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Hazardous Waste Bureau

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303

Subject: Transmittal of the Mine Ventilation Rate Monitoring Annual Report

Dear Mr. Kieling:

The Mine Ventilation Rate Monitoring Annual Report required by the Waste Isolation Pilot Plant Hazardous Waste Facility Permit No. NM4890139088—TSDF is attached. The report satisfies Permit Part 4, Section 4.6.4.2. and Permit Attachment O, Section O-5a.

The WIPP Permit requires that the test and balance of the WIPP mine ventilation system be conducted on a 12-18 month interval, not to exceed 18 months. As explained in the attached report, the test and balance is a comprehensive series of measurements and adjustments designed to ensure that the underground ventilation system is operating within acceptable design parameters for each operating mode. The test and balance is specified in the Permit as the acceptable method of verifying system flow because it provides consistent results based on good engineering practices. Once completed, the test and balance data become the baseline for underground ventilation system operation until the next test and balance is performed. The most recent test and balance was conducted in June 2013. The next test and balance is due no later than October 2014. However, due to the inaccessibility of many portions of the WIPP underground as a result of the February 14, 2014, radiological event, and the fact that the underground ventilation is currently being operated in the filtration mode, the test and balance of the WIPP mine ventilation system cannot be performed within the required time period. Information regarding the inability to conduct the test and balance was previously provided to you in the March 31, 2014, letter and the June 25, 2014, letter transmitting the Draft Underground Compliance Plan: Underground Compliance Plan Compliance Status and Schedule. Once the Permittees define and establish normal ventilation in the underground, the test and balance will be conducted. Until then, the Permittees will rely on the data from the latest test and balance. Our inability to conduct the test and balance does not pose a threat to human health or the environment since the system is being operated in filtration mode.

We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate, and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

141050

CBFO:EPD:GTB:MN:14-2634:UFC 5486.00

If you have questions regarding this submittal, please contact Mr. George T. Basabilvazo at (575) 234-7488.

Sincerely

DC Bryson for
Jose R. Franco, Manager
Carlsbad Field Office

RL McQuinn
Robert L McQuinn, Project Manager
Nuclear Waste Partnership LLC

cc: w/enclosure
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Mine Ventilation Rate Monitoring Annual Report

United States Department of Energy
Carlsbad Field Office
Carlsbad, New Mexico

October 2014

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ABBREVIATIONS/ ACRONYMS

acfm	actual cubic feet per minute
CMRO	Central Monitoring Room Operator
hp	horsepower
MOC	Management and Operating Contractor
MVRMP	Mine Ventilation Rate Monitoring Plan
NMED	New Mexico Environment Department
Permit	Waste Isolation Pilot Plant Hazardous Waste Facility Permit
QA	quality assurance
QAPD	Quality Assurance Program Description
RPD	relative percent difference
scfm	standard cubic feet per minute
U/G	underground
WIPP	Waste Isolation Pilot Plant

EXECUTIVE SUMMARY

The Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (Permit) Part 4 requires the WIPP facility Permittees to implement the WIPP Mine Ventilation Flow Rate Monitoring Plan (MVRMP) in Attachment O of the Permit. The MVRMP describes how compliance with the ventilation requirements described in Permit Part 4.5.3.2 and Attachment A2, Section A2-2a(3) for airflow rates for the total underground (U/G) repository and the active disposal room are obtained and documented. The MVRMP requires ventilation flow rate measurements for the total U/G repository and each active disposal room to ensure that the airflows meet Permit conditions.

Permit Part 4.6.4.2 requires that an annual report be submitted every October with the results of the data and analysis of the Mine Ventilation Rate Monitoring Plan. During the report period of July 1, 2013 through June 30, 2014 the lowest monthly annual running average total U/G repository ventilation flow rate was 267,324 standard cubic feet per minute (scfm).

