From: Hammond, Staci
To: Hart, Adam
Subject: FW: Jan 21, 2012 NARM
Date: Thursday, May 09, 2013 3:41:37 PM

On Mon, Jan 23, 2012 at 1:05 PM, Hammond, Staci <SHammond@peabodyenergy.com> wrote:
Gentlemen,

On January 21,2012 NARM's RO-1 sampler recorded a 24 hr average standard concentration of 200.00µg/m^3. On the morning of the 21st the average hourly wind speed reached 43 mph from the SW and winds gusted to over 62 mph from the SW. NARM adhered to the Air Quality Action Plan found in Appendix B of AQ Permit MD-6375A. Operations were suspended in the area and water trucks were used in an attempt to control dust. NARM will submit an Exceptional Event packet addressing the high wind event and the actions taken in response.

Sincerely,

Staci Hammond
Sr. Environmental Analyst
North Antelope Rochelle Mine
Phone: 307-464-4509
shammond@peabodyenergy.com

Peabody Powder River Operations, LLC
North Antelope Rochelle Mine
Caller Box 3035
Gillette, Wyoming 82717-3035

February 15, 2012

USPS CERTIFIED MAIL: 7009 1410 0002 3473 4238

Tanner Shattow
Wyoming DEQ - Air Quality Division
2100 West 5th St.
Sheridan, WY 82801

RE: North Antelope Rochelle Mine, January 21, 2012 High wind event

Dear Mr. Shattow,

On January 21, 2012 North Antelope Rochelle Mine (NARM) RO-1 sampler recorded a 24 hour average standard concentration of 200.0 STD µg/m^3. The reason for the elevated concentrations recorded on 1/21/2012 was due to a high wind event.

NARM officially requests that the data on January 21, 2012 be flagged as an Exceptional Event under the Natural Events Action Plan. Supporting documentation for this request is attached. The elevated concentrations were strongly influenced by the high wind event and NARM implemented reactionary measures in an effort to reduce emissions during the event.

If you need any additional information please feel free to contact me at (307) 464-4509.

Regards,

Staci Hammond
North Antelope Rochelle Mine

Attachments: Documentation Package

Cc: Cara Keslar (AQD – Cheyenne), Kirk Billings (AQD – Lander)
file

Report of Elevated PM_{10} Concentration, January 21, 2012

North Antelope Rochelle Mine

Sampler: RO-1
Date of Sample: January 21, 2012
24-hour PM_{10} concentration: 200.0 *u*g/m^3

All PM_{10} concentrations discussed are reported at standard temperature and pressure.

Summary

On January 21, 2012 TEOM sampler RO-1 recorded a PM_{10} concentration in excess of the 24-hour standard in Wyoming. High winds of significant duration and velocity were recorded at the NARM meteorological station on that same date. Analysis shows that the elevated sampler readings directly correlate with the high wind speeds.

When average hourly concentrations exceeded established thresholds, operating personnel made the necessary assessment and took action to reduce the generation of emissions from mining activities. Their actions included focusing water trucks in affected areas, adjusting the operation of the dragline, shutting down overburden and coal activities in affected pits.

Analysis of the sampler data shows that there were significant reductions in the average hourly concentrations in response to actions taken by mine personnel. But due to the high numbers recorded the continuous 24-hour average PM_{10} concentration exceeded state ambient air quality standards. Mine personnel continued implementation of the AQAP until the measured concentrations fell below monitor alarm thresholds.

Discussion

On January 21, 2012, the North Antelope Rochelle Mine TEOM sampler RO-1 recorded a 24-hour PM_{10} concentration of 200.0 *u*g/m^3 (STP). Following is a report of the pertinent information regarding this elevated reading. Attached to and referenced in this report are meteorological reports of wind speed, wind direction, temperature, and precipitation; and sampler reports of one-hour and 24-hour concentrations of PM_{10} from the RO-1 sampler. All PM_{10} concentrations discussed are reported at standard temperature and pressure.

Meteorological Data: Analysis of the hourly meteorological data for the *previous* day (January 20, 2012) shows that winds changed direction from north-northwest to the southeast, averaging about 11 mph. The highest hourly wind speed occurred at 2:00 am, peaking at 25.4 mph. Temperatures were moderate, in the range of 8.1 to 41.8 degrees (F).

In the early hours of January 21, 2012, the wind direction became steady from the east-southeast but then switched to west-southwest at 7:00 am. Wind speeds increased abruptly, reaching over 35 mph at 9:00 am and averaging about 33 mph from 7:00 am to 1:00 pm. A peak average hourly wind speed of 43.4 mph occurred at mid-day with wind gusts greater than 63 mph. From 7:00 am to 5:00 pm, average hourly wind speeds were between 20.6 and 43.4 mph. The average for that period of time was 29.8 mph. Wind direction steadily blew from the west-southwest. Temperatures ranged from 20.1 to 49.2 degrees (F) over the course of the day.

Total precipitation for the month of January 2012 was 0.21 inches. The last recorded precipitation had been 0.01 inches on January 16, 2012. 0.11 inches of precipitation occurred the first six hours of January 22.

TEOM data: Sampler RO-1 recorded a 24-hour average of 38.5 *u*g/m^{3}for the day *prior* to the exceedance, January 20, 2012. Hourly readings ranged from about 8.3 *u*g/m^{3}to 91.8 *u*g/m^3.

The 24-hour average at sampler RO-1 for January 21, 2012 was 200.0 *u*g/m^3. This was largely achieved with consistently high concentrations from 9:00 am to 1:00 pm when the wind speed decreased and the concentrations dropped. It was at 11:00 am that the 24-hour average first exceeded 150 *u*g/m^3. This can be attributed to a block of four hours where the hourly concentrations ranged from 542.7 to 1772.3 *u*g/m^3. At 2:00 pm, hourly concentrations dropped to below 100 *u*g/m^{3}and remained at this lower rate for the remainder of January 21. Four hours of the day had extremely high concentrations. The hours with high concentrations directly correlated to the hours that winds ranged from 33.7 to 43.4 mph.

Recordings at the two other samplers at North Antelope Rochelle showed similar trends, although at lower levels. The *prior* day showed very low 24-hour particulate concentrations at both NA-7 and NA-8 samplers.

Operating Information: Records indicate that overburden was being run from the Rail Loop Pit, East Pits and from the North Pit complex during the shift January 20-21, 2012. Coal was being actively loaded and hauled from these same pits. Seven water trucks were operated some or the entire shift during the day and 700,000 gallons of water were recorded as getting applied to the road for dust control.

At 11:00 am all Rail Loop and East Pit haul roads were shut down due to high winds. All shovels, loaders, trucks and motor graders were also shut down in the pits from 11:00 am to 2:30 pm on January 21, 2012.

Real Time Emissions Monitoring: As noted in permit MD-1172, North Antelope Rochelle Mine voluntarily replaced three PM_{10} samplers in 2002 with continuous monitors (TEOMs). Along with these continuous monitors, a mine wide response plan was developed and implemented based upon real-time reporting of the sampler data.

Whenever an hourly reading exceeds 250 *u*g/m^3 (or the continuous 24-hour reading exceeds 75 *u*g/m^3), an alarm is sounded in the security office. Operations personnel are immediately notified and they respond by making assessments as to wind conditions and operating factors that might be contributing to the elevated concentrations. They also determine whether any changes can or should be made in the operations to reduce operating emissions, and implement as appropriate. A record of the event is maintained showing results of assessments and actions taken.

Operations Response (Reactionary Control Measures): Observations recorded by operating supervisors indicate that on January 21, 2012 high winds and dusty conditions were being experienced. The RO-1 sampler alarm was triggered and operations supervisors were notified shortly after the 8:00 am MST. The main sources of dust were determined to be at the disturbed areas in the upwind pit areas. Similar observations were made most of the day.

Despite the fact that wind speeds and hourly concentrations were considerably reduced after Hour 14, mine records indicate that hourly alarms continued through the end of January 21, 2012 because of the elevated 24-hour concentration. The records also indicate that operations personnel maintained the modified operations and continued their mitigation activities described above.

Best Available Control: In addition to the specific response plan actions reported above, Peabody Powder River Operations, LLC had implemented numerous preventive control measures prior to January 21, 2012. Best Available Control Technologies are listed in the approved permit and have been implemented or are continuously implemented. Best Available Control Measures that were employed at North Antelope Rochelle Mine on or before January 21, 2012 include the following:

- All out-of-pit overburden stockpiles had been revegetated.
- All topsoil stockpiles that were not active during the winter months had been revegetated during the spring or fall 2011 seeding program.
- Acres available for permanent reclamation had been revegetated during the spring or fall 2011 seeding program.
- Topsoil stockpiles that were active after the 2011 revegetation season were left in a roughened condition at the end of each day to minimize wind erosion and increase the potential for infiltration of any precipitation.
- Most areas which had been stripped of topsoil had been scarified to create a roughened surface.
- Contractors involved in topsoil salvage were required, through their contract, to operate water trucks at all times that the scraper fleet operates.
- To satisfy Condition 18 of our Air Quality Permit MD-6375A, over 30% of actual open acres are stabilized by ripping against wind erosion.
- Twenty-eight miles of permanent haul roads were treated with chemical dust suppressant in summer 2011.

Stephens, Adam

From: Kirk Billings [kirk.billings@wyo.gov]
Sent: Wednesday, June 27, 2012 3:59 PM
To: Stephens, Adam
Cc: Brad Steidley; Josh Nall
Subject: NARM Exceptional Event Packet for 1/21/12

Follow Up Flag: Follow up
Flag Status: Flagged

Brad Steidley (AQD Compliance), Josh Nall (AQD Permitting) and I met today to discuss NARM's Exceptional Event packet for the RO-1 exceedance.
We have some questions we'd like to have answered before we make our final decision on flagging the data.

1. Please include a facility map with equipment and operations and roads marked on the map. Additionally, please mark roads and equipment that were shut down in response to the event.
2. Was a dragline operating in the area the day of the exceedance?
3. Please include a wind rose for the day.
4. Please clarify what time the original alarm was triggered by sampler RO-1 and the time that NARM's response to the alarm started.

Your response is requested on or before Friday, July 13, 2012.
--

Kirk Billings
Wyoming Department of Environmental Quality
Air Quality Division, Monitoring Group
(307) 335-6963 (desk)
(307) 438-2470 (cell)
kirk.billings@wyo.gov

E-Mail to and from me, in connection with the transaction of public business, is subject to the Wyoming Public Records Act and may be disclosed to third parties.

North Antelope Rochelle Mine
Caller Box 3034
Gillette, Wyoming 82717-3034

July 9, 2012

Kirk Billings
Wyoming Department of Environmental Quality
Air Quality Division, Monitoring Group
510 Meadowview Drive
Lander, Wyoming 82520

RE: Request for additional information, NEAP package for January 21, 2012, North Antelope Rochelle Mine

Dear Mr. Billings,

The attached documentation is submitted in response to your request for additional information on June 27, 2012 regarding the January 21, 2012 NEAP package for North Antelope Rochelle Mine.

Please find the attached documentation including; Attachment 1, Figure 1, Exhibit 1

If you need any additional information please feel free to contact me at (307) 464-4502

Regards,

Adam Stephens
North Antelope Rochelle Mine

Attachments: Attachment 1, Figure 1, Exhibit 1

Cc: B. Hansen (NARM), S. Hammond (NARM), A. Keyfauver (AQD), B. Steidley (AQD), D. Potter (AQD), J. Nall (AQD)
file

Attachment 1

Brad Steidley (AQD Compliance), Josh Nall (AQD Permitting) and I met today to discuss NARM's Exceptional Event packet for the RO-1 exceedance.
We have some questions we'd like to have answered before we make our final decision on flagging the data.

1. Please include a facility map with equipment and operations and roads marked on the map. Additionally, please mark roads and equipment that were shut down in response to the event.

See Exhibit 1

As discussed in the original NEAP package (submitted Feb. 15, 2012) *all* shovels, loaders, trucks and motor graders were shut down in the Railloop and East Pits from 1100MST until 1430MST. Water trucks remained active in these areas.

2. Was a dragline operating in the area the day of the exceedance?

Dragline 154, operating in the Railloop Pit, was shut down from 1100MST until 1430MST.

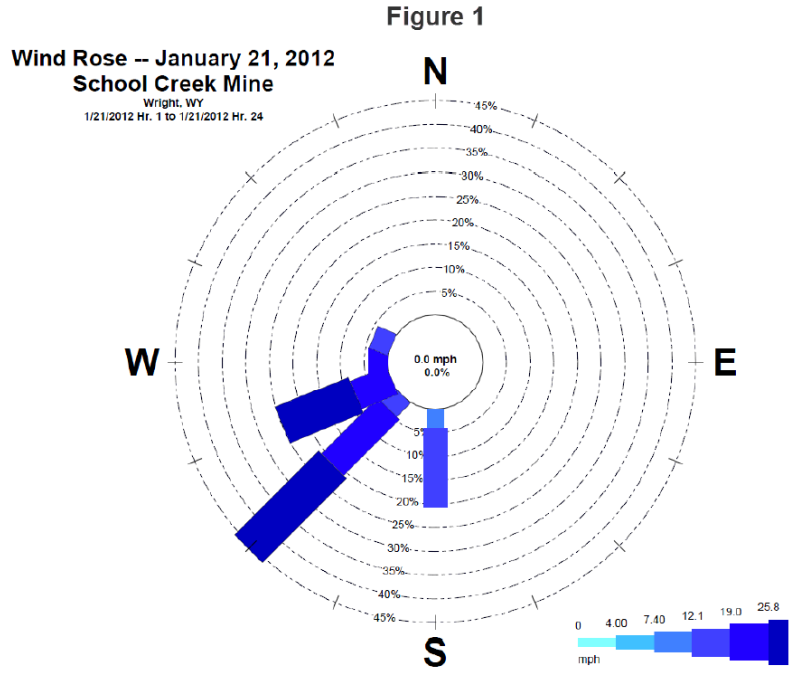
3. Please include a wind rose for the day.

