EPA Concern #1

Qualification of Station B as the designated point of compliance for the radionuclide NESHAP in 40 CFR Part 61, Subpart H.

DOE Response

The purpose of the Interim Ventilation System (IVS) is to increase filtration airflow. It will utilize two skid-mounted fans and high-efficiency particulate air (HEPA) filtration units to achieve a total ventilation flow of approximately 114,000 cubic feet per minute (cfm). The IVS exhaust air will exit the system through HEPA filters and will be sampled at Station B for radioactive particulates prior to release to the atmosphere. The emission point (exhaust stack) for the upgraded system will be the same as the exhaust point for the existing filtration system, and as labeled in the attached Figure 1. The air-sampling point for the original exhaust-air filtration system and the IVS system will continue to be referred to as Station B, shown in Figure 1.

Station B is the designated sampling point for calculating compliance with Title 40 Code of Federal Regulations (CFR) Part 61, Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities* (EPA 2002), implemented through the 1995 Memorandum of Understanding Between the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) (DOE 1995) and 40 CFR Part 191, Subpart A, *Environmental Standards for Management and Storage* (EPA 1993). Prior to the IVS being put into service, Station B will be qualified in accordance with ANSI/HPS N13.1-1999, *Sampling and Monitoring Releases of Airborne Radioactive Substances from the Stacks and Ducts of Nuclear Facilities* (ANSI 1999), to ensure measurements taken there remain representative of filtered repository exhaust.

Station B will undergo Coefficient of Variation (COV) testing, which will be documented in the Qualification Report, *Evaluation of Duct Mixing and Sampling System for Interim Ventilation System at the Waste Isolation Pilot Plant*. The draft Qualification Report has been prepared and will be finalized in the early spring of 2016. On February 8, 2016, the DOE emailed the EPA a copy of the draft Qualification Report minus the pending COV testing results. A copy of the final Qualification Report will be provided to the EPA when available.

EPA Concern #2

Monitoring of the exhaust from the underground, including plans for restoring continuous radiological monitoring of the underground.

DOE Response

Title 40 CFR Part 61.92, *Standard*, states,

> *Emissions of radionuclides to the ambient air from Department of Energy facilities shall not exceed those amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/yr* (EPA 2002).

Title 40 CFR Part 61.93, *Emission Monitoring and Test Procedures*, section (b)(4)(i) states,

> *Radionuclide emission measurements in conformance with the requirements of paragraph (b) of this section shall be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent in excess of 1% of the standard* (EPA 2002).

The estimated abated dose to the Maximally Exposed Offsite Individual (MEOSI) was calculated assuming the source term of the breached drum of the February 2014 radiological event. This source term calculation assumed that all radioactive material was released from the breached drum during normal operations. It does not take credit for control devices and assumes the breached drum remained in the Waste Isolation Pilot Plant (WIPP) underground unsealed. As identified in *Regulatory Assessment of Adding Interim Ventilation, Attachment C, 40 CFR 61 Appendix D Calculation for Breached Drum*, the estimated abated EDE to the MEOSI is 1.0E-04 mrem/yr, which is less than the exemption limit of 0.1 mrem/yr (Chavez 2014). Therefore, only periodic confirmatory measurement is needed to verify the low emissions and satisfy the requirements of 40 CFR Part 61, Subpart H and 40 CFR Part 191, Subpart A.

Currently, and with the addition of the IVS, exhaust air from the WIPP underground is routed through HEPA filtration units that are upstream of Station B. Effluent monitoring of the filtered exhaust air is conducted using a shrouded probe at Station B, which is the sampling point of record for air exhausted from the WIPP underground. The WIPP facility uses skid-mounted Fixed Air Samplers (FASs) at the effluent air monitoring Station B, shown in Figure 2, to collect representative samples of airborne particulates. These FAS filter samples are collected daily. To ensure uniform methods are employed to collect, package, and transport FAS filters, sample collection is performed according to approved and controlled operating procedures. There are two FAS filter sampling procedures; WP 12-HP1305, *Air Sampling Equipment* (NWP 2014) and WP12-HP3500, *Airborne Radioactivity* (NWP 2015). Filter samples are typically analyzed for gross alpha and beta activity. The effluent air sample filters are combined into a composite by Radiological Control and Site Environmental Compliance personnel and submitted to the WIPP Laboratories for isotopic analysis. The list of radioisotopes analyzed for the WIPP Effluent Monitoring Program includes Sr-90, Cs-137, U-233/234, U-238, Pu-238, Pu-239/240, and Am-241. The filter sample results are published annually and biennially in the following reports:

