

January 26, 2018

**Noise Monitoring Adjacent to the Common Completions Pad  
October 14, 2017, to November 29, 2017**

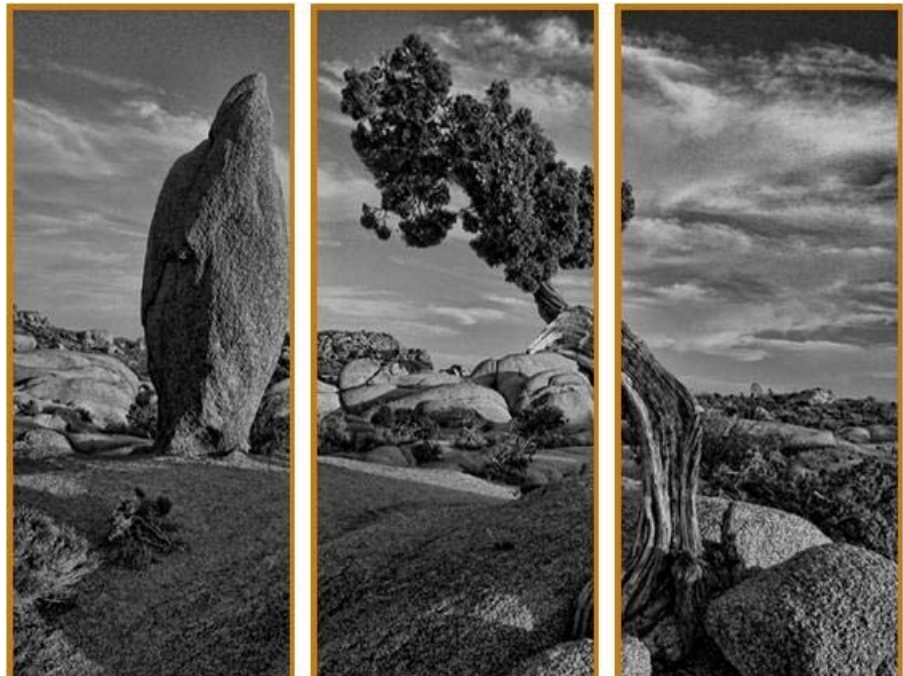
Noise Monitoring of Crestone Peak Resources Operations  
Erie, Colorado

**Prepared For:**

Town of Erie  
645 Holbrook Street  
Erie, Colorado 80516

**Pinyon Project No.:**

1/17-695-02.1200



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## Noise Monitoring of Crestone Peak Resources Operations Erie, Colorado

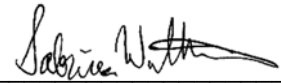
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**Pinyon Project No.:**

1/17-695-02.1200

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## I. Introduction

The Town of Erie (Town) has contracted with Pinyon Environmental, Inc. (Pinyon), to perform noise monitoring near the Crestone Peak Resources (Crestone) Common Completions Pad (Completions Pad). The Completions Pad site is used by Crestone for well completion activities for both the Waste Connections and Pratt well sites. Pinyon collected continuous noise measurements at three locations adjacent to the Completions Pad (Figure 1).

- Completions Site 1 is located approximately 350 feet to the south of the Completions Pad and was used to collect A-weighted noise measurements.
- Waste Connections Site 2 is located near a residential neighborhood approximately 3,475 feet to the southwest of the Completions Pad and was used to collect A-weighted and C-weighted noise measurements.
- Completions Site 2 is located near a residential neighborhood approximately 2,430 feet to the south of the Completions Pad and was used to collect A-weighted and C-weighted measurements.

C-weighted noise was not collected at Completions Site 1, as it is not located near any occupied structures. Crestone began well completion activities at the Completions Pad the week of September 11, 2017, and continued activities at this location throughout the reporting period. This report details noise measurements collected during well completions activities, from October 14, 2017, at 7:00 AM through November 29, 2017, at 11:00 AM. The noise monitoring data was analyzed to evaluate noise levels at the three locations during Crestone's well completions activities.

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## Figure I-1 Noise Monitoring Locations



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## 2. Methodology

### 2.1 Noise Monitoring Approach

The Colorado Oil and Gas Conservation Committee (COGCC) Rule 802.b established maximum permissible noise levels for well production facilities (Table 2-1). The Rule also specifies that during well completion activities the industrial zone maximum permissible noise level should be used. In addition to the maximum permissible A-weighted noise levels, expressed in A-weighted decibels (dBA) (Table 2-1), COGCC Rule 802 specifies that operators may not exceed 65 C-weighted decibels (dBC) measured from the exterior wall of the residence or occupied structure nearest to the noise source, at a distance of 25 feet from the structure.

