Alton Coal Development, LLC

463 North 100 West, Suite 1

Cedar City, Utah 84720

Phone (435) 867-5331 / Fax (435) 867-1192

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

FEB 27 2024

DIVISION OF AIR QUALITY

February 22,2024

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

RE: 4th QT 2023 Report - Coal Hollow Mine
Project ID: N14047-0004

Dear Mrs. Bartlett,

Please find enclosed the Summary of PM_{10} Data Collected at the Coal Hollow Mine, Utah during the Fourth Quarter, 2023 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

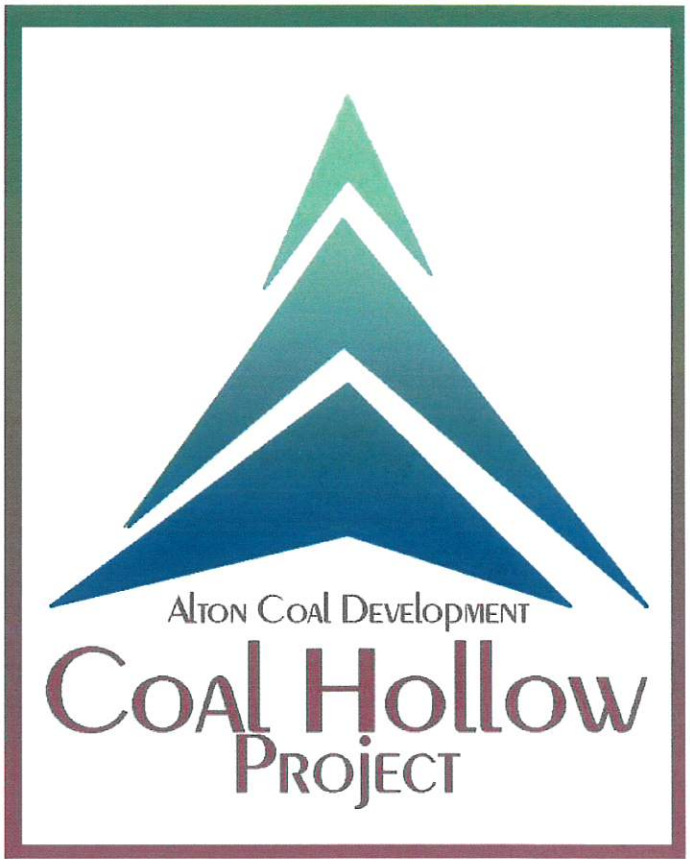
UTAH DEPARTMENT OF
ENVIRONMENTAL QUALITY
FEB 27 2024
DIVISION OF AIR QUALITY

Alton Coal Development LLC.

Summary of PM_{10} Data
Collected at Coal Hollow Mine, Utah
During the Fourth Quarter, 2023

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

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



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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 fourth quarter of 2024.

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 I on the following page gives an overview of the site location. Specifically, the Coal Hollow Mine is located in Sections 7, 18, 19, 20, 29, and 30 of Township 39S, Range 5W and Section 12 and 13 of Township 39S, Range 6W; 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. In preparation for future mining at the South Private Lease (SPL), the CHM compliance monitor and the co-located monitor have been relocated to the coordinates: Northing: 4140833, Easting 371231, (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

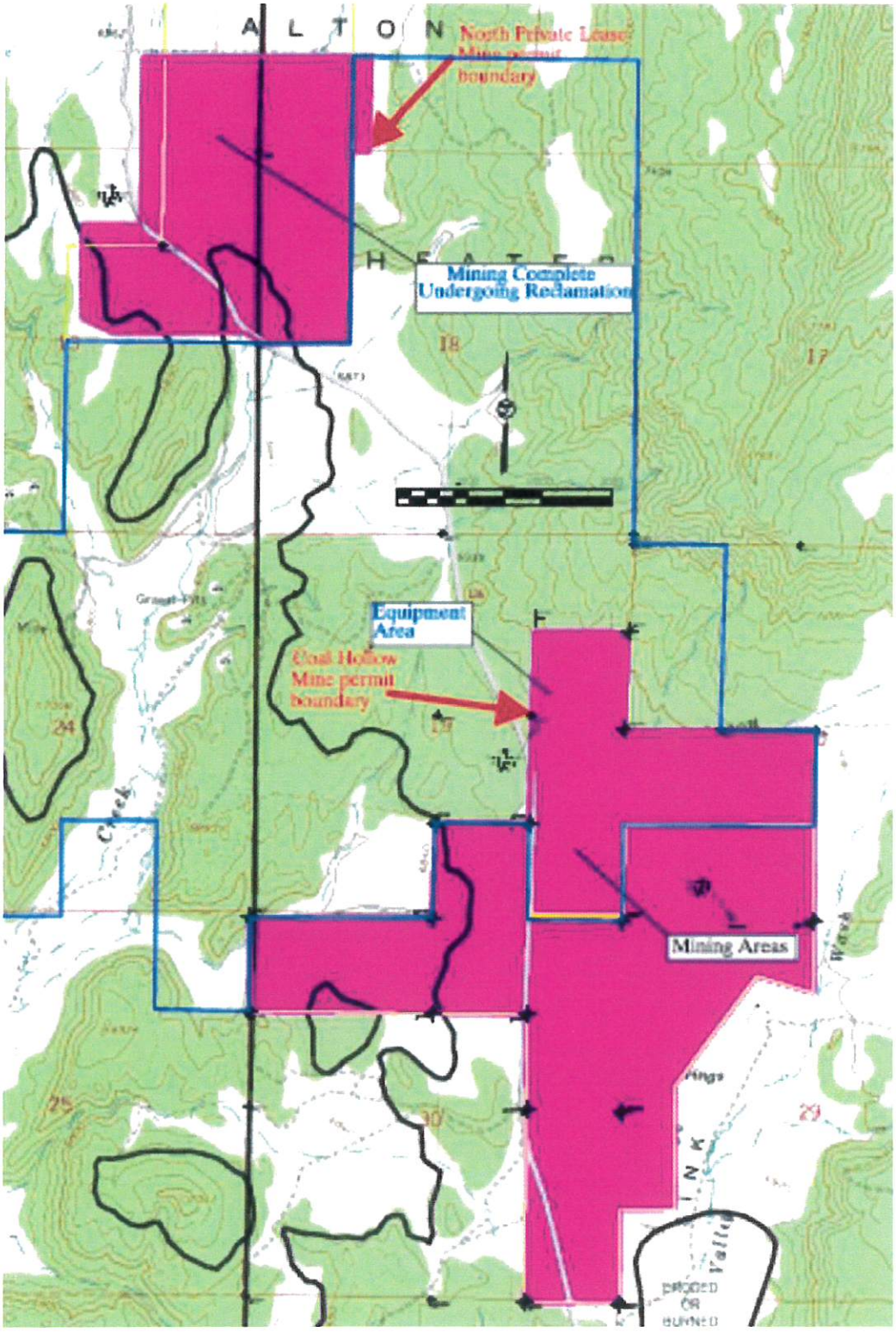
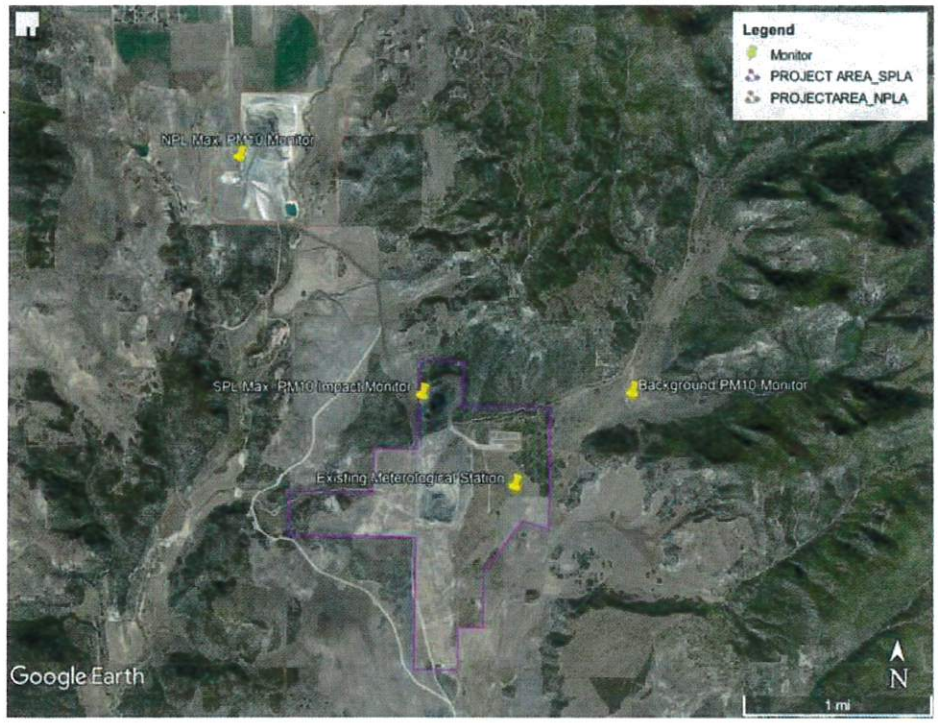


Figure 2 - Satellite View of Monitoring Locations



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. 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.

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	11/8/23	25.8
2nd Highest	12/14/23	7.7
Monthly Mean	10/1/23-10/31/23	NA
Monthly Mean	11/1/23-11/30/23	10.5
Monthly Mean	12/1/23-9/31/23	2.7
Quarterly Mean	10/1/23-12/31/23 (9 valid samples)	6.2

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

RANK	DATE	PM_{10} CONCENTRATION
Highest	11/14/23	56.4
2nd Highest	11/8/23	14.4
Monthly Mean	10/1/23-10/31/23	NA
Monthly Mean	11/1/23-11/30/23	19.5
Monthly Mean	12/1/23-9/31/23	3.1
Quarterly Mean	10/1/23-12/31/23 (8 valid samples)	11.3

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

RANK	DATE	PM_{10} CONCENTRATION
Highest	11/14/23	33.5
2nd Highest	12/20/23	10.2
Monthly Mean	10/1/23-10/31/23	NA
Monthly Mean	11/1/23-11/30/23	12.2
Monthly Mean	12/1/23-9/31/23	5.3
Quarterly Mean	10/1/23-12/31/23 (9 valid samples)	8.3

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

RANK	DATE	PM_{10} CONCENTRATION
Highest	12/8/23	60.4
2nd Highest	11/14/23	8.6
Monthly Mean	10/1/23-10/31/23	NA
Monthly Mean	11/1/23-11/30/23	4.6
Monthly Mean	12/1/23-9/31/23	17.1
Quarterly Mean	10/1/23-12/31/23 (8 valid samples)	10.8

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

RANK	DATE	PM_{10} CONCENTRATION
Highest	11/8/23	NA
2nd Highest	12/14/23	NA
Monthly Mean	10/1/23-10/31/23	NA
Monthly Mean	11/1/23-11/30/23	NA
Monthly Mean	12/1/23-9/31/23	NA
Quarterly Mean	10/1/23-12/31/23 (0 valid samples)	NA

Table VI – Mean Quarterly and Monthly Wind Speed

	4th Quarter 2023	Oct.	Nov.	Dec.
Mean Wind Speed (m/s)	1.97	2.09	2.02	1.80

4.0 DATA RECOVERY AND QUALITY ASSURANCE

4.1 Data Recovery

Monitor 962A

Monitor 962A collected 9 of the 16 samples during the quarter. The percent recovery for this quarter is 60%. For the sample dates of Oct. 3rd through Nov. 2nd the monitor was scheduled but not collected due to the lack of filters.

