U.S. DEPARTMENT OF ENERGY PLAN FOR ADDRESSING THE AREAS FOR IMPROVEMENT IDENTIFIED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER 1, 2014

SUMMARY OF EPA'S RESPONSE AND FINDINGS RELATED TO THE FEBRUARY 2014 RADIOACTIVE RELEASE AT THE WASTE ISOLATION PILOT PLANT

Executive Summary

Overview

On February 14, 2014, a radiological release occurred in the underground of the U.S. Department of Energy (DOE) Waste Isolation Pilot Plant (WIPP) facility. In April 2014, the U.S. Environmental Protection Agency (EPA) inspected the air sampling programs and current waste management and storage operations on the surface at the WIPP facility. The EPA confirmed in two reports, issued on October 1, 2014, that the radiological release from the WIPP facility to the environment as a result of the February 14, 2014 incident, was small, and that potential doses to the public did not approach the standards set under 40 CFR Part 191, Subpart A (CFR, 2014a), or the limits set in 40 CFR Part 61, Subpart H (CFR, 2014b).

The first EPA report, *Subpart A Inspection Report in Response to the February 14, 2014 WIPP Incident*, (EPA, 2014a) documented the EPA April 2014 inspection activities at the WIPP facility and in Carlsbad. The second EPA report, *Summary of EPA's Response and Findings Related to the February 2014 Radioactive Release at the Waste Isolation Pilot Plant*, (EPA, 2014b) summarized the EPA activities conducted during its initial response to the February 14, 2014, radiological incident. As a result of the EPA April 2014 inspection activities, the EPA identified three areas for improvement for the DOE which they specifically requested be addressed by the DOE in a plan.

Contents of the DOE Plan to Address Areas for Improvement Identified by the EPA

Since the February 14, 2014, radiological incident, the DOE has taken the initiative to implement several improvements that were also identified by the EPA. The DOE has prepared a comprehensive plan that addresses the following areas as identified by the EPA:

- Update the Ambient Environmental Monitoring Network
  - Improve the design, positioning, maintenance, and overall capability of its ambient environmental air monitoring network.
- Strengthen Emergency Response Protocols
  - Better integrate routine and incident procedures to enhance preparedness of multiple organization field and laboratory staff to respond to releases.
- Ensure the Highest Quality Laboratory Results
  - Implement stricter sample collection, sample tracking and documentation procedures to provide the highest quality, most defensible data possible at all times.

A high-level summary of the DOE plan for addressing areas of improvement is provided in the following "Crosswalk of the DOE Plan for Addressing Areas for Improvement as Identified by the EPA." A description of the DOE plan for addressing areas of improvement is provided in this document.

Crosswalk of the DOE Plan for Addressing Areas for Improvement as Identified by the EPA

Description		Date Implemented	Date Planned	Section of DOE Plan
Area Identified by EPA for Improvement: Update the Ambient Environmental Monitoring Network Improve the design, positioning, maintenance, and overall capability of its ambient environmental air monitoring network.				
Enhancements to Low-Volume Air Particulate (LVAP) Sampling Network	Add seven LVAP sampling locations to the monitoring network (including Angel Ranch).	March/November 2014	Completed	2.0
	Increase the number of LVAP samplers in the network to 24.	March/November 2014	Completed	2.0
	Separate operational monitoring program LVAP samplers from event evaluation samplers.	April 2014	See Table 1	2.0
Low-Volume Air Particulate Sampler Evaluations and Alterations	Inspect sampler locations using criteria from *DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, January 1991 (DOE, 1991),* and *DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations, July 1981 (DOE 1981).* Note: *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), (EPA, 1987), 40 CFR 58, Appendix E (CFR, 2014c)* was also used in evaluating the location of the LVAP samplers.	April 2014	Completed	3.0
	Make adjustments to Loving and Eunice sample locations based on evaluations.	April 2014	See Table 1	3.0
	Document LVAP siting inspections in two reports: *WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment, Rev 0, May 15, 2014 (NWP, 2014b)* and *WIPP Environmental Monitoring Program – Ambient Air Sampling Location Site Evaluation Follow-Up, Rev. 0, July 25, 2014 (NWP, 2014c).*	May 2014 and July 2014, respectively	Completed	3.0
	Enclose samplers in protective housing.	June 2014	Completed	3.0
	Relocate air sampler intake to a consistent height from the ground surface.	NA	January 31, 2015	3.0

Description		Date Implemented	Date Planned	Section of DOE Plan
Area Identified by EPA for Improvement: Update the Ambient Environmental Monitoring Network Improve the design, positioning, maintenance, and overall capability of its ambient environmental air monitoring network.				
Additional Low-Volume Air Particulate Sample Sites	Activate Angel Ranch Sampler.	November 2014	Completed	4.0
	Evaluate two additional LVAP sampler locations to the north and east of the WIPP facility.	NA	December 31, 2014	4.0
	Develop a facility air sampling technical basis document for onsite environmental air monitoring.	Currently in internal review	Scheduled to be finalized November 30, 2014	4.0
Maintenance and Calibration Program	Develop a procedure for performing and documenting maintenance of the LVAP samplers, to include logbooks.	NA	February 28, 2015	5.0
Alternative Low-Volume Air Particulate Samplers	Evaluate utilization of digital LVAP samplers.	NA	March 1, 2015	6.0
	Evaluate remote sensing/monitoring capability.	NA	March 1, 2015	6.0
Area Identified by EPA for Improvement: Strengthen Emergency Response Protocols Better integrate routine and incident procedures to enhance preparedness of multiple organization field and laboratory staff to respond to releases.				
Emergency Response and Sample Analysis	Revise *WP 12-RE3002*, *Radiological Engineering Off-site Sample Recovery (NWP, 2014a)*	October 2014	Completed	7.0
Area Identified by EPA for Improvement: Ensure the Highest Quality Laboratory Results Implement stricter sample collection, sample tracking and documentation procedures to provide the highest quality, most defensible data possible at all times.				
Additional Low-Volume Air Particulate Sample Sites	Develop a facility air sampling technical basis document for onsite environmental air monitoring.	Currently in internal review	Scheduled to be finalized November 30, 2014	4.0
Emergency Response and Sample Analysis	Revise *WP 12-RE3002*, *Radiological Engineering Off-site Sample Recovery (NWP, 2014a)*	NA	December 31, 2014	7.0

1.0 Introduction

On February 14, 2014, a radiological release (release event) occurred at the Waste Isolation Pilot Plant (WIPP) facility. Consequently, the environmental monitoring and sampling program was supplemented and expanded to provide additional information regarding the extent of the release. One of the aspects of the environmental monitoring and sampling program is the Low-Volume Air Particulate Sampling Program (LVAP) which includes a network of samplers used to collect ambient air particulates. This plan describes the LVAP monitoring network prior to the release event and the changes that were made to the system in order to respond to concerns and recommendations in the U.S. Environmental Protection Agency (EPA) Subpart A Inspection Report in Response to the February 14, 2014, WIPP Incident (EPA, 2014b), issued October 1, 2014.

Prior to the release event the LVAP network consisted of seven air sampling locations shown in Figure 1. One permanent LVAP sampler was employed at each location for environmental monitoring. Prior to the release event, sample filters were collected on a weekly basis from each location. On a quarterly basis the filters were composited by location and analyzed for 10 radionuclides: ^{241}Am, ^{60}Co, ^{137}Cs, ^{40}K, ^{238}Pu, $^{239/240}$Pu, ^{90}Sr, ^{234}U, ^{235}U, ^{238}U.

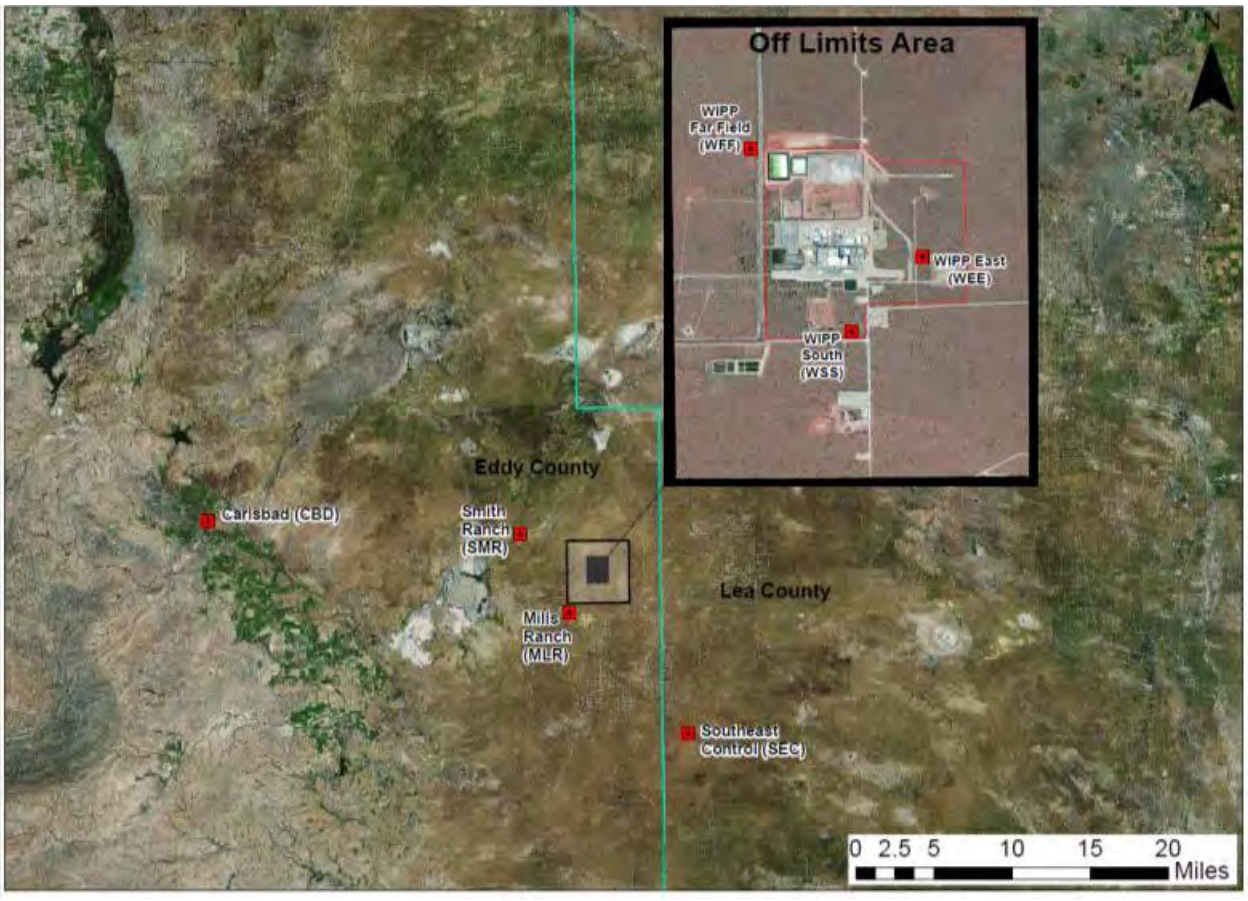

Figure 1, Original DOE Air Sampling Sites

After the release event the seven original air monitoring stations were used to focus on the consequences of the release event. Therefore, filters were only analyzed for ^{241}Am, ^{238}Pu, and

