

**EMISSIONS INVENTORY TEST PROTOCOL
FOR
EVALUATION OF THE IBC LD NO.'S 1-3, IBC RETAIL, AND
REPROCESSING PROCESSES**

**ALUF PLASTICS
ORANGEBURG, NEW YORK**

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1.0 PROJECT OVERVIEW / BACKGROUND INFORMATION

1.1 INTRODUCTION

An emissions inventory test program (stack testing) will be performed on the four (4) Internal Bubble Cooling (IBC) outlet locations and the outlet of the Reprocessing (Repro) process at the Aluf Plastics (Aluf) facility in Orangeburg, New York. The purpose of this test program is to provide emissions information to aid in developing a response to the New York State Department of Environmental Conservation's request.

This protocol describes the sources, the sampling locations, the technical approach and test methods, and all other details pertaining to the compliance evaluation.

MAQS-EASTON (Montrose) has been retained by KEMS LLC to perform the emissions inventory testing for Aluf's IBC and Repro processes. Montrose has prepared this test protocol and will perform the emissions inventory testing program in accordance with this document. This protocol describes the sources, the sampling locations, the technical approach and test methods, and all other details pertaining to the compliance evaluation.

1.2 PROGRAM RESPONSIBLE PARTIES

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1.3 HEALTH AND SAFETY INFORMATION

WSP and its subcontractors hold the health and safety of its employees and clients as the highest priority. WSP and its subcontractor personnel undergo safety training upon hire and periodically during their employment, with the goal of providing the individual with the knowledge and skills they need in order to work in accordance with applicable OSHA regulations and/or client safety requirements.

At Aluf Plastics, there are no specific air-quality related health and safety concerns, and Level D personal protective equipment (PPE) is appropriate. This includes steel-toe boots, safety glasses and hard hats. Since a fall prevention cable will need to be utilized to access the outlet locations of IBC LD No.'s 1 and 2, safety lanyards and harnesses will be needed at these locations.

2.0 SOURCE INFORMATION

2.1 FACILITY AND PROCESS DESCRIPTION

Aluf Plastics specializes in the making of plastic products, specifically bags for various clientele. Aluf Plastics utilizes two different types of processes to make their products. The first is an internal bubble cooling (IBC) operation that utilizes raw materials to produce their final product. The second is a reprocessing process that utilizes recycled materials to generate their final product. The emissions from both process types are captured and then controlled by cyclones, HEPA filters, and carbon media prior to being emitted.

2.2 PROCESS DATA

During each test run, facility personnel will record any pertinent process or control equipment data for inclusion in the final test report. This data will help determine the operating conditions of the processes and control equipment during the testing.

3.0 SAMPLING LOCATIONS

Sample locations have been previously verified to conform to the measurement requirements of USEPA Method 1. Acceptable cyclonic flow conditions will be confirmed prior to testing using USEPA Method 1, Section 11.4. Table 1 presents the anticipated stack measurements and traverse points for the sampling locations listed. Actual stack measurements, number of traverse points, and location of traverse points will be re-evaluated in the field as part of the test program. Attachment 1 contains diagrams of the proposed sampling locations.

Please note the following issues associated with the inlet sampling locations for these emission units:

- The inlet ductwork associated with IBC LD No.'s 1–3, and Retail do not have adequate straight runs of ductwork to meet EPA method 1 criteria. These locations also do not have adequate sampling clearances due to surrounding equipment.
- The IBC Repro Inlet duct is located at an angled orientation and the materials of construction are such that the stack can't support the source sampling equipment. Due to these issues, a superstructure surrounding the sample location would need to be constructed in order to provide safe access for the sampling equipment. The costs associated with this construction make it cost prohibitive to sampling at this location for the purposes of this testing (outlet mass emission rates).

Due to the sample location issues stated above, the test methods included in this protocol cannot be performed without significant modification. These modifications will result in significant biases to the data that would result from the inlet testing bringing the validity of the test results into question. Therefore, inlet testing is not included in this test program.

Please see Attachment 3 of this protocol (Aluf site plan) schematically illustrating the location of the five outlet stacks.