Monitor 963B

Monitor 963B collected 8 of the 16 samples during the quarter. The percent recovery for this quarter is 53%. For the sample dates of Oct. 3rd through Nov. 2nd the monitor was scheduled but not collected due to the lack of filters. For the sample date of Dec. 20th, the monitor did not get programed.

Monitor 964C

Monitor 964C collected 9 of the 16 samples during the quarter. The percent recovery for this quarter is 60%. For the sample dates of Oct. 3rd through Nov. 2nd the monitor was scheduled but not collected due to the lack of filters.

Monitor 2366D

Monitor 2366D collected 8 of the 16 samples during the quarter. The percent recovery for this quarter is 53%. For the sample dates of Oct. 3rd through Nov. 2nd the monitor was scheduled but not collected due to the lack of filters. For the sample date of Dec. 14th, the monitor did not get programed.

Monitor 2398E

Monitor 2398E collected 0 of the 16 samples during the quarter. The percent recovery for this quarter is 0%. For the sample dates of Oct. 3rd through Nov. 2nd the monitor was scheduled but not collected due to the lack of filters. For the sample date of Nov 8th through Dec 26th, the monitor fail to record any data.

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	16	9	60%
963B	16	8	53%
964C	16	9	60%
2366D	16	8	53%
2398E	16	0	0%

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. Single point precision based on *40 CFR, Part 58*, Appendix A Equation 2 results were -9.1 to 50.9%. The aggregate coefficient of variability (CV) calculated in accordance with *40 CFR, Part 58*, Appendix A Equation 11 is 54.4%. This value is not within the 10% goal for aggregate CV.

Precision calculations at the North Private Lease were not developed due to the lack of operation of 2398E monitor.

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 December 5, 2023. A copy of the audit report is presented in Appendix E and is summarized in Table VI. The audit results indicate that sampler 2366 was not operating properly. Following the completion of the audit O-rings were replaced and leak check ran again. The sampler passed the leak check with the new parts.

Table VIII- Audit Summary

SAMPLER	AUDIT % DIFFERENCE	LIMIT*	DESIGN % DIFFERENCE	LIMIT*
962A	-0.3	±10%	0.3	±10%
963B	0.1	±10%	-0.1	±10%

964C	1.1	±10%	-1.1	±10%
2366D	4.5	±10%	-4.3	±10%
2398E	Fail	±10%	Fail	±10%
*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 were performed by a site technician at the time of the audit. 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

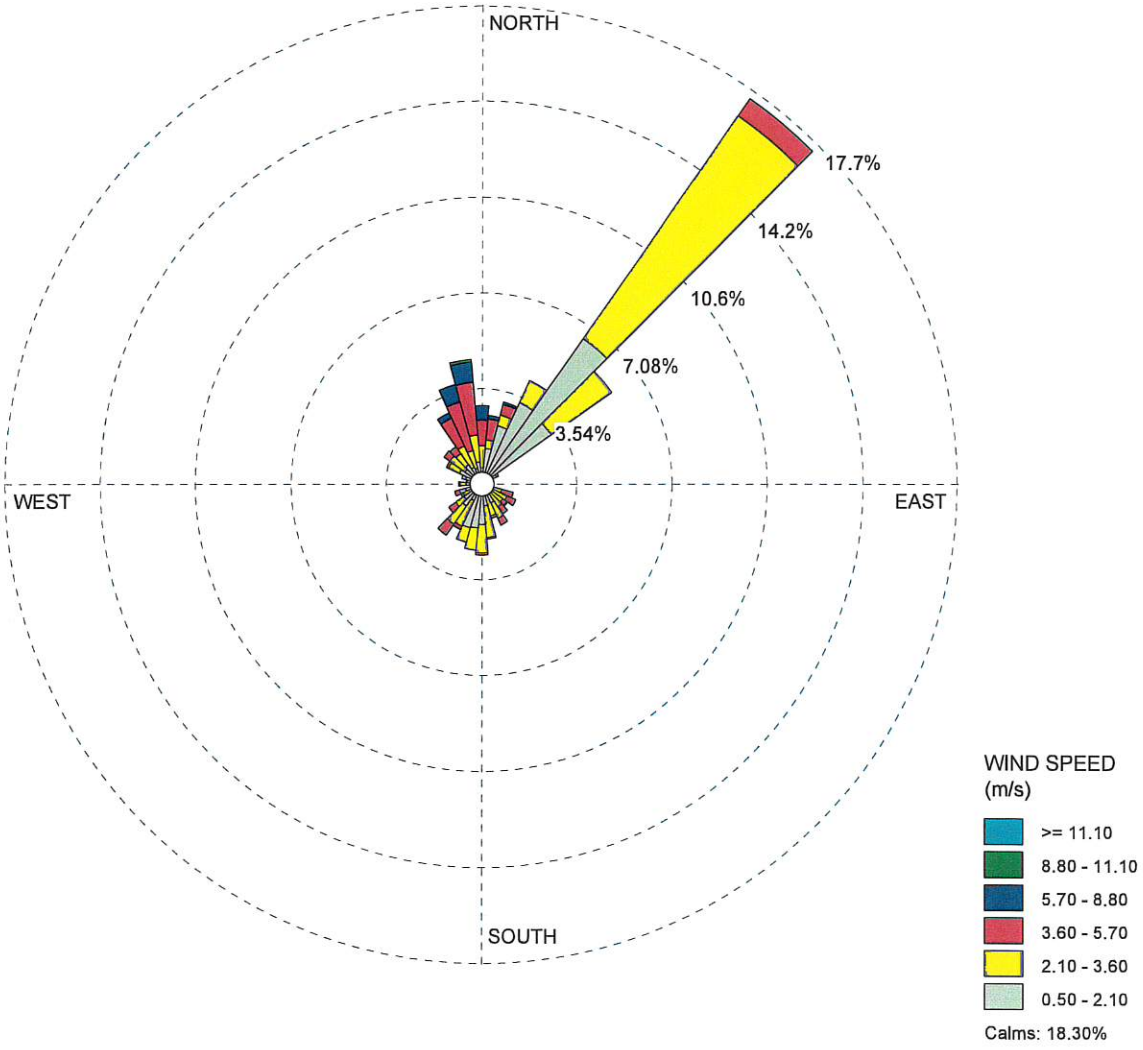
Windrose

WIND ROSE PLOT:

Alton Coal Development LLC
4th Quarter 2023

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD: **Start Date: 10/1/2023 - 00:00** **End Date: 12/31/2023 - 23:00**	COMPANY NAME: **Alton Coal Development LLC - Coal Hollow Mine**	
		MODELER: **Kirk Nicholes**	
	CALM WINDS: **18.30%**	TOTAL COUNT: **2208 hrs.**	
	AVG. WIND SPEED: **1.97 m/s**	DATE: **1/25/2024**	PROJECT NO.:

Station ID: 1
Start Date: 10/1/2023 - 00:00
End Date: 12/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	33	23	2	0	0	0	58
5-15	36	18	0	0	0	0	54
15-25	37	12	0	0	0	0	49
25-35	15	23	3	0	0	0	41
35-45	22	18	11	0	0	0	51
45-55	18	8	7	0	0	0	33
55-65	8	9	2	0	0	0	19
65-75	14	5	4	0	0	0	23
75-85	7	3	0	0	0	0	10
85-95	13	5	1	0	0	0	19
95-105	8	4	0	1	0	0	13
105-115	14	3	0	0	0	0	17
115-125	20	10	2	0	0	0	32
125-135	17	15	6	0	0	0	38
135-145	19	11	7	0	0	0	37
145-155	15	19	25	5	0	0	64
155-165	13	15	41	15	0	0	84
165-175	18	22	43	17	2	0	102
175-185	13	18	21	12	0	0	64
185-195	29	7	17	3	0	0	56
195-205	49	9	9	2	0	0	69
205-215	73	20	0	0	0	0	93
215-225	145	221	17	0	0	0	383
225-235	70	60	0	0	0	0	130
235-245	13	2	0	0	0	0	15
245-255	6	0	0	0	0	0	6
255-265	5	0	0	0	0	0	5
265-275	7	0	0	0	0	0	7
275-285	4	3	0	0	0	0	7
285-295	8	9	10	0	0	0	27
295-305	7	16	8	0	0	0	31
305-315	8	13	4	1	0	0	26
315-325	10	13	7	0	0	0	30
325-335	17	14	6	0	0	0	37
335-345	10	17	2	0	0	0	29
345-355	18	26	1	0	0	0	45
Total	819	671	256	56	2	0	2208

Frequency of Calm Winds: 404
Average Wind Speed: 1.97 m/s

Station ID: 1
Start Date: 10/1/2023 - 00:00
End Date: 12/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	0.014946	0.010417	0.000906	0.000000	0.000000	0.000000	0.026268
5-15	0.016304	0.008152	0.000000	0.000000	0.000000	0.000000	0.024457
15-25	0.016757	0.005435	0.000000	0.000000	0.000000	0.000000	0.022192
25-35	0.006793	0.010417	0.001359	0.000000	0.000000	0.000000	0.018569
35-45	0.009964	0.008152	0.004982	0.000000	0.000000	0.000000	0.023098
45-55	0.008152	0.003623	0.003170	0.000000	0.000000	0.000000	0.014946
55-65	0.003623	0.004076	0.000906	0.000000	0.000000	0.000000	0.008605
65-75	0.006341	0.002264	0.001812	0.000000	0.000000	0.000000	0.010417
75-85	0.003170	0.001359	0.000000	0.000000	0.000000	0.000000	0.004529
85-95	0.005888	0.002264	0.000453	0.000000	0.000000	0.000000	0.008605
95-105	0.003623	0.001812	0.000000	0.000453	0.000000	0.000000	0.005888
105-115	0.006341	0.001359	0.000000	0.000000	0.000000	0.000000	0.007699
115-125	0.009058	0.004529	0.000906	0.000000	0.000000	0.000000	0.014493
125-135	0.007699	0.006793	0.002717	0.000000	0.000000	0.000000	0.017210
135-145	0.008605	0.004982	0.003170	0.000000	0.000000	0.000000	0.016757
145-155	0.006793	0.008605	0.011322	0.002264	0.000000	0.000000	0.028986
155-165	0.005888	0.006793	0.018569	0.006793	0.000000	0.000000	0.038043
165-175	0.008152	0.009964	0.019475	0.007699	0.000906	0.000000	0.046196
175-185	0.005888	0.008152	0.009511	0.005435	0.000000	0.000000	0.028986
185-195	0.013134	0.003170	0.007699	0.001359	0.000000	0.000000	0.025362
195-205	0.022192	0.004076	0.004076	0.000906	0.000000	0.000000	0.031250
205-215	0.033062	0.009058	0.000000	0.000000	0.000000	0.000000	0.042120
215-225	0.065670	0.100091	0.007699	0.000000	0.000000	0.000000	0.173460
225-235	0.031703	0.027174	0.000000	0.000000	0.000000	0.000000	0.058877
235-245	0.005888	0.000906	0.000000	0.000000	0.000000	0.000000	0.006793
245-255	0.002717	0.000000	0.000000	0.000000	0.000000	0.000000	0.002717
255-265	0.002264	0.000000	0.000000	0.000000	0.000000	0.000000	0.002264
265-275	0.003170	0.000000	0.000000	0.000000	0.000000	0.000000	0.003170
275-285	0.001812	0.001359	0.000000	0.000000	0.000000	0.000000	0.003170
285-295	0.003623	0.004076	0.004529	0.000000	0.000000	0.000000	0.012228
295-305	0.003170	0.007246	0.003623	0.000000	0.000000	0.000000	0.014040
305-315	0.003623	0.005888	0.001812	0.000453	0.000000	0.000000	0.011775
315-325	0.004529	0.005888	0.003170	0.000000	0.000000	0.000000	0.013587
325-335	0.007699	0.006341	0.002717	0.000000	0.000000	0.000000	0.016757
335-345	0.004529	0.007699	0.000906	0.000000	0.000000	0.000000	0.013134
345-355	0.008152	0.011775	0.000453	0.000000	0.000000	0.000000	0.020380
Total	0.370924	0.303895	0.115942	0.025362	0.000906	0.000000	0.817029