**Table 2-1 COGCC Maximum Permissible Noise Levels**

Zone	Maximum Permissible Noise Level	
	7:00am to 7:00pm	7:00pm to 7:00am
Residential/Agricultural/Rural	55 dBA	50 dBA
Commercial	60 dBA	55 dBA
Light Industrial	70 dBA	65 dBA
Industrial	80 dBA	75 dBA

dBA A-weighted decibel

Pinyon mobilized to the three sites and monitored for noise at these locations using 3M Quest SoundPro DL Type I datalogging sound level meters. The sound level meters collected continuous measurements of both A-weighted and C-weighted decibels, as applicable to the location. At Completions Site 1, the sound level meter monitored continuously for A-weighted noise. At Waste Connections Site 2 and Completions Site 2, continuous A-weighted and C-weighted noise measurements were collected. The monitoring period for this report lasted from October 14, 2017, at 7:00 AM through November 29, 2017, at 11:00 AM. Crestone began well completion activities at the Completions Pad the week of September 11, 2017, and has continued well completion activities throughout this reporting period.

The sound level meters are configured with a data logging system that uploads one minute time resolved measurements to a secure online database at 10-minute intervals. The sound level meters are configured with an alert system that will send a message to Pinyon's noise specialist as soon as the data is uploaded, and whenever established noise criteria levels have been exceeded, based on the monitored equivalent continuous noise level (Leq). Leq is the preferred method to describe noise levels that vary over time, resulting in a single decibel value that represents the total sound energy over the period of time of interest. The Town and Pinyon agreed to set the alert system at 75 Leq dBA for A-weighted noise and 65 Leq dBC for C-weighted noise at Completions Site 2. The alert system for Waste Connections Site 2 was set to 70 Leq for C-weighted noise. These noise criteria levels were established based on the COGCC's maximum permissible noise levels, as well as baseline noise monitoring data collected prior to Crestone mobilizing to the well site. The C-weighted noise alert criteria level at Waste Connections Site 2 is set higher than the COGCC's maximum permissible noise level because baseline noise measurements collected prior to Crestone beginning operations at the well site exceeded 70 Leq.

### 2.2 Noise Monitoring Data Analysis

Pinyon's noise specialist downloaded the noise monitoring data from the online database for this collection period. The data was then formatted into spreadsheets that allowed for analysis of the noise monitoring data. Pinyon utilized statistical methods, as well as graphical representations of the data, to evaluate baseline noise levels at the two sampling locations during the monitoring period. COGCC's Rule 802 specifies different

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maximum permissible noise levels based on time of day (Table 2-1). Therefore, for the statistical analysis of the noise measurements, the data was split into two discrete analytical groups based on time of day:

- Daytime: 7:00 AM—6:59 PM
- Nighttime: 7:00 PM—6:59 AM

The daytime and nighttime analytical groups ended at 6:59 PM and 6:59 AM, respectively, in order to not complete a duplicate analysis of the 7:00 AM and 7:00 PM noise measurements.

To evaluate how noise levels may change over time during Crestone's operations at the well site, the monitoring data was separated into the following discrete analysis periods with each monitoring period then subdivided by time of day:

- October 14, 2017, at 7:00 AM to October 21, 2017, at 7:00 AM
- October 21, 2017, at 7:00 AM to October 28, 2017, at 7:00 AM
- October 28, 2017, at 7:00 AM to November 4, 2017, at 7:00 AM
- November 4, 2017, at 7:00 AM to November 14, 2017, at 7:00 AM
- November 14, 2017, at 7:00 AM to November 21, 2017, at 7:00 AM
- November 21, 2017, at 7:00 AM to November 29, 2017 at 7:00 AM

Section 3-2 describes how differences in the statistical mean between these monitoring periods were analyzed to confirm the existence of statistically significant increases in average observed noise levels as compared to the baseline monitoring period. The statistical mean, median and mode are used to evaluate the statistical distribution of the noise monitoring data. Large data sets, such as several days of continuous noise monitoring data, tend to follow the normal distribution, which is referred to as the central limit theorem (Shao, 2004). Evaluating the distribution of the noise monitoring data is important because this distribution is used to assess the appropriate statistical methods for further analysis. The observed relationship between the statistical mean, median and mode for the monitored datasets was evaluated to follow the normal distribution. The standard deviation for each monitoring periods was also calculated to evaluate the amount of variation in the baseline noise monitoring data and allow for a test of significance in differences between mean noise levels as compared to the initial monitoring period.



