden]

Hi All,

The ambient impact analysis completed by Pinyon Environmental and reviewed by the Dispersion Modeling Unit is satisfactory and shows that the proposed project will not cause a modeled violation of the 1-hour NO₂ NAAQS, annual NO₂ NAAQS, 24-hour PM_{2.5} NAAQS, annual PM_{2.5} NAAQS, 24-hour PM₁₀ NAAQS, 1-hour SO₂ NAAQS and 3-hour SO₂ NAAQS. The model review report has been attached. Final approval is subject to the Permit Engineer's review of emissions, operating schedule, and permit recommendations. Please provide the attached report to the permit engineer assigned to your application. Thank you!

Modeling Files Request

Dispersion Modeling Unit

Stationary Sources Program



O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 20, 2024 at 2:14 PM Anthony Der Tatevasion <dertatevasion@pinyon-env.com> wrote:

Good afternoon,

Please find attached the emissions impact assessment for the Crusoe Energy Systems, Inc. Ray Ranch North Pad modeling submittal. Additionally, I'm requesting invitation to the MOVEit transfer portal to submit the dispersion modeling analysis files.

Thank you,

Anthony Der Tatevasion

Air Quality Specialist



3222 S Vance St Suite 200

Lakewood, CO 80227

P: 303.980.5200 | D: 720.614.5603

E: dertatevasion@pinyon-env.com



asdfrewq

Kaitlin,

After reviewing the backgrounds for this project and the surrounding nearby sources sent by Dave, the Permit Modeling Unit has determined that you will not need to include any additional nearby sources in any of your cumulative runs (if needed).

Please let us know if you have any questions.

Modeling Files Request

Permit Modeling Unit

Stationary Sources Program



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 6, 2024 at 5:27 PM Kaitlin Meszaros <meszaros@pinyon-env.com> wrote:

Ok. Thank you for your help!

Kaitlin Meszaros

Air Quality & Noise Specialist

Pinyon Environmental, Inc.

D: 720.614.5598

From: Thayer - CDPHE He Him, David <david.thayer@state.co.us>

Sent: Tuesday, August 6, 2024 5:25 PM

To: Kaitlin Meszaros <meszaros@pinyon-env.com>

Cc: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>; CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>; lpritchard@crusoeenergy.com

Subject: Re: [EXTERNAL] Re: ATTN: Dave Thayer - Crusoe Ray Ranch North Pad Nearby Source Inventory Request

WARNING: The sender of this email could not be validated and may not match the person in the "from" field. Do not click links or open attachments unless you recognize the sender and know the content is safe.

I don't have a specific contact, queries directed to "CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>" should be answered in due course.

dt

--

Dave Thayer
Colorado Department of Public Health and Environment
Air Pollution Control Division / Stationary Sources Program
david.thayer@state.co.us, Voice:303-692-3187, FAX:303-782-0278

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 6, 2024 at 5:21 PM Kaitlin Meszaros <meszaros@pinyon-env.com> wrote:

Thank you, Dave. Do you have a specific contact for us to reach out to in the modeling group to check on status later this week?

Thanks,

Kaitlin Meszaros

Air Quality & Noise Specialist

Pinyon Environmental, Inc.

D: 720.614.5598

From: Thayer - CDPHE He Him, David <david.thayer@state.co.us>

Sent: Tuesday, August 6, 2024 5:02 PM

To: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>

Cc: CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>; Kaitlin Meszaros <meszaros@pinyon-env.com>; lpritchard@crusoeenergy.com

Subject: [EXTERNAL] Re: ATTN: Dave Thayer - Crusoe Ray Ranch North Pad Nearby Source Inventory Request

You don't often get email from david.thayer@state.co.us. [Learn why this is important](#)

I've completed the nearby source extraction(s) and preliminary QA for your request. The data will be sent to the Division's modeling group for review. Upon review they will contact you with further information.

If you have any questions regarding these data please feel free to contact me.

--

Dave Thayer
Colorado Department of Public Health and Environment
Air Pollution Control Division / Stationary Sources Program
david.thayer@state.co.us, Voice:303-692-3187, FAX:303-782-0278

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Thu, Aug 1, 2024 at 3:20 PM Anthony Der Tatevasion <dertatevasion@pinyon-env.com> wrote:

Good afternoon Dave,

Below and attached is a nearby source inventory request for the Crusoe Energy Systems, Inc. Ray Ranch North Pad in Jackson County, CO. Attached is a KMZ of the receptor grid for the 2019 1-hour NO2 with the largest area of receptors over the SIL of 7.5 ug/m3. The project details are below.

Site Coordinates: 40.61823, -106.40048

Pollutants requiring modeling: Annual and 1hr NO2, 24 hr PM10, 24 hour PM2.5 (1 hr and 3 hr SO2 / Annual PM2.5 are below SIL thresholds)

Extent of Area: See attached KMZ

Project Name: Ray Ranch North Pad

Thank you!

Anthony Der Tatevasion

Air Quality Specialist



3222 S Vance St Suite 200

Lakewood, CO 80227

P: 303.980.5200 | D: 720.614.5603

E: dertatevasion@pinyon-env.com



asdfrewq

9 attachments



image001.png
13K

 image002.png
1K

 image003.png
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 image004.png
1K



image001.png
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 image003.png
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 image004.png
1K

 **Modeling Checklist Report_CrusoeEnergySystems - RayRanchNorth_11122024.pdf**
9954K

Laura Pritchard <Laura.Pritchard@nydig.com>

Mon, Nov 17, 2025 at 1:28 PM

To: "jennifer.turk@state.co.us" <jennifer.turk@state.co.us>

Cc: Kaitlin Meszaros <meszaros@pinyon-env.com>, Anthony Der Tatevasion <dertatevasion@pinyon-env.com>, "Storey - CDPHE, David" <david.storey@state.co.us>

[Quoted text hidden]

 **RE- [EXTERNAL] Re- Crusoe Ray Ranch North Pad Modeling Submittal[18].eml.zip**
22684K

Turk - CDPHE, Jennifer <jennifer.turk@state.co.us>

Mon, Nov 17, 2025 at 1:47 PM

To: Laura Pritchard <Laura.Pritchard@nydig.com>

Cc: Kaitlin Meszaros <meszaros@pinyon-env.com>, Anthony Der Tatevasion <dertatevasion@pinyon-env.com>, "Storey - CDPHE, David" <david.storey@state.co.us>

Hi Laura,
I received your email. I will discuss it with my supervisor and we will get back to you.

Best,
Jenny

--

Jennifer Turk (She/Her)

Air Quality Modeler
Dispersion Modeling Unit
Stationary Sources Program



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

4300 Cherry Creek Drive S., Denver, CO 80246

jennifer.turk@state.co.us | <https://www.colorado.gov/cdphe/apcd>

[Quoted text hidden]

Turk - CDPHE, Jennifer <jennifer.turk@state.co.us>
To: David Storey - CDPHE <david.storey@state.co.us>

Fri, Nov 21, 2025 at 3:15 PM

Hi David,

I did some cursory modeling that included the co-located source and determined that it did not have a significant impact on the modeled results so we will not require the applicant to re-model. I've updated the report to include that in a note in the appendix and updated the billable hours report with the extra time I spent. Thanks for bringing this up. It definitely could have made a difference but they were just luckily very far below all the NAAQS standards already.

Hope you have a good holiday. I'm out next week so if you need anything further I'll have to get to it when I get back.

Best,
Jenny

--

Jennifer Turk (She/Her)

Air Quality Modeler
Dispersion Modeling Unit
Stationary Sources Program



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Air Pollution Control Division

Department of Public Health & Environment

4300 Cherry Creek Drive S., Denver, CO 80246

jennifer.turk@state.co.us | <https://www.colorado.gov/cdphe/apcd>

On Mon, Nov 17, 2025 at 1:56 PM Laura Pritchard <Laura.Pritchard@nydig.com> wrote:

Thanks Jenny

[Quoted text hidden]

 **Modeling Checklist Report_CrusoeEnergySystems - RayRanchNorth_11122024.pdf**
10008K

Turk - CDPHE, Jennifer <jennifer.turk@state.co.us>

Fri, Nov 21, 2025 at 3:18 PM

To: Laura Pritchard <Laura.Pritchard@nydig.com>

Cc: Kaitlin Meszaros <meszaros@pinyon-env.com>, Anthony Der Tatevasion <dertatevasion@pinyon-env.com>, "Storey - CDPHE, David" <david.storey@state.co.us>

Hi Laura,

I did modeling in house to confirm that you do not need to resubmit modeling to include this co-located source. I have provided an updated report to the permit engineer as well clarifying that information and he should be able to move forward with the permit. Let me know if you have any further questions.

Best,
Jenny

--

Jennifer Turk (She/Her)

Air Quality Modeler

Dispersion Modeling Unit

Stationary Sources Program



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Air Pollution Control Division

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[Quoted text hidden]



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COLORADO

Storey - CDPHE, David <david.storey@state.co.us>

Re: Crusoe Ray Ranch North Pad Modeling Submittal

Walsh - CDPHE, Heather <heather.walsh@state.co.us>

Tue, Dec 2, 2025 at 2:08 PM

To: Laura.Pritchard@nydig.com

Cc: David Storey - CDPHE <david.storey@state.co.us>, "Turk - CDPHE, Jennifer" <jennifer.turk@state.co.us>

Good Afternoon Laura,

Although we do not typically require updated modeling due to a change in the nearby source inventory, unless significant time has elapsed between providing the inventory and receiving modeling, there are exceptions. This scenario is different, because the source in question is not the typical nearby source that the applicant would not be expected to be aware of, but is a colocated source. This makes the situation more like requiring existing on-site units to be modeled in the cumulative analysis even though we do not provide those in the inventory, since we expect that the applicant has better information about their own sources than would be provided in our inventory anyway. The good news for this case is that DMU has done a rough model run that included the colocated facility, and the changes to the modeling results were small. Because of this result, we do not need you to submit updated modeling at this time. If future modeling for this facility is required, we would expect the colocated source to be included in any cumulative analyses.