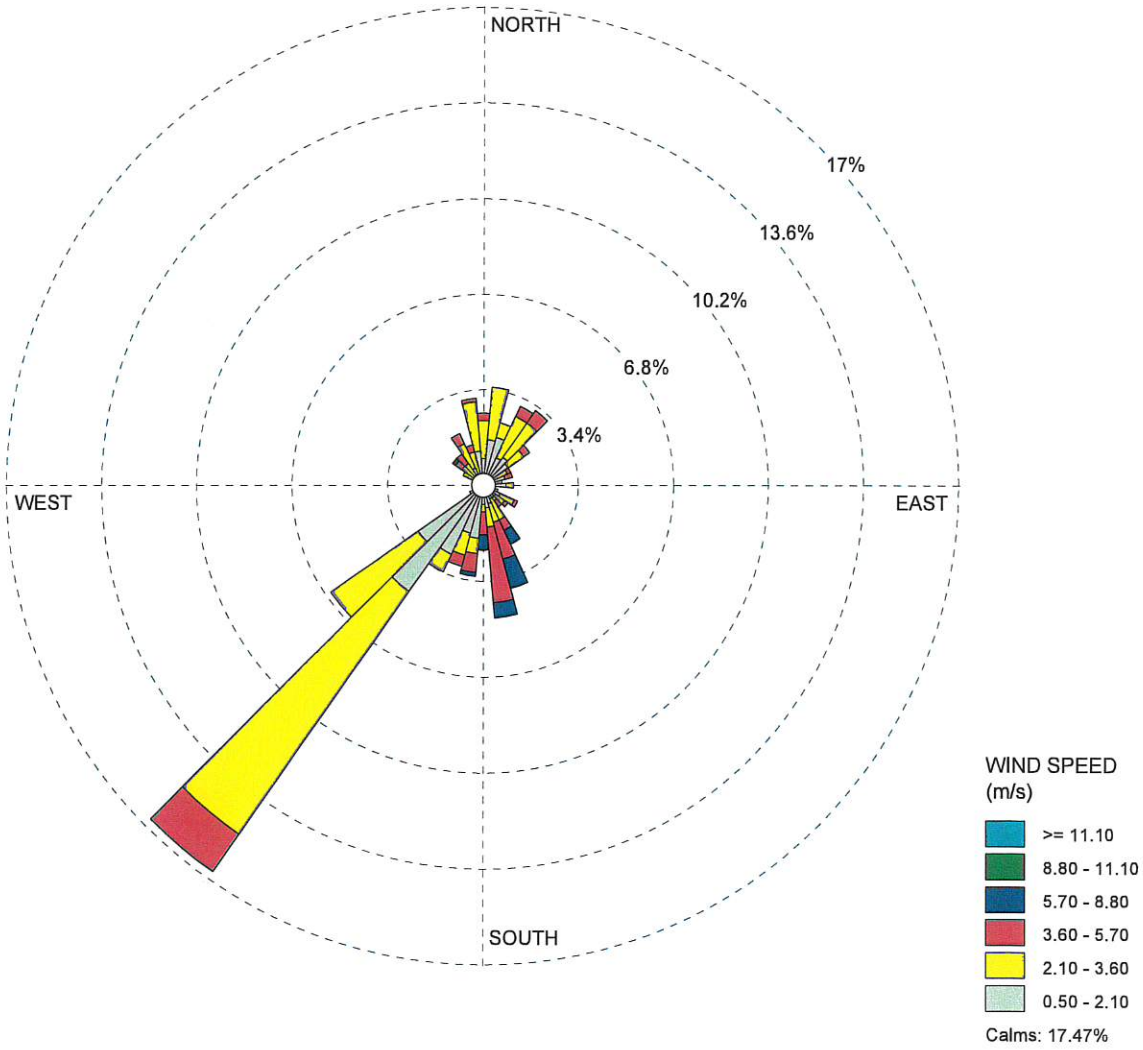
Frequency of Calm Winds: 18.30%
Average Wind Speed: 1.97 m/s

WIND ROSE PLOT:

Alton Coal Development LLC
October 2023

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD: **Start Date: 10/1/2023 - 00:00** **End Date: 10/31/2023 - 23:00**	COMPANY NAME: **Alton Coal Development LLC - Coal Hollow Mine**	
		MODELER: **Kirk Nicholes**	
	CALM WINDS: **17.47%**	TOTAL COUNT: **744 hrs.**	
	AVG. WIND SPEED: **2.09 m/s**	DATE: **1/25/2024**	PROJECT NO.:

Station ID: 1
Start Date: 10/1/2023 - 00:00
End Date: 10/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	7	10	2	0	0	0	19
5-15	12	14	0	0	0	0	26
15-25	13	4	0	0	0	0	17
25-35	8	12	3	0	0	0	23
35-45	9	11	4	0	0	0	24
45-55	8	5	2	0	0	0	15
55-65	3	4	1	0	0	0	8
65-75	6	0	2	0	0	0	8
75-85	2	3	0	0	0	0	5
85-95	6	2	0	0	0	0	8
95-105	0	0	0	1	0	0	1
105-115	1	3	0	0	0	0	4
115-125	5	4	1	0	0	0	10
125-135	4	3	1	0	0	0	8
135-145	4	1	2	0	0	0	7
145-155	4	6	3	4	0	0	17
155-165	5	5	10	8	0	0	28
165-175	6	5	20	4	0	0	35
175-185	5	2	6	4	0	0	17
185-195	14	4	5	1	0	0	24
195-205	13	6	3	0	0	0	22
205-215	20	5	0	0	0	0	25
215-225	34	78	12	0	0	0	124
225-235	21	28	0	0	0	0	49
235-245	3	1	0	0	0	0	4
245-255	1	0	0	0	0	0	1
255-265	3	0	0	0	0	0	3
265-275	3	0	0	0	0	0	3
275-285	1	0	0	0	0	0	1
285-295	1	2	0	0	0	0	3
295-305	2	4	0	0	0	0	6
305-315	3	4	2	1	0	0	10
315-325	3	4	3	0	0	0	10
325-335	5	7	3	0	0	0	15
335-345	3	6	2	0	0	0	11
345-355	9	13	1	0	0	0	23
Total	247	256	88	23	0	0	744

Frequency of Calm Winds: 130
Average Wind Speed: 2.09 m/s

Station ID: 1
Start Date: 10/1/2023 - 00:00
End Date: 10/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	0.009409	0.013441	0.002688	0.000000	0.000000	0.000000	0.025538
5-15	0.016129	0.018817	0.000000	0.000000	0.000000	0.000000	0.034946
15-25	0.017473	0.005376	0.000000	0.000000	0.000000	0.000000	0.022849
25-35	0.010753	0.016129	0.004032	0.000000	0.000000	0.000000	0.030914
35-45	0.012097	0.014785	0.005376	0.000000	0.000000	0.000000	0.032258
45-55	0.010753	0.006720	0.002688	0.000000	0.000000	0.000000	0.020161
55-65	0.004032	0.005376	0.001344	0.000000	0.000000	0.000000	0.010753
65-75	0.008065	0.000000	0.002688	0.000000	0.000000	0.000000	0.010753
75-85	0.002688	0.004032	0.000000	0.000000	0.000000	0.000000	0.006720
85-95	0.008065	0.002688	0.000000	0.000000	0.000000	0.000000	0.010753
95-105	0.000000	0.000000	0.000000	0.001344	0.000000	0.000000	0.001344
105-115	0.001344	0.004032	0.000000	0.000000	0.000000	0.000000	0.005376
115-125	0.006720	0.005376	0.001344	0.000000	0.000000	0.000000	0.013441
125-135	0.005376	0.004032	0.001344	0.000000	0.000000	0.000000	0.010753
135-145	0.005376	0.001344	0.002688	0.000000	0.000000	0.000000	0.009409
145-155	0.005376	0.008065	0.004032	0.005376	0.000000	0.000000	0.022849
155-165	0.006720	0.006720	0.013441	0.010753	0.000000	0.000000	0.037634
165-175	0.008065	0.006720	0.026882	0.005376	0.000000	0.000000	0.047043
175-185	0.006720	0.002688	0.008065	0.005376	0.000000	0.000000	0.022849
185-195	0.018817	0.005376	0.006720	0.001344	0.000000	0.000000	0.032258
195-205	0.017473	0.008065	0.004032	0.000000	0.000000	0.000000	0.029570
205-215	0.026882	0.006720	0.000000	0.000000	0.000000	0.000000	0.033602
215-225	0.045699	0.104839	0.016129	0.000000	0.000000	0.000000	0.166667
225-235	0.028226	0.037634	0.000000	0.000000	0.000000	0.000000	0.065860
235-245	0.004032	0.001344	0.000000	0.000000	0.000000	0.000000	0.005376
245-255	0.001344	0.000000	0.000000	0.000000	0.000000	0.000000	0.001344
255-265	0.004032	0.000000	0.000000	0.000000	0.000000	0.000000	0.004032
265-275	0.004032	0.000000	0.000000	0.000000	0.000000	0.000000	0.004032
275-285	0.001344	0.000000	0.000000	0.000000	0.000000	0.000000	0.001344
285-295	0.001344	0.002688	0.000000	0.000000	0.000000	0.000000	0.004032
295-305	0.002688	0.005376	0.000000	0.000000	0.000000	0.000000	0.008065
305-315	0.004032	0.005376	0.002688	0.001344	0.000000	0.000000	0.013441
315-325	0.004032	0.005376	0.004032	0.000000	0.000000	0.000000	0.013441
325-335	0.006720	0.009409	0.004032	0.000000	0.000000	0.000000	0.020161
335-345	0.004032	0.008065	0.002688	0.000000	0.000000	0.000000	0.014785
345-355	0.012097	0.017473	0.001344	0.000000	0.000000	0.000000	0.030914
Total	0.331989	0.344086	0.118280	0.030914	0.000000	0.000000	0.825269