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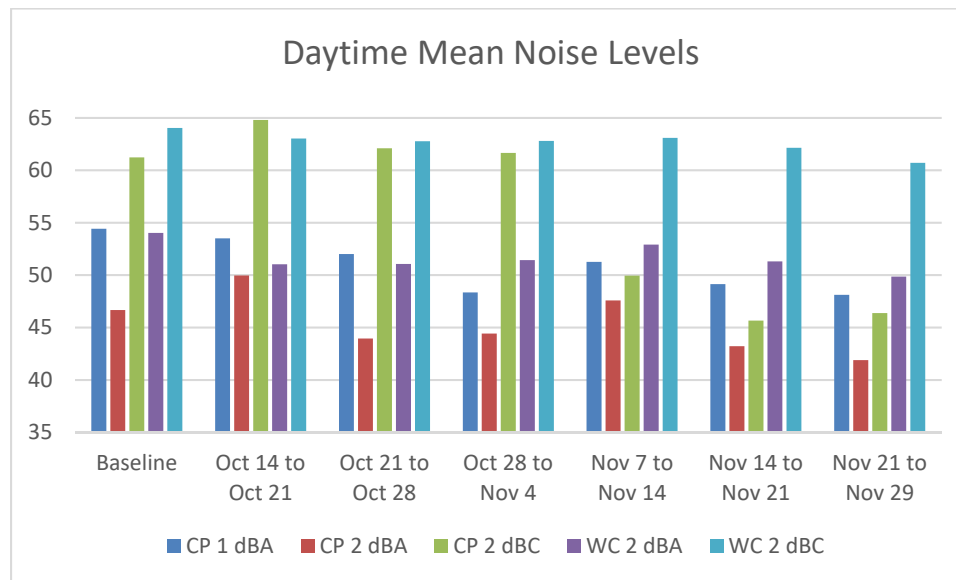
### 3. Data Analysis Results

#### 3.1 Graphical Representations of Data

##### 3.1.1 Average Daytime Noise Levels

The statistical mean for each noise monitoring period was calculated for the daytime hours (7:00 AM to 6:59 PM) (Figure 3-1). The highest mean daytime A-weighted noise levels were generally observed at Waste Connections Site 2. The highest mean daytime C-weighted noise level was observed at Completions Pad Site 2 during the week of October 14, 2017, to October 21, 2017; however, C-weighted noise was generally higher at Waste Connections Site 2.

**Figure 3-1 Daytime Mean Noise Levels**



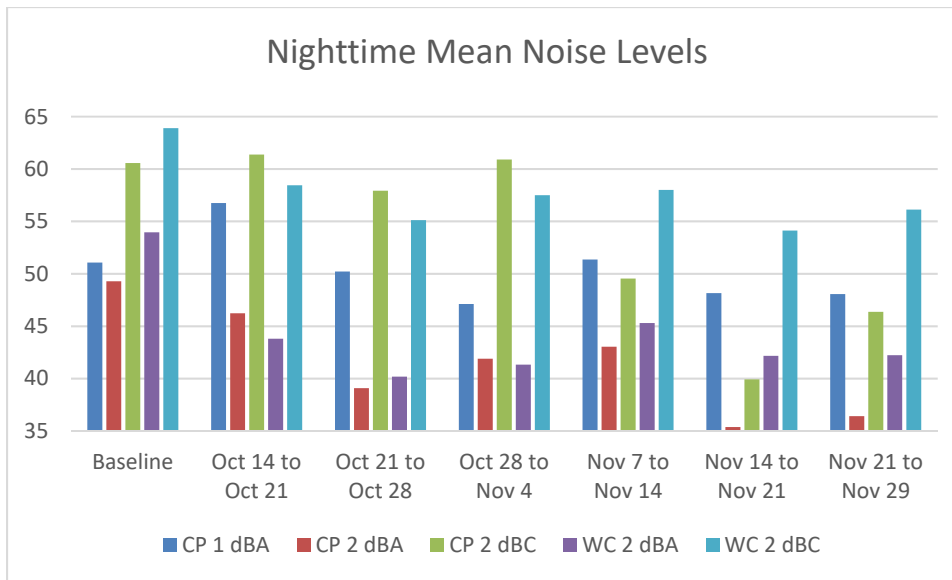
dBA A-weighted noise levels  
dBC C-weighted noise levels  
CP Completions Pad  
WC Waste Connections