- *Waste Isolation Pilot Plant Annual Site Environmental Report (ASER)*, as required by DOE Order 231.1B(4)(a), *Reporting Annual Site Environmental Information* (DOE 2011)
- *Annual Periodic Confirmatory Measurement NESHAP Compliance Report*, as required by 40 CFR Part 61.94, *Compliance and reporting* (EPA 2002)
- *Waste Isolation Pilot Plant Biennial Environmental Compliance Report (BECR)*, as required by the WIPP Land Withdrawal Act as amended by Public Law 104-201, Section 9(a)(2), Periodic Oversight by Administrator and State (U.S. Congress 1996)

Upon qualification of the Station B sampling location with the addition of exhaust air from the IVS, Station B will continue to be the designated point of record with 40 CFR §61,

Subpart H and 40 CFR §191, Subpart A. In addition to the effluent monitoring conducted at Station B, a Canberra iCAM Alpha Continuous Air Monitor is operated per 10 CFR Part 835, *Occupational Radiation Protection* (DOE 1993), and is used to demonstrate the effectiveness of the HEPA filtration. Figure 2 is a schematic diagram of the Station B fixed air samplers and Canberra iCAM. The Station B iCAM is monitored by personnel in the WIPP facility Central Monitoring Room (CMR), fulfilling the objective to detect unplanned releases to the atmosphere. Procedure 12-HP1325, *Station B Canberra iCAM Alpha Continuous Air Monitor*, addresses set points for the Alpha alarm (NWP 2016a). Further, iCAM-HDs Alpha/Beta Continuous Air Monitors will be placed at the bottom of the salt shaft, S-400 near E-300, S-700 near E-300, S-1300 near E-300, S-1950 near E-140, S-1950 near W-30, S-1950 near W 170, Panel 6 inlet, and Panel 6 outlet. In addition, two iCAM-HDs will be placed at the Panel 7 exhaust to notify underground workers of any potential radioactive material releases. The Panel 6 and 7 monitors are scheduled to be networked to the CMR by the end of calendar year 2016. The plant-installed iCAM-HDs are not considered portable, thus installation locations will be long-term and will be controlled by the Engineering Configuration Management process. Except for the waste panel locations noted above, most iCAM-HDs will be within non-waste handling areas of the mine, near transition areas to the waste handling side (i.e. air locks, vents and regulators). The iCAM-HDs will remain at the locations where they are installed until there is a change in the underground ventilation configuration that would necessitate their relocation. Generally, final panel closure means iCAM-HDs can be removed from that location. In the case of Panels 6 and 7, the use of iCAM-HDs will be evaluated on an individual basis, and will only be removed when it is determined that there is no longer a need.

EPA Concern #3

Testing of interim and supplemental ventilation units, including ramp-up procedures and testing criteria (e.g., equipment settings, sequencing and evaluation).

DOE Response

The IVS start-up testing will be done in accordance with the Work Control Document (WCD), *IVS Start-up and Test Procedure (*WCD#1511214). The procedure provides instructions for performing start-up testing of the IVS as a modification to the existing Underground Ventilation System (UVS). This will include instrumentation and control, fans, filter units, and dampers. Integrated functional testing of these components will be completed prior to IVS start-up testing and in accordance with the work document, *Functional Testing of Control Panel 413-CP-32103 for the Interim Ventilation System* (WCD#1616256). The scope of the start-up test will include: inspection of components, testing of components with ventilation flow isolation from the UVS, testing of components with exhaust ventilation flow connected to the filtration exhaust duct at Station B (intake isolated from UVS), and testing of components with intake and exhaust ventilation flow connected to the UVS. These WCDs are currently in review and at present are still being revised.

The IVS start-up test will verify that the 960A and 960B fans, shown in Figure 1, will provide a nominal flow of 27,000 cfm each. The differential pressure across the filter bank, including moderate and high efficiency filters, and HEPA filters, will be verified against the manufacturer's initial resistance values using the local indicating transmitters. Airflow distribution will be performed for the HEPA filter units. Indications for damper

positions, filter differential pressure, fan flow, and Variable Frequency Drive speed will be verified at the local control panel for the IVS and remotely at the CMR. Control logic permissive and interlock conditions for start and stop sequences will be verified in WCD #1511214, including fail-safe configurations of dampers and fans. Fault and common trouble alarms will be verified at the local control panel and remotely at the CMR, using simulation steps in WCD #1511214.

