Alton Coal Development, LLC

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UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
MAY 15 2020
DIVISION OF AIR QUALITY

May 8, 2020

DAQ-2020-006762

Catherine Wyffels
Engineer
Major New Source Review Section
Utah Division of Air Quality
195 North 1950 West
Salt Lake City, UT 84114

RE: 1st QT 2020 Report - Coal Hollow Mine
Project ID: N14047-0004

Dear Mrs. Wyffels,

Please find enclosed the Summary of PM_{10} Data Collected at the Coal Hollow Mine, Utah during the First Quarter, 2020 prepare by Alton Coal Development, LLC.

Please do not hesitate to contact me if you have any questions. I can be reached at (435) 867-5331 or (435) 691-1551.

Sincerely,

B. Kirk Nicholes
Environmental Specialist
Alton Coal Development, LLC

UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY
MAY 15 2020
DIVISION OF AIR QUALITY

Alton Coal Development, LLC.

Summary of PM_{10} Data Collected at Coal Hollow Mine, Utah During the First Quarter, 2020

Submitted to:
Utah Division of Environmental Quality
Division of Air Quality
195 North 1950 West
Salt Lake City, Utah
Contact: Catherine Wyffles

Prepared by:
Alton Coal Development, LLC.
463 N 100W, Suite1
Cedar City, Utah 84721
Contact: Kirk Nicholes
435.867.5331

Alton Coal Development
Coal Hollow
Project

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1.0 INTRODUCTION

This report summarizes measurements of Particulate Matter less than 10 microns nominal aerodynamic diameter (PM_{10}) collected and processed by Alton Coal Development, LLC, (ACD) from the five monitoring stations located at the Coal Hollow Mine Facility in Alton, Utah. Monitoring for PM_{10} is a condition of the mines operating permit.

PM_{10} monitoring at the site consists of five BGI PQ200 PM_{10} monitors run by solar power. Figure 2 of this report shows the approximate locations of the monitoring locations. The BGI PQ200 monitors are EPA Reference Method monitors and are operated on the National Particulate 1-in-6 Monitoring Schedule. The data summarized herein covers the data collected during the first quarter of 2020.

2.0 SITE LOCATION

The Coal Hollow Mine is located in Kane County, Utah, approximately three miles southeast of the town of Alton, Utah. Figure 1 on the following page gives an overview of the site location. Specifically, the Coal Hollow Mine is located in Sections 19, 20, 29, and 30 of Township 39S, Range 5W; with an approximate facility location of:

Northing: 41401699 meters

Easting: 371534 meters

Universal Transverse Mercator (UTM) Datum NAD27, Zone 12

The three monitoring locations as depicted in Figure 2, are located in positions to collect both background and maximum PM10 concentrations. The background monitor has a manufactures serial #962, therefore this monitor will be referred as monitor 962A. The compliance monitor for the Coal Hollow Mine (CHM) has a manufactures serial #963, therefore this monitor will be referred as monitor 963B. The co-located monitor has a manufactures serial #964, therefore this monitor will be referred as monitor 964C. The background monitor coordinates are Northing: 4140856, Easting 373119, (UTM) Datum NAD27, Zone 12. The CHM compliance monitor and the co-located monitor coordinates are Northing: 4140396, Easting 371147, (UTM) Datum NAD27, Zone 12. The North Private Lease area of the CHM is located in Sections 12, 13 of Township 39S, Range 6W and Sections 7, 18 of Township 39S, Range 5W. The compliance monitor for the North Private Lease has a manufactures serial #2366, therefore this monitor will be referred as monitor 2366D. The co-located monitor has a manufactures serial #2398, therefore this monitor will be referred as monitor 2398E. The NPL compliance monitor and the co-located monitor coordinates are Northing: 4141570, Easting 370928, (UTM) Datum NAD27, Zone 12.

Figure 1 - Site Location Map

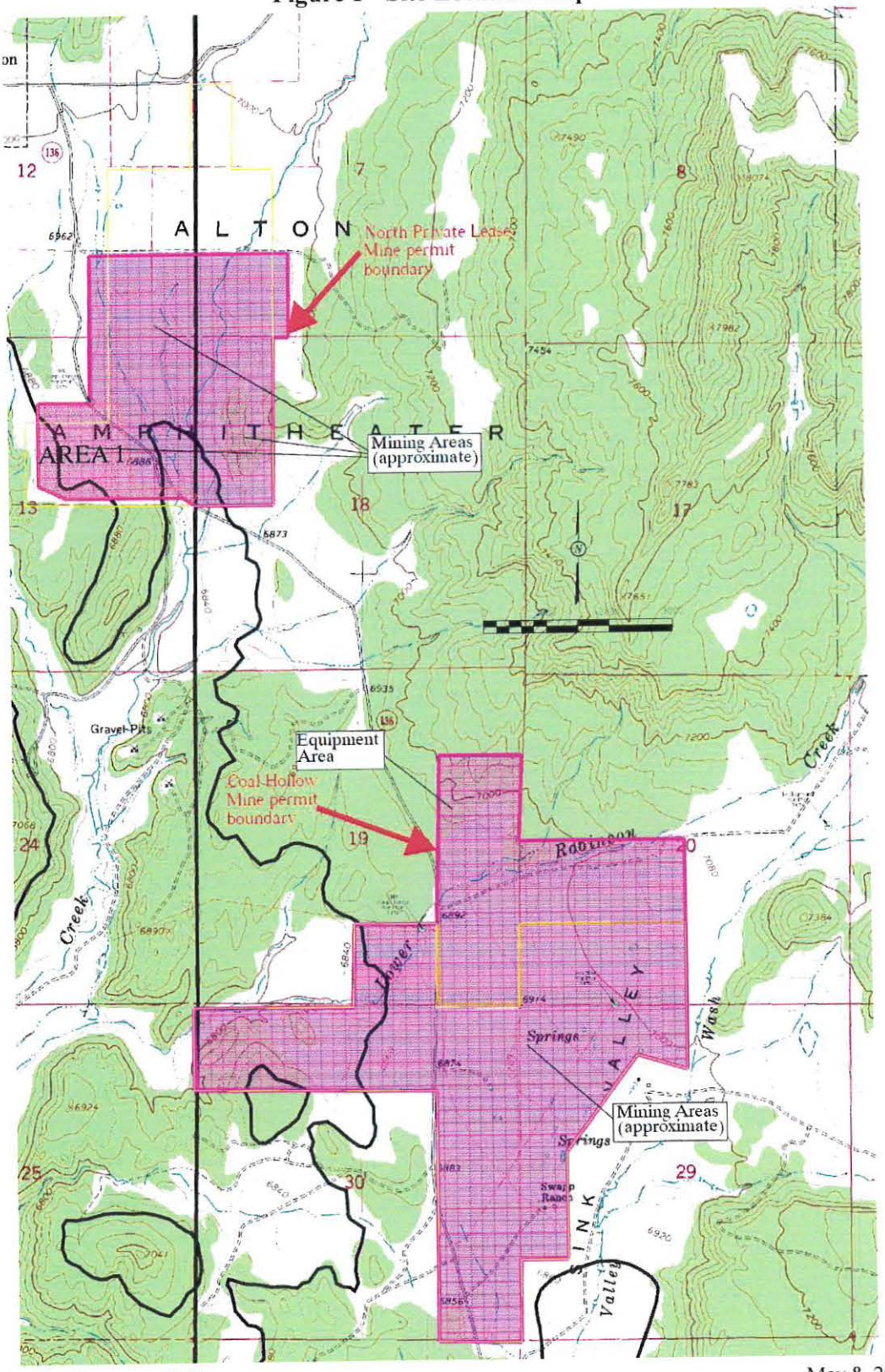
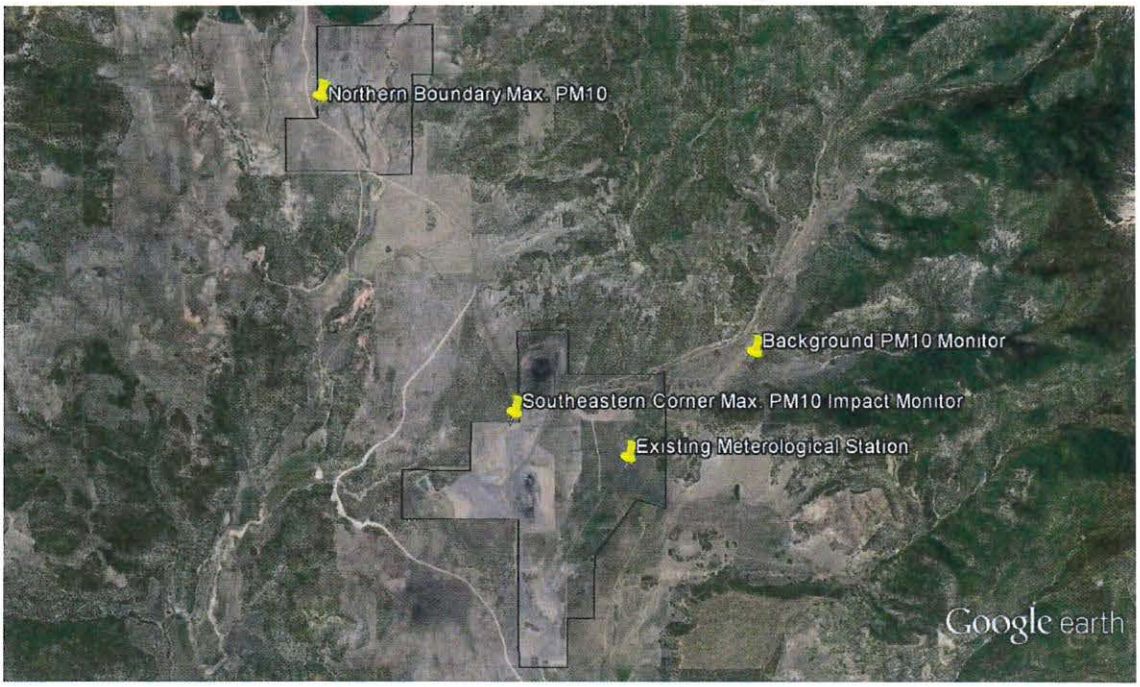


Figure 2 - Satellite View of Monitoring Locations



3.0 AIR QUALITY DATA SUMMARIES

A listing of the measured PM_{10} concentrations for the quarter are presented in Appendix B (individual data sheets are provided on the enclosed disk in the PDF version of Appendix B) and Field Data Sheets generated during the collection of each sample are presented in Appendix D. Measurements were collected during a 24-hour periods and represent the average PM_{10} concentration during the midnight to midnight data collection cycle. As required by the operating permit for the CHM, duplicate measurements were made with Sampler #963B (designated as a compliance monitor) and Sampler #964C (designated as a co-located sampler) to the extent possible. It should be noted that the 964C monitor was impacted from equipment failures during the quarter. The quarterly mean PM_{10} concentration and the comparison of measured concentrations to standards are based on measurements from the primary Sampler #963B. If a measurement from Sampler #963B was missing or invalid, the measurement from the secondary Sampler #964C would be used. Also, required by the operating permit for the NPL, duplicate measurements were made with Sampler #2366D (designated as a compliance monitor) and Sampler #2398E (designated as a co-located sampler) to the extent possible. The quarterly mean PM_{10} concentration and the comparison of measured concentrations to standards are based on measurements from the primary Sampler #2366D. If a measurement from Sampler #2366D was missing or invalid, the measurement from the secondary Sampler #2398E would be used. It should be noted that the 2366D monitor was impacted from equipment failures and was removed during the quarter to resolve these issues.

The highest 24-hour mean PM_{10} concentrations measured during the quarter from the three monitoring locations are summarized in Table I, Table II, Table III, Table IV and Table V. The three highest concentrations, # of valid samples, and the arithmetic mean concentrations from each of the sites are listed. All measured PM_{10} concentrations were below the 24-hour National Ambient Air Quality Standard (NAAQS) of 150 $\mu g/m^3$.