$^{239/240}$Pu, which are the radionuclides of concern resulting from the release event. Focusing on these three radionuclides at the exclusion of the other seven created a gap in the environmental monitoring data set. A solution to minimize this data gap was implemented and is one of the network enhancements discussed in Section 2.0.

The WIPP facility procedure *WP 12-RE3002, Radiological Engineering Off-site Sample Recovery* (NWP, 2014a) was revised to incorporate lessons learned from the release event related to sample collection, tracking, and documentation. A WIPP facility air sampling technical basis document is also being prepared to address the design, positioning, maintenance and overall capability of the onsite ambient environmental air monitoring network.

2.0 Enhancements to Low-Volume Air Particulate Sampling Network

Following the release event there were ten additional sampling locations added to the LVAP sampling network, bringing the total LVAP sampling locations to 17 (Table 1) and the number of samplers to 24. The following were considered in establishing these locations: coverage of populated areas, samplers located in the directions other than the predominant wind direction, onsite monitoring for personnel, and samplers at intermediate locations to the distant population centers. Some of these locations were added after the EPA inspection in April 2014 (Figure 2), but prior to the EPA October 1, 2014 report.

Table 1, WIPP Facility Low-Volume Air Particulate Samplers

Sampling Location	Location Code	Activation Date	Filter Exchange Frequency	Analysis Schedule	Comments
WIPP Far Field (AL)	WFF (AL)	1986	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
WIPP Far Field (EE)	WFF (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
WIPP South (AL)	WSS (AL)	1985	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
WIPP South (EE)	WSS (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
WIPP East (AL)	WEE (AL)	1985	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
WIPP East (EE)	WEE (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
Southeast Control (AL)	SEC (AL)	1990	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
Southeast Control (EE)	SEC (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
Mills Ranch (AL)	MLR (AL)	1985	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
Mills Ranch (EE)	MLR (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
Smith Ranch (AL)	SMR (AL)	1985	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program

Sampling Location	Location Code	Activation Date	Filter Exchange Frequency	Analysis Schedule	Comments
Smith Ranch (EE)	SMR (EE)	3/4/2014	Weekly	As needed	Replicate sampler for radiological release event evaluations
Carlsbad (AL)	CBD (AL)	7/1/2005	Weekly	Quarterly	WIPP's Operational Environmental Monitoring Program
Carlsbad (EE)	CBD (EE)		Weekly	As needed	Replicate sampler for radiological release event evaluations
Meteorology Station	MET (EE)	3/4/2014	Weekly	As needed	Located off-site northeast of the exhaust shaft. Operated to support radiological event evaluations. Environmental monitoring sampler.
Salt Shaft	SLT (EE)	3/4/2014	Weekly	As needed	Located on-site northwest of the exhaust shaft, north of the salt shaft. Sampler co-located with NMED air sampler. Operated to support radiological event evaluations. Work place sampler.
South Training Building	STB (EE)	3/4/2014	Weekly	As needed	Located immediately northwest of the exhaust shaft. Sampler is co-located with Carlsbad Environmental Monitoring and Research Center air sampler. Operated to support radiological event evaluations. Work place sampler.
Guard and Security Building	GSB (EE)	3/25/2014	Weekly	As needed	Located west of the exhaust shaft. Operated to support radiological event evaluations. Work place sampler.
Potash Mine Road	PMR (EE)	7/31/2014	Weekly	As needed	Located off-site northwest of the exhaust shaft. Operated to support radiological event monitoring.
Angel Ranch	ANG (EE)	11/4/2014	Weekly	As needed	Located northwest of the exhaust shaft. Operated to support radiological event monitoring.
Hobbs	HBS (EE)	4/10/2014	Weekly	As needed	Located northeast of the exhaust shaft. Operated to support radiological event monitoring. Located near populated area.
Artesia	ART (EE)	4/10/2014	Weekly	As needed	Located northwest of the exhaust shaft. Operated to support radiological event monitoring. Located near populated area.
Loving	LVG (EE)	4/10/2014 5/20/2014	Weekly	As needed	Located southwest of the exhaust shaft. Operated to support radiological event monitoring. Located near populated area.
Eunice	EUN (EE)	4/10/2014 5/16/2014	Weekly	As needed	Located east of the exhaust shaft. Operated to support radiological event monitoring. Located near populated area.

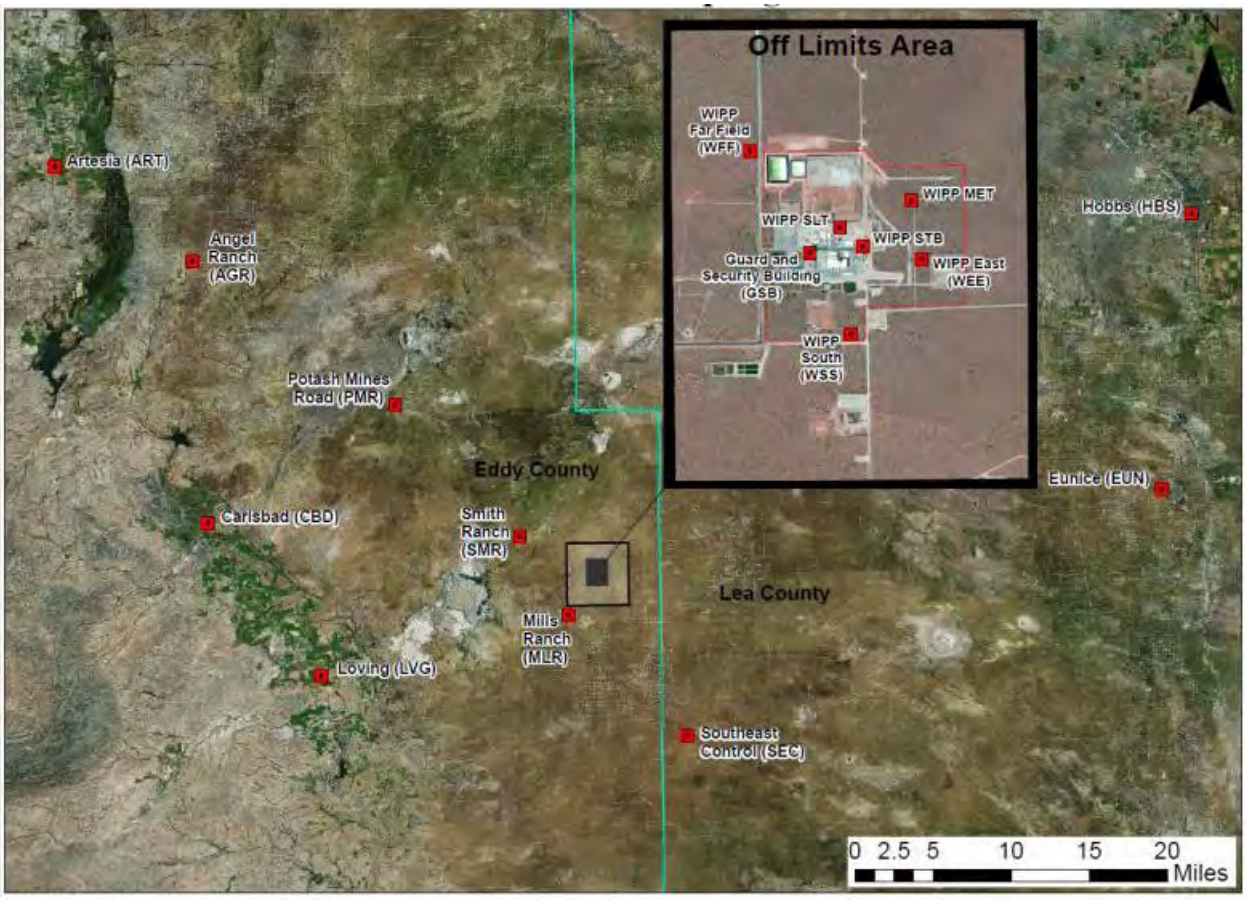

Figure 2, Active DOE Air Sampling Sites

Originally, the seven LVAP samplers were used for the environmental monitoring program and analysis of ten radionuclides. These are designated as air low volume (AL) samplers. When the release event occurred, the samplers were used as event evaluation (EE) samplers and the analysis targeted the three radionuclides of interest. Because samplers can only be used for either an AL or EE sample, each AL location now has a co-located EE sampler to prevent a gap in the program data set.