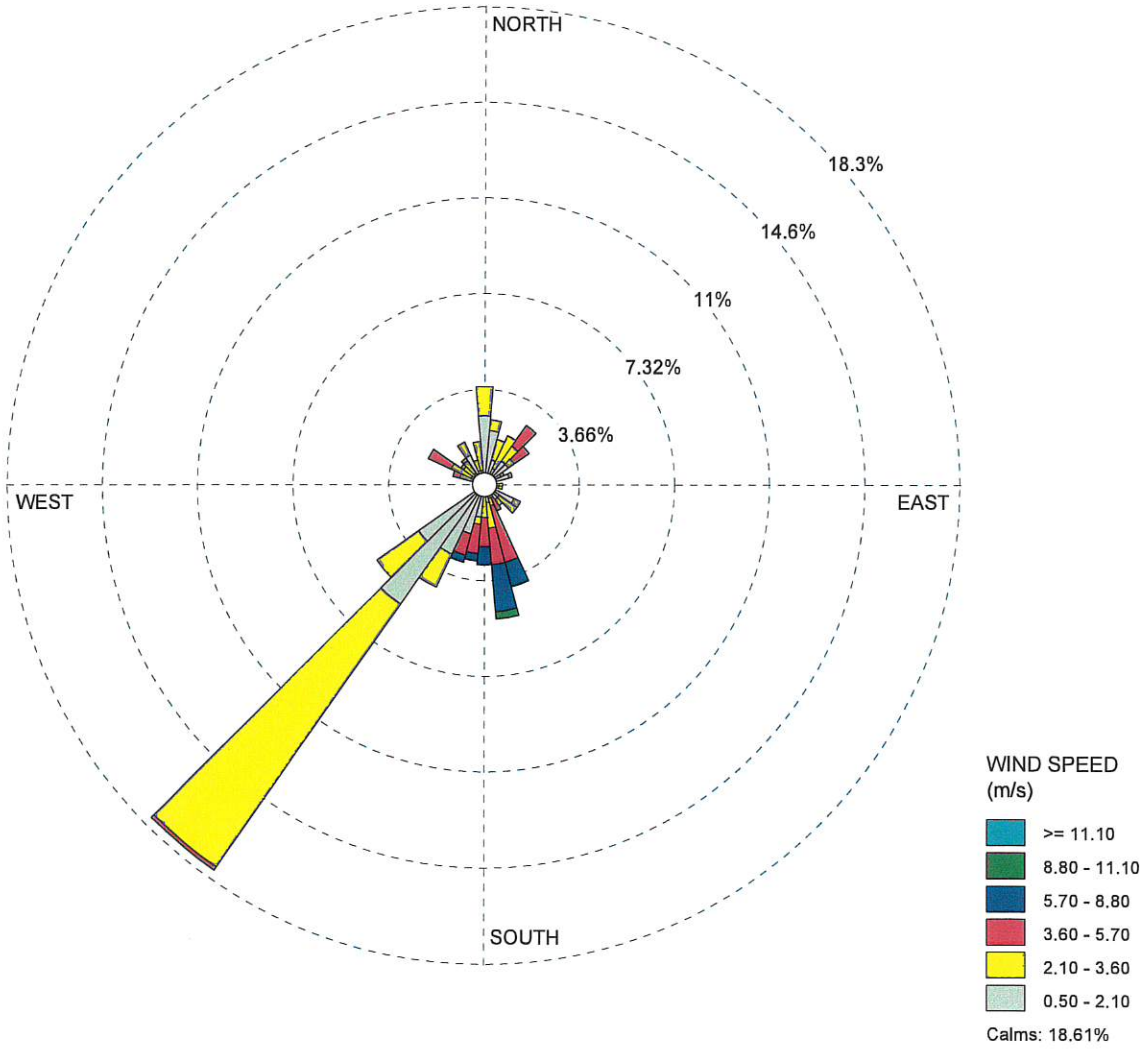
Frequency of Calm Winds: 17.47%
Average Wind Speed: 2.09 m/s

WIND ROSE PLOT:

Alton Coal Development LLC
November 2023

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD: **Start Date: 11/1/2023 - 00:00** **End Date: 11/30/2023 - 23:00**	COMPANY NAME: **Alton Coal Development LLC - Coal Hollow Mine**	
		MODELER: **Kirk Nicholes**	
	CALM WINDS: **18.61%**	TOTAL COUNT: **720 hrs.**	
	AVG. WIND SPEED: **2.02 m/s**	DATE: **1/25/2024**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Station ID: 1
Start Date: 11/1/2023 - 00:00
End Date: 11/30/2023 - 23:00

Run ID: Coal Hollow Mine

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	19	8	0	0	0	0	27
5-15	15	3	0	0	0	0	18
15-25	7	6	0	0	0	0	13
25-35	5	10	0	0	0	0	15
35-45	8	5	7	0	0	0	20
45-55	8	2	5	0	0	0	15
55-65	3	2	1	0	0	0	6
65-75	7	1	0	0	0	0	8
75-85	3	0	0	0	0	0	3
85-95	4	1	0	0	0	0	5
95-105	4	1	0	0	0	0	5
105-115	2	0	0	0	0	0	2
115-125	9	2	0	0	0	0	11
125-135	5	6	0	0	0	0	11
135-145	5	2	0	0	0	0	7
145-155	3	1	4	0	0	0	8
155-165	4	2	16	7	0	0	29
165-175	5	7	10	13	2	0	37
175-185	3	6	8	5	0	0	22
185-195	9	2	8	2	0	0	21
195-205	14	0	6	2	0	0	22
205-215	21	10	0	0	0	0	31
215-225	40	88	1	0	0	0	129
225-235	22	14	0	0	0	0	36
235-245	3	0	0	0	0	0	3
245-255	1	0	0	0	0	0	1
255-265	1	0	0	0	0	0	1
265-275	2	0	0	0	0	0	2
275-285	2	1	0	0	0	0	3
285-295	3	4	2	0	0	0	9
295-305	4	6	7	0	0	0	17
305-315	3	4	1	0	0	0	8
315-325	4	4	1	0	0	0	9
325-335	9	4	0	0	0	0	13
335-345	4	3	0	0	0	0	7
345-355	4	8	0	0	0	0	12
Total	265	213	77	29	2	0	720

Frequency of Calm Winds: 134
Average Wind Speed: 2.02 m/s

Station ID: 1
Start Date: 11/1/2023 - 00:00
End Date: 11/30/2023 - 23:00

Run ID: Coal Hollow Mine

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	0.026389	0.011111	0.000000	0.000000	0.000000	0.000000	0.037500
5-15	0.020833	0.004167	0.000000	0.000000	0.000000	0.000000	0.025000
15-25	0.009722	0.008333	0.000000	0.000000	0.000000	0.000000	0.018056
25-35	0.006944	0.013889	0.000000	0.000000	0.000000	0.000000	0.020833
35-45	0.011111	0.006944	0.009722	0.000000	0.000000	0.000000	0.027778
45-55	0.011111	0.002778	0.006944	0.000000	0.000000	0.000000	0.020833
55-65	0.004167	0.002778	0.001389	0.000000	0.000000	0.000000	0.008333
65-75	0.009722	0.001389	0.000000	0.000000	0.000000	0.000000	0.011111
75-85	0.004167	0.000000	0.000000	0.000000	0.000000	0.000000	0.004167
85-95	0.005556	0.001389	0.000000	0.000000	0.000000	0.000000	0.006944
95-105	0.005556	0.001389	0.000000	0.000000	0.000000	0.000000	0.006944
105-115	0.002778	0.000000	0.000000	0.000000	0.000000	0.000000	0.002778
115-125	0.012500	0.002778	0.000000	0.000000	0.000000	0.000000	0.015278
125-135	0.006944	0.008333	0.000000	0.000000	0.000000	0.000000	0.015278
135-145	0.006944	0.002778	0.000000	0.000000	0.000000	0.000000	0.009722
145-155	0.004167	0.001389	0.005556	0.000000	0.000000	0.000000	0.011111
155-165	0.005556	0.002778	0.022222	0.009722	0.000000	0.000000	0.040278
165-175	0.006944	0.009722	0.013889	0.018056	0.002778	0.000000	0.051389
175-185	0.004167	0.008333	0.011111	0.006944	0.000000	0.000000	0.030556
185-195	0.012500	0.002778	0.011111	0.002778	0.000000	0.000000	0.029167
195-205	0.019444	0.000000	0.008333	0.002778	0.000000	0.000000	0.030556
205-215	0.029167	0.013889	0.000000	0.000000	0.000000	0.000000	0.043056
215-225	0.055556	0.122222	0.001389	0.000000	0.000000	0.000000	0.179167
225-235	0.030556	0.019444	0.000000	0.000000	0.000000	0.000000	0.050000
235-245	0.004167	0.000000	0.000000	0.000000	0.000000	0.000000	0.004167
245-255	0.001389	0.000000	0.000000	0.000000	0.000000	0.000000	0.001389
255-265	0.001389	0.000000	0.000000	0.000000	0.000000	0.000000	0.001389
265-275	0.002778	0.000000	0.000000	0.000000	0.000000	0.000000	0.002778
275-285	0.002778	0.001389	0.000000	0.000000	0.000000	0.000000	0.004167
285-295	0.004167	0.005556	0.002778	0.000000	0.000000	0.000000	0.012500
295-305	0.005556	0.008333	0.009722	0.000000	0.000000	0.000000	0.023611
305-315	0.004167	0.005556	0.001389	0.000000	0.000000	0.000000	0.011111
315-325	0.005556	0.005556	0.001389	0.000000	0.000000	0.000000	0.012500
325-335	0.012500	0.005556	0.000000	0.000000	0.000000	0.000000	0.018056
335-345	0.005556	0.004167	0.000000	0.000000	0.000000	0.000000	0.009722
345-355	0.005556	0.011111	0.000000	0.000000	0.000000	0.000000	0.016667
Total	0.368056	0.295833	0.106944	0.040278	0.002778	0.000000	0.813889

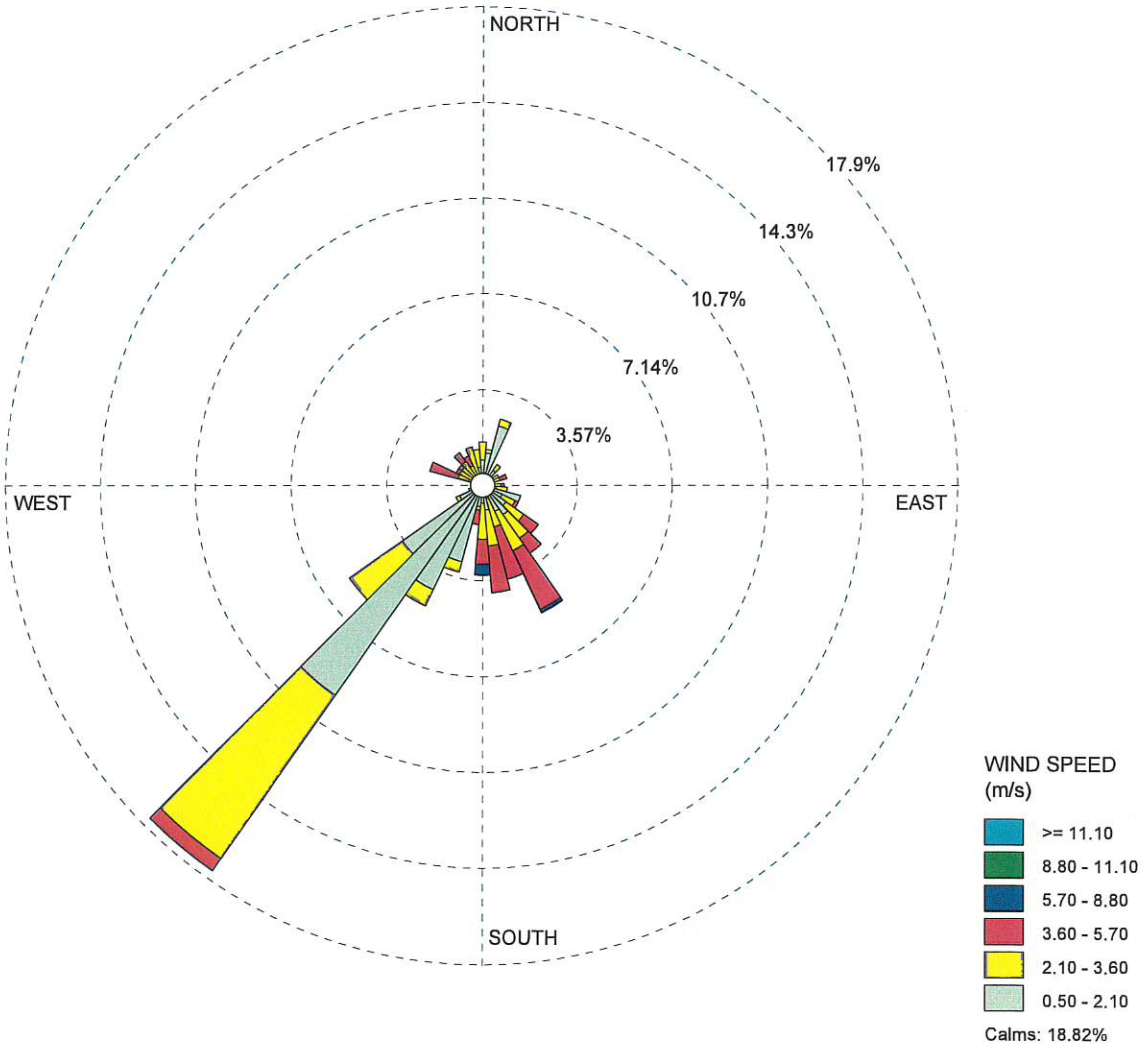
Frequency of Calm Winds: 18.61%
Average Wind Speed: 2.02 m/s