##### 3.1.2 Average Nighttime Noise Levels

Figure 3-2 shows the statistical mean of noise monitoring data collected during the nighttime period (7:00 PM to 6:59 AM). The highest observed A-weighted mean noise levels generally occurred at Completions Pad Site 1. The highest observed C-weighted mean noise levels occurred at Completions Pad Site 2 through November 4, 2017. After November 7, 2017, the highest C-weighted noise levels were observed at Waste Connections Site 2.

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**Figure 3-2 Nighttime Mean Noise Levels**



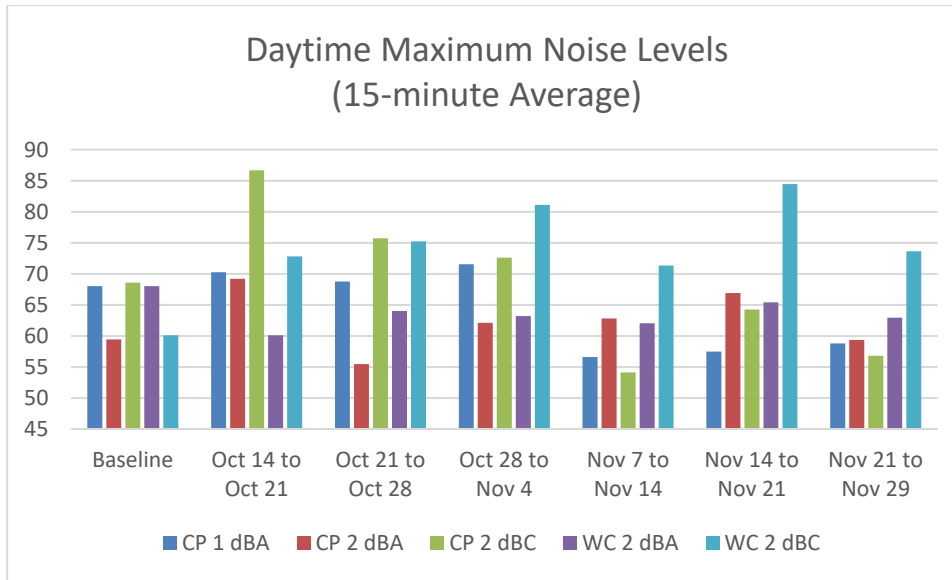
dBA A-weighted noise levels  
 dBC C-weighted noise levels  
 CP Completions Pad  
 WC Waste Connections

### 3.1.3 Maximum Observed Daytime Noise Levels

Figure 3-3 shows the maximum 15-minute average noise measurements collected during the daytime condition for the monitoring periods. Through November 4, 2017, the maximum observed A-weighted noise levels were highest at Completions Site 1, which is located closer to the Completions Pad than the other monitoring locations. After November 4, 2017, the maximum A-weighted noise levels were highest at Waste Connections Site 2. There were no daytime exceedances of the COGCC's maximum permissible noise criteria for A-weighted noise during this reporting period. The maximum observed C-weighted noise levels exceeded 65 dBC on numerous occasions during this reporting period at both Completions Site 2 and Waste Connections Site 2. However, instances where elevated C-weighted noise were measured generally corresponded to periods where wind speeds were greater than 5 miles per hour (mph) as recorded from the Erie Municipal Airport. Per COGCC's rule 802.b, noise measurements are not considered valid when wind speeds are greater than 5 mph. Therefore, it is not possible to determine whether the elevated noise levels during these periods were resultant from Crestone's activities at the Completions Pad.