Let us know if you have any questions,
Heather

Heather Walsh

Unit Manager

Dispersion Modeling Unit

Stationary Sources Program



COLORADO

Air Pollution Control Division

Department of Public Health & Environment

4300 Cherry Creek Drive S., Denver, CO 80246
heather.walsh@state.co.us | cdphe.colorado.gov/apcd

On Mon, Nov 17, 2025 at 1:43 PM Turk - CDPHE, Jennifer <jennifer.turk@state.co.us> wrote:

Best,
Jenny

--

Jennifer Turk (She/Her)

Air Quality Modeler

Dispersion Modeling Unit

Stationary Sources Program

Colorado Department of Public Health and Environment

Modeling Review Comments

Project ID: MA_20240827A

Plant/Site Name: Crusoe Energy Systems, Inc. Ray Ranch North Pad

Reviewed by: DMU

Document(s) Reviewed:

1. CrusoeRayRanchNorth_Emissions Impact Assessment_2024-10-04 | Air Dispersion Modeling Report Received on 10/4/2024.
2. October 4, 20214 Updated Model Files | Air Dispersion Modeling Files received on 10/4/2024.

Summary

Crusoe Energy Systems, Inc. is starting new facility Ray Ranch North Pad consisting of twelve Waukesha 9394 GSI generator engines and one Waukesha VGF H24SE compressor engine located at 381470m east and 4497125m north UTM Zone 13 NAD83 in Jackson County, CO outside of all ozone nonattainment areas. Crusoe Energy Systems Inc. submitted a 114 for the new facility in June of 2024 and DMU responded with the following: Total emissions from the facility are represented to be 44.21 tpy (10.09 lb/hr) NO_x, 88.42 tpy (20.19 lb/hr) CO, 10.11 tpy (2.31 lb/hr) SO₂, 28.97 tpy (158.74 lb/day) PM₁₀, and 2.93 tpy (16.05 lb/day) PM_{2.5}. The proposed emission rates of CO, and annual SO₂ are below the corresponding threshold in Table 1 of the Colorado Minor NSR Source Modeling Guideline for Air Quality Permits (May 2023). The threshold amounts in Table 1 are considered de minimis emissions, which have a low probability of causing or contributing to an exceedance of any NAAQS. The emissions represented for hourly and annual NO_x, hourly SO₂, daily PM₁₀, and daily PM_{2.5} are greater than the corresponding threshold in Table 1. A review of nearby sources show low potential nearby impacts associated with the location of the facility (Jackson County) outside of the ozone nonattainment area identified for the 2008 ozone standard and outside the ozone nonattainment area identified for the 2015 ozone standard. Based on the facility location and proposed emissions, PMU is requesting that dispersion modeling be submitted for the 1-hour NO₂, annual NO₂, 1hr SO₂, 3 hr SO₂, 24hr PM₁₀, annual PM_{2.5}, and 24 hr PM_{2.5}. The emission rates evaluated in the modeling analysis have changed from what was evaluated in the modeling determination.

The ambient air impact analysis performed by Pinyon Environmental and reviewed by the PMU showed that the facility will not cause a modeled violation of the 1-hour NO₂ NAAQS, annual NO₂ NAAQS, annual PM_{2.5} NAAQS, 24-hour PM_{2.5} NAAQS, 24-hour PM₁₀ NAAQS, 1-hour SO₂ NAAQS and 3-hour SO₂ NAAQS. Such compliance demonstration is valid under the following configuration (recommended permit conditions):

- 1) Emission Rate Factors- Modeled impacts were estimated assuming throughput limits approved by the permit engineer. The calculated emissions reflect the approved throughput limits. Appendix B provides full detail of equipment, hours of operations and throughput limits. Modeled impacts were also estimated assuming certain stack

characteristics as indicated in the modeling analysis submitted by the applicant. The permit should contain conditions that, for the duration of permit effectiveness, the exhaust from each emission unit shall be discharged at stack heights (release heights) and locations listed in Table B1 in Appendix B.

- 2) Preclusion of Public Access- Modeled impacts were estimated at ambient air receptors at the boundary, which will be depicted in Appendix A of the modeling report, the atmosphere over land owned or controlled by the stationary source may be excluded from ambient air where the source employs measures, which may include physical barriers, that are effective in precluding access to the land by the general public. Crusoe Energy precludes public access to the Ray Ranch North Pad using signage, video surveillance, fencing and boundary markers.

For 1-hr NO₂ Significance Impact Analysis, the maximum-modeled concentrations are shown in the following table:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m ³)	SIL (ug/m ³)
NO _x	Alamosa (2017-2021)	5-yr average	1-hr	45.3	7.5
NO _x	Kodak (1993-1997)	5-yr average	1-hr	81.5	7.5
NO _x	Alamosa (2017-2021)	5-yr average	Annual	2.4	1
NO _x	Kodak (1993-1997)	5-yr average	Annual	1.4	1

The modeled concentration values are the highest first high concentrations. Given that the NO₂ 1-hour SIL and NO₂ annual SIL were exceeded using either meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

The modeled concentration values are the form of the 1-hr NO₂ standard (highest eighth high) and annual NO₂ standard (highest first high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average NO₂ background concentrations from the Hebron 2023 monitor and Tier 2 NO_x conversion using default ISR values (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m ³)	Background (ug/m ³)	Total Impact (ug/m ³)	NAAQS (ug/m ³)
NO _x	Alamosa (2017-2021)	1-hr	37.7	27.5	65.2	188
NO _x	Kodak (1993-1997)	1-hr	51.7	27.5	79.2	188
NO _x	Alamosa (2017-2021)	Annual	2.4	2.82	5.22	100

NO _x	Kodak (1993-1997)	Annual	1.4	2.82	4.22	100
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For the 24-hour and annual PM_{2.5} significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m ³)	SIL (ug/m ³)
PM _{2.5}	Alamosa (2017-2021)	5-yr average	24-hr	1.55	1.2
PM _{2.5}	Kodak (1993-1997)	5-yr average	24-hr	1.03	1.2
PM _{2.5}	Alamosa (2017-2021)	5-yr average	Annual	0.18	0.13
PM _{2.5}	Kodak (1993-1997)	5-yr average	Annual	0.1	0.13

The modeled concentrations values for the 24-hour PM_{2.5} SIL and annual PM_{2.5} SIL are the highest first high concentrations. Given that the 24-hour PM_{2.5} SIL and annual PM_{2.5} SIL were exceeded using at least one meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

The modeled concentration values are the form of the 24-hr PM_{2.5} standard (highest eighth high) and annual PM_{2.5} standard (highest first high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average PM_{2.5} background concentrations from the Hebron 2023 monitor (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m ³)	Background (ug/m ³)	Total Impact (ug/m ³)	NAAQS (ug/m ³)
PM _{2.5}	Alamosa (2017-2021)	24-hr	0.79	12	12.79	35
PM _{2.5}	Kodak (1993-1997)	24-hr	0.52	12	12.52	35
PM _{2.5}	Alamosa (2017-2021)	Annual	0.18	4	4.18	9
PM _{2.5}	Kodak (1993-1997)	Annual	0.10	4	4.10	9

For the 1-hour and 3-hour SO₂ significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
SO2	Alamosa (2017-2021)	5-yr average	1-hr	1.06	7.85
SO2	Kodak (1993-1997)	5-yr average	1-hr	2.03	7.85
SO2	Alamosa (2017-2021)	5-yr average	3-hr	1.02	25
SO2	Kodak (1993-1997)	5-yr average	3-hr	1.08	25

The modeled concentration values for the SIL are the highest first high concentration over 5 years of non-representative data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997). Neither the 1-hour nor the 3-hour SO2 SIL were exceeded so it can be concluded that the new facility will not cause a modeled violation of the 1-hour or 3-hour SO2 NAAQS.

For the 24-hour PM10 significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
PM10	Alamosa (2017-2021)	5-yr average	24-hr	18.2	5
PM10	Kodak (1993-1997)	5-yr average	24-hr	15.8	5

The modeled concentrations values for the 24-hour PM10 SIL are the highest first high concentrations. Given that the 24-hour PM10 SIL was exceeded using either meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

The modeled concentration values are the form of the 24-hr PM10 standard (highest sixth high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average PM10 background concentrations from the Hebron 2023 monitor (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m3)	Background (ug/m3)	Total Impact (ug/m3)	NAAQS (ug/m3)
PM10	Alamosa (2017-2021)	24-hr	13.5	30	43.5	150

PM10	Kodak (1993-1997)	24-hr	8.6	30	38.6	150
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Review Checklist

1. Is this a PSD project?

No

The permitted facility is not applicable to PSD requirements.

2. Topographic Map with Site and Receptor Locations

Satisfactory

Submitted with the application.

3. Plant/Site Plot Plan

Satisfactory

Submitted with the application.

4. Building Dimension Data

Satisfactory

Submitted with the application.

5. Determination of Fenceline

Satisfactory

Submitted with the application.

6. Identification of Nearby Nonattainment Areas

Satisfactory

The facility is not located within any nonattainment areas.

7. Identification of Pollutants/Averaging Periods to Model

Satisfactory

For this application, quantitative impact analyses are warranted to demonstrate compliance with the NAAQS/CAAQS for the following pollutant with emissions above the modeling threshold: NO₂ (1-hr and annual), SO₂ (1-hour and 3-hour), PM_{2.5} (24-hour and annual) and PM₁₀ (24-hour).

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

Not Reviewed

Verification of emission rates and exhaust stack parameters of the proposed facility is deferred to the permit engineer.

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

Satisfactory

DMU determined that no nearby sources were required to be included in a cumulative analysis for any pollutants for this facility.

10. Background Concentrations(s)

Satisfactory

DMU provided the following background concentrations to the applicant: Hebron Monitor 2023: Ozone = 0.63 ppm, NO₂ 1-hr = 14.6 ppb, NO₂ annual =

1.5 ppb, PM10 24-hr = 30 ug/m³; Pagosa Springs 2020-2022: SO₂ 1-hr = 8 ppb; and Greasewood Hub 2009-2010 PM_{2.5} 24-hr = 12 ug/m³ and PM_{2.5} annual = 4.0 ug/m³. See Appendix C for background memo and any seasonal profiles that were provided.

11. Selection of Model(s)

Satisfactory

The applicant used the EPA regulatory model AERMOD, the terrain data processor AERMAP, and the building downwash parameters processor BPIPPRM. The applicant used the most current version of these programs available at the moment of submitting the application. The Division used the most current versions: AERMOD v23132, AERMAP v18081, and BPIPPRM v04274. The Division provided the applicant with the AERMOD-ready meteorological files, so there was no need for the applicant to use the meteorological data processor AERMET. The meteorological files were processed with AERMET v23132.

12. Selection of Modeling Parameters

Satisfactory

Regulatory default was used.

13. Receptor Network

Satisfactory

Submitted with the application. The receptor grid extended out to 10km.

14. Treatment of Atmospheric Chemistry (NO_x Conversion)

Satisfactory

Tier 2 with default ISR values.