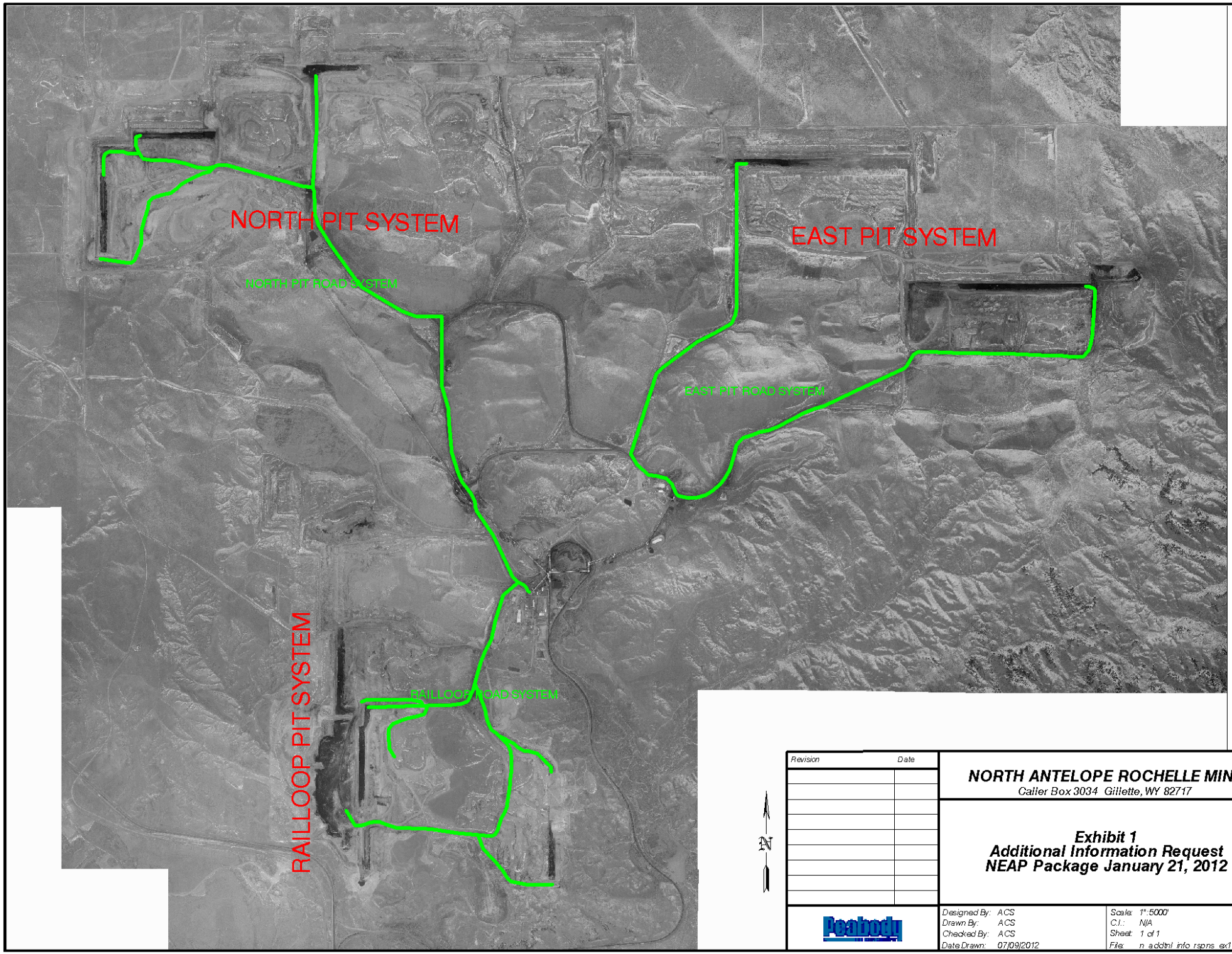
See Figure 1

4. Please clarify what time the original alarm was triggered by sampler RO-1 and the time that NARM's response to the alarm started.

The North Antelope Rochelle Mine Air Quality Action Plan states that "When hourly values are found to be above 250ug/m3" or "the 24-hour values are above 75ug/m3 "an automated alarm system will sound. The RO-1 sampler recorded 1 hour values greater than 250ug/m3 at 0900MST. At 0911MST field supervisors were notified of the high reading and took immediate action to identify and control the dust. Please refer to the original NEAP package (submitted Feb. 15, 2012) for further response details.

Figure 1


Wind Rose -- January 21, 2012
School Creek Mine
Wright, WY
1/21/2012 Hr. 1 to 1/21/2012 Hr. 24
N
E
S
W
45%
40%
35%
30%
25%
20%
15%
10%
5%
0.0 mph
0.0%
0
4.00
7.40
12.1
19.0
25.8
mph



Revision	Date

NORTH ANTELOPE ROCHELLE MINE
Caller Box 3034 Gillette, WY 82717

Exhibit 1
Additional Information Request
NEAP Package January 21, 2012

Peabody

Designed By: ACS	Scale: 1":5000'
Drawn By: ACS	C.I.: N/A
Checked By: ACS	Sheet: 1 of 1
Date Drawn: 07/09/2012	File: n addtnl info rspns ex1 120709

Hart, Adam

From: Dinsmoor, Phil
Sent: Friday, May 10, 2013 12:44 PM
To: Hart, Adam
Subject: FW: New Draft guidance documents on implementation of exceptional events rule

---

From: Cara Keslar [mailto:cara.keslar@wyo.gov]
Sent: Monday, July 16, 2012 7:54 AM
To: Bracken, Korby; peter.wolberg@anadarko.com; Kyle.wendtland@riotinto.com; Monica Williams; dhough@archcoal.com; Jerry Menge; erobinson@aecoal.com; Tim.Mordhorst@blackhillscorp.com; Jon Gross; Laura Ackermann; Allison.kalpin@cldph.com; Cugnetti, Michael T.; matthew.crowe@fmc.com; Tina M. (EB) 3302 Hutt; hunderberg@alphanr.com; lbruder@genchem.com; mandrews@mountaincement.com; Goldsmith, Jeffrey; LCherny@ocichemical.com; Gillespie, Dale; jason.murdock@pacificorp.com; Smith, Jim P.; Basko, Rose; Stephens, Adam; Darin.Howe@simplot.com; wbyrd@sinclairoil.com; Michelle Serres; danielle.knaphus@solvay.com; dkline@archcoal.com; Lecia Craft; Beth Goodnough; Mueller, Stevan; Warren, Michael; lane.larsen; Dinsmoor, Phil
Cc: Amber Potts; Kirk Billings; Steve Dietrich; Darla Potter; Tanner Shatto; Chris Hanify; Glenn Spangler; Tony Hoyt; Gregory Meeker; Robert Gill
Subject: New Draft guidance documents on implementation of exceptional events rule

Dear industrial monitoring contacts,

As you may know, EPA has released new guidance for comment on implementation of the exceptional events rule titled "Draft Guidance to Implement Requirements for the Treatment of Air Quality Monitoring Data Influenced by Exceptional Events" including attachments Draft exceptional Events Rule Frequently Asked Questions, Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds under the Exceptional Event Rule, and their request for comments.

With this release, EPA has pursued a more formal comment process that ends on September 4, 2012. The CFR notice and guidance documents can be found here: http://www.epa.gov/ttn/analysis/exevents.htm

My last email (attached) discussed EPA's use of these guidance documents to evaluate demonstration packages. EPA Region 8 has confirmed that they will now be following the newest set of guidance when they evaluate demonstration packages citing the federal register notice " The EPA has also begun applying the principles in the draft guidance documents as we receive exceptional event submittal packages." (page 39960)

The Air Quality Division (AQD) will continue to judge exceedance demonstrations in accordance with the Exceptional Events Rule and Natural Events Action Plan (NEAP), where applicable, and the notification procedures letter that was sent out by Steve Dietrich in July of 2011. The AQD will also rely heavily on the FAQ's when questions arise while evaluating demonstrations. However, seeing as that EPA has the ultimate authority to concur or not concur on these exceptional events, the AQD strongly suggests that facilities familiarize themselves with all of the EPA documents listed above and add elements to strengthen the demonstration as needed.

Due to the large volume of exceedances during 2012 many exceptional event demonstration packages have already been submitted. If facilities have packages currently in review by the AQD and wish to update/add information, the AQD will work with the facilities to update their packages as timelines allow. If you have questions, please contact me or your Monitoring Section Project Manager (Amber Potts or Kirk Billings).

We appreciate your cooperation in this matter,
Cara

Cara Keslar
Monitoring Section Supervisor
Wyoming DEQ - Air Quality Division
(307) 777-8684 (office)
(307) 286-2383 (cell)
cara.keslar@wyo.gov

---------- Forwarded message ----------
From: **Joseph Delwiche** <Delwiche.Joseph@epamail.epa.gov>
Date: Mon, Feb 6, 2012 at 10:14 AM
Subject: In re overview - draft guidance documents on implementation of exceptional events rule
To: Cara Keslar <cara.keslar@wyo.gov>
Cc: Richard Payton <Payton.Richard@epamail.epa.gov>

Cara,

As you know, the Western States Air Resources Council was among the organizations that commented to EPA on the March 22, 2007 "Treatment of Data Influenced by Exceptional Events; Final Rule," and WESTAR has continued to comment on issues and developments connected with the rule. EPA has likewise engaged air quality organizations regarding the rule.

In 2011, EPA made known to state, local and tribal air quality agencies information on preparing exceptional event demonstrations. The information included drafts of "Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds under the Exceptional Events Rule," a question and answer document and an overview. As stated by EPA in presenting this information for comment by state, local and tribal organizations, EPA "anticipates following the draft guidance during the review period." Thus EPA Region 8 understands that we are to follow the existing draft guidance at this time and to continue following the draft guidance as revised drafts are circulated.

Please let us know if you have any questions about this.

Joe Delwiche
EPA Region 8

303 312-6448

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Act and may be disclosed to third parties.

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matthew H. Mead, Governor

John Corra, Director

August 17, 2012

Mr. Phil Dinsmoor
Sr. Manager Environmental Services
Peabody Energy Company
Caller Box 3034
Gillette, WY 82717

Re: Request re-evaluate submittal for NARM's January 21, 2012 PM_{10} exceedance

Dear Mr. Dinsmoor,

This letter is in response to your verbal request on August 14, 2012 to re-evaluate the packet that North Antelope Rochelle Mine (NARM) submitted to support their request for an exceptional event flag for a January 21, 2012 PM_{10} exceedance (EE packet). As stated in my July 16, 2012 email to industrial facilities, the Air Quality Division (AQD) would work with facilities that wanted to re-evaluate their previously submitted EE packets in light of the newly published EPA Draft Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds under the Exceptional Events Rule (draft guidance). This opportunity is afforded for any EE packets that have already been submitted for exceedances that took place in first or second quarter of 2012. Please note this opportunity will not be available for EE packets for exceedances that take place outside of this timeframe.

The AQD grants your request to re-evaluate NARM's EE packet. Please complete your re-evaluation and submit an amended EE packet (if needed) no later than three (3) weeks from the receipt of this letter. For this and all future submittals, copies for AQD staff should be sent to Kirk Billings (Lander Office), Tanner Shatto (Sheridan Office) and hard copy to me (Cheyenne Office). Additionally, the original EE packet did not include a map. Please provide a map that is no larger than 11"X17".

Please keep in mind that while AQD had an extensive staff of monitoring, compliance, modeling and permitting personnel available to evaluate the EE packet, this packet may also be reviewed by the public and EPA. The AQD will suspend evaluation of the EE packet until a map and any amended materials are submitted. Please feel free to call me (307-777-8684) or Kirk Billings (307-335-6963) with any further questions. Thank you for your cooperation in the matter.

Sincerely,

Cara Keslar
Monitoring Section Supervisor

Cc: Kirk Billings, AQD Lander
Tanner Shatto, AQD Sheridan
Bryan Hansen, NARM

From:	Dinsmoor, Phil
To:	Hart, Adam
Subject:	2012 Exceptional Events Demonstrations
Date:	Friday, May 10, 2013 12:45:37 PM

From: Dinsmoor, Phil
Sent: Friday, August 24, 2012 3:14 PM
To: Cara Keslar (ckesla@wyo.gov)
Cc: Stephens, Adam; Goldsmith, Jeffrey
Subject: 2012 Exceptional Events Demonstrations

Cara

I received your July 16 email and subsequent letter dated August 17 regarding re-evaluation of the January 21, 2012 exceedance package for NARM monitor RO-1. We are diligently working to complete a review of the EPA guidance, supply comments as appropriate and then to update the package accordingly. Because of the volume EPA's guidance materials, simply getting through all the materials will not be completed until early September. The guidance identifies data and data evaluations that were not previously performed and that I do not believe can be completed within a 30-day period, and certainly not the 3 weeks afforded in your letter. Please consider this request for an extension until November 1st to submit a re-evaluation of this exceedance package.

As we discussed today, Peabody also wishes to re-evaluate the January 21, 2012 exceedance packages for School Creek Mine's SC-2 and SC-3 monitors. We are in the same situation and request your concurrence to re-evaluate these packages by November 1st.

Thank you for your consideration.

Phil Dinsmoor
Director Environmental Services, PRB
(307)687-3938

Peabody Powder River Operations, LLC
Caller Box 3034
Gillette, Wyoming 82717-3034
(307) 687-3900

November 21, 2012

Cara Keslar
Monitoring Section Supervisor
Air Quality Division
Wyoming Department of Environmental Quality
122 West 25th Street
Cheyenne, WY 82002

RE: North Antelope Rochelle Mine;
High Wind Event Demonstration – RO-1 PM_{10} Monitor

Dear Cara:

On January 21, 2012, the RO-1 PM_{10} monitor operated by Peabody near its North Antelope Rochelle Mine (NARM) recorded an exceedance of the 24-hour PM_{10} NAAQS. In keeping with the AQD's guidance, Peabody submitted an exceptional event documentation package related to that exceedance to the AQD Monitoring Section in February 2012, and then submitted supplemental materials in July 2012 in response to AQD's request for additional information.

As you are well aware, in July 2012 EPA published voluminous draft guidance to implement requirements for the treatment of air quality monitoring data influenced by exceptional events. Subsequently, with your email of July 16, 2012, the AQD advised industrial monitoring contacts to familiarize themselves with all of the EPA guidance and "...add elements to strengthen the demonstration as needed." Accordingly, the AQD committed to "work with facilities to update their packages as timelines allow."

Against that background, Peabody first wishes to thank the AQD for providing us with the opportunity and much-needed time to "get up to speed" with EPA's recent draft guidance. Informed by that new guidance, and consistent with the AQD's Natural Events Action Plan and EPA's Exceptional Events Rule, Peabody examined our earlier submittals and then made extensive revisions and additions to that original exceptional event package. Those amendments to both the content and format of the earlier submittals were so substantive that Peabody respectfully now submits the enclosed "Demonstration of Exceptional Event – High Winds" as a stand-alone replacement for the original exceptional event package involving the subject exceedance.

Again, Peabody thanks the AQD for its willingness not only to allow industrial monitoring facilities the time to revise their processes and procedures for the preparation of exceptional event demonstrations, but also to revise their prior 2012 submittals accordingly. We believe the enclosed High Wind Event demonstration thoroughly and appropriately addresses the requirements and principles of the NEAP and the EER as well as the enhanced approaches suggested by new federal guidance. In addition, we have endeavored to tailor our submittal to be more responsive to the information needs and requests of the Air Quality Division.