TABLE 1: SUMMARY OF ANTICIPATED SAMPLING LOCATIONS

Sampling Locations	Stack ID	Distance from nearest flow disturbance		Number of Isokinetic Traverse Points
		Upstream EPA "A"	Downstream EPA "B"	
IBC LD 1 Outlet	23 inches	250 inches (10.87 duct diameters)	48 inches (2.09 duct diameters)	Twenty-four (twelve per port) maximum
IBC LD 2 Outlet	23 inches	300 inches (13.04 duct diameters)	48 inches (2.09 duct diameters)	Twenty-four (twelve per port) maximum
IBC LD 3 Outlet	22.5 inches	>250 inches (>11.11 duct diameters)	>250 inches (>11.11 duct diameters)	Twenty-four (twelve per port) maximum
IBC Retail Outlet	23 inches	250 inches (10.87 duct diameters)	52 inches (2.26 duct diameters)	Twenty-four (twelve per port) maximum
IBC Repro Outlet	23 inches	250 inches (10.87 duct diameters)	48 inches (2.09 duct diameters)	Twenty-four (twelve per port) maximum

4.0 TEST PROGRAM AND METHODS

4.1 SUMMARY

The proposed emissions inventory test program will be performed for the parameters specified in the Aluf Plastics Inc., "Exhaust Concentrations vs. Odor Thresholds for Known or Potential Emissions" table as well as the additional compounds detailed in an email received from Mr. Syed Mehdi dated April 3, 2017 (please see Attachment 2 to this protocol). Three, sixty (60) minute test runs will be performed at all of the outlet locations. All test methods proposed for this compliance program conform to those promulgated by USEPA or those specified by the NYSDEC. Table 2 summarizes the pollutants and methodologies that will be utilized for this test program.

TABLE 2: TEST PARAMETERS AND METHODS

Sampling Locations	Parameters	USEPA Test Method	Duration (minutes)	Minimum Analytical Detection Limit	Reporting Units
IBC LD No.'s 1-3, Retail, and Repro Outlet Stacks (five total)	Velocity / Volumetric Flow Rate*	USEPA Methods 1 & 2	---	---	acfm, scfm, dscfm
	Moisture	USEPA Method 4	60 minutes	---	%
	Various VOCs (see Table 3 for analytes)	EPA Method TO-15 w/ additional TO-3 Analysis	~60 minutes	~100 ppbv	lb/hr for detectable compounds
	Aldehydes and Ketones (see Table 4 for analytes)	SW846 Method 0011	60 minutes	~1 ppbv	lb/hr for detectable compounds
	Hydrogen Cyanide	OTM-029	60 minutes	~0.1 ppbv	lb/hr
	Carbon Disulfide	EPA Method 15	60 minutes	~0.20 ppmv	lb/hr
	Acrolein (Bag) Acrylic Acid (XAD-2) Acetic Acid (Silica Gel) Formic Acid (Silica Gel)	EPA Method 18	60 minutes	~1 ppbv	lb/hr for detectable compounds

* Since the processes emits essentially ambient air, per section 8.6 of EPA Method 2 a dry molecular weight of 29.0 will be utilized in the volumetric flow rate calculations.

acfm: actual cubic feet per minute
dscfm: dry standard cubic feet per minute
lb/hr: pounds per hour
ppmv: parts per million by volume

scfm: standard cubic feet per minute
%: percent
ppbv: parts per billion by volume

TABLE 3: TO-15 / TO-3 ANALYTE LIST

Method	Pollutant		CAS #	
TO-3	Methane		74-82-8	
	Ethane		74-84-0	
	Propane		74-98-6	
	Butane		106-97-8	
	n-Pentane		109-67-1	
	n-Hexane		110-54-3	
	CAS #		CAS #	
TO-15	Acetonitrile	75-05-8	Dibromochloromethane	124-48-1
	Acrylonitrile	107-13-1	1,2-Dibromoethane	106-93-4
	Allyl chloride	107-05-1	1,2-Dichlorobenzene	95-50-1
	Benzene	71-43-2	1,3-Dichlorobenzene	541-73-1
	Benzyl chloride	100-44-7	1,4-Dichlorobenzene	106-46-7
	Bromodichloromethane	75-27-4	1,1-Dichloroethane	75-34-3
	Bromoethene	593-60-2	1,2-Dichloroethane	107-06-2
	Bromoform	75-25-2	1,1-Dichloroethene	75-35-4
	Bromomethane	74-83-9	cis-1,2-Dichloroethylene	156-59-2
	1,3-Butadiene	106-99-0	trans-1,2-	156-60-5
	Carbon tetrachloride	56-23-5	Dichloroethylene	78-87-5
	Chlorobenzene	108-90-7	1,2-Dichloropropane	542-75-6
	Chloroethane	75-00-3	cis-1,3-Dichloropropene	10061-02-6
	Chloroethene	75-01-4	trans-1,3-Dichloropropene	123-91-1
	Chloroform	67-66-3	1,4-Dioxane	64-17-5
	Chloromethane	74-87-3	Ethanol	141-78-6
	2-Chlorotoluene	95-49-8	Ethyl acetate	78-93-3
	Cyclohexane	110-82-7	Methyl Ethyl Ketone	