15. Standard Temperature Pressure Corrections

Not Applicable

STP corrections are currently not required for permit modeling in Colorado.

16. Meteorological Data for Model(s)

Satisfactory

DMU determined that there was no meteorological dataset that was adequately representative of the facility and provided a non-representative determination using Kodak 1993-1997 and Alamosa 2017-2021. DMU provided pre-processed data for both towers. See Appendix C for a copy of the meteorological determination.

17. Other Modeling Data

Not Applicable

18. Modeling Input/Output Files Provided Electronically

Satisfactory

All files were provided with the application

19. Comparison of Impacts with Significance Levels

Satisfactory

For 1-hr NO₂ Significance Impact Analysis, the maximum-modeled concentrations are shown in the following table:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
NOx	Alamosa (2017-2021)	5-yr average	1-hr	45.3	7.5
NOx	Kodak (1993-1997)	5-yr average	1-hr	81.5	7.5
NOx	Alamosa (2017-2021)	5-yr average	Annual	2.4	1
NOx	Kodak (1993-1997)	5-yr average	Annual	1.4	1

The modeled concentration values are the highest first high concentrations. Given that the NO₂ 1-hour SIL and NO₂ annual SIL were exceeded using either meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

For the 24-hour and annual PM_{2.5} significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
PM _{2.5}	Alamosa (2017-2021)	5-yr average	24-hr	1.55	1.2
PM _{2.5}	Kodak (1993-1997)	5-yr average	24-hr	1.03	1.2
PM _{2.5}	Alamosa (2017-2021)	5-yr average	Annual	0.18	0.13
PM _{2.5}	Kodak (1993-1997)	5-yr average	Annual	0.1	0.13

The modeled concentrations values for the 24-hour PM_{2.5} SIL and annual PM_{2.5} SIL are the highest first high concentrations. Given that the 24-hour PM_{2.5} SIL and annual PM_{2.5} SIL were exceeded using at least one meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

For the 1-hour and 3-hour SO₂ significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
SO ₂	Alamosa (2017-2021)	5-yr average	1-hr	1.06	7.85

SO2	Kodak (1993-1997)	5-yr average	1-hr	2.03	7.85
SO2	Alamosa (2017-2021)	5-yr average	3-hr	1.02	25
SO2	Kodak (1993-1997)	5-yr average	3-hr	1.08	25

The modeled concentration values for the SIL are the highest first high concentration over 5 years of non-representative data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997). Neither the 1-hour nor the 3-hour SO2 SIL were exceeded so it can be concluded that the new facility will not cause a modeled violation of the 1-hour or 3-hour SO2 NAAQS.

For the 24-hour PM10 significant impact analyses, the maximum-modeled concentrations are shown in the table below:

Pollutant	Meteorological Dataset	Year	Period	Modeled Concentrations (ug/m3)	SIL (ug/m3)
PM10	Alamosa (2017-2021)	5-yr average	24-hr	18.2	5
PM10	Kodak (1993-1997)	5-yr average	24-hr	15.8	5

The modeled concentrations values for the 24-hour PM10 SIL are the highest first high concentrations. Given that the 24-hour PM10 SIL was exceeded using either meteorological dataset, further cumulative impact analysis was necessary to demonstrate the facility would not cause and/or contribute to a modeled exceedance of the NAAQS.

20. Selection of Geographic Area for Full Impact Analysis

Satisfactory

The area selected for the full impact analysis was adequate. Extending beyond the SIA.

21. Compliance with NAAQS and State Standards

Satisfactory

The modeled concentration values are the form of the 1-hr NO2 standard (highest eighth high) and annual NO2 standard (highest first high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average NO2 background concentrations from the Hebron 2023 monitor and Tier 2 NOx conversion using default ISR values (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m3)	Background (ug/m3)	Total Impact (ug/m3)	NAAQS (ug/m3)
NOx	Alamosa (2017-2021)	1-hr	37.7	27.5	65.2	188

NO _x	Kodak (1993-1997)	1-hr	51.7	27.5	79.2	188
NO _x	Alamosa (2017-2021)	Annual	2.4	2.82	5.22	100
NO _x	Kodak (1993-1997)	Annual	1.4	2.83	4.22	100

The modeled concentration values are the form of the 24-hr PM_{2.5} standard (highest eighth high) and annual PM_{2.5} standard (highest first high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average PM_{2.5} background concentrations from the Greasewood Hub 2009-2010 monitor (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m ³)	Background (ug/m ³)	Total Impact (ug/m ³)	NAAQS (ug/m ³)
PM _{2.5}	Alamosa (2017-2021)	24-hr	0.79	12	12.79	35
PM _{2.5}	Kodak (1993-1997)	24-hr	0.52	12	12.52	35
PM _{2.5}	Alamosa (2017-2021)	Annual	0.18	4	4.18	9
PM _{2.5}	Kodak (1993-1997)	Annual	0.10	4	4.10	9

The modeled concentration values are the form of the 24-hr PM₁₀ standard (highest sixth high) concentration over 5 years of non-representative meteorological data (Alamosa non-adju 2017-2021 and Kodak non-adju 1993-1997) using annual average PM₁₀ background concentrations from the Greasewood Hub 2009-2010 monitor (no nearby sources were required for this facility). The maximum modeled concentrations are shown in the table below.

Pollutant	Meteorological Dataset	Period	Modeled Concentrations (ug/m ³)	Background (ug/m ³)	Total Impact (ug/m ³)	NAAQS (ug/m ³)
PM ₁₀	Alamosa (2017-2021)	24-hr	13.5	30	43.5	150
PM ₁₀	Kodak (1993-1997)	24-hr	8.6	30	38.6	150

22. Compliance with Non-Criteria Pollutant Thresholds

Not Applicable

23. Compliance with Regulations in Affected Adjacent States

Not Applicable

24. Risk Assessment

Not Applicable

Risk assessment 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). The SSP did not request risk assessment for this application.

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 Dispersion Modeling Unit 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.

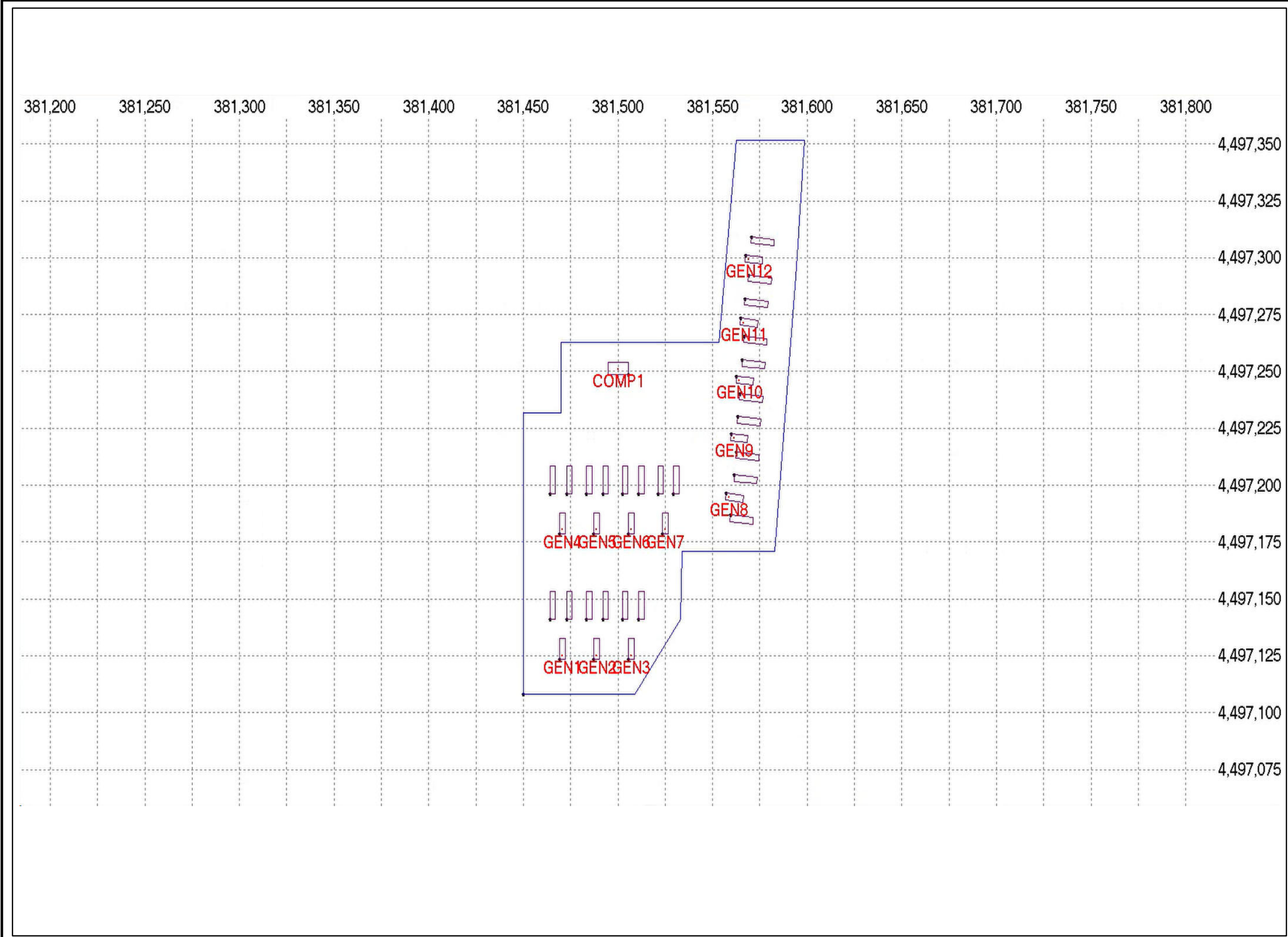
Appendix A





SOURCE LOCATIONS (AERIAL)

Ray Ranch North Pad
Crusoe Energy Systems, Inc.
Jackson County, Colorado





SOURCE LOCATIONS (AERMOD)

Ray Ranch North Pad
Crusoe Energy Systems, Inc.
Jackson County, Colorado

Appendix B

Crusoe Energy Systems Inc. – Ray Ranch North Pad

Table B1: Modeled on-site point source parameters. The exhaust stack(s) for the following emission point(s) must vent emissions at a point greater than or equal to the height and at the location specified in the table below.

