Report on Quarterly Air Monitoring, Area IV, First Quarter 2022

Santa Susana Field Laboratory Ventura County, California



Prepared for: United States Department of Energy

*Prepared by:* North Wind Portage, Inc.

June 2022 Rev. 0 (This page intentionally left blank)

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# Santa Susana Field Laboratory Ventura County, CA

June 2022

### Contract No. DE-EM0000837-DT0007583

#### Prepared for:

U.S. Department of Energy 4100 Guardian Street, Suite 160 Simi Valley, California 93063

#### Prepared by:

North Wind Portage, Inc. 1425 Higham Street Idaho Falls, Idaho 83402 (This page intentionally left blank)

# **EXECUTIVE SUMMARY**

This report summarizes the United States Department of Energy (DOE) air monitoring activities conducted during the first quarter of 2022, which is the sixteenth quarter (Q16) of the monitoring period (January 1, 2022, to March 31, 2022) at Area IV within the Santa Susana Field Laboratory (SSFL), located in Ventura County, California. The area specifically discussed within this report is the DOE portion, Area IV of SSFL, known as the Energy Technology Engineering Center (ETEC). Year one of the Baseline Air Monitoring Program consisted of Quarter 1 through Quarter 4. Year two consisted of Quarter 5 through Quarter 7. Year 3 consisted of Quarter 8 through Quarter 11. Year 4 consisted of Quarter 12 through Quarter 15. The program is continuing for a fifth year, which consists of Quarter 16 through Quarter 19.

This quarterly report has been developed by North Wind Portage, Inc., on behalf of DOE in cooperation with The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA), as part of the Baseline Air Monitoring Program.

In accordance with the *Final Baseline Air Monitoring Work Plan, Santa Susana Field Laboratory, Ventura County, California* (NASA 2017), the responsible parties are monitoring for particulate matter between 2.5 and 10 microns in aerodynamic diameter (PM<sub>10</sub>), volatile organic compounds (VOCs), and radionuclides at air monitoring stations DOE-1, DOE-2, DOE-3, and DOE-4 encompassing the ETEC, Area IV portion of SSFL. Having developed the baseline levels for PM<sub>10</sub>, VOCs, and radionuclides helps distinguish between levels that naturally occur or were previously present at the ETEC site and if onsite remediation activities produce elevated results. Air monitoring will be continued throughout remediation activities to be able to compare results from onsite remediation activities to baseline data in the Annual Air Monitoring Reports.

The following air monitoring activities conducted during 2022, Q1, by DOE within Area IV are summarized in this report:

- Collected meteorological data from one location (DOE-4);
- Collected PM<sub>10</sub> data from four locations (DOE-1 through DOE-4);
- Collected air samples from four locations (DOE-1 through DOE-4) for VOC laboratory analysis; and
- Collected radionuclide samples for laboratory analysis from four locations (DOE-1 through DOE-4).

Meteorological data, PM<sub>10</sub>, and radionuclide data all met the data completeness goal of 80% and VOC data met the completeness goal of 85% for Q16. The seventeenth quarter of the Air Monitoring Program will continue, beginning April 1, 2022.

The following site activities were conducted during Q16 by DOE within Area IV:

- Quarterly site-wide groundwater level monitoring
- Annual site-wide groundwater sampling event
- Demolition of contract line item number (CLIN) 0008 facilities
- CDM Smith conducted groundwater sampling activities at the Former Sodium Disposal Facility as a part of groundwater interim measures
- Surveillance and maintenance

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## ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
μCi	microcurie(s)
µg/m³	microgram(s) per cubic meter
Boeing	The Boeing Company
CAAQS	California Ambient Air Quality Standard
CFR	Code of Federal Regulations
CLIN	contract line item number
DASC	Data Assessment Statistical Calculator
DOE	U.S. Department of Energy
DTSC	State of California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ETEC	Energy Technology Engineering Center
GC	gas chromatography
Hg	mercury
HHRA	Human Health Risk Assessment
m	meter(s)
m/sec	meter(s) per second
mb	millibar(s)
MDC	minimum detectable concentration
mL	milliliter(s)
mph	miles per hour
MS	mass spectrometry
MDL	method detection limit
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NIST	National Institute of Standards and Technology
pCi	picocurie(s)
PM <sub>10</sub>	particulate matter less than 10 microns in aerodynamic diameter
Q16	sixteenth quarter
QA	quality assurance
QC	quality control
RAWS	Remote Automatic Weather Stations
RPD	relative percent difference
SDG	sample delivery group
SSFL	Santa Susana Field Laboratory
VOC	volatile organic compound

# 1. INTRODUCTION

National Aeronautics and Space Administration (NASA), The Boeing Company (Boeing), and the U.S. Department of Energy (DOE), also known as the responsible parties, are performing air monitoring at the Santa Susana Field Laboratory (SSFL) site located in Ventura County, California. The SSFL is a business segment of Boeing. SSFL operates the 2,849-acre site located atop a range of hills between the Simi and San Fernando valleys, north of Los Angeles. The westernmost 290 acres of the SSFL, known as Area IV, contains both DOE and Boeing facilities. The DOE portion is mainly contained within the 90 acres known as the Energy Technology Engineering Center (ETEC).

When opened in the late 1950s, ETEC was ideally remote from population centers to enable development of security-sensitive projects. These projects supported research for DOE and its predecessor agencies for nuclear research and energy development. Area IV includes buildings that house test apparatus for large-scale heat transfer and fluid mechanics experiments, mechanical and chemical test facilities, office buildings, and auxiliary facilities.

Air monitoring is being conducted in accordance with the *Final Baseline Air Monitoring Work Plan, Santa Susana Field Laboratory, Ventura County, California* (NASA 2017), which was submitted to the State of California Department of Toxic Substances Control (DTSC) on September 21, 2017. DTSC approved the Work Plan. Final locations of the air monitoring locations were approved by DTSC on January 30, 2018 (DTSC 2018).

The objective of the Air Monitoring Program is to evaluate project conditions and provide a basis for determining the magnitude of deviation from those baseline conditions that may result from onsite remediation activities (project) at SSFL. Responsible parties are monitoring for particulate matter between 2.5 and 10 microns in aerodynamic diameter (PM<sub>10</sub>), and volatile organic compounds (VOCs), at 14 locations at SSFL. Data was collected for four perimeter samplers (DOE-1 through DOE-4) and analyzed for gross alpha and gross beta. Individual radionuclide concentrations were determined by analysis at an offsite laboratory for these same four locations. Meteorological data is also collected as a part of the Air Monitoring Program.

Figure 1 shows the air monitoring locations for the Air Monitoring Program. These locations were selected based on the areas to be remediated, with consideration of winds in the area, topographic features, and accessibility. The air monitoring sites were also selected based on guidance obtained from the U.S. Environmental Protection Agency's (EPA's) *Quality Assurance Handbook for Air Pollution Measurement Systems*, Volume II, Ambient Air Monitoring Program (EPA 2017) and *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA 2000). Sites were evaluated per 40 Code of Federal Regulations (CFR) 58, Appendix C – Ambient Air Quality Monitoring Methodology. DOE is responsible for DOE-1, DOE-2, DOE-3, and DOE-4 of the 14 monitoring locations, represented in Figure 1. VOCs, PM<sub>10</sub>, and radionuclides are monitored at the four DOE monitoring locations, and meteorological conditions are monitored at the DOE-4 location. The DOE monitoring locations DOE-1 through DOE-4 are shown in Figure 2.

This report summarizes the first quarter in 2022, which is the sixteenth quarter (Q16) quarterly results and quality assurance (QA) activities performed between January 1, 2022, and March 31, 2022.

## 1.1 Regional Climate and Wind Direction

The climate in the SSFL area is characterized as "Mediterranean." The mean temperature during the winter months is approximately 50 degrees Fahrenheit (°F) and the mean temperature in the summer months is approximately 70°F. Based on climate data between 2019 and 2020 from Weather Currents, average rainfall is on the order of 15.9 inches per year. The majority of the rainfall occurs between December and April with January and February being the wettest months.

Through the first quarter in 2022, the Simi Valley received approximately 1.42 inches of rainfall.

The average hourly wind speed in Simi Valley varies significantly by season. The more turbulent part of the year lasts for 6 months, from November to April, with average western wind speeds of more than 7 miles per hour (mph). The calmer time of year lasts for 6 months, with northerly winds from May to October.

During the fall, winter, and spring, Santa Ana winds can blow from the north or northeast in excess of 35 mph.

# 2. SUMMARY

This report summarizes the air monitoring data collected during the Q16 reporting period (January 1, 2022, through March 31, 2022).

Quality objectives and data completeness were met for all meteorological, PM<sub>10</sub>, VOC, and radionuclide data for Q16 of the Air Monitoring Program.

Urban background data compared with air monitoring data indicate that the  $PM_{10}$  concentrations measured at stations DOE-1, DOE-2, DOE-3, and DOE-4 during Q16 are comparable to the  $PM_{10}$ concentrations measured at stations characterizing urban background. Other sources that emit VOC characteristics are motor vehicle emissions, fossil fuel combustion, and wildfires. The results are reflected when considering SSFL site's urban background and relatively remote location from vehicle traffic.  $PM_{10}$  concentrations did not exceed the California Ambient Air Quality Standard (CAAQS; 50 micrograms per cubic meter [ $\mu$ g/m<sup>3</sup>]) during Q16. During Q16 DOE-1 repeatedly experienced sensor failure between the hours of 1 a.m. and 6 a.m. Although DOE-1 was experiencing this issue, North Wind Portage was still able to use the available data to get valid readings for the daily hourly average on these days (as noted in Appendix A). DOE-4 experienced a sensor failure starting January 30, 2022, and was out of commission until March 15, 2022.

During Q16, two VOC analytes were detected above the EPA regional screening level (RSL). Naphthalene was detected at DOE-1 and Methylene chloride was detected at DOE-2. Naphthalene is made from crude oil or coal tar. It is produced during cigarette smoke, car exhaust and smoke from forest fires. Methylene chloride is a solvent used in a variety of industries and applications, such as adhesives, paint and coating products, pharmaceuticals, metal cleaning, chemical processing, and aerosols.

Data collected during Q16 agrees with data collected, analyzed, and reported by the State of California DTSC, Los Angeles County Emergency Response Organization, the DOE Emergency Response organization, or other Multi-Agency Task Forces. Air monitoring at Area IV of the SSFL is to be continued starting April 1, 2022, for the seventeenth quarter of the Air Monitoring Program.

Site activities during Q16 included quarterly site-wide groundwater level monitoring, annual site-wide groundwater sampling event, demolition of contract line item number (CLIN) 8 facilities, surveillance and maintenance, and groundwater sampling activities conducted by CDM Smith at the Former Sodium Disposal Facility as part of the groundwater interim measures. Work area air monitoring was conducted during asbestos abatement, confirming that there was no airborne contamination resulting from abatement activities. Trucking activities were not conducted near the perimeter air monitoring stations.

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## 3. ANALYTICAL SAMPLING EVENTS

VOCs are collected according to the EPA Toxic Compendium Method TO-15, *Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (EPA 1999). Twenty-four-hour time-integrated samples are collected into Summa canisters via a flow controller and sent to an offsite laboratory for analysis. VOCs are collected every other week. There were seven VOC sampling events in this reporting period with seven field duplicate samples collected during this reporting period.

During Q16, radionuclide samples were collected at four perimeter sampler locations, DOE-1 through DOE-4. These samples were collected on glass fiber (Type A/E) filters that are changed twice a week. After a minimum 120-hour holding time to allow the decay of short-lived radon and thoron daughter products, the samples are simultaneously counted for gross alpha and beta activity with a low-background, thin-window, gas-flow proportional-counting system continually purged with P-10 argon/methane counting gas over a preset time interval. There were 100 airborne radioactivity filter samples collected in Q16 — 25 each for DOE-1, DOE-2, DOE-3, and DOE-4. Following analysis for gross alpha and gross beta radiation, sample filters were combined to form one composite sample representative of each location. The four composite samples were then analyzed for individual radionuclides at an offsite laboratory.

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# 4. DATA

Sections 4.1 through 4.4 discuss Q16 air monitoring data.

## 4.1 Meteorological Data

### **General Summary**

Meteorological data, also called weather data, is being collected as part of the ETEC cleanup and restoration effort. This information, particularly the wind direction and wind speed, can be used to help understand how dust and other air pollutants from the site are carried by the wind to possibly affect nearby public and residential areas. This is especially important when the E-BAM particulate monitors at the site detect higher-than-normal amounts of dust in the air. Scientific computer models can be used with this weather data in association with the particulate monitoring data to describe the air quality for the communities near the ETEC site. However, before the weather data can be used with the computer models it must first be tested for completeness and accuracy. A detailed description of the weather data collection and quality testing is provided in the following paragraphs.

Monitored meteorology parameters at the DOE-4 station included wind speed, wind direction, air temperature at 2 meters (m) and 10 m, relative humidity, precipitation, barometric pressure, and solar radiation. In addition, statistical parameters provided by the data logger included delta temperature (i.e., defined as the 10-m temperature minus the 2-m temperature), maximum wind speed (i.e., wind gust), and standard deviation of wind direction. Observations were recorded at 15-minute intervals for :00, :15, :30, and :45 minutes each hour. There were 90 days in this reporting period (Q16), which covers January 1, 2022, to March 31, 2022, with a total of 8,640 possible 15-minute observations. This is the first quarter in Year 5 of the Air Monitoring Program.

#### **Data Validation and Statistics**

Data validation screening was performed on the recorded meteorological observations pursuant to EPA's *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA 2000), Table 8-4 (Suggested Data Screening Criteria) and Table 8-3 (Suggested Quality Control Codes). Validation screening provided the basis for evaluating data completeness and for determining sensor performance and/or maintenance status. Validation was performed following each weekly data download. Data validation quality control codes applied to the meteorological observations are defined in Table 1.

Code	Meaning	Description (as used for ETEC meteorological data validation)	
0	Valid	PASS – Observation is accurate within the performance limits of the instrument (i.e., value passes all data validation screening criteria).	
		PASS – Observation originally failed initial quality control (QC) check (see Code 6), but additional review using other independent data and meteorological judgment support final validity.	
6	6 Failed initial QC check FAIL – Observation did not pass data validation screening criteria.		
7 Suspect		FAIL – Observation failed initial data validation QC check (see Code 6) and could not be verified through additional review using other independent data.	
8	Invalid	FAIL – Observation judged to be inaccurate or in error, and the cause is known.	
9	Missing	FAIL – Observation was not collected.	

The validation screening involved comparing, on an individual parameter basis, the recorded values (i.e., observations) against the EPA screening criteria shown in Table 2. The data validation procedure involved an initial automated review to apply a first level QC Code of 0 (valid), 6 (failed), or 9 (missing) as defined in Table 1. Observations initially flagged with a QC Code = 6 were then manually (i.e., second-level) reviewed by a project meteorologist. The procedure is outlined below:

- Values meeting all screening criteria for the respective meteorological parameter were automatically considered "valid" (QC Code = 0).
- Values not meeting a screening criterion were automatically flagged as "failed initial QC" (QC Code = 6). These values were subjected to second-level manual meteorological review using other available observations (e.g., 2-m vs. 10-m temperature at DOE-4 or from nearby Remote Automatic Weather Stations [RAWS] meteorological station CEEC1 in the Cheeseboro Canyon, California, area located 2.6 miles south of the DOE-4 site), and meteorological judgment:
  - Values confirmed by second-level review were deemed "acceptable" (final QC Code = 3).
  - Otherwise, the values were deemed "suspect" (final QC Code = 7).
- Observations known to be inaccurate (QC Code = 8).
- Missing observations were automatically flagged as "missing" (QC Code = 9).

Values that pass validation with a final QC Code of 0 or 3 are included in the data completeness statistics and the final validated meteorological data set. Values with a final QC Code of 7, 8, or 9 are excluded from the final dataset and counted against the data completeness percentage. Quarterly data statistics for the meteorological parameters are listed in Table 2 along with year-to-date and project-to-date results. Year-to-date and project-to-date percentages are calculated as total valid observations through the completed quarters for the year divided by the total possible observations through this same period.

The completeness goal for meteorological data is 80% on an annual basis. Data completeness statistics for all completed reporting quarters in Year 5 of the Air Monitoring Program are presented in Table 2. Note that a correction has been applied to the solar radiometer data to eliminate an upward trending bias detected in this sensor. Table 2 reflects updates to the solar radiometer Year-to-Date and Project Data Completeness Percent based on adjusting the data to remove the bias from Q8 through Q16. See Section 5.1.8.2 of this report for a discussion of the bias identification and removal procedure.

### Wind Rose

The final validated 15-minute meteorological dataset was used to develop the wind rose for Q16 as presented in Figure 3. A wind rose is a graphical representation of wind speed and direction distribution (or climatology) for the period of interest. The frequency of winds blowing from a particular direction is shown as petals on the wind rose, with the frequency of wind speeds depicted by color bands. Calm winds are identified as being less than 0.5 meters per second (m/sec).

During Q16, data capture for wind speed and direction at DOE-4 was 99.99%. The average and maximum wind speeds were 5.37 m/sec and 18.3 m/s, respectively. The maximum recorded wind gust was 26.6 m/sec. The predominant wind directions were from the north (N) to the northeast (NE).

Meteorological	Screening Criteria <sup>(1)</sup>	Data Completeness Percent (%) <sup>(2)</sup>			
Parameter	(for valid sensor responses)	Q16	Year 5 to Date	Project to Date	
	between 0 and 25 m/sec	99.99	99.99	93.71	
Wind Speed	> 0.1 m/sec variation over 3 hours				
	> 0.5 m/sec variation over 12 hours				
	between 0 and 360 degrees			94.55	
Wind Direction	> 1 degree variation over 3 hours	99.99	99.99		
	> 10 degree variation over 12 hours				
Standard Deviation of	Inherits the completeness stats of Wind	99.99	99.99	04 55	
Wind Direction	Direction	99.99	99.99	94.55	
	≤ local record high (monthly basis)			94.55	
Temperature	≥ local record low (monthly basis)	99.99	99.99		
@ 2 m	> 0.5 degrees Celsius (°C) variation over 12	99.99	99.99		
	hours				
Tomporatura	≤ local record high (monthly basis)		99.99	94.55	
Temperature @ 10 m	≥ local record low (monthly basis)	99.99			
	> 0.5°C variation over 12 hours				
	≤ 0.1°C during daytime	99.99	99.99	94.55	
Delta Temperature	≥ -0.1°C during nighttime				
	between -3.0 and 5.0°C				
	relative humidity between 0-100%		99.99	88.35	
Relative Humidity	dew point T ≤ ambient T	99.99			
(and Dewpoint	dew point T ≤ 5.0°C variation over 1 hour				
Temperature)	dew point T > 0.5°C variation over 12 hours				
	≤ 1 inch in 1 hour	99.99	99.99	94.54	
Precipitation	≤ 4 inches in 24 hours				
·	≥ 2 inches in 3 months				
	between 871 and 982 millibar (mb) (local)		99.99	94.54	
Barometric Pressure	(i.e., between 940 and 1060 mb sea level)	99.99			
	≤ 6 mb variation over 3 hours				
	> 0 at night		00.00	94.53	
Solar Radiation	≤ maximum possible for date and latitude	99.90	99.90		

Table 2 Data cereo	ning cummory for	monitorod motor	prological parameters.
Table Z. Data Sciel	ining Summary IOF	monitored meter	JI Ulugical paraliteters.