Table I - Summary of Measured PM_{10} Concentrations ($\mu g/m^3$)
Background Monitor - 962A

RANK	DATE	PM_{10} CONCENTRATION
Highest	2/3/2020	5.0
2nd Highest	3/28/2020	4.1
Monthly Mean	1/1/20-1/31/20	2.2
Monthly Mean	2/1/20-2/29/20	3.4
Monthly Mean	3/1/20-3/31/20	3.0
Quarterly Mean	1/1/20-3/31/20 (14 valid samples)	2.9

Table II - Summary of Measured PM_{10} Concentrations ($\mu g/m^3$)
Compliance Monitor - 963B

RANK	DATE	PM_{10} CONCENTRATION
Highest	3/4/2020	61.0
2nd Highest	2/21/2020	21.2
Monthly Mean	1/1/20-1/31/20	8.2
Monthly Mean	2/1/20-2/29/20	24.3
Monthly Mean	3/1/20-3/31/20	61.0
Quarterly Mean	1/1/20-3/31/20 (7 valid samples)	20.4

Table III - Summary of Measured PM_{10} Concentrations ($\mu g/m^3$)
Collocated Monitor – 964C

RANK	DATE	PM_{10} CONCENTRATION
Highest	2/21/2020	41.3
2nd Highest	1/16/2020	30.3
Monthly Mean	1/1/20-1/31/20	9.9
Monthly Mean	2/1/20-2/29/20	16.5
Monthly Mean	3/1/20-3/31/20	4.0**
Quarterly Mean	1/1/20-3/31/20 (6 valid samples)	4.3

**** Only 1 valid run was completed in March**

Table IV - Summary of Measured PM_{10} Concentrations ($\mu g/m^3$)
Compliance Monitor – 2366D

RANK	DATE	PM_{10} CONCENTRATION
Highest		N/A**
2nd Highest		N/A**
Monthly Mean	1/1/20-1/31/20	N/A**
Monthly Mean	2/1/20-2/29/20	N/A**
Monthly Mean	3/1/20-3/31/20	N/A**
Quarterly Mean	1/1/19-3/31/19 (0 valid samples)	N/A**

**** Monitor was out for maintenance, no valid runs.**

Table V - Summary of Measured PM_{10} Concentrations ($\mu g/m^3$)
Collocated Monitor – 2398E

RANK	DATE	PM_{10} CONCENTRATION
Highest	3/4/2020	18.4
2nd Highest	2/21/2020	8.3
Monthly Mean	1/1/20-1/31/20	4.6
Monthly Mean	2/1/20-2/29/20	8.3
Monthly Mean	3/1/20-3/31/20	7.8
Quarterly Mean	1/1/20-3/31/20 (14 valid samples)	6.8

Table VI – Mean Quarterly and Monthly Wind Speed

	1st Quarter 2020	Jan.	Feb.	Mar.
Mean Wind Speed (m/s)	2.45	2.80	3.43	2.86

4.0 DATA RECOVERY AND QUALITY ASSURANCE

4.1 Data Recovery

Monitor 962A

Monitor 962A collected 14 of the 15 samples during the quarter. The percent recovery for this quarter is 93%. For the sample date of March 4th, the operator incorrectly programed the monitor to run an incorrect 24-hour period.

Monitor 963B

Monitor 963B collected 7 of the 15 samples during the quarter. The percent recovery for this quarter is 47%. For the sample date of January 28th, February 3rd,9th & 27th, and March 10th, 16th, 22nd, & the monitor had power issues and would shut down shortly after initiation of a run.

Monitor 964C

Monitor 964C collected 10 of the 15 samples during the quarter. The percent recovery for this quarter is 67%. For the sample dates of February 27th, March 4th, 10th and 16th the monitor had power issues. For the sample date of March 22nd, the monitor over ran the programmed sample period.

Monitor 2366D

Monitor 2366D collected 0 of the 15 samples during the quarter. The percent recovery for this quarter is 0%. The monitor was removed during the quarter for repair and testing. Initially, the motherboard was returned to the manufacture which resolved some issues, the keyboard and several wiring harnesses were then replaced. It is hopeful that all issues have been resolved.

Monitor 2398E

Monitor 2398E collected 14 of the 15 samples during the quarter. The percent recovery for this quarter is 93%. For the sample date of February 9th, the operator did not program the monitor to run therefore it did not run.

The PM_{10} data recoveries for the five monitoring stations are presented below:

Table VII - Summary of Data Recovery

SAMPLER	POSSIBLE SAMPLES	VALID SAMPLES	PERCENT DATA RECOVERY
962A	15	14	93%
963B	15	7	47%
964C	15	10	67%
2366D	15	0	0%
2398E	15	14	93%

4.2 Quality Assurance

Quality assurance procedures utilized to verify the integrity of the measured PM_{10} data included the following:

1. Review of PM_{10} precision measurements based upon duplicate, collocated measurements.

2. Independent quarterly audits of the PM_{10} samplers.

3. Monthly zero and single point flow rate checks of the PM_{10} samplers.

4.2.1 Precision of PM_{10} Measurements

The precision of the PM_{10} measurements was determined from the duplicate samples collected from the collocated BGI PQ200 Monitors 963B and 964C at the Coal Hollow Mine and 2366D and 2398E at the North Private Lease. As recommended in *40 CFR, Part 58*, Appendix A, Section 5.3.1, PM_{10} precision checks are reported for instances when the concentrations for duplicate samples both exceed 3 $\mu g/m^3$. Duplicate samples that did not meet this condition were omitted for the purposes of the precision checks. Appendix C, of this report summarizes precision calculations between the compliance monitor and the co-located monitor. Monthly flow rate verification data is also summarized in Appendix C.

Precision calculations at the Coal Hollow Mine were developed based on 5 valid pairs of co-located monitoring data during the quarter due to equipment malfunctions with both the 962 B and the 963C monitor. Single point precision based on *40 CFR, Part 58*, Appendix A Equation 2 results were -61.8% to 132.4%. The aggregate coefficient of variability (CV) calculated in accordance with *40 CFR, Part 58*, Appendix A Equation 11 is 106.3%. This value is not within the 10% goal for aggregate CV.

Precision calculations at the North Private Lease were not completed as the 2366 D monitor was out of service for the entire quarter.

4.2.2 Audit Results

The accuracy of the PM_{10} sampler flows was verified by a performance audit conducted by Air Resource Specialist on March 24, 2020. A copy of the audit report is presented in Appendix E and is summarized in Table VI. The audit results indicate that four of the five samplers were operating properly. Sampler 2366D was removed from service at the time for repairs.

Table VIII- Audit Summary

SAMPLER	AUDIT % DIFFERENCE	LIMIT*	DESIGN % DIFFERENCE	LIMIT*
962A	-0.2	±4%	0.2	± 5%

963B	-1.8	±4%	1.9	± 5%
964C	-0.9	±4%	0.9	± 5%
2366D	N/A	±4%	N/A	± 5%
2398E	-3.8	±4%	4.0	± 5%
*Values between ± 7% and ± 10% require recalibration but no data are invalidated.				

4.2.3 Zero and Single Point Flow Rate Checks

Zero and single-point flow rate verifications are performed by a site technician on a monthly basis. The data was then input into a statistical calculator to calculate percent difference and bias between each of the monitors and the monthly single point flow rate measured by a NIST traceable calibration orifice. The calculator used is called the "Data Assessment Statistical Calculator" DASC Tool. DASC was developed for the data user community and can be found in the Precision and Accuracy Reporting System within the Quality Assurance section of EPA's Ambient Monitoring Technology Information System. This data is presented in Appendix C of this report.

APPENDIX A

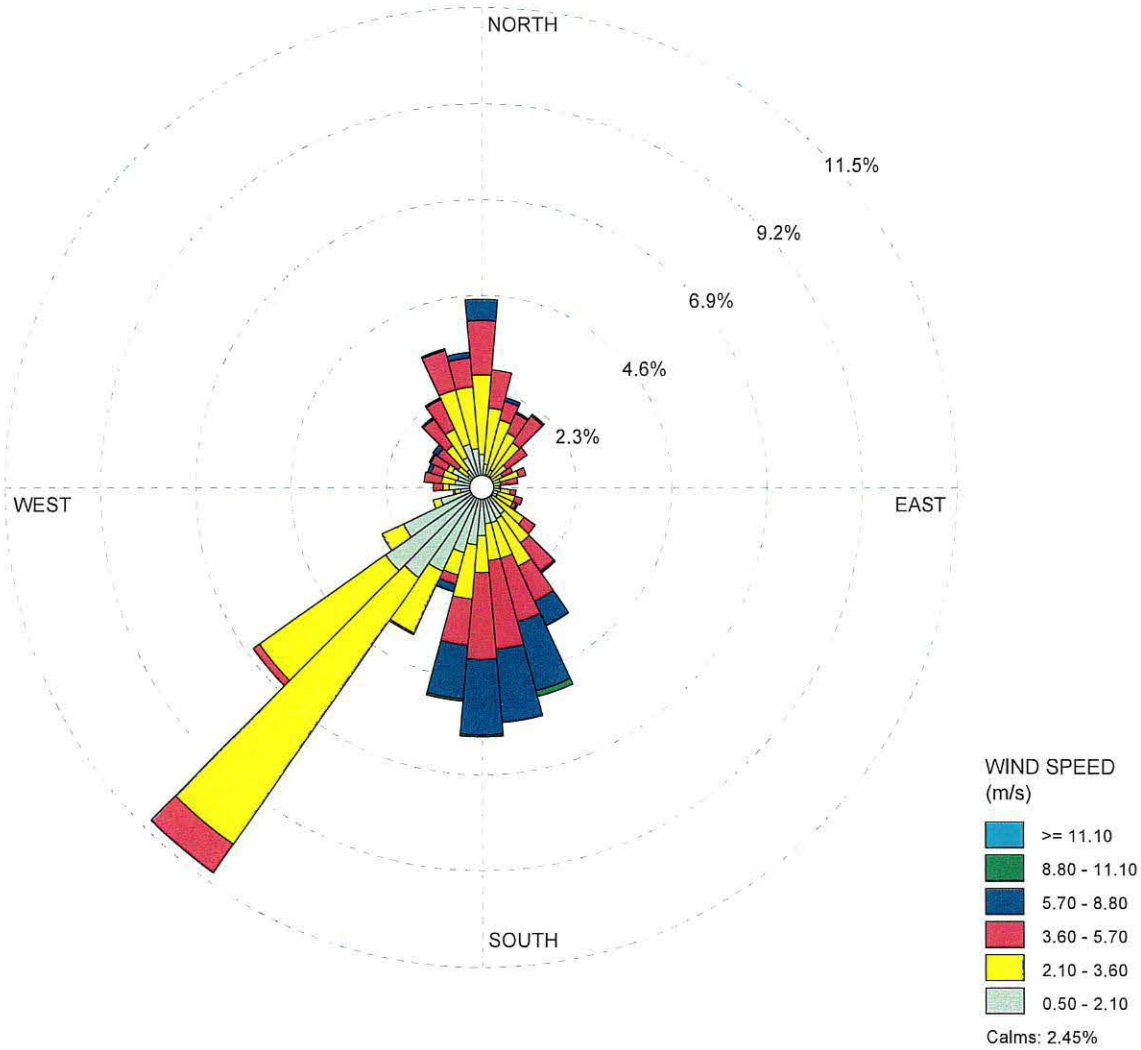
Windrose

WIND ROSE PLOT:

ACD_COAL HOLLOW MINE
2020 1st Quarter

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2020 - 00:00 **End Date: 3/31/2020 - 23:00**	**Alton Coal Development, LLC - Coal Hollow Mine**	
		MODELER: **B. Kirk Nicholes**	
	CALM WINDS: **2.45%**	TOTAL COUNT: **2160 hrs.**	
	AVG. WIND SPEED: **3.01 m/s**	DATE: **4/24/2020**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Station ID: 1
Start Date: 1/1/2020 - 00:00
End Date: 3/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Count)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	17	41	28	11	0	0	97
5-15	12	29	20	0	0	0	61
15-25	7	29	10	2	0	0	48
25-35	10	21	11	1	0	0	43
35-45	7	21	17	1	0	0	46
45-55	6	10	13	0	0	0	29
55-65	5	7	6	0	0	0	18
65-75	10	10	4	0	0	0	24
75-85	5	5	9	0	0	0	19
85-95	4	5	1	0	0	0	10
95-105	10	5	3	0	0	0	18
105-115	9	9	4	0	0	0	22
115-125	9	9	2	1	0	0	21
125-135	7	20	7	0	0	0	34
135-145	17	18	18	1	0	0	54
145-155	18	27	20	14	0	0	79
155-165	19	19	34	37	3	0	112
165-175	19	19	46	38	0	0	122
175-185	25	19	45	39	1	0	129
185-195	30	28	24	28	1	0	111
195-205	35	12	5	4	0	0	56
205-215	48	35	1	0	0	0	84
215-225	57	168	18	0	0	0	243
225-235	61	80	4	0	0	0	145
235-245	45	12	0	0	0	0	57
245-255	22	4	0	0	0	0	26
255-265	11	3	1	0	0	0	15
265-275	17	3	5	0	0	0	25
275-285	14	7	9	0	0	0	30
285-295	13	8	6	2	0	0	29
295-305	17	3	9	1	0	0	30
305-315	9	6	13	3	0	0	31
315-325	11	15	17	1	0	0	44
325-335	17	16	17	1	0	0	51
335-345	23	29	21	1	0	0	74
345-355	20	32	15	3	0	0	70
Total	666	784	463	189	5	0	2160

