



Department of Energy
 Carlsbad Field Office
 P. O. Box 3090
 Carlsbad, New Mexico 88221

 **ENTERED**

OCT 20 2011



Mr. John Kieling, Acting Bureau 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 Condition 4.6.4.2.

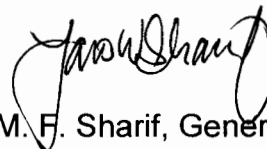
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Please contact Ms. Susan McCauslin at (575) 234-7349 if you have any questions regarding this data transmittal.

Sincerely,



Edward Ziemianski, Interim Manager
 Carlsbad Field Office



M. F. Sharif, General Manager
 Washington TRU Solutions LLC

Enclosure

cc: w/enclosure
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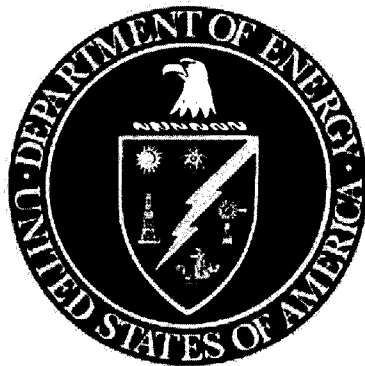
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Mine Ventilation Rate Monitoring Annual Report

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

October 2011



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DOE/WIPP-11-3369

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ACRONYMS AND ABBREVIATIONS

acfm	actual cubic feet per minute
CMRO	Central Monitoring Room Operator
hp	horsepower
MVRMP	Mine Ventilation Rate Monitoring Plan
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
QA	quality assurance
QAPD	Quality Assurance Program Description
RPD	relative percent difference
scfm	standard cubic feet per minute
WIPP	Waste Isolation Pilot Plant
WTS	Washington TRU Solutions LLC

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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 repository and the active disposal room are obtained and documented. The MVRMP requires ventilation flow rate measurements for the total underground 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, 2010 through June 30, 2011, the lowest monthly annual running average total underground repository ventilation flow rate was 384,497 standard cubic feet per minute (scfm), which did not trigger any notification requirements. Notification would be required if the minimum annual running average total underground repository ventilation flow rate (calculated monthly) was under 260,000 scfm (Permit Part 4.6.4.3 beginning December 30, 2010).

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 55,077 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.

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1.0 INTRODUCTION

The New Mexico Environment Department (NMED) issued the WIPP Permit, NM4890139088-TSDF, 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) for airflow rates for the total underground repository and the active disposal room when workers are present.

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, 2010, to June 30, 2011.

1.1 Total Mine Ventilation Rate Monitoring in the Underground Repository

To comply with Permit Part 4, the running annual average mine ventilation rate is computed on a monthly basis to assure that it exceeds the minimum value of 260,000 scfm. 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 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 (October 2010)
Normal (two 600 hp fans)	425,000	±2.5%
Alternate (one 600 hp fan)	260,000	±4.5%
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	±3.3%

* Note The modes of operations were not modeled in the October 2010 Test and Balance

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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:

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

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

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

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 waste room when workers are present and waste handling is underway. Permit Part 4.6.4.3 requires compliance to be assessed 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 through the active disposal room was achieved when workers were present and waste handling was underway. Multiple measurements were taken at each field location to ensure accurate results and correlated within 10 percent to be acceptable. Data was collected and recorded by qualified operators, and the data was verified. The facility operator verified proper ventilation when workers were going to be present in the active room and waste handling was underway, any time there was an operational mode change, or if there was a change in the system's configuration that could affect the ventilation system. A momentary reduction in underground ventilation caused by the realignment or switching of underground 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. The Permit states

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that the 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 system is operating within acceptable design parameters. The Test and Balance is an appropriate method of verifying 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 is the baseline for underground 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 in comparison to the overall system resistance. Historic data indicates 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 October 2010. A summary of the results of the October 2010 Test and Balance is presented in Table 1 in accordance with Permit Section O-5a. The next Test and Balance will be due no later than April 2012.

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 is 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 facility Metrology Program. The WIPP facility Metrology Program ensures that maintenance and test equipment used in the

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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 was 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 384,497 scfm for the reporting period. In addition, it shows that the lowest running annual average mine ventilation flow rate in the underground repository occurred in June 2011, when the running annual average flow rate was 384,497 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)	Running Annual Active Disposal Room Annual Average (acfm)
Jul 10	386,650	410,018	58,945	55,900
Aug 10	413,180	410,550	54,160	55,975
Sep 10	408,780	409,741	54,116	56,025
Oct 10	407,590	409,185	54,607	56,082
Nov 10	417,710	410,871	60,828	56,096
Dec 10	277,410	402,914	56,989	56,609
Jan 11	282,530	391,270	53,794	56,483
Feb 11	384,830	388,493	57,654	56,900
Mar 11	414,000	388,208	54,441	56,737
Apr 11	411,220	387,360	47,863	55,626
May 11	398,350	385,295	57,570	55,566
Jun 11	411,710	384,497	49,953	55,077

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

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 that the running annual average active disposal room ventilation flow rate was 55,077 acfm for the reporting period. In addition, it shows that the lowest average monthly ventilation rate in the active disposal room occurred in April 2011, when the average flow rate was 47,863 acfm.