(1) Screening criteria from EPA Meteorological Monitoring Guidance (EPA 2000), Table 8-4.

(2) Data Completeness % = [Observations Passing] / [Possible Observations)].

a. Missing or suspect observations count against data completeness statistics.

- b. Year Two is an abbreviated data collection year spanning the period Apr 15-Dec 31, 2019 (i.e., Quarters 5, 6, and 7). This was done to synchronize future data collection years with calendar years.
- c. Last column in this table represents the cumulative Completeness % for all completed quarterly reporting periods.

(3) The number of possible 15-minute observations in the completed reporting periods:

• Year One = 35,040 • Q1 = 8,736 • Q2 = 8,832 • Q3 = 8,832 • Q4 = 8,640 • Q7 = 7,488 (only 3 quarters) • Q10 = 8,832 • Q11 = 8,832 • Q5 = 8,736 • Year Two = 25,056 (abbreviated) • Q6 = 8,832 • Q8 = 8,736 • Q9 = 8,736 • Year Three = 35,136 • Q12 = 8,640 • Q13 = 8,736 • Q14 = 8,832 • Q15 = 8,832 • Year Four = 35,040 • Q16 = 8,640 • Year Five = 8,640 (to-date) • Project = 138,912 (to-date)

## 4.2 PM<sub>10</sub> Data

PM<sub>10</sub> data, defined as coarse particles between 2.5 and 10 microns in aerodynamic diameter, are measured at the ETEC site. Sources of particulate matter can be naturally occurring or caused by human activity. The air monitoring conducted at ETEC is used to determine if any suspended particles are from activities conducted onsite or if they are consistent with surrounding air quality data. Some of the naturally occurring particles can originate from high winds, forest or grass fires, burning of fossil fuels in vehicles, or stirred-up road dust.

PM<sub>10</sub> data are collected with Met One E-BAM monitors at four monitoring locations. The Met One E-BAM uses the principle of beta attenuation to provide a determination of mass concentration. Twenty-four-hour concentrations are calculated from the hourly concentrations. There were 90 days in this reporting period.

- DOE-1 had valid readings all 90 days
- DOE-2 had valid readings all 90 days
- DOE-3 had valid readings all 90 days
- DOE-4 had valid readings 48 out of 90 days

DOE-1, DOE-2, and DOE-3 had 100% data completeness for PM<sub>10</sub> in Q16. DOE-4 had a completeness of 53.33%, for a total data completeness of 88.33%, exceeding the project goal of 80% completeness for total samples collected (see Table 3). The complete table of daily averages is presented in Appendix A. During Q16, the E-BAM unit located at DOE-1 (W23314) had problems with the sample nozzle getting stuck in the up position when the nozzle would lift up for tape advancement between the hours of 0100 and 0600 hours. When this occurred a technician would clean the nozzle and the unit would be turn back on and would operate correctly for a few days. Although this happened on multiple occasions, as noted in Appendix A, we were still able to achieve 100% data completeness at DOE-1. The unit at DOE-4 (X16067) stopped working on January 30, 2022, due to failed seals on the air pump and had to be repaired. Neither W23314 nor X16067 could be immediately replaced since the spare unit was being repaired and was therefore unavailable. DOE-4 was not back up and running until March 15, 2022. DOE-1 had a total of 23 days when a full set of data was not available but a daily average was collected and recorded. DOE-4 had 45 days during which no data was collected.

On March 15, 2022, at DOE-4, the newly repaired unit W23310 was put into service. On March 22, 2022, the unit with the faulty sample nozzle (W23314) at DOE-1 was replaced with the newly repaired unit X16067. From March 22, 2022, through the end of the reporting period, all four E-BAM stations had 100% data completeness.

Location	Valid Readings (Days)	Possible Readings (Days)	Data Completeness (Percent)				
DOE-1	90	90	100%				
DOE-2	90	90	100%				
DOE-3	90	90	100%				
DOE-4 48		90	53.33%				
Average Total Data Completeness 88.33%							

Table 3. PM<sub>10</sub> data completeness for January 1, 2022, to March 31, 2022.

The five highest  $PM_{10}$  results identified for the reporting period are listed in Table 4 along with the CAAQS for  $PM_{10}$ .  $PM_{10}$  concentrations were consistent with levels typically found in urban air. Of these top five

results, two were recorded at DOE-2, two at DOE-4, and one at DOE-3. None of the top five values in Q16 were above the CAAQS of 50  $\mu$ g/m<sup>3</sup> or NAAQS of 150  $\mu$ g/m<sup>3</sup>.

Date	Location	PM <sub>10</sub> Value (µg/m <sup>3</sup> )	CAAQS (µg/m³)		
1/17/2022	DOE-4	44.75	50		
1/8/2022	DOE-3	34.041	50		
1/8/2022	DOE-4	32.458	50		
1/8/2022	DOE-2	29.041	50		
3/26/2022	DOE-2	28.66	50		

Table 4. Top five PM<sub>10</sub> 24-hour average concentration days for Q16.

Note: No values were above CAAQS screening level.

## 4.3 Volatile Organic Compound Data

VOCs are organic chemicals that have a high vapor pressure, which causes them to evaporate quickly and enter the surrounding air. VOCs can be naturally occurring or man-made. The VOC data collected can help distinguish between man-made detections from onsite activities or naturally existing organic chemicals. The VOC data collected are compared against screening levels. These screening levels are risk-based concentrations derived from standardized equations combining exposure information with toxicity data.

All four DOE locations were sampled each day during the seven VOC sampling events this period. Data completeness goals for VOCs exceeded the project goal of 85% (see Table 5).

Location	Valid Readings (Days)	Possible Readings (Days)	Data Completeness (Percent)			
DOE-1	7	7	100%			
DOE-2 7		7	100%			
DOE-3	7	7	100%			
DOE-4 7 7		100%				
Average Total Data Completeness 100%						

Table 5. Ambient air VOC data completeness.

VOC detection results are presented in Table B-1 (Appendix B), including comparison to the April 2019 DTSC Human Health Risk Assessment (HHRA) Note 3 Screening Levels (DTSC 2019) or the 40 CFR 136 Appendix D for MDLs. During Q16, two VOC analytes were detected above the EPA regional screening level (RSL). Naphthalene was detected at DOE-1 and Methylene chloride was detected at DOE-2. Naphthalene is made from crude oil or coal tar. It is produced during cigarette smoke, car exhaust and smoke from forest fires. Methylene chloride is a solvent used in a variety of industries and applications, such as adhesives, paint and coating products, pharmaceuticals, metal cleaning, chemical processing, and aerosols.

Two man-made VOC analytes, dichlorodifluoromethane (freon-12) and ethyl acetate, have been detected routinely at all four monitoring stations, during all quarterly sampling events, and in duplicate samples. These analytes were also detected as estimated values at NASA stations, but were not detected at Boeing stations. Based on laboratory QC data (method blanks, clean canister certifications),

the sampling process and laboratory process are not the sources of the two analytes. The onsite source of the analytes is currently unknown.

By using the results from the baseline Air Monitoring Program, along with other site characterization information, analytes were selected for routine air monitoring during soil disturbances. Establishing sources for specific contaminants, or performing source apportionment was not a requirement for identifying remedial air quality impacts nor was it within the scope or data quality objectives of the Air Monitoring Program.

# 4.4 Radionuclide Data

ETEC continuously monitors air at multiple locations for radioactive particles. This is performed for two reasons: (1) to determine the background airborne radioactivity concentration so that any possible releases from work activities can be detected, and (2) to detect any possible release from existing activities. As shown on the trend graphs, the background airborne radioactive contamination continued at low and stable concentrations, and there was no detected release of material.

There were 100 airborne radioactivity filter samples collected in Q16 — 25 each for DOE-1, DOE-2, DOE-3, and DOE-4. Each sample was collected on a glass-fiber filter (as discussed in Section 3) and was analyzed using a "low background" Protean radiation counter system onsite. These samples included background radioactive materials and the potential of Area IV–specific radioactive materials.

The alpha and beta data are presented in Table C-1 (Appendix C). The onsite analysis determined only "alpha" or "beta/gamma" and did not analyze for specific isotopes. Isotopic analysis was performed later by an offsite laboratory. Each sample produced a gross alpha and beta-gamma count. The analysis compared these values with the background radiation count rates, and using the volume of air collected determined the net counts and the MDC for each sampling event. Some results in Table C-1 (Appendix C) are shown as negative values (because detector background is subtracted from the result).

All but two alpha samples were below the MDC, and these samples were only slightly greater than the MDC. Each MDC was below the airborne effluent limits specified in California regulations. There was no possibility of significant Area IV alpha radioactive material on these filters.

Approximately 31% of the beta samples were below MDC, and the gross (background radioactive material included) samples exceeded the MDC in 69% of samples, indicating the presence of airborne radioactive material (including background materials). The beta-gamma samples greater than the MDC were only slightly above the MDC, and were well below the effluent limits specified in California regulations. The elevated (but still low) results may be due to more airborne dust.

Following collection and onsite analysis, the air filters were composited and analyzed for specific radionuclides by an offsite laboratory. This data is shown in Table C-2 (Appendix C). This laboratory data determined that most radioactive material present was natural in origin, consisting of beryllium-7, polonium-210, potassium-40, combined radium-226 and radium-228, thorium-228, thorium-230, thorium-232, uranium-233/234, uranium-235/236, and uranium-238.

While artificial radionuclides (e.g., Cs-137, Sr-90, Pu-239) were present in very small amounts, none of the results were above the MDC in Q16. The presence of these radionuclides is considered a part of the normal variation of global fallout and resuspension activities.

A summary of the gross air sampling data is shown in Table 6 below.

Location	Average alpha result (μCi/mL)	Average alpha MDC (μCi/mL)	Average beta result (µCi/mL)	Average beta MDC (μCi/mL)
DOE-1	-1.33E-17	6.12E-15	3.20E-14	2.57E-14
DOE-2	-3.61E-18	6.12E-15	4.40E-14	2.57E-14
DOE-3	2.14E-16	6.16E-15	3.62E-14	2.59E-14
DOE-4	4.05E-16	6.13E-15	3.49E-14	2.58E-14
Average	1.51E-16	6.13E-15	3.68E-14	2.58E-14

Table 6. Gross alpha and beta-gamma average results for Q16.

# 5. QA/QC ACTIVITIES

The following QA/QC activities were conducted for the  $PM_{10}$ , VOC, radionuclide, and meteorological data collection and analysis.

# 5.1 Field QA/QC

### 5.1.1 PM<sub>10</sub>

The 24-hour daily averages for Q16 are presented in Appendix A along with the monthly minimum, maximum, and 95<sup>th</sup> percentile for each station location.

### **Flow Verifications**

Functionality of the Met One E-BAM units is verified and recorded monthly during instrument audits; however, the instruments are also checked several times a week for operability. During the monthly audits, the Met One E-BAM temperature, pressure, and flow rate are verified against a National Institute of Standards and Technology (NIST) traceable flowmeter. E-BAM units are occasionally swapped out for maintenance, and preliminary audits of the new units are performed. The Q16 audit results for the four DOE sites showed bias percentages that ranged from -1.92 to 0.86%. None of the results exceeded the flow rate measurement quality objective of +/- 4%.

Complete audit reports and flow verification results for Q16 are presented in Appendix D of this document. The flow rate verifications were based on 40 CFR 58, Appendix A, 3.3.1 and 4.2.2 through 4.2.3, along with the *Guideline on the Meaning and the Use of Precision and Bias Data Required by 40 CFR Part 58 Appendix A* (EPA 2007). The *Data Assessment Statistical Calculator* (DASC) tool, which is an EPA Excel-based software application, was used to perform the necessary statistical calculations based on input audit data. Sections 2 and 2.5 of this EPA guidance document (EPA 2007) provide additional information and instruction for using the DASC tool.

## 5.1.2 VOCs

All data underwent at least two levels of QC review at the laboratory prior to transmission to North Wind. A minimum of 20% of the transmitted VOC results undergo a Level IV third-party data validation, annually. During this quarter, two of the seven SDGs, P2200062 and P2201179, underwent the Level IV

data validation. The data validation ensures that the required analytical measurement quality objectives are met to ensure the data are of sufficient quality for their intended purpose.

Each location had valid readings on the seven sample days for a sample completeness of 100%. Data completeness goals for VOCs exceeded the project goal of 85%.

## 5.1.3 Field Duplicates

Seven field duplicates were collected during this reporting period, one per sampling event. Ethyl acetate in SDG P2201179 was detected in one field duplicates pair that exceeded the quality objective of +/- 15% relative percent difference (RPD). For SDG P2200062 the analyte ethyl acetate and for SDG P2201179 the analyte 2-propanol were detected at levels higher than the RL in either the sample or duplicate, and in comparison, were reported as a non-detect in the associated sample or duplicate and exceeded the quality objective of +/- 15% RPD. Sixteen sample and duplicate analyte detections were within the quality objective of +/- 15% RPD. There were no other detections associated with the samples and associated duplicates collected during this reporting period.

## 5.1.4 Canister Pressure

Vacuum in the canisters is measured before and after sampling with an analog pressure gauge to ensure proper function. Final canister vacuums ranged from -4 inches mercury (Hg) to -1 inches Hg during this reporting period.

## 5.1.5 Radiological

The detector for onsite gross alpha and beta sample analysis is calibrated annually by a third-party vendor using sources traceable to the NIST. The detector is checked by counting alpha- and beta-emitting sources at the site when received from the vendor following calibration. This establishes an acceptable performance range for daily source checks. On each day the detector is used, performance is determined with the site source. The detector may be used if the daily check is within the acceptable performance range.

Samples analyzed at the offsite laboratory are QC-checked at the laboratory. These QC checks include blanks, laboratory replicates, matrix spikes, and matrix spike duplicates. Barium, which behaves chemically similar to radium, is used as a carrier to determine the yield of the chemical extraction.

Since Q13, 100% of the radiological analytical results have undergone Level IV, third-party data validation. The data validation ensures that the required analytical measurement quality objectives are met to ensure the data are of sufficient quality for their intended purpose.

## 5.1.6 Meteorological

During the reporting period, a weekly data validation screening and review was performed on the monitored meteorological parameters based on the EPA guidance document *Meteorological Monitoring Guidance for Regulatory Modeling Applications* (EPA 2000), Table 8-4 – Suggested Data Screening Criteria, as outlined in Section 4.1. The data validation procedure provided the basis for evaluating data completeness and for determining sensor performance and/or maintenance status.

#### 5.1.7 Maintenance

Routine visual checks were performed on the meteorological station during weekly data downloading site visits. This included inspection of the meteorological tower sensors, E-BAM monitoring unit wind sensors, and solar-powered batteries to ensure proper functioning.

#### 5.1.8 Corrective Action

Issues and corrective actions regarding the PM<sub>10</sub> monitors and the meteorological station are noted in Sections 5.1.8.1 and 5.1.8.2, respectively. Issues and corrective actions regarding the E-BAM monitors are noted in Section 4.2. No issues or corrective actions were noted regarding the remaining monitoring equipment or sampling events during this reporting period.

#### 5.1.8.1 PM<sub>10</sub> Monitors

Refer to Section 4.2 for a detailed description of  $PM_{10}$  air monitoring equipment issues.

#### 5.1.8.2 Meteorological Station

Although the data percent completion goal during Q16 has been met: (1) the solar radiometer continued to record values that exceed the daily screening criteria and was affected by shadows cast by the tower, (2) the data logger clock time had drifted (slowed) by approximately 45 minutes, and (3) the improperly programmed data logger continues to affect calculation of delta temperature (i.e., temperature difference between 2 m and 10 m). These three items are discussed below, including issues and corrective actions/resolutions. The recommend sensor maintenance schedule is provided as item (4) below.

#### (1) Solar Radiometer:

- Data Quality Issues:
  - The solar radiometer continued to display an upward bias drift in the raw data observations.
- <u>Corrective Actions:</u>
  - <u>Bias Removal</u> In the quarterly report for Quarter 14, details of the bias and correction were first presented. Quarterly adjustment factors have been developed and applied to the project datasets starting with the first quarter of 2020 based on a statistical trend analysis. A "bias removal" adjustment factor was also developed and applied to the Q16 solar radiometer. All validated project meteorological datasets to-date now include "unbiased" solar radiometer observations.
  - <u>Resolutions</u> The unbiased observations are in line with the baseline year observations and theoretical values. The sensor drift bias will continue to be evaluated and correction factors applied during upcoming quarters. The following table presents the quarterly adjustment factors that have been applied to the solar radiometer raw data. In addition, replacement of the solar radiometer is being considered.

(adustment factor to eliminate drift bias)					
MON	2018	2019	2020	2021	2022
1					
2		1.000	0.946	0.894	0.859
3					
4					
5	No Adj	0.980	0.924	0.889	-
6	Factor for				
7	Baseline				
8	Qtrs	0.926	0.888	0.860	-
9					
10					
11		0.935	0.893	0.849	-
12					

# Solar Radiometer Adjustment Factor - Quarterly

### (2) <u>Wind Speed Sensor</u>

- Data Quality Issue:
  - Near the end of Quarter 15 the wind speed sensor failed and then began working again after an 11-day period. For Q16, to avoid having the same failure, the data was closely monitored to verify that this was no longer a problem. This issue was not present during Q16.
- <u>Corrective Action:</u>
  - <u>Resolution</u> The wind speed sensor observations will continue to be monitored for unusual or unacceptable response. Replacement of the sensor or bearings will be performed if needed.

### (3) <u>Delta Temperature Calculation</u>

- Data Quality Issue:
  - For meteorological monitoring, delta temperature should be defined as T at the higher level minus T at the lower level. However, the datalogger was improperly programmed to calculate the inverse of delta temperature when the station was replaced after the Woolsey Wildfire during Q3. Consequently, delta temperature observations are being calculated with an opposite sign compared to the values from the original data logger.
- <u>Corrective Action:</u>
  - <u>Datalogger Equation</u> Instead of reprogramming the datalogger to correctly calculate delta temperature, an adjustment multiplication factor of "-1" has been applied to the delta temperature values from the new data logger prior to performing the data validation.