TABLE 4: ALDEHYDES AND KETONES ANALYTE LIST

Method	Pollutant	CAS #
SW846 Method 0011**	2-Butenal - Crotonaldehyde	4170-30-3
	2-Nonenal	2463-53-8
	2-pentanone	107-87-9
	3-heptanone	106-35-4
	3-hexanone	589-38-8
	3-methyl-2-heptanone	2371-19-9
	7-octen-2-one	3664-60-6
	8-Nonenal	39770-04-2
	Acetaldehyde	75-07-0
	Acetone	67-64-1
	Benzaldehyde	100-52-7
	Benzaldehyde, 2-methyl	529-20-4
	Benzaldehyde, 3□and/or 4□ methyl	104-87-0
	Butanal - Butyraldehyde	123-72-8
	Butanal, 3-methyl	590-86-3
	Butyraldehyde, 3□methyl (Butanal, 3□methyl; Isovaleraldehyde)	590-86-3
	Crotonaldehyde	4170-30-3
	Decanal - Isovaleraldehyde	112-31-2
	Formaldehyde	50-00-0
	Heptanal	111-71-1
	Hexanal	66-25-1
	Hexanaldehyde	66-25-1
	n□Butyraldehyde (Butanal)	123-72-8
	Nonanal	124-19-6
	Octanal	124-13-0
	Pentanal - Valeraldehyde	110-62-3
Pentane	109-66-0	
Propanal	123-38-6	
Propionaldehyde	123-38-6	
Undecanal	112-44-7	
Valeraldehyde	110-62-3	

** Some of the pollutants included in this list do not currently have standards available. An attempt will be made to generate these standards, but the resultant analysis may be more qualitative rather than quantitative.

4.2 VELOCITY AND VOLUMETRIC FLOW RATE MEASUREMENT

SUMMARY: The volumetric flow rate for each test run conducted on the ducts associated with the IBC outlets (4 test locations) and repro outlet will be determined in accordance with USEPA Methods 1 and 2. The moisture content of the applicable gas streams will be determined in conjunction with the SW846 Method 0011 as described in USEPA Method 4. Since these test locations are comprised mostly of ambient air, a molecular weight of 29.0 will be utilized per USEPA Method 2.

CALIBRATION: Pitot tubes will be calibrated in accordance with USEPA Method 2. All new pitot tubes or those meeting the dimensions of USEPA Method 2, section 6.1, will be assigned a baseline coefficient of 0.84, per section 10.1 of this method. A pitot tube coefficient of 0.99 will be assigned to each standard pitot tube.

DETECTION LIMITS: The lower detection limit for the pitot tube/manometer measurement system is 0.01 inches of water for a standard water manometer and 0.005 inches of water for a low-flow water manometer. In lieu of the inclined water manometer, per USEPA Method 2, an electronic micro-manometer or equivalent may be used in conjunction with an S-type pitot tube if the average of velocity pressure readings is less than 0.05 inches water.

OPERATING RANGE: The standard water manometer has a range up to 10 inches with 0.01 increments. The low-flow water manometer has a range up to 0.25 inches with 0.005 increments. The electronic micro-manometer has a range up to 50 inches with 0.0001 increments.

PRINCIPLE OF OPERATION: The total stack or duct pressure will be a combination of the static and the velocity pressure. The velocity pressure, also referred to as the delta P, will be equal to the total pressure minus the static pressure.