Frequency of Calm Winds: 53
Average Wind Speed: 3.01 m/s

Station ID: 1
Start Date: 1/1/2020 - 00:00
End Date: 3/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Normalized)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.007870	0.018981	0.012963	0.005093	0.000000	0.000000	0.044907
5-15	0.005556	0.013426	0.009259	0.000000	0.000000	0.000000	0.028241
15-25	0.003241	0.013426	0.004630	0.000926	0.000000	0.000000	0.022222
25-35	0.004630	0.009722	0.005093	0.000463	0.000000	0.000000	0.019907
35-45	0.003241	0.009722	0.007870	0.000463	0.000000	0.000000	0.021296
45-55	0.002778	0.004630	0.006019	0.000000	0.000000	0.000000	0.013426
55-65	0.002315	0.003241	0.002778	0.000000	0.000000	0.000000	0.008333
65-75	0.004630	0.004630	0.001852	0.000000	0.000000	0.000000	0.011111
75-85	0.002315	0.002315	0.004167	0.000000	0.000000	0.000000	0.008796
85-95	0.001852	0.002315	0.000463	0.000000	0.000000	0.000000	0.004630
95-105	0.004630	0.002315	0.001389	0.000000	0.000000	0.000000	0.008333
105-115	0.004167	0.004167	0.001852	0.000000	0.000000	0.000000	0.010185
115-125	0.004167	0.004167	0.000926	0.000463	0.000000	0.000000	0.009722
125-135	0.003241	0.009259	0.003241	0.000000	0.000000	0.000000	0.015741
135-145	0.007870	0.008333	0.008333	0.000463	0.000000	0.000000	0.025000
145-155	0.008333	0.012500	0.009259	0.006481	0.000000	0.000000	0.036574
155-165	0.008796	0.008796	0.015741	0.017130	0.001389	0.000000	0.051852
165-175	0.008796	0.008796	0.021296	0.017593	0.000000	0.000000	0.056481
175-185	0.011574	0.008796	0.020833	0.018056	0.000463	0.000000	0.059722
185-195	0.013889	0.012963	0.011111	0.012963	0.000463	0.000000	0.051389
195-205	0.016204	0.005556	0.002315	0.001852	0.000000	0.000000	0.025926
205-215	0.022222	0.016204	0.000463	0.000000	0.000000	0.000000	0.038889
215-225	0.026389	0.077778	0.008333	0.000000	0.000000	0.000000	0.112500
225-235	0.028241	0.037037	0.001852	0.000000	0.000000	0.000000	0.067130
235-245	0.020833	0.005556	0.000000	0.000000	0.000000	0.000000	0.026389
245-255	0.010185	0.001852	0.000000	0.000000	0.000000	0.000000	0.012037
255-265	0.005093	0.001389	0.000463	0.000000	0.000000	0.000000	0.006944
265-275	0.007870	0.001389	0.002315	0.000000	0.000000	0.000000	0.011574
275-285	0.006481	0.003241	0.004167	0.000000	0.000000	0.000000	0.013889
285-295	0.006019	0.003704	0.002778	0.000926	0.000000	0.000000	0.013426
295-305	0.007870	0.001389	0.004167	0.000463	0.000000	0.000000	0.013889
305-315	0.004167	0.002778	0.006019	0.001389	0.000000	0.000000	0.014352
315-325	0.005093	0.006944	0.007870	0.000463	0.000000	0.000000	0.020370
325-335	0.007870	0.007407	0.007870	0.000463	0.000000	0.000000	0.023611
335-345	0.010648	0.013426	0.009722	0.000463	0.000000	0.000000	0.034259
345-355	0.009259	0.014815	0.006944	0.001389	0.000000	0.000000	0.032407
Total	0.308333	0.362963	0.214352	0.087500	0.002315	0.000000	0.975463

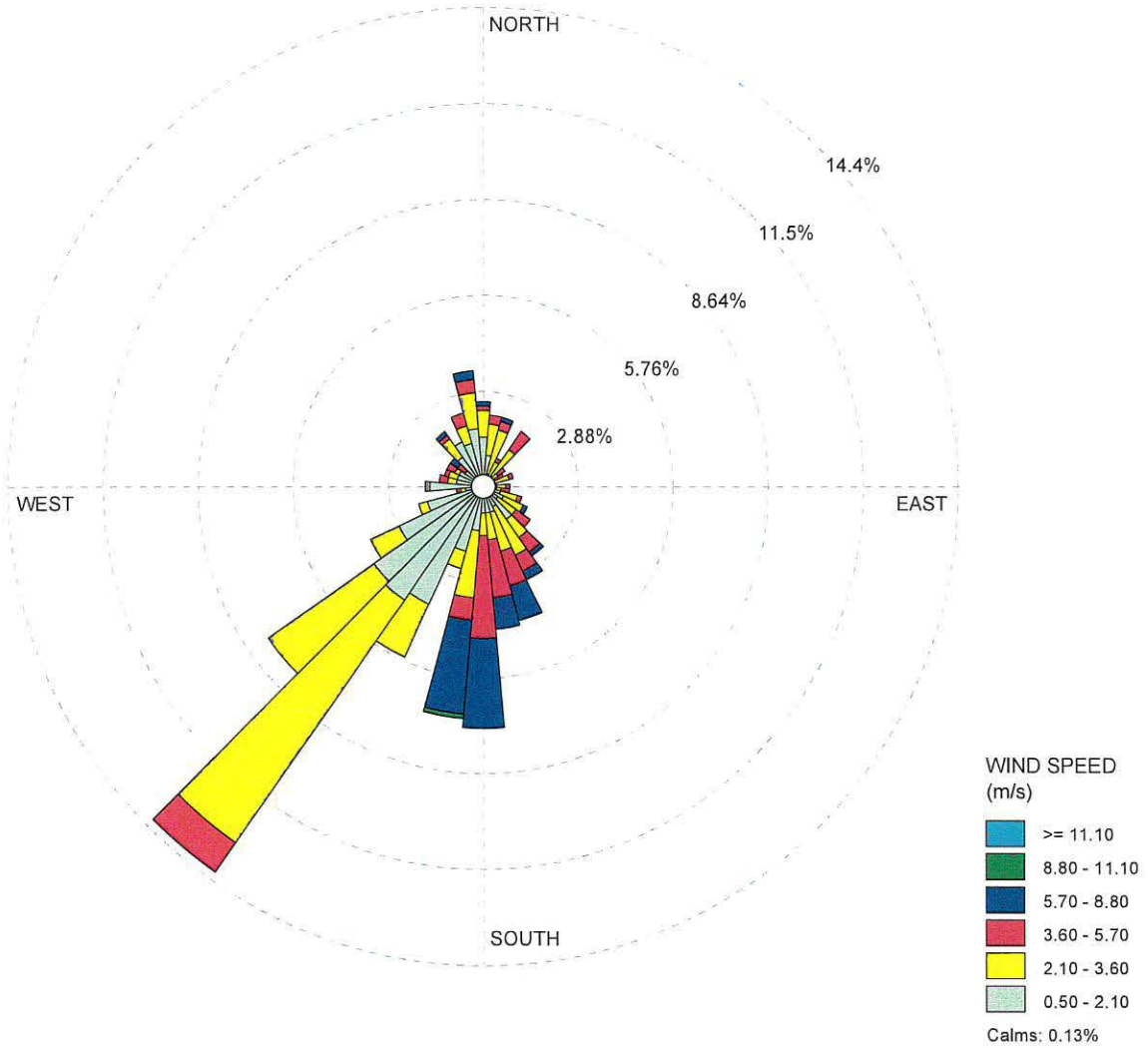
Frequency of Calm Winds: 2.45%
Average Wind Speed: 3.01 m/s

WIND ROSE PLOT:

ACD_COAL HOLLOW MINE
2020 January

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2020 - 00:00 **End Date: 1/31/2020 - 23:00**	**Alton Coal Development, LLC - Coal Hollow Mine**	
		MODELER: **B. Kirk Nicholes**	
	CALM WINDS: **0.13%**	TOTAL COUNT: **744 hrs.**	
	AVG. WIND SPEED: **2.80 m/s**	DATE: **4/24/2020**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Station ID: 1
Start Date: 1/1/2020 - 00:00
End Date: 1/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Count)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	11	6	1	1	0	0	19
5-15	7	7	2	0	0	0	16
15-25	3	10	2	1	0	0	16
25-35	1	5	1	0	0	0	7
35-45	3	7	5	0	0	0	15
45-55	2	2	2	0	0	0	6
55-65	2	1	2	0	0	0	5
65-75	2	4	1	0	0	0	7
75-85	1	0	2	0	0	0	3
85-95	3	2	1	0	0	0	6
95-105	3	1	2	0	0	0	6
105-115	4	4	1	0	0	0	9
115-125	5	5	0	1	0	0	11
125-135	4	5	4	0	0	0	13
135-145	9	5	4	1	0	0	19
145-155	5	12	4	2	0	0	23
155-165	6	9	8	8	0	0	31
165-175	6	6	13	7	0	0	32
175-185	6	5	23	20	0	0	54
185-195	10	15	5	21	1	0	52
195-205	15	4	0	0	0	0	19
205-215	29	13	0	0	0	0	42
215-225	31	66	8	0	0	0	105
225-235	30	29	0	0	0	0	59
235-245	21	7	0	0	0	0	28
245-255	13	2	0	0	0	0	15
255-265	4	1	1	0	0	0	6
265-275	12	1	0	0	0	0	13
275-285	6	2	2	0	0	0	10
285-295	6	2	1	0	0	0	9
295-305	6	1	2	0	0	0	9
305-315	5	0	2	2	0	0	9
315-325	8	5	1	1	0	0	15
325-335	11	0	0	0	0	0	11
335-345	10	4	3	0	0	0	17
345-355	13	8	3	2	0	0	26
Total	313	256	106	67	1	0	744

Frequency of Calm Winds: 1
Average Wind Speed: 2.80 m/s

Station ID: 1
Start Date: 1/1/2020 - 00:00
End Date: 1/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Normalized)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.014785	0.008065	0.001344	0.001344	0.000000	0.000000	0.025538
5-15	0.009409	0.009409	0.002688	0.000000	0.000000	0.000000	0.021505
15-25	0.004032	0.013441	0.002688	0.001344	0.000000	0.000000	0.021505
25-35	0.001344	0.006720	0.001344	0.000000	0.000000	0.000000	0.009409
35-45	0.004032	0.009409	0.006720	0.000000	0.000000	0.000000	0.020161
45-55	0.002688	0.002688	0.002688	0.000000	0.000000	0.000000	0.008065
55-65	0.002688	0.001344	0.002688	0.000000	0.000000	0.000000	0.006720
65-75	0.002688	0.005376	0.001344	0.000000	0.000000	0.000000	0.009409
75-85	0.001344	0.000000	0.002688	0.000000	0.000000	0.000000	0.004032
85-95	0.004032	0.002688	0.001344	0.000000	0.000000	0.000000	0.008065
95-105	0.004032	0.001344	0.002688	0.000000	0.000000	0.000000	0.008065
105-115	0.005376	0.005376	0.001344	0.000000	0.000000	0.000000	0.012097
115-125	0.006720	0.006720	0.000000	0.001344	0.000000	0.000000	0.014785
125-135	0.005376	0.006720	0.005376	0.000000	0.000000	0.000000	0.017473
135-145	0.012097	0.006720	0.005376	0.001344	0.000000	0.000000	0.025538
145-155	0.006720	0.016129	0.005376	0.002688	0.000000	0.000000	0.030914
155-165	0.008065	0.012097	0.010753	0.010753	0.000000	0.000000	0.041667
165-175	0.008065	0.008065	0.017473	0.009409	0.000000	0.000000	0.043011
175-185	0.008065	0.006720	0.030914	0.026882	0.000000	0.000000	0.072581
185-195	0.013441	0.020161	0.006720	0.028226	0.001344	0.000000	0.069892
195-205	0.020161	0.005376	0.000000	0.000000	0.000000	0.000000	0.025538
205-215	0.038978	0.017473	0.000000	0.000000	0.000000	0.000000	0.056452
215-225	0.041667	0.088710	0.010753	0.000000	0.000000	0.000000	0.141129
225-235	0.040323	0.038978	0.000000	0.000000	0.000000	0.000000	0.079301
235-245	0.028226	0.009409	0.000000	0.000000	0.000000	0.000000	0.037634
245-255	0.017473	0.002688	0.000000	0.000000	0.000000	0.000000	0.020161
255-265	0.005376	0.001344	0.001344	0.000000	0.000000	0.000000	0.008065
265-275	0.016129	0.001344	0.000000	0.000000	0.000000	0.000000	0.017473
275-285	0.008065	0.002688	0.002688	0.000000	0.000000	0.000000	0.013441
285-295	0.008065	0.002688	0.001344	0.000000	0.000000	0.000000	0.012097
295-305	0.008065	0.001344	0.002688	0.000000	0.000000	0.000000	0.012097
305-315	0.006720	0.000000	0.002688	0.002688	0.000000	0.000000	0.012097
315-325	0.010753	0.006720	0.001344	0.001344	0.000000	0.000000	0.020161
325-335	0.014785	0.000000	0.000000	0.000000	0.000000	0.000000	0.014785
335-345	0.013441	0.005376	0.004032	0.000000	0.000000	0.000000	0.022849
345-355	0.017473	0.010753	0.004032	0.002688	0.000000	0.000000	0.034946
Total	0.420699	0.344086	0.142473	0.090054	0.001344	0.000000	0.998656