<u>Resolution</u> – With application of the "-1" multiplication factor, delta temperature values in the validated project dataset accurately present delta temperature as:

Delta Temperature = [Temperature @ 2 m] minus [Temperature @ 10 m]

#### (4) Recommended Maintenance Schedule:

Although not a corrective action, the manufacturer's recommended maintenance frequency for meteorological sensors is presented below for information purposes. Proper and timely maintenance of the meteorological sensors is critical for ensuring that the data are not only valid (based on screening criteria) but also accurate. Schedules for maintenance and calibration are provided in the sensor user manuals and based on the in-service time of the sensor. Table 7 lists the recommended maintenance schedules for the Met One sensors installed at the DOE-4 meteorological station.

Sensor	Frequency	Maintenance
ws	6–12 Month	Inspect for proper operation (manual check of pulses per revolution, bearing condition, anemometer cup condition, and bearing replacement if warranted)
	12–24 Month	Return to Met One for complete overhaul
6–12 Month		Inspect for proper operation (manual check of sensor readings through 360°)
WD	6–12 Month	Field calibration
	12–24 month	Replace bearings & potentiometer
т	6–12 Month	Inspect sensor for proper operation (field comparison sensor reading against a precision mercury thermometer)
DU	6–12 Month	Inspect sensor for proper operation (compare sensor reading against local weather service or field psychrometer)
RH	12 Month	Return sensor to Met One for calibration and replacement of O-rings and filter membrane
Rain Gauge	6 Month	Clean sensor and bucket and field verify proper operation
Pressure	12 Month	Return sensor to Met One for calibration and replacement of O-rings and filter membrane
Radiometer	Monthly	Clean sensor glass dome with clean rag/tissue

#### Table 7. Meteorological sensor recommended maintenance frequency (Met One).

Note: Maintenance schedules as specified in the respective Met One sensor user manuals.

# 5.2 Laboratory QA/QC

This report covers 35 air monitoring samples for VOCs collected and analyzed according to the EPA Toxic Compendium Method TO-15, *Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (EPA 1999). These samples were reported under seven SDGs by the laboratory. All seven SDG analyses were performed by ALS in Simi Valley, CA. For each SDG, the laboratory ran continuing calibration verification, a method blank, and laboratory control samples, and verified surrogate recoveries for each sample.

The laboratory provided certified clean canisters for the sampling events. The certification of the canister batch is considered the equipment blank for each sampling event. The ALS case narrative discusses the cleaning of the canisters.

## 5.3 Audit Results

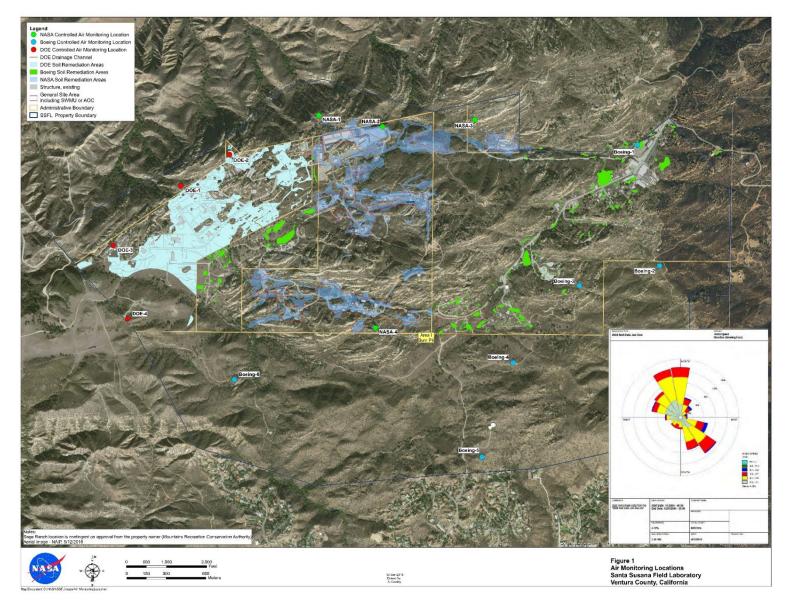
The  $PM_{10}$  instruments were calibrated at the manufacturer and were functioning properly upon installation. The  $PM_{10}$  instruments were audited monthly with a secondary NIST traceable flow meter. Although audits occur only monthly, the instruments were checked several times a week to ensure that they were functioning. Table 8 lists the dates for audits conducted in January through March. No flow rate comparisons exceeded the project's acceptance criterion of +/- 4; however, on February 21, 2022, no sensor was available at DOE-4 as X16067 had a seal failure, preventing collection of data. The sample nozzles and support vanes were cleaned as needed. Complete audit reports are presented in Appendix D.

Location	Met One E-BAM Serial Number	Parameter	Date	
DOE-1	W23314	PM <sub>10</sub>	01/13/2022	
DOE-2	Y12096	PM <sub>10</sub>	01/13/2022	
DOE-3	W23313	PM <sub>10</sub>	01/13/2022	
DOE-4	X16067	PM <sub>10</sub>	01/13/2022	
DOE-1	W23314	PM <sub>10</sub>	02/21/2022	
DOE-2	Y12096	PM <sub>10</sub>	02/21/2022	
DOE-3	W23313	PM <sub>10</sub>	02/21/2022	
DOE-4	No Unit Available	No Unit Available	02/21/2022	
DOE-1	W23314 & X16067	PM <sub>10</sub>	03/22/2022	
DOE-2	Y12096	PM <sub>10</sub>	03/23/2022	
DOE-3	W23313	PM <sub>10</sub>	03/23/2022	
DOE-4	W23310	PM <sub>10</sub>	03/23/2022	

Table 8. PM<sub>10</sub> audit completeness.

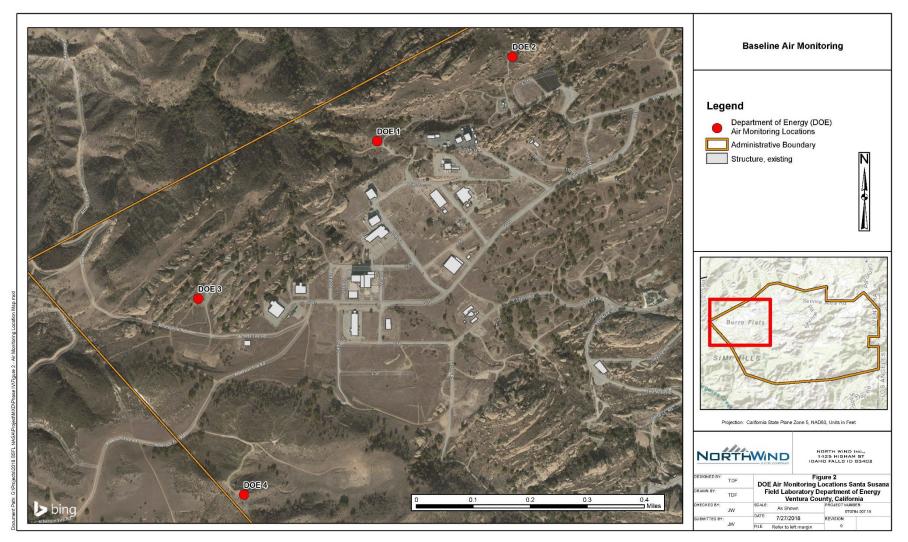
## 6. REFERENCES

- 10 Code of Federal Regulations (CFR) 20, Appendix B, "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage," Table 2.
- 40 CFR 58, Appendix C Ambient Air Quality Monitoring Methodology.
- 40 CFR 136, Appendix B Definition and Procedure for the Determination of the Method Detection Limit.
- California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2018. Approval of the Final Air Monitoring Station Locations for the Santa Susana Field Laboratory, Ventura County, California. January.
- California Environmental Protection Agency, DTSC. 2019. Human and Ecological Risk Office Human Health Risk Assessment Note Number 3, DTSC-modified Screening Levels. April. <u>https://www.dtsc.ca.gov/AssessingRisk/upload/HHRA-Note-3-April-2019.pdf.</u>
- National Aeronautics and Space Administration (NASA). 2017. Santa Susana Field Laboratory Baseline Air Monitoring Report Work Plan Report. Prepared for California Department of Toxic Substances Control. Prepared on behalf of National Aeronautics and Space Administration, George C. Marshall Space Flight Center, The Boeing Company, and Department of Energy, Energy Technology and Engineering Center. September. Available online at:<u>https://www.dtscssfl.com/files/lib\_air\_monitor/work\_plan/67496\_SSFL\_AirMonitoringWorkPlan\_Final.pdf</u>
- U.S. Environmental Protection Agency (EPA). 1999. Air Method, Toxic Organics-15 (TO-15), Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). EPA 625/R-96/010b. January. Available online at: <u>https://www.epa.gov/homeland-security-research/epaair-method-toxic-organics-15-15-determination-volatile-organic</u>
- U.S. Environmental Protection Agency (EPA). 2000. *Meteorological Monitoring Guidance for Regulatory Modeling Applications, United State Environmental Protection Agency, Office of Air Quality Planning and Standards*. EPA-454/R-99-005. February.
- U.S. Environmental Protection Agency (EPA). 2007. *Guideline on the Meaning and the Use of Precision and Bias Data Required by 40 CFR Part 58 Appendix A, Version 1.1*. EPA-454/B-07-001. October 2007.
- U.S. Environmental Protection Agency (EPA). 2017. *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II, Ambient Air Monitoring Program*. EPA-454/B-17-001. January.

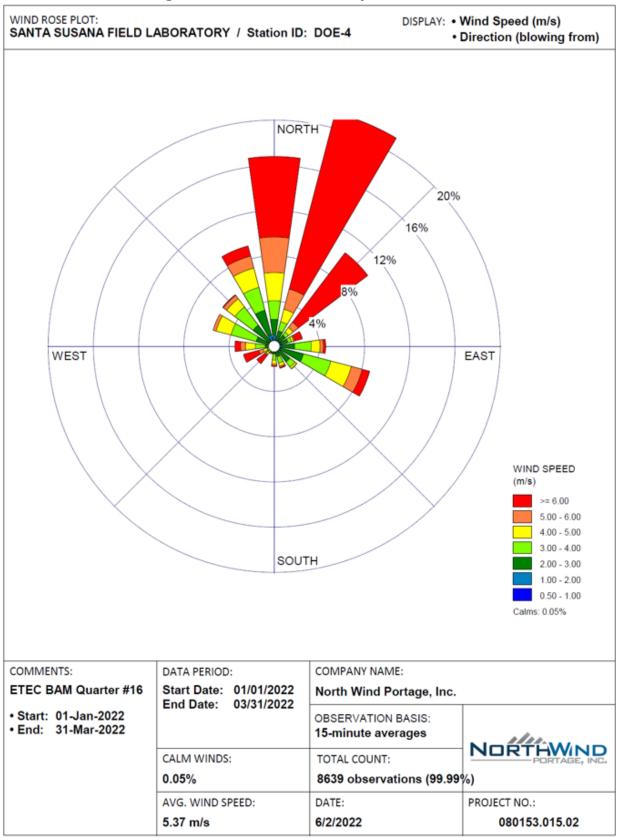


# Figure 1 – SSFL Air Monitoring Locations

Santa Susana Field Laboratory Ventura County, California



# Figure 2 – DOE Air Monitoring Locations





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# APPENDIX A

# PM<sub>10</sub> Daily Averages and Monthly Statistics

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Pivi <sub>10</sub> Daily Averages						
Site ID	DOE-1	DOE-2	DOE-3	DOE-4		
Sample Date	PM <sub>10</sub> (μg/m³) (CAAQS	PM <sub>10</sub> (μg/m <sup>3</sup> ) (CAAQS	PM <sub>10</sub> (μg/m³) (CAAQS	PM <sub>10</sub> (μg/m³) (CAAQS		
	50 μg/m³)	50 μg/m³)	50 μg/m³)	50 μg/m³)		
01/01/22	5	-3	-5	2		
01/02/22	0.708	0.791	0.875	2.583		
01/03/22	2.625	4.541	6.958	6		
01/04/22	3.958	19.416	10.708	7.25		
01/05/22	0.708	1.875	1.166	2.25		
01/06/22	3.291	6.333	3.541	8.791		
01/07/22	19.791	26.333	28.166	22.833		
01/08/22	15.5	29.041	34.041	32.458		
01/09/22	3.583	7.041	1.75	5.791		
01/10/22	1.188*	1.708	1	2.625		
01/11/22	1.708	2.541	1.958	4.541		
01/12/22	0.75	0.916	0.833	2.041		
01/13/22	7*	4.25	5.125	5.625		
01/14/22	5.5	5.958	10.041	7.333		
01/15/22	4.125	11.583	4.166	9.125		
01/16/22	-3	3.416	4.75	6.375		
01/17/22	17.467*	23.791	11.833	44.75		
01/18/22	18.666	18.125	19.25	27		
01/19/22	10.291	8.291	7.333	12.458		
01/20/22	3.313*	2.75	2.458	4.708		
01/21/22	15.958	12.458	13.833	15.75		
01/22/22	24	8.416	10.416	12.708		
01/23/22	24	1.208	1.791	2.375		
01/24/22	9.5*	8.166	6.916	19.083		
01/25/22	8.867*	8.458	8.625	15.708		
01/26/22	2.188*	1.541	3.125	3.541		
01/27/22	2.833	2.375	2.666	3.958		
01/28/22	6.429*	5.625	6.083	8.125		
01/29/22	1.916	2.166	1.833	3.875		
01/30/22	4.708	4.666	4.541	0.75		
01/31/22	25.416	19.708	24.958	30.458		
02/01/22	25.041	25.125	24.875			
02/02/22	12.125	11.25	11			
02/03/22	7.458	6.583	8.25			
02/04/22	5.541	5.375	5.5			
-		•		•		

## PM<sub>10</sub> Daily Averages

Site ID	DOE-1	DOE-2	DOE-3	DOE-4
	PM <sub>10</sub> (μg/m <sup>3</sup> )			
Sample Date	(CAAQS	(CAAQS	(CAAQS	(CAAQS
00/05/00	50 μg/m <sup>3</sup> )	50 μg/m <sup>3</sup> )	50 μg/m <sup>3</sup> )	50 μg/m³)
02/05/22	1.458	2.375	1.916	
02/06/22	1.708	2.083	2.166	
02/07/22	2.875*	1.666	2.125	
02/08/22	2.125	1.5	2.291	
02/09/22	2.833	2.166	1.708	
02/10/22	4.958	5.541	5.458	
02/11/22	2.541	1.833	2	
02/12/22	3.333	2.958	3.291	
02/13/22	5.166	4.333	4.333	
02/14/22	-3	8.5	8.166	
02/15/22	-3	10	11.5	
02/16/22	12.333*	8.166	8.291	
02/17/22	10.791	9.375	10.291	
02/18/22	4.416	3.791	19.666	
02/19/22	6	4.291	4.583	
02/20/22	6	13.375	13.75	
02/21/22	13.067*	11.25	12.333	
02/22/22	9.291	9.458	12.625	
02/23/22	-5	2.583	3.083	
02/24/22	4.938*	2.958	4.708	
02/25/22	5.75	4.416	4.458	
02/26/22	4.625	3.416	3.958	
02/27/22	3.708	3	2.958	
02/28/22	4.958	3.625	2.958	
03/01/22	2.958	1.958	3.041	
03/02/22	9.625	7.541	7.75	
03/03/22	12.875	11.875	14.083	
03/04/22	7.125	6.333	7.416	
03/05/22	10.916	11.708	13.291	
03/06/22	5.291	4.875	6.333	
03/07/22	3	5.208	6.583	
03/08/22	5.933*	3.916	4.875	
03/09/22	11	9.541	10.708	
03/10/22				
03/10/22	12.375	6 708	11.75	
03/11/22	8.458 -5	6.708 5.25	7.333 5.666	

Site ID	DOE-1	DOE-2	DOE-3	DOE-4
Sample Date	PM <sub>10</sub> (μg/m³) (CAAQS 50 μg/m³)	PM <sub>10</sub> (μg/m³) (CAAQS 50 μg/m³)	PM <sub>10</sub> (μg/m <sup>3</sup> ) (CAAQS 50 μg/m <sup>3</sup> )	PM <sub>10</sub> (μg/m <sup>3</sup> ) (CAAQS 50 μg/m <sup>3</sup> )
03/13/22	-5	9.833	10.625	
03/14/22	4.5	6.291	7.083	
03/15/22	9.541	7.625	7.791	15.214*
03/16/22	8.938*	6.625	6.5	10.291
03/17/22	9.471*	6.958	8.458	11.666
03/18/22	9.923*	7.208	6.875	8.208
03/19/22	11.958	10.041	12.666	13.25
03/20/22	5.041	4.625	5.333	6.125
03/21/22	8.5	6.375	6.875	8.041
03/22/22	6	5.5	6.041	6.791
03/23/22	7.125	5.583	8.166	5.875
03/24/22	7.458	5.875	6.5	6.541
03/25/22	5.583	4.583	4.083	4.863
03/26/22	10.875	28.666	12.125	10.083
03/27/22	14.791	12.083	13	13.958
03/28/22	4.083	8.208	4.708	3.666
03/29/22	3.375	4.458	6.666	5.375
03/30/22	11.083	10.625	11.875	9.958
03/31/22	11.304	12.608	13.695	14.043

Note: \* indicates the average is only for a partial day worth of readings due to sensor failure

	J	anuary 202	2	F	February 2022			March 2022			
		<b>PM</b> <sub>10</sub>			PM <sub>10</sub>			PM10			
Location			95th	95th				95th			
ID	High	Low	PCTL	High	Low	PCTL	High	Low	PCTL		
DOE-1	19.79100	0.70800	19.39725	25.04100	1.45800	13.01900	14.79100	3.37500	12.31245		
DOE-2	29.04100	0.79100	25.06200	25.12500	1.50000	12.62500	28.66600	3.91600	12.42425		
DOE-3	34.04100	0.83300	26.56200	24.87500	1.70800	16.87450	13.69500	4.08300	13.18915		
DOE-4	44.75000	2.04100	30.27480				15.21400	3.66600	14.27720		

## PM<sub>10</sub> Monthly Statistics

Note: DOE-4 had no valid readings in February 2022.