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**Figure 3-3 Daytime Maximum Noise Levels**



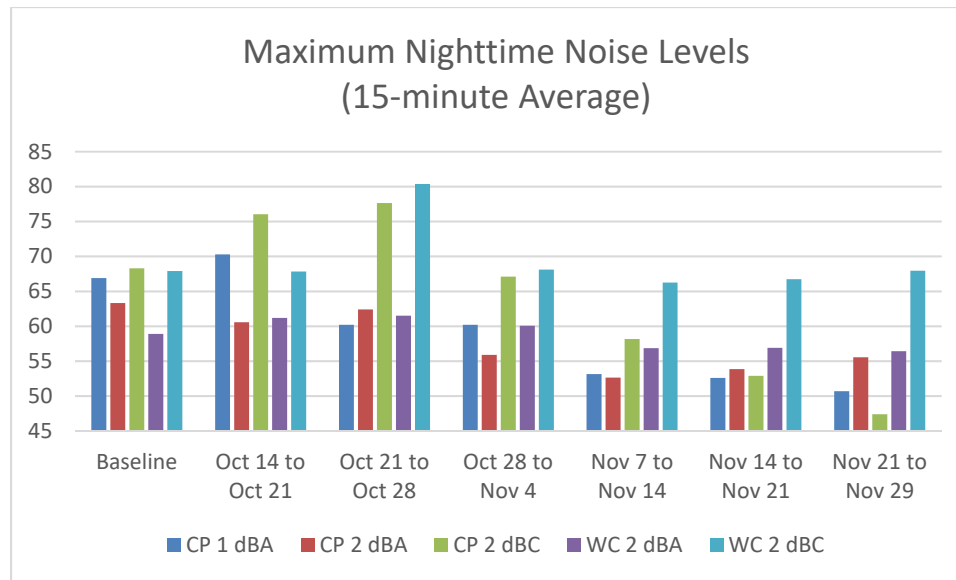
dBA A-weighted decibels  
 dBC C-weighted decibels  
 CP Completions Pad  
 WC Waste Connections

### 3.1.4 Maximum Observed Nighttime Noise Levels

Figure 3-4 shows the maximum 15-minute average nighttime noise levels. A-weighted noise levels were highest at Completions Site 1 the during the October 14, 2017, to October 21, 2017 monitoring period. For all other monitoring periods, A-weighted noise was highest at Waste Connections Site 2. During this reporting period, there were no recorded exceedances of the COGCC's maximum permissible noise nighttime noise criteria at the three locations for A-weighted noise levels. The highest observed 15-minute average nighttime noise levels were observed at Waste Connections Site 2, which is located farther from the Completions Pad than Completions Site 1. However, C-weighted noise at Completions Site 2 also frequently exceeded the COGCC's maximum permissible noise criteria of 65 dBC. Per the Town's request, Pinyon provided monitoring data at Completions Site 2 in tabular format for the period from November 3, 2017, at 11:00 AM to November 4, 2017, at 2:00 PM to investigate the source of the elevated C-weighted noise with the COGCC. As with the daytime maximum observed noise levels, these instances often corresponded to periods where wind speeds were greater than 5 mph, which results in the invalidation of the noise measurements. Therefore, it is not possible to determine whether elevated noise levels during these time periods constituted an exceedance of the maximum permissible noise criteria for C-weighted noise.

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**Figure 3-4 Nighttime Maximum Noise Levels**



dBA A-weighted noise levels  
 dBC C-weighted noise levels  
 CP Completions Pad  
 WC Waste Connections

### 3.2 Statistical Analysis of Noise Monitor Data

Pinyon observed a statistically significant change in the mean measured noise values from the baseline and/or initial monitoring period while analyzing the monitoring data. Furthermore, this difference was also observed when generating graphical representations of the measured noise values at the three noise monitors for this reporting period, which was separated into 10 analysis periods for each monitor. A t-test was performed to evaluate whether the difference in calculated mean values was statistically significant. A t-test is a statistical method for evaluating the difference in means between two sample groups (Davis, 2003). The higher the t-value the greater the difference between the two means. To assess the level of confidence in the calculated t-value, a p-value is calculated. The p-value is based on the magnitude of the t-value and the total number of samples collected between the two monitoring periods. A p-value of less than or equal to 0.001 means that there is a 99.9% confidence level that the difference between means is statistically significant. The variation in statistical mean, the t-value and the p-value was calculated for the five noise monitors for each analysis period. The calculated p-values were less than 0.001 for all comparisons meaning that the means are statistically significantly different at the 99.9% confidence interval. A 99.9% confidence interval indicates that there is less than a 0.01% likelihood that the calculated differences in statistical means are insignificant.