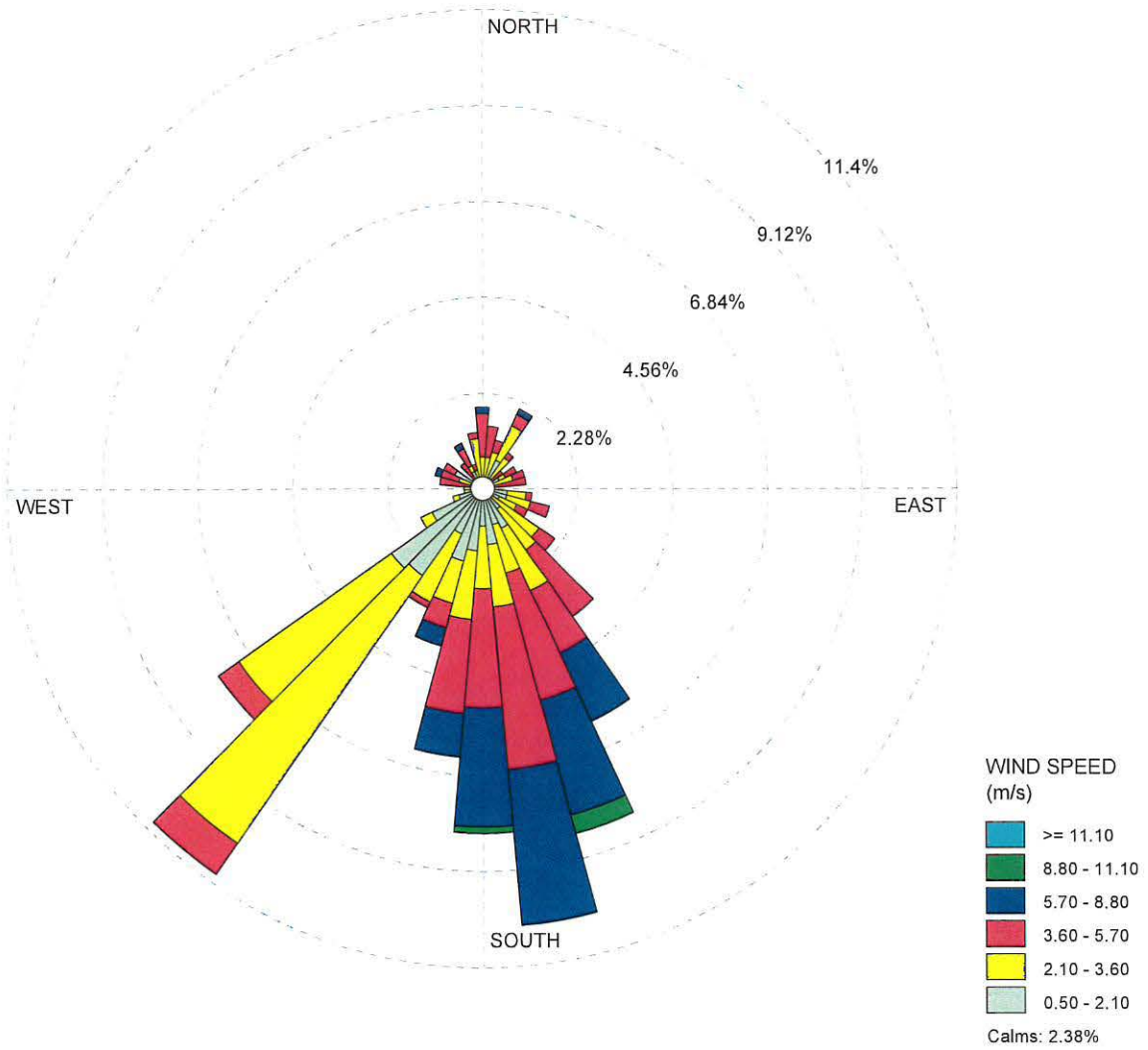
Frequency of Calm Winds: 0.13%
Average Wind Speed: 2.80 m/s

WIND ROSE PLOT:

ACD_COAL HOLLOW MINE
2020 Febuary

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 2/1/2020 - 00:00 **End Date: 2/28/2020 - 23:00**	**Alton Coal Development, LLC - Coal Hollow Mine**	
		MODELER: **B. Kirk Nicholes**	
	CALM WINDS: **2.38%**	TOTAL COUNT: **672 hrs.**	
	AVG. WIND SPEED: **3.43 m/s**	DATE: **4/24/2020**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Station ID: 1
Start Date: 2/1/2020 - 00:00
End Date: 2/28/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Count)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0	5	7	1	0	0	13
5-15	0	5	5	0	0	0	10
15-25	1	5	2	0	0	0	8
25-35	5	6	2	1	0	0	14
35-45	2	4	1	0	0	0	7
45-55	0	2	2	0	0	0	4
55-65	3	1	2	0	0	0	6
65-75	1	4	2	0	0	0	7
75-85	1	1	5	0	0	0	7
85-95	0	2	0	0	0	0	2
95-105	4	3	1	0	0	0	8
105-115	4	4	3	0	0	0	11
115-125	3	3	2	0	0	0	8
125-135	1	10	3	0	0	0	14
135-145	4	8	13	0	0	0	25
145-155	7	11	11	12	0	0	41
155-165	6	8	21	19	3	0	57
165-175	9	10	26	25	0	0	70
175-185	6	10	19	19	1	0	55
185-195	10	11	15	7	0	0	43
195-205	12	7	4	3	0	0	26
205-215	8	12	1	0	0	0	21
215-225	17	52	6	0	0	0	75
225-235	18	30	4	0	0	0	52
235-245	9	2	0	0	0	0	11
245-255	4	1	0	0	0	0	5
255-265	2	1	0	0	0	0	3
265-275	3	0	0	0	0	0	3
275-285	2	0	5	0	0	0	7
285-295	2	2	3	1	0	0	8
295-305	5	0	2	0	0	0	7
305-315	0	1	1	0	0	0	2
315-325	1	0	4	0	0	0	5
325-335	3	1	3	1	0	0	8
335-345	0	3	1	0	0	0	4
345-355	1	7	1	0	0	0	9
Total	154	232	177	89	4	0	672

Frequency of Calm Winds: 16
Average Wind Speed: 3.43 m/s

Station ID: 1
Start Date: 2/1/2020 - 00:00
End Date: 2/28/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Normalized)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.000000	0.007440	0.010417	0.001488	0.000000	0.000000	0.019345
5-15	0.000000	0.007440	0.007440	0.000000	0.000000	0.000000	0.014881
15-25	0.001488	0.007440	0.002976	0.000000	0.000000	0.000000	0.011905
25-35	0.007440	0.008929	0.002976	0.001488	0.000000	0.000000	0.020833
35-45	0.002976	0.005952	0.001488	0.000000	0.000000	0.000000	0.010417
45-55	0.000000	0.002976	0.002976	0.000000	0.000000	0.000000	0.005952
55-65	0.004464	0.001488	0.002976	0.000000	0.000000	0.000000	0.008929
65-75	0.001488	0.005952	0.002976	0.000000	0.000000	0.000000	0.010417
75-85	0.001488	0.001488	0.007440	0.000000	0.000000	0.000000	0.010417
85-95	0.000000	0.002976	0.000000	0.000000	0.000000	0.000000	0.002976
95-105	0.005952	0.004464	0.001488	0.000000	0.000000	0.000000	0.011905
105-115	0.005952	0.005952	0.004464	0.000000	0.000000	0.000000	0.016369
115-125	0.004464	0.004464	0.002976	0.000000	0.000000	0.000000	0.011905
125-135	0.001488	0.014881	0.004464	0.000000	0.000000	0.000000	0.020833
135-145	0.005952	0.011905	0.019345	0.000000	0.000000	0.000000	0.037202
145-155	0.010417	0.016369	0.016369	0.017857	0.000000	0.000000	0.061012
155-165	0.008929	0.011905	0.031250	0.028274	0.004464	0.000000	0.084821
165-175	0.013393	0.014881	0.038690	0.037202	0.000000	0.000000	0.104167
175-185	0.008929	0.014881	0.028274	0.028274	0.001488	0.000000	0.081845
185-195	0.014881	0.016369	0.022321	0.010417	0.000000	0.000000	0.063988
195-205	0.017857	0.010417	0.005952	0.004464	0.000000	0.000000	0.038690
205-215	0.011905	0.017857	0.001488	0.000000	0.000000	0.000000	0.031250
215-225	0.025298	0.077381	0.008929	0.000000	0.000000	0.000000	0.111607
225-235	0.026786	0.044643	0.005952	0.000000	0.000000	0.000000	0.077381
235-245	0.013393	0.002976	0.000000	0.000000	0.000000	0.000000	0.016369
245-255	0.005952	0.001488	0.000000	0.000000	0.000000	0.000000	0.007440
255-265	0.002976	0.001488	0.000000	0.000000	0.000000	0.000000	0.004464
265-275	0.004464	0.000000	0.000000	0.000000	0.000000	0.000000	0.004464
275-285	0.002976	0.000000	0.007440	0.000000	0.000000	0.000000	0.010417
285-295	0.002976	0.002976	0.004464	0.001488	0.000000	0.000000	0.011905
295-305	0.007440	0.000000	0.002976	0.000000	0.000000	0.000000	0.010417
305-315	0.000000	0.001488	0.001488	0.000000	0.000000	0.000000	0.002976
315-325	0.001488	0.000000	0.005952	0.000000	0.000000	0.000000	0.007440
325-335	0.004464	0.001488	0.004464	0.001488	0.000000	0.000000	0.011905
335-345	0.000000	0.004464	0.001488	0.000000	0.000000	0.000000	0.005952
345-355	0.001488	0.010417	0.001488	0.000000	0.000000	0.000000	0.013393
Total	0.229167	0.345238	0.263393	0.132440	0.005952	0.000000	0.976190

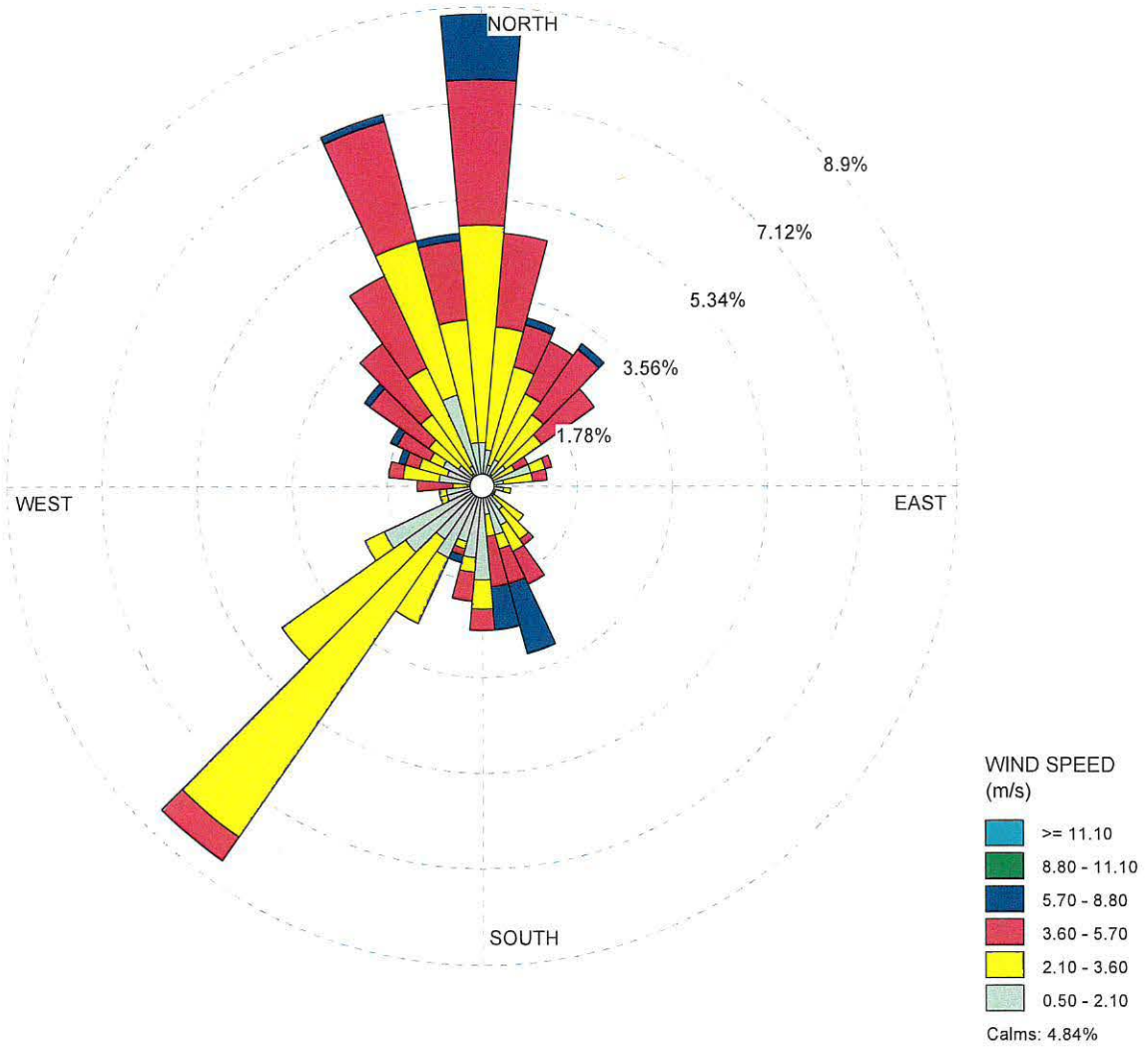
Frequency of Calm Winds: 2.38%
Average Wind Speed: 3.43 m/s