PCTL = percentile

## **APPENDIX B**

## **Analytical Results for Ambient Air VOCs**

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Location	Sample		Method Detection		Screening	
ID	Date	Analyte	Limit	Result	Level Value	SL Source
DOE-1	01/06/2022	Dichlorodifluoromethane	0.13	2.4	100	US EPA RSL
DOE-1	01/06/2022	Ethyl acetate	0.42	17	73	US EPA RSL
DOE-1	01/06/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-2	01/06/2022	Dichlorodifluoromethane	0.14	2.4	100	US EPA RSL
DOE-2	01/06/2022	Ethyl acetate	0.44	3.4	73	US EPA RSL
DOE-2	01/06/2022	Trichlorofluoromethane	0.13	1.2	1300	DTSC HHRA NOTE 3
DOE-3	01/06/2022	Dichlorodifluoromethane	0.13	2.5	100	US EPA RSL
DOE-3	01/06/2022	Trichlorofluoromethane	0.12	1.2	1300	DTSC HHRA NOTE 3
DOE-4	01/06/2022	Dichlorodifluoromethane	0.13	2.5	100	US EPA RSL
DOE-4	01/06/2022	Trichlorofluoromethane	0.12	1.2	1300	DTSC HHRA NOTE 3
DOE-1	01/21/2022	Dichlorodifluoromethane	0.14	2.6	100	US EPA RSL
DOE-1	01/21/2022	Trichlorofluoromethane	0.13	1.4	1300	DTSC HHRA NOTE 3
DOE-2	01/21/2022	Dichlorodifluoromethane	0.12	2.7	100	US EPA RSL
DOE-2	01/21/2022	Trichlorofluoromethane	0.11	1.4	1300	DTSC HHRA NOTE 3
DOE-3	01/21/2022	Dichlorodifluoromethane	0.14	2.6	100	US EPA RSL
DOE-3	01/21/2022	Trichlorofluoromethane	0.13	1.4	1300	DTSC HHRA NOTE 3
DOE-4	01/21/2022	Dichlorodifluoromethane	0.13	2.7	100	US EPA RSL
DOE-4	01/21/2022	Trichlorofluoromethane	0.12	1.4	1300	DTSC HHRA NOTE 3
DOE-1	02/04/2022	Dichlorodifluoromethane	0.12	2.2	100	US EPA RSL
DOE-1	02/04/2022	Ethyl acetate	0.39	8.8	73	US EPA RSL
DOE-1	02/04/2022	Trichlorofluoromethane	0.11	1.1	1300	DTSC HHRA NOTE 3
DOE-2	02/04/2022	Dichlorodifluoromethane	0.12	2.2	100	US EPA RSL
DOE-2	02/04/2022	Ethyl acetate	0.40	5.3	73	US EPA RSL
DOE-2	02/04/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-3	02/04/2022	Dichlorodifluoromethane	0.13	2.3	100	US EPA RSL
DOE-3	02/04/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-4	02/04/2022	Dichlorodifluoromethane	0.14	2.1	100	US EPA RSL
DOE-4	02/04/2022	Ethyl acetate	0.46	3.8	73	US EPA RSL
DOE-4	02/04/2022	Trichlorofluoromethane	0.13	1.1	1300	DTSC HHRA NOTE 3
DOE-1	02/17/2022	Dichlorodifluoromethane	0.12	1.9	100	US EPA RSL
DOE-1	02/17/2022	Trichlorofluoromethane	0.11	1.0	1300	DTSC HHRA NOTE 3
DOE-2	02/17/2022	Dichlorodifluoromethane	0.13	1.9	100	US EPA RSL
DOE-2	02/17/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-3	02/17/2022	Dichlorodifluoromethane	0.13	1.9	100	US EPA RSL
DOE-3	02/17/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-4	02/17/2022	Dichlorodifluoromethane	0.12	1.9	100	US EPA RSL
DOE-4	02/17/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-1	03/02/2022	Dichlorodifluoromethane	0.12	2.1	100	US EPA RSL
DOE-1	03/02/2022	Trichlorofluoromethane	0.11	1.0	1300	DTSC HHRA NOTE 3
DOE-2	03/02/2022	Dichlorodifluoromethane	0.13	2.1	100	US EPA RSL
DOE-2	03/02/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-3	03/02/2022	Dichlorodifluoromethane	0.12	2.0	100	US EPA RSL

Table B-1. Ambient air VOC detection results compared to SLs.

			Method			
Location	Sample		Detection		Screening	
ID	Date	Analyte	Limit	Result	Level Value	SL Source
DOE-3	03/02/2022	Ethyl acetate	0.38	4.0	73	US EPA RSL
DOE-3	03/02/2022	Trichlorofluoromethane	0.11	0.99	1300	DTSC HHRA NOTE 3
DOE-4	03/02/2022	Dichlorodifluoromethane	0.13	2.1	100	US EPA RSL
DOE-4	03/02/2022	Ethyl acetate	0.41	18	73	US EPA RSL
DOE-4	03/02/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-1	03/15/2022	Dichlorodifluoromethane	0.11	2.2	100	US EPA RSL
DOE-1	03/15/2022	Ethyl acetate	0.36	2.9	73	US EPA RSL
DOE-1	03/15/2022	Trichlorofluoromethane	0.1	1.1	1300	DTSC HHRA NOTE 3
DOE-2	03/15/2022	Dichlorodifluoromethane	0.13	2.2	100	US EPA RSL
DOE-2	03/15/2022	Ethyl acetate	0.41	28 ( ;J)	73	US EPA RSL
DOE-2	03/15/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-3	03/15/2022	Dichlorodifluoromethane	0.13	2.2	100	US EPA RSL
DOE-3	03/15/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-4	03/15/2022	Dichlorodifluoromethane	0.13	2.2	100	US EPA RSL
DOE-4	03/15/2022	Ethyl acetate	0.41	6.4	73	US EPA RSL
DOE-4	03/15/2022	Trichlorofluoromethane	0.12	1.1	1300	DTSC HHRA NOTE 3
DOE-1	03/29/2022	Dichlorodifluoromethane	0.12	2.1	100	US EPA RSL
DOE-1	03/29/2022	Ethyl acetate	0.40	3.9	73	US EPA RSL
DOE-1	03/29/2022	Naphthalene	0.11	1.2	0.083	US EPA RSL
DOE-1	03/29/2022	Trichlorofluoromethane	0.12	1.0	1300	DTSC HHRA NOTE 3
DOE-2	03/29/2022	Dichlorodifluoromethane	2.2	2.2	100	US EPA RSL
DOE-2	03/29/2022	Ethyl acetate	17	17	73	US EPA RSL
DOE-2	03/29/2022	Methylene chloride	0.23	1.3	1	DTSC HHRA NOTE 3
DOE-2	03/29/2022	Trichlorofluoromethane	1.1	1.1	1300	DTSC HHRA NOTE 3
DOE-3	03/29/2022	Dichlorodifluoromethane	0.12	2.0	100	US EPA RSL
DOE-3	03/29/2022	Ethyl acetate	0.38	3.0	73	US EPA RSL
DOE-3	03/29/2022	Trichlorofluoromethane	0.11	1.0	1300	DTSC HHRA NOTE 3
DOE-4	03/29/2022	Dichlorodifluoromethane	0.12	2.3	100	US EPA RSL
DOE-4	03/29/2022	Ethyl acetate	0.39	5.3	73	US EPA RSL
DOE-4	03/29/2022	Trichlorofluoromethane	0.11	1.1	1300	DTSC HHRA NOTE 3

Notes: The bold numbers / highlighted cells are above the screening levels.

J = estimated value

## **APPENDIX C**

## **Radionuclide Results**

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Sample Collection Date	Result Alpha (mCi/mL)	MDC – Alpha (mCi/mL)	Result Beta (mCi/mL)	MDC – Beta (mCi/mL)						
	Sample location DOE-1									
1/4/2022	-1.18E-15	5.24E-15	1.80E-14	2.18E-14						
1/7/2022	-1.58E-15	7.06E-15	1.02E-14	2.94E-14						
1/10/2022	-2.55E-15	6.95E-15	2.19E-14	2.90E-14						
1/14/2022	-1.48E-15	5.45E-15	3.26E-14	2.27E-14						
1/18/2022	-1.21E-15	5.40E-15	5.72E-14	2.25E-14						
1/21/2022	4.33E-16	7.11E-15	7.18E-14	2.96E-14						
1/24/2022	-9.07E-16	7.02E-15	3.89E-14	2.93E-14						
1/27/2022	4.29E-16	7.06E-15	6.21E-14	2.94E-14						
1/31/2022	-2.17E-15	5.24E-15	3.22E-14	2.18E-14						
2/4/2022	2.27E-15	5.27E-15	4.92E-14	2.28E-14						
2/7/2022	-2.30E-15	6.60E-15	3.43E-15	2.85E-14						
2/10/2022	1.60E-15	6.80E-15	4.94E-14	2.93E-14						
2/14/2022	4.86E-16	5.42E-15	2.18E-14	2.34E-14						
2/18/2022	-1.26E-15	5.01E-15	1.55E-14	2.16E-14						
2/21/2022	-4.08E-16	7.22E-15	4.24E-14	3.12E-14						
2/25/2022	-7.84E-16	5.09E-15	8.94E-15	2.20E-14						
2/28/2022	-2.19E-15	7.29E-15	5.15E-14	3.15E-14						
3/3/2022	4.69E-15	7.06E-15	5.70E-14	2.92E-14						
3/7/2022	1.95E-15	5.13E-15	1.32E-14	2.12E-14						
3/11/2022	3.51E-15	5.28E-15	3.80E-14	2.19E-14						
3/14/2022	-6.67E-16	7.19E-15	1.05E-14	2.98E-14						
3/18/2022	2.37E-15	5.54E-15	2.53E-14	2.29E-14						
3/21/2022	3.48E-16	7.07E-15	1.03E-14	2.93E-14						
3/24/2022	1.01E-17	5.33E-15	1.70E-14	2.21E-14						
3/29/2022	2.55E-16	5.18E-15	4.26E-14	2.15E-14						

Sample Collection Date	Result Alpha MDC – Alpha (mCi/mL) (mCi/mL)		Result Beta (mCi/mL)	MDC – Beta (mCi/mL)						
	Sample location DOE-2									
1/4/2022	-1.42E-15	5.24E-15	1.07E-14	2.18E-14						
1/7/2022	-3.93E-15	7.05E-15	1.62E-14	2.94E-14						
1/10/2022	-2.22E-15	6.96E-15	5.12E-14	2.90E-14						
1/14/2022	-1.99E-15	5.44E-15	5.87E-14	2.27E-14						
1/18/2022	2.39E-15	5.41E-15	6.90E-14	2.26E-14						
1/21/2022	7.71E-16	7.11E-15	9.35E-14	2.96E-14						
1/24/2022	4.27E-16	7.02E-15	4.84E-14	2.93E-14						
1/27/2022	4.29E-16	7.06E-15	5.15E-14	2.94E-14						
1/31/2022	-1.79E-16	5.24E-15	5.57E-14	2.18E-14						
2/4/2022	1.24E-15	5.27E-15	5.49E-14	2.27E-14						
2/7/2022	2.71E-16	6.61E-15	3.27E-14	2.85E-14						
2/10/2022	6.10E-16	6.80E-15	2.88E-14	2.94E-14						
2/14/2022	4.86E-16	5.42E-15	5.11E-14	2.34E-14						
2/18/2022	9.37E-16	5.01E-15	3.20E-14	2.16E-14						
2/21/2022	-2.17E-15	7.23E-15	4.96E-14	3.12E-14						
2/25/2022	-1.53E-15	5.09E-15	3.41E-14	2.20E-14						
2/28/2022	-3.60E-15	7.28E-15	4.43E-14	3.14E-14						
3/3/2022	4.70E-15	7.07E-15	3.94E-14	2.93E-14						
3/7/2022	7.38E-16	5.13E-15	3.83E-14	2.12E-14						
3/11/2022	3.76E-15	5.28E-15	4.16E-14	2.19E-14						
3/14/2022	1.36E-17	7.19E-15	5.18E-14	2.98E-14						
3/18/2022	5.35E-16	5.54E-15	5.28E-14	2.29E-14						
3/21/2022	3.48E-16	7.06E-15	3.11E-14	2.92E-14						
3/24/2022	7.69E-16	5.34E-15	5.02E-14	2.21E-14						
3/29/2022	-1.46E-15	5.18E-15	1.34E-14	2.15E-14						

Sample Collection Date	Result Alpha MDC – Alpha Result Beta (mCi/mL) (mCi/mL) (mCi/mL)		Result Beta (mCi/mL)	MDC – Beta (mCi/mL)						
	Sample location DOE-3									
1/4/2022	1.31E-15	5.23E-15	1.59E-14	2.18E-14						
1/7/2022	-5.76E-16	7.04E-15	5.49E-14	2.93E-14						
1/10/2022	4.24E-16	6.98E-15	4.50E-14	2.91E-14						
1/14/2022	8.46E-16	5.43E-15	5.02E-14	2.26E-14						
1/18/2022	-1.47E-15	5.42E-15	4.58E-14	2.26E-14						
1/21/2022	-8.71E-16	6.73E-15	6.53E-14	2.81E-14						
1/24/2022	-3.24E-15	7.02E-15	1.47E-14	2.93E-14						
1/27/2022	-5.77E-16	7.06E-15	5.36E-14	2.94E-14						
1/31/2022	6.87E-17	5.16E-15	6.01E-14	2.15E-14						
2/4/2022	1.01E-14	5.34E-15	6.45E-14	2.31E-14						
2/7/2022	-1.34E-15	6.61E-15	1.33E-14	2.85E-14						
2/10/2022	-2.03E-15	6.77E-15	2.45E-14	2.92E-14						
2/14/2022	-8.38E-16	5.44E-15	3.81E-14	2.35E-14						
2/18/2022	-1.02E-15	5.01E-15	3.64E-14	2.16E-14						
2/21/2022	-2.87E-15	7.23E-15	3.06E-14	3.12E-14						
2/25/2022	-2.52E-15	5.09E-15	-8.11E-15	2.20E-14						
2/28/2022	-4.67E-15	7.28E-15	2.55E-14	3.14E-14						
3/3/2022	1.04E-14	7.07E-15	5.81E-14	2.93E-14						
3/7/2022	2.43E-15	5.11E-15	2.80E-14	2.12E-14						
3/11/2022	3.02E-15	5.29E-15	5.43E-14	2.19E-14						
3/14/2022	-2.03E-15	7.19E-15	5.88E-14	2.98E-14						
3/18/2022	2.72E-16	5.53E-15	4.30E-14	2.29E-14						
3/21/2022	1.02E-15	7.07E-15	3.83E-15	2.93E-14						
3/24/2022	7.69E-16	5.34E-15	2.14E-14	2.21E-14						
3/29/2022	-1.24E-15	6.60E-15	7.27E-15	2.73E-14						

Sample Collection Date	Result Alpha (mCi/mL)	MDC – Alpha (mCi/mL)	Result Beta (mCi/mL)	MDC – Beta (mCi/mL)						
	Sample location DOE-4									
1/4/2022	-1.79E-16	5.24E-15	3.01E-14	2.18E-14						
1/7/2022	-1.91E-15	7.01E-15	2.62E-14	2.92E-14						
1/10/2022	-2.23E-15	6.98E-15	2.93E-14	2.91E-14						
1/14/2022	5.89E-16	5.44E-15	3.72E-14	2.27E-14						
1/18/2022	-4.44E-16	5.43E-15	6.43E-14	2.26E-14						
1/21/2022	2.12E-15	7.11E-15	7.32E-14	2.96E-14						
1/24/2022	-5.74E-16	7.02E-15	4.66E-14	2.93E-14						
1/27/2022	-1.25E-15	7.06E-15	3.28E-14	2.94E-14						
1/31/2022	-9.12E-16	5.16E-15	4.49E-14	2.15E-14						
2/4/2022	4.91E-15	5.34E-15	4.19E-14	2.31E-14						
2/7/2022	-3.91E-15	6.60E-15	2.39E-14	2.85E-14						
2/10/2022	9.42E-16	6.80E-15	2.04E-14	2.94E-14						
2/14/2022	2.09E-15	5.48E-15	3.19E-14	2.37E-14						
2/18/2022	-3.90E-17	5.00E-15	2.58E-14	2.16E-14						
2/21/2022	-2.52E-15	7.23E-15	1.12E-14	3.12E-14						
2/25/2022	-1.30E-15	5.17E-15	1.63E-14	2.23E-14						
2/28/2022	-2.19E-15	7.28E-15	5.52E-14	3.14E-14						
3/3/2022	2.69E-15	7.07E-15	3.98E-14	2.93E-14						
3/7/2022	7.36E-16	5.11E-15	4.26E-14	2.12E-14						
3/11/2022	4.02E-15	5.29E-15	4.41E-14	2.19E-14						
3/14/2022	3.76E-15	7.19E-15	4.08E-14	2.98E-14						
3/18/2022	2.11E-15	5.54E-15	3.32E-14	2.29E-14						
3/21/2022	3.48E-16	7.06E-15	6.70E-15	2.92E-14						
3/24/2022	2.03E-15	5.34E-15	2.27E-14	2.21E-14						
3/29/2022	1.24E-15	5.18E-15	3.15E-14	2.14E-14						

Note: Some values are negative after background subtraction.

Table C-2. Individual radionucil	Result	MDC	Data	Airborne Concentration
Radionuclide	(pCi/sample)	(pCi/sample)	Qualifier	(μCi/mL)
Loc	cation DOE-1 – Air			
Cesium-137	0.815	7.05	UU	8.543E-16
Strontium-90	-0.230	2.29	UU	-2.411E-16
Cobalt-60	-0.757	7.20	UU	-7.935E-16
Potassium-40	10.1	108	UU	1.059E-14
Beryllium-7	239	80.6		2.505E-13
Plutonium-238	-0.0464	0.529	UU	-4.864E-17
Polonium-210	14.0	0.769		1.468E-14
Plutonium-241	26.9	40.2	UU	2.820E-14
Thorium-230	1.22	1.25	UU	1.279E-15
Thorium-228	0.586	1.37	UU	6.143E-16
Actinium-228	9.81	38.0	UU	4.361E-15
Americium-241	-0.193	1.39	UU	1.028E-14
Plutonium-239	-0.0490	0.416	UU	-2.023E-16
Ra-228 – total	4.84	6.89	U UJ	-5.136E-17
Radium-226, -228 combined	9.94	7.61	UJ	5.073E-15
Thorium-232	0.656	0.617	U	1.042E-14
Uranium-238	0.621	0.497	UJ	6.876E-16
Uranium-233/234	1.30	0.557 UJ		6.509E-16
Uranium-235/236	0.0396	0.422	UU	1.363E-15
Lo	cation DOE-2 – Aiı	volume/sample	=9.54E+08	
Cesium-137	1.39	6.66	UU	1.457E-15
Strontium-90	2.28	2.73	UU	2.390E-15
Cobalt-60	-1.95	5.25	UU	-2.044E-15
Potassium-40	39	55.9	UU	4.088E-14
Beryllium-7	163	98.1		1.709E-13
Plutonium-238	0.0731	0.349	U UJ	7.662E-17
Polonium-210	12.3	1.09		1.289E-14
Plutonium-241	18.5	33.1	U UJ	1.939E-14
Thorium-230	0.901	0.466	UJ	9.444E-16
Thorium-228	0.524	0.608	UU	5.493E-16
Actinium-228	3.22	30.1	UU	3.375E-15
Americium-241	0.108	1.19	UUJ	1.132E-16
Plutonium-239	-0.151	0.51	U UJ	-1.583E-16
Ra-228 – total	7.36	5.55	J	7.715E-15
Radium-226, -228 combined	3.42	11.3	UU	3.585E-15
Thorium-232	0.344	0.425	UU	3.606E-16
Uranium-238	0.813	0.44	UJ	8.522E-16

Table C-2. Individual radionuclide analysis for the composite filter samples.