Model ID	Description	UTM E (m)	UTM N (m)	Base Elevation (m)	Stack height (m)
GEN1	Waukesha 9394GSI Generator	381470.61	4497125.53	2472	7.62
GEN2	Waukesha 9394GSI Generator	381488.72	4497125.53	2472	7.62
GEN3	Waukesha 9394GSI Generator	381506.99	4497125.53	2472	7.62
GEN4	Waukesha 9394GSI Generator	381470.61	4497180.74	2472	7.62
GEN5	Waukesha 9394GSI Generator	381488.72	4497180.74	2472	7.62
GEN6	Waukesha 9394GSI Generator	381506.99	4497180.74	2472	7.62
GEN7	Waukesha 9394GSI Generator	381524.97	4497180.74	2472	7.62
GEN8	Waukesha 9394GSI Generator	381558.59	4497194.96	2472	7.62
GEN9	Waukesha 9394GSI Generator	381561.32	4497221.05	2472	7.62
GEN10	Waukesha 9394GSI Generator	381564.22	4497246.46	2472	7.62
GEN11	Waukesha 9394GSI Generator	381566.25	4497271.75	2472	7.62
GEN12	Waukesha 9394GSI Generator	381569.08	4497299.68	2472	7.62
COMP1	Waukesha VGF H24SE Compressor	381499.99	4497251.44	2472	7.62

Table B2: Facility-wide emissions and unit emission rates.

Device	NOx Emission Rate (lbs/hr)	NOx Emission Rate (tpy)	Hourly SO2 Emissions (lb/hr)	Annual SO2 Emissions (tpy)	Hourly PM10 Emissions (lb/hr)	Annual PM10 Emissions (tpy)	Hourly PM2.5 Emissions (lb/hr)	Annual PM2.5 Emissions (tpy)
GEN1	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN2	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN3	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN4	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN5	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241

GEN6	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN7	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN8	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN9	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN10	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN11	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
GEN12	0.826	3.620	0.017	0.073	0.55	2.41	0.055	0.241
COMP1	0.176	0.770	0.003	0.013	0.10	0.44	0.012	0.051
Total	10.093	44.206	0.203	0.889	6.699	29.342	0.673	2.948

The facility is represented to operate 24 hours per day, 7 days per week.

Table B3: Modeled on-site point source parameters.

Model ID	Stack Diameter (m)	Stack Temp (K)	Stack Exhaust Velocity (m/s)
GEN1	0.38	857.6	58.11
GEN2	0.38	857.6	58.11
GEN3	0.38	857.6	58.11
GEN4	0.38	857.6	58.11
GEN5	0.38	857.6	58.11
GEN6	0.38	857.6	58.11
GEN7	0.38	857.6	58.11
GEN8	0.38	857.6	58.11
GEN9	0.38	857.6	58.11
GEN10	0.38	857.6	58.11
GEN11	0.38	857.6	58.11
GEN12	0.38	857.6	58.11
COMP1	0.33	958.2	15.83

Table B4: DMU modeled highest first high concentrations compared to the applicable significant impact levels.

Met Dataset	Year of Met Data	Pollutant	Averaging period	Rank	Concentration (µg/m3)	Tier Method	Total Impact (µg/m3)	SIL (µg/m3)	% of SIL
Alamosa	5-YR AVG	NO2	1-HR	H1H	45.32	Tier 2	45.32	7.5	604%
Kodak	5-YR AVG	NO2	1-HR		81.50		81.5	7.5	1087%
Alamosa	5-YR AVG	NO2	ANNUAL		2.4		2.4	1	240%
Kodak	5-YR AVG	NO2	ANNUAL		1.4		1.4	1	140%
Alamosa	5-YR AVG	SO2	3-HR		1.02	N/A	1.02	25	4%
Kodak	5-YR AVG	SO2	3-HR		1.08		1.08	25	4%
Alamosa	5-YR AVG	SO2	1-HR		1.06		1.06	7.85	14%
Kodak	5-YR AVG	SO2	1-HR		2.03		2.03	7.85	26%
Alamosa	5-YR AVG	PM10	24-HR		18.2		18.2	5	364%
Kodak	5-YR AVG	PM10	24-HR		15.8		15.8	5	316%
Alamosa	5-YR AVG	PM25	24-HR		1.55		1.55	1.2	129%
Kodak	5-YR AVG	PM25	24-HR		1.03		1.03	1.2	86%
Alamosa	5-YR AVG	PM25	ANNUAL		0.18		0.18	0.13	138%
Kodak	5-YR AVG	PM25	ANNUAL		0.1		0.1	0.13	77%

Table B5: Applicant reported modeled concentrations compared to the applicable significant impact level.

Pollutant	Averaging Period	Design Concentration	Modeled Result ^{1,2} (µg/m³)	Class II SIL (µg/m³)	Above SIL? (Yes/No)
NO ₂	Annual	HIH	2.6	1	Yes
	1 hour	HIH	94.5	7.5	Yes
SO ₂	3 hours	HIH	1.1	25	No
	1 hour	HIH	2.1	7.8	No
PM ₁₀	24 hours	HIH	18.1	5	Yes
PM _{2.5}	Annual	HIH	0.195	0.2	No
	24 hours	HIH	1.8	1.2	Yes

The differences between DMU reported concentrations and the applicants reported concentrations are due the applicant choosing the maximum concentration out of all five years for every pollutant rather than the appropriate averaging period for each pollutant. Additionally,

the applicant did not use the recently updated annual PM2.5 SIL of 0.13. As such, they did not conduct cumulative analysis for annual PM2.5. DMU conducted that analysis internally.

Table B6: DMU modeled concentrations at the maximum receptors compared to the applicable NAAQS.

Met Dataset	Year of Met Data	Pollutant	Averaging period	Rank	Concentration (µg/m3)	Tier Method	Background (µg/m3)	Total Impact (µg/m3)	NAAQS	% of NAAQS
Alamosa	5-YR AVG	NO2	1-HR	H8H	37.7	Tier 2	27.5	65.2	188	35%
Kodak	5-YR AVG		1-HR		51.7		27.5	79.2	188	42%
Alamosa	5-YR AVG		ANNUAL	H1H	2.4		2.82	5.22	100	5%
Kodak	5-YR AVG		ANNUAL		1.4		2.82	4.22	100	4%
Alamosa	5-YR AVG	PM10	24-HR	H6H	13.5	N/A	30	43.5	150	29%
Kodak	5-YR AVG		24-HR		8.6		30	38.6	150	26%
Alamosa	5-YR AVG	PM2.5	24-HR	H8H	0.79		12	12.79	35	37%
Kodak	5-YR AVG		24-HR		0.52		12	12.52	35	36%
Alamosa	5-YR AVG		ANNUAL	H1H	0.18		4	4.18	9	46%
Kodak	5-YR AVG		ANNUAL		0.10		4	4.10	9	46%

Table B7: Applicant reported modeled concentrations at the maximum receptor compared to the applicable NAAQS.

Meteorological Data Set	Modeled Result ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Modeled Impact ($\mu\text{g}/\text{m}^3$)	1-hr NO ₂ Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
Kodak	52.0	27.4	79.4	188	42%*
Alamosa	36.9	27.4	63.3	188	34%

Meteorological Data Set	Modeled Result ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Modeled Impact ($\mu\text{g}/\text{m}^3$)	Annual NO ₂ Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
Alamosa	2.6	2.8	5.4	100	5%

Meteorological Data Set	Modeled Result ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Modeled Impact ($\mu\text{g}/\text{m}^3$)	24-hr PM ₁₀ Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
Kodak	8.6	30	38.6	150	26%
Alamosa	13.5	30	43.5	150	29%

Meteorological Data Set	Modeled Result ($\mu\text{g}/\text{m}^3$)	Background ($\mu\text{g}/\text{m}^3$)	Total Modeled Impact ($\mu\text{g}/\text{m}^3$)	24-hour PM _{2.5} Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard
Kodak	0.7	12	12.7	35	36%
Alamosa	0.9	12	12.9	35	37%

Any differences between the applicants' results and DMUs results are due to slight differences in the elevations.

Note: After completion of this review it was brought to our attention by the permit engineer that this site is co-located and therefore the co-located sources should have been included in the cumulative assessments. DMU did modeling runs to confirm that the inclusion of the Fulcrum Energy - Ray Ranch North co-located sources did not significantly impact the modeled concentrations and therefore did not require the applicant to resubmit modeling.

Note added 11/21/25

Appendix C



Facility and Project Information Submittal Form for Modeling Requirements Determination Form APCD-114

Please answer all questions on this form. If requested information does not apply to your project, insert "N/A." Form completion and submission of all associated documentation is required to obtain a Permit Modeling Unit (PMU) Determination. This Determination must describe and include all substantially related changes to the source that are being made as part of the modification(s) leading to this permit action, even if those changes are being, or have been, submitted under a separate application, and even if those changes are not being permitted as part of this permit action. All information submitted to obtain this modeling determination must be the same as that submitted to the Division's permitting staff in support of the permit application, including, but not limited to, requested emission limitations, requested annual operating hours, facility configuration, and stack characteristics provided on the Air Pollutant Emissions Notice (APEN). Any changes to this information can result in the need for a new modeling determination. Please submit this form and all attachments to cdphe_apcd_modelingdeterminations@state.co.us.

1) Date: June 27, 2024

2) Company Name: Crusoe Energy Systems, Inc.

3) Company Contact Information

Name: Laura Pritchard

Email: lpritchard@crusoeenergy.com

Phone Number: 970-749-8615

4) Applicant Contact Information (if different than company contact)

Name: _____

Email: _____

Phone Number: _____

5) Facility Name: Ray Ranch North Pad

6) Is this a new facility or a modification to an existing facility? New Facility ☒ Modification ☐

If new, please provide location (LAT/LONG or UTM coordinates and zone): 40.61823, -106.40048

Describe the existing modified and new emission points (including APEN- and permit-exempt sources), AIRS ID number, and location (LAT/LONG or UTM):

<u>Description</u>	<u>AIRS ID Number</u>	<u>LAT/LONG or UTM</u>
<u>12 x Waukesha 9394 GSI Generator Engines</u>	<u>TBD</u>	<u>40.61823, -106.40048</u>
<u>1 x Waukesha VGF H24SE Compressor Engine</u>	<u>TBD</u>	<u>40.61823, -106.40048</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

Provide a detailed description of all changes to the source that are “substantially related” as that term is defined in EPA’s “Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Aggregation and Project Netting” 74 Fed. Reg. 2376, 2377 (January 15, 2009) and EPA’s 2018 Reinstatement Rule, 83 Fed. Reg. 57324 (Nov. 15, 2018) (Units moving? Operational changes?). Please identify which of the substantially related changes are part of the current permit action, and which may have been separately permitted.