Peabody Powder River Operations, LLC
Caller Box 3034
Gillette, Wyoming 82717-3034
(307) 687-3900

In the event that the AQD either has any questions about the enclosure or requires further information, please do not hesitate to contact me or Jeffrey Goldsmith at your convenience. Jeffrey can be reached at the mine (307) 464-4787, or by email (jgoldsmith@peabodyenergy.com). My phone number is (307) 687-3938 and email is pdinsmoor@peabodyenergy.com.

Sincerely,

Philip C. Dinsmoor
Director, Environmental Services
Peabody Energy

Enclosure

ec: J. Goldsmith - NARM

NORTH ANTELOPE ROCHELLE MINE

DEMONSTRATION OF EXCEPTIONAL EVENT – HIGH WINDS
RO-1 PM_{10} MONITOR
JANUARY 21, 2012

Prepared for

WYOMING DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
NOVEMBER 21, 2012

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INTRODUCTION

The Air Quality Division (AQD) of the Wyoming Department of Environmental Quality (DEQ) requires Peabody to operate an approved ambient PM_{10} monitoring network at its North Antelope Rochelle Mine (NARM) to demonstrate compliance with the PM_{10} NAAQS, codified at Chapter 2, Section 2 of the Wyoming Air Quality Standards and Regulations (WAQSR). On January 21, 2012 one of NARM's ambient PM_{10} monitors near the Mine measured a 24-hour average PM_{10} concentration of 200 µg/m^3, i.e., an exceedance of the 24-hour national ambient air quality standard (NAAQS) for PM_{10}.[1] The purpose of this document is to demonstrate that this measured exceedance was caused by a high wind event.

BACKGROUND

Peabody Powder River Mining, LLC operates the North Antelope Rochelle Mine, a surface coal mine located in the southern portion of the Powder River Basin (PRB) approximately sixteen miles southeast of Wright, Wyoming. As shown in Exhibit 1, NARM includes three major pit systems: the North Pits, the East Pits and the West Pits. The southern portion of the West Pits is typically referred to as the Rail Loop Pits and constitutes the southernmost mining activity at NARM. The major mining equipment utilized at NARM includes 3 draglines, 4 coal shovels, 8 overburden shovels, 2 large-capacity loaders and a fleet of 55 haul trucks with capacities ranging from 200 tons to 400 tons. NARM also operates 9 water trucks and a large fleet of support equipment including dozers, scrapers, graders, loaders, service trucks and light-duty vehicles.

In 2007 DEQ began implementation of a Natural Events Action Plan (NEAP) for coal mines of the PRB.[2] Based on the U.S. Environmental Protection Agency's (EPA's) Natural Events Policy,[3] Wyoming's NEAP recognizes that high ambient concentrations of PM_{10} may be caused by an uncontrollable natural event that results in particles such as fugitive dust or smoke becoming entrained in ambient air. The NEAP further provides that a measured exceedance of

[1] 40 C.F.R. § 50.6. The State of Wyoming has a 24-hour state ambient air quality standard equal to the NAAQS, i.e., 150 µg/m^3.
[2] DEQ, *Natural Events Action Plan for the Coal Mines of the Powder River Basin of Campbell & Converse Counties, Wyoming* (rev. Jan. 23, 2007) (hereinafter "NEAP").
[3] Memorandum from Mary D. Nichols, EPA Ass't Administrator for Air and Radiation, to EPA Regional Air Directors, of June 6, 1996 ("Areas Affected by PM-10 Natural Events"; aka "EPA's Natural Events Policy" (NEP)).

an ambient PM_{10} standard in the PRB due to such natural events need not be considered, i.e., may be "excluded," when characterizing ambient PM_{10} levels in that area, provided the measured exceedance is demonstrated to be caused by a natural event. Finally, for a measured exceedance to be caused by a natural event, the NEAP requires that any anthropogenic sources of dust contributing significantly to the measured PM_{10} exceedance must have been controlled during that event by a three-tiered program of control measures consisting of best available control technology (BACT), best available control measures (BACM) for disturbed surface areas, and appropriate, source-specific reactionary control measures for mining operations.

Also in 2007, EPA promulgated its Exceptional Events Rule (EER).[4] Under the EER, a demonstration that a NAAQS exceedance was caused by an exceptional event must show that:

(A) The event satisfies the criteria set forth in 40 C.F.R. § 50.1(j) that:

(i) the event affects air quality;

(ii) the event is not reasonably controllable or preventable;

(iii) the event is caused by human activity that is unlikely to recur at a particular location *or* the event is a natural event; and

(iv) the event is determined by the Administrator in accordance with 40 C.F.R. § 50.14 to be an exceptional event.

(B) There is a clear causal relationship between the measurement under consideration and the event that is claimed to have affected the air quality in the area;

(C) The event is associated with a measured concentration in excess of normal historical fluctuations, including background; and

(D) There would have been no exceedance or violation but for the event.

EPA has recently issued draft guidance to assist States in their administration of the EER by providing examples of how each of the above elements of an exceptional event may be demonstrated.[5]

[4] 40 C.F.R. § 50.14.

[5] *See, e.g.,* EPA, *Draft Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High Winds,* June 2012 (hereinafter "Draft High Winds Guidance"); EPA, *Draft Exceptional Events Rule Frequently Asked Questions,* June 2012.

DEMONSTRATION OF EXCEPTIONAL EVENT AT NARM ON JANUARY 21, 2012

On January 21, 2012, NARM's ambient PM_{10} monitor designated as "RO-1" recorded a 24-hour average PM_{10} concentration of 200 µg/m^3, thereby exceeding the ambient 24-hour PM_{10} standard of 150 µg/m^3. The purpose of this document is to demonstrate that this monitored exceedance was caused by an exceptional event. Peabody's conclusion that this exceedance was due to a high wind event follows from a weight-of-evidence analysis as suggested by EPA.[6] Consistent with EPA's policy that the appropriate level of supporting documentation for an exceptional event demonstration will vary on a case-by-case basis,[7] Peabody strongly believes the documentation and analyses provided herein are more than sufficient to demonstrate that the exceedance in question was caused by a high wind event.

A. The Event at NARM on January 21, 2012 Was a High Wind Event

While developing the NEAP for PRB coal mines, AQD commissioned a study of the relationship between meteorological conditions and ambient PM_{10} concentrations in the PRB. Among other things, that study found that the influence of wind speed on PM_{10} concentrations in the PRB increases as wind speed increases. In particular, that study found that wind speed is the dominant predictor of ambient PM_{10} concentrations in the PRB at wind speeds in excess of 20 mph.[8]

According to DEQ, a "high wind event" occurs in the PRB "when hourly average wind speeds reach or exceed 20 mph."[9] EPA has explained further that "[g]enerally, the EPA will accept that high winds could be the cause of a high 24-hour average PM_{10} or $PM_{2.5}$ concentration if there was *a least one full hour* in which the hourly average wind speed was above the area-specific high wind threshold."[10]

NARM's 10-meter meteorological tower (PRCC-1) is located roughly equidistant from the Mine's North and East Pits to the north and the Rail Loop Pits to the south. That met tower's wind

[6] EPA, Draft High Winds Guidance at 8.
[7] *Id.*
[8] NEAP, Appendix D ("Statistical Analyses of the Influence of Wind Speed on PM_{10} Concentration in the Powder River Basin").
[9] NEAP at 10.
[10] EPA, Draft High Winds Guidance at 40 (emphasis added).

measurements are therefore generally representative of winds experienced across the Mine. Table 1 identifies the hourly average wind speeds measured at PRCC-1 on January 21, 2012.

Table 1 confirms that hourly average wind speeds reached or exceeded 20 mph during 14 hours of the day, including (1) 10 straight hours beginning in the morning and continuing into the afternoon, and (2) a second episode of 4 straight hours at the end of the day. During 5 of these hours, hourly average wind speeds exceeded 30 mph. Notably, during 9 hours of the day wind gusts exceeded 40 mph, reaching a maximum of 63 mph.

Because wind speeds at NARM on January 21, 2012 equaled or exceeded 20 mph for numerous hours, a high wind event clearly occurred at NARM on that day.

B. Evidence Indicates That High Winds Caused the PM_{10} Exceedance

1. *Spatial Relationship*

In addition to hourly average wind speeds, Table 1 also identifies hourly average wind directions measured at the PRCC-1 meteorological station during January 21, 2012. The wind rose provided in Figure 1 summarizes the relative frequencies of those wind parameters on that day.

In addition, Exhibit 1 illustrates the location of the RO-1 monitor which recorded the exceedance on January 21 relative to NARM's various emission source areas having the potential to contribute to measured PM_{10} levels at that monitor. With a monitoring network for evaluating localized impacts from a mine, it is axiomatic that the likely contributors to a PM_{10} monitor's measurements during a high wind event are the particular source areas which are located upwind of that monitor, especially during the specific hours in which the high winds occurred.

TABLE 1					
METEOROLOGICAL DATA AND RO-1 MONITOR DATA FOR JANUARY 21, 2012					
Date	Time	Wind Speed (mph)	Wind Direction (°)	Wind Gust Speed (mph)	Hourly PM_{10} Conc. (µg/m³ @STP)
01/21/12	1:00	7.6	112.0	10.1	19.1
01/21/12	2:00	6.4	140.0	10.5	16.3
01/21/12	3:00	6.3	155.0	10.6	14.9
01/21/12	4:00	7.9	176.0	13.1	22.2
01/21/12	5:00	6.1	138.0	9.7	15.5
01/21/12	6:00	8.0	187.0	24.5	19.3
01/21/12	7:00	23.1	234.0	42.7	120.6
01/21/12	8:00	29.5	246.0	47.6	176.0
01/21/12	9:00	35.6	244.0	56.5	542.7
01/21/12	10:00	35.1	243.0	57.4	871.6
01/21/12	11:00	43.4	248.0	63.1	1772.3
01/21/12	12:00	33.7	245.0	55.6	733.0
01/21/12	13:00	32.3	245.0	53.0	136.3
01/21/12	14:00	20.6	258.0	35.9	42.9
01/21/12	15:00	19.8	259.0	42.5	78.0
01/21/12	16:00	25.0	241.0	42.2	54.9
01/21/12	17:00	10.1	215.0	23.3	13.2
01/21/12	18:00	9.1	229.0	19.0	6.1
01/21/12	19:00	17.2	238.0	29.8	14.6
01/21/12	20:00	18.1	239.0	28.4	14.9
01/21/12	21:00	20.5	252.0	28.8	24.6
01/21/12	22:00	22.2	260.0	36.1	32.5
01/21/12	23:00	23.8	273.0	33.9	31.0
01/22/12	00:00	20.3	291.0	29.6	7.9

Figure 1
Wind Rose -- January 21, 2012
North Antelope Rochelle Mine
Wright, WY
1/21/2012 Hr. 1 to 1/21/2012 Hr. 24

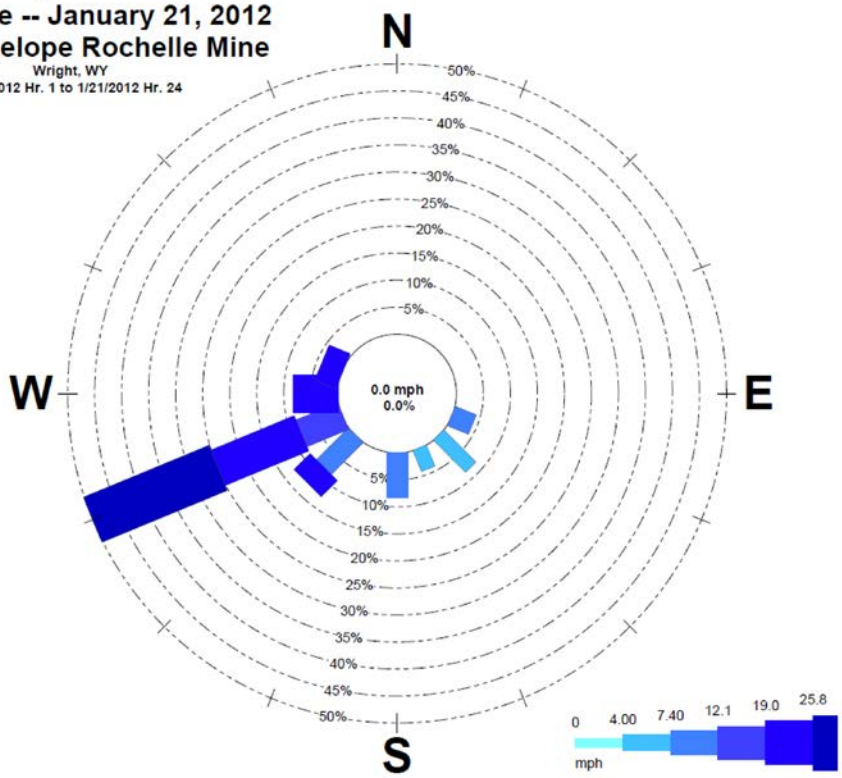


Table 1 confirms that hourly average wind directions changed little during 12 of the 14 high wind hours of the day. In particular, high winds during those 12 hours blew consistently from the west-southwest, i.e., confined within an angle between 234º and 260º. Therefore, the likely significant contributors to the PM_{10} exceedance measured by the RO-1 monitor on January 21 are the emission source areas located upwind of the RO-1 monitor and within a sector bounded by wind directions between 234º and 260º.

As demonstrated in Exhibit 1, constructing a "reverse trace" of those predominant directions of high winds, starting from the RO-1 monitor, identifies the following upwind sources of PM_{10} as being likely significant contributors to the PM_{10} NAAQS exceedance measured at RO-1 on January 21, 2012:

- Active mining areas in the North and West Rail Loop Pits;
- Disturbed areas associated with the North and West Rail Loop Pits; and
- Undisturbed areas between the North and West Rail Loop Pits and the RO-1 monitor.

Conversely, mining activities as well as disturbed and undisturbed lands associated with the North Pits and East Pits at NARM were not located upwind of the RO-1 monitor during prolonged hours of high winds on January 21. Consequently, mining activities and lands related to those two main pit systems cannot reasonably be considered as source areas likely to have meaningfully contributed to the measured PM_{10} exceedance at RO-1.

Closer scrutiny of the hourly data within Table 1 reveals the presence of an "exceptionally high" wind event nested within the high wind event day of January 21. That is, the hourly average values for wind directions reported from 0900 through 1200 on January 21 varied by only 5º (243º-248º) while hourly average wind speeds of 34-43 mph for that period were considerably above the wind speed threshold. In addition, maximum hourly wind gusts over that same period ranged between 56-63 mph.