A type S-pitot tube will be connected to a water manometer, the total pressure and the static pressure will be measured to yield the velocity pressure. The volumetric gas flow in a stack or duct will be equal to the area times the velocity.

4.3 VOC MEASUREMENT VIA TO-15

SUMMARY: Sampling of VOC will be conducted using an evacuated stainless steel canister according to Method TO-15. This method is designed for use in determining VOC in air. The sampling system consists of a subatmospheric canister, temperature indicator, timer, and a flow controller.

Emissions will be calculated for each compound detected at or above the analytical detection or reporting limit.

CALIBRATION: To verify correct sample flow, an evacuated canister is used in the sampling system. A flow controller equipped with a critical orifice is attached to the inlet

line of the manifold, just in front of the filter. The critical orifice will be setup to ensure that the proper sample volume is obtained over the course of the test duration.

PRINCIPLE OF OPERATION: In preparation for subatmospheric sample collection in a canister, the canister is evacuated to 0.05 mm Hg. When opened to the atmosphere containing the VOC to be sampled, the differential pressure causes the sample to flow into the canister.

SAMPLE RECOVERY: Canister samples will be transported from the test site to MAQS-Easton's office for transfer to Enthalpy Analytical for analysis by gas chromatography/mass spectrometry. During analysis, water vapor is reduced in the gas stream by a dryer, and the VOC are then concentrated by collection in a cryogenically-cooled trap. The cryogen is then removed, and the temperature of the trap is raised. The VOC originally collected in the trap are revolatilized, separated on a GC column, and then detected by one or more detectors for identification and quantitation. At the completion of the TO-15 analysis, the samples will then be re-analyzed following the procedures in USEPA Method TO-3.

4.4 ALDEHYDES, KETONES AND MOISTURE MEASUREMENT

SUMMARY: Emissions for acetaldehyde, ketones and those compounds listed in Table 4 will be measured in accordance with SW846-0011. Each test run will be sixty minutes in duration. Gaseous and particulate pollutants are isokinetically withdrawn from the stack and are collected in aqueous acidic 2,4-dinitrophenylhydrazine (DNPH). Aldehydes, ketones and other compounds in Table 4 present in the emissions react with the DNPH and are analyzed by high performance liquid chromatography (HPLC) according to Method 8315 or other appropriate technique at Enthalpy Analytical.

PREPARATION OF COLLECTION TRAIN: The entire sampling train is washed with detergent, rinsed with tap water, methanol and finally rinsed with methylene chloride and allowed to air dry.

Two hundred milliliters (ml) of purified DNPH reagent is placed in the first impinger, and 100 ml of reagent is placed in the second and third impingers. The fourth impinger is left empty. The fifth impinger is loaded with approximately 200 grams of silica gel. All of the impingers will be weighed before assembling and after the test to determine the stack gas moisture. Glass crossovers will be used to connect the impingers.

LEAK-CHECK PROCEDURES: A leak-check of the entire sample train will be performed prior to and after each test run. Leak checking is performed by plugging the nozzle and pulling a controlled vacuum in the sample train equal to or greater than the highest sample vacuum obtained during the test run. If the leakage rate is measured to be less than 0.02 cubic feet per minute (cfm), then it is acceptable. If the leak rate is higher, the tester shall, at the discretion of the regulatory personnel, either record the leakage rate and correct the sample volume, or void the test run.

SAMPLE TRAIN OPERATION: A single train traversing the cross-sectional area of the stack shall be used for the entire test. The sampling system will consist of a heated quartz probe liner and a stainless steel or borosilicate glass nozzle using a S-type pitot tube. The impinger train will consist of five impingers immersed in an ice bath and connected in series with glass crossovers.

SAMPLE TRAIN OPERATION: During testing, a sample rate is maintained such that it is within 10 percent of the true isokinetic. First, the manometer is leveled and zeroed. The sample train is assembled and leak checked. The initial dry gas meter volume is recorded, and the sampling train is placed at the first sampling point in the stack. At this point, the stack gas velocity, the stack temperature and initial gas meter volume are all recorded in order to establish the proper sample rate.

At each subsequent traverse point in the stack, the following data are recorded:

- the temperature of the stack gas;
- the meter system temperature(s);
- the probe temperature;
- the exit impinger temperature;
- the sampling rate.

