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Independent PM₁₀ Sampler Performance Audit Report

1.0 INTRODUCTION

This report summarizes measurements of Particulate Matter less than 10 microns nominal aerodynamic diameter (PM₁₀) collected and processed by Alton Coal Development, LLC, (ACD) from the three monitoring stations located at the Coal Hollow Mine Facility in Alton, Utah. Monitoring for PM₁₀ is a condition of the mines operating permit.

PM₁₀ monitoring at the site consists of three BGI PQ200 PM₁₀ 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 2014.

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 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 two 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 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 compliance monitor and the co-located monitor coordinates are 37° 24' 5.04" North Latitude, 112° 27' 20.91" West Longitude, WGS84 Datum. The background monitor coordinates are 37° 24' 21.96" North Latitude, 112° 25' 59.97" West Longitude, WGS84 Datum.

Figure 1 - Site Location Map

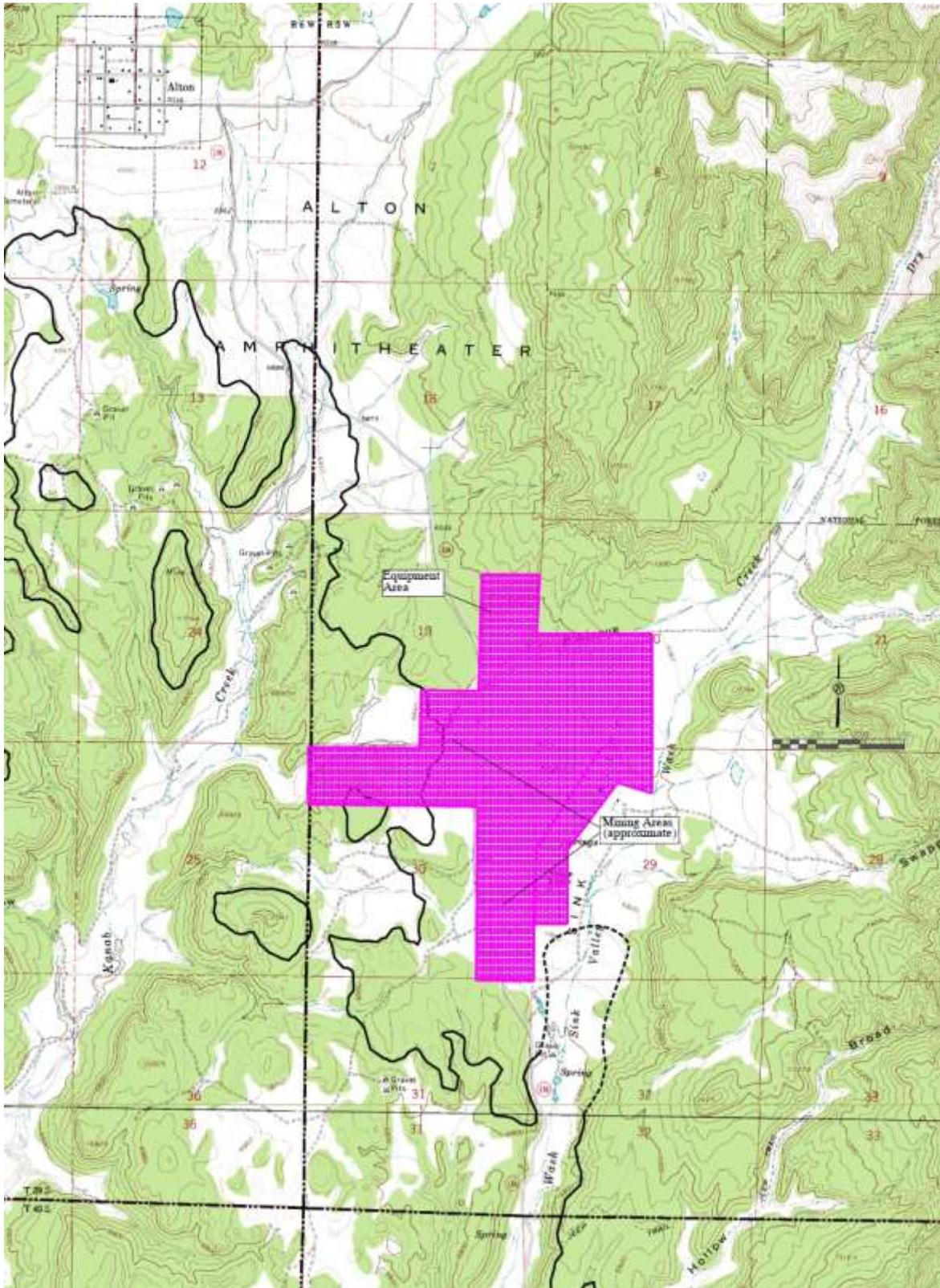


Figure 2 - Satellite View of Monitoring Locations



3.0 AIR QUALITY DATA SUMMARIES

A listing of the measured PM₁₀ 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 PM₁₀ concentration during the midnight to midnight data collection cycle. As required by the operating permit, 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 PM₁₀ 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.