WIND ROSE PLOT:

ACD_COAL HOLLOW MINE
2020 March

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 3/1/2020 - 00:00 **End Date: 3/31/2020 - 23:00**	**Alton Coal Development, LLC - Coal Hollow Mine**	
		MODELER: **B. Kirk Nicholes**	
	CALM WINDS: **4.84%**	TOTAL COUNT: **744 hrs.**	
	AVG. WIND SPEED: **2.86 m/s**	DATE: **4/24/2020**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Station ID: 1
Start Date: 3/1/2020 - 00:00
End Date: 3/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Count)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	6	30	20	9	0	0	65
5-15	5	17	13	0	0	0	35
15-25	3	14	6	1	0	0	24
25-35	4	10	8	0	0	0	22
35-45	2	10	11	1	0	0	24
45-55	4	6	9	0	0	0	19
55-65	0	5	2	0	0	0	7
65-75	7	2	1	0	0	0	10
75-85	3	4	2	0	0	0	9
85-95	1	1	0	0	0	0	2
95-105	3	1	0	0	0	0	4
105-115	1	1	0	0	0	0	2
115-125	1	1	0	0	0	0	2
125-135	2	5	0	0	0	0	7
135-145	4	5	1	0	0	0	10
145-155	6	4	5	0	0	0	15
155-165	7	2	5	10	0	0	24
165-175	4	3	7	6	0	0	20
175-185	13	4	3	0	0	0	20
185-195	10	2	4	0	0	0	16
195-205	8	1	1	1	0	0	11
205-215	11	10	0	0	0	0	21
215-225	9	50	4	0	0	0	63
225-235	13	21	0	0	0	0	34
235-245	15	3	0	0	0	0	18
245-255	5	1	0	0	0	0	6
255-265	5	1	0	0	0	0	6
265-275	2	2	5	0	0	0	9
275-285	6	5	2	0	0	0	13
285-295	5	4	2	1	0	0	12
295-305	6	2	5	1	0	0	14
305-315	4	5	10	1	0	0	20
315-325	2	10	12	0	0	0	24
325-335	3	15	14	0	0	0	32
335-345	13	22	17	1	0	0	53
345-355	6	17	11	1	0	0	35
Total	199	296	180	33	0	0	744

Frequency of Calm Winds: 36
Average Wind Speed: 2.86 m/s

Station ID: 1
Start Date: 3/1/2020 - 00:00
End Date: 3/31/2020 - 23:00

Run ID: ACD_CHM

Frequency Distribution
(Normalized)

Flow Vector (Blowing To) / Wind Speed (m/s)

	0.50 - 2.10	2.10 - 3.60	3.60 - 5.70	5.70 - 8.80	8.80 - 11.10	>= 11.10	Total
355-5	0.008065	0.040323	0.026882	0.012097	0.000000	0.000000	0.087366
5-15	0.006720	0.022849	0.017473	0.000000	0.000000	0.000000	0.047043
15-25	0.004032	0.018817	0.008065	0.001344	0.000000	0.000000	0.032258
25-35	0.005376	0.013441	0.010753	0.000000	0.000000	0.000000	0.029570
35-45	0.002688	0.013441	0.014785	0.001344	0.000000	0.000000	0.032258
45-55	0.005376	0.008065	0.012097	0.000000	0.000000	0.000000	0.025538
55-65	0.000000	0.006720	0.002688	0.000000	0.000000	0.000000	0.009409
65-75	0.009409	0.002688	0.001344	0.000000	0.000000	0.000000	0.013441
75-85	0.004032	0.005376	0.002688	0.000000	0.000000	0.000000	0.012097
85-95	0.001344	0.001344	0.000000	0.000000	0.000000	0.000000	0.002688
95-105	0.004032	0.001344	0.000000	0.000000	0.000000	0.000000	0.005376
105-115	0.001344	0.001344	0.000000	0.000000	0.000000	0.000000	0.002688
115-125	0.001344	0.001344	0.000000	0.000000	0.000000	0.000000	0.002688
125-135	0.002688	0.006720	0.000000	0.000000	0.000000	0.000000	0.009409
135-145	0.005376	0.006720	0.001344	0.000000	0.000000	0.000000	0.013441
145-155	0.008065	0.005376	0.006720	0.000000	0.000000	0.000000	0.020161
155-165	0.009409	0.002688	0.006720	0.013441	0.000000	0.000000	0.032258
165-175	0.005376	0.004032	0.009409	0.008065	0.000000	0.000000	0.026882
175-185	0.017473	0.005376	0.004032	0.000000	0.000000	0.000000	0.026882
185-195	0.013441	0.002688	0.005376	0.000000	0.000000	0.000000	0.021505
195-205	0.010753	0.001344	0.001344	0.001344	0.000000	0.000000	0.014785
205-215	0.014785	0.013441	0.000000	0.000000	0.000000	0.000000	0.028226
215-225	0.012097	0.067204	0.005376	0.000000	0.000000	0.000000	0.084677
225-235	0.017473	0.028226	0.000000	0.000000	0.000000	0.000000	0.045699
235-245	0.020161	0.004032	0.000000	0.000000	0.000000	0.000000	0.024194
245-255	0.006720	0.001344	0.000000	0.000000	0.000000	0.000000	0.008065
255-265	0.006720	0.001344	0.000000	0.000000	0.000000	0.000000	0.008065
265-275	0.002688	0.002688	0.006720	0.000000	0.000000	0.000000	0.012097
275-285	0.008065	0.006720	0.002688	0.000000	0.000000	0.000000	0.017473
285-295	0.006720	0.005376	0.002688	0.001344	0.000000	0.000000	0.016129
295-305	0.008065	0.002688	0.006720	0.001344	0.000000	0.000000	0.018817
305-315	0.005376	0.006720	0.013441	0.001344	0.000000	0.000000	0.026882
315-325	0.002688	0.013441	0.016129	0.000000	0.000000	0.000000	0.032258
325-335	0.004032	0.020161	0.018817	0.000000	0.000000	0.000000	0.043011
335-345	0.017473	0.029570	0.022849	0.001344	0.000000	0.000000	0.071237
345-355	0.008065	0.022849	0.014785	0.001344	0.000000	0.000000	0.047043
Total	0.267473	0.397849	0.241935	0.044355	0.000000	0.000000	0.951613

Frequency of Calm Winds: 4.84%
Average Wind Speed: 2.86 m/s

APPENDIX B

Listing of PM_{10} Concentrations

Background Monitor 962A

PM_{10} Sampler Summary

January 1, 2020 - March 31, 2020

Network: **Alton Coal Development**
Site: Coal Hollow
Sampler ID: Coal Hollow-A
Sampler Type: BGI PQ100

AQS ID:

Date	Filter ID	Concentration (µg/m3) LTP	Concentration (µg/m3) STP	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
01/04/20	P2961757	**0.7**	**0.9**	24:00	24.0	20.3	400.3630	400.3819	0.0189		
01/10/20	P2961761	**1.4**	**1.6**	24:00	24.0	20.5	398.1944	398.2287	0.0343		
01/16/20	P2962030	**2.1**	**2.6**	24:00	24.0	19.8	378.2245	378.2762	0.0517		
01/22/20	P2962034	**2.0**	**2.4**	24:00	24.0	20.2	397.9699	398.0196	0.0497		
01/28/20	P2962184	**2.9**	**3.5**	24:00	24.0	20.3	391.4921	391.5636	0.0715		
02/03/20	P2962175	**4.2**	**5.0**	24:00	24.0	20.2	402.2431	402.3457	0.1026		
02/09/20	P2962179	**3.0**	**3.6**	24:00	24.0	20.0	405.1414	405.2150	0.0736		
02/15/20	P2962575	**2.4**	**2.9**	24:00	24.0	20.1	401.2053	401.2642	0.0589		
02/21/20	P2962579	**2.8**	**3.4**	24:00	24.0	20.0	398.8609	398.9298	0.0689		
02/27/20	P2962721	**1.6**	**1.9**	24:00	24.0	20.1	397.2095	397.2496	0.0401		
03/04/20	P2962727	**Invalid - AQ**	**Invalid - AQ**	24:00	24.0	19.8	395.4778	395.5318	0.0540	CI	
03/10/20	P2962893	**2.3**	**2.8**	24:00	24.0	19.9	399.8808	399.9368	0.0560		
03/16/20	P2962897	**2.1**	**2.6**	24:00	24.0	19.6	403.4446	403.4958	0.0512		
03/22/20	P2962901	**2.1**	**2.6**	24:00	24.0	20.0	396.8141	396.8661	0.0520	HT	
03/28/20	P2963085	**3.4**	**4.1**	24:00	24.0	20.1	398.2607	398.3438	0.0831		
02/28/20	P2962725		**Field Blank**				391.9325	391.9456	0.0131		

# Valid	Recovery	Average	St. Dev.	Max	Min
14	**93%**	**2.9**	**1.0**	**5.0**	**0.9**

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Compliance Monitor 963B

PM_{10} Sampler Summary

January 1, 2020 - March 31, 2020

Network: **Alton Coal Development**
Site: Coal Hollow
Sampler ID: Coal Hollow-B
Sampler Type: BGI PQ100

AQS ID:

Date	Filter ID	Concentration (µg/m3) LTP	Concentration (µg/m3) STP	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
01/04/20	P2961758	**2.1**	**2.5**	23:59	24.0	20.6	398.8851	398.9378	0.0527		
01/10/20	P2961762	**9.7**	**11.2**	23:59	24.0	20.8	393.9244	394.1581	0.2337		
01/16/20	P2962031	**13.5**	**16.0**	24:00	24.0	20.4	374.6308	374.9574	0.3266		
01/22/20	P2962035	**2.8**	**3.2**	24:00	24.0	20.5	376.0233	376.0910	0.0677		
01/28/20	P2962040	**Invalid - AN**	**Invalid - AN**				393.5888	393.5961	0.0073		Did not run
02/03/20	P2962176	**Invalid - AN**	**Invalid - AN**				397.3576	397.3678	0.0102		Did not run
02/09/20	P2962180	**Invalid - AN**	**Invalid - AN**				406.1353	406.1403	0.0050		Did not run
02/15/20	P2962576	**20.0**	**23.6**	24:00	24.0	20.4	399.4186	399.9007	0.4821		
02/21/20	P2962580	**21.2**	**25.0**	24:00	24.0	20.4	400.8733	401.3850	0.5117		
02/27/20	P2962722	**Invalid - AN**	**Invalid - AN**	24:00	24.0	20.4	396.6781	396.7101	0.0320		Did not run
03/04/20	P2962728	**50.9**	**61.0**	24:00	24.0	20.1	394.4099	395.6356	1.2257		
03/10/20	P2962894	**Invalid - AN**	**Invalid - AN**				397.5971	397.6023	0.0052	SP,MD	Did not run
03/16/20	P2962898	**Invalid - AN**	**Invalid - AN**				399.8838	399.8969	0.0131	SP,HT	Did not run
03/22/20	P2962902	**Invalid - AN**	**Invalid - AN**				396.8244	396.8442	0.0198	SP,MD	Did not run
03/28/20	P2963086	**Invalid - AN**	**Invalid - AN**				400.8979	400.9110	0.0131	SP	Did not run
02/28/20	P2962726		**Field Blank**				391.8750	391.8847	0.0097		

# Valid	Recovery	Average	St. Dev.	Max	Min
7	**47%**	**20.4**	**20.0**	**61.0**	**2.5**

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Collocated Monitor 964C

PM_{10} Sampler Summary

January 1, 2020 - March 31, 2020

Network: **Alton Coal Development**
Site: Coal Hollow
Sampler ID: Coal Hollow-C
Sampler Type: BGI PQ100

AQS ID:

Date	Filter ID	Concentration (µg/m3) LTP	Concentration (µg/m3) STP	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
01/04/20	P2961759	**2.1**	**2.5**	23:59	24.0	20.7	398.1846	398.2367	0.0521		
01/10/20	P2961763	**7.5**	**8.7**	23:59	24.0	20.9	398.6753	398.8577	0.1824		
01/16/20	P2962032	**25.7**	**30.3**	23:59	24.0	20.4	375.7706	376.3891	0.6185		
01/22/20	P2962039	**2.8**	**3.3**	23:59	24.0	20.5	399.7306	399.7999	0.0693		
01/28/20	P2962041	**4.1**	**4.8**	23:59	24.0	20.6	397.4605	397.5593	0.0988		
02/03/20	P2962177	**10.5**	**12.3**	23:59	24.0	20.5	400.5092	400.7633	0.2541		
02/09/20	P2962181	**6.2**	**7.4**	23:59	24.0	20.4	391.3446	391.4958	0.1512		
02/15/20	P2962577	**4.1**	**4.8**	24:00	24.0	20.4	394.8533	394.9523	0.0990		
02/21/20	P2962581	**35.7**	**41.3**	23:59	24.0	20.8	397.9300	398.7883	0.8583		
02/27/20	P2962723	**Invalid - AN**	**Invalid - AN**				388.8885	388.9246	0.0361	SP,MD	Did not run
03/04/20	P2962729	**Invalid - AN**	**Invalid - AN**	0:32	0.5	0.4	393.4127	393.4439	0.0312	SP	
03/10/20	P2962895	**Invalid - AN**	**Invalid - AN**	0:32	0.5	0.4	400.0766	400.0855	0.0089	SP	
03/16/20	P2962899	**Invalid - AN**	**Invalid - AN**	0:32	0.4	0.3	402.6560	402.6692	0.0132	SP,HT	
03/22/20	P2963083	**Invalid - AN**	**Invalid - AN**				400.6463	400.7824	0.1361	SP,MD	Did not run
03/28/20	P2963087	**4.0**	**4.7**	23:59	24.0	20.4	398.8930	398.9902	0.0972		

# Valid	Recovery	Average	St. Dev.	Max	Min
10	**67%**	**12.0**	**13.1**	**41.3**	**2.5**

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Compliance Monitor 2366D

Collocated Monitor 2398E

PM_{10} Sampler Summary

January 1, 2020 - March 31, 2020

Network: **Alton Coal Development**
Site: Coal Hollow
Sampler ID: Coal Hollow-E
Sampler Type: BGI PQ100

AQS ID:

Date	Filter ID	Concentration (µg/m3) LTP	Concentration (µg/m3) STP	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
01/04/20	P2961760	**3.1**	**3.6**	24:00	24.0	20.7	402.2391	402.3141	0.0750		
01/10/20	P2961764	**3.8**	**4.4**	24:00	24.0	20.9	401.1720	401.2653	0.0933		
01/16/20	P2962033	**7.7**	**9.1**	24:00	24.0	20.4	400.3350	400.5220	0.1870		
01/22/20	P2962038	**2.6**	**3.1**	24:00	24.0	20.5	403.0896	403.1544	0.0648		
01/28/20	P2962037	**2.2**	**2.6**	24:00	24.0	20.6	399.9747	400.0296	0.0549		
02/03/20	P2962178	**8.4**	**9.9**	24:00	24.0	20.5	400.0913	400.2949	0.2036		
02/09/20	P2962182	**Invalid - AN**	**Invalid - AN**				397.6390	397.6421	0.0031		Did not run
02/15/20	P2962578	**4.8**	**5.6**	24:00	24.0	20.4	397.9924	398.1085	0.1161		
02/21/20	P2962582	**10.3**	**12.1**	24:00	24.0	20.4	392.3249	392.5729	0.2480		
02/27/20	P2962724	**4.6**	**5.5**	24:00	24.0	20.5	393.9572	394.0698	0.1126		
03/04/20	P2962730	**15.4**	**18.4**	24:00	24.0	20.2	395.1498	395.5222	0.3724		
03/10/20	P2962896	**4.3**	**5.1**	24:00	24.0	20.3	396.6145	396.7190	0.1045		
03/16/20	P2962900	**7.1**	**8.5**	24:00	24.0	20.0	396.7689	396.9406	0.1717	HT	
03/22/20	P2963084	**2.3**	**2.7**	24:00	24.0	20.3	399.1754	399.2307	0.0553	HT	
03/28/20	P2963088	**3.6**	**4.3**	24:00	24.0	20.4	400.1109	400.1994	0.0885		
03/31/20	P2963093		**Field Blank**				396.1148	396.1304	0.0156		

# Valid	Recovery	Average	St. Dev.	Max	Min
14	**93%**	**6.8**	**4.4**	**18.4**	**2.6**

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APPENDIX C

Precision and Single-Point Flow Rate Checks

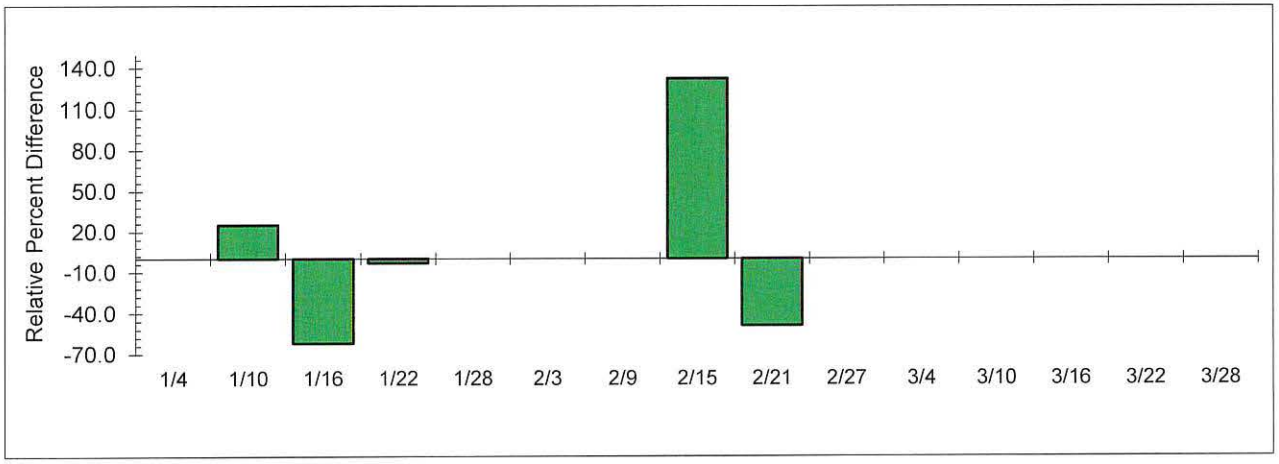
Alton Coal Development
Coal Hollow

Precision Report For Collocated Samplers

STP PM10 Concentrations(µg/m³)
January 1, 2020 - March 31, 2020

Date	1/4	1/10	1/16	1/22	1/28	2/3	2/9	2/15	2/21	2/27	3/4	3/10	3/16	3/22	3/28
Coal Hollow-B	2.5	11.2	16.0	3.2	0.3			23.6	25.0		61.0				
Coal Hollow-C	2.5	8.7	30.3	3.3	4.8	12.3	7.4	4.8	41.3						4.7
Rel. %Diff.	*	25.1	-61.8	-3.1	*	*	*	132.4	-49.2	*	*	*	*	*	*

Relative Percent Difference = ((X - Y) / ((X + Y) / 2)) * 100 X=Coal Hollow-B Y =Coal Hollow-C



Statistical Calculations:

n=	5.0	S Dev=	77.5 %
Mean=	8.7	** CV=	106.3 %

*** Both sample concentrations must be greater than or equal to 3 µg/m³ to be used for these precision calculations.**
For a detailed discussion of these precision calculations, refer to 40 CFR 58, Appendix A.

**** CV - Upper 90% Confidence bound for Coefficient of Variation**

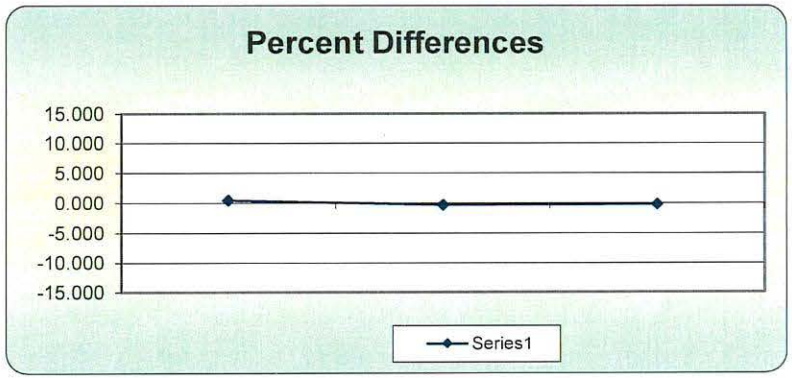
Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 962A		Pollutant type:					Bias (%)
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d^2	|d|	$\|d\|^2$	
16.7	16.63	0.421	-0.298	0.177	0.421	0.177	
16.7	16.76	-0.358	75th Percentile	0.128	0.358	0.128	
16.7	16.74	-0.239	0.091	0.057	0.239	0.057	

n	$\Sigma\|d\|$	"AB" (Eqn 4)
3	1.018	0.339
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
2	0.362	0.092

Bias (%) (Eqn 3)	Both Signs Positive
0.5	FALSE
Signed Bias (%)	Both Signs Negative
+/-0.5	FALSE



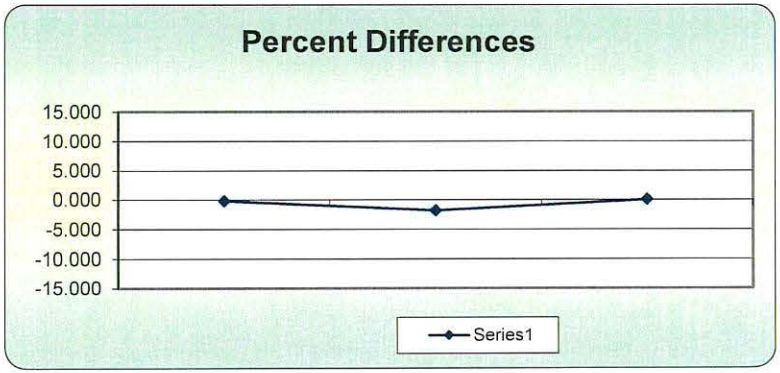
Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 963B		Pollutant type:					Bias (%)
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d^2	|d|	$\|d\|^2$	
16.7	16.74	-0.239	-1.427	0.057	0.239	0.057	
16.7	17.01	-1.822	75th Percentile	3.321	1.822	3.321	
			-0.635				

n	$\Sigma\|d\|$	"AB" (Eqn 4)
2	2.061	1.031
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
1	3.378	1.120

Bias (%) (Eqn 3)	Both Signs Positive
6.03	FALSE
Signed Bias (%)	Both Signs Negative
-6.03	TRUE



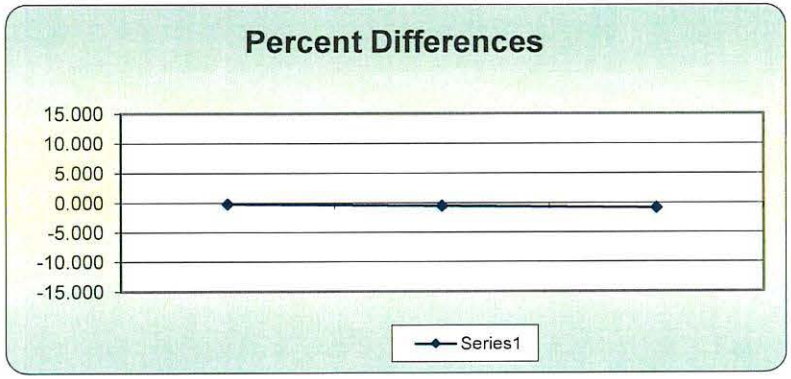
Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 964C		Pollutant type:					Bias (%)
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d^2	|d|	$\|d\|^2$	
16.7	16.74	-0.239	-0.713	0.057	0.239	0.057	
16.7	16.79	-0.536	75th Percentile	0.287	0.536	0.287	
16.7	16.85	-0.890	-0.387	0.792	0.890	0.792	

n	$\Sigma\|d\|$	"AB" (Eqn 4)
3	1.665	0.555
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
2	1.137	0.326

Bias (%) (Eqn 3)	Both Signs Positive
1.1	FALSE
Signed Bias (%)	Both Signs Negative
-1.1	TRUE



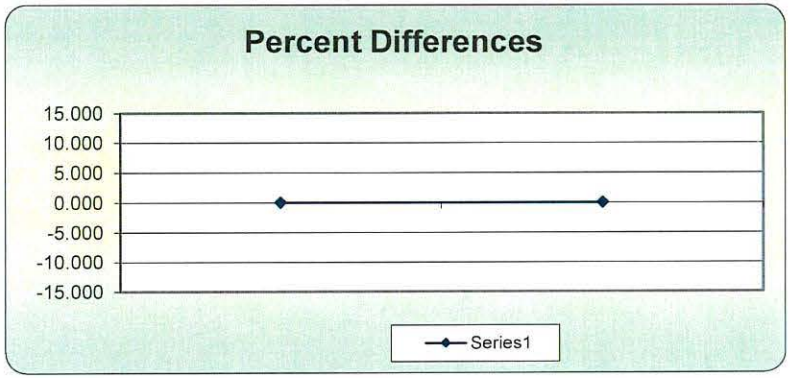
Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 2366D		Pollutant type:					Bias (%)
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d^2	$\|d\|$	$\|d\|^2$	
16.7			#NUM!				
16.7			75th Percentile				
			#NUM!				

n	$\Sigma\|d\|$	"AB" (Eqn 4)
2	0.000	#DIV/0!
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
1	0.000	0.000

Bias (%) (Eqn 3)	Both Signs Positive
#DIV/0!	#NUM!
Signed Bias (%)	Both Signs Negative
#NUM!	#NUM!