2.3 Test and Balance

The most recent Test and Balance of the mine ventilation system was performed in October 2010. The next Test and Balance has been scheduled for March 2012.

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.

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 associated with the MVRMP consists of several elements. The qualifications of personnel conducting ventilation flow measurements are maintained through a prescribed training qualification process. The ventilation simulation software program is controlled in accordance with the Washington TRU Solutions LLC (WTS) Quality Assurance Program Description (WP 13-1), and WIPP facility computer software QA plans.

Data and records generated by the MVRMP, as well as records, and procedures to support the MVRMP, are maintained and managed in accordance with the WTS QAPD. Nonconformance or conditions adverse to quality will be 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

WIPP conducts regular mine ventilation rate monitoring of the underground repository and active disposal rooms. The following is an analysis of the data from this program:

- Permit requirements related to mine ventilation rate monitoring have been met.
- Data quality is acceptable.
- Ventilation through the mine was maintained above permit stipulated levels.
- NMED was notified by letter on April 27, 2011 in accordance with Permit Attachment O, Section O-3b(2) of one event when workers entered Room 7 of Panel 6 without having established 35,000 cubic feet per minute of airflow. Waste disposal was not taking place and access to the area was restricted by the use of barriers in accordance with Permit, Attachment O, Section O-1.

5.0 REFERENCES

- 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, *Washington TRU Solutions LLC Quality Assurance Program Description*
- IC041098, *U/G Exhaust Mass Flow Measurement System for Fans 700A, B & C*

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	39268	654.47	425	278148.33
ALTERNATE VENTILATION (1-700 FAN)	738	12.30	260	3198.00
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)	596	9.93	260	2582.67
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)	3740	62.33	60	3740.00
NO VENTILATION	298	4.97	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				287689.00
MONTHLY AVERAGE FLOW RATE(kscfm)				386.65

CALENDAR MONTH ~July, 2010

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	58.945
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		96.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	42872	714.53	425	303676.67
ALTERNATE VENTILATION (1-700 FAN)	491	8.02	260	2084.33
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)	357	5.95	260	1547.00
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)	80	1.33	60	80.00
FILTRATION 1-860 FAN thru HEPA)	15	0.25	60	15.00
NO VENTILATION	835	13.92	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				307403.00
MONTHLY AVERAGE FLOW RATE(kscfm)				413.18

CALENDAR MONTH -August, 2010

<p>COMMENTS: None</p>

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.160
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		69.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfm-hr)
NORMAL VENTILATION (2-700 FANS)	39052	650.87	425	276618.33
ALTERNATE VENTILATION (1-700 FAN)	201	3.35	280	871.00
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	280	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2-860-FANS)	0	0.00	280	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	3869	64.48	280	16765.67
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	280	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)	67	1.12	60	67.00
NO VENTILATION	11	0.18	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				294322.00
MONTHLY AVERAGE FLOW RATE(kscfm)				408.78

CALENDAR MONTH -September, 2010

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.116
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		77.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40283	671.05	425	285196.25
ALTERNATE VENTILATION (1-700 FAN)	541	9.02	260	2344.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	43	0.72	260	186.33
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	260	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	3508	58.47	260	15201.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	260	0.00
REDUCED VENTILATION (0-700 FANS w/ 2-860 FANS)	38	0.63	120	76.00
MINIMUM VENTILATION (0-700 FANS w/ 1-860 FAN)	65	1.08	60	65.00
FILTRATION (1-860 FAN thru HEPA)	178	2.97	60	178.00
NO VENTILATION	4	0.07	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				303247.25
MONTHLY AVERAGE FLOW RATE(kscfm)				407.59

CALENDAR MONTH -October, 2010

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.607
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		95.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	41412	690.20	425	293335.00
ALTERNATE VENTILATION (1-700 FAN)	13	0.22	260	56.33
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)	1695	28.25	260	7345.00
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)	12	0.20	60	12.00
NO VENTILATION	68	1.13	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				300748.33
MONTHLY AVERAGE FLOW RATE(kscfm)				417.71