The mine ventilation was shifted to Filtration Mode (60,000 scfm) on February 14, 2014 due to a radiation release from Panel 7, Room 7. The low annual running average total U/G repository flow rate of 267,324 scfm is a result of a low monthly average for February 2014 and 60,000 scfm flow for March 2014 through June 2014.

The average ventilation flow rates were calculated for the flow through the active disposal room in accordance with the MVRMP. The monthly average ventilation rate in the active disposal room was 34,981 actual cubic feet per minute (acfm). A minimum of 42,000 acfm is required to meet the 35,000 scfm flow rate stipulated in the Permit. Access to the active waste disposal rooms has been restricted and no waste handling has taken place in the U/G after the February 5, 2014 salt haul truck fire. There were no active disposal room measurements after February 5, 2014 therefore a flow rate of zero was reported for the months of March through June 2014.

1.0 INTRODUCTION

The New Mexico Environment Department (NMED) renewed the Permit on November 30, 2010.

The MVRMP in the Permit is Attachment O. The MVRMP contains the methods for documenting compliance with the ventilation requirements described in Permit Part 4.5.3.2 and Attachment A2, Section A2-2a(3).

The Permit also specifies that an annual report be submitted every October that describes the implementation of the MVRMP, and presents the results of the monitoring activities. This document was prepared to fulfill the annual reporting requirement for the period from July 1, 2013, to June 30, 2014.

A salt haul truck fire occurred in the U/G on February 5, 2014. Waste emplacement, mining, and U/G support activities were stopped while an investigation was performed. Subsequently a radiation release from Panel 7, Room 7 occurred on February 14, 2014. Ventilation modes were changed many times in February up to February 14th. The U/G repository has been in Filtration Mode since February 14, 2014. While the U/G remains in Filtration Mode, the Running Mine Average Annual Flow Rate will fall below the reportable minimum of 260,000 scfm and continue to drop on a monthly basis. In addition, the Active Disposal Room Annual Average will continue to drop as zeros are averaged in for the months in which no waste handling takes place.

1.1 Total Mine Ventilation Rate Monitoring in the U/G Repository

To comply with Permit Part 4, the running annual average mine ventilation rate is computed on a monthly basis to assure that the minimum value of 260,000 scfm is achieved. This running annual average is calculated based on monthly averages for run-times for the WIPP facility modes of ventilation operation as tabulated in the Central Monitoring Room Operator (CMRO) Log. This information was recorded each time the ventilation system configuration changed, including periods when there was no ventilation. The operator used the logged runtime data for various modes of operation, multiplied by the flow-rates for the different modes presented in Table 1, to calculate the average monthly and annual flow rate for the facility.

Table 1 – Ventilation Operating Modes and Associated Flow Rate

Mode of Operation	Flow Rate (scfm) – Nominal Values	Test and Balance Summary (June 2013)
Normal (two 600 hp fans)	425,000	±4.3%
Alternate (one 600 hp fan)	260,000	±4.4%
Maintenance Bypass [parallel operation of 600 hp fan(s) and 235 hp fan(s)]	260,000 to 425,000	NA*
Reduced (two 235 hp fans)	120,000	NA*
Minimum (one 235 hp fan)	60,000	NA*
Filtration (one 235 hp fan)	60,000	±4.8%

* Note: The modes of operations were not modeled in the June 2013 Test and Balance

The calculation of the running average annual total mine flow rate was computed monthly using the times entered in the CMRO Log in accordance with the following formula:

Monthly Average Flow Rate = [(Normal Mode Run-Time (hours) x 425,000 scfm] + [Alternate Mode Run-Time (hours) x 260,000 scfm] + [Maintenance Bypass Run-Time (hours) x 260,000 scfm] + [(Reduced Mode Run-Time (hours) x 120,000 scfm] + [Minimum Mode Run-Time (hours) x 60,000 scfm] + [Filtration Mode Run-Time (hours) x 60,000 scfm)] / 730 hours per month.