Crusoe is requesting permit coverage for twelve (12) Waukesha 9394 GSI generator engines and one (1) Waukesha VGF H24SE compressor engine. Each generator engine is site rated at 2,500 horsepower (hp), and the compressor engine is site rated at 530 hp. The engines will be located at the Fulcrum Energy Operating, LLC Ray Ranch North Pad in Jackson County. The engines will be fueled by field gas from the well pad that would otherwise be flared to power a small data center. Each engine is built with an NSCR device and equipped with an AFR controller.

Environmental Justice Requirements

The Environmental Justice Report Tool for Regulation Number 3 is available on the Air Pollution Control Division’s website: <https://cdphe.colorado.gov/new-environmental-justice-report-tool-for-air-quality-regulation-3> Instructions for the tool are available in the tool’s online user guide and frequently asked questions document, both of which are available on the website above. Instructions on how to submit a required EJ Summary and Report are also available on the website above. If you have questions about the EJ Report process, please email: cdphe_apcd_ejreports@state.co.us.

Note: As part of the pre-permit process, you must submit your EJ Report and Summary to cdphe_apcd_ejreports@state.co.us at the same time that you submit this Form APCD 114.

☐ Check this box if your application was submitted prior to July 15, 2023, and is therefore not subject to these Environmental Justice requirements. If this is the case, you do not need to answer questions 7 through 9 below.

- 7) Have you submitted the required EJ Summary or will you submit it soon after submitting this Form APCD-114? Yes ☒ No ☐

Please see associated information at: Incorporation of Environmental Justice Provisions Addendum here: <https://oitco.hylandcloud.com/cdphermop/docpop/docpop.aspx?clienttype=activex&docid=14385512>

- 8) Based on the Environmental Justice Requirements, is this facility an Affected Construction Source? Yes ☐ No ☒

- 9) Based on the Environmental Justice Report generated by the tool, is this facility located in a Disproportionately Impacted (DI) Community? Yes ☐ No ☒

If yes, is this facility located in a Cumulatively Impacted (CI) Community or a Socioeconomically Vulnerable (SV) Community? CI ☐ SV ☐
(Note: Check all that apply. Check both if the facility is located in a CI community and a SV community.)

- 10) If the proposed project includes a new General Permit Registration for GP01, GP02, GP05, GP06, GP07, GP08, GP09, GP10, and/or GP11 coverage, please identify the applicable General Permit for each applicable Source ID:

Source ID

General Permit Number

EU01 through EU13

GP02

- 11) Is the proposed permitting action a conversion of a GP09 or GP10 to a construction permit?

Yes ☐

No ☐

If yes, when was the original GP09 or GP10 registration request submitted to the Division?

- 12) Please provide a topographical or an aerial map with the new or modified emissions point(s), structures, and site boundary shown.
- 13) Attach facility criteria pollutant (NOX, SO₂, CO, PM₁₀ and PM_{2.5}) permitted emissions for permitted units and potential to emit (PTE) emission estimates from all insignificant activities for all new and modified emission units, as well as facility totals, before and after this modification (including all substantially related changes) and the total change in emissions. Include fugitive and APEN- and permit-exempt emission units.

If the source is subject to the Environmental Justice provisions, provide facility benzene, toluene, ethylbenzene, xylenes, and total BTEX as described above.

Please include Form APCD-102 or APCD-102a for the facility.

- 14) Provide release parameters for each emissions unit (as provided in tables below). The tables below provide a guide for the information required to make the modeling determination. Please provide details in an attachment, as the below tables do not provide adequate space.

Point Sources (e.g. stacks and isolated vents) with a vertical release (not a flare)									
Pollutant:									
Source ID	Description of source	Location LAT/LONG or UTM	Emission rate (tpy)	Emission rate (lb/hr)	Source release height above ground (m)	Stack gas exit temperature (K)	Stack gas exit velocity (m/s)	Stack inside diameter (m)	Capped, J-tube, or Horizontal release?
Example. Do not complete this table. Please attach information according to instructions.									

Flares								
Pollutant:								
Source ID	Description of source	Location LAT/LONG or UTM	Emission rate (tpy)	Emission rate (lb/hr)	Effective Stack Height	Stack gas exit temperature	Stack gas exit velocity	Effective Stack inside Diameter
					Value (m)	Value (K)	Value (m/s)	Value (m)
Example. Do not complete this table. Please attach information according to instructions.								

Calculate the effective stack parameters for flares as discussed in the AERSCREEN User's Guide. For ECDs provide source release height and stack inside diameter.

Volume Sources (releases at an elevation e.g. multiple vents, conveyor belts)							
Pollutant:							
Source ID	Description of source	Location LAT/LONG or UTM	Emission rate (tpy)	Emission rate (lb/hr)	Release height	Initial lateral dimension σ_y	Initial vertical dimension σ_z
					Value (m)	Value (m)	Value (m)
Example. Do not complete this table. Please attach information according to instructions.							

Use procedures in Table 3-2 of the AERMOD User's Guide to calculate vertical and lateral dimensions.

Area Sources (low level releases e.g. storage piles, slag dumps, lagoons)							
		Pollutant:					
Source ID	Description of source	Location LAT/LONG or UTM	Emission rate (tpy)	Emission rate (lb/hr)	Release height	Length of side X- and Y-dimension	Initial vertical dimension σ_z
					Value (m)	Values (m)	Value (m)
Example. Do not complete this table. Please attach information according to instructions.							

Use this table to include Areacircle and Areapoly sources as well.

Openpit Sources							
Pollutant:							
Source ID	Description of source	Location LAT/LONG or UTM	Emission rate (tpy)	Emission rate (lb/hr)	Release height above base of pit	Length of side X- and Y- dimension	Pit Volume
					Value (m)	Values (m)	Value (m³)
Example. Do not complete this table. Please attach information according to instructions							

15) Please provide the source's operating schedule:

Daily starting and ending hours (e.g. 7 AM - 5 PM): Operates 24/7/365

Days of the week (e.g. Monday - Friday): Operates 24/7/365

16) If emissions points are located adjacent to buildings or other structures, please provide structure dimensions.

<u>Building Description</u>	<u>Height (m)</u>	<u>Length (m)</u>	<u>Width (m)</u>
Generator Buildings (1 per generator)	6.10	9.05	3.05
Compressor Building	5.50	10.70	5.50
Miners Boxes (2 per engine)	2.40	12.20	2.90

17) Has this facility been modeled before?

Yes ☐

No ☒

If yes, provide any records of previous modeling demonstrations that the facility will not cause or contribute to a violation of the NAAQS.

18) If you do not believe modeling should be required for the proposed permitting action, please provide clear justification for this, along with the information requested above.

19) Has a permit application already been submitted for this facility and still awaiting permit approval?

Yes ☐

No ☒

If yes, when was the application submitted? _____

1) Modeling determination identification number: MD__1708

2) Existing Source Facility ID and AIRS number: TBA

3) Is the proposed facility located in a Cumulatively Impacted Community?

Yes ☐

No ☒

4) Based on the application information submitted, is modeling required to determine source-specific monitoring requirements?

Yes ☐

No ☒

5) Based on the application information submitted, is modeling needed to complete the required NAAQS analysis?

Yes ☒

No ☐

6) Justification for Modeling Determination (e.g., previous NAAQS modeling demonstration has been made):

The facility is not located in a Cumulatively Impacted Community, therefore additional modeling under AQCC Regulation 3 Part B III.B.4 is not applicable.

The submitted form is represented to be for a new facility which has not previously been evaluated as to if the source will not cause an exceedance of any National Ambient Air Quality Standards ("NAAQS") as required by Colorado Air Quality Control Commission Regulation 3, Part B. In every permitting action the Division must conduct a NAAQS analysis regarding whether the proposed source or activity which is the basis of the new permit application will cause an exceedance of the NAAQS. Depending on several variables, modeling may be required in some cases to conduct the required NAAQS analysis. This permitting action must be evaluated on its own merit and site-specific/case-specific facts.

In this current permit application, Crusoe Energy is proposing to start up new facility Ray Ranch North which will include twelve Waukesha 9394 GSI generator engines and one Waukesha VGF H24SE compressor engine. Total emissions from the facility are represented to be 44.21 tpy (10.09 lb/hr) NOx, 88.42 tpy (20.19 lb/hr) CO, 10.11 tpy (2.31 lb/hr) SO2, 28.97 tpy (158.74 lb/day) PM10, and 2.93 tpy (16.05 lb/day) PM2.5. The proposed emission rates of CO, and annual SO2 are below the corresponding threshold in Table 1 of the Colorado Minor NSR Source Modeling Guideline for Air Quality Permits (May 2023). The threshold amounts in Table 1 are considered de minimis emissions, which have a low probability of causing or contributing to an exceedance of any NAAQS. The emissions represented for hourly and annual NOx, hourly SO2, daily PM10, and daily PM2.5 are greater than the corresponding threshold in Table 1. A review of nearby sources show low potential nearby impacts associated with the location of the facility (Jackson County) outside of the ozone nonattainment area identified for the 2008 ozone standard and within the ozone nonattainment area identified for the 2015 ozone standard. Based on the facility location and proposed emissions, PMU is requesting that dispersion modeling be submitted for the 1-hour NO2, annual NO2, 1hr SO2, 3 hr SO2, 24hr PM10, annual PM2.5, and 24 hr PM2.5.

- 7) If modeling is required, which criteria pollutants and averaging periods need to be modeled to demonstrate compliance with the National Ambient Air Quality Standards and Colorado Ambient Air Quality Standards?

Annual and 1hr NO₂, 1hr and 3 hr SO₂, 24 hr PM₁₀, Annual and 24 hr PM_{2.5}

- 8) If BTEX modeling is required, which pollutants need to be modeled to determine applicability to the Source Specific Monitoring Thresholds?

BTEX modeling is not required

- 9) If modeling is needed, provide modeling procedure guidance.