	Result	MDC	Data	Airborne Concentration					
Radionuclide	(pCi/sample)	(pCi/sample)	Qualifier	(µCi/mL)					
Uranium-233/234	0.629	0.572	UJ	6.593E-16					
Uranium-235/236	0.177	0.389	UU	1.855E-16					
Location DOE-3 – Air volume/sample = 9.46E+08									
Cesium-137	0.908	8.27	UU	1.457E-15					
Strontium-90	-1.3	2.24	UU	2.390E-15					
Cobalt-60	-0.524	7.19	UU	-2.044E-15					
Potassium-40	127	65.4		4.088E-14					
Beryllium-7	113	108		1.709E-13					
Plutonium-238	0.0614	0.184	UU	7.662E-17					
Polonium-210	13.6	0.818		1.289E-14					
Plutonium-241	-5.43	40.9	UU	1.939E-14					
Thorium-230	1.46	0.692	UJ	9.444E-16					
Thorium-228	0.845	0.545		5.493E-16					
Actinium-228	-9.47	36.4	UU	3.375E-15					
Americium-241	0.113	1.09	U UJ	1.132E-16					
Plutonium-239	0.0956	0.453	UU	-1.583E-16					
Ra-228 – total	9.57	4.8	J	7.715E-15					
Radium-226, -228 combined	6.7	6.88	UU	3.585E-15					
Thorium-232	0.681	0.475	UJ	3.606E-16					
Uranium-238	0.738	0.482	UJ	8.522E-16					
Uranium-233/234	0.265	0.604	UU	6.593E-16					
Uranium-235/236	-0.0142	0.498	UU	1.855E-16					
Loc	cation DOE-4 – Air	volume/sample	= 9.53E+08						
Cesium-137	4.09	9.69	UU	1.457E-15					
Strontium-90	0.0165	2.68	UU	2.390E-15					
Cobalt-60	-5.46	7.7	UU	-2.044E-15					
Potassium-40	-16.8	159	UU	4.088E-14					
Beryllium-7	118	130	UU	1.709E-13					
Plutonium-238	0.0524	0.332	UU	7.662E-17					
Polonium-210	15.8	0.831		1.289E-14					
Plutonium-241	18.1	31	UU	1.939E-14					
Thorium-230	0.62	0.609	UJ	9.444E-16					
Thorium-228	0.781	0.586		5.493E-16					
Actinium-228	-2.31	49.1	UU	3.375E-15					
Americium-241	-0.194	1.48	U UJ	1.132E-16					
Plutonium-239	-0.0101	0.353	UU	-1.583E-16					
Ra-228 – total	4.83	5.88	U UJ	7.715E-15					
Radium-226, -228 combined	1.92	12.6	UU	3.585E-15					
Thorium-232	0.559	0.451	UJ	3.606E-16					

Radionuclide	ResultMDC(pCi/sample)(pCi/sample)		Data Qualifier	Airborne Concentration (μCi/mL)
Uranium-238	0.616	0.462	UJ	8.522E-16
Uranium-233/234	0.511	0.506	UJ	6.593E-16
Uranium-235/236	0.056	0.354	UU	1.855E-16

Note - Data Qualifier meanings:

UU – Analyte was analyzed for but not detected and is qualified as a non-detect.

U – The analyte was analyzed for, but not detected or is qualified as non-detect because of blank contamination.

J – The analyte was positively identified; the quantitation is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

UJ – The analyte was not detected; however, the result is estimated because of discrepancies in meeting certain analyte-specific QC criteria.

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## APPENDIX D

## PM<sub>10</sub> Monthly Audit Reports and Flow Verification Results

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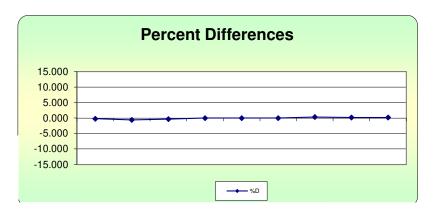
ETEC Site: DOE-1						Pol	Pollutant type: PM10			Bias (%)		
Quarter	E-BAM	Date	Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	Percentile	d²	<b>d</b>	<b>d</b>   <sup>2</sup>			
16	W23314	1/13/2022	14.00	14.03	-0.214		0.046	0.214	0.046	n	Σldl	"AB" (Eqn 4)
			16.70	16.80	-0.595	<u>25th</u>	0.354	0.595	0.354	9	3.264	0.363
			17.50	17.56	-0.342	-0.455	0.117	0.342	0.117	n-1	$\sum  \mathbf{d} ^2$	"AS" (Eqn 5)
16	W23314	2/21/2022	(see note)							8	1.474	0.191
						<u>75th</u>						
						0.172					Bias (%) (Eqn 3)	Both Signs Positive
16	W23314	3/22/2022	14.00	13.95	0.358		0.128	0.358	0.128		0.48	FALSE
			16.70	16.67	0.180		0.032	0.180	0.032		Signed Bias (%)	Both Signs Negative
			17.50	17.47	0.172		0.029	0.172	0.029		+/-0.48	FALSE
16	X16067	3/22/2022	14.00	14.10	-0.709		0.503	0.709	0.503			_
			16.70	16.74	-0.239		0.057	0.239	0.057			
			17.50	17.58	-0.455		0.207	0.455	0.207			

**Note**: Feb 2022 audit not performed. BGI Deltacal calibrator needed for flow rate checks was being recalibrated. Also, E-BAM unit was replaced during the Mar 2022 audit due to Nozzle Failed errors. Both E-BAM units audit results are included for completeness.

 Reference:
 U.S. EPA, Ambient Monitoring Technology Information Center (AMTIC)
 Quality Indicator Assessment Reports

 Data Assessment Statistical Calculator - Software to calculate precision and bias statistics
 MS Excel filename - "11/3/2017 (dasc\_11\_3\_17.xls)"

https://www3.epa.gov/ttn/amtic/gareport.html





ETEC	C Site: D	OE-2				Pol	lutant ty	ype: P	M10		Bias	s (%)
Quarter	E-BAM	Date	Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	Percentile	d²	d	<b>d</b>   <sup>2</sup>			
16	Y12096	1/13/2022	14.00	14.09	-0.639		0.408	0.639	0.408		n <u>Σ</u>  d	"AB" (Eqn 4)
			16.70	16.76	-0.358	<u>25th</u>	0.128	0.358	0.128	(	6 2.145	0.358
			17.50	17.55	-0.285	-0.340	0.081	0.285	0.081	n	$-1 \sum  \mathbf{d} ^2$	"AS" (Eqn 5)
16	Y12096	2/21/2022	(see note)							ļ	5 0.893	0.158
						<u>75th</u>						_
						0.118					Bias (%) (Eqn 3)	Both Signs Positive
16	Y12096	3/23/2022	14.00	14.03	-0.214		0.046	0.214	0.046		0.49	FALSE
			16.70	16.63	0.421		0.177	0.421	0.177		Signed Bias (%)	Both Signs Negative
			17.50	17.46	0.229		0.052	0.229	0.052		+/-0.49	FALSE

**Note**: Feb 2022 audit not performed. BGI Deltacal calibrator needed for flow rate checks was being recalibrated.

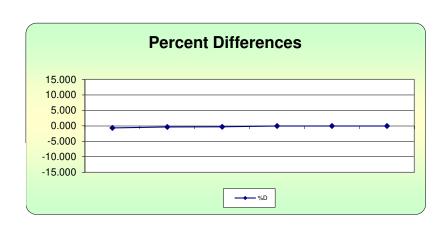
 Reference:
 U.S. EPA, Ambient Monitoring Technology Information Center (AMTIC)

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 MS Excel filename - "11/3/2017 (dasc\_11\_3\_17.xls)"

 https://www3.epa.gov/ttn/amtic/gareport.html

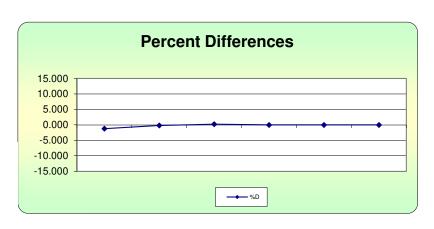




ETE	C Site: D	OE-3				Pol	lutant ty	ype: P	M10		Bias	; <b>(%)</b>
Quarter	E-BAM	Date	Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	Percentile	d²	<b>d</b>	<b>d</b>   <sup>2</sup>			
16	W23313	1/13/2022	14.00	14.17	-1.200		1.439	1.200	1.439	Г	n <u>Σ</u>  d	"AB" (Eqn 4)
			16.70	16.73	-0.179	<u>25th</u>	0.032	0.179	0.032	(	6 2.879	0.480
			17.50	17.46	0.229	-0.735	0.052	0.229	0.052	n	$-1 \sum  \mathbf{d} ^2$	"AS" (Eqn 5)
16	W23313	2/21/2022	(see note)							ļ	5 2.432	0.458
						<u>75th</u>						_
						0.084					Bias (%) (Eqn 3)	Both Signs Positive
16	W23313	3/23/2022	14.00	14.13	-0.920		0.846	0.920	0.846		0.86	FALSE
			16.70	16.73	-0.179		0.032	0.179	0.032		Signed Bias (%)	Both Signs Negative
			17.50	17.47	0.172		0.029	0.172	0.029		+/-0.86	FALSE

Note: Feb 2022 audit not performed. BGI Deltacal
performed. BGI Deltacal
calibrator needed for flow rate
calibrator needed for flow rate checks was being recalibrated.

<u>Reference</u>: U.S. EPA, Ambient Monitoring Technology Information Center (AMTIC) Quality Indicator Assessment Reports Data Assessment Statisical Calculator - Software to calculate precision and bias statistics MS Excel filename - "11/3/2017 (dasc\_11\_3\_17.xls)" <u>https://www3.epa.gov/ttn/amtic/qareport.html</u>





ETE	C Site: D	OE-4				Pol	lutant ty	ype: P	M10		Bias	(%)
Quarter	E-BAM	Date	Meas Val (Y)	Audit Val (X)	d (Eqn. 1)	Percentile	ď²	<b>d</b>	<b>d</b>   <sup>2</sup>			
16	X16067	1/13/2022	14.00	14.28	-1.961		3.845	1.961	3.845		n ∑ d	"AB" (Eqn 4)
			16.70	17.01	-1.822	<u>25th</u>	3.321	1.822	3.321		9 8.538	1.423
			17.50	17.79	-1.630	-1.774	2.657	1.630	2.657	n	-1 ∑ d ²	"AS" (Eqn 5)
16	X16067	(see note)	14.00								3 13.156	0.795
			16.70			<u>75th</u>						_
			17.50			-1.029					Bias (%) (Eqn 3)	Both Signs Positive
16	W23310	3/23/2022	14.00	14.18	-1.269		1.611	1.269	1.611		1.92	FALSE
			16.70	16.86	-0.949		0.901	0.949	0.901		Signed Bias (%)	Both Signs Negative
			17.50	17.66	-0.906		0.821	0.906	0.821		-1.92	TRUE

Note: Feb 2022 audit not
performed. E-BAM unit was not
operational. Plus, BGI Deltacal calibrator needed for flow rate
calibrator needed for flow rate
checks was being recalibrated.

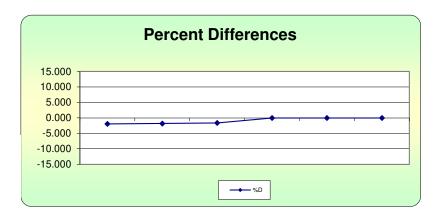
 Reference:
 U.S. EPA, Ambient Monitoring Technology Information Center (AMTIC)

 Quality Indicator Assessment Reports

 Data Assessment Statisical Calculator - Software to calculate precision and bias statistics