Initially when the LVAP samplers were used as EE samplers the filters were collected and analyzed weekly until analytical results were consistently below minimum detectable concentration (MDC). For the months of June, July, and August, 2014, the analytical frequency for the filters from the EE samplers was changed to a monthly composite. The EE sampler analysis for the February release event will be concluded after one quarterly composite is analyzed. Subsequent filters from the EE samplers will be archived for one year before disposal and are available for analysis as needed or if another release event should occur.

3.0 Low-Volume Air Particulate Sampler Evaluations and Alterations

After the EPA inspection in April 2014, an evaluation was performed of the LVAP network in two phases. The first phase was performed to evaluate the five specific samplers the EPA viewed during the April 2014 inspection. The second phase was performed for the remaining samplers. The siting criteria defined in *DOE/EH-0173T, Environmental Regulatory Guide for Radiological*

Effluent Monitoring and Environmental Surveillance, January 1991 (DOE, 1991), and *DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations, July 1981* (DOE, 1981) were used for this evaluation. Results of the evaluation were documented in the following reports: *WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment, Rev 0, May 15, 2014* (NWP, 2014b) and *WIPP Environmental Monitoring Program – Ambient Air Sampling Location Site Evaluation Follow-Up, Rev. 0, July 25, 2014* (NWP, 2014c). *These evaluations are included as Attachments 1 and 2.*

Criteria for the location (relative to interference factors) of the samplers were derived from 40 CFR 58 Appendix E (CFR, 2014c) (for PM^{10} sampling) and from DOE, 1981 for air particulate sampling of ambient air.

The specific criteria for each sampler included the following:

- Spatial coordinate documentation (latitude/longitude),
- Height of sample head above ground,
- Distances from individual trees, tree dripline, and tree rows,
- Distance to un-vegetated areas and road/dust-producing areas,
- Distances to/height of obstacles, and the height-to-top ratio from the sampler head,
- Distance to co-located samplers,
- Photos from cardinal directions to include vegetation and obstacles, and
- Degrees of unrestricted (no obstacle) air flow around the sample head.

The EPA verbally identified improvements for LVAP sampling locations at Carlsbad (CBD), Artesia (ART), Loving (LVG), Hobbs (HBS), and Eunice (EUN) during the April 2014 inspection. After the inspection and evaluations, changes were made for the Loving and Eunice locations. A summary of each site is provided below.

- Carlsbad

  No change to this location. This sampling location is considered adequate by having 90% of the monitoring path unrestricted as well as having 180^0 of unrestricted airflow (for locations next to buildings, 40 CFR Part 58 Appendix E (CFR, 2014c)).

- Artesia

  Alternate locations were considered, but none afforded a better choice. A protective sampler enclosure was installed at this location to provide better security from vandalism and protection from weather. Additionally, after several filter exchanges, the mass loading onto the filters did not appear to affect the desired flow rate of the LVAP sampler for this location. Fields are typically plowed (disturbed) in this area once per year.

- Loving

  The sampling location was moved away from the building in order to alleviate the concern regarding the fire station exhaust fan. Alternate locations were considered, but none afforded a better choice. A protective sampler enclosure was installed at this

location to provide better security from vandalism and protection from weather. Additionally, after several filter exchanges, the mass loading onto the filters did not appear to affect the desired flow rate of the LVAP sampler for this location. Fields are typically plowed (disturbed) in this area once per year.

- Hobbs

  A protective sampler enclosure was installed at this location to provide better security from vandalism and protection from weather.

- Eunice

  The sampling location was moved to the Police Department, because the location meets more of the screening criteria. A protective sampler enclosure was installed at this location to provide better security from vandalism and protection from weather.

After evaluation of the LVAP sampling locations, each sampler was fitted with a protective sampler enclosure (birdhouse). Plans are in place at this time to extend air intake masts to a consistent and uniform sample head height range of 5 feet to 7 feet. This is consistent with *DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, January 1991* (DOE, 1991), and *DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations, July 1981* (DOE, 1981), and EPA guidance, which recommend a sample head height range of 5 feet to 23 feet.

4.0 Additional Low-Volume Air Particulate Sample Sites

The intent of the DOE is to have air sampler coverage in cardinal directions in distant populated areas and also intermediate distances between the WIPP facility and the populated areas. This sampling strategy is to account for variability in wind direction during a release event. Intermediate locations would be able to detect migration of a plume if it is short lived and does not reach the samplers in more populous locations. Cardinal directions are accounted for in the immediate area of the WIPP facility. Locations north and east of the WIPP facility are areas currently under evaluation for additional LVAP samplers.

Nuclear Waste Partnership LLC (NWP) has developed a facility air sampling technical basis document (currently in review) to address the design, positioning, maintenance and overall capability of its onsite ambient environmental air monitoring network. This technical basis document may lead to improvements in the network and will ensure that samplers are positioned appropriately so that the data will accurately reflect potential inhalation exposure. Additionally the technical basis document specifies the appropriate quality assurance and control of sample handling, tracking, and analytical type determination.

5.0 Maintenance and Calibration Program

The systems currently in operation at this time have two components under the WIPP facility metrology calibration program. These components are a portable mass flow meter and an electronic stop watch, each of which are calibrated annually or sooner if a malfunction is suspected. The WIPP Metrology department annually notifies Environmental Monitoring and Hydrology (EM&H) of the calibration due date and coordinates the third party calibration of the instruments. The flow meter is used to verify and adjust, if necessary, the flow rate of the LVAP

sampler per procedural requirements. The calibrated stop watch is used to verify that the LVAP sampler timers are accurate and functioning properly.

The EPA has suggested sending the LVAP samplers to a vendor for third party calibration or performing in-house calibration. The selection of an alternative calibration process will depend on the type of LVAP sampler that DOE uses in the future (see Section 6.0).

The LVAP samplers are maintained by the EM&H technicians; however, a procedure specifically defining the maintenance process is being developed. Currently the intake and exhaust motor filters are replaced per manufacturer's instructions every four months and documented on the field data sheets. Other maintenance is performed as needed, such as timer replacements, motor vane replacement, or replacement of entire units.

The EPA has recommended utilization of logbooks to document maintenance records. Although maintenance records are kept for the LVAP samplers, because they are embedded in field data sheets, it is difficult to locate and identify trends in maintenance problems.

A maintenance procedure will be developed and include logbooks to document what is performed. Each sampler location will have a dedicated logbook (not to exclude electronic recordkeeping) or logbooks for collocated samplers, to document repairs.

During the EPA inspection a failed timer on a LVAP sampler was observed. This happens from time to time. Procedures call for inspection and verification of the timers to try and preclude this from happening. The new maintenance procedure (under development) addresses weekly inspection of timers as well as motors and pumps.

6.0 Alternative Low-Volume Air Particulate Samplers

The current LVAP samplers in the network are HI-Q Model CMP-0523CV operated at a flow rate of two cubic feet per minute. The local display sampler-running timers are both electromechanical digital indicators (odometer style) and electronic readout, and flow rates are measured using a portable calibrated in-line mass flow instrument, with liquid crystal diode (LCD) readout, before and after filter changes. The EPA has suggested replacing LVAP samplers with digital systems and internal data loggers. Systems of this type have the capability of recording and locally displaying air flow rates, total volume sampled, and sampler runtimes, and downtimes due to pump or power failures. An integrated digital system would be able to provide more data with respect to the operability of the LVAP sampler between filter retrieval times. Current LVAP systems do not have this capability. Evaluations will provide alternate actions and justification if it is decided not to implement this recommendation.

Currently, a preliminary evaluation of three systems is being performed to determine the best system available for the network needs. Current systems being evaluated are as follows:

- HI-Q CMP-DIGITAL 4.0
- HI-Q CF-5624
- F&J DF-EDL-1

The LVAP network will also be evaluated for the feasibility of remote readout capability to determine operability and efficiency from a central desktop computer. Because the systems are located across such a vast distance with a radius of 50 miles, and due to manpower and

resource constraints, it is difficult to visit each location more often than once per week as the EPA has suggested. The remote readout capability will be evaluated and compared to more frequent (2–3 times per week) visits. Currently LVAP filters are retrieved weekly at which time operability checks are also performed. If remote readout is a viable option, system operability (on/off) will be checked at a minimum of every other work day.

7.0 Emergency Response and Sample Analysis

Nuclear Waste Partnership LLC revised procedure *WP 12-RE3002, Radiological Engineering Off-site Sample Recovery* (NWP, 2014a) and adding it to their drill program to strengthen emergency response protocols by integrating routine and incident procedures to enhance preparedness of field and laboratory staff to respond to releases.

Procedural steps have been enhanced to ensure the maintenance of strict chain of custody protocol and to clarify that the location of sample analysis will be determined by the crisis manager based on preliminary field survey results. Management of the Station "A" and "B" samples will not change; they will continue to be stored inside the instrument room of the TRUPACT Maintenance Facility and will be analyzed as determined by NWP management with regulatory agency concurrence. The crisis manager will control samples, determine where they will be analyzed, and track the sample until results are obtained.

This revision will also enhance the quality of laboratory results by implementing stricter sample collection, tracking and documentation to provide the highest quality, most defensible data possible. The procedural section on sample collection (Section 2.7) has been rewritten to incorporate lessons learned from the release event and will result in improved contamination control during sample collection as well as enhanced detail related to documentation. Specifically, the procedure utilizes technicians who routinely perform filter exchanges on a weekly basis to assure consistency in sample handling, chain of custody, and procedural compliance.

8.0 Summary

A great deal of work has been accomplished since the February radiological event and the EPA inspection in April 2014. The EPA inspection report contained a number of suggested improvements, some of which were already completed or evaluated when the inspection report was issued in October 2014. A list of the accomplishments and planned actions is provided below.

List of Accomplishments

- Added seven LVAP sampling locations to the monitoring network.
- Increased the number of LVAP samplers in the network to 24.
- Separated environmental monitoring LVAP samplers from event evaluation samplers.
- Inspected sampler locations using criteria from *DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, January 1991* (DOE, 1991), and *DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations, July 1981* (DOE, 1981).
- Made adjustments to two sample locations based on evaluations.