Guidance on modeling procedures can be found here:

<https://cdphe.colorado.gov/emissions-from-business-and-industry/air-quality-modeling-guidance-for-permits#comod>

- 10) Date modeling decision provided to Applicant and CDPHE Permitting Representative

7/8/2024

- 11) Number of hours spent on modeling determination

1 hr

APPROVED
MODELING REQUIRED

Point Sources

Source ID	Description of Source	Latitude/Longitude	Source Release Height (m)	Stack gas exit temperature (K)	Stack gas exit velocity (m/s)	Stack inside diameter (m)	Capped, J-tube, or horizontal release?	NO _x (lb/hr)	NO _x (ton/yr)	CO (lb/hr)	CO (ton/yr)	PM ₁₀ (lb/hr)	PM ₁₀ (ton/yr)	PM _{2.5} (lb/hr)	PM _{2.5} (ton/yr)	SO ₂ (lb/hr)	SO ₂ (ton/yr)
EU01	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU02	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU03	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU04	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU05	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU06	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU07	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU08	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU09	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU10	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU11	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU12	Waukesha 9394GSI generator engine - proposed new	40.61823, -106.40048	7.62	857.6	58.11	0.38	No	0.83	3.62	1.65	7.24	0.55	2.41	0.055	0.24	0.19	0.83
EU13	Waukesha VGF H24SE compressor engine - proposed new	40.61823, -106.40048	7.62	958.2	15.83	0.33	No	0.18	0.77	0.35	1.54	0.10	0.44	0.012	0.051	0.034	0.15

I. Only point sources will be installed at this facility.



Facility Wide Emissions Inventory Form

Ver. April, 2015

Company Name: Crusoe Energy Systems, Inc.

Source Name: Ray Ranch North Pad

Source AIRS ID: TBD

AIRS ID	Equipment Description	Uncontrolled Potential to Emit (PTE)																Controlled Potential to Emit (PTE)																	
		Criteria (TPY)							HAPs (lbs/yr)									Criteria (TPY)							HAPs (lbs/yr)										
		TSP	PM10	PM2.5	SO2	NOx	VOC	CO	BCH3O	Aerol	Aero	BZ	Tol	EB	Nyl	n-Hex	Meth	2,24-TMP	TSP	PM10	PM2.5	SO2	NOx	VOC	CO	BCH3O	Aerol	Aero	BZ	Tol	EB	Nyl	n-Hex	Meth	2,24-TMP
THD	EU01	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU02	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU03	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU04	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU05	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU06	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU07	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU08	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU09	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU10	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU11	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU12	2.41	2.41	0.24	0.83	299.8	2.99	141.7	2,414	693.0	653.0	392.0	139.0	6.20	48.00	-	760.0	-	2.41	2.41	0.24	0.83	3.62	0.72	7.24	48.28	525.0	495.0	298.0	105.0	4.70	36.70	-	576.0	-
THD	EU13	0.44	0.44	0.051	0.15	71.90	1.02	47.10	511.8	125.6	118.4	71.14	25.12	1.12	8.78	-	137.8	-	0.051	0.051	0.051	0.15	0.777	0.10	1.54	10.24	113.7	107.2	64.38	22.74	1.01	7.95	-	124.7	-
Permitted Sources Subtotal		29.36	29.36	2.93	10.11	3,670	36.90	1,748	29,480	8,442	7,954	4,775	1,693	75.52	584.8	0.00	9,258	0.00	28.97	28.97	2.93	10.11	44.21	8.74	88.42	589.6	6,414	6,047	3,640	1,283	57.41	448.4	0.00	7,837	0.00
APEN Only - Permit Exempt Sources																																			

Footnotes:

1. This form should be completed to include both existing sources and all proposed new or modifications to existing emissions sources.
2. If the emissions source is new then enter "proposed" under the Permit No. and AIRS ID data columns
3. HAP abbreviations include:
- | | |
|----------------------------|---|
| BZ = Benzene | 224-TMP = 2,2,4-Trimethylpentane |
| Tol = Toluene | Acetal = Acetaldehyde |
| EB = Ethylbenzene | Acro = Acroline |
| Xyl = Xylene | n-Hex = n-Hexane |
| HCHO = Formaldehyde | Meth = Methanol |
4. APEN Exempt/Insignificant Sources should be included when warranted.

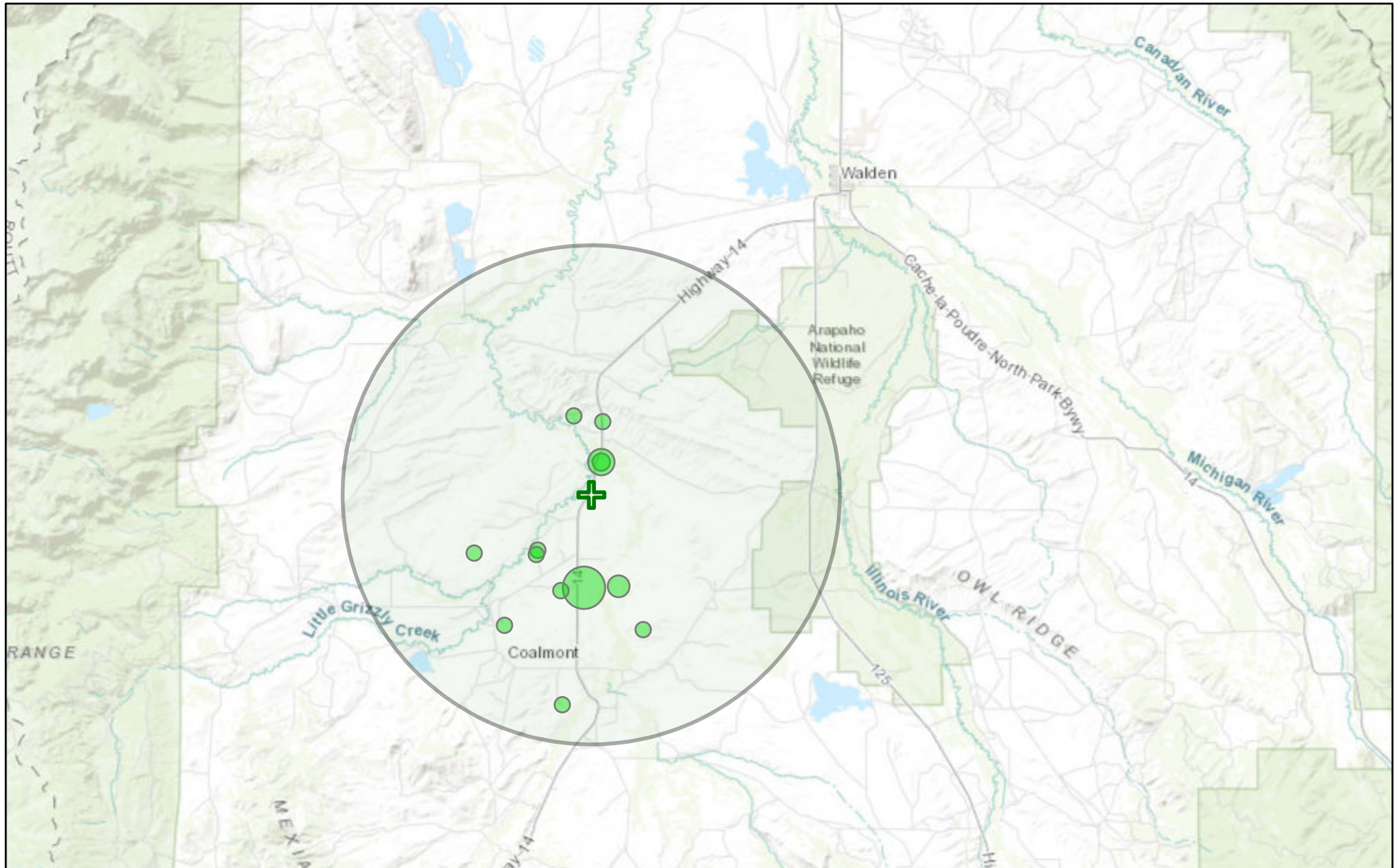
40.61823, -106.40048 X Q

Show search results for 40.61823, -10

Home Refresh



51.9 tpy NOx: Crusoe Energy Systems - Ray Ranch North



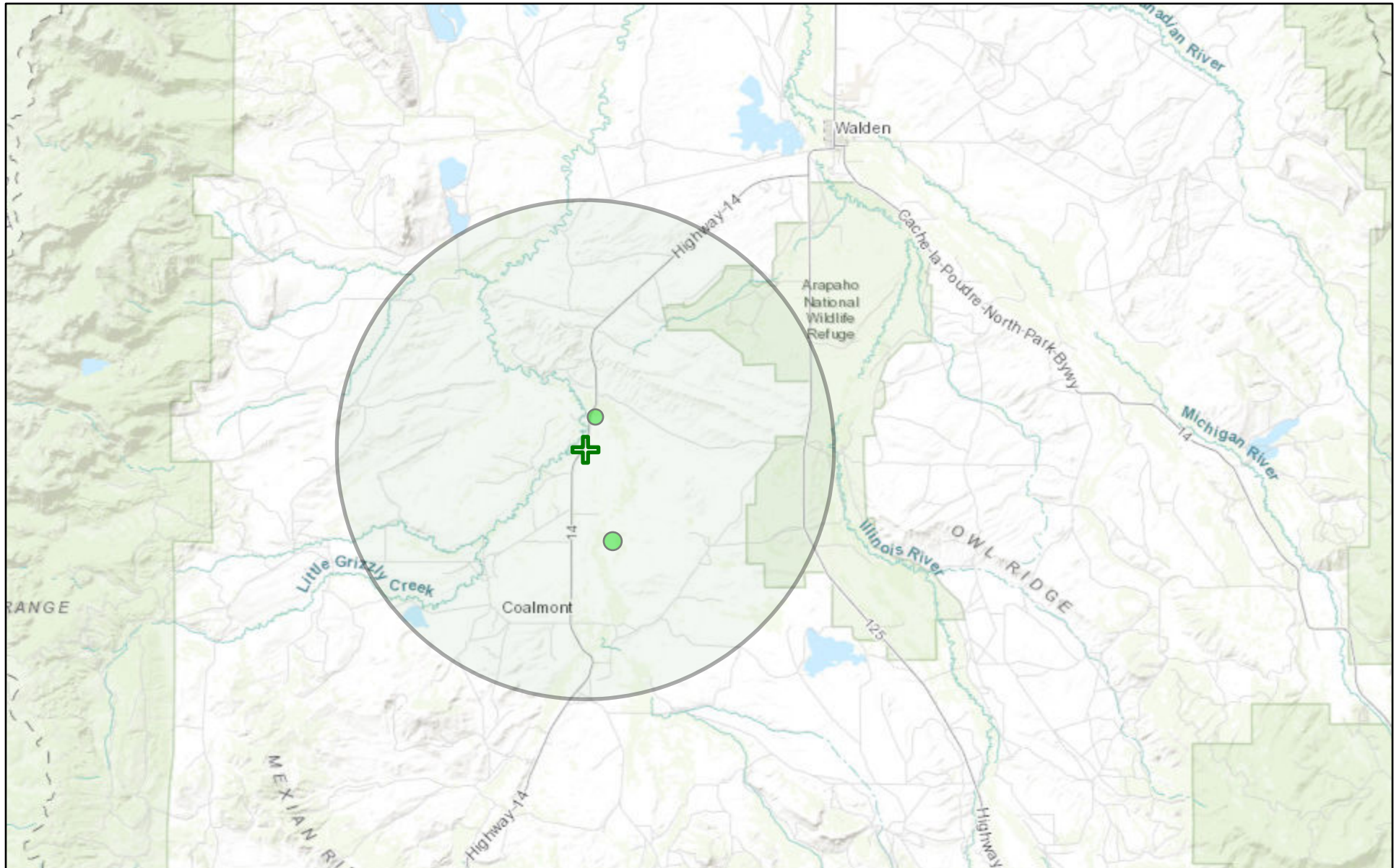
7/7/2024

 b520b27f04364920bd3fc7e215901421

 Ozone8HourCounty_Dissolve

1:288,895
0 1.75 3.5 7 mi
0 3 6 12 km
Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS, CDPHE, Tracking