WIND ROSE PLOT:

Alton Coal Development LLC
December 2023

DISPLAY:

Wind Speed
Flow Vector (blowing to)



COMMENTS:	DATA PERIOD: **Start Date: 12/1/2023 - 00:00** **End Date: 12/31/2023 - 23:00**	COMPANY NAME: **Alton Coal Development LLC - Coal Hollow Mine**	
		MODELER: **Kirk Nicholes**	
	CALM WINDS: **18.82%**	TOTAL COUNT: **744 hrs.**	
	AVG. WIND SPEED: **1.80 m/s**	DATE: **1/25/2024**	PROJECT NO.:

Station ID: 1
Start Date: 12/1/2023 - 00:00
End Date: 12/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	7	5	0	0	0	0	12
5-15	9	1	0	0	0	0	10
15-25	17	2	0	0	0	0	19
25-35	2	1	0	0	0	0	3
35-45	5	2	0	0	0	0	7
45-55	2	1	0	0	0	0	3
55-65	2	3	0	0	0	0	5
65-75	1	4	2	0	0	0	7
75-85	2	0	0	0	0	0	2
85-95	3	2	1	0	0	0	6
95-105	4	3	0	0	0	0	7
105-115	11	0	0	0	0	0	11
115-125	6	4	1	0	0	0	11
125-135	8	6	5	0	0	0	19
135-145	10	8	5	0	0	0	23
145-155	8	12	18	1	0	0	39
155-165	4	8	15	0	0	0	27
165-175	7	10	13	0	0	0	30
175-185	5	10	7	3	0	0	25
185-195	6	1	4	0	0	0	11
195-205	22	3	0	0	0	0	25
205-215	32	5	0	0	0	0	37
215-225	71	55	4	0	0	0	130
225-235	27	18	0	0	0	0	45
235-245	7	1	0	0	0	0	8
245-255	4	0	0	0	0	0	4
255-265	1	0	0	0	0	0	1
265-275	2	0	0	0	0	0	2
275-285	1	2	0	0	0	0	3
285-295	4	3	8	0	0	0	15
295-305	1	6	1	0	0	0	8
305-315	2	5	1	0	0	0	8
315-325	3	5	3	0	0	0	11
325-335	3	3	3	0	0	0	9
335-345	3	8	0	0	0	0	11
345-355	5	5	0	0	0	0	10
Total	307	202	91	4	0	0	744

Frequency of Calm Winds: 140
Average Wind Speed: 1.80 m/s

Station ID: 1
Start Date: 12/1/2023 - 00:00
End Date: 12/31/2023 - 23:00

Run ID: Coal Hollow Mine

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	0.009409	0.006720	0.000000	0.000000	0.000000	0.000000	0.016129
5-15	0.012097	0.001344	0.000000	0.000000	0.000000	0.000000	0.013441
15-25	0.022849	0.002688	0.000000	0.000000	0.000000	0.000000	0.025538
25-35	0.002688	0.001344	0.000000	0.000000	0.000000	0.000000	0.004032
35-45	0.006720	0.002688	0.000000	0.000000	0.000000	0.000000	0.009409
45-55	0.002688	0.001344	0.000000	0.000000	0.000000	0.000000	0.004032
55-65	0.002688	0.004032	0.000000	0.000000	0.000000	0.000000	0.006720
65-75	0.001344	0.005376	0.002688	0.000000	0.000000	0.000000	0.009409
75-85	0.002688	0.000000	0.000000	0.000000	0.000000	0.000000	0.002688
85-95	0.004032	0.002688	0.001344	0.000000	0.000000	0.000000	0.008065
95-105	0.005376	0.004032	0.000000	0.000000	0.000000	0.000000	0.009409
105-115	0.014785	0.000000	0.000000	0.000000	0.000000	0.000000	0.014785
115-125	0.008065	0.005376	0.001344	0.000000	0.000000	0.000000	0.014785
125-135	0.010753	0.008065	0.006720	0.000000	0.000000	0.000000	0.025538
135-145	0.013441	0.010753	0.006720	0.000000	0.000000	0.000000	0.030914
145-155	0.010753	0.016129	0.024194	0.001344	0.000000	0.000000	0.052419
155-165	0.005376	0.010753	0.020161	0.000000	0.000000	0.000000	0.036290
165-175	0.009409	0.013441	0.017473	0.000000	0.000000	0.000000	0.040323
175-185	0.006720	0.013441	0.009409	0.004032	0.000000	0.000000	0.033602
185-195	0.008065	0.001344	0.005376	0.000000	0.000000	0.000000	0.014785
195-205	0.029570	0.004032	0.000000	0.000000	0.000000	0.000000	0.033602
205-215	0.043011	0.006720	0.000000	0.000000	0.000000	0.000000	0.049731
215-225	0.095430	0.073925	0.005376	0.000000	0.000000	0.000000	0.174731
225-235	0.036290	0.024194	0.000000	0.000000	0.000000	0.000000	0.060484
235-245	0.009409	0.001344	0.000000	0.000000	0.000000	0.000000	0.010753
245-255	0.005376	0.000000	0.000000	0.000000	0.000000	0.000000	0.005376
255-265	0.001344	0.000000	0.000000	0.000000	0.000000	0.000000	0.001344
265-275	0.002688	0.000000	0.000000	0.000000	0.000000	0.000000	0.002688
275-285	0.001344	0.002688	0.000000	0.000000	0.000000	0.000000	0.004032
285-295	0.005376	0.004032	0.010753	0.000000	0.000000	0.000000	0.020161
295-305	0.001344	0.008065	0.001344	0.000000	0.000000	0.000000	0.010753
305-315	0.002688	0.006720	0.001344	0.000000	0.000000	0.000000	0.010753
315-325	0.004032	0.006720	0.004032	0.000000	0.000000	0.000000	0.014785
325-335	0.004032	0.004032	0.004032	0.000000	0.000000	0.000000	0.012097
335-345	0.004032	0.010753	0.000000	0.000000	0.000000	0.000000	0.014785
345-355	0.006720	0.006720	0.000000	0.000000	0.000000	0.000000	0.013441
Total	0.412634	0.271505	0.122312	0.005376	0.000000	0.000000	0.811828

Frequency of Calm Winds: 18.82%
Average Wind Speed: 1.80 m/s

APPENDIX B

Listing of PM_{10} Concentrations

Individual Data Sheets provided on CD

Background Monitor 962A

PM_{10} Sampler Summary

October 1, 2023 - December 31, 2023

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

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
10/03/23		Invalid - AF	Invalid - AF								
10/09/23		Invalid - AF	Invalid - AF								
10/15/23		Invalid - AF	Invalid - AF								
10/21/23		Invalid - AF	Invalid - AF								
10/27/23		Invalid - AF	Invalid - AF								
11/02/23		Invalid - AF	Invalid - AF								
11/08/23	P2986820	21.5	25.8	24:00	24.0	20.0	401.1657	401.6832	0.5175	HT	
11/14/23	P2986825	6.1	7.5	24:00	24.0	19.6	402.5822	402.7307	0.1485	HT	
11/20/23	P2986830	2.6	3.1	24:00	24.0	20.3	405.8056	405.8701	0.0645		
11/26/23	P2986999	4.8	5.6	24:00	24.0	20.6	410.7202	410.8361	0.1159	HT	
12/02/23	P2987004	1.4	1.7	24:00	24.0	20.3	399.1936	399.2286	0.0350		
12/08/23	P2987013	2.5	3.0	24:00	24.0	20.2	399.2426	399.3038	0.0612		
12/14/23	P2987291	6.4	7.7	24:00	24.0	20.2	403.2155	403.3716	0.1561	HT	
12/20/23	P2987296	0.2	0.2	24:00	24.0	19.9	404.3209	404.3266	0.0057		
12/26/23	P2987488	0.7	0.8	24:00	24.0	20.2	405.3785	405.3961	0.0176		

# Valid	Recovery	Average	St. Dev.	Max	Min
9	60%	6.2	7.9	25.8	0.2

Validation of data is limited by the provided information. Data have been validated based on laboratory QC, field observations and instrument data if made available, as well as other information available to Pace Analytical Services , Air Science Division. Additional data validation based on information not provided to Pace may be required. Final validation of these data are the responsibility of the data owner.

Compliance Monitor 963B

PM_{10} Sampler Summary

October 1, 2023 - December 31, 2023

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

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
10/03/23		Invalid - AF	Invalid - AF								
10/09/23		Invalid - AF	Invalid - AF								
10/15/23		Invalid - AF	Invalid - AF								
10/21/23		Invalid - AF	Invalid - AF								
10/27/23		Invalid - AF	Invalid - AF								
11/02/23		Invalid - AF	Invalid - AF								
11/08/23	P2986821	12.2	14.4	24:00	24.0	20.3	403.3068	403.6015	0.2947	HT	
11/14/23	P2986826	46.9	56.4	24:00	24.0	20.0	399.3307	400.4585	1.1278	HT	
11/20/23	P2986831	2.0	2.4	24:00	24.0	20.6	410.8824	410.9323	0.0499		
11/26/23	P2987000	3.9	4.6	24:00	24.0	20.8	405.8537	405.9498	0.0961	HT	
12/02/23	P2987005	1.7	2.0	24:00	24.0	20.6	402.8028	402.8441	0.0413		
12/08/23	P2987011	4.5	5.3	24:00	24.0	20.5	405.5993	405.7093	0.1100		
12/14/23	P2987292	3.9	4.6	24:00	24.0	20.5	399.5343	399.6301	0.0958		
12/20/23	P2987297	Invalid - AN	Invalid - AN				400.1641	400.1713	0.0072	SP,MD	No data
12/26/23	P2987489	0.5	0.6	24:00	24.0	20.5	403.4620	403.4761	0.0141		

# Valid	Recovery	Average	St. Dev.	Max	Min
8	53%	11.3	18.7	56.4	0.6

Validation of data is limited by the provided information. Data have been validated based on laboratory QC, field observations and instrument data if made available, as well as other information available to Pace Analytical Services , Air Science Division. Additional data validation based on information not provided to Pace may be required. Final validation of these data are the responsibility of the data owner.