During those "exceptionally high" wind speeds coming from the same direction for 4 straight hours, hourly average PM_{10} concentrations measured at RO-1 were especially and unusually elevated, i.e., 543, 872, 1772 and 733 $\mu g/m^3$. There can be little doubt that contributions of wind-blown particulate matter to the RO-1 monitor during those 4 particular hours were primarily

responsible for that monitor's measured exceedance of the 24-hour PM_{10} NAAQS on January 21.[11]

Furthermore, the nearly constant direction of those exceptionally high winds over 4 hourly readings allows construction of a second, narrow reverse-trace from the RO-1 monitor (243º-248º) that identifies specific source areas that almost certainly were the principal contributors to the January 21 exceedance. In particular, analysis of the trajectory for those exceptionally high winds over 4 hours identifies mining activities and disturbed lands within the West Rail Loop Pit area as NARM sources which most likely contributed a large majority of the particulate matter measured by the RO-1 monitor on that day. Also, undisturbed lands between the West Rail Loop Pit area and RO-1 are other most likely significant contributors to the January 21 exceedance due to those particular natural areas being directly upwind of the RO-1 monitor during the same 4 hours of exceptionally high winds.

In sum, NARM source areas likely to have significantly contributed to the RO-1 monitor's measured exceedance on January 21, 2012 can be identified from the spatial relationship between that monitor and the source areas located upwind from that monitor during hours of high winds at NARM. Based on that relationship, sources within the North and West Rail Loop Pits have been identified as likely significant anthropogenic contributors to the measured exceedance on January 21.

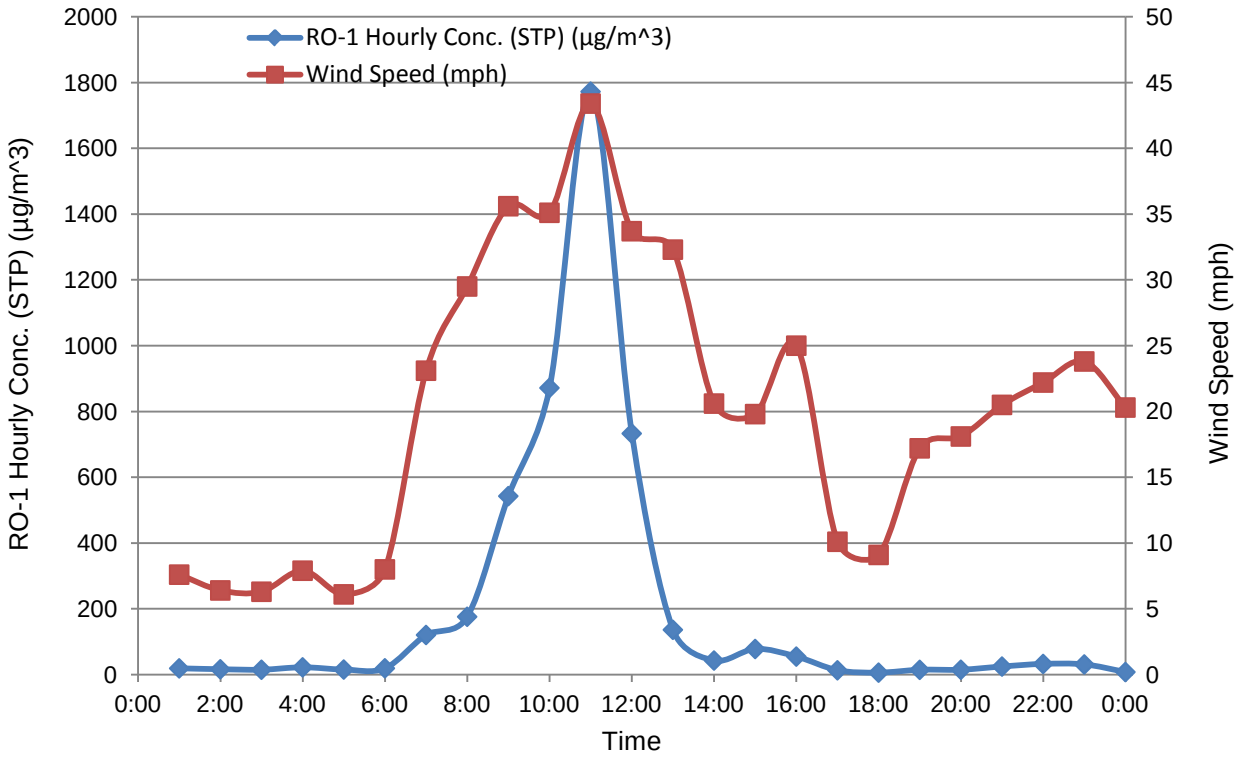
Moreover, NARM source areas most likely to have significantly contributed to that measured exceedance can be identified from the spatial relationship between the RO-1 monitor and the source areas located directly upwind from that monitor during the 4 straight hours of exceptionally high winds on that day. Given that relationship, anthropogenic sources within the West Rail Loop Pit, in particular, have been identified as the most likely significant contributors to the measured exceedance on January 21.

[11] The exceptionally high wind speeds coupled with the very elevated PM_{10} concentrations during those four hours also leave little doubt that high winds on January 21, 2012 "affected air quality," one of the elements of a high winds event demonstration.

2. *Temporal Relationship*

As shown in Figure 2, changes in PM_{10} levels measured by the RO-1 monitor clearly correlated with changes in high wind speeds at NARM on January 21, 2012. In particular, for hourly wind speeds above the PRB's high wind threshold, hourly PM_{10} concentrations at RO-1 increased when hourly wind speeds increased. Likewise, during high winds, hourly PM_{10} concentrations decreased when hourly wind speeds decreased. On the other hand, hourly PM_{10} concentrations at RO-1 did not correlate appreciably with changes in wind speed when wind speeds were below the high wind threshold.

FIGURE 2
Wind Speed vs PM_{10} Concentration
for Monitor RO-1 on January 21, 2012



On January 21, 2012, the straight-line distance from the area where topsoil had been removed

The straight-line distance from the RO-1 monitor to the area where topsoil had been removed at the north end of the Rail Loop West Pit on January 21 is about 4.5 miles. The "exceptionally high" winds at NARM on that day, blowing at an average of 37 mph from the subject area of topsoil removal, would reach the RO-1 monitor in about 7 minutes. This explains why the track of hourly PM_{10} concentrations at RO-1, as shown in Figure 2, is so closely synchronized with the track of the hourly high wind speeds at NARM.

The short lag time between a change in high wind speed and the subsequent change in PM_{10} concentration at RO-1 is consistent with high winds from the North and West Rail Loop Pits reaching RO-1 in a matter of minutes. Figure 2 is fully consistent with AQD's earlier finding for the PRB that wind speed is the dominant predictor of ambient PM_{10} concentrations at wind speeds in excess of 20 mph. That temporal relationship between high wind speeds and PM_{10} levels at the RO-1 monitor was clearly present on January 21, 2012.

3. *Other Measured Exceedances on the Same Day*

Measurements of high winds and multiple exceedances of the 24-hour PM_{10} NAAQS in the same area of the PRB on January 21, 2012 provide considerable weight to a conclusion that the subject of this demonstration, i.e., the measured exceedance at NARM's RO-1 monitor on January 21, 2012, was caused by a high winds event.

In particular, on January 21 at the School Creek Mine (SCM) adjacent to NARM, two of SCM's ambient PM_{10} monitors (SC-2 and SC-3) recorded 24-hour average PM_{10} concentrations equal to 223 $\mu g/m^3$ and 226 $\mu g/m^3$, respectively. Each of those incidents was also characterized by several hours of exceptionally high winds contained with a prolonged period of high winds, all blowing from the same general direction. The fact that multiple exceedances were measured on the same day when persistent high winds were reported over the general area is clearly more than coincidence. Rather, that evidence collectively supports a conclusion that high winds were responsible for those concurrent, multiple exceedances.

4. *Comparison of Event-affected Concentration to Non-event Concentration*

Comparison of the PM_{10} concentrations measured by the RO-1 monitor on January 21, 2012 and on a day similar to January 21 but without high winds can also demonstrate a clear causal relationship between high winds and the subject PM_{10} NAAQS exceedance.

For example, on January 21, 2012, winds blew for a period of 4 straight hours toward the RO-1 monitor almost from a constant direction (243º to 248º). Similarly, as shown in Table 2, on March 10, 2012 winds blew for a period of 4 straight hours toward the RO-1 monitor from essentially that same constant direction (239º to 246º). However, while hourly average wind speeds during the 4 straight hours on January 21 ranged from 34 to 43 mph, hourly average wind speeds during the 4 straight hours on March 10 only ranged from 14 to 15 mph.

The almost constant wind direction over the 4-hour period for each of the two days meant that the upwind source areas in the West Rail Loop Pit that almost certainly contributed most of the particulate matter to the RO-1 monitor during the January 21 exceedance were likewise directly upwind of the RO-1 monitor on March 10. Nevertheless, while hourly PM_{10} concentrations at that monitor during the 4 straight hours of January 21 were extremely elevated at levels of 543 $\mu g/m^3$ to 1,772 $\mu g/m^3$, hourly PM_{10} concentrations at that monitor during the 4 straight hours of March 10 never exceeded 48 $\mu g/m^3$. Because operating levels in the West Rail Loop Pit area on January 21 were not unlike those on March 10, the substantive differences between hourly PM_{10} concentrations at RO-1 for the 4 hours on January 21 and for the 4 hours on March 10 must be attributed to high winds on January 21 that were not also present on March 10.

In short, with wind directions during the 4-hour periods of each day being virtually the same, the significant differences in hourly PM_{10} concentrations at the RO-1 monitor during those two periods highlight a clear causal relationship between the high winds on January 21, 2012 and the measured exceedance of the 24-hour PM_{10} NAAQS on that day.

TABLE 2					
METEOROLOGICAL AND RO-1 MONITOR DATA FOR MARCH 10, 2012					
Date	Time	Wind Speed (mph)	Wind Direction (°)	Wind Gust Speed (mph)	Hourly PM_{10} Conc. (μg/m³ @STP)
03/10/12	1:00	3.6	299.0	10.1	69.8
03/10/12	2:00	5.1	177.9	8.8	53.0
03/10/12	3:00	2.5	221.9	4.8	32.8
03/10/12	4:00	2.9	278.8	7.0	38.2
03/10/12	5:00	1.5	305.2	4.8	42.6
03/10/12	6:00	3.5	293.9	7.2	51.8
03/10/12	7:00	5.4	297.8	8.5	47.0
03/10/12	8:00	2.0	125.1	4.4	71.4
03/10/12	9:00	3.7	181.9	8.0	47.0
03/10/12	10:00	6.4	228.0	11.0	33.7
03/10/12	11:00	11.1	251.5	17.5	121.5
03/10/12	12:00	13.3	250.3	19.5	68.0
03/10/12	13:00	14.0	246.2	21.0	47.9
03/10/12	14:00	13.9	241.9	23.8	34.3
03/10/12	15:00	14.8	245.2	23.0	48.2
03/10/12	16:00	14.7	238.9	22.9	32.9
03/10/12	17:00	14.0	243.1	20.6	62.1
03/10/12	18:00	10.9	259.1	17.5	131.0
03/10/12	19:00	3.9	259.7	10.8	112.5
03/10/12	20:00	2.4	228.2	7.9	95.5
03/10/12	21:00	3.2	215.2	9.4	93.4
03/10/12	22:00	5.7	226.2	9.7	111.0
03/10/12	23:00	4.3	225.8	10.9	104.1
03/11/12	00:00	4.8	224.2	10.9	63.7

5. *Visual Observations*

AQD-issued Permit No. MD-6375 for NARM requires adherence to the Mine's Air Quality Action Plan during "high particulate events." The Action Plan specifies that mine personnel "will determine possible emission sources areas at and surrounding the mine" whenever an hourly PM_{10} concentration in excess of 250 µg/m^3 is recorded.

After Hour 9 on January 21, 2012 an alarm was sounded in NARM's security office indicating that an hourly PM_{10} measurement at the RO-1 monitor had exceeded 250 µg/m^3. Measured hourly average wind speed at NARM at that time was 36 mph. Operations personnel then began a visual survey of ongoing operations at NARM, observing blowing dust originating from areas associated with the Rail Loop Pits and heading downwind in the general direction of the RO-1 monitor. No dust from other source areas was observed blowing toward RO-1 during that initial survey nor during periodic visual surveys thereafter as high winds continued.

Those visual observations during high winds on January 21 provided further evidence that one or more emission source areas in the Rail Loop Pits were likely significant contributors to PM_{10} concentrations measured at the downwind RO-1 monitor on that day.

6. *Conclusion*

The weight of the various evidence discussed above clearly indicates a strong cause-and-effect relationship between sustained high winds in the area of NARM on January 21, 2012 and the concurrent measurement of a 24-hour average PM_{10} concentration at NARM's RO-1 monitor that exceeded the 24-hour ambient PM_{10} standard on that day.

C. The Historical Context for the Subject High Wind Event Is Persuasive

High winds are not uncommon in the Powder River Basin. A prior study sponsored by AQD during development of the NEAP found that the southern portion of the PRB (including NARM) experienced winds in excess of 20 mph between 77 and 135 days per year. Furthermore, the same area of the PRB experienced winds in excess of 30 mph between 11 and 26 days per year. Yet, the frequency of previously measured PM_{10} exceedances in that region of the PRB has been far lower than the region's historical frequency of high winds.

EPA guidance acknowledges that analysis of historical fluctuations ("HF") in measured concentrations is a technical element that can be satisfied by submittal of certain comparative data.[12] To that end, a time series of ambient PM_{10} concentrations measured by NARM's RO-1 continuous monitor during the past three years is presented in Figure 3. That compilation of historical monitoring data plainly demonstrates that RO-1's measured PM_{10} level of 200 µg/m^3 on January 21, 2012 is atypical, i.e., not representative, of PM_{10} concentrations that have been measured by that monitor during the past three years.

A quantitative assessment of that prior monitoring data confirms what the time series in Figure 3 clearly illustrates. The average 24-hour PM_{10} concentration measured by the RO-1 monitor during the period from April 1, 2009 through March 31, 2012, was 36.4 µg/m^3. The measured 24-hour PM_{10} concentration on January 21, 2012 was 5.5 times greater than that average 24-hour value at RO-1 over three years. Stated differently, the measured 24-hour PM_{10} concentration on January 21, 2012 consists of the second highest daily measurement over that analysis period and represents the 99.9th percentile of all 1,155 quality–assured 24-hour concentrations measured by RO-1 during that period.

The high winds and resulting PM_{10} exceedance on January 21, 2012 is one of only two such events that have occurred at RO-1 during the analysis period. Consequently, a similar assessment of the percentile of the January 21, 2012 measured PM_{10} exceedance relative to other 24-hour measurements over the analysis period, without all high wind dust events during that period, would not be materially different from the above result.