At Completions Site I, baseline noise measurements were collected from September 12, 2017, to September 15, 2017. These baseline measurements were used to assess whether statistically significant changes in mean measured noise levels were observed at the location. There was a statistically significant decrease in A-weighted noise relative to the initial noise measurements for the daytime monitoring periods (Table 3-1). During the nighttime monitoring periods, there was a statistically significant increase in mean measured noise levels from October 14, 2017, to October 21, 2017, as compared to the baseline (Table 3-2). However, mean measured noise levels were below the COGCC's maximum permissible noise criteria. A statistically significant decrease in mean measured noise levels was observed for all other monitoring periods with the exception of November 4, 2017, to November 14, 2017, when the difference in mean measured noise levels was not shown to be statistically significant (Table 3-2).

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**Table 3-1 Variation in Daytime Statistical Mean for A-weighted Noise at Completions Site 1**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Sept 12 to Sept 15	54.4	NA	NA	NA
Oct 14 to Oct 21	53.5	-0.9	-4.78	<0.0001
Oct 21 to Oct 28	52.0	-2.4	-14.94	<0.0001
Oct 28 to Nov 4	48.3	-6.1	-41.84	<0.0001
Nov 4 to Nov 14	51.3	-3.2	-22.86	<0.0001
Nov 14 to Nov 21	49.1	-5.3	-25.59	<0.0001
Nov 21 to Nov 29	48.1	-6.3	-45.30	<0.0001

dBA A-weighted decibels

**Table 3-2 Variation in Nighttime Statistical Mean for A-weighted Noise at Completions Site 1**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Sept 12 to Sept 15	51.1	NA	NA	NA
Oct 14 to Oct 21	56.8	5.7	26.98	<0.0001
Oct 21 to Oct 28	50.2	-0.9	-3.85	<0.0001
Oct 28 to Nov 4	47.1	-4.0	-19.29	<0.0001
Nov 4 to Nov 14	51.4	0.3	1.51	0.1311
Nov 14 to Nov 21	48.1	-2.9	-14.12	<0.0001
Nov 21 to Nov 29	48.1	-3.0	-14.98	<0.0001

dBA A-weighted decibels

Noise monitoring at Completions Site 2 began after Crestone had begun activities at the Completions Pad. Therefore, there is no baseline data available to determine whether statistically significant changes in mean noise levels occurred relative to a period of no well completions activities occurring. To assess changes in mean noise levels over time, the initial monitoring period from September 26, 2017, to September 30, 2017, was used to compare changes in mean noise levels. At Completions Site 2, a statistically significant increase in daytime mean noise values was observed during this reporting period relative to the initial monitoring period from October 14, 2017, to October 21, 2017, and November 4, 2017, to November 14, 2017 (Table 3-3). A statistically significant decrease in mean noise levels was observed during all other monitoring periods (Table 3-3). The nighttime statistical mean during this reporting period indicated decreasing measured values (Table 3-4). Crestone had already commenced operations at the Completions Pad during the initial monitoring period at Completions Site 2. Therefore, the t-values calculated in this reporting period represent a change in mean levels between the initial and subsequent monitoring periods, rather than a comparison to baseline data.

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**Table 3-3 Variation on Daytime Statistical Mean for A-weighted Noise at Completions Site 2**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Sept 26 to Sept 30	46.7	NA	NA	NA
Oct 14 to Oct 21	50.0	3.3	22.21	<0.0001
Oct 21 to Oct 28	44.0	-2.7	-19.82	<0.0001
Oct 28 to Nov 4	44.4	-2.3	-17.33	<0.0001
Nov 4 to Nov 14	47.6	0.9	6.86	<0.0001
Nov 14 to Nov 21	43.2	-3.5	-23.65	<0.0001
Nov 21 to Nov 29	41.9	-4.8	-37.33	<0.0001

dBA A-weighted decibels

**Table 3-4 Variation in Nighttime Statistical Mean for A-weighted Noise at Completions Site 2**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Sept 26 to Sept 30	49.3	NA	NA	NA
Oct 14 to Oct 21	46.2	-3.1	-10.46	<0.0001
Oct 21 to Oct 28	39.1	-10.2	-35.47	<0.0001
Oct 28 to Nov 4	41.9	-7.4	-26.06	<0.0001
Nov 4 to Nov 14	43.0	-6.3	-22.10	<0.0001
Nov 14 to Nov 21	35.4	-13.9	-49.04	<0.0001
Nov 21 to Nov 29	36.4	-12.9	-45.86	<0.0001

dBA A-weighted decibels

At Completions Site 2, daytime measured mean C-weighted noise values were statistically significantly higher than the initial monitoring period from October 14, 2017, to November 4, 2017 (Table 3-5). From November 4, 2017, to November 29, 2017, a statistically significant decrease in daytime C-weighted noise levels was observed (Table 3-5). Nighttime mean C-weighted noise levels at Completions Site 2 from October 14, 2017, to October 21, 2017, and October 28, 2017, to November 4, 2017, increased relative to the initial monitoring period (Table 3-6).