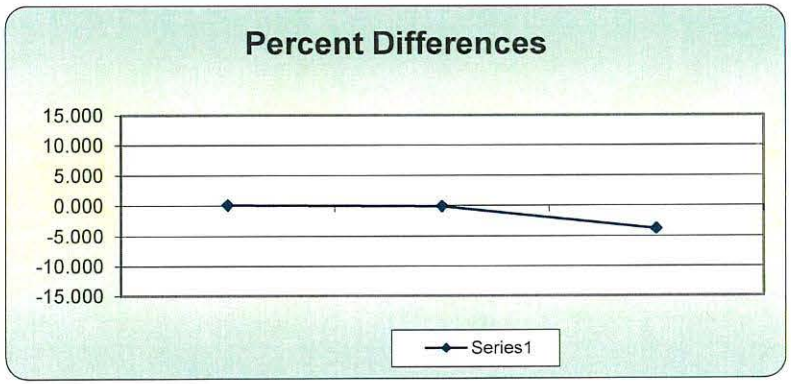
Alton Coal Development, LLC - Coal Hollow Mine

One-Point Flow Rate Bias Estimate

Site ID: Monitor 2398E		Pollutant type:					Bias (%)
Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	25th Percentile	d^2	$\|d\|$	$\|d\|^2$	
16.7	16.69	0.060	-1.961	0.004	0.060	0.004	
16.7	16.72	-0.120	75th Percentile	0.014	0.120	0.014	
16.7	17.36	-3.802	-0.030	14.454	3.802	14.454	

n	$\Sigma\|d\|$	"AB" (Eqn 4)
3	3.981	1.327
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
2	14.472	2.143

Bias (%) (Eqn 3)	Both Signs Positive
4.94	FALSE
Signed Bias (%)	Both Signs Negative
-4.94	TRUE



APPENDIX D

Field Data Sheets

Background Monitor 962A

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials	
01-06-20	1042	01-06-20	1035	22	26	M-M	01-10-20	JKSR	codes P & G
01-13-20	0954	01-13-20	0946	26	10	M-M	01-16-20	JKSR	" " "
01-17-20	1009	01-17-20	1001	10	14	M-M	01-22-20	JKSR	" " "
01-23-20	1119	01-23-20	1111	14	37	M-M	01-28-20	JKSR	" " "
01-29-20	0909	01-29-20	0856	37	4	M-M	02-03-20	JKSR	" " "
02-04-20	1244	02-04-20	1235	4	31	M-M	02-0920	KN	" P "
02-11-20	0910	02-11-20	0900	31	8	M-M	02-15-20	JKSR	" " "
02-18-20	0752	02-18-20	0742	8	22	M-M	02-21-20	JKSR	" " "
02-24-20	1038	02-24-20	1028	22	10	M-M	02-27-20	JKSR	" " "
02-28-20	1334	02-28-20	1323	10	16	1323	02-28-20	JKSR	Blank
02-28-20	1336	02-28-20	1325	16	26	M-M	03-04-20	JKSR	codes P & G
03-06-20	1341	03-06-20	1330	26	4	M-M	03-10-20	JKSR	
03-12-20	1138	03-12-20	1027	4	14	M-M	03-16-20	JKSR	
03-18-20	1138	03-18-20	1027	14	31	M-M	03-22-20	JKSR	
03-24-20	9:48	03-24-20	8:36	31	35	M-M	03-28-20	KN	
03-31-20	0951	03-31-20	0849	35	39	M-M	0403-20	JKSR	

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
1/29/20	1328	132	131	Pass	KN	Cleaned
2/28/20	1051	129	128	Pass	KN	Cleaned
3/24/20		128	126	Pass	KN	

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/29/20	1331	16.7	583	582	6.0	7.4	13.59	16.63	0.42	KN
2/28/20	1055	16.7	583	582	6.0	7.3	14.01	16.76	-0.36	KN
3/24/20		16.7	583	583	2.5	2.1	~~16.74~~	16.74	-0.2	KN

~~Notes~~

Compliance Monitor 963B

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials	
01-06-20	1102	01-06-20	1101	23	27	M-M	01-10-20	JKSR	
01-13-20	1014	01-13-20	1012	27	11	M-M	01-16-20	JKSR	
01-17-20	1031	01-17-20	1030	11	15	M-M	01-22-20	JKSR	
01-23-20	1139	01-23-20	1138	15	39	M-M	01-28-20	JKSR	
01-29-20	0924	01-29-20	0923	39	5	M-M	02-03-20	JKSR	?
02-04-20	1308	02-04-20	1307	5	32	M-M	02-09-20	KN	Did not Run
02-11-20	0936	02-11-20	0933	32	9	M-M	02-15-20	JKSR	
02-18-20	0845	02-18-20	0842	9	23	M-M	02-21-20	JKSR	
02-24-20	1108	02-24-20	1104	23	11	M-M	02-27-20	JKSR	code P
02-28-20	1358	02-28-20	1354	11	17	1354	02-28-20	JKSR	Blank
02-28-20	1400	02-28-20	1356	17	27	M-M	03-04-20	JKSR	code P
03-06-20	1355	03-06-20	1350	27	5	M-M	03-10-20	JKSR	
03-12-20	1155	03-12-20	1049	5	15	M-M	03-16-20	JKSR	
03-18-20	1155	03-18-20	1049	15	32	M-M	03-22-20	JKSR	code T No Run
03-24-20	10:23	03-19-20	10:25	32	36	M-M	03-28-20	KN	wrong date & Time
03-31-20	1032	03-31-20	0930	36	40	M-M	04-03-20	JKSR	no run Didn't Run

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
3/19/20	10:29	103	103	Pass	KN	
3/24/20		103	102	Pass	KN	Fixed Filter Height

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
3/19/20	10:31	16.7	587	586	0.3°C	0.9°C	13.87	16.51		KN
3/19/20	1338	16.7	589	587.5	1.6°C	2.2°C	14.00	16.74		KN
3/24/20		16.7	592	589	4.3	4.2		17.01	1.9	KN

adj. Flow up

Cmonitor notes

Cal. Mem had 10 LPM changed back to 16.7

106 18

Co-located Monitor 964C

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials
01-06-20	1104	01-06-20	1059	24	28	M-M	01-10-20	JKSR
01-13-20	1016	01-13-20	1011	28	12	M-M	01-16-20	JKSR
01-17-20	1032	01-17-20	1026	12	16	M-M	01-22-20	JKSR
01-23-20	1140	01-23-20	1135	16	42	M-M	01-28-20	JKSR
01-29-20	0726	01-29-20	0721	42	6	M-M	02-03-20	JKSR
02-04-20	1320	02-04-20	1314	6	34	M-M	02-09-20	KN
02-11-20	0938	02-11-20	0932	34	19	M-M	02-15-20	JKSR
02-18-20	0847	02-18-20	0841	19	24	M-M	02-21-20	JKSR
02-24-20	1109	02-24-20	1102	24	12	M-M	02-27-20	JKSR
02-28-20	1401	02-28-20	1354	12	28	M-M	03-04-20	JKSR
03-06-20	1357	03-06-20	1349	28	6	M-M	03-10-20	JKSR
03-12-20	1157	03-12-20	1050	6	18	M-M	03-16-20	JKSR
03-18-20	1157	03-18-20	1050	18	33	M-M	03-22-20	JKSR
03-24-20	1031	03-24	930	33	37	M-M	03-28-20	KN
03-31-20	1033	03-31-20	0931	37	41	M-M	04-03-20	JKSR

codes: Q & T NO Run
" " " "
" P " " "
Still Running

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
~~1/29/20~~	~~1414~~	~~16.7~~	~~590~~	~~588~~	~~8.01~~	~~7.8~~
~~2/28/20~~	~~1208~~	~~16.7~~	~~589~~	~~588~~	~~7.2~~	
1/29/20	1409	96	96	Pass	KN	Cleaned
2/28/20	1202	97	97	Pass	KN	Cleaned
3/24/20		98	96	Pass	KN	cleaned

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/29/20	1414	16.7	590	588	8.01	7.8	16.74	16.74	-0.24	KN
2/28/20	1208	16.7	589	588	7.2	7.4	16.79	16.79	-0.54	KN
3/24/20		16.7	592	589	3.3	3.0		16.85	-0.9	KN

Compliance Monitor 2366D

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials
01-06-20		01-06-20			NOT	Running		JKSR
01-13-20	—	01-13-20	—	~~30~~	30	M-M	01-16-20	JKSR
01-17-20		01-17-20		30	~~78~~	M-M	01-22-20	JKSR Did Not Run
01-23-20		01-23-20			NOT	Running		JKSR
01-29-20		01-29-20			"	"		JKSR
02-11-20		02-11-20			"	"		JKSR
02-18-20		02-18-20			"	"		JKSR
02-24-20		02-24-20			"	"		JKSR
02-28-20		02-28-20			"	"		JKSR
03-06-20		03-06-20			"	"		JKSR
03-12-20		03-12-20			"	"		JKSR
03-18-20		03-18-20			"	"		JKSR
03-31-20		03-31-20			"	"		JKSR

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
			N/A			

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
			N/A							

Co-located Monitor 2398E

Table I - Every 6th Day Sampling

Date	Time	Displayed Date	Displayed Time	Collected Filter ID#	New Filter ID#	Sample Start Time	Sample Start Date	Sampler Initials	
01-06-20	1121	01-06-20	1115	25	29	M-M	01-10-20	JKSR	
01-13-20	1032	01-13-20	1026	29	13	M-M	01-16-20	JKSR	
01-17-20	1045	01-17-20	1046	13	20	M-M	01-22-20	JKSR	
01-23-20	1155	01-23-20	1155	20	18	M-M	01-28-20	JKSR	
01-29-20	0940	01-29-20	0939	18	7	M-M	02-03-20	JKSR	
02-04-20	1336	02-04-20	1335	7	35	M-M	02-09-20	KN	
02-11-20	0952	02-11-20	0950	35	21	M-M	02-15-20	JKSR	
02-18-20	0912	02-18-20	0910	21	25	M-M	02-21-20	JKSR	
02-24-20	1124	02-24-20	1121	25	13	M-M	02-27-20	JKSR	
02-28-20	1417	02-28-20	1414	13	29	M-M	03-04-20	JKSR	
03-06-20	1326	03-06-20	1323	29	7	M-M	03-10-20	JKSR	
03-12-20	1107	03-12-20	1004	7	20	M-M	03-16-20	JKSR	
03-18-20	1221	03-18-20	1116	20	34	M-M	03-22-20	JKSR	
03-24-20	11:05	03-24-20	10:00	34	38	M-M	03-28-20	KN	
03-31-20	1110	03-31-20	1009	38	~~42~~	~~M-M~~	~~03-31-20~~	JKSR	Blank JBR1
03-31-20	1113	03-31-20	1012	JBR1	~~JKR~~ 42	M-M	04-03-20	JKSR	

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
1/29/20	1425	122	119	Pass	KN	Cleaned
2/28/20	1420	120	118	Pass	KN	Cleaned
3/24/20		119	117	Pass	KN	Cleaned

Table III - Monthly Flow Rate Verification

Date	Time	Monitor Flow (Q Lpm)	Monitor Baro Pressure (mmHg)	Delta Cal Baro Pressure (mmHg)	Monitor Temp (A)	Delta Cal Temp (Ta)	Delta Cal Flow (Qs)	Delta Cal Flow (Qa)	Accuracy	Initials
1/28/20	1429	16.7	587	588	5.6	6.7	13.69	16.65	0.70	KN
2/28/20	1430	16.7	587	588	5.6	6.8	13.72	16.72	-0.72	KN
3/24/20		16.7	592.0	588.5	2.7	3.4		17.36	-3.8	KN

APPENDIX E

Independent PM_{10} Sampler Performance Audit Report

AUDIT REPORT
FOR

ALTON COAL DEVELOPMENT, LLC
COAL HOLLOW MINE
ALTON, UTAH
FIRST QUARTER 2020

Prepared for

Kirk Nicholes
Alton Coal Development, LLC
463 N 100 W
Cedar City, Utah, 84721

Prepared by

Air Resource SPECIALISTS

1901 Sharp Point Drive, Suite F
Fort Collins, CO 80525
970-484-7941

Site Audited: March 24, 2020

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1.0 INTRODUCTION

Air Resource Specialists, Inc. (ARS) conducted a performance audit of Alton Coal Development, LLC ambient air quality monitoring systems on March 24, 2020. The monitoring sites are located at the Coal Hollow Mine near Alton, Utah.