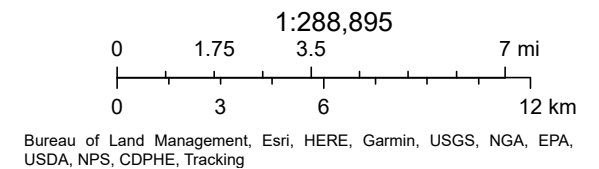
2.6 tpy PM2.5: Crusoe Energy Systems - Ray Ranch North



7/8/2024

 d1c2541af4e9465385d51a5fc89f14fc

 PM10AttainMaintenanceAreas



Kaitlin Meszaros

From: Kaitlin Meszaros
Sent: Friday, July 26, 2024 1:34 PM
To: andrew.white@state.co.us; APCD Modeling Files - CDPHE , CDPHE
Cc: Anthony Der Tatevasion; lpritchard@crusoeenergy.com
Subject: RE: [EXTERNAL] Re: APCD Modeling Data Request - Met/Background

Hi Andrew,

Thank you for the email. Anthony has lost power and asked me to respond to you.

We will let you know if we have any questions. Following the SIL runs, we will coordinate on the nearby source inventory.

Is it possible to provide an estimated timeline for the technical review and approval for dispersion modeling following a completeness determination? Based on the below, it seems those details are on the air permit application as a whole, and not specifically for the modeling.

Thanks,

Kaitlin Meszaros
Air Quality & Noise Specialist
Pinyon Environmental, Inc.
D: 720.614.5598

From: andrew.white@state.co.us <andrew.white@state.co.us> on behalf of APCD Modeling Files - CDPHE , CDPHE <cdphe_apcd_modeling_files@state.co.us>
Sent: Friday, July 26, 2024 12:36:28 PM
To: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>
Subject: [EXTERNAL] Re: APCD Modeling Data Request - Met/Background

Anthony,

Meteorological determination

Please see attached meteorological data processed with and without ADJ_U*.

<Please acknowledge receipt of this email>

The Division has completed the AERMOD meteorological determination for: **Crusoe Energy Systems, Inc. - Ray Ranch North Pad**

Approximate Location: **381539** m E, **4497321** m N, Zone 13, NAD 83 (**Jackson County**)

To the Division's knowledge, there is no existing meteorological data adequately representative of dispersion conditions expected at this site, as detailed in the [Meteorological Determinations and Application of Dispersion Models document](#).

Option 1: (Representative Data)

Collect at least one year of site specific meteorological data with a tower setup and location approved by the Division. The monitoring program must be performed in accordance with U.S.EPA accepted procedures as approved by the Division. If this option is pursued, it is strongly recommended that a monitoring plan be prepared and submitted to the Division for review prior to collection of the data. Once data has been collected and approved by the Division, contact the Division for site-specific AERMET processing guidance.

Option 2: (Not Adequately Representative Data)

If the available meteorological data is deemed not adequately representative of dispersion conditions at the source site, the Division will provide two meteorological datasets to the applicant. These meteorological datasets will be the two most representative datasets available to the Division and will be ranked by the Division; i.e. #1 (most representative) and #2 (second-most representative). These selected meteorological data could be any combination of NWS data, site-specific data, or prognostic data (once prognostic data become available). The applicant will then model with both data sets.

For annual standards, the design concentration will be determined using the appropriate modeled concentration using only the #1 (most representative) meteorological data set.

For short-term standards, both meteorological data sets will be modeled. The design concentration will be ascertained from the modeled meteorological data set with the highest impacts using the form of the NAAQS for the pollutant and averaging period being modeled.

Example: Based on 1-hour modeling for nitrogen dioxide (NO₂), where the form of the standard is the 98th percentile concentration, or

the highest-eighth-highest (H8H) concentration for one-year of modeling data. The form of the standard will vary based on the specific pollutant of interest.

Met Data 1 H8H: 75

Met Data 2 H8H: 100

100 > 75, therefore, use 100 as the design concentration (Maximum H8H value from the two data sets).

There is one exception to the above rule, which would occur when the design value from the second-ranked data set exceeds the maximum value based on the first-ranked data set, e.g., H8H (2nd data set) > H1H (1st data set). In this case, the H1H value from the 1st-ranked data set would be selected as the design value. This exception assures that the two-station approach adopted by the Division does not return a higher design value compared to the Division's former modeling approach.

Met Data 1 H1H: 90

Met Data 1 H8H: 75

Met Data 2 H8H: 100

Met Data 2 H8H (100) > Met Data 1 H1H (90), therefore, use 90 as the design value (Met Data 1 H1H)

#1 (most representative)

SURFACE METEOROLOGY

Met Site: **Alamosa**

Tower LAT/LONG: 37.439N, 105.862W

Tower type: ASOS

Data type: 1-min

Profile Base Elevation: 2299m

Data period: 2017-2021

Data availability: attached

UPPER AIR METEOROLOGY

Site: DEN (Denver, Colorado)

WBAN number: 23062

Site LAT/LONG: 39.847N, 104.656W

Collected by: National Weather Service (NWS)

Data type: Radiosonde, NOAA Forecast Systems Laboratory (fsl) format

Data availability: attached

#2

SURFACE METEOROLOGY

Met Site: **Kodak**

Tower LAT/LONG: 40.461N, 104.875W

Tower type: Private (On-site)

Data type: 15-minute site-specific

Tower Elevation: 2, 10 m

Profile Base Elevation: 1451 m

Data period: 1993-1997

Data availability: attached

UPPER AIR METEOROLOGY

Site: DEN (Denver, Colorado)

WBAN number: 23062

Site LAT/LONG: 39.847N, 104.656W

Collected by: National Weather Service (NWS)

Data type: Radiosonde, NOAA Forecast Systems Laboratory (fsl) format

Data availability: attached

This determination is not applicable for an unlimited period and may expire if there is a substantial delay between the date of this determination and the submittal of the permit application. If the location of the source moves or if additional modeling is warranted in the future at this site, contact the Division to confirm if this met determination is still valid. This determination is applicable provided that the permit application is not subject to the PSD rules. If the permitting action is subject to PSD rules, please contact the Division for a PSD pre-construction monitoring determination.

The completeness checklist for modeling submittals is available here: <https://drive.google.com/file/d/1XoSn1QSPBnpDGHh0Ojib7L-sGAN074bh/view?usp=sharing>. State law requires that the Division determine the completeness of an application or any supplemental information requested for the application by the Division within 60 days of receipt. If the application (this includes the modeling submittal) is deemed incomplete, the applicant will be notified regarding the deficiencies and asked to either supplement the application or submit a new complete application. It is important to note that our review will not begin until a complete application has been received.

Background determination

Per your request, attached is the ambient background concentration letter for this facility. Due to the facility's remote location, we do not have seasonal profiles developed yet for NO₂ and O₃ in this area. Please run your model and add the backgrounds from the letter to the

cumulative impacts. If NAAQS compliance cannot be demonstrated using this approach, please let us know and then we will work on developing new seasonal profiles for NO2 and O3 at that time.

Nearby Source Inventory request procedure

To request a nearby source inventory, please send a request to the attention of Dave Thayer with the following information:

- Coordinates of the site.
- The pollutants that will require modeling.
- The extent of the area included in the inventory based on your project's Significant Impact Area (SIA).
- A name for the project.

Dave will send the inventory to us for review and then we'll send you a final excel sheet with the nearby sources that need to be modeled (if any).

Thanks and please let us know if you have any questions.

Modeling Files Request

[Permit Modeling Unit](#)

[Stationary Sources Program](#)



COLORADO
Air Pollution Control Division
Department of Public Health & Environment

O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Mon, Jul 22, 2024 at 8:16 AM APCD Modeling Files - CDPHE , CDPHE <cdphe_apcd_modeling_files@state.co.us> wrote:

Good morning,

We are working on your request and expect to have backgrounds and met data for this project this week.

Are you also requesting nearby source inventories for each of the pollutants being modeled for this project?

To request a nearby source inventory, please send a request to the attention of Dave Thayer with the following information:

- Coordinates of the site.
- The pollutants that will require modeling.
- The extent of the area included in the inventory based on your project's Significant Impact Area (SIA).
- A name for the project.

Dave will send the inventory to us for review and then we'll send you a final excel sheet with the nearby sources that need to be modeled (if any).

Thanks and please let us know if you have any questions.

Modeling Files Request

[Permit Modeling Unit](#)

[Stationary Sources Program](#)



O 720.235.8143

4300 Cherry Creek Drive South, Denver, CO 80246-1530

<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Mon, Jul 22, 2024 at 8:02 AM Anthony Der Tatevasion <dertatevasion@pinyon-env.com> wrote:

Good morning,

Can I please get an update on this modeling data request?

Thank you,

Anthony Der Tatevasion
Air Quality Specialist
Pinyon Environmental, Inc.
D: 720.614.5603

From: Anthony Der Tatevasion
Sent: Friday, July 12, 2024 11:53 AM
To: cdphe_apcd_modeling_files@state.co.us
Subject: APCD Modeling Data Request - Met/Background

Good morning,

Please find below and attached a modeling date request for background concentrations and meteorological data for the Crusoe Energy Systems, Inc. Ray Ranch North Pad in Jackson County. Please let me know if you need any additional information to complete this request.

Site Coordinates: 40.61823, -106.40048

1:24,000 Topographic Map: See attached

Facility Description: Crusoe is requesting permit coverage for twelve (12) Waukesha 9394 GSI generator engines and one (1) Waukesha VGF H24SE compressor engine. Each generator engine is site rated at 2,500 horsepower (hp), and the compressor engine is site rated at 530 hp. The engines will be located at the Fulcrum Energy Operating, LLC Ray Ranch North Pad in Jackson County. The engines will be fueled by field gas from the well pad that would otherwise be flared to power a small data center. Each engine is built with an NSCR device and equipped with an AFR controller.