Collocated Monitor 964C

PM_{10} Sampler Summary

October 1, 2023 - December 31, 2023

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

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
10/03/23		Invalid - AF	Invalid - AF								
10/09/23		Invalid - AF	Invalid - AF								
10/15/23		Invalid - AF	Invalid - AF								
10/21/23		Invalid - AF	Invalid - AF								
10/27/23		Invalid - AF	Invalid - AF								
11/02/23		Invalid - AF	Invalid - AF								
11/08/23	P2986822	7.3	8.6	23:59	24.0	20.2	405.1013	405.2770	0.1757	HT	
11/14/23	P2986827	27.7	33.5	23:59	24.0	19.9	402.7561	403.4226	0.6665	HT	
11/20/23	P2986832	2.0	2.4	23:59	24.0	20.5	401.7113	401.7609	0.0496		
11/26/23	P2987001	3.6	4.2	23:59	24.0	20.7	411.8372	411.9253	0.0881	HT	
12/02/23	P2987006	2.0	2.3	23:59	24.0	20.5	401.4076	401.4558	0.0482		
12/08/23	P2987012	4.9	5.8	23:59	24.0	20.4	406.8167	406.9354	0.1187		
12/14/23	P2987293	5.9	7.0	23:59	24.0	20.4	403.2061	403.3496	0.1435		
12/20/23	P2987298	8.6	10.2	23:59	24.0	20.1	410.6148	410.8219	0.2071		
12/26/23	P2987490	0.9	1.1	23:59	24.0	20.4	404.8575	404.8805	0.0230		

# Valid	Recovery	Average	St. Dev.	Max	Min
9	60%	8.3	9.9	33.5	1.1

Validation of data is limited by the provided information. Data have been validated based on laboratory QC, field observations and instrument data if made available, as well as other information available to Pace Analytical Services , Air Science Division. Additional data validation based on information not provided to Pace may be required. Final validation of these data are the responsibility of the data owner.

Compliance Monitor 2366D

PM_{10} Sampler Summary

October 1, 2023 - December 31, 2023

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

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
10/03/23		Invalid - AF	Invalid - AF								
10/09/23		Invalid - AF	Invalid - AF								
10/15/23		Invalid - AF	Invalid - AF								
10/21/23		Invalid - AF	Invalid - AF								
10/27/23		Invalid - AF	Invalid - AF								
11/02/23		Invalid - AF	Invalid - AF								
11/08/23	P2986823	4.3	5.1	24:00	24.0	20.2	410.2314	410.3353	0.1039	HT	
11/14/23	P2986828	7.2	8.6	24:00	24.0	20.0	406.6319	406.8051	0.1732	HT	
11/20/23	P2986833	2.0	2.4	24:00	24.0	20.5	408.3308	408.3800	0.0492		
11/26/23	P2987002	1.8	2.1	24:00	24.0	20.7	410.1816	410.2256	0.0440	HT	
12/02/23	P2987007	1.6	1.9	24:00	24.0	20.4	402.7933	402.8338	0.0405		
12/08/23	P2987009	51.2	60.4	24:00	24.0	20.4	403.3845	404.6156	1.2311		
12/14/23	P2987294	Invalid - AN	Invalid - AN	24:00			397.8488	397.8506	0.0018	MD	No data
12/20/23	P2987299	3.8	4.5	24:00	24.0	20.1	403.0877	403.1795	0.0918		
12/26/23	P2987491	1.3	1.6	24:00	24.0	20.5	399.5083	399.5411	0.0328		

# Valid	Recovery	Average	St. Dev.	Max	Min
8	53%	10.8	20.2	60.4	1.6

Validation of data is limited by the provided information. Data have been validated based on laboratory QC, field observations and instrument data if made available, as well as other information available to Pace Analytical Services , Air Science Division. Additional data validation based on information not provided to Pace may be required. Final validation of these data are the responsibility of the data owner.

Collocated Monitor 2398E

PM_{10} Sampler Summary

October 1, 2023 - December 31, 2023

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
10/03/23		Invalid - AF	Invalid - AF								
10/09/23		Invalid - AF	Invalid - AF								
10/15/23		Invalid - AF	Invalid - AF								
10/21/23		Invalid - AF	Invalid - AF								
10/27/23		Invalid - AF	Invalid - AF								
11/02/23		Invalid - AF	Invalid - AF								
11/08/23	P2986824	Invalid - AN	Invalid - AN				403.2385	403.2486	0.0101	SP,MD	No data
11/14/23	P2986829	Invalid - AN	Invalid - AN	0:00	24.0	19.3	404.5770	404.5843	0.0073	SP,HT	
11/20/23	P2986834	Invalid - AN	Invalid - AN				409.3250	409.3416	0.0166	SP,MD	No data
11/26/23	P2987003	Invalid - AN	Invalid - AN				403.0005	403.0076	0.0071	SP,MD	No data
12/02/23	P2987008	Invalid - AN	Invalid - AN				397.4642	397.4944	0.0302	SP,MD	No data
12/08/23	P2987010	Invalid - AN	Invalid - AN				403.6969	403.7206	0.0237	SP,MD	No data
12/14/23	P2987295	Invalid - AN	Invalid - AN				403.7941	403.8198	0.0257	SP,MD	No data
12/20/23	P2987300	Invalid - AN	Invalid - AN				404.7157	404.7335	0.0178	SP,MD	No data
12/26/23	P2987492	Invalid - AN	Invalid - AN				403.8751	403.8859	0.0108	SP,MD	No data

# Valid	Recovery	Average	St. Dev.	Max	Min
0	0%	#DIV/0!	#DIV/0!	0.0	0.0

Validation of data is limited by the provided information. Data have been validated based on laboratory QC, field observations and instrument data if made available, as well as other information available to Pace Analytical Services , Air Science Division. Additional data validation based on information not provided to Pace may be required. Final validation of these data are the responsibility of the data owner.

APPENDIX C

Precision and Single-Point Flow Rate Checks

Alton Coal Development

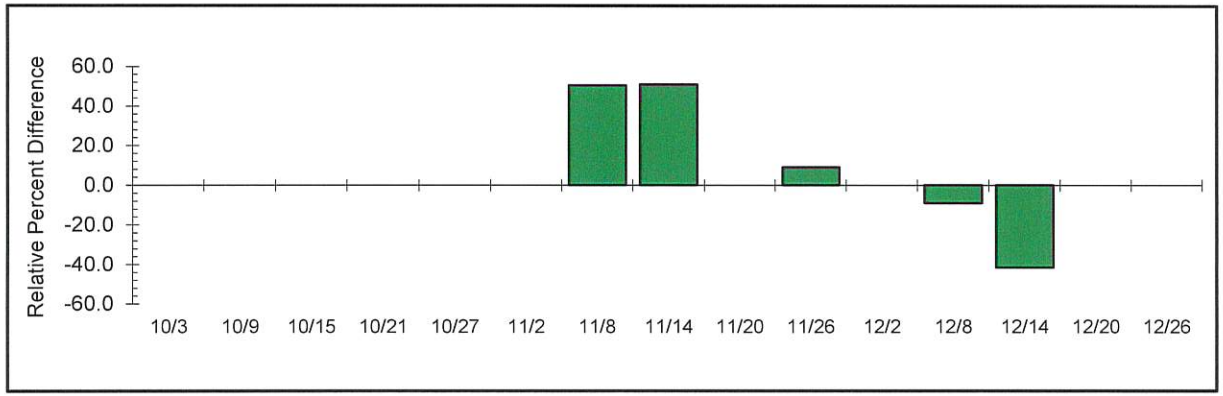
Coal Hollow

Precision Report For Collocated Samplers

STP PM10 Concentrations(µg/m³)
October 1, 2023 - December 31, 2023

Date	10/3	10/9	10/15	10/21	10/27	11/2	11/8	11/14	11/20	11/26	12/2	12/8	12/14	12/20	12/26
Coal Hollow-B							14.4	56.4	2.4	4.6	2.0	5.3	4.6		0.6
Coal Hollow-C							8.6	33.5	2.4	4.2	2.3	5.8	7.0	10.2	1.1
Rel. %Diff.	*	*	*	*	*	*	50.4	50.9	*	9.1	*	-9.0	-41.4	*	*

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



Statistical Calculations:

n=	5.0	S Dev=	39.7 %
Mean=	12.0	** CV=	54.4 %

*** 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**

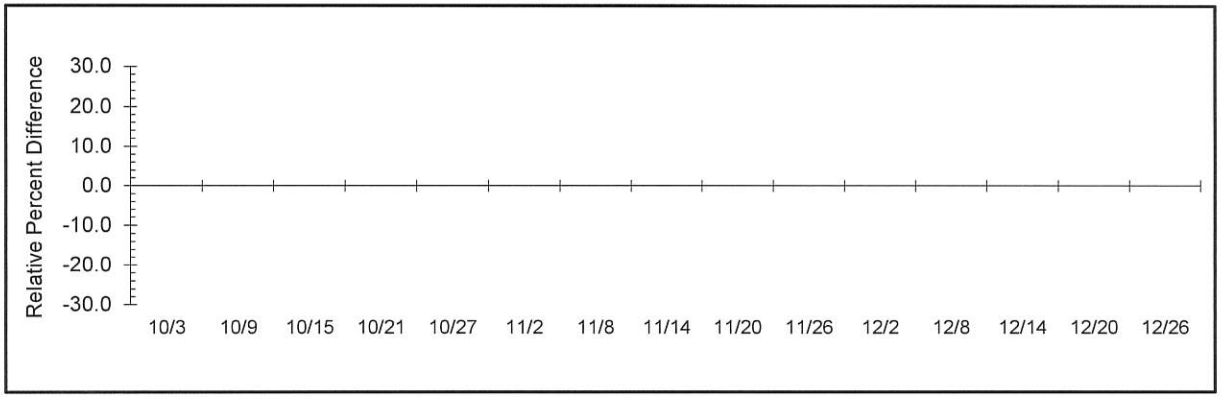
Alton Coal Development
Coal Hollow

Precision Report For Collocated Samplers

STP PM10 Concentrations(µg/m³)
October 1, 2023 - December 31, 2023

Date	10/3	10/9	10/15	10/21	10/27	11/2	11/8	11/14	11/20	11/26	12/2	12/8	12/14	12/20	12/26
Coal Hollow-D							5.1	8.6	2.4	2.1	1.9	60.4		4.5	1.6
Coal Hollow-E															
Rel. %Diff.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

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



Statistical Calculations:			
n=	0.0	S Dev=	N/A %
Mean=	N/A	** CV=	N/A %

*** 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**

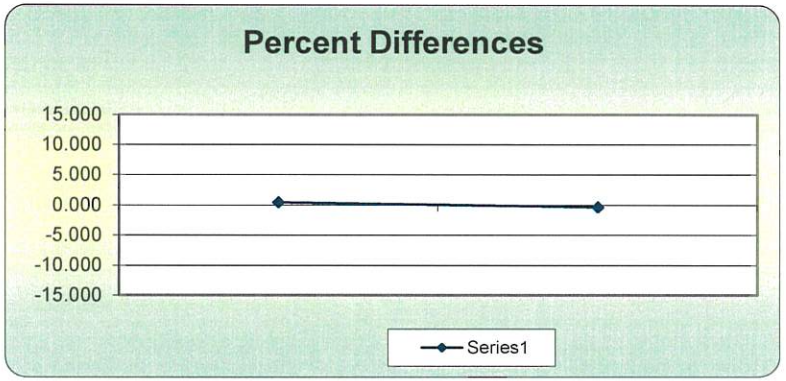
Alton Coal Development, LLC - Coal Hollow Mine

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	-0.163	0.177	0.421	0.177	
16.7	16.76	-0.358	**75th Percentile**	0.128	0.358	0.128	
			0.226				

n	$\Sigma\|d\|$	"AB" (Eqn 4)
2	0.779	0.389
n-1	$\Sigma\|d\|^2$	**"AS" (Eqn 5)**
1	0.305	0.044

Bias (%) (Eqn 3)	Both Signs Positive
0.59	FALSE
Signed Bias (%)	Both Signs Negative
+/-0.59	FALSE