The annual average flow rate was calculated using the times entered in the CMRO Log by the following formula:

$$\text{Annual Average Flow Rate} = \sum \frac{\text{Monthly Average for Previous 12 Months}}{12}$$

1.2 Ventilation Rate Monitoring in the Active Disposal Room

The ventilation flow rate in the active waste disposal room was measured at the entrance to the room to demonstrate compliance with Permit Part 4.5.3.2 and Attachment A2,Section A2-2a(3), which requires a minimum of 35,000 scfm of airflow through the active room when waste disposal is taking place and workers are present in the room. Permit Part 4.6.4.3 requires compliance to be evaluated monthly for the active disposal room.

A calibrated Davis ball-bearing anemometer and full-entry traverse, as described in *Subsurface Ventilation Engineering*, (McPherson 2009), is the standard method for measurement of airflow in the active waste disposal room. Airflow measurements were collected at an established location near the entrance of each active disposal room. The location was chosen by the operator to minimize airflow disturbances caused by system intersections and corners in accordance with McPherson (2009). The operator

used a calibrated anemometer and the completion of a full-entry traverse. These readings verified that a minimum of 35,000 scfm ventilation flow was achieved through the active room when waste disposal was taking place and workers were present in the room. Multiple measurements were taken at each field location to ensure accurate results and correlated within 10 percent for acceptability. Data were collected and recorded by qualified operators, and the data were verified. The facility operator verified proper ventilation when waste disposal was taking place and workers were present in the room, any time there was an operational mode change, or if there was a change in the U/G ventilation system configuration that could affect the ventilation system. A momentary reduction in U/G ventilation caused by the realignment or switching of U/G ventilation fans is not an operational mode change and does not require verification of airflow in the active disposal room.

Once the ventilation is verified, the operator records the acfm value on the log sheet. The operator compares the recorded acfm value with the minimum acfm value provided at the top of the Active Disposal Room Ventilation Rate Log Sheet. As described in Permit Attachment O, an actual airflow of at least 42,000 acfm is needed to ensure that the 35,000 scfm minimum requirement is met. The operator checks and records the airflow through the active room during the shift whenever there is an operational mode change, or a change in system configuration that could affect the ventilation system. If the required ventilation rate is not achieved, or cannot be supported due to operational needs, access to the room is restricted.

1.3 Test and Balance

The Test and Balance is a comprehensive series of measurements and adjustments designed to ensure that the U/G ventilation system is operating within acceptable design parameters. The Test and Balance is an appropriate method of verifying U/G ventilation system flow because it provides consistent results based on good engineering practices. The Test and Balance is conducted at 12-to-18-month intervals, as required by the MVRMP, Permit Attachment O, Section O-3a(2).

Once completed, the Test and Balance data are the baseline for U/G ventilation system operations until the next Test and Balance is performed. Test and Balance results were used to accommodate varying operational conditions and to provide adequate airflow in the mine.

The Test and Balance interval is sufficient to account for changes in the mine and verify system performance. Minor system modifications that occur between tests produce small changes to the system resistance to airflow in comparison to the overall system resistance. Historic data indicate changes can be attributed to additional or reduced linear feet of mined passage such as mining new entries or closure of formerly ventilated portions of the mine, or reduction in drift size due to salt creep.

The most recent Test and Balance of the mine ventilation system was performed in June 2013. A summary of the results of the June 2013 Test and Balance is presented in Table 1 in accordance with Permit Section O-5a.

1.4 Quarterly Airflow Verification Checks

Quarterly verification checks of the total mine airflow were performed in accordance with the inspection schedule identified in the Permit Attachment E, procedure IC041098 (U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C). These checks require the measurement of airflow induced by each of the fans during various modes of operation using a standard pitot tube traverse. The flow measurement indicators (e.g., central monitoring system, Flosonic®) are then compared to the standard pitot traverse. If the relative percent difference (RPD) was greater than ± 5 percent, sensors were cleaned and calibrated. Another pitot tube traverse was then performed to verify an RPD of less than ± 5 percent.