- Documented LVAP siting inspections in two reports: *WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment, Rev 0, May 15, 2014* (NWP, 2014b) and *WIPP Environmental Monitoring Program – Ambient Air Sampling Location Site Evaluation Follow-Up, Rev. 0, July 25, 2014* (NWP, 2014c).
- Constructed/installed protective housings for samplers.
- Developed a Facility Air Sampling Technical Basis Document (currently in review) for onsite environmental air monitoring.

List of Planned Actions

- Relocate air sampler intake to a consistent height from the ground surface.
- Evaluate two additional LVAP sampler locations to the north and east of the WIPP facility.
- Develop a procedure for performing and documenting maintenance of the LVAP samplers, to include logbooks.
- Evaluate digital LVAP samplers.
- Evaluate remote reading capability.
- Revise *WP 12-RE3002*, *Radiological Engineering Off-site Sample Recovery* (NWP, 2014a) and incorporate into Emergency Management drills.

9.0 Plan

Listed below are the planned actions and anticipated schedule for improving the LVAP monitoring program based on the recommendations identified in the Summary of EPA's Response and Findings Related to the February 2014 Radioactive Release at the Waste Isolation Pilot Plant.

Planned Actions	Anticipated Schedule
Relocate intake heights	December 1, 2014 – January 31, 2015
Evaluate Siting of North and East Samplers	November 1, 2014 – December 31, 2014
Develop maintenance procedure for LVAP Samplers	November 1, 2014 – February 28, 2015
Evaluate using digital LVAP Samplers, to include funding requirements	November 1, 2014 – March 1, 2015
Evaluate remote reading for LVAP samplers, to include funding requirements	November 1, 2014 – March 1, 2015
Revise *WP 12-RE3002, Radiological Engineering Off-site Sample Recovery (NWP, 2014a)*	November 1, 2014 – December 31, 2014
Develop a Facility Air Sampling Technical Basis Document for onsite environmental air monitoring	November 30, 2014

10.0 **References**

(CFR, 2014a) Code of Federal Regulations, 40 CFR 191, Subpart B*, Environmental Standards for Management and Storage*

(CFR, 2014b) Code of Federal Regulations, 40 CFR Part 61, Subpart H*, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities*

(CFR, 2014c) Code of Federal Regulations, 40 CFR Part 58 Appendix E, *Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring*

(DOE, 1991) *U.S. Department of Energy, DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance,* January 1991

(DOE, 1981) *U.S. DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations,* July 1981

(EPA, 1987) *Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), EPA-4504-87-007,* April 1987

(EPA, 2014a) *U.S. Environmental Protection Agency, Subpart A Inspection Report in Response to the February 14, 2014 WIPP Incident*, October 2014

(EPA, 2014b) *U.S. Environmental Protection Agency, Summary of EPA's Response and Findings related to the February 2014 Radioactive Release at the Waste Isolation Pilot Plant,* October 2014

(NWP, 2014a) *NWP procedure WP 12-RE3002*, *Radiological Engineering Off-site Sample Recovery,* October 2014

(NWP, 2014b) *WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment, Rev 0,* May 15, 2014

(NWP, 2014c) *WIPP Environmental Monitoring Program – Ambient Air Sampling Location Site Evaluation Follow-Up, Rev. 0*, July 25, 2014

ATTACHMENT 1

WIPP Environmental Monitoring Program-
Ambient Air Sampling Location Assessment

Rev. 0
15 May 2014

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WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment

Rev. 0

15 May 2014

1.0 Introduction

On February 14, 2014, a radiological release occurred at the Waste Isolation Pilot Plant (WIPP) facility. Consequently, the environmental sampling program was supplemented to provide information regarding the extent of the release. Environmental media sampled included air particulate, soils, surface water and sediment, and vegetation. Siting of the supplemental low-volume air particulate (LVAP) ambient air samplers was based upon information and data collected during as part of the original environmental baseline program for the WIPP facility. This document assesses the specific arrangements at the locations of the supplemental samplers to determine if adjustments are needed due to relation to interference with nearby buildings and activities.

2.0 Environmental Air Particulate Filter Sampling

Air particulate sampling is performed weekly in accordance with WIPP procedure WP 02-EM1012, *Airborne Particulate Sampling*. These samples are collected at seven locations described in Section 2.1. This weekly sampling is also in accordance with the *WIPP Environmental Monitoring Plan* (DOE/WIPP-99-2194).

2.1 Air Particulate Sampling Historically Performed Through February 2014

In the years preceding and the days immediately following the radiological release of 14 February 2014, air filter samples were obtained from the seven LVAP sampling stations: WIPP Far Field, WIPP East, WIPP South, Mills Ranch, Smith Ranch, Carlsbad, and Southeast Control (Figure 1).

2.2 Current Air Particulate Sampling

After collecting the initial air particulate samples at the locations identified in section 2.1, eight additional LVAP sampling stations were added:

<u>Activated March 4</u>

- Salt Hoist [SLT**]** (co-located with a Carlsbad Environmental Monitoring Research Center (CEMRC) station and a New Mexico Environment Department (NMED) station
  LVAS 1).

- Southeast of Training Building [STB]

- Meteorology Tower Building [MET] (co-located with NMED station LVAS 3).

Activated March 25

- Guard and Security Building [GSB]

Activated April 10

- Hobbs [HBS]
- Eunice [EUN]
- Loving [LVG]
- Artesia [ART]

All fifteen stations are currently operating, but the eight samplers activated since the radiological release event were deployed on an expedited schedule, and are being assessed against criteria provided by the U.S. Department of Energy (DOE) and the U. S. Environmental Protection Agency's (EPA) National Analytical Radiation Environmental Laboratory (NAREL) in order to optimize the location. EPA NAREL staff comments were made as part of April 2014 WIPP site visit during which EPA air samplers were co-located with existing DOE air samplers. In addition, the historically-operating samplers will be assessed against the same criteria.

2.3 Planned Additional Air Particulate Sampling

Additional LVAP sampling stations and their locations have been evaluated, but equipment has not yet been deployed. Those six locations include Angel Ranch [AGR], H2 Well Pad [H2P], WIPP North [WNN], LWA East [LWE], Mosaic Shaft 5 [MS5],and Potash Mines Road] [PMR].

2.4 Air Particulate Sampling Placement Criteria

Recommendations for placement of air samplers about a nuclear facility are provided in DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, January 1991, and DOE/EP-0023, A Guide for Environmental Radiological Surveillance at U.S. Department of Energy Installations, July 1981, legacy DOE guidance documents. Those principles were applied in the original siting selections referenced in the April 1985 Radiological Baseline Program for the Waste Isolation Pilot Plant: Program Plan (WTSD-TME-057). The original baseline locations (distance/sector from WIPP) are being re-used, but the locale in some cases has changed due to obstructions, interim adjacent land use changes, or line power availability.

Specific criteria for the locale (relative to interference factors) have been developed using specific criteria derived from 40 CFR 58 Appendix E (for PM^{10} sampling) and from DOE/EP-0023 for air particulate sampling of ambient air. Specific criteria for each identified sampler include:

Spatial coordinates (lat/long)
Height of sample head above ground

Distances from individual trees, tree dripline, and tree rows
Distances to un-vegetated areas and roads/dust-producing areas
Distances to/height of obstacles, and the height-to-top ratio from the sampler head
Distances to co-located samplers
Photos from cardinal directions to include vegetation and obstacles
Degrees of unrestricted (no obstacle) air flow around the sample head.

3.0 Initial Field Assessment

On 23 April 2014 a team of WIPP scientists visited a number of off-site air samplers to collect information and assess the installations against a set of criteria, including the above-listed factors. A field protocol was followed to ensure uniform data collection (see Attachment 1), and a checklist was provided for each location assessed.

4.0 Assessment Results

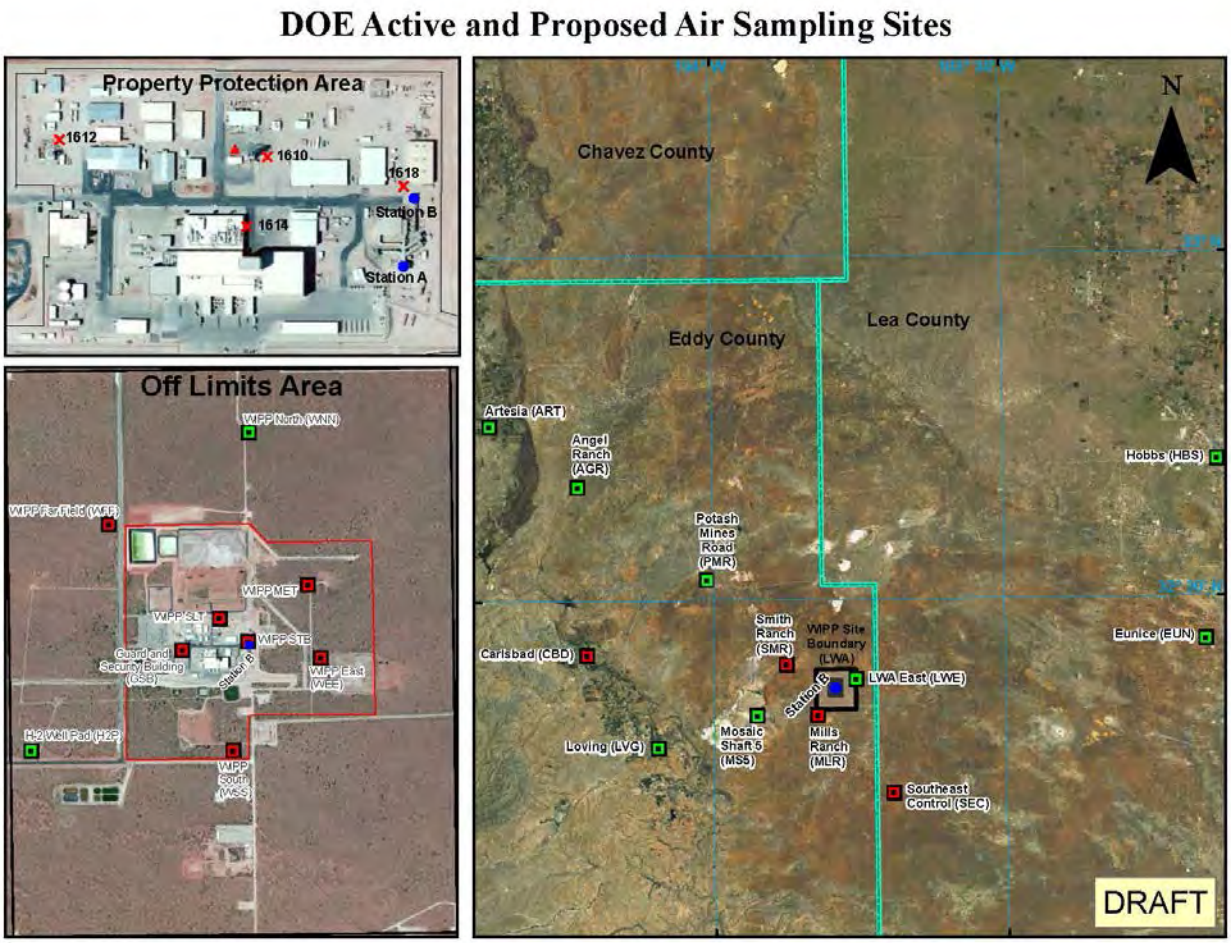
The results of the sampler location assessment showed that the one historical location [CBD] and two proposed locations visited met all the criteria.