The highest 24-hour mean PM₁₀ concentrations measured during the quarter from the two monitoring locations are summarized in Table I, Table II, and Table III. The three highest concentrations, # of valid samples, and the arithmetic mean concentrations from each of the sites are listed. All measured PM₁₀ concentrations were below the 24-hour National Ambient Air Quality Standard (NAAQS) of 150 µg/m³.

**Table I - Summary of Measured PM₁₀ Concentrations (µg/m³)
Background Monitor - 962A**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	11/01/2014	14.7
2 nd Highest	11/13/2014	10.8
Monthly Mean	10/1/14-10/31/14	5.1
Monthly Mean	11/1/14-11/30/14	6.4
Monthly Mean	12/1/14-12/31/14	3.7
Quarterly Mean	10/1/14-12/31/14 (16 valid samples)	5.0

**Table II - Summary of Measured PM₁₀ Concentrations (µg/m³)
Compliance Monitor - 963B**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	10/20/2014	136.3
2 nd Highest	11/19/2014	74.1
Monthly Mean	10/1/14-10/31/14	35.7
Monthly Mean	11/1/14-11/30/14	38.2
Monthly Mean	12/1/14-12/31/14	6.5
Quarterly Mean	10/1/14-12/31/14 (16 valid samples)	29.1

**Table III - Summary of Measured PM₁₀ Concentrations (µg/m³)
Compliance Monitor – 964C**

RANK	DATE	PM ₁₀ CONCENTRATION
Highest	10/20/2014	137.1
2 nd Highest	11/01/2014	36.4
Monthly Mean	10/1/14-10/31/14	51.8
Monthly Mean	11/1/14-11/30/14	29.9
Monthly Mean	12/1/14-12/31/14	2.9
Quarterly Mean	10/1/14-12/31/14 (8 valid samples)	28.0

Table IV – Mean Quarterly and Monthly Wind Speed

	4th Quarter 2014	October	November	December
Mean Wind Speed (m/s)	2.64	2.68	2.84	2.42

4.0 DATA RECOVERY AND QUALITY ASSURANCE

4.1 Data Recovery

Monitor 962A

Monitor 962A collected 16 of the 16 samples during the quarter. The percent recovery for this quarter is 100%.

Monitor 963B

Monitor 963B collected 16 of the 16 samples during the quarter. The percent recovery for this quarter is 100%.

Monitor 964C

Monitor 964C collected 8 of the 16 samples during the quarter. The percent recovery for this quarter is 50%. For the sample date of Oct 2nd the monitor ran 5 minutes and shut down with Q and T errors. For the sample date of Oct 15th the monitor ran 3 seconds and shut down with Q and T errors. For the sample date of Nov 7th the monitor ran 3 seconds and shut down with Q and T errors. For the sample date of Nov 19nd the monitor ran 3 seconds and shut down with Q and T errors. For the sample date of Nov 25th the monitor ran 3 seconds. For the sample date of Dec 2nd the monitor ran for 3 seconds and shut down with Q and T errors. For the sample date of Dec 25th the monitor ran for 12:24 hours and shut down with “Max Load Exceeded”. For the sample date of Dec 31st the monitor ran 3 seconds and shut down with Q and T errors.

The PM₁₀ data recoveries for the three monitoring stations are presented below:

Table V - Summary of Data Recovery

SAMPLER	POSSIBLE SAMPLES	VALID SAMPLES	PERCENT DATA RECOVERY
962A	16	16	100%
963B	16	16	100%
964C	16	8	50%

4.2 Quality Assurance

Quality assurance procedures utilized to verify the integrity of the measured PM₁₀ data included the following:

1. Review of PM₁₀ precision measurements based upon duplicate, collocated measurements.
2. Independent quarterly audits of the PM₁₀ samplers.
3. Monthly zero and single point flow rate checks of the PM₁₀ samplers.

4.2.1 Precision of PM₁₀ Measurements

The precision of the PM₁₀ measurements was determined from the duplicate samples collected from the collocated BGI PQ200 Monitors 963B and 964C. As recommended in *40 CFR, Part 58, Appendix A, Section 5.3.1*, PM₁₀ precision checks are reported for instances

when the concentrations for duplicate samples both exceed $3 \mu\text{g}/\text{m}^3$. 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 were developed based on 2 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 -20.9% to 24.7%. The aggregate coefficient of variability (CV) calculated in accordance with *40 CFR, Part 58, Appendix A Equation 11* is 181.5%. This value is not within the 10% goal for aggregate CV. Due to the 964C monitors failing to operate properly, the number of valid point did not generate any useful information.

4.2.2 Audit Results

The accuracy of the PM₁₀ sampler flows was verified by a performance audit conducted by Air Resource Specialist on May 6, 2014. A copy of the audit report is presented in Appendix E and is summarized in Table VI. The audit results indicate that the three samplers were operating properly.

Table VI - Audit Summary

SAMPLER	AUDIT % DIFFERENCE	LIMIT*	DESIGN % DIFFERENCE	LIMIT*
962A	4.4	±4%	-4.0	± 5%
963B	-0.1	±4%	0.5	± 5%
964C	-3.4	±4%	3.7	± 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

APPENDIX B

Listing of PM₁₀ Concentrations

Individual Data Sheets provided on CD

Background Monitor 962A

Compliance Monitor 963B

Collocated Monitor 964C

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