This procedure is repeated until the end of the test run. The impinger temperatures are maintained to allow proper condensation to occur. At no time will the last (exit) impinger temperature exceed 68°F. Accordingly, ice and/or cold water is added, as necessary.

SAMPLE RECOVERY: Sample recovery is performed on-site in the mobile lab or in a clean location protected from wind, particulate or debris. The probe nozzle and liner is washed and brushed with methylene chloride into Container #1 until the rinse shows no visible particles. The impingers are disassembled and wiped free of any water or ice, and

the volume is weighed to the nearest 0.1 gram for moisture determination.

The contents of the first three impingers will be transferred to Container #1. The connecting glassware and the impingers will be rinsed three times with methylene chloride and water into Container #1. When the rinse is completed, the jar will be sealed, labeled, and the fluid level will be marked for each test run.

A separate sample blank of DNPH and methylene chloride (Container #2) will be collected for analyses. Samples will be transported from the test site to MAQS-Easton's office for assignment of chain-of-custody and transfer to Enthalpy Analytical for analysis.

4.5 ACROLEIN, ACRYLIC ACID, ACETIC ACID AND FORMIC ACID MEASUREMENT

SUMMARY: Emissions of acrolein, acrylic acid, acetic acid and formic acid will be measured in accordance with USEPA Method 18 (bag and sorbent tube approach). Each test run will be one hour in duration. Emission samples from each location will be withdrawn from the stack using sorbent tubes (acrylic, acetic and formic acids) and Tedlar gas bag (acrolein). The VOC concentrations in the sorbent tubes and gas bags will be determined using a gas chromatography/flame ionization detection (GC/FID) or other required detector.

In order to report mass-emissions, volumetric flow will be determined as part of a concurrent isokinetic sampling.

PREPARATION OF COLLECTION TRAIN: The Tedlar bags will be nitrogen purged and leak checked prior to use.

SAMPLE TRAIN OPERATION: The Tedlar bag sampling system will consist of a Teflon probe and Teflon tubing to connect the components. The sorbent tubes will be vertically orientated.

The Teflon sample probe will be connected to a lung sampler, in which a Tedlar bag with attached Teflon tubing is placed in an air-tight chamber with the tubing protruding from the chamber. The sealed chamber will then be evacuated via a pump, causing the bag to expand which draws the sample from the stack and into the bag. The lung sampler will be connected to a VOST type metering system.

A pre-sampling leak check from the probe tip to the pump outlet will be performed by

closing off the inlet to the probe and observing the leak rate. The leak rate will be less than two percent of the sampling rate of 0.5 liter per minute (lpm) or <0.01 lpm.

During testing, the pump flow rate will be set and maintained at approximately 0.5 lpm throughout the duration of the one-hour test run. At each data point, the following will be recorded:

- dry gas meter volume
- vacuum
- meter pressure
- rotameter flow rate
- metering system temperature

Following each test run, a post-test leak check will be performed on the sampling train. The leak rate will be less than two percent of the sampling rate of 0.5 lpm or <0.01 lpm. If the leak rate is higher, the run will be voided.

SAMPLE RECOVERY: Sample recovery will be performed on-site in one of MAQS - Easton's mobile laboratories or in a clean location protected from wind, particulate or debris.

ANALYSIS: Tedlar gas bag and sorbent tube samples will be transferred from the test site to the laboratory (Enthalpy Analytical) for analysis using GC/FID, or other approved approach in accordance with USEPA Method 18.

LABORATORY SPIKES:

Sorbent Tube Sampling: Due to the expected variability of the emissions for these sources, the proper sorbent tube spiking level cannot be determined prior to the sampling event. Therefore, the sorbent tubes will be spiked at a level that represents five times the detection limit for the various pollutants. The percent recovery of the spike will be reported in the final laboratory report. However, if the actual measured concentrations of the applicable analytes obscure the spiking level, the results of the analysis will be reported without a recovery correction.

Bag Sampling: After the completion of analysis, one Tedlar gas bag sample from each source will be spiked with a known mixture of the target pollutant. Prior to analysis, the spiked sample bag will be stored for the same period of time as the samples collected in the field. The percent recovery of the spike will be reported in the final laboratory report.

DATA ANALYSIS AND CALCULATIONS: Data analysis and calculations will be performed per Method 18, Sections 12.7 – 12.9.