Four of the locations (representing urban communities) were in less-than-optimal positions relative to nearby buildings, dust-producing land use, or inadequate sample head height. The samplers were, for the most part, placed in the best location available as dictated by space, security, and power availability. Placement was determined by the deployment team within an accelerated schedule. For longer-term operation, improved locations are being evaluated. The specific criteria assessed are shown on the completed field checklists (see Attachment 2). For those factors not meeting the criteria, an “Adjust” entry is made to signify that either the equipment parameter or location needs to be adjusted, or the situation documented as technically acceptable, to optimize the sampler performance.

5.0 Continuing Sampler Siting Activities

In the coming weeks, assessments of the remaining operating air sampler locations will continue. The seven original LVAP locations will continue to be operated to comply with the requirements of DOE Orders as part of the WIPP’s Operational Monitoring Program as defined in the WIPP Environmental Monitoring Plan (DOE/WIPP-99-2194). For purposes of radiological event evaluation, additional samplers are planned at each of these locations. One set of samplers will be part of the WIPP’s Operational Monitoring Program and used to obtain data used for the Annual Site Environmental Report (ASER) required by DOE Order 231.1B, and the other set of samplers will be designated for radiological event evaluation only.

Optimization of the locations that do not presently meet the desired criteria will proceed concurrently, and the entire network will be assessed after final configuration to document the status.



*Currently active sampling locations are shown in red while proposed locations are shown in green.

Figure 1 WIPP Active and Proposed Low-Volume Air Particulate Stations

Environmental Monitoring Field Information Collection Protocol

Ambient Air Particulate Sampler Siting Information

SYNOPSIS:

The air particulate samplers deployed in the environs around WIPP are used for corroborating demonstration that the WIPP operations have not impacted the environment or the public adversely, in accordance with the requirements of DOE Order 458.1. Several guidance documents from DOE (DOE/EH-0173T, DOE/EP-0023) specify air sampler siting requirements, as do EPA guidance and compliance documents (EPA-450 4-87-007, 40 CFR 58, Appendix E). In order to determine the status of the sampler installations regarding these requirements or guidance, a field information “WIPP Ambient Air Sampler On-Location Checklist” is used to document conditions at each sampler installation for review and reference. The checklist contains information needed to ascertain whether the installation siting adequately meets the relevant criteria.

Refer to WP 02-EM1012, Airborne Particulate Sampling, for precautions regarding potential risks when accessing air sampler locations. No air sampler work is conducted under this protocol.

This protocol does not contain required steps, but is to be used as guidance only to obtain necessary information to properly assess the status of air particulate samplers in the WIPP environs.

PROCESS:

1. Review the checklist and determine the equipment and tools needed to measure and document the required information. This may include, but is not limited to, local maps, a GPS, measuring tape(s), a compass (with clinometer), digital camera, and calculator. An environmental-level radiation detector may also be used to establish new location information. A storyboard may be used for photo identification. Assemble the equipment and tools, and the required checklists before proceeding to the sampler location.

2. Enter the date & time of the start of the checklist information collection. Document the sampler unit being assessed.

3. Determine and record the plane coordinates of the sampler head in WGS84 decimal degrees latitude/longitude.

4. Measure and record the height of the sampler head (probe) to the ground. Lay a flat board down to average the ground surface elevation if it is uneven.

5. Measure the distance to the sampler head from the nearest obstruction that rises above the sampler head. Measure or estimate the height of the obstacle (above the sampler), and record these data.

6. Using a compass, estimate the degrees of unrestricted view from the sampler head, and record in total degrees (out of 360N for full circle).

7. Measure, or estimate, and record distances from the sampler head to the nearest roadway or dusty area, un-vegetated un-paved surface (includes tilled land), and co-located sampler intake, if applicable.

8. If equipment is available, take and record a radiation reading at the sampler location at 1.0 meter above the ground. Document the instrument information.

9. Take photos of the sampler installation from the front (including any nearby vegetation), and from each of the four cardinal directions (NEWS). Use a storyboard to aid in photo ID later, as convenient.

10. Identify the field team using the blank spaces at the bottom of the form.

11. Input the data collected into the computerized form for that sampler station location.

12. Identify any obstructions, spacing, or proximity issues that need to be “adjusted.”

13. Using the coordinates collected, find that location using internet mapping, and capture the location (with an ID “pin” on the map) on a satellite image, both at maximum zoom, and at a medium setting allowing nearby road or street identification. Hyperlink these files from an associated directory to the sampler checklist in the provided spaces. Note: Portable document format images are preferable.

14. Upload, and hyperlink the cardinal point images from the associated directory to the sampler checklist in the respective spaces. Note: Portable document format images are preferable, once the quality has been ascertained to be “excellent.”

15. Scan the field sheet with associated hand-entries to produce an image, and save in an associated directory for that sampler along with the electronic update.

16. Link the field sheet as needed to the Environmental Monitoring database/index for future retrieval and reference.

Ambient Air Sampler On-Location Checklists

[linked photos not included]

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection:	4/23/14 9:50	Sampler Unit ID:	NA

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
AGR	ANGEL RANCH Lo-Vol	TBD	32.665257	-104.233104	NA	On NM State land (to be verified)

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	NA	m	NA	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	NA	m	NA	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	900	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		600	ft	355	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		6	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, dirt well pad at 355 degrees

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA		Date of Photos:		
Height from ground to sample head (ft)	NA	ft	measure		No sampler	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure		4/23/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure		4/23/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc		4/23/2014	Looking South	(hyperlink)
					4/23/2014	Looking West	(hyperlink)
Sample head height (ft)	NA	ft	measure			Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure			Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc		(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	NA	ft	calc				

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection:	4/23/14 11:30	Sampler Unit ID:	TBD

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
HBS	**HOBBS Lo-Vol**	4/10/2014	32.698433	-103.133618	5.0	On municipal property, at streetside corner of fire station.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.52	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.52	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	1	ratio	Adjust	
5	Deg. unrestricted airflow, min	270	degrees	200	degrees	Adjust	
6	Distance from road/dust, min	10	m	27	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		100	ft	200	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, small visible un-vegetated, un-paved area across the street. Building overhang edge 47" directly above sampler head.

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	3.8	Dist/Ht Ratio:	0.55		Date of Photos:		
Height from ground to sample head (ft)	5.0	ft	measure		4/23/2014	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	0	degrees	measure		4/23/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	12.0	ft	measure		4/23/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	7.0	ft	calc		4/23/2014	Looking South	(hyperlink)
					4/23/2014	Looking West	(hyperlink)
Sample head height (ft)	5.0	ft	measure			Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure			Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc		(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	NA	ft	calc				

E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection:	4/23/14 14:30	Sampler Unit ID:	Ser#9178

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
LVG	LOVING Lo-Vol	4/10/2014	32.277478	-104.095348	4.6	On municipal property behind Fire Station #2.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.40	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.40	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	0	ratio	Adjust	
5	Deg. unrestricted airflow, min	270	degrees	250	degrees	Adjust	
6	Distance from road/dust, min	10	m	200	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		0	ft	140 +/- 50	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, un-vegetated, un-paved areas in 270 degree arc around site. Proposed move to Lat 32.77685, Long -104.095324

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	3.5	Dist/Ht Ratio:	0.26	Date of Photos:			
Height from ground to sample head (ft)	4.6	ft	measure	4/23/2014	Front of Sampler	(hyperlink)	
Azimuth from sampler to obstacle (degrees)	270	degrees	measure	4/23/2014	Looking North (label incorrect)	(hyperlink)	
Height from ground to top of obstacle (ft)	18.3	ft	measure	4/23/2014	Looking East	(hyperlink)	
Obstacle height above sample head (ft)	13.7	ft	calc	4/23/2014	Looking South	(hyperlink)	
				4/23/2014	Looking West	(hyperlink)	
Sample head height (ft)	4.6	ft	measure		Aerial with pin (in)	(hyperlink)	
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out)	(hyperlink)	
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))		
Obstruction ht. above ground (ft)	NA	ft	calc				

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 4/23/14 8:40 | Sampler Unit ID: Ser#9915

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
ART	**ARTESIA Lo-Vol**	4/10/2014	32.754539	-104.383714	4.4	On public property, at agricultural station.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.35	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.35	m	Pass	
3	Distance from tree dripline, min	10	m	40	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	4	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	140	degrees	Adjust	
6	Distance from road/dust, min	10	m	0	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		90	ft	260	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		8	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: Single trees at 40' SSW, 90' NNW, visible un-vegetated, un-paved areas all west sectors, low buildings about 220 degrees arc to east.