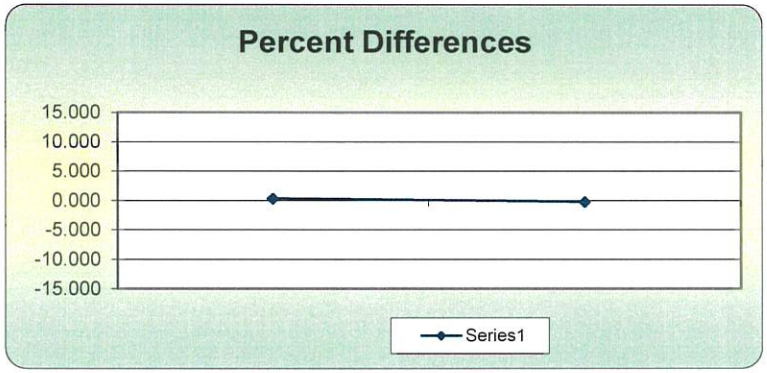
Alton Coal Development, LLC - Coal Hollow Mine

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	16.65	0.300	-0.104	0.090	0.300	0.090	
16.7	16.74	-0.239	**75th Percentile**	0.057	0.239	0.057	
			0.165				

n	$\Sigma\|d\|$	"AB" (Eqn 4)
2	0.539	0.270
n-1	$\Sigma\|d\|^2$	**"AS" (Eqn 5)**
1	0.147	0.043

Bias (%) (Eqn 3)	Both Signs Positive
0.46	FALSE
Signed Bias (%)	Both Signs Negative
+/-0.46	FALSE



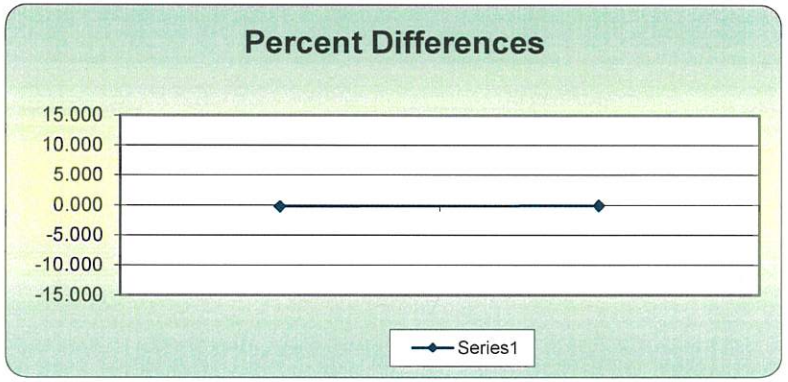
Alton Coal Development, LLC - Coal Hollow Mine

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	-0.209	0.057	0.239	0.057	
16.7	16.72	-0.120	**75th Percentile**	0.014	0.120	0.014	
			-0.149				

n	**$\Sigma\|d\|$**	**"AB" (Eqn 4)**
2	0.359	0.179
n-1	**$\Sigma\|d\|^2$**	**"AS" (Eqn 5)**
1	0.071	0.084

Bias (%) (Eqn 3)	Both Signs Positive
0.56	FALSE
Signed Bias (%)	Both Signs Negative
-0.56	TRUE



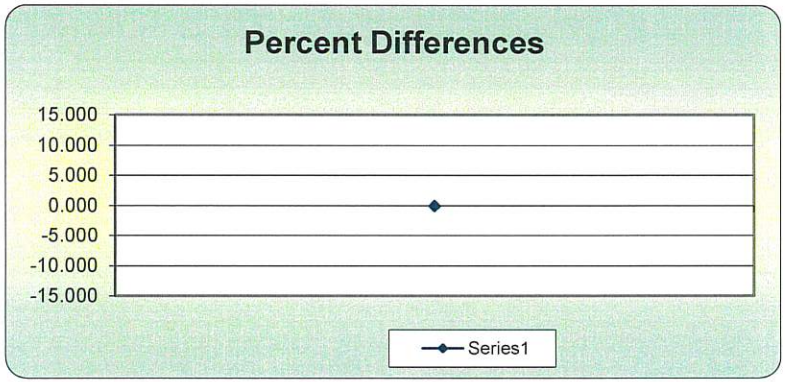
Alton Coal Development, LLC - Coal Hollow Mine

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	16.72	-0.120	-0.120	0.014	0.120	0.014	
			75th Percentile				
			-0.120				

n	$\Sigma\|d\|$	"AB" (Eqn 4)
1	0.120	0.120
n-1	$\Sigma\|d\|^2$	"AS" (Eqn 5)
0	0.014	#DIV/0!

Bias (%) (Eqn 3)	Both Signs Positive
#NUM!	FALSE
Signed Bias (%)	Both Signs Negative
#NUM!	TRUE



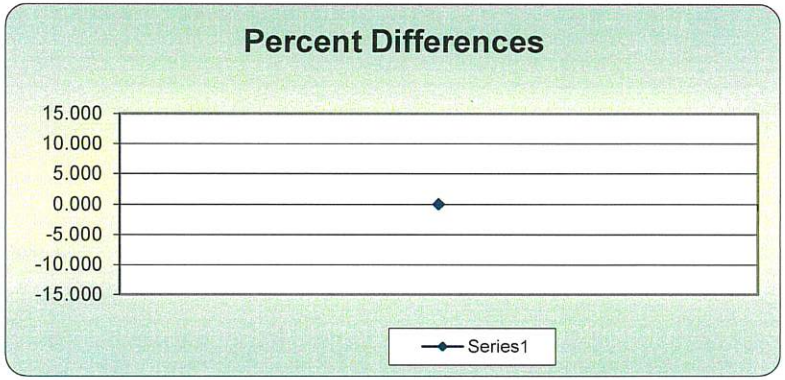
Alton Coal Development, LLC - Coal Hollow Mine

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	$\|d\|$	$\|d\|^2$	
			#NUM!				
			75th Percentile				
			#NUM!				

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

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



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
11-3-23	1329	11-3-23	1326	—	4	M-M	11-8-23	KN
11-9-23	1304	11-9-23	1301	4	9	M-M	11-14-23	KN
11-15-23	0940	11-15-23	0940	9	17	M-M	11-20-23	KN
11-21-23	1012	11-21-23	1012	17	12	M-M	11-26-23	KN
11-27-23	1013	11-27-23	1013	12	26	M-M	12-2-23	KN
12-05-23	0957	12-05-23	0955	26	33	M-M	12-8-23	KN
12-11-23	0924	12-11-23	0924	33	34	M-M	12-14-23	KN
12-15-23		12-15-23		34	39	M-M	12-20-23	KN
12-21-23	0945	12-21-23	0944	39	4	M-M	12-26-23	KN
12-27-23	0839	12-27-23	0839	4	9	M-M	1-1-24	KN
1-3-24	1055	1-3-24	1057	9	12	M-M	1-7-24	KN
1-9-24	1002	1-9-24	1001	12	15	M-M	1-13-24	KN

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
10-4-23	1306	132	131	Pass	KN	Cleaned
12-11-23	0959	129	128	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
11-9-23	1310	16.7	553	552	8.0	8.4	13.59	16.63	(),42	KN
12-11-23	[redacted]	16.7	553	552	6.0	7.3	14.01	16.76	-0.56	KN

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
11-3-23	1342	11-3-23	1239	—	5	MM	11-8-23	KN
11-9-23	1322	11-9-23	1319	5	10	M-M	11-14-23	KN
11-15-23	0955	11-15-23	0955	10	28	M-M	11-20-23	KN
11-21-23	1043	11-21-23	1043	24	13	M-M	11-26-23	KN
11-27-23	1032	11-27-23	1031	13	21	M-M	12-2-23	KN
12-5-23	0920	12-5-23	0918	13	21	M-M	12-8-23	KN
12-11-23	0954	12-11-23	0954	21	35	M-M	12-14-23	KN
12-15-23	1655	12-15-23	1657	35	40	M-M	12-20-23	KN
12-21-23	1006	12-21-23	1006	40	5	M-M	12-26-23	KN
12-27-23	0856	12-27-23	0855	5	10	M-M	1-1-24	KN
1-3-24	1251	1-3-24	1249	10	13	M-M	1-7-24	KN

Manual 6.2 hrs
Date not Programmed

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
11-9-23	1324	104	103	Pass	KN	Cleaned
12-11-23	0957	103	102	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
11-9-23	1330	16.7	587	586	8.5	5.9	15.67	16.65	0.30	KN
12-11-23	1002	16.7	583	587	6.0	7.3	14.06	16.74	-0.24	KN

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
11-3-23	1349	11-3-23	1247	—	6	M-M	11-8-23	KN
11-9-23	1331	11-9-23	1336	6	11	M-M	11-14-23	KN
11-15-23	1001	11-15-23	1000	11	29	M-M	11-20-23	KN
11-21-23	1050	11-21-23	1049	29	14	M-M	11-26-23	KN
11-27-23	1038	11-27-23	1037	14	22	M-M	12-2-23	KN
12-5-23	0923	12-5-23	0921	22	32	M-M	12-8-23	KN
12-11-23	0959	12-11-23	0959	32	76	M-M	12-14-23	KN
12-15-23	1651	12-15-23	1651	76	41	M-M	12-20-23	KN
12-21-23	1012	12-21-23	1012	41	6	M-M	12-26-23	KN
12-27-23	0963	12-27-23	0962	6	11	M-M	1-1-24	KN
1-3-24	1254	1-3-24	1253	11	14	M-M	1-7-24	KN

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
11-9-23	1333	96	96	Pass	KN	Cleaned
12-11-23	1004	97	97	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
11-9-23	1337	16.7 590	588	8.01	7.8	13.74	16.74		-0.24	
12-11-23	1009	16.7 589	588	7.2	7.4	13.72	16.72		-0.12	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
11-3-23	1412	11-3-23	1308	-	7	M-M	11-8-23	KN
11-9-23	1345	11-9-23	1344	7	15	M-M	11-14-23	KN
11-15-23	1016	11-15-23	1016	15	30	M-M	11-20-23	KN
11-21-23	1213	11-21-23	1211	30	18	M-M	11-26-23	KN
11-27-23	1056	11-27-23	1054	18	23	M-M	12-2-23	KN
12-5-23	0838	12-5-23	0836	23	26	M-M	12-8-23	KN
12-11-23	1016	12-11-23	1015	26	37	M-M	12-14-23	KN
12-15-23	1710	12-15-23	1709	37	42	M-M	12-20-23	KN
12-21-23	1105	12-21-23	1104	42	7	M-M	12-26-23	KN
12-27-23	0917	12-27-23	0915	7	15	M-M	1-1-24	KN
1-3-24	1308	1-3-24	1306	15	17	M-M	1-7-24	KN

= Not Programmed

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
~~11-15-23~~	~~1002~~	~~124~~			~~KN~~	
12-11-23	1102	106	106	Pass	KN	Replaced O-rings

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
12-11-23	1102	16.7	588	589	7.2	7.5	13.72	16.72	-0.12	KN

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
11-3-23	1416	11-3-23	1316	—	8	MM-AA	11-8-23	KN
11-9-23	1351	11-9-23	1350	8	16	M-M	11-14-23	KN
11-15-23	1027	11-15-23	1027	16	31	MM-AA	11-20-23	KN
11-21-23	1215	11-21-23	1213	31	19	M-M	11-26-23	KN
11-27-23	1412	11-27-23	1413	19	25	MM-AA	12-2-23	KN
12-5-23	0840	12-5-23	0838	25	27	M-M	12-8-23	KN
12-11-23	1021	12-11-23	1019	27	28	M-M	12-14-23	
12-15-23	1212	12-15-23	1211	35	46	M-M	12-20-23	KN
12-21-23	1112	12-21-23	1142	46	8	M-M	12-26-23	KN
12-27-23	0921	12-27-23	0921	8	16	M-M	1/-24	KN
1-3-24	1314	1-3-24	1313	16	15	M-M	P. Hall	Pump

Table II - Monthly Leak Test

Date	Time	Initial SP Value	Final SP Value	Pass/Fail	Initials	Maintenance
11-15-23	1023	124	122	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

APPENDIX E

Independent PM_{10} Sampler Performance Audit Report

AUDIT REPORT
FOR

ALTON COAL DEVELOPMENT, LLC
COAL HOLLOW MINE
ALTON, UTAH
FOURTH QUARTER 2023

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: December 5th, 2023

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LIST OF TABLES

1.0 INTRODUCTION

Air Resource Specialists, Inc. (ARS) conducted a performance audit of Alton Coal Development, LLC ambient air quality monitoring systems on December 5th, 2023. The monitoring sites are located at the Coal Hollow Mine near Alton, Utah.