4.6 HYDROGEN CYANIDE AND MOISTURE MEASUREMENT

SUMMARY: Stack gas will be sampled for Hydrogen Cyanide (HCn) emissions in accordance with USEPA Other Test Method (OTM) 29.

Gaseous and particulate pollutants are withdrawn from an emission source at an isokinetic sampling rate and are collected in a multi-component sampling train. The primary components of the sampling train include a heated probe, a heated filter, three impingers containing 6.0 N sodium hydroxide (NaOH) solution, and an impinger containing silica gel.

Hydrogen cyanide present in the stack gas stream reacts with the NaOH to form a cyanide ion, which is retained in the alkaline solution.

Recovered samples will then be analyzed by ion chromatography (IC) in accordance with Method OTM-29.

Key sample train components will include:

- A sized, tapered-edge, glass "button-hook" sample nozzle,
- A stainless-steel sample probe with a heated glass liner, S-type pitot tube and thermocouple,
- A heated glass filter holder with a tared borosilicate/glass filter bonded with PTFE, supported by a Teflon frit,
- An impinger train consisting of Greenburg-Smith glass impingers and connecting pieces,
- A sample control/metering system consisting of a vacuum pump, dry gas meter, sample flow controls, sample rate manometer, stack gas velocity manometer, temperature indicator and heat controllers.

PREPARATIONS: Glassware must be scrupulously cleaned. Clean all glassware as soon as possible after use by rinsing with the last solvent used. Follow this rinse by washing the glassware with hot water and detergent, and rinsing with tap water and deionized water. Drain the glassware and then rinse it using reagent grade acetone.

ONSITE LEAK-CHECK PROCEDURES: A leak-check will be performed prior to and after each test by plugging the nozzle and creating a vacuum in the sample train equal to or greater than the highest sample vacuum obtained during the test. A leakage rate no greater than 0.02 cubic feet per minute (cfm) is acceptable. If a higher leakage rate than 0.02 cfm is obtained post run, the run will be voided.

SAMPLE VOLUMES AND DETECTION LIMITS: The maximum sample volume to be collected is 1 dry standard cubic meter (dscm) (35.31 dry standard cubic feet [dscf]). Less than the maximum sample volume may be collected if prior testing indicates sufficient cyanide concentration is present in the sampled gas to meet the minimum detection limit required for the testing data quality objective or the regulatory compliance limit requirement. For this test program, the test run duration will be 60-minutes.

SAMPLE TRAIN OPERATION: During testing, a sample rate is maintained such that it is within 10 percent of the true isokinetic. First, the manometer is leveled and zeroed. The sample train is assembled and leak checked. The initial dry gas meter volume is recorded, and the sampling train is placed at the first sampling point in the stack. At this point, the stack gas velocity, the stack temperature and initial gas meter volume are all recorded in order to establish the proper sample rate.

At each subsequent traverse point in the stack, the following data are recorded:

- the temperature of the stack gas;
- the meter system temperatures;
- the probe and filter holder temperatures;
- the exit impinger temperature;
- the sampling rate.

Completion of each test run will include the following key procedures:

- Each sample point will be sampled for an equal duration.
- Probe and filter holder hotbox temperature will be maintained at $120^{\circ}\text{C} \pm 14^{\circ}\text{C}$ ($248^{\circ} \pm 25^{\circ}\text{F}$) to prevent internal moisture condensation.
- At no time will the last (exit) impinger temperature exceed 68°F . Accordingly, ice and/or cold water is added, as necessary to allow proper condensation to occur.

- All necessary temperature and sample rate adjustments (to maintain isokinetic sampling) will be made at each sample point.

SAMPLE RECOVERY: Sample recovery will be performed in the field in a suitable area that is clean and protected from external conditions. Each impinger will be weighed to 0.1 gram for moisture determination.

Measure the pH of each of the NaOH impinger solutions with pH paper or a pH meter and record the separate pH measurements on the data sheet. If the pH of the first impinger is below 12, add 10 ml of 6N NaOH and recheck the pH. Repeat this procedure until the pH is greater than 12. If the pH of the second impinger is less than 12, repeat the procedure used for impinger #1. Record the amounts of NaOH that were added. If the pH of the final NaOH impinger is less than 12, discard the samples and repeat the sample run making the appropriate adjustments to maintain a pH of >12 in the last NaOH impinger.