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	28.0	Dist/Ht Ratio:	3.54	Date of Photos:	
Height from ground to sample head (ft)	4.4	ft	measure	4/23/2014	Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	75	degrees	measure	4/23/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	12.3	ft	measure	4/23/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	7.9	ft	calc	4/23/2014	Looking South (hyperlink)
				4/23/2014	Looking West (hyperlink)
Sample head height (ft)	4.4	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection:	4/23/14 10:30	Sampler Unit ID:	NA

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
PMR	**POTASH MINES ROAD Lo-Vol**	TBD	32.529723	-104.011918	NA	On BLM property at NE corner of intersection US 180/ Hackberry Lake access road NM 360.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	NA	m	NA	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	NA	m	NA	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	150	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		100	ft	280	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		6	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No nearby trees, small, visible un-vegetated, un-paved area to the east

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)		NA	Dist/Ht Ratio:	NA	Date of Photos:		
Height from ground to sample head (ft)		NA	ft	measure	4/23/2014	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)		NA	degrees	measure	4/23/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)		NA	ft	measure	4/23/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)		NA	ft	calc	4/23/2014	Looking South	(hyperlink)
					4/23/2014	Looking West	(hyperlink)
Sample head height (ft)		NA	ft	measure		Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.		NA	ft	measure		Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction		NA	degrees	measure			
Obstruction ht. above sampler (ft)		NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)		NA	ft	calc			

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 4/23/14 12:50 | Sampler Unit ID: Ser#9917

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
EUN	**EUNICE Lo-Vol**	4/10/2014	32.4375	-103.157355	5.0	On municipal property, fire station parking lot.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.52	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.52	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	1	ratio	Adjust	
5	Deg. unrestricted airflow, min	270	degrees	310	degrees	Pass	
6	Distance from road/dust, min	10	m	70	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		0	ft	310	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, sited in un-vegetated, un-paved gravelled parking lot

Distance-to-Height Ratio Worksheet				Location Photos		
Distance to obstacle from sample head (ft)	3.0	Dist/Ht Ratio:	0.75	Date of Photos:		
Height from ground to sample head (ft)	5.0	ft	measure	4/23/2014	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	80	degrees	measure	4/23/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	9.0	ft	measure	4/23/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	4.0	ft	calc	4/23/2014	Looking South	(hyperlink)
				4/23/2014	Looking West	(hyperlink)
Sample head height (ft)	5.0	ft	measure		Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure			
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	NA	ft	calc			

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 4/23/14 7:45 | Sampler Unit ID: West | page 1 of 2

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
CBD	**CARLSBAD Lo-Vol**	7/1/2005	32.420932	-104.218172	6.4	On BLM developed property, inside secure parking lot.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.96	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.96	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	3	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	300	degrees	Pass	
6	Distance from road/dust, min	10	m	600	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	7	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	7	ft	Pass	WIPP CBD East
9	Distance to un-vegetated area	"not in unpaved area..."		400	ft	90	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, no visible un-vegetated, un-paved areas

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	5.0	Dist/Ht Ratio:	2.86	Date of Photos:			
Height from ground to sample head (ft)	6.4	ft	measure	4/23/2014	Front of Sampler	(hyperlink)	
Azimuth from sampler to obstacle (degrees)	240	degrees	measure	4/23/2014	Looking North	(hyperlink)	
Height from ground to top of obstacle (ft)	8.2	ft	measure	4/23/2014	Looking East	(hyperlink)	
Obstacle height above sample head (ft)	1.8	ft	calc	4/23/2014	Looking South	(hyperlink)	
				4/23/2014	Looking West	(hyperlink)	
Sample head height (ft)	6.4	ft	measure		Aerial with pin (in)	(hyperlink)	
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out)	(hyperlink)	
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))		
Obstruction ht. above ground (ft)	NA	ft	calc				

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection:	4/23/14 7:45	Sampler Unit ID:	East	page 2 of 2

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
CBD	CARLSBAD Lo-Vol	7/1/2005	32.420932	-104.218172	5.0	On BLM developed property, inside secure parking lot.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.53	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.53	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	4	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	300	degrees	Pass	
6	Distance from road/dust, min	10	m	600	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	7	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	7	ft	Pass	WIPP CBD West
9	Distance to un-vegetated area	"not in unpaved area..."		NA	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, no visible un-vegetated, un-paved areas

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	12.0	Dist/Ht Ratio:	3.81		Date of Photos:		
Height from ground to sample head (ft)	5.0	ft	measure		4/23/2014	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	240	degrees	measure		4/23/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	8.2	ft	measure		4/23/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	3.1	ft	calc		4/23/2014	Looking South	(hyperlink)
					4/23/2014	Looking West	(hyperlink)
Sample head height (ft)	5.0	ft	measure			Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure			Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc		(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	NA	ft	calc				

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo		4/24/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

ATTACHMENT 2

WIPP Environmental Monitoring Program-
Ambient Air Sampling Location Site Evaluation Follow-Up

Rev.0

July 25, 2014

Pages 52

WIPP Environmental Monitoring Program-

Ambient Air Sampling Location Site Evaluation Follow-Up

Rev.0

July 25, 2014

1.0 Introduction

On May 15, 2014, a report entitled *WIPP Environmental Monitoring Program-Ambient Air Sampling Location Assessment* was issued to document the specific installation arrangements of the supplemental samplers and to assess if modifications were needed to improve the installation arrangements. Included in the May 15, 2014 report were discussions of recommendations from the Environmental Protection Agency (EPA) and plans for further evaluations at additional sampling locations. This report will serve to communicate and document actions taken since the issuance of the May 15, 2014 report regarding location modifications, results of the additional location evaluations, and status all active and proposed air monitoring locations.

2.0 Recommendations From EPA

During a field tour of air monitoring locations on April 23, 2014, a team from EPA recommended improvements to some of the sampling locations. These recommendations included:

- Completion of evaluations for additional monitoring locations
- Evaluate alternate locations for Loving, Artesia, and Eunice
    - Loving
        - Proximity to agricultural fields
        - Location was directly below fire station exhaust fan
    - Artesia
        - Proximity to agricultural fields
    - Carlsbad
        - Proximity to building
    - Hobbs
        - Proximity to building
    - Eunice
        - Proximity to unvegetated area
- Uniform sample head heights at each location

3.0 Additional Site Assessments

Additional site assessments were performed for Guard and Security Building (GSB), Met Tower (MET), Mills Ranch (MLR), Salt Hoist (SLT), Southeast Control (SEC), Smith Ranch (SMR), Southeast of Training Building (STB), WIPP East (WEE), WIPP Far Field (WFF), and WIPP South (WSS). Most of the assessments were acceptable with only a few exceptions. Location SMR has a co-located sampler just inside of the minimum distance requirement. This location will remain as sited. There are a few sample locations that do not meet the minimum sample height requirement. Material is on order and these will be modified when that material arrives.

The Carlsbad, Hobbs, Eunice, GSB, and STB locations are unique in that they are immediately adjacent to buildings. These sampling locations near buildings are considered adequate by having 90% of the monitoring path unrestricted as well as having 180° of unrestricted airflow (for locations next to buildings, 40 CFR Part 58 Appendix E). Although the unrestricted airflow is not ideal, it is allowable. These locations provide a higher level of security as well as the power needed to operate sampling equipment. Although the Artesia location does not meet the unrestricted airflow objective, the sampling location distance from the obstruction in the monitoring path ratio meets requirements.

4.0 Modifications Made to Sampling Locations

- **Loving**
  The sampling location was moved away from the building in order to alleviate the concern regarding the fire station exhaust fan. Alternate locations were considered, but none afforded a better proximity to agricultural fields as this community has many such areas. A protective sampler enclosure was installed at this location to provide better security and protection from weather.

- **Artesia**
  Alternate locations were considered, but none afforded a better proximity from agricultural fields as this community has many such areas. A protective sampler enclosure was installed at this location to provide better security and protection from weather.

- **Carlsbad**
  No change to this location (due to the above listed criteria for locations adjacent to buildings).

- **Hobbs**
  A protective sampler enclosure was installed at this location to provide better security and protection from weather.

- **Eunice**
  The sampling location was moved to the Police Department, as it met more of the screening criteria. A protective sampler enclosure was installed at this location to provide better security and protection from weather.

The following attachment documents actions taken subsequent to EPA visit.

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 4/23/14 8:40 | Sampler Unit ID: Ser#9915

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
ART	ARTESIA Lo-Vol	4/10/2014	32.754539	-104.383714	4.4	On public property, at agricultural station. Sample location meets distance to obstacle ratio requirements.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.35	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.35	m	Pass	
3	Distance from tree dripline, min	10	m	40	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	4	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	140	degrees	Adjust	
6	Distance from road/dust, min	10	m	0	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		90	ft	260	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		8	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: Single trees at 40' SSW, 90' NNW, visible un-vegetated, un-paved areas all west sectors, low buildings about 220 degrees arc to east.