The equipment used to perform the quarterly airflow verification checks was controlled and calibrated through the WIPP Metrology Program. The WIPP Metrology Program ensures that maintenance and test equipment used in the performance of maintenance activities meets the WIPP Quality Assurance Program Description (QAPD) requirements and is traceable to National Institute of Standards and Technology standards. The frequency and method of calibration are governed by the WIPP facility Metrology Program using the manufacturer's recommendations and the equipment's reliability.

2.0 MINE VENTILATION RATE MONITORING RESULTS

This section presents the results of implementing the mine ventilation rate monitoring program. The data presented in this section were collected in accordance with the latest revision of the MVRMP as documented in Permit Attachment O.

2.1 Total Mine Ventilation Rate

A summary of the monthly total mine ventilation rate flow data is provided in Table 2. This table shows that the running annual average total mine ventilation flow was 267,324 scfm for the reporting period. In addition, it shows that the lowest running annual average mine ventilation flow rate in the U/G repository occurred in June 2014 when the running annual average flow rate was 267,324 scfm. This running annual average was above the 260,000 scfm range required in Permit Part 4.5.3.2.

The data sheets showing the calculation of the mine ventilation rate monitoring data monthly averages are presented in Attachment 1.

Table 2 - Summary of Total Mine and Active Disposal Room Ventilation Flow Rate Monitoring Data

	Total Mine Ventilation Flow Data (avg scfm)	Running Annual Average Total Mine Ventilation Flow Data (avg scfm)*	Active Disposal Room Ventilation Flow Data (avg acfm)
Jul 13	392,210	403,026	50,196
Aug 13	407,620	403,812	53,084
Sep 13	404,680	403,967	50,839
Oct 13	383,810	401,995	56,215
Nov 13	406,520	401,369	55,233
Dec 13	409,720	406,086	52,005
Jan 14	390,750	404,275	48,228
Feb 14	172,580	383,718	53,974
Mar 14	60,000	357,274	0†
Apr 14	60,000	324,308	0†
May 14	60,000	294,737	0†
Jun 14	60,000	267,324	0†

*Note: Running Annual Average is calculated based on the twelve previous months and includes data not presented in this table.

† Access to the disposal rooms restricted

2.2 Active Disposal Room Ventilation Rate

Monitoring was performed at the start of each shift, any time there was an operational mode change, or if there was a change in the system's configuration whenever workers were present. If the minimum 35,000 scfm flow rate in the active disposal room could not be achieved, access to the disposal room was restricted.

Table 2 shows the average monthly flow data for the Active Disposal Rooms. Rooms were not opened for waste handling unless a minimum of 42,000 acfm was established at the entrance to the room. A minimum of 42,000 acfm is required to meet the 35,000 scfm flow rate stipulated in the Permit.

2.3 Test and Balance

The most recent Test and Balance of the mine ventilation system was performed in June 2013. The next Test and Balance is due no later than October 2014.

2.4 Quarterly Airflow Verification Checks

Maintenance Operations performs a quarterly airflow verification check of the total mine airflow to document that the flow measurement indicators are accurate. The data sheets showing the as-left condition of the quarterly verification checks are available at the facility. Quarterly airflow verification checks of the total mine airflow will not be performed for the 600 hp fans while the U/G remains in Filtration Mode because the fans are not in use.

3.0 QUALITY ASSURANCE RESULTS

This section describes the Quality Assurance Program as it relates to the MVRMP.

3.1 Description of Mine Ventilation Rate Monitoring QA Program

Quality Assurance (QA) associated with the MVRMP consists of several elements. The qualifications of personnel conducting ventilation flow measurements are maintained through a training qualification process. The ventilation simulation software program is controlled in accordance with the Management and Operating Contractor (MOC) *Quality Assurance Program Description* (WP 13-1, QAPD), and WIPP facility computer software QA plans.