**Table 3-5 Variation in Daytime Statistical Mean for C-weighted Noise at Completions Site 2**

Period	Mean (dBC)	Change (dBC)	t-value	p-value
Sept 26 to Sept 30	61.2	NA	NA	NA
Oct 14 to Oct 21	64.8	3.6	33.05	<0.0001
Oct 21 to Oct 28	62.1	0.9	8.37	<0.0001
Oct 28 to Nov 4	61.7	0.4	4.41	<0.0001
Nov 4 to Nov 14	49.9	-11.3	-121.94	<0.0001
Nov 14 to Nov 21	45.6	-15.6	-133.68	<0.0001
Nov 21 to Nov 29	46.4	-14.9	-113.64	<0.0001

dBC C-weighted decibels

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### Noise Monitoring Adjacent to the Common Completions Pad

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**Table 3-6 Variation in Nighttime Statistical Mean for C-weighted Noise at Completions Site 2**

Period	Mean (dBC)	Change (dBC)	t-value	p-value
Sept 26 to Sept 30	60.6	NA	NA	NA
Oct 14 to Oct 21	61.4	0.8	5.77	<0.0001
Oct 21 to Oct 28	57.9	-2.6	-18.81	<0.0001
Oct 28 to Nov 4	60.9	0.3	2.48	<0.0001
Nov 4 to Nov 14	49.5	-11.0	-80.70	<0.0001
Nov 14 to Nov 21	39.9	-20.6	-146.05	<0.0001
Nov 21 to Nov 29	46.4	-17.7	-123.69	<0.0001

dBC C-weighted decibels

Baseline noise measurements were collected at Waste Connections Site 2 from April 15, 2017, to April 21, 2017, prior to Crestone beginning activities at the Completions Pad. These baseline measurements were used to assess whether statistically significant changes in mean measured noise levels were observed at the location. There was a statistically significant decrease in A-weighted noise relative to the initial noise measurements for both the daytime and nighttime monitoring periods (Table 3-7 and Table 3-8).

**Table 3-7 Variation in Daytime Statistical Mean for A-weighted Noise at Waste Connections Site 2**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Apr 15 to Apr 21	54.0	NA	NA	NA
Oct 14 to Oct 21	51.0	-3.0	-58.71	<0.0001
Oct 21 to Oct 28	51.1	-2.9	-52.85	<0.0001
Oct 28 to Nov 4	51.4	-2.6	-47.66	<0.0001
Nov 4 to Nov 14	52.9	-1.1	-23.16	<0.0001
Nov 14 to Nov 21	51.3	-2.7	-45.73	<0.0001
Nov 21 to Nov 29	49.9	-4.1	-87.60	<0.0001

dBA A-weighted decibels

**Table 3-8 Variation in Nighttime Statistical Mean for A-weighted Noise at Waste Connections Site 2**

Period	Mean (dBA)	Change (dBA)	t-value	p-value
Apr 15 to Apr 21	54.0	NA	NA	NA
Oct 14 to Oct 21	43.8	-10.2	-114.63	<0.0001
Oct 21 to Oct 28	40.2	-13.8	-129.55	<0.0001
Oct 28 to Nov 4	41.3	-12.7	-144.88	<0.0001
Nov 4 to Nov 14	45.3	-8.7	-135.00	<0.0001
Nov 14 to Nov 21	42.2	-11.8	-189.06	<0.0001
Nov 21 to Nov 29	42.2	-11.8	-210.65	<0.0001

dBA A-weighted decibels

At Waste Connections Site 2, there were statistically significant decreases in mean C-weighted noise values relative to the baseline measurements for both daytime and nighttime hours for all monitoring periods during this reporting period (Table 3-9 and Table 3-10). This indicates that Crestone's activities at the Completions Pad are not resulting in increased mean noise levels at this location.