Based on that three-year period of record for RO-1 measurements, an analysis was performed on seasonal data from January 1 through March 31 of each year. The average 24-hour PM_{10} concentration for three years of that seasonal data (343 quality-assured measurements) was 38.6 µg/m^3, with a maximum value of 200 µg/m^3 and a minimum value of 0 µg/m^3. The measured 24-hour PM_{10} concentration on January 21, 2012 represents the 100th percentile of the January - March seasonal data for the analysis period.

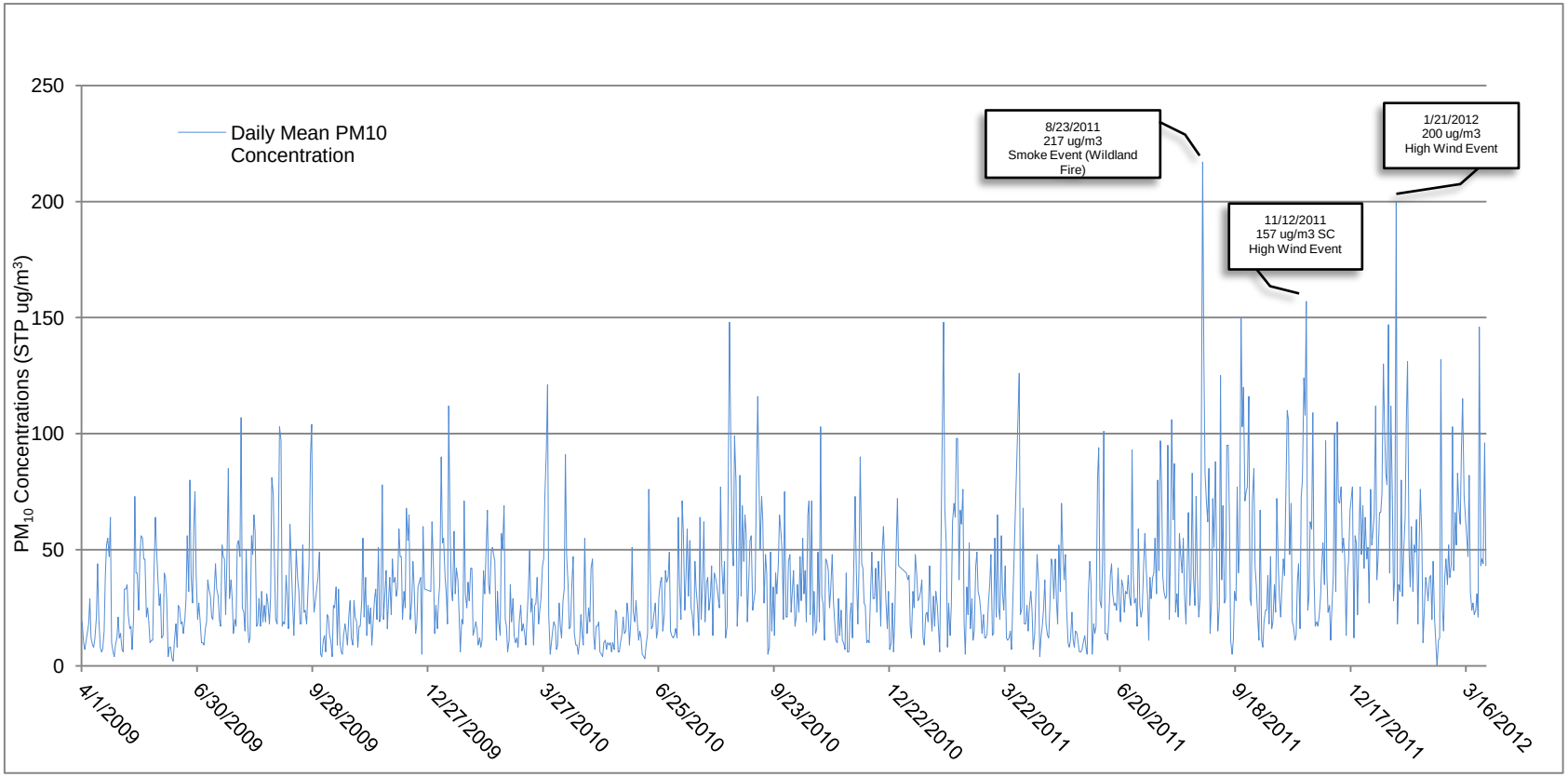
The value of a historical fluctuations analysis, as EPA has noted, is that the more an exceedance stands out from historical concentrations, the more plausible it is that the high wind

[12] EPA, High Winds Guidance at 8.

event was the cause of the exceedance.[13] As shown above, the magnitude of the concentration measured on January 21 at RO-1 is far greater than concentrations that typically have been observed in the past three years by that monitor. Simply characterizing that exceedance of January 21, 2012 as "standing out" from historical concentrations would be an understatement. Because that January 21 concentration is such a true "outlier," far from the normal range of historical concentrations, it is highly plausible that exceedance was caused by the high winds of January 21.

[13] EPA, Draft High Winds Guidance at 19.

FIGURE 3
RO-1 Monitor
3-Year Historical Fluctuations
24-Hour Averages



D. NARM's Significantly Contributing Sources Were Not Reasonably Controllable During the High Wind Event of January 12, 2012

Demonstrating that a PM_{10} NAAQS exceedance was caused by a high wind event requires a showing that the event, including emissions from significantly contributing anthropogenic and natural dust sources, was not reasonably controllable. Importantly, EPA has explained that the degree of event-specific information and data necessary for demonstrating that emissions were not reasonably controllable will generally be less for sustained wind speeds at or above the area-specific high wind threshold.[14] Moreover, for high wind events, EPA has observed that the level of rigor required to demonstrate that reasonable controls were (1) in place, (2) implemented and enforced, and (3) overwhelmed by high winds depends on the wind speed during the event relative to the area's high wind threshold.[15] Finally, some anthropogenic sources are not affected by high winds, e.g., transportation and industrial point sources. Those types of sources are considered "non-event sources" that are not subject to a requirement that they be reasonably controlled during a high wind event.[16]

1. *NARM's Contributing Anthropogenic Sources Were Not Reasonably Controllable*

Anthropogenic sources of dust are determined to be not reasonably controllable during a high wind event if:

(1) Those anthropogenic sources have reasonable controls in place during the event;

(2) The reasonable controls have been effectively implemented and enforced; and

(3) Wind speed was high enough to overwhelm the reasonable controls.[17]

Consistent with the basic methodology for demonstrating each element of a high wind event, a determination whether anthropogenic sources of dust were not reasonably controllable utilizes a weight-of-evidence approach.[18]

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[14] *Id. at 12.*
[15] *Id.*
[16] *Id.*
[17] *Id.* at 10.
[18] *Id.* at 8.

a. NARM's Contributing Anthropogenic Sources Had Reasonable Controls in Place on January 21, 2012

Whether controls on anthropogenic sources were reasonable for a high wind event must be judged in light of the technical information available to the agency at the time of the event.[19] In this particular case of high winds at NARM, DEQ previously has identified the threshold for the influence of high winds in the Powder River Basin and has required implementation of economically and technically feasible controls on mines in the PRB to minimize the occurrence of PM_{10} NAAQS exceedances in that area. In particular, the DEQ-developed NEAP requires individual coal mines in the PRB to implement (1) BACM for disturbed areas at the mines on a continuing basis and (2) reactionary control measures for active mine operations during a "high particulate event." Given the underlying purpose of those controls, they constitute "reasonable controls" for NARM's anthropogenic sources of dust.

(1) BACM -- "Reasonable controls," i.e., BACM, are required at NARM for active haul roads and for disturbed areas, as follows:

- *Active long-term coal haul roads* must be treated with dust control chemicals and/or water.
- *Active short-term mine haul roads* must be watered and maintained while in use.
- *All haul roads* must be regularly maintained to reduce the amount of dust re-entrained by haulage equipment.
- *Topsoiled areas* ≥ 150 contiguous acres that will not be revegetated within 60 days of topsoil laydown and *regraded backfill areas* ≥ 150 contiguous acres that will not be topsoiled within 60 days must, as soon as feasible, be ripped or chiseled to create a roughened surface, or be seeded with a temporary vegetative cover or otherwise be effectively stabilized against wind erosion.
- *Topsoiled areas* < 150 contiguous acres that will not be immediately revegetated and *regraded backfill areas* < 150 acres that will not be topsoiled for an extended period of time must, as soon as feasible, be ripped or chiseled to create a roughened surface, or be seeded with a temporary vegetative cover or otherwise be effectively stabilized against wind erosion.
- At least 30% of the actual open acres at the Mine must be stabilized against erosion during any calendar year.

[19] *Id.* at 12.

As previously explained, sources at NARM that likely contributed significantly to the PM_{10} NAAQS exceedance measured by the RO-1 monitor on January 21, 2012 were identified by constructing a "reverse trace" of the predominant directions (234º-260º) of high winds on that day, upwind from the RO-1 monitor. The result of that "reverse trace" is shown in Exhibit 2.

Exhibit 2 identifies the following active haul roads and specific disturbed surface areas at NARM over which high winds blew toward the RO-1 monitor on January 21, 2012. As the high wind event began on January 21, the following BACM were in place on those disturbed areas identified below that were likely significant contributors to the measured exceedance at RO-1:

- A combined 210 acres (of a possible 253 acres) of various active haul roads, facilities, rail and hydrologic structures were controlled with BACM on January 21 by prior use of one or more of the following methods: revegetation, riprap, chemical treatments, watering or pavement.
- Slopes adjacent to haul roads accounted for 245 acres of which all 245 acres had been scarified or temporarily revegetated prior to January 21.
- A total of 51 acres of reclaimed lands on which topsoil had been replaced. All of these acres had been immediately scarified in preparation for revegetation.
- A total of 120 acres of regraded backfill. Eighty of those acres had been ripped in preparation for topsoil replacement. The remaining 40 acres had not yet been treated because they were not planned to remain without topsoil for an extended period of time.

In addition to the above disturbed lands at NARM for which BACM is expressly required, similar control measures were also in place on January 21, 2012 for the following other disturbed areas at NARM over which high winds passed toward the RO-1 monitor:

- 433 acres of lands that had been stripped of topsoil in advance of the pits. This disturbed ground had been scarified in all but the most inaccessible of terrain.
- A combined 80 acres of overburden and topsoil stockpiles were located within the area over which high winds passed on January 21 toward the RO-1 monitor. Those stockpile areas had been graded and scarified prior to January 21.
- 198 acres of topsoiled acres which had recently been revegetated prior to January 21.

In short, reasonable controls were in place on January 21, 2012 for those disturbed areas at NARM that were likely significant contributors to the measured exceedance at RO-1.

(2) Reactionary Control Measures -- As with NARM's BACM requirements, the Mine's requirement to implement reactionary control measures is contained in NARM's AQD permit. In particular, NARM's required reactionary control measures are contained in the Mine's *Air Quality Action Plan,* incorporated in its AQD permit as Appendix B.

That *Action Plan* must be implemented for "high particulate events" at NARM. That is, when measured PM_{10} levels at NARM first fall within either a certain hourly range (250-500 µg/m^3) or a specified 24-hour range (75-100 µg/m^3), then operations personnel must make various preparations, including (1) status checks of ongoing operations in the different areas of the Mine, (2) periodic visual observations and monitoring of key meteorological parameters, (3) identification of emission source areas possibly contributing to elevated PM concentrations of concern, and (4) general planning for utilization of personnel and equipment resources if monitored PM_{10} concentrations continue to increase.

Should measured PM_{10} concentrations increase to the point of exceeding higher prescribed "action" thresholds on either an hourly basis (> 500 µg/m^3) or a 24-hour basis (> 100 µg/m^3), then NARM is required to "focus[ ] chemical and water treatment in active mine areas" and to implement, "if necessary, temporary realignment or suspension of certain mine activities that are determined to contribute to the levels of concern."[20]

Notably, however, NARM's *Action Plan* does not identify any specific reactionary control measure that must be applied to a particular type of mining activity, nor does the *Action Plan* specify either the extent of any particular activity's "temporary realignment or suspension" that may be "necessary" or the criteria for determining when such responses are "necessary."

After 9:00 on January 21, an alarm notified operations personnel that the hourly PM_{10} measurement by the RO-1 monitor had exceeded 500 µg/m^3. Operators began making preparations in anticipation of further high hourly readings. A second alarm at 10:00 notified operations personnel that the hourly PM_{10} measurement by the RO-1 monitor had exceeded 800 µg/m^3. Thereafter, operators monitored recent and current wind speeds and directions, visually observed any dusty conditions, and concluded that fugitive dust from the Rail Loop Pits, upwind of RO-1, was the likely cause of the elevated hourly measurements at that monitor. In keeping

[20] Permit, Appendix D.

with NARM's Action Plan, operations personnel then began implementing reactionary control measures for various emission source areas in the Rail Loop Pits.

A more rigorous, after-the-fact assessment of the conditions at NARM on January 21 (i.e., a reverse trace of predominant high wind directions upwind of the RO-1 monitor) determined that the active mining activities which were likely to have contributed significantly to the measured exceedance were those specific mining operations in the North and West Rail Loop Pits. As shown in Exhibit 1, one dragline (#154), two overburden shovels (#107 and #112) and one coal shovel (#108) were operating in the North and West Rail Loop Pits on January 21. The two overburden shovels were assigned a total of eight haul trucks between them. Four trucks were assigned to Shovel #108. In addition to trucks, each shovel had a rubber-tire dozer and a grader assigned to maintain "dig-and-dump" areas as well as haul roads.

The chronology for applying reactionary control measures during January 21 to active mining operations that likely contributed significantly to the measured exceedance at RO-1 on that day, i.e., activities in the North and West Rail Loop Pits, is presented below. A timeline or graphical depiction of that chronology is provided in Figure 4. Data used to construct this timeline are specific as to time of day and location on the mine site for shovels, haul trucks and draglines. For water trucks, however, the data only indicate whether a truck operated during the course of a 12-hour shift. As a result, Figure 4 suggests that 100% of the available water truck fleet was placed into operation at the beginning of shift (06:30) on January 21 and operated until end of shift (18:30). However, as noted below and in the notes section on Figure 4, Peabody cannot be certain about what portion of that 12-hour day shift each of the available trucks operated.

06:30

- Four water trucks were put into service to supplement the three already operating. Each of the seven trucks operated either all or only part of the 12-hour day shift.

11:00

- Shovel 112 in overburden was shut down along with six haul trucks, one motor grader and a rubber-tire dozer.

11:30

- Shovel 107 in overburden was shut down along with two haul trucks, one motor grader and a rubber-tire dozer.
- Dragline 154 shut down along with support machines including one track dozer.