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	28.0	Dist/Ht Ratio:	3.54	Date of Photos:	
Height from ground to sample head (ft)	4.4	ft	measure	6/10/2014	Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	75	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	12.3	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	7.9	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	4.4	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo	On File	4/24/2014			

Sampling Location: ART **Date of Photos: 6/10/2014**

Sampling Location: ART **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/16/14 0:00 | Sampler Unit ID: | New Location near Police Station

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
EUN-EE	EUNICE Lo-Vol	5/16/2014	32.441768	-103.171514	5.0	On municipal property, behind police station. 180 degree unrestricted adjacent to building.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.52	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.52	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	5	ratio	Pass	
5	Deg. unrestricted airflow, min	180	degrees	240	degrees	Pass	
6	Distance from road/dust, min	10	m	300	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		450	ft	45	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µrem/hr	Instrument/Ser/cal due	NA

Notes: No trees, sited in un-vegetated, un-paved gravelled parking lot

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	18.0	Dist/Ht Ratio:	4.50	Date of Photos:	
Height from ground to sample head (ft)	5.0	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	90	degrees	measure	5/16/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	9.0	ft	measure	5/16/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	4.0	ft	calc	5/16/2014	Looking South (hyperlink)
				5/16/2014	Looking West (hyperlink)
Sample head height (ft)	5.0	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	18.0	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	70	degrees	measure		
Obstruction ht. above sampler (ft)	49.5	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	81.8	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		5/16/2014			

Sampling Location: Eunice **Date of Photos: 6/10/2014**

Sampling Location: Eunice **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/14 0930 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
GSB-EE	WIPP GUARD & SECURITY BLDG Lo-Vol	3/25/2014	32.3721	-103.795102	4.6	On WIPP property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.40	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.40	m	Pass	
3	Distance from tree dripline, min	10	m	25.0	ft	Adjust	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	2.4	ratio	Pass	
5	Deg. unrestricted airflow, min	180	degrees	200	degrees	Pass	Sampling site adjacent to building
6	Distance from road/dust, min	10	m	600.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		700	ft	200	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	25.0	Dist/Ht Ratio:	2.40	Date of Photos:		
Height from ground to sample head (ft)	4.6	ft	measure	6/10/2014	Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	20.0	degrees	measure	6/10/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	15.0	ft	measure	6/10/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	10.4	ft	calc	6/10/2014	Looking South	(hyperlink)
				6/10/2014	Looking West	(hyperlink)
Sample head height (ft)	4.6	ft	measure	NA	Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	20.0	ft	measure	NA	Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	50	degrees	measure			
Obstruction ht. above sampler (ft)	23.8	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	22.1	ft	calc			

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

Sampling Location: GSB **Date of Photos: 6/10/2014**

Sampling Location: GSB **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 4/23/14 11:30 | Sampler Unit ID: TBD

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
HBS	HOBBS Lo-Vol	4/10/2014	32.698433	-103.133618	5.0	On municipal property, at streetside corner of fire station.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.52	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.52	m	Pass	
3	Distance from tree dripline, min	10	m	NA	ft	NA	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	1	ratio	Adjust	
5	Deg. unrestricted airflow, min	180	degrees	200	degrees	Pass	Sampler adjacent to building
6	Distance from road/dust, min	10	m	27	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		100	ft	200	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, small visible un-vegetated, un-paved area across the street. Building overhang edge 47" directly above sampler head.

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	3.8	Dist/Ht Ratio:	0.55	Date of Photos:	
Height from ground to sample head (ft)	5.0	ft	measure	6/10/2014	Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	0	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	12.0	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	7.0	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	5.0	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
E.D. Picazo	On File	4/24/2014			

Sampling Location: Hobbs **Date of Photos: 6/10/2014**

Sampling Location: Hobbs **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/14 12:30 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
LVG	LOVING Lo-Vol	5/20/2014	32.277648	-104.095265	4.5	On municipal property behind Fire Station #2.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.37	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.37	m	Pass	
3	Distance from tree dripline, min	10	m	100	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	2	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	290	degrees	Pass	
6	Distance from road/dust, min	10	m	30	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	None
9	Distance to un-vegetated area	"not in unpaved area..."		30	ft	290	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		5	µrem/hr	Instrument/Ser/cal due	Thermo Microrem Ser#1546, cal due 02/24/15

Notes: No trees, un-vegetated, un-paved areas in 270 degree arc around site. General radiation levels retained from measurements associated with original location (within 50').

Distance-to-Height Ratio Worksheet					Location Photos		
Distance to obstacle from sample head (ft)	30.0	Dist/Ht Ratio:	2.18		Date of Photos:		
Height from ground to sample head (ft)	4.5	ft	measure			Front of Sampler	
Azimuth from sampler to obstacle (degrees)	310	degrees	measure		7/1/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	18.3	ft	measure		7/1/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	13.8	ft	calc		7/1/2014	Looking South	(hyperlink)
					7/1/2014	Looking West	(hyperlink)
Sample head height (ft)	4.5	ft	measure			Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure			Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure				
Obstruction ht. above sampler (ft)	NA	ft	calc		(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	NA	ft	calc				

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

Sampling Location: LVG **Date of Photos: 7/1/2014**

Sampling Location: LVG **Date of Photos: 7/1/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/2014 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
MET-EE	MET TOWER Lo-Vol	3/4/2014	32.374883	-103.788617	4.6	On WIPP property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.40	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.40	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	30.0	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	EPA LoVol,
9	Distance to un-vegetated area	"not in unpaved area..."		500	ft	160	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	4.6	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	4.6	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		5/22/2014			

Sampling Location: MET **Date of Photos: 6/10/2014**

Sampling Location: MET **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-1000 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
MLR-AL	MILLS RANCH Lo-Vol	1985	32.332033	-103.82395	7.8	On private property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.36	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.36	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	350.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	MLR-EE
9	Distance to un-vegetated area	"not in unpaved area..."		NA	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.8	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	7.8	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Wesley Boatwright | 5/22/2014

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-1000 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
MLR-EE	MILLS RANCH Lo-Vol	3/4/2014	32.332033	-103.82395	7.8	On private property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.36	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.36	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	350.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	MLR-AL
9	Distance to un-vegetated area	"not in unpaved area..."		NA	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.8	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	7.8	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		5/22/2014			

Sampling Location: MLR **Date of Photos: 6/10/2014**

Sampling Location: MLR **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/2014-1047 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
SEC-AL	SOUTHEAST CONTROL Lo-Vol	1990	32.218383	-103.6951	6.0	On BLM property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.83	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.83	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	200.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	SEC-EE
9	Distance to un-vegetated area	"not in unpaved area..."		NA	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	6.0	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	6.0	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/2014-1047 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
SEC-EE	SOUTHEAST CONTROL Lo-Vol	3/4/2014	32.218383	-103.6951	6.0	On BLM property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

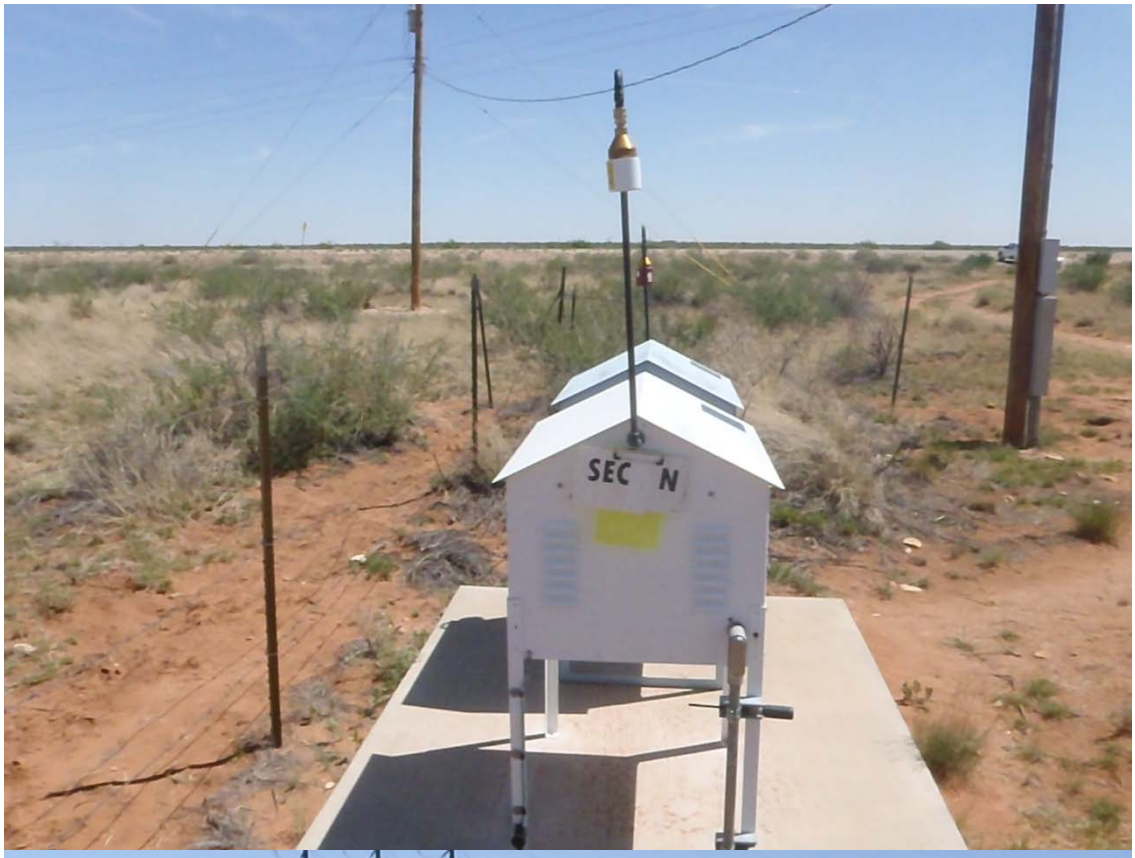
No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.83	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.83	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	200.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	SEC-AL
9	Distance to un-vegetated area	"not in unpaved area..."		NA	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	6.0	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	6.0	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

Sampling Location: SEC **Date of Photos: 6/10/2014**



Sampling Location: SEC **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/14-0830 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
SLT-EE	WIPP SALT HOIST Lo-Vol	3/4/2014	32.37347	-103.793162	6.3	On WIPP property. Onsite-unvegetated.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.91	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.91	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	5.6	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	270	degrees	Pass	
6	Distance from road/dust, min	10	m	0.0	ft	Adjust	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	CEMRC
9	Distance to un-vegetated area	"not in unpaved area..."		0	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	7.0	Dist/Ht Ratio:	5.60	Date of Photos:	
Height from ground to sample head (ft)	6.3	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	280.0	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	7.5	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	1.3	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	6.3	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	100.0	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	20	degrees	measure		
Obstruction ht. above sampler (ft)	36.4	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	14.7	ft	calc		