Data generated by the MVRMP, as well as record and procedures to support the MVRMP, are maintained and managed in accordance with the MOC QAPD. Nonconformance or conditions adverse to quality are addressed and corrected as necessary in accordance with applicable Quality Assurance procedures.

Instrumentation used to implement the MVRMP is of known precision and accuracy. This information is recorded in the instrumentation calibration documentation.

4.0 SUMMARY OF MINE VENTILATION RATE MONITORING

Regular mine ventilation rate monitoring of the U/G repository and active disposal rooms is conducted at the WIPP facility. The following is an analysis of the data from this program:

- Permit requirements related to mine ventilation rate monitoring have been met up to February 14, 2014.
- Data quality is acceptable.
- Ventilation through the mine was maintained above Permit stipulated levels up to February 14, 2014.
- Access to the WIPP facility U/G for hazardous waste management purposes has been restricted since February 14, 2014.

REFERENCES
DOCUMENT NUMBER AND TITLE
New Mexico Environment Department, November 30, 2010, Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Identification No. NM4890139088-TSDF
McPherson, Malcolm J., 2009, Subsurface Ventilation Engineering, Omnipress, Second Edition
WP 13-1, *Nuclear Waste Partnership LLC Quality Assurance Program Description*
IC041098, *U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C*

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (ksc-fm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	35776	596.27	425	253413.33
ALTERNATE VENTILATION (1-700 FAN)	1930	32.17	260	8363.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	1886	31.43	260	8172.67
MAINTENANCE BYPASS (1-700 FAN w/ 2-860 FANS)	3234	53.90	260	14014.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1331	22.18	260	5767.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	476	7.93	260	2062.67
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	7	0.12	60	7.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				291900.67
MONTHLY AVERAGE FLOW RATE(kscfm)				392.21

CALENDAR MONTH -July- 2013

COMMENTS

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM – 35K scfm – 42K scfm	50.196
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		39.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2 700 FANS)	41302	688.70	425	293122.50
ALTERNATE VENTILATION (1-700 FAN)	5	0.00	260	21.67
MAINTENANCE BYPASS (1 700 FAN w/ 1 860 FAN)	0	0.00	200	0.00
MAINTENANCE BYPASS (1 700 FAN w/ 2 860 FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2 700 FANS w/ 1 860 FAN)	1075	31.25	260	8125.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	268	4.47	260	1161.33
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	939	13.97	60	938.00
NO VENTILATION	272	4.53	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				303368.50
MONTHLY AVERAGE FLOW RATE(kscfm)				407.62

CALENDAR MONTH -August- 2013

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	53.084
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		46.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	39213	653.55	425	277758.75
ALTERNATE VENTILATION (1-700 FAN)	1960	32.67	260	8493.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	959	15.98	260	4155.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	961	16.02	60	961.00
NO VENTILATION	107	1.78	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				291368.75
MONTHLY AVERAGE FLOW RATE(kscfm)				404.68

CALENDAR MONTH -September-2013

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	50.839
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		47.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	38331	638.85	425	271511.25
ALTERNATE VENTILATION (1-700 FAN)	1318	21.97	260	5711.33
MAINTENANCE BYPASS (1 700 FAN w/ 1 860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1015	16.92	260	4398.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	3932	65.53	60	3932.00
NO VENTILATION	44	0.73	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				285552.92
MONTHLY AVERAGE FLOW RATE(kscfm)				383.81

CALENDAR MONTH -October-2013

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	56.215
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		44.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	39272	654.53	425	278176.67
ALTERNATE VENTILATION (1-700 FAN)	1409	23.48	260	6105.67
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	670	11.30	260	2930.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	1144	19.07	260	4957.33
MAINTENANCE BYPASS (2 700 FANS w/ 2 860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	109	1.82	60	109.00
FILTRATION 1-860 FAN thru HEPA)	410	6.83	60	410.00
NO VENTILATION	178	2.97	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				292696.67
MONTHLY AVERAGE FLOW RATE(kscfm)				406.62