- Shovel 108 in coal was shut down along with four haul trucks, one motor grader and a rubber-tire dozer.

13:30

- Shovel 108 in coal returned to service at a reduced rate along with haul trucks, a motor grader and a rubber-tire dozer.
- Shovel 107 in overburden returned to service along with haul trucks, a motor grader and a rubber-tire dozer.

14:00

- Dragline 154 returned to service along with support machines including one track dozer.
- Shovel 112 in overburden returned to service along with haul trucks, a motor grader and a rubber-tire dozer.

(**3**) ***Conclusion*** **--** As required by NARM's permit, BACM was fully in place during the January 21, 2012 high wind event for those disturbed areas expressly named in the permit that likely contributed significantly to the measured exceedance. Furthermore, although not required by regulation or permit, BACM had also been implemented on January 21 at NARM's other disturbed areas that likely contributed significantly to the measured exceedance. In sum, NARM's disturbed areas which likely contributed significantly to the measured exceedance had appropriate BACM in place immediately before the high wind event of January 21.

NARM also implemented a series of practicable and appropriate reactionary control measures during January 21 for those mining activities that were likely significant contributors to the measured exceedance, i.e., operations in the North and West Rail Loop Pits. Furthermore, substantial, "focused" watering of haul roads in the areas around those pits was implemented throughout the day on January 21.

Nothing within Wyoming's NEAP or EPA's EER mandates a complete shutdown of core mining operations during a high wind event. Rather, the NEAP and the EER contemplate the application of reasonable control strategies during a high wind event in an attempt to offset the inevitable increase in fugitive dust emissions when high winds simply overwhelm most, if not all, reasonable control measures. For example, when considering the operation of an overburden dragline during a period of high winds, DEQ's NEPA contemplates the operator "evaluat[ing]

whether it is practicable to dump the overburden as low as possible."[21] Or, with respect to road *maintenance* activities during a period of high winds, the NEAP suggests that "*road rock* hauling and *road rock* dumping (as opposed to coal or overburden) may be shut down during a high wind event if it is generating dust."

In short, the evidence arising from an objective assessment of (1) the reduced operations in the Rail Loop North and West Pits on January 21, 2012, (2) the increased frequency of watering haul roads serving those pits on that day, and (3) the BACM fully in place for NARM's disturbed areas affected by high winds on that day weighs heavily in support of a conclusion that anthropogenic sources of dust at NARM that significantly contributed to that day's PM_{10} NAAQS exceedance were reasonably controlled.

b. NARM's Reasonable Controls Have Been Effectively Implemented and Enforced

Compliance with NARM's requirements to implement BACM and reactionary control measures is evaluated in a variety of ways. For example, each year DEQ conducts a full on-site inspection of NARM's operations to assess the Mine's compliance with the relevant requirements in NARM's air quality permit. The most recent DEQ inspection prior to the January 21, 2012 measured exceedance was performed on August 2, 2011. Overall, DEQ did not observe a violation of any permit condition.

In particular, the following excerpts from DEQ's inspection report summarize DEQ's observations of NARM's compliance with individual BACM requirements:

- AQ 2011 Inspection Report –NARM p. 5
  "Haul roads were well maintained and several water trucks were observed watering haul roads."

- AQ 2011 Inspection Report –NARM Appendix-Compliance Table
  Condition - "…all permanent haul roads shall be treated with chemical dust suppressant in addition to water to control fugitive emissions…"
  Status- **In compliance**

- AQ 2011 Inspection Report –NARM Appendix-Compliance Table
  Condition - "…all temporary haul routes, …, shall be treated with water…"

[21] NEAP at 18.

Status- **In compliance**

- AQ 2011 Inspection Report –NARM Appendix-Compliance Table
  Condition - "…coal truck dump pads shall be cleaned, treated, and maintained"
  Status- **In compliance**

- AQ 2011 Inspection Report –NARM p. 5
  "Several disturbed areas were observed and many of them had been ripped to control dust."

- AQ 2011 Inspection Report – NARM Appendix-Compliance Table
  Condition – "Topsoiled areas ≥ 150 contiguous acres….and regraded backfill areas ≥ 150 contiguous acres…shall be…stabilized against wind erosion."
  Status – **In compliance**

- AQ 2011 Inspection Report – NARM Appendix-Compliance Table
  Condition – "Topsoiled areas < 150 contiguous acres….and regraded backfill areas < 150 contiguous acres..shall be…stabilized against wind erosion…"
  Status – **In compliance**

At the time of that DEQ's inspection, NARM was not experiencing high winds and elevated PM_{10} measurements. Consequently, DEQ had no opportunity to observe the Mine's implementation of any reactionary control measures in keeping with its Air Quality Action Plan. Nevertheless, the following findings were recorded by DEQ:

- AQ 2011 Inspection Report – NARM-Compliance Table
  Condition - "The contingency action plan [AQAP] has been adhered to."
  Status – **In Compliance**

- AQ 2011 Inspection Report – NARM-Compliance Table
  Condition – "No demonstration showing that the Air Quality Action Plan is adequate has been required."
  Status – **In Compliance**

- AQ 2011 Inspection Report – NARM-Compliance Table
  Condition – "Measures taken under the Air Quality Action Plan are being documented."
  Status – **In Compliance**

In addition to its on-site inspections of NARM's operations, the DEQ-issued air quality permit contains various recordkeeping and reporting requirements which serve to document NARM's implementation of required control measures. In particular, that permit prescribes that:

- Peabody must prepare and submit an annual report to DEQ that "addresses road dust control measures employed during the past year and a disturbed acreage report for the year. Specific contents of that required report include:

  - a map of all roads existing at the end of the year that were treated with water and/or dust suppressant;
  - locations of active operations, treated disturbed areas, and reclaimed areas;
  - type and quantity of dust suppressant used during the year and a description of the general application procedures and schedule;
  - number of water trucks, capacities of each, and quantity of water used during the year;
  - operating hours of each water truck, and total water truck fleet hours for the year;
  - total length of permanent and temporary haul roads existing at year end, in miles, which were treated with water and/or dust suppressant;
  - overburden and coal production rates for the year;
  - a table, summarizing by calendar quarter, the acreage and control measures or BMP uses applied by active operations, treated disturbed areas, and reclaimed areas; and
  - a report on the percentage of acres stabilized for the year, computed as the average of the quarterly percentage of acres stabilized.

- Peabody must document what reactionary control measures were implemented when an action level in NARM's Air Quality Action Plan was triggered.

Along with its on-site inspections of NARM and periodic reviews of NARM's required records and reports, DEQ has an active enforcement program to address measured PM_{10} exceedances at NARM which indicate a failure to comply with applicable BACM and reactionary control measures. An example of DEQ's satisfaction of its enforcement obligation is evidenced by its response to the most recently measured PM_{10} exceedance at NARM prior to this January 21, 2012 event. After Peabody had reported that exceedance, DEQ investigated the particular circumstances surrounding that incident of November 12, 2011 and subsequently issued a Notice of Violation (NOV) to Peabody, alleging that NARM had failed to minimize fugitive dust emissions from its operations and had failed to adhere to its Air Quality Action Plan.[22]

In sum, Wyoming DEQ has an active compliance-monitoring program for evaluating NARM's implementation of its required BACM and reactionary control measures. Moreover, DEQ takes enforcement actions against NARM's failure to satisfy those requirements in an effort to eliminate the likelihood of future exceedances of the PM_{10} NAAQS around NARM.

[22] *In the Matter of the Notice of Violation Issued to Powder River Coal, LLC,* Docket No. 5014-12 (DEQ June 29, 2012) (Notice of Violation). Discussions between the parties regarding settlement of this particular alleged NOV were ongoing at the time of this demonstration's submittal.

c. Wind Speeds on January 21, 2012 Were High Enough to Overwhelm NARM's Reasonable Controls

DEQ has determined that 20 mph is the high wind threshold for the Powder River Basin. An area-specific high wind threshold is representative of the sustained wind speeds that are capable of overwhelming reasonable controls on anthropogenic sources of dust. As a result of those reasonable controls being overwhelmed, significant emissions begin to be transported in the direction of the high winds.

This high wind event demonstration has previously shown that wind speeds at NARM during January 21 equaled or exceeded 20 mph for a total of 14 hours. Twelve of those hours were characterized by high winds from the same general direction passing over the North and West Rail Loop Pits. Moreover, four of those hours were characterized by exceptionally high winds (hourly average of 34-43 mph) from virtually the same direction passing over the West Rail Loop Pit. Winds gusted during those latter 4 hours at hourly maxima between 56 and 63 mph.

Therefore, there can be no doubt that wind speeds at NARM on January 21, 2012 were more than high enough to overwhelm NARM's reasonable controls on the anthropogenic sources of dust at the North and West Rail Loop Pits.

d. Conclusion

The preceding discussion has shown that during high winds at NARM on January 21, 2012:

- That NARM's anthropogenic sources which likely contributed significantly to the measured PM_{10} exceedance on that day at the RO-1 monitor had reasonable controls in place prior to commencement of a high wind event on that day;
- That those reasonable controls have been effectively implement by NARM and enforced by DEQ; and
- That wind speeds during January 21 were high enough to overwhelm NARM's reasonable controls that were in place on that day.

Based on that showing, Peabody has demonstrated that NARM's significantly contributing anthropogenic sources were not reasonably controllable on January 21, 2012.

2. *NARM's Contributing Natural Sources Were Not Reasonably Controllable.*

Natural sources of dust are determined to be not reasonably controllable if wind speeds are high enough to cause emissions from natural, undisturbed areas.[23] An area-specific high wind threshold is representative of the sustained wind speeds that are capable of causing emissions from natural disturbed areas. DEQ has determined that 20 mph is the high wind threshold representative of conditions in the Powder River Basin.

In Exhibit 2, the grey surface area which is located upwind of the RO-1 monitor but prior to NARM's upwind anthropogenic sources that likely contributed significantly to the measured exceedance on January 21 consists of 1,134 acres of natural, undisturbed lands. High winds at or above 20 mph and from the same general direction passed over those naturally stabilized surfaces for 12 hours. For 4 of those hours, exceptionally high winds from virtually the same direction passed over those natural, undisturbed lands.

Consequently, given their prolonged exposure to those high wind conditions, those 1,134 acres of natural, undisturbed lands likely contributed significantly to the measured exceedance at the RO-1 monitor on January 21. Those natural sources of windblown dust were not reasonably controllable on January 21 because the high winds over a prolonged period on that day were able to entrain significant amounts of dust from those lands. Furthermore, emissions from those natural, undisturbed lands were not reasonably controllable through the use of any specific control measures due to the cost of applying those controls over such a large land area and because of the potential detrimental effect on the natural ecosystem that could result.[24]

In sum, Peabody has demonstrated that NARM's significantly contributing natural sources were not reasonably controllable on January 21, 2012.

E. The High Wind Event at NARM on January 21, 2012 Was a Natural Event

A high wind event is classified as a natural event in cases where windblown dust is entirely from natural sources or where all significant anthropogenic sources of windblown dust have been

[23] EPA, High Wind Guidance at 10.
[24] *Id.* at 43.

reasonably controlled.[25] In this demonstration, Peabody has first identified those particular anthropogenic sources at NARM (mining activities and disturbed areas) that were located upwind of the RO-1 monitor during extended periods of high winds. Those were the "significant anthropogenic sources" on January 21, 2012 that had to be reasonably controlled in order for the high wind event of that day to be classified as a natural event.

Peabody has shown herein (1) how each of the "significant" disturbed areas on January 21 were reasonably controlled with the applicable BACM required for those sources, and (2) how each of the "significant" mining activities were reasonably controlled through implementation of practical and appropriate reactionary control measures that were consistent with the control scheme within NARM's *Action Plan*.

Therefore, because a high wind event occurred at NARM on January 21, and because the significant sources of windblown dust at NARM on that day were reasonably controlled, that high wind event also constituted a natural event.

F. The Measured Exceedance on January 21, 2012 Would Not Have Occurred But For the High Wind Event on That Day.

The demonstration of a high wind event must also show that the measured concentration would have been below the applicable NAAQS without the impact of the high wind event. However, that showing generally does not need a single or precise approximation of the estimated air quality impact from the event. Rather, for events where the typical concentrations on non-event days are well below the applicable NAAQS, the showing that a measured concentration would not have been an exceedance but for the high winds may be relatively straightforward and a qualitative explanation may be acceptable.[26]

The circumstances of this particular high wind event on January 21 justify a qualitative explanation for why the exceedance on that day would not have occurred but for the high wind event. First, the previous Historical Fluctuations analysis showed that the typical 24-hour PM_{10} concentration at the RO-1 monitor during the past three years was well below the NAAQS of150 $\mu g/m^3$. The measured concentration of 200 $\mu g/m^3$ on January 21 was nowhere near the

[25] *Id.* at 5.
[26] *Id.* at 23.

"normal" concentration that would otherwise have been expected at the RO-1 monitor on that day.

Second, a previous analysis herein compared hourly concentrations at RO-1 during four hours on January 21 to hourly concentrations at RO-1 during four hours on another day. During those two 4-hour periods, wind directions were virtually the same, but wind speeds for those two periods were dramatically different. On January 21 wind speeds for that 4-hour period ranged from 34-43 mph, while wind speeds for the 4-hour period on the other day were 14-15 mph. Not surprisingly, the hourly average PM_{10} concentrations for the 4 hours of January 21 (543 µg/m^3 to 1,772 µg/m^3) were substantially higher than those concentrations for the 4 hours on the other day (≤ 48 µg/m^3). With all key factors other than wind speed being roughly the same for the 4-hour period on each day, the high winds during the 4 hours on January 21 were almost certainly responsible for the much higher hourly PM_{10} concentrations on January 21.

In light of those considerations, Peabody believes the measured exceedance on January 21 is a textbook example of the result of a high wind event. Sources upwind of the measured exceedance were reasonably controlled, but the magnitude and the duration of the high winds on that day plainly caused those controls to fail. Had those high winds not overwhelmed the reasonable controls in place, the likelihood that an exceedance would still have occurred is very minimal.