Table 1-1

Site Location Information

	Primary CHM	Background	Primary NPL	Meteorological
Latitude	37° 24' 5.0" N	37° 24' 20.9" N	37° 24' 43" N	37° 23' 53.2" N
Longitude	112° 27' 21.0" W	112° 26' 1.1" W	112° 27' 30.6" W	112° 26' 43.1" W
UTM	12S 371147 4140396	12S 373119 4140856	12S 370928 4141570	12S 372073 4140018
Elevation	6,890 feet MSL	7,158 feet MSL	6,959 feet MSL	7,007 feet MSL

Audit results for the particulate samplers are summarized in Table 1-2. Audit results for the meteorological measurements are summarized in Table 1-3. Detailed discussions of performance audit findings and other findings can be found in Section 3.0.

Table 1-2

Summary of Particulate Sampler Audit Results

	Parameter	**Instrument**	**Within Accuracy Goal**
Primary CHM	PM_{10}	BGI PQ200S	No
	PM_{10} (collocated)	BGI PQ200S	Yes
Background #1	PM_{10}	BGI PQ200S	Yes
Primary NPL	PM_{10}	BGI PQ200	Out for Repair
	PM_{10} (collocated)	BGI PQ200	Yes

Details of the audit are presented in the following sections:

Section 2.0	Audit Methods and Equipment
Section 3.0	Audit Results
Appendix A	Audit Data Forms
Appendix B	Audit Standards Certifications

Any questions related to this audit or audit report should be addressed to:

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Quality Assurance Officer / Lead Auditor
Air Resource Specialists, Inc.
1901 Sharp Point Drive, Suite F
Fort Collins, Colorado 80525
Telephone: 970-484-7941
Fax: 970-484-3423
E-mail: ckirk@air-resource.com

2.0 AUDIT METHODS

Audit procedures, audit challenge ranges, and acceptance criteria are described below. These ranges and limits conform to EPA's PSD guidelines. Audit results were verbally communicated to the site operator prior to departure from the site. A follow-up e-mail summarizing audit findings was also sent to Alton Coal Development, LLC personnel. Audit details are provided in Appendix A.

Guidance from the following EPA documents was used to establish the audit procedures:

- 40 CFR 58, Appendix B. *Quality Assurance Requirements for Prevention of Significant Deterioration (PSD) Air Monitoring*
- EPA *Quality Assurance Handbook for Air Pollution Measurement Systems:*
  - *Volume I. A Field Guide to Environmental Quality Assurance*
  - *Volume II. Ambient Air Quality Monitoring Program*
  - *Volume IV. Meteorological Measurements*
- EPA *Meteorological Monitoring Guidance for Regulatory Modeling Applications*

2.1 PARTICULATE SAMPLERS (FRM PM_{10})

The filter-based FRM PM_{10} particulate samplers are audited in their normal operating mode. ARS audits the samplers with a BGI deltaCal audit standard which measures flow, temperature, and barometric pressure. Prior to conducting the flow audit, a system leak check is performed in accordance with the manufacturer's specifications. The observed volumetric operational flow and design flow of the sampler are compared to the audit flows measured by the audit standard. Differences between the operational sampler flow and audit flow that are greater than ±10% are considered out of tolerance. Differences between the designated design flow and the audit flow greater than ±10% are considered out of tolerance. In addition to the flow audits, observed ambient temperature, filter temperature, and barometric pressure measurements of the particulate samplers are also audited by comparison to the audit standard. A temperature difference greater than ±2°C and a barometric pressure difference greater than ±10mm Hg are considered out of tolerance. Audit methods and acceptable criteria for the particulate samplers are summarized in Table 2-1.

Table 2-1

Particulate Samplers
Audit Acceptance Criteria

Parameter	Audit Method	Acceptance Criteria
FRM PM_{10}	Leak Check	Manufacturer specs
	Audit flow to actual sampler flow	≤ ± 10%
	Design criteria flow to audit flow	≤ ± 10%
	Audit temperature to sampler temperature	≤ ± 2 °C
	Audit temperature to sampler filter temperature	≤ ± 2 °C
	Audit barometric pressure to sampler pressure	≤ ±10mm Hg

Table 2-2

Particulate Samplers
Audit Equipment

References	Manufacturer	Model Number	Serial Number	Expiration Date
FRM Flow	BGI	DeltaCal	1237	1/21/2021

3.0 AUDIT RESULTS

Audit findings and recommendations are discussed below. Detailed audit results are provided in Appendix A.

Performance Audit Results

The primary CHM sampler was found with a clock that was five days off. The instrument also failed the leak check. The leak check results indicate a very small issue that needs to be remedied; however it does not likely affect the sampling. Although a minor finding, the background sampler was found with a clock that was 12 minutes behind.

APPENDIX A

AUDIT DATA FORMS

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/21/2021
PM Temperature Standard #1	BGI	deltaCal	1237	1/21/2021
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/21/2021

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N963B

Date and Time correct?
☐ Yes ☑ No
If no, time off by:
-5 days

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK	
Vacuum Loss Rate	Pass/Fail
>5cm	FAIL

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	17.01	16.70	-1.8%	1.9%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	3.0	2.8	-0.2	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	4.2	4.3	0.1	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	589.0	592.0	3.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/21/2021
PM Temperature Standard #1	BGI	deltaCal	1237	1/21/2021
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/21/2021

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N964C

Date and Time correct?
☑ Yes ☐ No
If no, time off by:
0 min

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK		
	Vacuum Loss Rate	Pass/Fail
	2 cm	PASS

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.85	16.70	-0.9%	0.9%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

AMBIENT TEMPERATURE SENSOR (°C)				
	Reference	Instrument	Difference	
	3.3	3.0	-0.3	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

FILTER TEMPERATURE SENSOR (°C)				
	Reference	Instrument	Difference	
	3.7	3.7	0.0	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

PRESSURE SENSOR (mmHg)				
	Reference	Instrument	Difference	
	589.0	592.0	3.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/21/2021
PM Temperature Standard #1	BGI	deltaCal	1237	1/21/2021
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/21/2021

MANUFACTURER	BGI
MODEL	PQ200S
SERIAL NUMBER	N962

Date and Time correct?
☐ Yes ☑ No
If no, time off by:
-12 min

SETTINGS	
Total Flow	16.70

	Automated LEAK CHECK	
	Vacuum Loss Rate	Pass/Fail
	2 cm	PASS

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.74	16.70	-0.2%	0.2%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	2.1	2.5	0.4	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	2.1	2.4	0.3	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	583.0	583.0	0.0	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	deltaCal	1237	1/21/2021
PM Temperature Standard #1	BGI	deltaCal	1237	1/21/2021
PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/21/2021

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	2398E

Date and Time correct?
☐ Yes ☑ No
If no, time off by:
-4 min

SETTINGS	
Total Flow	16.70

	Automated LEAK CHECK	
	Vacuum Loss Rate	Pass/Fail
	2 cm	PASS

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	17.36	16.70	-3.8%	4.0%	PASS

AUDIT CRITERIA (<=)	
Actual Flow % Diff	10%
Design Flow % Diff	10%

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	3.4	2.7	-0.7	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	4.3	4.4	0.1	PASS

AUDIT CRITERIA (<=)	
Temperature Difference (°C)	2

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	588.5	592.0	3.5	PASS

AUDIT CRITERIA (<=)	
Pressure Difference (mmHg)	10

NOTES:

Air Resource SPECIALISTS

SITE INFORMATION

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
NETWORK TYPE		Alton Coal- Coal Hollow					

		Deg	Min	Sec		Decimal
LATITUDE	North				--CALCULATE->	
LONGITUDE	West					

Decimal		Deg	Min	Sec
	--CALCULATE->			

	Meters		Feet
ELEVATION		--CALCULATE->	

Feet		Meters
	--CALCULATE->	

Please verify site standards used by the site operator

SITE STANDARDS	MANUFACTURER	MODEL	SERIAL #	Calibration Expiration Date
PM Flow Reference				

NOTES:

Air Resource SPECIALISTS

CALIBRATION AND VERIFICATION STANDARDS

ABBR.	n/a	CLIENT	Alton	AUDITOR	C.Kirk	DATE	3/24/2020
SITE NAME		Coal Hollow Mine					
Network type		Alton Coal- Coal Hollow					

	MANUFACTURER	MODEL	SERIAL #	Calibration Expiration Date
Ozone Transfer Standard				
Gas Dilution Transfer Standard				
MFC High Flow Reference				
MFC Low Flow Reference				
Temperature Reference				
AT/RH Sensor Reference				
Barometric Pressure Reference				
Wind Speed Reference (high rpm)				
Wind Speed Reference (low rpm)				
Wind Speed Torque Gauge				
Wind Direction Alignment Reference				
Wind Direction Linearity Reference				
Wind Direction Torque Gauge				
Solar Radiation Reference				
Multiplier ___ W/m2 / mV				
UV Radiation Reference				
Multiplier ___ W/m2 / mV				
Precipitation Reference				
Volume ___ mL				

PM Flow Standard #1	BGI	deltaCal	1237	1/21/2021
PM Flow Standard #2				
PM Flow Standard #3				
PM Flow Standard #4				

PM Temperature Standard #1	BGI	deltaCal	1237	1/21/2021
PM Temperature Standard #2				
PM Temperature Standard #3				
PM Temperature Standard #4				

PM Barometric Pressure Standard #1	BGI	deltaCal	1237	1/21/2021
PM Barometric Pressure Standard #2				
PM Barometric Pressure Standard #3				
PM Barometric Pressure Standard #4				

TEOM MTV Standard				

HiVol Direct Flow Reference				
Orifice				
ΔP orifice manometer				

APPENDIX B

AUDIT STANDARDS CERTIFICATIONS

Mesa Labs 10 Park Place Butler, NJ 07405
NIST Traceable Calibration Facility, ISO 9001:2008 Registered

MesaLabs

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

(Refer to instruction manual for further details of calibration)

DeltCal Serial Number: 1237 **Date:** 10-Jan-20

Calibration Technician : Jan Oviedo

Critical Venturi Flow Meter: Max Uncertainity = 0.346%

Serial Number: 1 CEESI NVLAP NIST Data File 04BGI151
Serial Number: 2 CEESI NVLAP NIST Data File 04BGI152
Serial Number: 3 CEESI NVLAP NIST Data File 04BGI153
Serial Number: 4 CEESI NVLAP NIST Data File 02BGI004

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 23.90 °C
NIST Traceability No. 516837

Brand: Telatemp **Serial Number:** 300907
Std Cal Date: 3-Jul-19 **Std Cal Due Date:** 2-Jul-20
DeltaCal :
Ambient Temperature (set): 23.90 °C
Aux (filter) Temperature (set): °C

Barometric Pressure and Absolute Pressure

Vaisala Model: PTB330(50-1100) Digital Accuracy: 0.03371%
Serial Number: C4310002
Std Cal Date: 13-Mar-19 **Std Cal Due Date:** 12-Mar-20
Serial Number:
TetraCal :
Barometric pressure (set): **761** mm of Hg

Results of Venturi Calibration

Flow Rate (Q) vs. Pressure Drop (ΔP). Where: Q=Lpm, ΔP= Cm of H2O

Q= 4.05476 ΔP ^ 0.51624 Overall Uncertainty: 0.35%
Q= 3.91546 ΔP ^ 0.53466 Overall Uncertainty: 0.35%

Date Placed In Service 1/21/20
(To be filled in by operator upon receipt)

Recommended Recalibration Date 1/21/21
(12 months from date placed in service)

Revised: August 2019
Cal102-01T1 Rev E

Mesa Labs 10 Park Place Butler, NJ 07405

NIST Traceable Calibration Facility, ISO 9001:2008 Registered

Pre-Recertification

To Check a deltaCal

1.5-19.5 VER 4.00

Date	Technician
10-Jan-2020	J. Oviedo

Maximum allowable error at any flow rate is .75%.

Serial No. 1237

BP= 762 mm of Hg

	Reading Abs. P Crit. Vent. mm of Hg	Room Temp	CV Qa Flow Lpm	Qa deltaCal Indicated	% Error
# 2	158.79	23.60	1.755	1.769	**0.80**
	269.05	23.60	3.006	3.012	**0.19**
	340.27	23.60	3.815	3.810	**-0.12**
	416.61	23.60	4.681	4.679	**-0.04**
	516.19	23.60	5.811	5.870	**1.01**
# 1	175.74	23.60	6.798	6.749	**-0.72**
	267.20	23.60	10.438	10.333	**-1.01**
	348.19	23.60	13.662	13.556	**-0.78**
	427.19	23.60	16.806	16.742	**-0.38**
	487.02	23.60	19.188	19.177	**-0.06**
				Average %	**-0.11**

As Received

	DUT	Standard	Difference		Allowable	Condition
Pres AMB mmhg	762	762	0		1	In Tolerance
Temp AMB °C	24.3	23.5	0.8		1	In Tolerance
Temp Filter °C	23.5	23.5	0		1	In Tolerance