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16.7 Ipm Flow Rate       as found:       Igent I         14.0 Ipm Flow Rate       as found:       Igent I         17.5 Ipm Flow Rate       as found:       Igent I         16.7 Ipm Flow Rate       as found:       Igent I         17.5 Ipm Flow Rate       as found:       Igent I         19.0 Difference       PM10 particle trap clean:       as foo         10 Manual Span Membrane Test       Igent I       Igent I         Expected Span Mass (mg/cm2):       0.919       Igent I         Measured Span Mass (mg/cm2):       0.919       Igent	No:       15         Ref. Str.       19,0         717.8       9.0         19,0       17.8         19,0       14.03         14.03       14.03         17.56       19.03         17.56       19.03         14.03       19.03         1000       1000         1000       1000         1000       1000         1000       15.0         (Ipm)       14.7         14.7       1000         14.7       1000	as c as left mmHg as left lpm as left lpm as left lpm as left lpm as left lpm as left lpm as left r as Y	left: <u>18</u> eft: <u>18</u> eft: <u>14</u> eft: <u>14</u> eft: <u>14</u> left <u>16</u> left <u>16</u> left <u>16</u> left <u>17</u> left <u>17</u> left <u>18</u> left <u>18</u>	E-BAM 3.9 7.0 mm 7.5 li 7.5 li Y Y Y Y Y Qua	Ref           °C         19.0           1Hg         717.1           pm         16.8           pm         14.0           pm         17.5	f. Std. 0 11 0 11 0 11 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 10
eak Check Value:       as found: 0.5         mbient Temperature:       as found: 18.9 °C         arometric Pressure:       as found: 18.9 °C         16.7 lpm Flow Rate       as found: 16.7 lpm I         14.0 lpm Flow Rate       as found: 16.7 lpm I         17.5 lpm Flow Rate       as found: 16.7 lpm I         17.5 lpm Flow Rate       as found: 17.5 lpm I         17.5 lpm Flow Rate       as found: 17.5 lpm I         Mechanical Audits (Y         Sample nozzle clean:       as fo         Tape support vane clean:       as fo         Tape support vane clean:       as fo         PM10 particle trap clean:       as fo         PM10 drip jar empty:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       14         Expected Span Mass (mg/cm2): 0.916       14         Difference / Pass or Fail: 0.33%       1         V       Setup and Calibra         Parameter       Expected Found       Parameter         Expected I       Found       Parameter       Expected         Clock 12.12       12.12       Analog Mode       1         Location 1       1       Baud Rate       1         Tape Advance       24 hrs	Ref. Sta 19,0 717,8 6,80 14.03 17.56 7 = Yes N ound	as $c^{\circ}$ as let mmHg as let lpm as let lpm as let lpm as let lpm as let lpm as let lpm as let r as Y as r as $r$ as r as r as r as	left: <u>18</u> eft: <u>18</u> eft: <u>14</u> eft: <u>14</u> eft: <u>14</u> left <u>16</u> left <u>16</u> left <u>16</u> left <u>17</u> left <u>17</u> left <u>18</u> left <u>18</u>	), 5 E-BAM 3.9 7.0 mm 7.0 li 7.0 li 7.5	Ref           °C         19.0           1Hg         717.1           pm         16.8           pm         14.0           pm         17.5	f. Std. 0 11 0 11 0 11 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 10
mbient Temperature:       as found:       IB.9       °C         arometric Pressure:       as found:       IB.9       °C         16.7 lpm Flow Rate       as found:       IL.7       lpm IL         14.0 lpm Flow Rate       as found:       IL.7       lpm IL         17.5 lpm Flow Rate       as found:       IL.7.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       IT.5       lpm IL         17.5 lpm Flow Rate       as found:       as found:       lpm IL         10 protice       rape spool covers tight:       as fo       pm PM10	19,0 717,8 6,80 14,03 17,56 7 = Yes N ound ound ound ound ound ound ound ound	d. °C as le mmHg as le lpm as	eft: 18 eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ left 12 left 12 lef	E-BAM 3.9 7.0 mm 7.0 li 1.0 li 1.	°c       19.0         HB       717.3         pm       16.8         pm       14.0         pm       17.5	) 8 mm 0 li 1) 3 li 6 li
mbient Temperature:       as found:       18.9       °c         arometric Pressure:       as found:       7/7.0       mmHg       7         16.7 lpm Flow Rate       as found:       16.7       lpm       l         14.0 lpm Flow Rate       as found:       16.7       lpm       l         14.0 lpm Flow Rate       as found:       16.7       lpm       l         14.0 lpm Flow Rate       as found:       14.0       lpm       l         17.5 lpm Flow Rate       as found:       17.5       lpm       l         Mechanical Audits (Y       Sample nozzle clean:       as fo         Tape support vane clean:       as fo         Tape spool covers tight:       as fo         PM10 particle trap clean:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       Expected Span Mass (mg/cm2):       0.916         Measured Span Mass (mg/cm2):       0.916       14         Difference (mg/cm2):       0.003       14         Difference / Pass or Fail:       0.33%       16         Setup and Calibra       Setup and Calibra       Setup and Calibra         Parameter       Expected	19,0 717,8 6,80 14,03 17,56 7 = Yes N ound ound ound ound ound ound ound ound	°c     as let       Ipm     as let       Y     as       Jes     yet	eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ left 7/ lef	3.9 7.0 mm 7.0 li 7.5 li 7.5 li 7.5 Y Y Y Y G OTest Qua Good /	°c       19.0         HB       717.3         pm       16.8         pm       14.0         pm       17.5	2 8 mm 0 li 13 li 6 li
arometric Pressure: as found: 7/7.0 mmHg 7 16.7 lpm Flow Rate as found: 16.7 lpm I 1 14.0 lpm Flow Rate as found: 14.0 lpm I 1 17.5 lpm Flow Rate as found: 17.5 lpm I 1 Mechanical Audits (Y Sample nozzle clean: as fo Tape support vane clean: as fo Tape support vane clean: as fo PM10 particle trap clean: as fo PM10 drip jar empty: as fo PM10 bug screen clear: as fo PM10 bug screen cl	717.8       14.03       17.56       17.56       17.56       17.56       17.56       17.56       17.56       19.03       1000       1000       1000       1000       1000       14.7       14.7       14.7       15.0       14.7       15.0       14.7	mmHg     as let       lpm     as let       Y     as       Jes     Jes	eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ eft: 7/ left 7/ lef	7.0 mm .7 li 1.0 li 7.5 li Y Y Y Y Good /	ality Categ	8 mm 0 1 03 1 6 1
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17.5 lpm Flow Rate       as found:       17.5 lpm       Imm         Mechanical Audits (Y         Sample nozzle clean:       as fo         Tape support vane clean:       as fo         Tape support vane clean:       as fo         Tape support vane clean:       as fo         PM10 particle trap clean:       as fo         PM10 particle trap clean:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       Flo         Expected Span Mass (mg/cm2):       0.919         Measured Span Mass (mg/cm2):       0.919         Measured Span Mass (mg/cm2):       0.003         % Difference / Pass or Fail:       0.33%         Setup and Calibra         Parameter       Expected         Found       Parameter         Expected       Found         Parameter       Expected         Clock       12.12         IZ12       Analog Mode         Location       1         I       Baud Rate         Tape Advance       24 hrs         Z4 hrs       24 hrs         Z4 hrs	V = Yes N bund _ bund bund _ bund _ bund _ bund _ bund _ bund _ bund _ bund _ bund _ b	$\frac{ pm }{Y} as left \\ \frac{Y}{As} \\$	eft: 77	Y Y Y Test Qua Good /	pm 17,5 ality Categ ' Marginal	iory
Mechanical Audits (Y         Sample nozzle clean:       as fo         Tape support vane clean:       as fo         Tape spool covers tight:       as fo         PM10 particle trap clean:       as fo         PM10 particle trap clean:       as fo         PM10 particle trap clean:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       as fo         Expected Span Mass (mg/cm2):       0.919         Measured Span Mass (mg/cm2):       0.916         Measured Span Mass (mg/cm2):       0.916         Measured Span Mass (mg/cm2):       0.916         Measured Span Mass (mg/cm2):       0.003         % Difference / Passor Fail:       0.33%         Setup and Calibra         Parameter       Expected         Found       Parameter         Expected       Found         Parameter       Expected         Clock       12.12         IZIZ       Analog Mode         Location       1         I       Baud Rate         Tape Advance       24 hrs         24 hrs       24 hr         Realtime Avg       60 mins	V = Yes N bund bund bund bund bund bund bund bund	$\begin{array}{c} 1 = No \\ Y \\ Y \\ as \\ Y \\ S \\ S$	left left left left left left um ue t)	Y Y Y Test Qua Good/	ality Categ ' Marginal	ory
Sample nozzle clean:       as fo         Tape support vane clean:       as fo         Tape spool covers tight:       as fo         PM10 particle trap clean:       as fo         PM10 particle trap clean:       as fo         PM10 drip jar empty:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       as fo         Expected Span Mass (mg/cm2):       0.919         Measured Span Mass (mg/cm2):       0.919         Measured Span Mass (mg/cm2):       0.916         Measured Span Mass (mg/cm2):       0.93%         Wifference (mg/cm2):       0.003         % Difference / Passor Fail:       0.33%         Setup and Calibra         Parameter       Expected         Found       Parameter         Expected       Found         Parameter       Expected         Clock       12.12       12.12         Analog Mode       H         Location       1       1         Baud Rate       9         Tape Advance       24 hrs       24 hr         Realtime Avg       60 mins       60 mins	ound ound ound ound ound ow Rate 4.0 - 15.0 (Ipm) I 4. 7 ition Valu	Y as Y as Y as Y as Y as Y as Y as Y as Vacu Valu (Hg 425 -	left left left left left um ue to to to to to to to to to to to to to	Qua Good /	Marginal	
Tape support vane clean:       as fo         Tape support vane clean:       as fo         Tape spool covers tight:       as fo         PM10 particle trap clean:       as fo         PM10 drip jar empty:       as fo         PM10 drip jar empty:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       Expected Span Mass (mg/cm2): Ø. 919         Measured Span Mass (mg/cm2): Ø. 919       Floc         Measured Span Mass (mg/cm2): Ø. 919       Floc         Measured Span Mass (mg/cm2): Ø. 919       I4         Difference (mg/cm2): Ø. 003       I4         Setup and Calibra       Setup and Calibra         Parameter       Expected Found       Parameter         Expected Found       Parameter       Expected Found         Clock       12.12       12.12       Analog Mode         Location       1       1       Baud Rate       9         Tape Advance       24 hrs       24 hr       RH Setpoint         Realtime Avg       60 mins       60 mins       Delta T Setpoint	ound ound ound ound ow Rate 4.0 - 15.0 (lpm) 1 4. 7 ation Valu	Y as Y as Y as Y as Y as Y as Vacu Valu (Hg 425 -	left left left left left um ue to to to to to to to to to to to to to	Qua Good /	Marginal	
Tape spool covers tight: as fo PM10 particle trap clean: as fo PM10 drip jar empty: as fo PM10 bug screen clear: as fo PM10 bug screen clear: as foManual Span Membrane TestExpected Span Mass (mg/cm2): Ø. 919Expected Span Mass (mg/cm2): Ø. 919Flo Measured Span Mass (mg/cm2): Ø. 919Measured Span Mass (mg/cm2): Ø. 919Flo 14Difference (mg/cm2): Ø. 003K% Difference / Pass or Fail: Ø. 33%KSetup and CalibraParameterExpected FoundParameterExpected FoundLocation 1IIBaud RateTape Advance24 hrs24 hrs24 hrRealtime Avg60 mins60 mins60 mins60 mins60 mins	ound ound ound ow Rate 4.0 - 15.0 (Ipm) I 4. 7 Ition Valu	Y   as     Y   as     Y   as     Y   as     Y   as     Y   as     Vacu   Vacu     Valu   (Hg     425	left left left Pump um um ue g) G	Qua Good /	Marginal	
PM10 particle trap clean:       as fo         PM10 drip jar empty:       as fo         PM10 bug screen clear:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       Image: Color of the second clear of the s	ound ound ow Rate 4.0 - 15.0 (Ipm) I 4. 7 ation Valu	Y as Y as Y as Vacu Valu (Hg 425	left left Pump um um je g) G	Qua Good /	Marginal	
PM10 drip jar empty:       as fo         PM10 bug screen clear:       as fo         Manual Span Membrane Test       Image: Color of the second s	ow Rate 4.0 - 15.0 (Ipm) 14.7 ation Valu	Y as Y as Vacu Valu (Hg 425	left left um ue g) G	Qua Good /	Marginal	
PM10 bug screen clear:       as fo         Manual Span Membrane Test       Expected Span Mass (mg/cm2): Ø.919       Flo         Measured Span Mass (mg/cm2):       Ø.919       Flo         Measured Span Mass (mg/cm2):       Ø.919       14         Difference (mg/cm2):       Ø.003       14         Øbifference / Pass or Fail:       Ø.33%       16         Setup and Calibra       Setup and Calibra       14         Parameter       Expected       Found       Parameter       Expected         Clock       12.12       Analog Mode       H         Location       1       1       Baud Rate       9         Tape Advance       24 hrs       24 hr       RH Setpoint       14         Realtime Avg       60 mins       60 mins       Delta T Setpoint       14	ow Rate 4.0 - 15.0 (lpm) 1 4. 7 ation Valu	Y as Vacu Valu (Hg 425 -	Pump um Je (j)	Qua Good /	Marginal	
Manual Span Membrane Test       Expected Span Mass (mg/cm2): 0.919       Flo         Measured Span Mass (mg/cm2): 0.919       14         Difference (mg/cm2): 0.916       14         Difference (mg/cm2): 0.003       14         % Difference / Passor Fail: 0.33%       1         Setup and Calibra       14         Parameter       Expected Found       Parameter         Clock       12.12       12.12       Analog Mode         Location       1       1       Baud Rate       14         Tape Advance       24 hrs       24 hr       RH Setpoint       14         Realtime Avg       60 mins       60 mins       60 mins       Delta T Setpoint	ow Rate 4.0 - 15.0 (lpm) 1 4. 7 ation Valu	Vacu Valu (Hg 425 -	Pump um Je g)	Qua Good /	Marginal	
Expected Span Mass (mg/cm2): 0.919       Flo         Measured Span Mass (mg/cm2): 0.919       14         Difference (mg/cm2): 0.003       14         % Difference / Passor Fail: 0.33%       1         Setup and Calibra       Setup and Calibra         Parameter       Expected       Found       Parameter       Expected         Clock       12.12       12.12       Analog Mode       H         Location       1       1       Baud Rate       9         Tape Advance       24 hrs       24 hr       RH Setpoint       Realtime Avg       60 mins       Lo min       Delta T Setpoint	4.0 - 15.0 (lpm) 1 4. 7 ntion Valu spected	Valu (Hg 425 -	um Je 3) G	Qua Good /	Marginal	
Measured Span Mass (mg/cm2): 0.91/e       14         Difference (mg/cm2): 0.003       14         % Difference / Pass or Fail: 0.33%       1         Setup and Calibra       Setup and Calibra         Parameter       Expected       Found       Parameter       Exc         Clock       12.12       12.12       Analog Mode       H         Location       1       1       Baud Rate       9         Tape Advance       24 hrs       24 hr       RH Setpoint       1         Realtime Avg       60 mins       60 mins       0       Delta T Setpoint	4.0 - 15.0 (lpm) 1 4. 7 ntion Valu spected	Valu (Hg 425 -	um Je 3) G	Qua Good /	Marginal	
Difference (mg/cm2): 0.003 % Difference / Passor Fail: 0.33% ( Setup and Calibra Parameter Expected Found Parameter Ex Clock 12.12 12.12 Analog Mode H Location 1 1 8aud Rate 9 Tape Advance 24 hrs 24 hr RH Setpoint Realtime Avg 60 mins 60 min Delta T Setpoint	(lpm) 14.7 Ition Value (pected)	(Hg 425-	s) B	Good /	Marginal	
% Difference / Passor Fail:       0.33%       1         Setup and Calibra         Parameter       Expected       Found       Parameter       Ex         Clock       12.12       17.12       Analog Mode       H         Location       1       1       Baud Rate       9         Tape Advance       24 hrs       24 hr       RH Setpoint       1         Realtime Avg       60 mins       60 mins       Delta T Setpoint       1	14.7 ntion Valu	425. Jes	8			
Setup and Calibra       Parameter     Expected     Found     Parameter     Expected       Clock     12.12     17.12     Analog Mode     H       Location     1     1     Baud Rate     9       Tape Advance     24 hrs     24 hr     RH Setpoint       Realtime Avg     60 mins     60 mins     0	tion Valu	les		Marg	ina)	
Setup and Calibra       Parameter     Expected     Found     Parameter     Expected       Clock     12.12     17.12     Analog Mode     H       Location     1     1     Baud Rate     9       Tape Advance     24 hrs     24 hr     RH Setpoint       Realtime Avg     60 mins     60 mins     0	tion Valu	les		IVIAVa	inal	
ParameterExpectedFoundParameterExClock12121712Analog ModeHLocation11Baud Rate9Tape Advance24 hrs24 hrRH Setpoint9Realtime Avg60 mins60 minsDelta T Setpoint1	pected					-
Clock12121212Analog ModeHLocation11Baud Rate9Tape Advance24 hrs24 hrRH SetpointRealtime Avg60 mins60 minsDelta T Setpoint	-	i ound	Para	meter	Expected	Eour
LocationIIBaud RateSTape Advance24 hrs24 hrs24 hrRH SetpointRealtime Avg60 mins60 minsDelta T Setpoint		Houver		Type	Actual	Act
Tape Advance24 hrs24 hrRH SetpointRealtime Avg60 mins60 minsDelta T Setpoint	9600	9600		t Voltage	12.5 v	12.5
Realtime Avg 60 mins 60 min Delta T Setpoint		15%		nd Temp		250
		5C		AC	8.0 v	8.0
Machine Type PM-10 PmID RH Control	0 1	on		onnect	No	NO
		6.7		Protect	Off	off
Last 6 Errors in E-B/	AM Erro	Log	incester in a			A la contra c
Error Date Time		Error		1	Date	Time
Nozzie Failed up 10 Jan 22 0109 4			-			
Nozzle failed up 13 Janzz 0115 5						
6						

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	Contraction of the local division of the loc	WA F	
	IRT	IRTH	IRTHWN

Baseline Air Monitoring Program - DOE E-BAM Monthly Audit and Maintonese

Audit Date: 2/21/202	2	Δ			3314 j. wi	lliford		
	New Second	and the second	Audit		1. 199			
Flow Audit Device Model:	BGI Delta	Cal DC-1A Ser	ial No: 1	58047	Calib	oration Dat	e: 2/25/	2021
Leak Check Value:	as fou	nd:	_		as left	:		
		E-BAM	Ref. S	Std.		E-BAM	Re	ef. Std.
Ambient Temperature:	as found	1: 10.3 °C	NA	°C	as left:	16.3		A °(
Barometric Pressure:	as found	1: 715.8 mmHg	s NA		as left:	715.8 "		A mmH
16.7 lpm Flow Rate	as found	1: 16.7 Ipm	NA	lpm	as left:	16.7	lpm N	
14.0 lpm Flow Rate	as found	1: 14.0 Ipm	NA	lpm	as left:	14.0	a straight of the	A Ipn
17.5 lpm Flow Rate	as found	1: 17.5 Ipm	NA	lpm	as left:	17.5	lpm N	A Ipn
		Mechanical Audits	(Y = Yes	N = No	)			
	Sample	nozzle clean: as	s found	Y	as left	Y		
	Tape suppo	rt vane clean: as	s found	Y	as left			
	Tape spool	l covers tight: as	s found		as left	6		
			s found	Y	as left			
	PM10 di	rip jar empty: as	s found	Y	as left	Y		
			s found	Ý	as left	Y		
Manual Span	Membrane	Test			D.,			
Expected Span Mass (mg			Flow Rate		acuum	mp Test	unlity Cata	
Measured Span Mass (mg	z/cm2) : 0	a18	14.0 - 15.	1. St. 1. St.	Value	and the second second second second	uality Categ	
Difference (mg	g/cm2) : 0		(lpm)		(Hg)	Guud	/ Marginal	17 Poor
% Difference / ass								4
, vo Difference / Use			14.6		9.3	ma	ivgina	
Parameter Expected	Found	Setup and Calik					Expected Found	
Clock 0921			Expected			arameter	Expected	
Location	0921	Analog Mode Baud Rate	Hourly 9600	Hour		ow Type	Actual	Act
Tape Advance 24 hrs	24 hrs	RH Setpoint	45%	9600		tart Voltage		12.51
and the second	60min	Delta T Setpoint		45%	Sta	Cond Temp		25C
Realtime Avel 60 mins		Delta i Setpoliti	150	15%		DAC	8.0 v	8.0V
Realtime Avg 60 mins Machine Type PM-10		PH Control	On	10				NO
Machine Type PM-10	Pm-10	RH Control	On	On		Connect	No	A COLORED AND A COLORED AND
		Flow Setpoint	16.7	16.7		np Protect	Off	off
Machine Type PM-10 Analog FS 1.0 v	PM-10	Flow Setpoint Last 6 Errors in E	16.7	16.7 or Log	Pun			66
Machine Type PM-10 Analog FS 1.0 v Error	PM-10 1.01 D	Flow Setpoint Last 6 Errors in E ate Time	16.7 -BAM Erro	16.7 or Log Erro	Pun	np Protect	Off Date	A COLORED AND A COLORED AND
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed Up	PM-10 1.01 D 2/7/	Flow Setpoint Last 6 Errors in E ate Time 22 0001 4	16.7 -BAM Erro	16.7 or Log Erro	Pun or Slad 1	np Protect	Off Date 2/19/22	66
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed up Nozzle Failed up	Pm-vo 1.0√ D 2/7/ 2/14	Flow Setpoint Last 6 Errors in E ate Time 22 6001 4 22 6001 5	16.7 -BAM Erro	16.7 or Log Erro	Pun	np Protect	Off Date 2/19/22	Time
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed Up Nozzle Failed Up Nozzle Failed Up	Pm-vo 1.0√ D 2/7/ 2/14	Flow Setpoint Last 6 Errors in E ate Time 22 0001 4	16.7 -BAM Erro	16.7 or Log Erro	Pun or Slad 1	np Protect	Off Date 2/19/22	Time
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed up Nozzle Failed up Nozzle Failed up Nozzle Failed up	Pm-vo 1.0v D 2/7/ 2/14 z/15	Flow Setpoint Last 6 Errors in E ate Time 22 0001 4 /22 0001 5 5 22 0001 6	16.7 -BAM Erro No-22 ( No 22 (	16.7 Erro Le Fa	Pun or Slad 1	np Protect	Off Date 2/19/22	Time
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed up Nozzle Failed up Nozzle Failed up Nozzle Failed up Nozzle Failed up Nozzle Failed up	Pm- 10 1.0 V D 2/7/ 2/14 2/15 L calibre	Flow Setpoint Last 6 Errors in E ate Time 22 0001 4 /22 0001 5 5/22 0001 6	16.7 -BAM Erro No 22 ( No 22 (	16.7 Erro Le Fa	Pun or Slad 1	np Protect	Off Date 2/19/22 2/2 <b>1</b> /22	Time
Machine Type PM-10 Analog FS 1.0 v Error Nozzle Failed Up Nozzle Failed Up	PM-10 1.01 D 2/7/ 2/14 2/15 L calibr ck the	Flow Setpoint Last 6 Errors in E ate Time 22 0001 4 /22 0001 5 5/22 0001 6	16.7 -BAM Erro No.22 ( No.22 ( No.22 (	16.7 erro e Fa hop	Pun or Slad 1	μρ μρ μγ j recali	Off Date 2/19/22 2/2 <b>1</b> /22	Time 0001



E-BAM Monthly Audit and Maintenance DOE-1 Station # Serial # W23314 3/22/20.22 Audit Date: Audited By : T.S. Williford Flow Audit Flow Audit Device Model: BGI Delta Cal DC-1A 158047 Serial No: Calibration Date: -2/25/2021 Leak Check Value: as found: 0.5 1444 6/11/2021 as left: 0.5 E-BAM Ref. Std. E-BAM Ref. Std. Ambient Temperature: as found: 29.2 °c °c 28.4 as left: °c 29.2 28.4 °c Barometric Pressure: as found: 716.0 mmHg 715.5 mmHg as left: 716.0 mmHg 715 SmmHg 16.7 Ipm Flow Rate as found: 7 16. Ipm 16.67 Ipm as left: 16.7 Ipm 16.67 Ipm 14.0 lpm Flow Rate as found: 140 Ipm 13.95 Ipm as left: 14.0 13.95 Ipm lpm 17.5 lpm Flow Rate as found: 7.5 Ipm 17.47 Ipm as left: 17.5 lpm] 17.47 Ipm Mechanical Audits (Y = Yes N = No) ٠. Sample nozzle clean: as found as left Tape support vane clean: as found as left Tape spool covers tight: as found as left PM10 particle trap clean: as found as left PM10 drip jar empty: as found as left PM10 bug screen clear: as found as left Manual Span Membrane Test **Pump Test** Expected Span Mass (mg/cm2): 0.919 Flow Rate Vacuum Quality Category Measured Span Mass (mg/cm2): 0.919 14.0 - 15.0 Value Good / Marginal / Poor Difference (mg/cm2): 0.0 (lpm) (Hg) % Difference / Pass or Fail: 0% 14.2 403.8 Margina Setup and Calibration Values Parameter Expected Found Parameter Expected Found Parameter Expected Found Clock 1253 1253 Analog Mode Hourly Flow Type Actual tourly Act Location 1 **Baud Rate** 9600 9600 **Restart Voltage** 12.5 v 1250 Tape Advance 24 hrs zyhrs **RH** Setpoint 45% 45% Std Cond Temp 25 C 25 C° **Realtime Avg** 60 mins 60 min Delta T Setpoint 15 C 15C DAC 8.0 v 8.00 Machine Type PM-10 PM-10 **RH** Control On On **RH Connect** No VO Analog FS 1.0 v 1.00 **Flow Setpoint** 16.7 16-7 **Pump Protect** Off off Last 6 Errors in E-BAM Error Log Error Date Time Error Date Time Nozzl ULO 3/7/22 0001 4 Nozzl NO 3/17/22 0001 2 Nozzle Failed 3/12/22 0001 5 Nozzle 14.0 Failed 3/18/22 0001 3 Nozzla Faild 3/16/22 6 Nozzl 0001 Failed up 3/22/22 0001 Audit Notes: NOZZLO Fa CONT occurring but anex have replace . Sample vare and got 4 0 clean again until it shut off again.