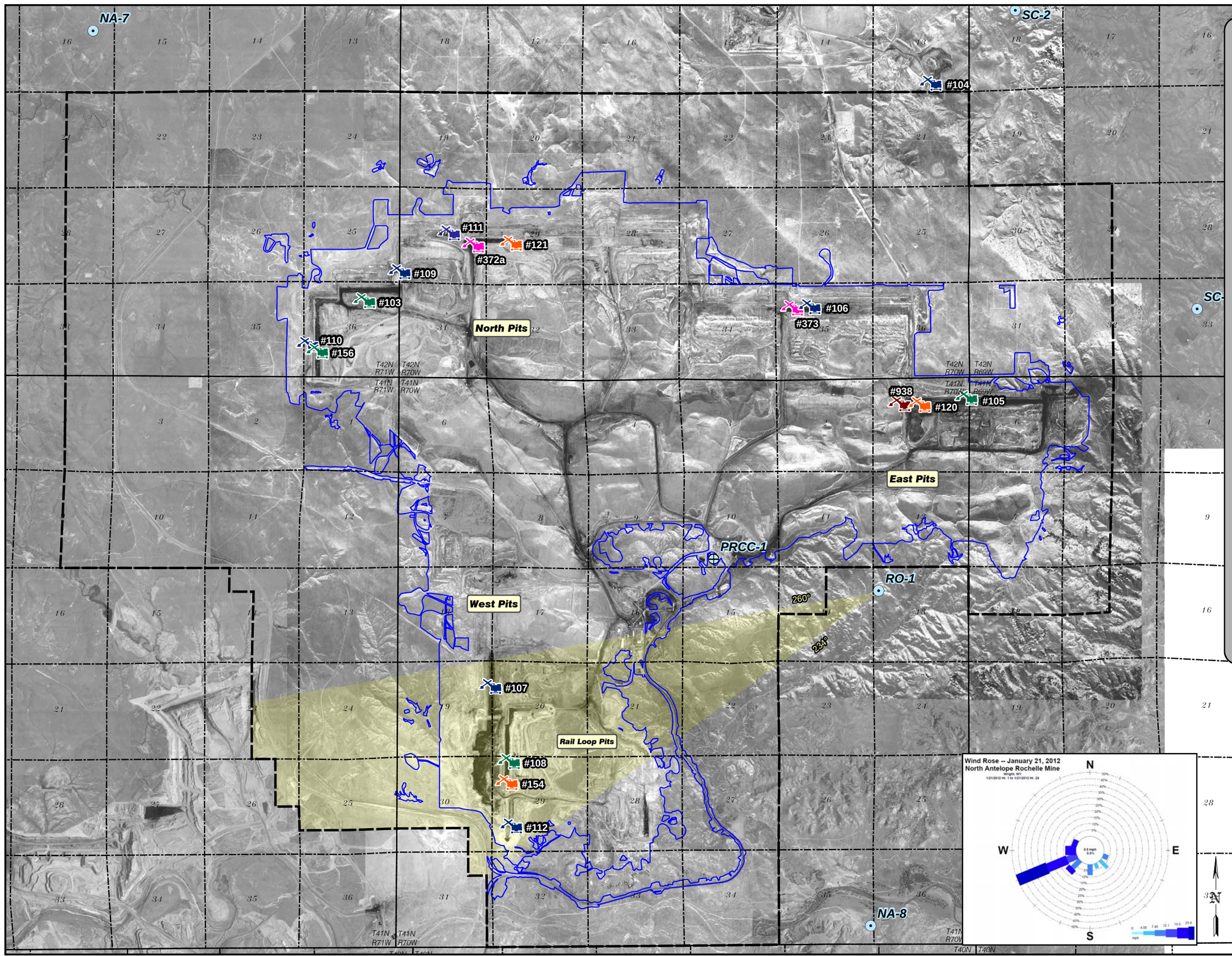
Conclusively proving the absence of all other possible or plausible causes of the measured exceedance is not required by EPA's Exceptional Events Rule or by DEQ's NEAP. The weight of the evidence presented herein that high winds caused the exceedance on January 21 is very persuasive. A finding that the measured exceedance at RO-1 would not have occurred but for the high winds is the only reasonable conclusion that the evidence supports.

CONCLUSION

On January 21, 2012 high winds blew over the North Antelope Rochelle Mine. At the end of that day, an exceedance of the PM_{10} NAAQS was recorded by one of the Mine's ambient PM_{10} monitors. The preceding discussion has demonstrated just how strongly those two occurrences were interrelated.

In particular, the demonstration above has shown that on that day (1) a natural event in the form of high winds was present at NARM and that (2) those high winds affected air quality in the area, in general, and at the RO-1 monitor, in particular. Moreover, the demonstration herein has shown that on that day (3) the measured exceedance at RO-1 was far in excess of the normal fluctuations in that monitor's measurements, and that (4) there was a clear causal relationship between the persistent high winds and the measured exceedance at RO-1. In addition, the above demonstration has shown that (5) a high wind dust event occurred at RO-1 because NARM's significant anthropogenic sources of dust and NARM's significant natural sources of dust were overwhelmed considerably by high winds on that day. Finally, the demonstration herein has shown that (6) the measured exceedance at RO-1 would not have happened in the absence of high, and at times exceptionally high, wind speeds from a persistent direction on that day which overwhelmed the reasonable controls in place on those significant sources at NARM.

In sum, the demonstration herein has shown that the measured PM_{10} NAAQS exceedance at NARM on January 21, 2012 was caused by a high wind event.



Legend

- MET Station
- TEOM Location
- Total Cumulative Disturbance as of End of Jan. 2012 (19,592 acres)
- Reverse Trace from RO-1
- NARM LNCM Boundary

Mine Equipment

- #103 Coal Shovel
- #104 Overburden Shovel
- #105 Coal Shovel
- #106 Overburden Shovel
- #107 Overburden Shovel
- #108 Coal Shovel
- #109 Overburden Shovel
- #110 Overburden Shovel
- #111 Overburden Shovel
- #112 Overburden Shovel
- #120 Dragline
- #121 Dragline
- #154 Dragline
- #156 Coal Shovel
- #372a Coal Loader
- #373 Coal Loader
- #938 Overburden Hoe

0 5000 10000'

Peabody ENERGY

NORTH ANTELOPE ROCHELLE MINE
Caller Box 3034 Gillette, WY 82717

JANUARY 21, 2012 RO-1 HIGH WIND EVENT
EXHIBIT 1

REVERSE TRACE AND EQUIPMENT LOCATIONS

Permit No. MD-6375A

Designed By: ACH/PCD	Scale: 1 " = 5000 '
Drawn By: ACH	C.I.: N/A
Checked By: PCD/ACS/JG	Sheet: 1 of 1
Date Drawn: 10/10/12	File: n_aq_ro1_ex01_121009.mxd

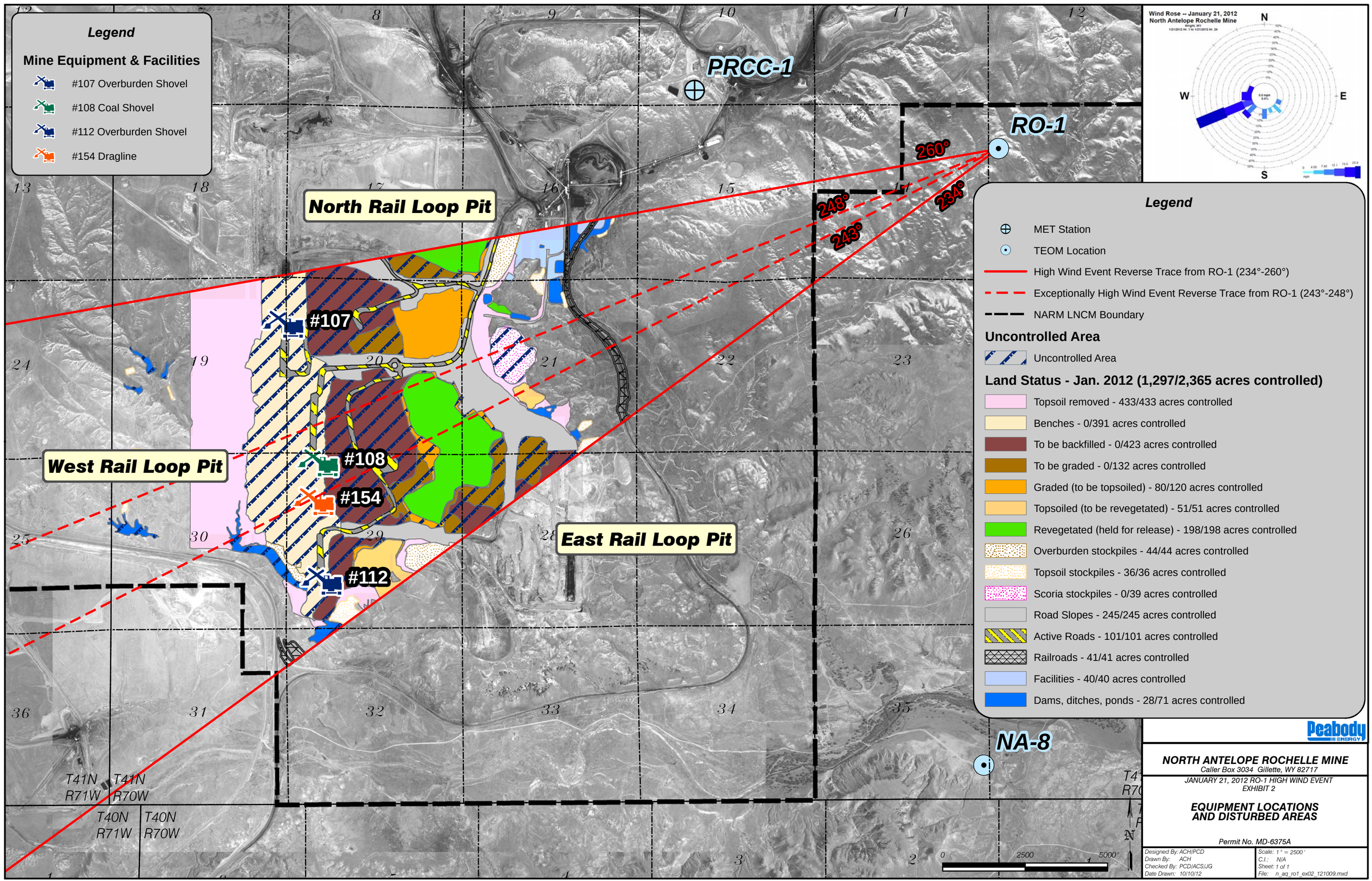
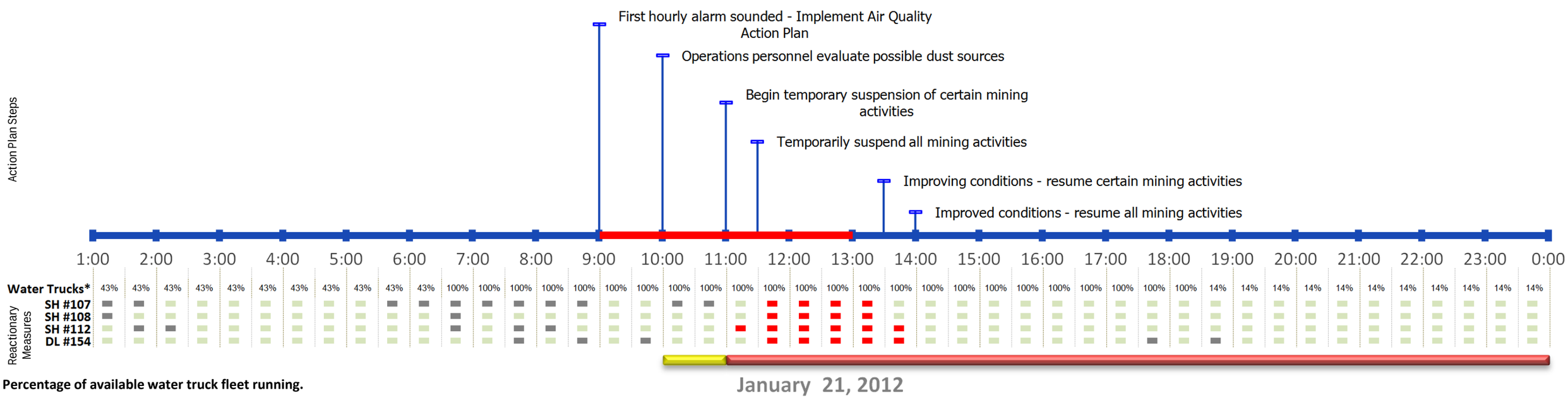

Legend
Mine Equipment & Facilities
#107 Overburden Shovel
#108 Coal Shovel
#112 Overburden Shovel
#154 Dragline
PRCC-1
RO-1
NA-8
North Rail Loop Pit
West Rail Loop Pit
East Rail Loop Pit
#107
#108
#154
#112
260°
248°
243°
234°
Wind Rose -- January 21, 2012
North Antelope Rochelle Mine
N
E
S
W
Legend
MET Station
TEOM Location
High Wind Event Reverse Trace from RO-1 (234°-260°)
Exceptionally High Wind Event Reverse Trace from RO-1 (243°-248°)
NARM LNCM Boundary
Uncontrolled Area
Uncontrolled Area
Land Status - Jan. 2012 (1,297/2,365 acres controlled)
Topsoil removed - 433/433 acres controlled
Benches - 0/391 acres controlled
To be backfilled - 0/423 acres controlled
To be graded - 0/132 acres controlled
Graded (to be topsoiled) - 80/120 acres controlled
Topsoiled (to be revegetated) - 51/51 acres controlled
Revegetated (held for release) - 198/198 acres controlled
Overburden stockpiles - 44/44 acres controlled
Topsoil stockpiles - 36/36 acres controlled
Scoria stockpiles - 0/39 acres controlled
Road Slopes - 245/245 acres controlled
Active Roads - 101/101 acres controlled
Railroads - 41/41 acres controlled
Facilities - 40/40 acres controlled
Dams, ditches, ponds - 28/71 acres controlled
T41N R71W
T41N R70W
T40N R71W
T40N R70W
0
2500
5000'
Peabody ENERGY
NORTH ANTELOPE ROCHELLE MINE
Caller Box 3034 Gillette, WY 82717
JANUARY 21, 2012 RO-1 HIGH WIND EVENT
EXHIBIT 2
EQUIPMENT LOCATIONS AND DISTURBED AREAS
Permit No. MD-6375A
Designed By: ACH/PCD
Drawn By: ACH
Checked By: PCD/ACS/JG
Date Drawn: 10/10/12
Scale: 1" = 2500'
C.I.: N/A
Sheet: 1 of 1
File: n_aq_ro1_ex02_121009.mxd

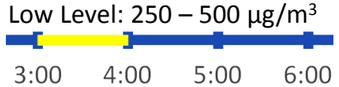
Figure 4: Timeline for RO-1 High Wind Event



*** Percentage of available water truck fleet running.**

1hr Alarms
shown on timeline

Low Level: 250 – 500 µg/m³



High Level: 500+ µg/m³

24hr Alarms
shown beneath timeline

Low Level: 75 – 100 µg/m³

High Level: 100+ µg/m³

Equipment Activity

- Normal Production
- Normal Operation Shutdown
- Reactionary Measures

Equipment Abbreviations

DL = Dragline
SH = Shovel

Notes:

1. Supervisors and Environmental staff notified each hour of alarm.
2. Water truck records are not specific to any particular pit system.
3. Records of all other equipment are specific to the reverse trace from RO-1 TEOM.