Table 1-1

Site Location Information

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

Audit results for the particulate samplers are summarized in Table 1-2. 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	Yes
	PM_{10} (collocated)	BGI PQ200S	Yes
Background #1	PM_{10}	BGI PQ200S	Yes
Primary NPL	PM_{10}	BGI PQ200	No
	PM_{10} (collocated)	BGI PQ200	No

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:

Christian A. Kirk
Vice President – Technical Operations
Air Resource Specialists, Inc.
1901 Sharp Point Drive, Suite F
Fort Collins, Colorado 80525
Telephone: 970-484-7941
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	1220	4/3/2024

3.0 AUDIT RESULTS

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

Performance Audit Results

Sampler 2367 would not hold enough vacuum to perform a leak test indicating a large leak. Sampler 2398 failed to generate enough vacuum to properly conduct a leak test. The pump would run continuously, and the solenoid valve seemed to have an issue engaging. During this first attempt, the pump sounded rough and would only pull about 19cm of vacuum. A second leak test attempt generated the same results. On a third attempt, a proper vacuum was generated, and the solenoid valve closed correctly. This leak test passed. However, the measured flow on this sampler was found to be outside of the audit criteria.

APPENDIX A

AUDIT DATA FORMS

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	A962

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
	-1.0	PASS

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.75	16.70	-0.3%	0.3%	PASS

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

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	8.3	7.9	-0.4	PASS

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

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	5.1	4.9	-0.2	PASS

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

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	594.5	590.0	-4.5	PASS

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

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	N963B

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
	-2.0	PASS

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.69	16.70	0.1%	-0.1%	PASS

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

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	7.1	7.3	0.2	PASS

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

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	4.2	3.5	-0.7	PASS

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

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	599.0	598.0	-1.0	PASS

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

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024

MANUFACTURER	BGI
MODEL	PQ200
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
	-2.0	PASS

FLOW VERIFICATION					
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	16.52	16.70	1.1%	-1.1%	PASS

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

AMBIENT TEMPERATURE SENSOR (°C)				
Reference	Instrument	Difference		
7.0	7.6	0.6	PASS	

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

FILTER TEMPERATURE SENSOR (°C)			
Reference	Instrument	Difference	
4.7	3.7	-1.0	PASS

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

PRESSURE SENSOR (mmHg)			
Reference	Instrument	Difference	
599.0	597.0	-2.0	PASS

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

NOTES:

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	2398

Date and Time correct?
☐ Yes ☑ No
If no, time off by:
-3 minutes

SETTINGS	
Total Flow	16.70

Automated LEAK CHECK	
Vacuum Loss Rate	Pass/Fail
-2.0	PASS

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	14.37	16.70	16.2%	-14.0%	FAIL

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

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	4.8	5.8	1.0	PASS

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

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	3.2	3.0	-0.2	PASS

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

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	599.0	594.0	-5.0	PASS

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

NOTES: PQ200 unable to perform leak check initially. After a third attempt it ran through the process properly and passed. Pump runs continuous and rough without building more than 19 cm of vacuum. The instrument is also prone to locking up in cold weather conditions. Then operator reports that the instrument is having firmware or motherboard issues.

Air Resource SPECIALISTS

FRM AUDIT (PM_{10})

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	MANUFACTURER	MODEL	SERIAL NUMBER	EXPIRATION DATE
PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024

MANUFACTURER	BGI
MODEL	PQ200
SERIAL NUMBER	2367

Date and Time correct?
☑ Yes ☑ No
If no, time off by:
-2 min

SETTINGS	
Total Flow	16.70

	Automated LEAK CHECK	
	Vacuum Loss Rate	Pass/Fail
		FAIL

	FLOW VERIFICATION				
	Reference	Instrument	Actual Diff	Design Diff	
Total Flow	15.98	16.70	4.5%	-4.3%	PASS

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

	AMBIENT TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	2.8	3.9	1.1	PASS

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

	FILTER TEMPERATURE SENSOR (°C)			
	Reference	Instrument	Difference	
	1.8	1.6	-0.2	PASS

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

	PRESSURE SENSOR (mmHg)			
	Reference	Instrument	Difference	
	599.0	595.0	-4.0	PASS

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

NOTES: Would not hold vacuum to complete leak check.

Air Resource SPECIALISTS

SITE INFORMATION

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

		Deg	Min	Sec		Decimal
LATITUDE	North	37	24	22	--CALCULATE->	37.4061
LONGITUDE	West	112	27	16		112.4544

NOTES:	

Air Resource SPECIALISTS

CALIBRATION AND VERIFICATION STANDARDS

ABBR.	N/A				
CLIENT	Alton Coal Development	FIELD SPECIALIST	J. Wenrick	DATE	12/5/2023
SITE NAME	Coal Hollow Mine				

	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 #1				
Solar Radiation Reference #2				
UV Radiation Reference				
Multiplier [ ] W/m2 / mV				
Precipitation Reference				
Volume [ ] mL				

PM Flow Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Flow Standard #2				
PM Flow Standard #3				
PM Flow Standard #4				

PM Temperature Standard #1	BGI	DeltaCal	1220	4/3/2024
PM Temperature Standard #2				
PM Temperature Standard #3				
PM Temperature Standard #4				

PM Barometric Pressure Standard #1	BGI	DeltaCal	1220	4/3/2024
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

MesaLabs

Mesa Labs 12100 W. 6th Ave
Lakewood, CO 80228
NIST Traceable Calibration Facility

CERTIFICATE OF CALIBRATION - NIST TRACEABILITY

Calibration Report #: 1220-03042023
DeltaCal Serial Number: 1220
Calibration Technician: Leigh Clark
Date: 3-Apr-2023
Recommended Recal Date: 3-Apr-2024

Critical Venturi Flow Meter

Max Uncertainty = 0.346%

TE20005	6 - 30.00 LPM	Calibration Due:	11-Jul-2023
TE20007	1.40 - 6.0 LPM	Calibration Due:	11-Jul-2023

Room Temperature: +- 0.03°C from -5°C - 70°C **Room Temperature:** 23.3 °C

Brand: Eutechnics
TE Number: TE12306 **Serial Number:** 308304
Std Cal Date: 8-Apr-22 **Std Cal Due Date:** 8-Apr-23

Ambient Temperature (set): 23.3 °C
Aux (filter) Temperature (set): 23.3 °C

Barometric and Absolute Pressure

Vaisala Model PTB330 (50-1100) Digital Accuracy: 0.03371%

TE Number: TE12311 **Serial Number:** H0850001
Std Cal Date: 6-Feb-23 **Std Cal Due Date:** 6-Feb-24

DeltaCal:
Barometric pressure (set): 604.0 mmHg

Results of Venturi Calibration

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

Venturi

TE20005	Q= 3.96435	ΔP ^	0.51977	Overall Uncertainty: 0.35%
TE20007	Q= 3.93753	ΔP ^	0.52281	Overall Uncertainty: 0.35%

MesaLabs

Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As Shipped Calibration Data for DeltaCal

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1220
Firmware Version:	4.00P

Date	Technician
03Apr2023	Leigh Clark

Ambient Pressure:	604.0	mmHg
Ambient Temperature:	23.3	°C

Range 1	
Venturi	TE20005
Type	1B
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	132.71	603.5	6.605	6.564	-0.621
2	203.00	604.0	10.149	10.084	-0.640
3	261.67	604.0	13.110	13.051	-0.450
4	319.83	604.0	16.046	16.017	-0.181
5	359.21	604.0	18.034	18.021	-0.072
6	385.36	604.0	19.354	19.378	0.124
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.307
				Result	PASS

Range 2	
Venturi	TE20007
Type	2B
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	148.36	604.0	2.113	2.107	-0.284
2	209.63	604.0	3.010	3.028	0.598
3	257.98	604.0	3.718	3.743	0.672
4	310.35	604.0	4.485	4.475	-0.223
5	368.36	604.0	5.335	5.326	-0.169
6	405.87	604.0	5.885	5.878	-0.119
	Maximum allowable error at any flow rate is 0.75%.			Average	0.079
				Result	PASS

Performed By: Leigh Clark **Date:** 3-Apr-2023

Approved By: Leonard Reinert, Quality Specialist **Date:** 04 APR 2023

MesaLabs

Mesa Labs 12100 W. 6th Ave Lakewood, CO 80228
NIST Traceable Calibration Facility

As-Found data for DeltaCal

Date	Technician
03Apr2023	Leigh Clark

Unit Type:	DC 1
Flow Range:	1.5-19.5 LPM
Serial No. :	1220
Firmware Version:	4.00P

Ambient Pressure:	604.0	mmHg
Ambient Temperature:	23.3	°C

	As Received Temp. Press. Calibration				As Shipped Temp. Press. Calibration			
	DUT	**Standard**	**Diff**	**+/- 1 mmHg**	**DUT**	**Standard**	**Diff**	**+/-1 mmHg**
$Pres_{AMB}$ mmHg	603.5	604.0	-0.5	Pass	604.0	604.0	0.0	Pass
	DUT	**Standard**	**Diff**	**+/- 1 °C**	**DUT**	**Standard**	**Diff**	**+/- 1 °C**
$Temp_{AMB}$ °C	23.3	23.3	0.0	Pass	23.3	23.3	0.0	Pass
$Temp_{Filter}$ °C	23.3	23.3	0.0	Pass	23.3	23.3	0.0	Pass

	Offset	New Offset
PresAMB	2.5	3.0
TempAMB	0.3	0.3
Temp Filter	0.2	0.2

Range 1

Venturi	TE20005
Type	1B
Flow range	6 - 30.00 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	133.89	604.0	6.659	6.580	-1.186
2	202.83	604.0	10.140	10.055	-0.838
3	262.15	604.0	13.134	13.022	-0.853
4	322.61	604.0	16.187	16.096	-0.562
5	361.72	604.0	18.161	18.071	-0.496
6	386.65	604.0	19.419	19.348	-0.366
	Maximum allowable error at any flow rate is 0.75%.			Average	-0.717
				Result	FAIL

Range 2

Venturi	TE20007
Type	2B
Flow range	1.40 - 6.0 LPM

Test #	Static Pressure mmHg	Barometric Pressure mmHg	Venturi Qa LPM	DUT Qa LPM	% error %
1	149.32	604.0	2.127	2.043	-3.949
2	213.48	604.0	3.066	3.041	-0.815
3	264.84	604.0	3.819	3.738	-2.121
4	316.67	604.0	4.578	4.520	-1.267
5	372.62	604.0	5.397	5.303	-1.742
6	413.73	604.0	6.000	5.901	-1.650
	Maximum allowable error at any flow rate is 0.75%.			Average	-1.924
				Result	FAIL