E-BAM Monthly Audit and Maintenance Station # DOG -1 Serial # X 16067 Audit Date: 3/22/2022 Audited By : T.S.Willifa Flow Audit Flow Audit Device Model: BGI Delta Cal DC-1A Serial No: -158047 **Calibration Date:** -2/25/2021 TSU Leak Check Value: as found: 1444 0.5 as left: 0,5 6/11/2021 E-BAM Ref. Std. E-BAM Ref. Std. Ambient Temperature: as found: 30.0 °c 28.9 °c as left: °c 30,0 °c 28.9 **Barometric Pressure:** as found: 717.0 mmHg 715.5 mmHg as left: 717.0 mmHg 715.5 mmHg 16.7 lpm Flow Rate as found: 16.7 Ipm as left: Ipm 16.74 16.7 16.74 Ipm Ipm 14.0 lpm Flow Rate as found: 14.0 1pm 14.00 Ipm as left: 14.0 14.00 Ipm Ipm 17.5 lpm Flow Rate as found: 7.5 Ipm 17.58 Ipm as left: 17.5 Ipm 17,58 lpm Mechanical Audits (Y = Yes N = No) ٠., Sample nozzle clean: as found as left Tape support vane clean: as found as left Tape spool covers tight: as found as left PM10 particle trap clean: as found as left PM10 drip jar empty: as found as left PM10 bug screen clear: as found as left Manual Span Membrane Test Pump Test Expected Span Mass (mg/cm2): 0.950 Flow Rate Vacuum **Quality Category** Measured Span Mass (mg/cm2): 0.945 14.0 - 15.0 Value Good / Marginal / Poor Difference (mg/cm2): 0.005 (lpm) (Hg) % Difference / Plass or Fail: 0,53% 408.7 15.0 Good Setup and Calibration Values Parameter Expected Found Parameter Expected Found Parameter Expected Found Clock 1415 1415 Analog Mode Hourly Flow Type Actual tourly Act Location i l Baud Rate 9600 9600 **Restart Voltage** 12.5 v 12.5V Tape Advance 24 hrs Zyhrs **RH** Setpoint 45% Std Cond Temp 45% 25 C 25C Realtime Avg 60 mins 60mm **Delta T Setpoint** 15 C DAC 15C 8.0 v 8.0V Machine Type PM-10 PM-10 **RH** Control On On **RH** Connect No NO Analog FS 1.0 v 1.00 **Flow Setpoint** 16.7 16.7 Pump Protect Off off Last 6 Errors in E-BAM Error Log Error Date Time Error Date Time 1 No Messages 3/22/22 1423 4 2 5 3 6 Audit Notes: \* This is the intitial Audit For this unit. Replaced unit W23314 due to

Nozzle up failures.



E-BAM Monthly Audit and Maintenance Station # DOE-2 Serial # Y12096 Audit Date: 13/2022 1 Audited By: TS Williford Flow Audit Flow Audit Device Model: BGI Delta Cal DC-1A Serial No: 158047 Calibration Date: 2/25/2021 Leak Check Value: as found: 0.5 as left: 0.5 E-BAM Ref. Std. E-BAM Ref. Std. Ambient Temperature: as found: 18.3 °c 18.4 °c 8.3 °C as left: 4 °c Barometric Pressure: as found: 714.1 mmHg 214.0 mmHg as left: 714 mmHg () mmHg 16.7 lpm Flow Rate as found: 16.7 Ipm Ipm as left: 16.76 16.7 lpm 76 Ipm 14.0 lpm Flow Rate as found: 14.0 14.09 Ipm Ipm as left: 14.0 Ipm 09 Ipm 17.5 lpm Flow Rate as found: 17.5 lpm 7.55 Ipm as left: 17.5 lpm 1.55 lpm Mechanical Audits (Y = Yes N = No) 14 Sample nozzle clean: as found as left Tape support vane clean: as found as left Tape spool covers tight: as found as left PM10 particle trap clean: as found as left PM10 drip jar empty: as found as left PM10 bug screen clear: as found as left Manual Span Membrane Test Pump Test Expected Span Mass (mg/cm2) : 0, 991 Flow Rate Vacuum **Quality Category** Measured Span Mass (mg/cm2): 0,902 14.0 - 15.0 Value Good / Marginal / Poor Difference (mg/cm2): O. O. ( (lpm) (Hg) % Difference (Pass)or Fail: Good / Marginal 1.23% 401.3 14.0 Setup and Calibration Values Parameter Expected Found Parameter Expected Found Parameter Expected Found Clock 1304 1304 Analog Mode Hourly Flow Type Actual tourly Act Location 2 2 **Baud Rate** 9600 **Restart Voltage** 12.5 v 9600 ZSV Tape Advance 24 hrs ZUhr **RH** Setpoint 45% Std Cond Temp 45% 25 C 25C **Realtime Avg** 60 mins Loumin Delta T Setpoint 15 C ISC DAC 8.0 v 8.0V Machine Type PM-10 PM-10 **RH** Control On **RH** Connect No On NO Analog FS 1.0 v Flow Setpoint 16.7 1.00 **Pump Protect** 16 Off off Last 6 Errors in E-BAM Error Log Error Date Time Error Date Time 1No new messages 4 1/13/22 1310 2 5 3 6 Audit Notes:



E-BAM Monthly Audit and Maintenance

Station # Do	E-2				Serial #	Y1200	26			
Audit Date: 2/	21/2020	<u> </u>	1	-	Audited By	: <u></u> ≤	s. w	Illifor	d	
Flaur Avelli D			<u></u>	And the second	w Audit	A. S. Star			S. And	
Flow Audit Devic			elta Cal E	<u>C-1A</u> S	erial No:	158047	Calibr	ation Date	: 2/25/2	2021
Leak Check Value	5:	as	found:	0.5			as left:	0.5		
				E-BAM	Ref.	Std.		E-BAM	Re	f. Std.
Ambient Temper		as fo	ound:	11.2	°C NA	°cas	left:	11.2	°C N	
Barometric Press			ound: 🔄	714.0 mm		mmHg as	left:	714.0 mr	74,789/3107	
16.7 lpm Flow		as fo	ound:	6.7	pm NA	Ipm as	and the second sec	1 7	Ipm NI	and the second se
14.0 lpm Flow		as fo	ound:	4.0 1	pm NA	lpm as	left:	1 -	Ipm N	
17.5 lpm Flow	Rate	as fo	ound:	17.5 1	pm NA	lpm as	left:	Care and the second sec	Ipm NC	
		- STO, 1999	Mech	anical Aud	its ( Y = Yes	N = No)			1.	
		Sam		le clean:	as found	Manuel Tenteries	as left	Y		
		Tape su	oport var	ne clean:	as found		as left	~		
		Tape sp	oool cove	ers tight:	as found		as left	Y		
	1		article tra	10-11	as found		as left	Y		
			0 drip ja		as found		as left	Y		
			bug scree	20 T	as found		as left	Y		
Mar	nual Span	Membra	ane Test		a Carlos a			np Test	No. and the second	ale se ale se ale
Expected Span	and the second se			31	Flow Rate	a Vac	cuum		lity Catao	
Measured Span					14.0 - 15.		lue		ality Categ Marginal	
Diffe	rence (mg	(/cm2) :	0 0	13	(lpm)	17. No. 2 10. 200	Hg)		warginai	/ POOr
	nce / Pass							(A A	0.00 h. o	1
			1-10		14.1	411	.0	1 10 10	avgina	1
Parameter	Expected	Found		rameter	libration Va		1			
Clock		1			Expected		and the second second	ameter	Expected	
Location	2	1116		nalog Mod Baud Rat		Hourh	1	w Туре	Actual	Act
Tape Advance		2- 24hr			and the second	9600		rt Voltage	12.5 v	12.50
Realtime Avg				RH Setpoir		45%		ond Temp	25 C	256
Machine Type	and the second se	leo m		a T Setpoir		ISC		DAC	8.0 v	8.01
Analog FS		Pm-10		RH Contro ow Setpoir		on		Connect	No	NO
	1.0 V	1.00				1.6.7	Pump	Protect	Off	off
F				1	E-BAM Erro	and the second				
Err			Date	Time		Error			Date	Time
NO New M	ressage	es i	2/21/22		4					
and the second					5					
					6					
udit Notes:	c. k.									
JA=BGI D	ettacal	Call	brathr	was i	n the sh	op get	tim	ecalibre	ated s	0
> could not	aheek	flow	rates.			. 0	0			



Station # DOE-Z			M Monthly				096			
Audit Date: 3/23/2	022			-	and a second sec			2illifor	7	
			F		Audit		51.04	- 1101000	-1	
Flow Audit Device Mod	el: BGI	Delta Ca			al No:	1444	Cali	bration Date	: 6/11/2	0021
Leak Check Value:		as found:	the second s					t: <u>0, 5</u>		2021
		[	E-BAM			·				CAL NUMBER
Ambient Temperature:	as	found:	23.4	°c	Ref. 9		a lafte	E-BAM		f. Std.
Barometric Pressure:		found:					as left:	23.4	°C 221	
16.7 lpm Flow Rate		found:	16.7	nmHg Ipm			as left:	113.5 mr		<u>S</u> mm
14.0 lpm Flow Rate		found:	14.0	lpm	10.02		as left:		1pm 16.6	
17.5 lpm Flow Rate		found:	17.5	Ipm			as left:		1pm 14.0	
			chanical Au					17.5	Ipm 17.4	46 1
	PN PM1	/10 drip .0 bug sci	trap clean: jar empty: reen clear:	as	found found found	Y	as left as left as left	Y		
Manual Sp	an Memł	orane Ter	st				D.	ump Test		
Expected Span Mass					Flow Rate		acuum		ality Categ	084
Measured Span Mass			709		14.0 - 15.	1811	Value	and the second of the second second	Marginal	and the second second
Difference	mg/cm2				(lpm)		(Hg)		in an ghiar	/ 1001
% Difference / 🥐	assor Fa	24/2	.0%		14.6	41	9,4	Marg	inal	
	<u>in a</u>	and the second se	Setup and (	Calib	oration Va	lues		. (	)	
Parameter Expec			Parameter		Expected	Found	d P	arameter	Expected	Found
Clock 083	1		Analog Mo			Hourb		low Type	Actual	Act
Location Z			Baud R		9600	960		tart Voltage	12.5 v	12.50
Tape Advance 24 h			RH Setpo		45%	459		Cond Temp	25 C	25C
Realtime Aval 60 m			elta T Setpo		15 C	15C		DAC	8.0 v	8.0
Realtime Avg 60 m		1 10 1	RH Cont		On 16.7	on		H Connect	No	No
Machine Type PM-:	lo pm-	1	Flow Satas		16.7	16:		mp Protect	Off	0.f.f
	lo pm-	V	Flow Setpo				All of the owner of the design of the owner of the design			
Machine Type PM-: Analog FS 1.0	lo pm-	La	st 6 Errors					<u>.</u>		
Machine Type PM-: Analog FS 1.0 Error	10 pm- v 1.0	La La	st 6 Errors Time	in E-		or Log Erre	or		Date	Time
Machine Type PM-: Analog FS 1.0 Error No new Messa	10 pm- v 1.0	La La	st 6 Errors	in E-			or		Date	Time
Machine Type PM-: Analog FS 1.0 Error	10 pm- v 1.0	La La	st 6 Errors Time	in E-			or		Date	Time



Station # DOE Audit Date:	-3	17			udited By :	N233		CI			
	3 20	LL				TSO	willi	tord			
			0.100		Audit		- III		- 1 1-		
Flow Audit Device	woder:		a Cal DC-		al No: 15			ion Date:	2/25/2	021	
Leak Check Value:		as to	und: O	. >	-	as	s left: C	1.>	-		
				E-BAM	Ref. St	d.		E-BAM	Ref	. Std.	
Ambient Temperat	ture:	as fou	nd: 19	U) °c	18.9	°c as le	eft: 10	i.1	° 18.9	? ⁰0	
Barometric Pressu	re:	as fou	nd: 71	5.9 mmH	WY715.0	mmHg as li	eft: 7	5,9 mm	18 715.	O mmHg	
16.7 lpm Flow R	late	as fou	nd: 16			ipm as le	eft: 14	p.7 lp	m 16	73 Ipm	
14.0 lpm Flow R	ate	as fou	nd: 19	,O lpm	114.17	Ipm as le	eft: 14	1.0 lp	m 14.1	7 Ipm	
17.5 lpm Flow R	ate	as fou	nd: 17	1.5 lpm	17.46	Ipm as lo	eft: 17	7.5 lp	m 17.4	6 Ipn	
1			Mechai	nical Audits	s (Y = Yes I	V = No )					
N		Samp	le nozzle		s found		s left	(			
	Т	ape supp	port vane	clean: a	s found	Y as	s left	5			
			ool cover		s found	Y as	s left	Y			
			ticle trap	•	s found		s left	Y			
			drip jar		s found		s left	Y			
			ug screer		s found		s left	Y			
Man	ual Span N	Vembrar	ne Test		1		Pumi	Test			
Expected Span				5	Flow Rate	Vacu			lity Categ	orv	
Measured Span					14.0 - 15.				Marginal		
	ence (mg				(lpm) (Hg)						
% Differer				5 X 1 4 4	14.0	411.0		Mary	N		
	0				ibration Va		.0	TATOLA	ginal		
Parameter	Expected	Found		ameter	Expected	Found	Dara	meter	Expected	Eound	
	1355	1355		nalog Mode		Hourly		v Type	Actual	Act	
Location	3	3	1 1	Baud Rate		9600	1	t Voltage	12.5 v	1	
Tape Advance	24 hrs	124hr		RH Setpoin		45%		and Temp	25 C	12.5	
Realtime Avg		1		a T Setpoin		15C		DAC	8.0 v	8.0	
Machine Type		PM-11		RH Contro		On		onnect	No	The second second	
Analog FS		1.00		ow Setpoin		16.7		Protect	Off	NO	
		11,0 V					1			loff	
Err	or	1	Date	Time	E-BAM Erro	Error		T	Date	Time	
1					ţ	EIIUI			Date	Time	
1 No new Mes	sages		1/13/22		+ 5						
					5						
3											



E-BAM Monthly Audit and Maintenance Station # DOE-3 Serial # WZ 3313 Audit Date: 2/21/2022 Audited By: T.S. Willifund Flow Audit Flow Audit Device Model: BGI Delta Cal DC-1A 158047 Serial No: Calibration Date: 2/25/2021 Leak Check Value: as found: A. as left: P.S E-BAM Ref. Std. E-BAM Ref. Std. Ambient Temperature: as found: 14.0 °C °c las left: NA 14.0 °c °c NA **Barometric Pressure:** as found: 715,3 mmHg mmHg as left: NA 715.3 mmHg NA mmHg 16.7 lpm Flow Rate as found: 16.7 Ipm NA Ipm as left: 16.7 lpm NA lpm 14.0 lpm Flow Rate as found: 14.0 Ipm NA Ipm as left: 14.0 Ipm lpm NA 17.5 lpm Flow Rate as found: 17.5 Ipm NA Ipm as left: 17.5 lpm NA lpm Mechanical Audits (Y = Yes N = No) Sample nozzle clean: as found as left Tape support vane clean: as found as left Tape spool covers tight: as found as left PM10 particle trap clean: as found as left PM10 drip jar empty: as found as left PM10 bug screen clear: as found as left Manual Span Membrane Test Pump Test Expected Span Mass (mg/cm2): 0.885 Flow Rate Vacuum **Quality Category** Measured Span Mass (mg/cm2): 0.882 14.0 - 15.0 Value Good / Marginal / Poor Difference (mg/cm2): 0.003 (lpm) (Hg) % Difference / Pass or Fail: 0.34% Margina 415.3 14.4 Setup and Calibration Values Parameter Expected Found Parameter Expected Found Parameter Expected Found Clock 1322 1322 Analog Mode Hourly Flow Type Actual Hourly Act Location 3 3 **Baud Rate** 9600 9600 **Restart Voltage** 12.5 v 12,50 **Tape Advance** 24 hrs **RH** Setpoint 24 / 45% Std Cond Temp 45% 25 C 25% **Realtime Avg** 60 mins 60 mir **Delta T Setpoint** 15 C 15% DAC 8.0 v A.O. Machine Type PM-10 **RH** Control PM-10 On **RH** Connect On No NO Analog FS 1.0 v 1.0V **Flow Setpoint** 16.7 16.7 **Pump Protect** Off off Last 6 Errors in E-BAM Error Log Error Date Time Error Date Time 1 No new message 4 1331 2/21/22 2 5 3 6 Audit Notes: NA= BEI Deltacal calibrator is in the stop So I couldn't check tow rates