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matt Mead, Governor

Todd Parfitt, Director

February 14, 2013 Certified Mail Receipt Number: 7011 1570 0003 4871 6812

Staci Hammond
Environmental Analyst
North Antelope Rochelle Mine
Caller Box 3034
Gillette, WY 82717-3034

Re: Request for Flag under the Exceptional Event Rule for PM_{10} January 21, 2012 Exceedance at Site RO-1

Dear Ms. Hammond,

The Air Quality Division (AQD) has reviewed the request to flag the January 21, 2012 PM_{10} ambient monitored data at site RO-1 as an Exceptional Event in accordance with 40 CFR Part 50.14 at the North Antelope Rochelle Mine (NARM). Although the AQD has placed a temporary "High Wind" flag in AQS on the January 21, 2012 PM_{10} data, with the description "Possible Exceptional Event – under evaluation by AQD", the team of AQD staff found deficiencies in the "weight of evidence" approach presented in the November 21, 2012 submittal. Supplemental information is needed before AQD can determine if all elements were addressed to exclude event-related concentrations from regulatory determinations.

The review team requests the following information to supplement the packet:

- Please include 24-hour particulate data on the day of the exceedance for both upwind and downwind monitors at the North Antelope Rochelle Mine.

The AQD level of review for Exceptional Event packages is greatly dependent on the level of detail and information provided by the facility in the request to flag exceedances. EPA has also provided examples of exceptional events demonstrations that meet the requirements of the draft high wind guidance. The following link http://www.epa.gov/ttn/analysis/exevents.htm is the best place to find examples of information that are needed to have EPA concur with an exceptional event demonstration.

Please keep in mind that while AQD had an extensive staff of monitoring, compliance and permitting personnel available to evaluate the documentation packet, this packet will also be reviewed by the public and EPA.

Please submit the requested supplemental information to Cara Keslar, Monitoring Section Supervisor no later than two (2) weeks from receipt of this letter. The AQD evaluation team will reconvene to determine if all requirements were met under the Exceptional Event Rule. If all requirements of the rule were met, AQD will keep the flags in the AQS database and the documentation package will be made available for public review and submitted to EPA Region 8 for concurrence. If you have questions please contact me at (307) 335-6963 or kirk.billings@wyo.gov.

Sincerely,

Kirk Billings
Monitoring Project Advisor

Cc: NARM Monitoring File

February 25, 2013

DEQ-AQ Division
Herschler Building
122 W. 25th St.
Cheyenne, WY 82002

Re: 4th Quarter supplemental information

Dear Ms. Keslar,

Enclosed is the requested supplemental information for the Exceptional Event package North Antelope Rochelle Mine submitted in accordance with 40 CFR Part 50.14. North Antelope Rochelle Mine has requested to flag the January 21, 2012 PM_{10} ambient monitored data at site RO-1.

Mr. Kirk Billings requested the following supplemental information:

"Please include 24-hour particulate data on the day of the exceedance for both upwind and downwind monitors at the North Antelope Rochelle Mine."

Please see tables for NA-8 (downwind) and NA-7 (upwind) monitors included in this package.

Thank you for your time in reviewing our Exceptional Event package.

Please contact me at (307) 464-4509 if you have any questions.

Sincerely,

Staci Hammond
Environmental Supervisor

North Antelope Mine Exceptional Events NA-7 and Met Data

Date	Time	**NA-7** Hourly Conc. (STP) (ug/m3)	Wind Speed (mph)	Wind Direction (°)	Gust Speed (mph)
01/21/12	100	52.1	7.6	112.0	10.1
01/21/12	200	58.2	6.4	140.0	10.5
01/21/12	300	32.8	6.3	155.0	10.6
01/21/12	400	22.2	7.9	176.0	13.1
01/21/12	500	26.8	6.1	138.0	9.7
01/21/12	600	25.9	8.0	187.0	24.5
01/21/12	700	43.1	23.1	234.0	42.7
01/21/12	800	40.5	29.5	246.0	47.6
01/21/12	900	70.3	35.6	244.0	56.5
01/21/12	1000	18.1	35.1	243.0	57.4
01/21/12	1100	35.7	43.4	248.0	63.1
01/21/12	1200	16.2	33.7	245.0	55.6
01/21/12	1300	5.0	32.3	245.0	53.0
01/21/12	1400	9.5	20.6	258.0	35.9
01/21/12	1500	19.9	19.8	259.0	42.5
01/21/12	1600	5.4	25.0	241.0	42.2
01/21/12	1700	8.4	10.1	215.0	23.3
01/21/12	1800	3.3	9.1	229.0	19.0
01/21/12	1900	4.2	17.2	238.0	29.8
01/21/12	2000	2.5	18.1	239.0	28.4
01/21/12	2100	5.0	20.5	252.0	28.8
01/21/12	2200	6.9	22.2	260.0	36.1
01/21/12	2300	7.8	23.8	273.0	33.9
01/21/12	2400	3.6	20.3	291.0	29.6

North Antelope Mine Exceptional Events NA-8 and Met Data

Date	Time	**NA-8** Hourly Conc. (STP) (ug/m3)	Wind Speed (mph)	Wind Direction (°)	Gust Speed (mph)
01/21/12	100	7.8	7.6	112.0	10.1
01/21/12	200	9.1	6.4	140.0	10.5
01/21/12	300	12.1	6.3	155.0	10.6
01/21/12	400	14.6	7.9	176.0	13.1
01/21/12	500	6.5	6.1	138.0	9.7
01/21/12	600	23.7	8.0	187.0	24.5
01/21/12	700	26.8	23.1	234.0	42.7
01/21/12	800	43.2	29.5	246.0	47.6
01/21/12	900	97.8	35.6	244.0	56.5
01/21/12	1000	40.1	35.1	243.0	57.4
01/21/12	1100	186.1	43.4	248.0	63.1
01/21/12	1200	72.0	33.7	245.0	55.6
01/21/12	1300	16.4	32.3	245.0	53.0
01/21/12	1400	30.9	20.6	258.0	35.9
01/21/12	1500	28.9	19.8	259.0	42.5
01/21/12	1600	20.4	25.0	241.0	42.2
01/21/12	1700		10.1	215.0	23.3
01/21/12	1800	5.7	9.1	229.0	19.0
01/21/12	1900	4.6	17.2	238.0	29.8
01/21/12	2000	2.8	18.1	239.0	28.4
01/21/12	2100	4.9	20.5	252.0	28.8
01/21/12	2200	6.5	22.2	260.0	36.1
01/21/12	2300	21.0	23.8	273.0	33.9
01/21/12	2400	8.2	20.3	291.0	29.6

IML (consulant) was unable to recover the missing data.

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matt Mead, Governor

Todd Parfitt, Director

April 12, 2013 Certified Mail Receipt Number: 7011 1570 0003 4871 6935

Staci Hammond
Environmental Analyst
North Antelope Rochelle Mine
Caller Box 3034
Gillette, WY 82717-3034

Re: Request for Flag under the Exceptional Event Rule for PM_{10} January 21, 2012 Exceedance at Site RO-1

Dear Ms. Hammond,

The Air Quality Division (AQD) has reviewed the request to flag the January 21, 2012 PM_{10} ambient monitored data at site RO-1 as an Exceptional Event in accordance with 40 CFR Part 50.14 at the North Antelope Rochelle Mine (NARM). Although the AQD has placed a temporary "High Wind" flag in AQS on the January 21, 2012 PM_{10} data, with the description "Possible Exceptional Event – under evaluation by AQD", the team of AQD staff found deficiencies in the "weight of evidence" approach presented in the November 21, 2012 submittal. Supplemental information is needed before AQD can determine if all elements were addressed to exclude event-related concentrations from regulatory determinations.

The review team requests the following information to supplement the packet:

- Please include 24-hour particulate data on the day of the exceedance for both upwind and downwind monitors at the North Antelope Rochelle Mine.

Please note that this request for additional information is requesting the same information as the previous request for information because, while one-hour particulate data on the day of the exceedance for both upwind and downwind monitors was provided, the 24-hour data requested in the previous letter was not provided.

The AQD level of review for Exceptional Event packages is greatly dependent on the level of detail and information provided by the facility in the request to flag exceedances. EPA has also provided examples of exceptional events demonstrations that meet the requirements of the draft high wind guidance. The following link http://www.epa.gov/ttn/analysis/exevents.htm is the best place to find examples of information that are needed to have EPA concur with an exceptional event demonstration.

Please keep in mind that while AQD had an extensive staff of monitoring, compliance and permitting personnel available to evaluate the documentation packet, this packet will also be reviewed by the public and EPA.

Please submit the requested supplemental information to Cara Keslar, Monitoring Section Supervisor no later than two (2) weeks from receipt of this letter. The AQD evaluation team will reconvene to determine if all requirements were met under the Exceptional Event Rule. If all requirements of the rule were met, AQD will keep the flags in the AQS database and the documentation package will be made available for public review and submitted to EPA Region 8 for concurrence. If you have questions please contact me at (307) 335-6963 or kirk.billings@wyo.gov.

Sincerely,

Kirk Billings
Monitoring Project Advisor

Cc: NARM Monitoring File

Peabody ENERGY

Cert #:
Tanner 7009 1680 0000 3229 7628
Cara " " " " 7635
Kirk " " " " 7642

April 25, 2013

Kirk Billings
DEQ-AQ Division
510 Meadowview Dr.
Lander, WY 82520

Re: Response for supplemental information

Dear Mr. Billings,

Enclosed is the requested supplemental information for the Exceptional Event package North Antelope Rochelle Mine submitted in accordance with 40 CFR Part 50.14. North Antelope Rochelle Mine has requested to flag the December 21, 2012 PM_{10} ambient monitored data at site RO-1. This should not count as a second round response. The hourly concentrations were submitted previously due to a misunderstanding of the initial request.

Mr. Kirk Billings requested the following supplemental information:

"Please include 24-hour particulate data on the day of the exceedance for both upwind and downwind monitors at the North Antelope Rochelle Mine."

Please see the enclosed table with the hourly 24-hour particulate data on the day of the exceedance for both upwind and downwind monitors at the North Antelope Rochelle Mine.

Thank you for your time in reviewing our Exceptional Event package.

Please contact me at (307) 464-4509 if you have any questions.

Sincerely,

Staci Hammond

Staci Hammond
Environmental Supervisor

Cc: Tanner Shatto, WDEQ-Sheridan
Cara Keslar, WDEQ-Cheyenne

	NA8	NA7	RO1
Time	24-hour Avg Conc (STP) (µg/m^3)		
01/21/2012 12:00 AM	29.8	32.3	38.5
01/21/2012 01:00 AM	30	34.2	37.7
01/21/2012 02:00 AM	30.3	36.7	36.4
01/21/2012 03:00 AM	30.8	38	36.2
01/21/2012 04:00 AM	31.2	38.3	36.8
01/21/2012 05:00 AM	30.5	38.3	35.2
01/21/2012 06:00 AM	28.6	39.9	33
01/21/2012 07:00 AM	27.6	41.3	36.1
01/21/2012 08:00 AM	27.1	42.4	40.6
01/21/2012 09:00 AM	28.5	44.7	59.4
01/21/2012 10:00 AM	28	44.9	93.1
01/21/2012 11:00 AM	33.6	45.8	165.4
01/21/2012 12:00 PM	34.2	45.6	193.9
01/21/2012 01:00 PM	32.6	45.1	197.6
01/21/2012 02:00 PM	32.3	44.7	197.7
01/21/2012 03:00 PM	32.1	44.2	199.5
01/21/2012 04:00 PM	31.9	43.1	200.2
01/21/2012 05:00 PM	*	40.7	199.9
01/21/2012 06:00 PM	30.5	38.1	199
01/21/2012 07:00 PM	29.8	35.4	198.7
01/21/2012 08:00 PM	29.4	34	199.1
01/21/2012 09:00 PM	29	31.9	199.2
01/21/2012 10:00 PM	28.7	28.6	199.6
01/21/2012 11:00 PM	29	24.9	200.1

*data not recoverable

Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Matthew H. Mead, Governor

Todd Parfitt, Director

May 20, 2013

Staci Hammond
Environmental Analyst
North Antelope Rochelle Mine
Caller Box 3034
Gillette, WY 82717-3034

Re: Request for Flag under the Exceptional Event Rule for PM_{10} January 21, 2012 Exceedance

Dear Ms. Hammond,

On January 21, 2012, the North Antelope Rochelle Mine's (NARM) RO-1 sampler recorded an exceedance of the 24-hour PM_{10} standard, with a final concentration of 200 $\mu g/m^3$.

On February 22, 2012 the Air Quality Division (AQD) received a request that data for the RO-1 monitor on this day be flagged under 40 CFR Part 50.14 "Treatment of Data Influenced by Exceptional Events" due to high winds.

On July 12, 2012, at the request of the AQD, NARM submitted additional information to clarify the request to flag the data under 40 CFR Part 50.14.

On November 21, 2012 the AQD received new exceptional event packets for this exceedance. The opportunity to resubmit packets was extended to industry by the AQD to allow facilities with Q1-12 Exceptional Event packets to submit packets that took into account newly issued Exceptional Event Guidance from the EPA.

On March 1, 2013, at the request of the AQD, NARM submitted additional information to clarify the request to flag the data under 40 CFR Part 50.14.

On May 3, 2013, at the request of the AQD, NARM submitted additional information to clarify the request to flag the data under 40 CFR Part 50.14.

After review of the submitted materials, the AQD has decided to pursue NARM's request to flag the PM_{10} data collected at the RO-1 monitor on January 21, 2012 under 40 CFR 50.14.

The next step in the process is a 30 day public comment period. In order to move forward, the AQD needs an electronic copy of all the documentation and correspondence submitted during

the review process. All correspondence, starting with the original notification to the AQD, the original Exceptional Event packet, any requests for additional information, responses to those requests and other information submitted to the AQD during the review process should be combined into a single, chronologically ordered .pdf document and submitted to the AQD.

Once received, the chronological packet will be posted to the AQD's website and the public comment period will be advertised.

NARM's final packet is requested on or before May 30, 2013 in order to allow time for public comment before the federal due date for Exceptional Event packets. Please email it to kirk.billings@wyo.gov

Please contact Kirk Billings at (307) 335-6963 or kirk.billings@wyo.gov if you have any questions regarding this matter.

Sincerely,

Cara Keslar
Monitoring Section Supervisor

Cc: Kirk Billings, Air Quality Analyst
Tanner Shatto, District 3 District Engineer