Project Name: Ray Ranch North Pad

Thank you,

Anthony Der Tatevasion

Air Quality Specialist



3222 S Vance St Suite 200

Lakewood, CO 80227

P: 303.980.5200 | **D:** 720.614.5603

E: dertatevasion@pinyon-env.com





COLORADO
Air Pollution Control Division
Department of Public Health & Environment

Mr. Anthony Der Tatevasion
By email: dertatevasion@pinyon-env.com

July 26, 2024

Request Information

Facility: Ray Ranch North Pad
Company: Crusoe Energy Systems, Inc.
County: Jackson
Latitude (NAD83): 40.61823
Longitude (NAD83): -106.40048

Requested Pollutants

Pollutant: O₃, 8-hr (4th Maximum)
Air Quality Standard: 0.070 ppm
Background: 0.063 ppm
Basis: Hebron, 2023

Pollutant: SO₂, 1-hr (99th percentile of maximum daily 1-hr values)
Air Quality Standard: 75 ppb
Background: 8 ppb
Basis: Pagosa Springs, 2020-2022

Pollutant: NO₂, 1-hr (98th percentile of maximum daily 1-hr values)
Air Quality Standard: 100 ppb
Background: 14.6 ppb
Basis: Hebron, 2023

Pollutant: NO₂, Annual Mean
Air Quality Standard: 53 ppb
Background: 1.5 ppb
Basis: Hebron, 2023

Pollutant: PM₁₀, 24-hr (2nd Maximum)
Air Quality Standard: 150 µg/m³
Background: 30 µg/m³
Basis: Hebron, 2023

Pollutant: PM_{2.5}, 24-hr (98th percentile)
Air Quality Standard: 35 µg/m³
Background: 12 µg/m³
Basis: Greasewood Hub, 2009-2010

Pollutant: PM_{2.5}, annual mean
Air Quality Standard: 9.0 µg/m³
Background: 4.0 µg/m³
Basis: Greasewood Hub, 2009-2010

Not Requested Pollutants

Carbon Monoxide (CO)

Lead (Pb)

Upon request, refinement of a single value background concentration listed above may be conducted by the modeling staff (email: cdphe_apcd_modeling_files@state.co.us), if applicable, appropriate, and justified.

These estimates are derived from ambient monitored concentrations that are available to the Division to represent background levels (added to the impacts of the project emissions and emissions from other nearby sources) in cumulative ambient air impacts for comparison to the NAAQS. They are not suitable for applications beyond that scope of use. The quantity of data is sometimes limited and may be of uncertain quality. The ambient background concentrations -

1. Do not necessarily substitute for on-site monitoring data; i.e., for permitting actions subject to PSD rules, pre-construction monitoring may be required.
2. Indicate the ambient levels in general geographic areas, not a specific location. This is particularly true for particulate concentration values.
3. Are subject to change without notice as new information is acquired.

Use of these background estimates should be accompanied by an appropriate citation that indicates their source and their limitations. Referencing this letter would be adequate, but an expanded explanation is suggested.

If you have questions, I can be reached at 720-235-8143, or email: cdphe_apcd_modeling_files@state.co.us.

Sincerely,

Permit Modeling Unit

Air Pollution Control Division

Kaitlin Meszaros

From: andrew.white@state.co.us on behalf of APCD Modeling Files - CDPHE , CDPHE <cdphe_apcd_modeling_files@state.co.us>
Sent: Wednesday, August 7, 2024 8:24 AM
To: Kaitlin Meszaros
Cc: Thayer - CDPHE He Him, David; Anthony Der Tatevasion; lpritchard@crusoeenergy.com
Subject: Re: [EXTERNAL] Re: ATTN: Dave Thayer - Crusoe Ray Ranch North Pad Nearby Source Inventory Request

WARNING: The sender of this email could not be validated and may not match the person in the "from" field. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Kaitlin,

After reviewing the backgrounds for this project and the surrounding nearby sources sent by Dave, the Permit Modeling Unit has determined that you will not need to include any additional nearby sources in any of your cumulative runs (if needed).

Please let us know if you have any questions.

Modeling Files Request

[Permit Modeling Unit](#)
[Stationary Sources Program](#)



O 720.235.8143
4300 Cherry Creek Drive South, Denver, CO 80246-1530
<https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Learn more about COVID19 <https://www.colorado.gov/pacific/cdphe/apcd-covid-19> .

Are you curious about ground-level ozone in Colorado? Visit our [ozone webpage](#) to learn more.

Any correspondence with this Email address is subject to the Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 6, 2024 at 5:27 PM Kaitlin Meszaros <meszaros@pinyon-env.com> wrote:

Ok. Thank you for your help!

Kaitlin Meszaros

Air Quality & Noise Specialist

Pinyon Environmental, Inc.

D: 720.614.5598

From: Thayer - CDPHE He Him, David <david.thayer@state.co.us>

Sent: Tuesday, August 6, 2024 5:25 PM

To: Kaitlin Meszaros <meszaros@pinyon-env.com>

Cc: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>; CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>;
lpritchard@crusoeenergy.com

Subject: Re: [EXTERNAL] Re: ATTN: Dave Thayer - Crusoe Ray Ranch North Pad Nearby Source Inventory Request

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I don't have a specific contact, queries directed to "CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>" should be answered in due course.

dt

--

Dave Thayer

Colorado Department of Public Health and Environment

Air Pollution Control Division / Stationary Sources Program
david.thayer@state.co.us, Voice:303-692-3187, FAX:303-782-0278

Any correspondence with this Email address is subject to the
Colorado Open Records Act and may be disclosed to third parties.

On Tue, Aug 6, 2024 at 5:21 PM Kaitlin Meszaros <meszaros@pinyon-env.com> wrote:

Thank you, Dave. Do you have a specific contact for us to reach out to in the modeling group to check on status later this week?

Thanks,

Kaitlin Meszaros
Air Quality & Noise Specialist
Pinyon Environmental, Inc.
D: 720.614.5598

From: Thayer - CDPHE He Him, David <david.thayer@state.co.us>
Sent: Tuesday, August 6, 2024 5:02 PM
To: Anthony Der Tatevasion <dertatevasion@pinyon-env.com>
Cc: CDPHE APCD Modeling Files - CDPHE <cdphe_apcd_modeling_files@state.co.us>; Kaitlin Meszaros <meszaros@pinyon-env.com>;
lpritchard@crusoeenergy.com
Subject: [EXTERNAL] Re: ATTN: Dave Thayer - Crusoe Ray Ranch North Pad Nearby Source Inventory Request

I've completed the nearby source extraction(s) and preliminary QA for your request. The data will be sent to the Division's modeling group for review. Upon review they will contact you with further information.

If you have any questions regarding these data please feel free to contact me.

--

Dave Thayer
Colorado Department of Public Health and Environment
Air Pollution Control Division / Stationary Sources Program
david.thayer@state.co.us, Voice:303-692-3187, FAX:303-782-0278

Any correspondence with this Email address is subject to the
Colorado Open Records Act and may be disclosed to third parties.

On Thu, Aug 1, 2024 at 3:20 PM Anthony Der Tatevasion <dertatevasion@pinyon-env.com> wrote:

Good afternoon Dave,

Below and attached is a nearby source inventory request for the Crusoe Energy Systems, Inc. Ray Ranch North Pad in Jackson County, CO. Attached is a KMZ of the receptor grid for the 2019 1-hour NO₂ with the largest area of receptors over the SIL of 7.5 ug/m³. The project details are below.

Site Coordinates: 40.61823, -106.40048

Pollutants requiring modeling: Annual and 1hr NO2, 24 hr PM10, 24 hour PM2.5 (1 hr and 3 hr SO2 / Annual PM2.5 are below SIL thresholds)

Extent of Area: See attached KMZ

Project Name: Ray Ranch North Pad

Thank you!

Anthony Der Tatevasion

Air Quality Specialist



3222 S Vance St Suite 200
Lakewood, CO 80227

P: 303.980.5200 | **D:** 720.614.5603

E: dertatevasion@pinyon-env.com



Colorado Department of Public Health and Environment Completeness Check Report

Facility: Crusoe Energy Systems, Inc. - Ray Ranch North Pad
Dispersion Modeling Report - submitted on 8/27/2024.

Prepared by: Permit Modeling Unit
Air Pollution Control Division – Stationary Sources Program

Report date: 9/4/2024

The Division's Permit Modeling Unit (PMU) has conducted a completeness check for the ambient air impact analysis submitted on August 27th 2024 by Pinyon Environmental as part of the application to start new facility, Ray Ranch North Pad (AIRS ID and Permit No. TBD) located in Jackson County, CO.

This completeness check was performed within the 60-day of receiving all information from permitting, regulatory time frame and has been conducted to determine if all the information and data required to evaluate the application has been submitted to the Division. No determination is being made at this moment as to whether the information submitted is correct.

Please provide the following information as outlined in the Modeling Submittal Completeness Checklist:

1. Description of how public access is precluded from the facility.

This completeness review is based on the Modeling Submittal Completeness Checklist developed by the PMU and posted on the Division's website: <https://cdphe.colorado.gov/air-emissions/air-quality-modeling-guidance-for-permits>

Report of Worked Hours for Billing

Date: updated 11/21/25

To: Permit Engineer

From: Jennifer Turk

Subject: Modeling review for Crusoe Energy Systems, Ray Ranch North Pad

1. CrusoeRayRanchNorth_Emissions Impact Assessment_2024-10-04 | Air Dispersion Modeling Report Received on 10/4/2024.

2. October 4, 20214 Updated Model Files | Air Dispersion Modeling Files received on 10/4/2024.

Worked hours

Date	Hours	Comments
7/8/24	1	Modeling Determination (OB)
7/26/24	2.0	Meteorological Determination (AW)
7/26/24	5.0	Background Determination (AW)
8/7/24	2.0	Nearby Source Determination (AW)
9/23/24	3.5	Completeness Check (JT & NC)
Oct 2024	61.5	Reviewing modeling files and writing DMU report (JT)
11/12/24	3.5	Second level review of modeling checklist report and final modeling files (NC)

Total Modeling Review Hours: 78.5 hours

Completed by Jennifer Turk, Nathaniel Collett, Andrew White and Olliander Beucler.



COLORADO
Air Pollution Control Division
Department of Public Health & Environment