EPA Concern #4

Control of exhaust streams during testing to ensure no release of unfiltered exhaust to the surface.

DOE Response

The IVS start-up testing will be performed in two phases, cold start-up and hot start-up. The ductwork for the IVS is currently isolated from the UVS by blind flanges installed in the ductwork. This includes the duct tie-in section at the B-700A fan inlet duct, which will connect the IVS to the Exhaust Shaft, and the duct tie-in section at the B-860C fan discharge duct, which will connect the IVS to the Station B discharge duct, as shown in Figure 1. During cold start-up testing, the IVS ductwork will remain physically isolated at the 700A fan duct tie-in, to prevent underground exhaust air from flowing through the IVS filter units. The cold start-up test is a comprehensive test of the IVS components to ensure the system is ready to exhaust air from the underground. In-place leak testing of the HEPA filters will be performed according to ASME N510, *Nuclear Air Treatment Systems*, prior to hot start-up testing (ASME 2007). The in-place leak test will use aerosol challenge testing to verify the removal efficiency of the system. During the hot start-up testing, the IVS intake ductwork will be connected to the UVS and configured to exhaust air from the underground. The hot start-up testing will verify several of the same performance parameters as the cold testing. The UVS will undergo a final test and balance with the IVS in operation as final commissioning of the system for regular operation and use. This will complete start-up testing of the IVS.

EPA Concern #5

Operating parameters during normal and off-normal situations.

DOE Response

Normal operation and abnormal conditions for the IVS will be addressed in WIPP facility standard operating procedures (SOPs). The following SOPs will also be validated before system turnover to WIPP Facility Operations and will be available for EPA review upon completion.

- WP 04-VU2001, *Normal Interim Ventilation System Operations (currently being developed)*
- WP 04-VU2003, *Abnormal Interim Ventilation System Operation (currently being developed)*
- WP 04-VU4605, *UVFS Alarm Response (NWP 2016b)*

Normal operating parameters will include nominal fan flow, differential pressure across each filter bank, damper position indications, and underground differential pressures.

References

American National Standards Institute (ANSI). 1999. *ANSI N13.1-1999, Sampling and Monitoring Releases of Airborne Radioactive Substance from the Stacks and Ducts of Nuclear Facilities*. January 12, 1999. Health Physics Society.

American Society of Mechanical Engineers (ASME). 2007. *ASME N510, Testing of Nuclear Air Treatment Systems.*

Chavez, R.R. 2014. Letter (with Enclosures) to Mr. G. T. Basabilvazo, Director (Subject: *Regulatory Assessments and Presentations for Recovery-Driven Ventilation Changes.*) September 8, 2014. RES:14:180.

Nuclear Waste Partnership LLC (NWP). 2014. *Air Sampling Equipment (Rev. 12).* WP 12-HP1305. January 16, 2014. Carlsbad, NM: Carlsbad Field Office.*

Nuclear Waste Partnership LLC (NWP). 2015. *Airborne Radioactivity (Rev. 21).* WP 12-HP3500. November 24, 2015. Carlsbad, NM: Carlsbad Field Office.*

Nuclear Waste Partnership LLC (NWP). 2016a. *Station B Canberra iCAM Alpha Continuous Air Monitor (Rev. 5).* WP 12-HP1325. February 15, 2016. Carlsbad, NM: Carlsbad Field Office.*

Nuclear Waste Partnership LLC (NWP). 2016b. *UVFS Alarm Response (Rev. 32).* WP 04-VU4605. February 15, 2016. Carlsbad, NM: Carlsbad Field Office.*

Nuclear Waste Partnership LLC (NWP). *The IVS Start-up and Test Procedure.* Waste Isolation Pilot Plant Work Control Document #1511214.

Nuclear Waste Partnership LLC (NWP). *Functional Testing of Control Panel 413-CP-32103 for the Interim Ventilation System.* Waste Isolation Pilot Plant Work Control Document #1616256.

U.S. Congress. 1996. Public Law 102-579. *The Waste Isolation Pilot Plant Land Withdrawal Act, as amended by Public Law 104-201.*

U.S. Department of Energy (DOE). 1993. *10 CFR Part 835: Occupational Radiation Protection.* Federal Register, vol. 58 (December 14, 1993): 65485.