Wesley Boatwright — 6/10/2014

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

Sampling Location: SLT **Date of Photos: 6/10/2014**

Sampling Location: SLT **Date of Photos: 6/10/2014**

Sampling Location: SLT **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/2014-1141 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
SMR-AL	SMITH RANCH Lo-Vol	1985	32.40585	-103.876483	7.0	Onprivate property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.13	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.13	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	7.5	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	300	degrees	Pass	
6	Distance from road/dust, min	10	m	600.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	3.0	ft	Adjust	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	3.0	ft	Pass	SMR-EE
9	Distance to un-vegetated area	"not in unpaved area..."		200	ft	60	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	60.0	Dist/Ht Ratio:	7.50	Date of Photos:	
Height from ground to sample head (ft)	7.0	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	290.0	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	15.0	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	8.0	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	7.0	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	210.0	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	5	degrees	measure		
Obstruction ht. above sampler (ft)	18.4	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	1.7	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/2014-1141 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
SMR-EE	SMITH RANCH Lo-Vol	3/4/2014	32.40585	-103.876483	7.0	Onprivate property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.13	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.13	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	7.5	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	300	degrees	Pass	
6	Distance from road/dust, min	10	m	600.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	3.0	ft	Adjust	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	3.0	ft	Pass	SMR-AL
9	Distance to un-vegetated area	"not in unpaved area..."		200	ft	60	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	60.0	Dist/Ht Ratio:	7.50	Date of Photos:		
Height from ground to sample head (ft)	7.0	ft	measure		Front of Sampler	(hyperlink)
Azimuth from sampler to obstacle (degrees)	290.0	degrees	measure	6/10/2014	Looking North	(hyperlink)
Height from ground to top of obstacle (ft)	15.0	ft	measure	6/10/2014	Looking East	(hyperlink)
Obstacle height above sample head (ft)	8.0	ft	calc	6/10/2014	Looking South	(hyperlink)
				6/10/2014	Looking West	(hyperlink)
Sample head height (ft)	7.0	ft	measure		Aerial with pin (in)	(hyperlink)
Distance to obstruction base (ft) at sample head ht.	210.0	ft	measure		Aerial with pin (out)	(hyperlink)
Angle (clinometer) sample head to top of obstruction	5	degrees	measure			
Obstruction ht. above sampler (ft)	18.4	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))	
Obstruction ht. above ground (ft)	1.7	ft	calc			

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

Sampling Location: SMR **Date of Photos: 6/10/2014**

Sampling Location: SMR **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/10/2014-0800 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
STB-EE	WIPP TRAINING BUILDING Lo-Vol	3/4/2014	32.37244	-103.791728	4.5	On WIPP property. Onsite, unvegetated area.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	1.37	m	Adjust	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	1.37	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	1.0	ratio	Adjust	
5	Deg. unrestricted airflow, min	270	degrees	280	degrees	Pass	
6	Distance from road/dust, min	10	m	200.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	NA	ft	NA	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	NA	ft	NA	CEMRC/EPA LoVol
9	Distance to un-vegetated area	"not in unpaved area..."		60	ft	NA	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	26.0	Dist/Ht Ratio:	1.02	Date of Photos:	
Height from ground to sample head (ft)	4.5	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	80.0	degrees	measure	6/10/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	30.0	ft	measure	6/10/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	25.5	ft	calc	6/10/2014	Looking South (hyperlink)
				6/10/2014	Looking West (hyperlink)
Sample head height (ft)	4.5	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	26.0	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	75	degrees	measure		
Obstruction ht. above sampler (ft)	97.0	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	-607.9	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/10/2014			

Sampling Location: STB **Date of Photos: 7/2/2014**

Sampling Location: STB **Date of Photos: 7/2/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-0800 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WEE-AL	WIPP EAST Lo-Vol	1985	32.3717	-103.787983	7.3	On WIPP property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.21	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.21	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	100.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WEE-EE
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	110	
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.3	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	7.3	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Wesley Boatwright | 5/22/2014

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-0800 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WEE-EE	WIPP EAST Lo-Vol	3/4/2014	32.3717	-103.787983	6.9	On WIPP property. Duplicate location measures 7.5 ft.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.10	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.10	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	100.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WEE-AL
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	110	
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	6.9	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	6.9	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Wesley Boatwright | 5/22/2014

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date

Sampling Location: WEE **Date of Photos: 6/10/2014**

Sampling Location: WEE **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/27/2014 11:00 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WFF-AL	WIPP FARFIELD Lo-Vol	1986	32.377633	-103.798817	7.8	On WIPP property. Co-location with CEMRC Near Field Ambient air Sampler

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.36	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.36	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	250.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WFF-EE, CEMRC
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	90	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		N/A	µR/hr	Instrument/Ser/cal due	N/A

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA		
Height from ground to sample head (ft)	7.8	ft	measure		
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure		
Height from ground to top of obstacle (ft)	NA	ft	measure		
Obstacle height above sample head (ft)	NA	ft	calc		
Sample head height (ft)	7.8	ft	measure		
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Location Photos

Date of Photos:		
6/27/2014	Front of Sampler	(hyperlink)
6/27/2014	Looking North	(hyperlink)
6/27/2014	Looking East	(hyperlink)
6/27/2014	Looking South	(hyperlink)
6/27/2014	Looking West	(hyperlink)
	Aerial with pin (in)	(hyperlink)
	Aerial with pin (out)	(hyperlink)

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		6/27/2014			

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 6/27/2014 11:00 | Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WFF-EE	WIPP FARFIELD Lo-Vol	3/4/2014	32.377633	-103.798817	7.2	On WIPP property. Co-location with CEMRC Near Field Ambient air Sampler

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.19	m	Pass	Note 1: See DOE/EP-0023, Table 4 1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.19	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	Pass	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	250.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WFF-AL, CEMRC
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	90	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		N/A	µR/hr	Instrument/Ser/cal due	N/A

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.2	ft	measure	6/27/2014	Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	6/27/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	6/27/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	6/27/2014	Looking South (hyperlink)
				6/27/2014	Looking West (hyperlink)
Sample head height (ft)	7.2	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Wesley Boatwright — 6/27/2014

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

Sampling Location: WFF **Date of Photos: 6/10/2014**

Sampling Location: WFF **Date of Photos: 6/10/2014**

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-0830 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WSS-AL	WIPP SOUTH Lo-Vol	1985	32.3677	-103.79255	7.4	On WIPP property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.26	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.26	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	100.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WSS-EE
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	120	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.4	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	7.4	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

Wesley Boatwright [signature] 5/22/2014

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

On-Location Scientist: Printed name | Signature | Date | On-Location Scientist: Printed name | Signature | Date

WIPP Ambient Air Sampler On-Location Checklist

Date/Time of Data Collection: 5/22/14-0830 Sampler Unit ID:

WIPP Samp Loc	MonitorOwner ID	DateBegin	Latitude	Longitude	AboveGround (ft)	LocationNotes
WSS-EE	WIPP SOUTH Lo-Vol	3/4/2014	32.3677	-103.79255	7.4	On WIPP property.

EPA Siting Criteria [40 CFR 58 App E, for PM^{10} samplers], Table E-4

0.3048000 m/ft conversion

No	Factor	Criterion	units	Actual	units	Pass/Adjust	Notes
1	Height of probe to ground, min	1.5	m Note 1	2.26	m	Pass	Note 1: See DOE/EP-0023, Table 4.1 (1.5 m = human breathing height)
2	Height of probe to ground, max	7	m	2.26	m	Pass	
3	Distance from tree dripline, min	10	m	100.0	ft	Pass	If > 100 ft, use 100 ft
4	Distance ratio to obstacle, min	2	ratio	NA	ratio	NA	
5	Deg. unrestricted airflow, min	270	degrees	360	degrees	Pass	
6	Distance from road/dust, min	10	m	100.0	ft	Pass	Road with <10k veh/dy
7	Distance to co-located unit, min	1	m	4.0	ft	Pass	Co-Located Sampler ID: ↓
8	Distance to co-located unit, max	4	m	4.0	ft	Pass	WSS-AL
9	Distance to un-vegetated area	"not in unpaved area..."		300	ft	120	Azimuth (degrees)
10	General radiation level at sampler	(taken at 1.0 m above ground)		NA	µR/hr	Instrument/Ser/cal due	NA

Distance-to-Height Ratio Worksheet

Distance to obstacle from sample head (ft)	NA	Dist/Ht Ratio:	NA	Date of Photos:	
Height from ground to sample head (ft)	7.4	ft	measure		Front of Sampler (hyperlink)
Azimuth from sampler to obstacle (degrees)	NA	degrees	measure	5/22/2014	Looking North (hyperlink)
Height from ground to top of obstacle (ft)	NA	ft	measure	5/22/2014	Looking East (hyperlink)
Obstacle height above sample head (ft)	NA	ft	calc	5/22/2014	Looking South (hyperlink)
				5/22/2014	Looking West (hyperlink)
Sample head height (ft)	7.4	ft	measure		Aerial with pin (in) (hyperlink)
Distance to obstruction base (ft) at sample head ht.	NA	ft	measure		Aerial with pin (out) (hyperlink)
Angle (clinometer) sample head to top of obstruction	NA	degrees	measure		
Obstruction ht. above sampler (ft)	NA	ft	calc	(For right-angle Δ only)	calc=(D30)*TAN((D31*PI()/180))
Obstruction ht. above ground (ft)	NA	ft	calc		

On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date
Wesley Boatwright		5/22/2014			
On-Location Scientist: Printed name	Signature	Date	On-Location Scientist: Printed name	Signature	Date

Sampling Location: WSS **Date of Photos: 6/10/2014**

Sampling Location: WSS **Date of Photos: 6/10/2014**