Station # DOE-3			·	Se	erial #	WZ.	3313	3		
Audit Date: <u>3/23/24</u>	022			Αι	udited By	: 1.9	5. W	illiford		
1.	1883 A.		Flo	ow A	Audit	1. J. S.	812			-36 -
Flow Audit Device Mode	el: BGI De	elta Cal D	C-1A 9	Seria	al No:	1444	Calik	oration Date	6/11/2	021
Leak Check Value:	as	found:	0.4				as left	: 0,4		
			E-BAM		Ref. S	itd.		E-BAM	Ret	. Std.
Ambient Temperature:	as fo	und: Z	4.2	°C	23.5	°C	as left:	24.2	°c 23	.5
Barometric Pressure:	as fo	und: 🔽	15.9 m	mHg	716.5	mmHg	as left:			5 mm
16.7 lpm Flow Rate	as fo	und: 1	6.7	lpm	16.73	and the second se	as left:	111	Ipm 16.7	
14.0 lpm Flow Rate	as fo	und:	4.0	lpm	14.13		s left:	1.1.1	lpm 14.1	
17.5 lpm Flow Rate	as fo		7.5	lpm	17.4		s left:		Ipm 17.4	
Manual Spa	PM10 pa PM1 PM10 an Membra	0 drip jan bug scree nne Test	ip clean: r empty: en clear:	as as	found found found found	Y Y Y	as left as left as left as left Pu			
Expected Span Mass (	the second s	0.88	the second s		Flow Rate	e Va	acuum	Qua	lity Categ	ory
Measured Span Mass (	and the second se	0.8	86		14.0 - 15.	0 1	/alue	Good /	Marginal	/ Poor
Difference (	mg/cm2) :	0.0	01		(lpm)	1. 1. 1. 1. 1.	(Hg)			
% Difference / 🦉	ass or Fail:	0,11			14.5		1.8	Mara	ronal	
	<u></u>		tup and C	alib	ration Va	lues		6	)	
Parameter Expect			rameter		Expected	Found	l Pa	arameter	Expected	Found
Clock 0945		A	nalog Mo	de	Hourly	Hourl	- Fl	ow Type	Actual	Act
Location 3	3		Baud Ra	ite	9600	9600	Res	tart Voltage	12.5 v	12.5
	rs 24hrs	1	<b>RH</b> Setpo		45%	45%	Std	Cond Temp	25 C	250
Tape Advance 24 h	1000 C C C C C C C C C C C C C C C C C C	1 m 1			15 C	15C		DAC	8.0 v	8.0
Realtime Avg 60 mi	00111		a T Setpoi	-				Commont	No	NO
Realtime Avg 60 mi Machine Type PM-1	0 pm-11	0	RH Cont	rol	On	On		l Connect	NU	100
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Realtime Avg 60 mi Machine Type PM-1	0 pm-11	o Fl	RH Cont	rol int	On 16.7	On 16.7				
Realtime Avg 60 mi Machine Type PM-1	0 pm-11	o Fl	RH Contr ow Setpoi	rol int	On 16.7	On 16.7	Pur			
Realtime Avg 60 mi Machine Type PM-1 Analog FS 1.0 v Error	0 pm-11 1.0 J	Date	RH Contr ow Setpoi 6 Errors i	rol int n E- 4	On 16.7	On 16.7 or Log	Pur		Off	0ft
Realtime Avg 60 mi Machine Type PM-1 Analog FS 1.0 v Error	0 pm-11 1.0 J	Date	RH Contr ow Setpoi 6 Errors i Time	rol int n E-	On 16.7	On 16.7 or Log	Pur		Off	0ff



Barometric Pressure:as found: $708.4$ mmHg $706.0$ mmHg $208.4$ mmHg $708.4$	Station # DOE-			-DAIVI IV	5		×160	567	_			
Flow Audit Device Model:       BGI Delta Cal DC-1A       Serial No:       158047       Calibration Date:       2/25/2021         Ambient Temperature:       as found: $0, S$ as left: $0. S$ as left: $0. S$ as left: $2.2.3$ $C$ $0.6$ $0.5$ Barometric Pressure:       as found: $120, S$ $C$ $0.6$	Audit Date: 113	202	2		/	Audited By :	TSI	villi	ford			
Leak Check Value:a found: $0.5$ a left: $0.5$ Ambient Temperature:as found: $2.2,3 °c2.0,8 °cBarometric Pressure:as found:2.2,3 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,3 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,3 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c16.7 lpm Flow Rateas found:1.2,0 °c2.0,8 °c16.7 lpm Flow Rateas found:17.7 °c2.0,8 °c17.7 °c16.7 °c2.0,8 °c17.7 °c2.0,8 °c2.0,8 °c2.0,8 °c17.7 °c2.0,8 °$						Audit		-				
In the second s		Model:										
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17.5 lpm Flow Rateas found: $(1, 5)$ lpm $17.79$ lpmas left: $(7, 5)$ lpm $(7, 79)$ lpmMechanical Audits (Y = Yes N = No )Sample nozzle clean: as found Yas left: YTape support vane clean: as found Yas left YTape support vane clean: as found Yas left YPM10 particle trap clean: as found Yas left YPM10 bug screen clear: as found Yas left YPM10 bug screen clear: as found Yas left YPM10 bug screen clear: as found Yas left YPump TestExpected Span Mass (mg/cm2): $O, 9(11)$ Flow RateVacuumQuality CategoryManual Span Membrane TestPump TestExpected Span Mass (mg/cm2): $O, 9(11)$ H.0 41(0.6 Mavg/max)Setup and Calibration ValuesParameterExpected FoundParameter Expected FoundParameterExpected FoundParameterExpected FoundParameterExpected FoundParameterExpected FoundParameterExpected FoundParameterExpected FoundParameterExpected FoundParamet	14.0 lpm Flow Ra	ate	as four	nd: 14	O Ipr							
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Expected Span Mass (mg/cm2): $O, 9/14$ Flow RateVacuumQuality CategoryMeasured Span Mass (mg/cm2): $O, 9/11$ 14.0 - 15.0ValueGood / Marginal / PoorDifference (mg/cm2): $O, 003$ (lpm)(Hg)Good / Marginal / Poor% Difference / Passor Fail: $O, 33\%$ 14.0 $4(0.6)$ Mavg/nalSetup and Calibration ValuesParameterExpectedFoundParameterExpectedFoundClock 14551455Analog ModeHourlyHourlyFlow TypeActualLocation44Baud Rate96009600Restart Voltage12.5 v12.5 vTape Advance24 hrs24 hrsRH Setpoint15 C15 CDAC8.0 v8.0 vMachine TypePM-10RH ControlOn0nRH ConnectNoNoAnalog FS1.0 v1.0 vFlow Setpoint16.71a.7Pump ProtectOffErrorDateTimeErrorDateTime1N0 new MesSages1/(3/22.14594553614.0	Manı	al Span N	/lembrar	e Test		1		Pum	in Test			
Measured Span Mass (mg/cm2):       Parameter       O, 911       14.0 - 15.0       Value       Good / Marginal / Poor         Difference (mg/cm2):       O.003       (lpm)       (Hg)       Good / Marginal / Poor         % Difference / Passor Fail:       O.33%       14.0       410.6       Mavg/nal         Setup and Calibration Values         Parameter       Expected       Found       Parameter       Expected       Found         Clock 1455       1455       Analog Mode       Hourly       Hourly       Flow Type       Actual         Location       4       4       Baud Rate       9600       Restart Voltage       12.5 v       12.5         Tape Advance       24 hrs       24 hrs       24 hrs       RH Setpoint       15 C       15 C       DAC       8.0 v       8.0 v         Machine Type       PM-10       PM-10       RH Control       On       0n       RH Connect       No       No         Analog FS       1.0 v       1.0 v       Flow Setpoint       16.7       ILa, 7       Pump Protect       Off       OC         Machine Type       PM-10       RH Control       On       0n       R       RH connect       No       No         Analog FS				ie rest	0914	Flow Rate	el Va			lity Categ	07/	
Difference (mg/cm2): $O.003$ (lpm)(Hg)% Difference / Passor Fail: $O.33\%$ 14.0 $410.6$ MarginalSetup and Calibration ValuesParameterExpectedFoundParameterExpectedFoundClock 14551455Analog ModeHourlyHourlyHourlyFlow TypeActualLocation44Baud Rate9600 $9600^{\circ}$ Restart Voltage12.5 v12.5 vTape Advance24 hrs24 hrsRH Setpoint45%45%Std Cond Temp25 C25 CRealtime Avg60 mins $e_{0min}$ Delta T Setpoint15 C15 CDAC8.0 v8.0 vMachine TypePM-10RH ControlOn $D_{M}$ RH ConnectNoNoAnalog FS1.0 v1.0 vFlow Setpoint16.7 $16.7$ $16.7$ $16.7$ $10.7$ Pump ProtectOffErrorDateTimeErrorDateTime1No new messages $1/(3/c2.1459)$ 4444256111116116111116116111		<u> </u>		1	A. Phys. Rev. B 46 Cold. Grav. 7 as 194 (1991).							
% Difference / Passor Fail:       0.33%       14.0       410.6       Marginal         Setup and Calibration Values         Parameter       Expected       Found       Parameter       Expected       Found       Parameter       Expected       Found         Clock 1455       1455       Analog Mode       Hourly       Hourly       Flow Type       Actual       Act         Location       4       4       Baud Rate       9600       Restart Voltage       12.5 v       12.5 v         Tape Advance       24 hrs       24 hrs       RH Setpoint       45%       45%       Std Cond Temp       25 C       25 C         Realtime Avg       60 mins       60 mins       60 mins       60 mins       60 mins       0 min       No       No         Machine Type       PM-10       PM-10       RH Control       On       0 min       RH Connect       No       No         Analog FS       1.0 v       1.0 v       Flow Setpoint       16.7       16.7       Pump Protect       Off       Off         Last 6 Errors in E-BAM Error Log       Error       Date       Time       1       1       1       1       1       1       1       1       1       1       1 <td></td> <td></td> <td></td> <td>2211</td> <td>V. 111</td> <td>-</td> <td></td> <td></td> <td> </td> <td></td> <td>///001</td>				2211	V. 111	-					///001	
Setup and Calibration Values       V         Parameter       Expected       Found       Actual       Actual       Actual       Act         Location       4       4       Baud Rate       9600       9600 <sup>-1</sup> Restart Voltage       12.5 v       12.5 v<	% Differen		1		Mara	11.14)	ina)					
ParameterExpectedFoundParameterExpectedFoundParameterExpectedFoundClock14551455Analog ModeHourlyHourlyHourlyFlow TypeActualActualActualLocation44Baud Rate96009600Restart Voltage12.5 v12.5 vTape Advance24 hrs24 hrsRH Setpoint45%45%Std Cond Temp25 C25 CRealtime Avg60 mins(e0 mult)Delta T Setpoint15 C15 CDAC8.0 v8.0 vMachine TypePM-10RH ControlOnDmRH ConnectNoNoAnalog FS1.0 v1.0 vFlow Setpoint16.716.7Pump ProtectOffOffErrorDateTimeErrorDateTime1No new messages1/(3/22.145945111361511111Find5	1				and the second se				1	June		
Clock14551455Analog ModeHourlyHourlyHourlyFlow TypeActualActualLocation44Baud Rate96009600Restart Voltage12.5 v12.5 vTape Advance24 hrs24 hrs24 hrsRH Setpoint45%45%Std Cond Temp25 C25 CRealtime Avg60 mins60 mins60 mins60 mins60 mins15 C15 CDAC8.0 v8.0 vMachine TypePM-10PM-10RH ControlOn0nRH ConnectNoNoMachine TypePM-10PM-10RH ControlOn0nRH ConnectNoNoAnalog FS1.0 v1.0 vFlow Setpoint16.716.716.7Pump ProtectOff0CFLast 6 Errors in E-BAM Error LogErrorDateTimeErrorDateTime1No new messages1/(3/22,145941112516111136111111	Parameter	Expected	Found	1				Par	ameter	Expected	Found	
Location $\mathcal{Y}$ $\mathcal{Y}$ Baud Rate9600 $9600^{\circ}$ Restart Voltage12.5 v12.5 vTape Advance24 hrs $24 hrs$ $24 hrs$ RH Setpoint45% $45\%$ $45\%$ Std Cond Temp25 C $25 c$ Realtime Avg60 mins $60 mins$ $60 mins$ $60 mins$ $100 min$ Delta T Setpoint15 C $15 c$ DAC $8.0 v$ $8.0 v$ Machine TypePM-10RH ControlOn $0m$ RH ConnectNo $NO$ Analog FS $1.0 v$ $t. ov$ Flow Setpoint $16.7$ $16.7$ $16.7$ Pump ProtectOffLast 6 Errors in E-BAM Error LogErrorDateTime $1 No new messages$ $1/(3/22) 1959$ 425555361	Clock	1455	1455	A	nalog Mod			y Flo	w Type			
Tape Advance24 hrs $24 hrs$ RH Setpoint45% $45\%$ $45\%$ Std Cond Temp $25 \text{ C}$ $25 \text{ C}$ Realtime Avg60 mins $40\%$ Delta T Setpoint15 C $15 \text{ C}$ DAC $8.0 \text{ v}$ $8.0 \text{ v}$ Machine TypePM-10PM-10RH ControlOn $0\mu$ RH ConnectNo $No$ Analog FS $1.0 \text{ v}$ $1.0 \text{ v}$ Flow Setpoint $16.7$ $16.7$ $16.7$ Pump ProtectOff $OCF$ Last 6 Errors in E-BAM Error LogErrorDateTime1NoNoS $1/(3/22, 1459)$ 425 $6$	Location	4	4		Baud Rat	e 9600	9600	Resta	rt Voltage	12.5 v		
Realtime Avg60 mins $(eO_{MVM})$ Delta T Setpoint15 C $i \leq C$ DAC8.0 v8.0 vMachine TypePM-10PM-10RH ControlOn $O_M$ RH ConnectNoNOAnalog FS1.0 vt. $ov$ Flow Setpoint16.7 $ L_0, 7 $ Pump ProtectOffOCFLast 6 Errors in E-BAM Error LogErrorDateTimeErrorDateTime1 No new messages $t/(3/22, 1459)$ 4444256644	Tape Advance	24 hrs	24 445	1.00	RH Setpoin	t 45%						
Machine Type     PM-10     PM-10     RH Control     On     On     On     RH Connect     No     No       Analog FS     1.0 v     1.0 v     1.0 v     Flow Setpoint     16.7     10,7     Pump Protect     Off     OCF       Last 6 Errors in E-BAM Error Log       Error     Date     Time     Error     Date     Time       1 No new messages     1/(3/22.1459     4     1     1       3     6     1     1     1     1	Realtime Avg	60 mins	60mm	Delt	a T Setpoin	t 15 C		1.200			the second se	
Analog FS     1.0 v     1.0 v     Flow Setpoint     16.7     Ile, 7     Pump Protect     Off     Off       Last 6 Errors in E-BAM Error Log       Error     Date     Time     Error     Date     Time       1 No new messages     1/(3/22/1459/4     6     6     6	Machine Type	PM-10	PM-10			the second s	1	RH				
Last 6 Errors in E-BAM Error Log           Error         Date         Time         Error         Date         Time           1 No new messages         1/(3/22 1459         4         1	Analog FS	1.0 v	1.0V	Fl	ow Setpoin	t 16.7	1	Pum	p Protect	Off	OFF	
Error         Date         Time         Error         Date         Time           1 No new messages         1/(3/22.1459         4         1		1		Last	6 Errors in	E-BAM Err						
1 No new messages 1/13/22 1459 4 2 5 3 6	Erro	or	1					1	Date	Time		
2 <i>0</i> 5 3 6	1 No new mes	ssages		1/13/22	1459	4						
3 6	2	0		1						1		
	3											
	Audit Notes:				1					1		



**E-BAM Monthly Audit and Maintenance** Station # DOE-4 Serial # NA Audit Date: 2/21/2022 Audited By: TS willi ford Flow Audit Flow Audit Device Model: BGI Delta Cal DC-1A Serial No: 158047 **Calibration Date:** 2/25/2021 Leak Check Value: as found: as left: E-BAM Ref. Std. E-BAM Ref. Std. Ambient Temperature: as found: <sup>0</sup>C °c as left: °C °C Barometric Pressure: as found: mmHg as left: mmHg mmHg mmHg 16.7 lpm Flow Rate as found: Ipm as left: lpm lpm lpm 14.0 lpm Flow Rate as found: Ipm Ipm as left: Ipm lpm 17.5 lpm Flow Rate as found: lpm pm as left: lpm lpm Mechanical Audits ( Yes N = No) Sample nozzle clean. asford as left Tape support vane clean as found as left Tape spool covers as found ht. b as left PM10 particle trop as found as left o ja re npty: as found as left en clear: PM 0 bug s as found as left Manual Span M ane lest -111 **Pump Test** Expected Span Mas Flow Rate Vacuum Quality Category Measured Span Mass m 14.0 - 15.0 Value Good / Marginal / Poor 1 n s/cm2) Difference (lpm) (Hg) %0 iff rence / Pas s or/ hil: Setup and Calibration Values Paramete Expected Found Parameter Expected Found Parameter Expected Found Clock Analog Mode Hourly Flow Type Actual Locatio **Baud Rate** 9600 **Restart Voltage** 12.5 v Tape Advance 24 hrs **RH** Setpoint 45% Std Cond Temp 25 C Realtime Avg Delta T Setpoint 60 mins 15 C DAC 8.0 v Machine Type PM-10 **RH** Control On **RH** Connect No halog FS 1.0 v Flow Setpoint 16.7 **Pump Protect** Off Last 6 Errors in E-BAM Error Log Error Date Time Error Date Time 1 4 5 6 Audit Notes: There is no audit data for DOE-4 because no unit is running.

Two units are in the shop so no spare is available

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Baseline Air Monitoring Program - DOE E-BAM Monthly Audit and Maintenance

Station # Dol	E-U		E-BAM	Monthly A									
Audit Date: 3/2	3/202	7.			Serial # Audited By		.3311		1				
	<u></u>			Fla	w Audit	· <u> </u>	<u>&gt;.u</u>	illiford	21				
Flow Audit Device	Model	BGLDe	Ita Cal E		and the second	1 4 4 4	0.11			<u> Carlos e</u>			
					Serial No: 1444 Calibration Date: 6/11/2021								
		45		0.4			asier	t: <u>0.4</u>					
E-BAN					Ref.	and the second design of the		E-BAM	Ref. Std.				
Ambient Temperat					°C 26.2		as left:	27.1	°C 26.				
Barometric Pressure: as for 16.7 lpm Flow Rate as for			-	<u>08.7 mm</u>		Contraction of the local division of the loc	as left:	the second s		.5 mmł			
14.0 lpm Flow R		as fo as fo		and the second se	m 16.86		as left:		Ipm 16.9				
17.5 lpm Flow R			-		im 14.18	Contraction of the local division of the loc	as left:		1pm 14.				
27.5 Ipin 16W I		as 10		7.5 Ir nanical Audi	m 17.66		as left:	17.5	lpm 17.	66 lp			
		PM10 pa PM10 PM10 k	rticle tra 0 drip ja oug scree	ap clean: r empty:	as found as found as found as found	Y Y Y Y	as left as left as left as left	Ý					
	al Span I		and the second se		100		Pı	ump Test					
Expected Span Mass (mg/cm2): 0.915						Flow Rate Vacuum Quality Category							
Measured Span N	The second s		0.9		14.0 - 15	.0	Value	Good /	' Marginal	/ Poor			
				8% 0,00	3 (lpm)		(Hg)						
% Difference / Pass or Fail: 0.88%					14.4								
			the second s	etup and Ca	libration Va				1.000				
	Expected			arameter	Expected	Found	d P	arameter	Expected	Found			
	1131	131	A	Analog Mod		Houri	m F	low Type	Actual	Act			
Location	4	4		Baud Rat		abox		tart Voltage	12.5 v	72.5V			
Tape Advance	24 hrs	24hr	Dal	RH Setpoin		45%		Cond Temp	25 C	256			
Realtime Avg Machine Type	PM-10			ta T Setpoin RH Contro		15 C°		DAC	8.0 v	8.01			
Analog FS	1.0 v	PM-10 1.0 v	Provenue and	low Setpoin		on		H Connect	No	NO			
						16.7		mp Protect	Off	Off			
Free		T		t 6 Errors in	E-BAM Erro	0							
Erro		21-22-22	Date	Time	a	Erro	or		Date	Time			
No new mes	sages		3/23/22	100 1-	4 5								
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					5								