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**Table 3-9 Variation in Daytime Statistical Mean for C-weighted Noise at Waste Connections Site 2**

Period	Mean (dBC)	Change (dBC)	t-value	p-value
Apr 15 to Apr 21	64.0	NA	NA	NA
Oct 14 to Oct 21	63.0	-1.0	-25.43	<0.0001
Oct 21 to Oct 28	62.8	-1.2	-23.00	<0.0001
Oct 28 to Nov 4	62.8	-1.2	-24.23	<0.0001
Nov 4 to Nov 14	63.1	-0.9	-21.85	<0.0001
Nov 14 to Nov 21	62.1	-1.9	-26.61	<0.0001
Nov 21 to Nov 29	60.7	-3.3	-75.57	<0.0001

dBC C-weighted decibels

**Table 3-10 Variation in Nighttime Statistical Mean for C-weighted Noise at Waste Connections Site 2**

Period	Mean (dBC)	Change (dBC)	t-value	p-value
Apr 15 to Apr 21	63.9	NA	NA	NA
Oct 14 to Oct 21	58.4	-5.5	-114.57	<0.0001
Oct 21 to Oct 28	55.1	-8.8	-158.77	<0.0001
Oct 28 to Nov 4	57.5	-6.4	-115.08	<0.0001
Nov 4 to Nov 14	58.0	-5.9	-129.07	<0.0001
Nov 14 to Nov 21	54.1	-9.8	-152.03	<0.0001
Nov 21 to Nov 29	56.1	-7.8	-184.08	<0.0001

dBC C-weighted decibels



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### 4. Conclusions

Pinyon collected continuous noise measurements at three monitoring locations adjacent to Crestone's Completions Pad. This reporting period analyzed noise measurements collected from October 14, 2017, at 7:00 AM, to November 29, 2017, at 11:00 AM. Crestone commenced well completions activities at the Completions Pad the week of September 11, 2017, and has continued activities throughout this reporting period.

An evaluation of the noise measurements collected showed an overall decrease in ambient C-weighted mean noise levels during this reporting period. However, there were numerous instances when measured C-weighted noise levels were greater than the COGCC's maximum permissible noise criteria of 65 dBA at Completions Site 2 and Waste Connections Site 2. During some of these instances, measured wind speeds invalidated the noise measurements. Furthermore, exceedances of the COGCC's maximum permissible C-weighted noise levels were also observed during the baseline monitoring period at Waste Connections Site 2, prior to Crestone beginning well development activities. Therefore, a determination cannot be made as to whether the elevated C-weighted noise at Waste Connections Site 2 is directly attributable to Crestone's activities at the well site. It is possible that some degree of the increase in C-weighted noise is attributable to activity in the neighborhood adjacent to Site 2. Noise measurements collection at Completions Site 2 began after Crestone has already commenced activities at the Completions Pad; thus, the level of C-weighted noise in that location not attributable to well development activities is unknown.

A-weighted noise levels during this reporting period were variable between the monitoring locations. Completions Site 1, which is located closest to the Completions Pad, demonstrated increases in mean A-weighted noise levels during some monitoring periods. Completions Pad 2 and Waste Connections Site 2 generally had decreasing noise levels relative to the initial and baseline monitoring periods respectively. During this reporting period, there were no measured exceedances of the COGCC's maximum permissible noise criteria for A-weighted noise during the daytime or nighttime hours.

Analysis of the noise measurements indicated statistically significant differences between observed mean values between the baseline and/or initial monitoring period and subsequent monitoring periods that captured Crestone's completion activities, which were broken down between daytime and nighttime hours. During this reporting period, A-weighted noise generally decreased from the initial monitoring periods and no exceedances were measured. Elevated levels of C-weighted noise were frequently observed; however, due to wind speeds and other factors it is not possible to determine if these resulted in exceedances of the COGCC's maximum permissible noise criteria.

Pinyon has monitored continuously for noise at locations determined by the Town during Crestone's operations at the Completions Pad and has compared measured levels of A-weighted and C-weighted noise to baseline and initial levels, and assessed potential changes in ambient noise levels during various phases of activity and evaluated whether potential exceedances of the COGCC's maximum permissible noise levels were observed.

## **Table of Contents (continued)**

### **5. References**

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Shao, J. 2004. "Mathematical Statistics." Second Edition. Springer Texts in Statistics. ISBN-13: 978-0387953823