CALENDAR MONTH -November, 2010

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	60.828
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		81.00

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Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	25504	426.57	425	181290.83
ALTERNATE VENTILATION (1-700 FAN)	1579	26.32	280	6842.33
MAINTENANCE BYPASS (1-700 FAN w/ 1-860 FAN)	0	0.00	280	0.00
MAINTENANCE BYPASS (1-700 FAN w/ 2 860-FANS)	0	0.00	280	0.00
MAINTENANCE BYPASS (2-700 FANS w/ 1-860 FAN)	301	5.02	280	1304.33
MAINTENANCE BYPASS (2-700 FANS w/ 2-860 FANS)	0	0.00	280	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	80	0.00
FILTRATION 1-860 FAN thru HEPA)	16959	282.65	80	16959.00
NO VENTILATION	207	3.45	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				208396.50
MONTHLY AVERAGE FLOW RATE(kscfm)				277.41

CALENDAR MONTH -December, 2010

COMMENTS:
Annual U/G Maintenance

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	56.989
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		11.00

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	26237	437.28	425	185845.42
ALTERNATE VENTILATION (1-700 FAN)	1980	31.00	260	8060.00
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)	16296	271.60	60	16296.00
NO VENTILATION	247	4.12	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				210201.42
MONTHLY AVERAGE FLOW RATE(kscfm)				282.53

CALENDAR MONTH ~January, 2011

<p>COMMENTS: Annual U/G Maintenance</p>

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	53.794
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE	26.00	

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	32989	549.82	425	233872.08
ALTERNATE VENTILATION (1-700 FAN)	2460	41.00	260	10680.00
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)	2871	47.85	260	12441.00
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)	1831	30.52	60	1831.00
NO VENTILATION	169	2.82	0	0.00
TOTAL		672.00		
SUM OF FLOW(kscfm-hr)				258604.08
MONTHLY AVERAGE FLOW RATE(kscfm)				384.83

CALENDAR MONTH -February, 2011

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	57.654
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		67.00

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfm-hr)
NORMAL VENTILATION (2-700 FANS)	41885	694.75	425	295268.75
ALTERNATE VENTILATION (1-700 FAN)	1	0.02	260	4.33
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)	2940	49.00	260	12740.00
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)	1	0.02	60	1.00
FILTRATION 1-860 FAN thru HEPA)	4	0.07	60	4.00
NO VENTILATION	9	0.15	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				308018.08
MONTHLY AVERAGE FLOW RATE(kscfm)				414.00

CALENDAR MONTH -March, 2011

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	54.441
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		100.00

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfm-hr)
NORMAL VENTILATION (2-700 FANS)	41057	684.28	425	290820.42
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)	1010	16.83	260	4376.87
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)	884	14.73	60	884.00
NO VENTILATION	240	4.15	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				296081.08
MONTHLY AVERAGE FLOW RATE(kscfm)				411.22

CALENDAR MONTH -April, 2011

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	47.863
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		97.00

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40428	674.97	425	288860.83
ALTERNATE VENTILATION (1-700 FAN)	2	0.03	260	8.87
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)	1816	26.93	260	7002.67
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)	2500	41.87	60	2500.00
NO VENTILATION	24	0.40	0	0.00
TOTAL		744.00		
SUM OF FLOW(kscfm-hr)				298372.17
MONTHLY AVERAGE FLOW RATE(kscfm)				398.35

CALENDAR MONTH -May, 2011

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	57.570
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE		74.00

Mine Ventilation Rate Monitoring Annual Report
DOE/WIPP-11-3369

Attachment 1 – Monthly Summary of Mine Ventilation Rate Monitoring Data

SURFACE				
MODE OF OPERATION	RUNTIME (min)	RUNTIME (hours)	FLOW RATE (kscfm)	TOTAL FLOW (kscfmhr)
NORMAL VENTILATION (2-700 FANS)	40235	670.58	425	284997.92
ALTERNATE VENTILATION (1-700 FAN)	53	0.98	260	229.67
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)	2486	41.47	260	10781.33
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)	4	0.07	60	4.00
FILTRATION 1-860 FAN thru HEPA)	417	6.95	60	417.00
NO VENTILATION	3	0.05	0	0.00
TOTAL		720.00		
SUM OF FLOW(kscfm-hr)				296429.92
MONTHLY AVERAGE FLOW RATE(kscfm)				411.71

CALENDAR MONTH -June, 2011

COMMENTS:
None

ACTIVE ROOM		
MONTHLY AVERAGE FLOW (kacfm)	MINIMUM = 35K scfm = 42K acfm	49.953
NUMBER OF DATA POINTS USED IN CALCULATION OF AVERAGE	81.00	