CALENDAR MONTH -November-2013

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	55.233
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		36.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40506	675.10	425	286917.50
ALTERNATE VENTILATION (1-700 FAN)	3880	64.67	260	16813.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	254	4.23	260	1100.67
MAINTENANCE BYPASS (2 700 FANS w/ 2 860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	0	0.00	60	0.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				304831.50
MONTHLY AVERAGE FLOW RATE(kscfm)				409.72

CALENDAR MONTH -December - 2013

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	52.005
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		18.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	36100	601.67	425	255708.33
ALTERNATE VENTILATION (1-700 FAN)	1123	18.72	260	4866.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	820	13.67	260	3553.33
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	4998	83.30	260	21658.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	742	12.37	260	3215.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	319	5.32	260	1382.33
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	333	5.55	60	333.00
NO VENTILATION	205	3.42	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				290716.67
MONTHLY AVERAGE FLOW RATE(kscfm)				390.75

CALENDAR MONTH -January - 2014

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	48.228
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		30.00

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WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kacfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	0	0.00	425	0.00
ALTERNATE VENTILATION (1-700 FAN)	1960	32.67	260	8493.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	21181	353.02	260	91784.33
MAINTENANCE BYPASS (2 700 FANS w/ 1 860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	42	0.70	120	84.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	1500	25.00	60	1500.00
FILTRATION 1-860 FAN thru HEPA)	14031	233.85	60	14031.00
NO VENTILATION	1526	25.43	0	0.00
TOTAL		672.00		
SUM OF FLOW(kscfm-hr)				115972.67
MONTHLY AVERAGE FLOW RATE(kscfm)				172.58

CALENDAR MONTH -February - 2014

COMMENTS:

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	53.974
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		5.00

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WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	0	0.00	425	0.00
ALTERNATE VENTILATION (1-700 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0 700 FANS w/ 1 860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	11610	744.00	60	11610.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				44640.00
MONTHLY AVERAGE FLOW RATE(kscfm)				60.00

CALENDAR MONTH -MARCH - 2014

COMMENTS:
No active room status due to fire and radiological events.
No access to the U/G

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kscfm)	MINIMUM = 35K scfm = 42K acfm	0.000
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		0.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfm/hr)
NORMAL VENTILATION (2-700 FANS)	0	0.00	425	0.00
ALTERNATE VENTILATION (1-700 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	43200	720.00	60	43200.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				43200.00
MONTHLY AVERAGE FLOW RATE(kscfm)				60.00

CALENDAR MONTH -APRIL - 2014

COMMENTS:
No active room status due to fire and radiological events
No access to the U/G

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kscfm)	MINIMUM = 35K scfm = 42K acfm	0.000
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		0.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	0	0.00	425	0.00
ALTERNATE VENTILATION (1-700 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (2 700 FANS w/ 2 860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	47840	797.33	60	47840.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		797.33		
SUM OF FLOW(kscfm-hr)				47840.00
MONTHLY AVERAGE FLOW RATE(kscfm)				60.00

CALENDAR MONTH -MAY - 2014

COMMENTS:
No active room status due to fire and radiological events.
No access to the U/G

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	0.000
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		0.00

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring

WIPP MINE VENTILATION RATE MONITORING PLAN

SURFACE

MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	0	0.00	425	0.00
ALTERNATE VENTILATION (1-700 FAN)	0	0.00	250	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	0	0.00	120	0.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	0	0.00	60	0.00
FILTRATION 1-860 FAN thru HEPA)	43200	720.00	60	43200.00
NO VENTILATION	0	0.00	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				43200.00
MONTHLY AVERAGE FLOW RATE(kscfm)				60.00

CALENDAR MONTH -JUNE - 2014

COMMENTS:
No active room status due to fire and radiological events.
No access to the U/G

ACTIVE ROOM

MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	0.000
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		0.00