U.S. Department of Energy (DOE). 1995. Letter to E. Ramona Travato, Director (Subject: *Memorandum of Understanding Between the U.S. Environmental Protection Agency and the U.S. Department of Energy concerning the Clean Air Act Emission Standards for Radionuclides 40 CFR Part 61 Including Subparts H, I, Q, & T.*) May 16, 1995.

U.S. Department of Energy (DOE). 2012. *DOE O 231.1B Admin Chg 1, Environment, Safety and Health Reporting.* November 28, 2012.

U.S. Environmental Protection Agency (EPA). 1993. *40 CFR Part 191, Subpart A: Environmental Standards for Management and Storage.* Federal Register, vol. 58 (December 20, 1993): 66398.

* Indicates a reference provided with this enclosure

U.S. Environmental Protection Agency (EPA). 2002. *40 CFR Part 61, Subpart H: National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities.*" Federal Register, vol. 67 (September 9, 2002): 57166.

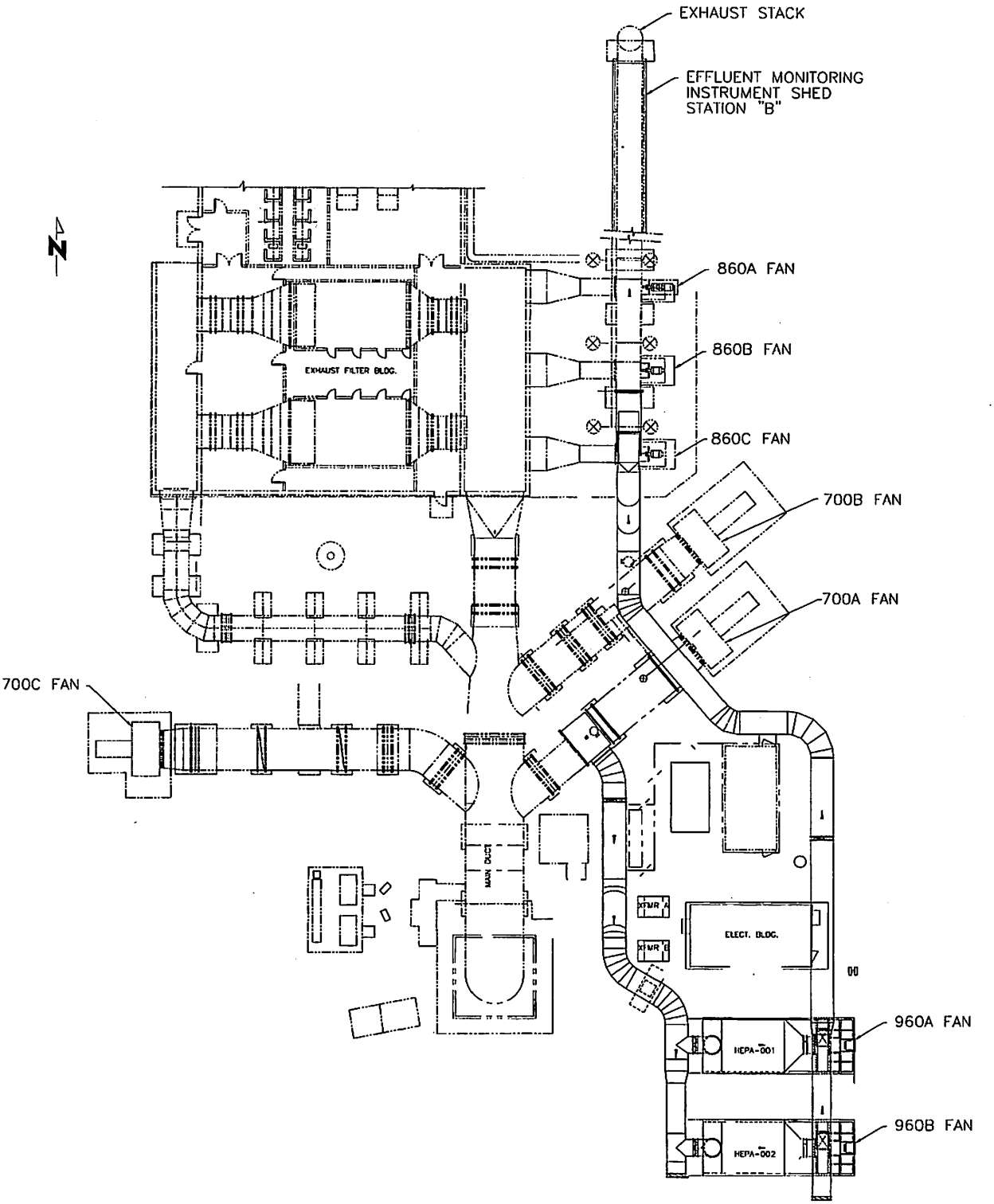

Figure 1 - Emission Point (Exhaust Stack), Station B and Fans

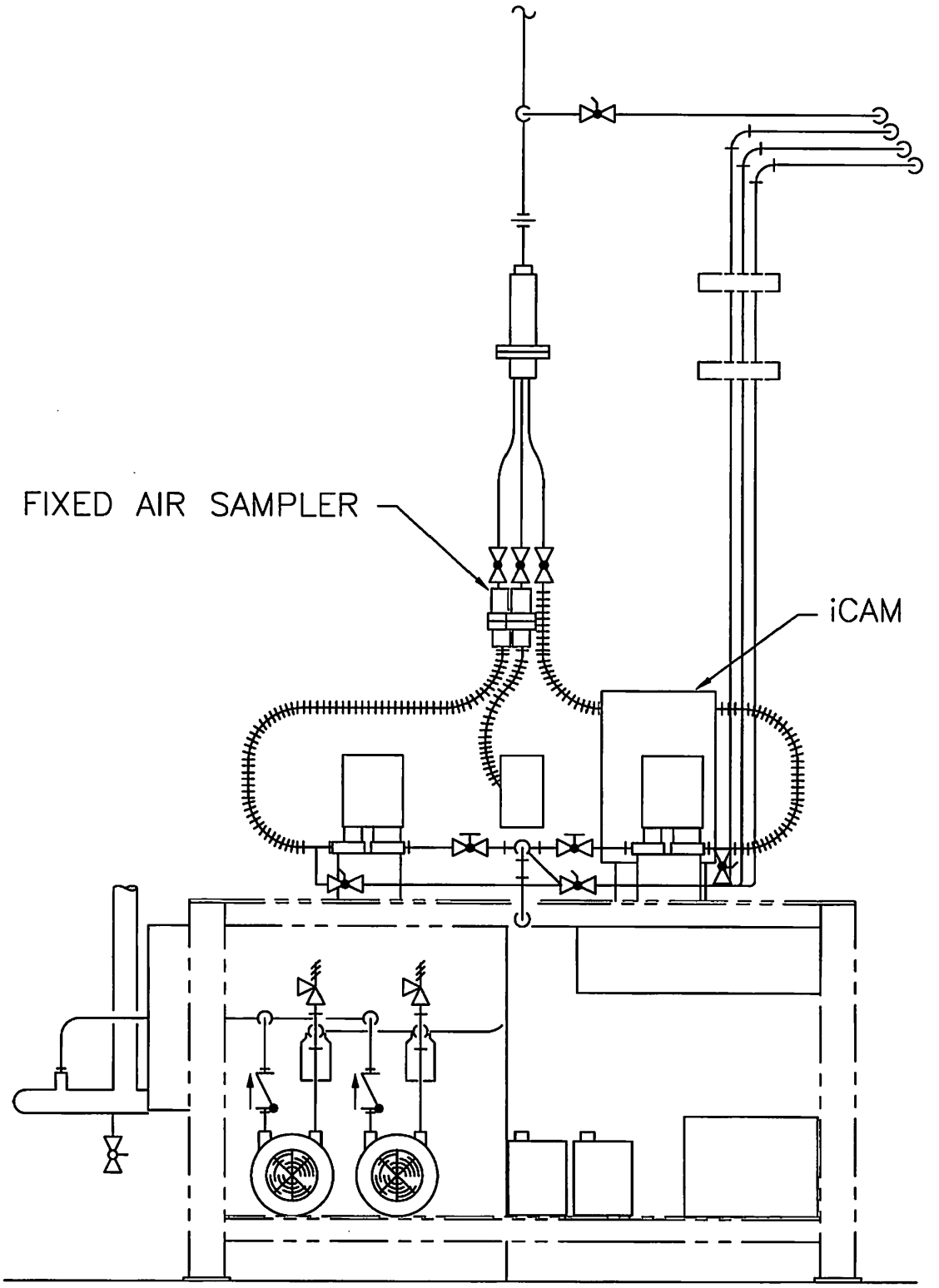

Figure 2 - Station B (Fixed Air Samplers and Canberra iCAM)