The nozzle and probe liner will be rinsed with acetone to remove visible particulate matter. This will be combined with the rinse of the front half of the filter housing. This rinse can be discarded if particulate matter is not being determined.

The impingers will be rinsed a minimum of three times with 0.1 N NaOH (the back half of the filter holder will not be rinsed). The final NaOH impinger will be rinsed separately from the first two NaOH impingers.

FIELD TRAIN BLANK: One field train blank will be recovered for the test program. This field train blank will be heated, but not subjected to any sampling. At the end of the test run, this field train blank will be recovered following the procedures of OTM-029.

FIELD SPIKE: A field spike will be conducted by introducing 2 mL of the Field Spike Standard into a single impinger (taken to the field expressly for this purpose, and not part of the actual stack sample) containing 100 mL of NaOH solution. Follow standard impinger recovery procedures and use the spike as a check on field handling and recovery procedures. Recovery must be +/- 20%. Retain an aliquot of the Field Spike Standard in the laboratory for comparative analysis

Reagent blanks will also be collected in separate containers.

SAMPLE SHIPMENT AND STORAGE: Samples will be labeled according to scenario and test run number. All samples will be transported from the test site to the MAQS-Easton laboratory and prepared for shipment to Enthalpy Analytical. The samples will be stored in their recovery containers until analysis.

SAMPLE ANALYSIS: The analysis will be performed at Enthalpy Analytical's laboratory following the procedures in OTM-029.

5.0 QUALITY ASSURANCE / QUALITY CONTROL INFORMATION

All sampling equipment and instrumentation to be used for this test program are calibrated per the applicable test method. Copies of all pre-test and post-test calibration data will be included in the final test report. The information presented below addresses quality assurance items not mentioned in the sections above. Additional calibration information may include but is not limited to the following:

- **Dry Gas Meters:** Dry gas meters are calibrated prior to use in accordance with USEPA Method 5, section 10.3 using a dry gas meter as described in section 16.1. Dry gas meter calibrations will be verified in the field in accordance with Alternate Method 009, unless data is not available, then post-test calibration checks will be performed as per section 10.3.2 of USEPA Method 5.
- **Pitot Tubes/Probes:** Pitot tubes and probes are calibrated in accordance with USEPA Method 2. All new pitot tubes/probes or those meeting the dimensions of USEPA Method 2, Section 6.1, are assigned a baseline coefficient of 0.84, per Section 10.1 of this method.
- **Thermocouples:** Stack temperature (pitot) thermocouple calibrations are checked after each field use in accordance USEPA Alternative Method 2 (ALT-011) by comparing the thermocouple to an ASTM mercury-in-glass thermometer at a single, convenient temperature. The thermocouple reading must agree within $\pm 2^{\circ}$ F of the thermometer reading. Stack temperature thermocouple measurement system continuity will be checked in the field prior to sampling in accordance with ALT-011 by observing that the temperature reading changes as expected upon insertion or withdrawal of the thermocouple from the stack.
- **Nozzles:** Copies of calibration data for all glass and/or stainless steel nozzles used during the test program will be included in the final report.

- **Method 4 Daily Balance Audit:** Once daily, the balance used for Method 4 impinger weight measurements will be audited with an NIST traceable weight between 500 grams and one kilogram.

6.0 TEST REPORT

The raw field data will be combined into spreadsheets to calculate the applicable test results. All field data sheets, emissions calculation spreadsheets, analytical data, calibration data and analyzer data summaries will be included in the final report. Test results will be presented in the reporting units as listed in Table 2.

Montrose will issue the emissions inventory test report within 60 days of the completion of testing. The final report will be signed by both the composer and reviewer. It will document all results of the testing program, and it will include all of the support data to independently calculate the test results. The results section will present emissions and summarize the results. Other than the title and certification pages, the main components of the report will be as follows:

1. Introduction, which includes an overview and a summary of purpose and scope;
2. A summary and discussion of results, as well as a summary of test dates and times;
3. Summary of sampling locations;
4. Sampling / analysis procedures as well as any departures from USEPA test methods;
5. Appendices.

The appendices may include but are not limited to raw field data, notes, process/production data, laboratory reports and chains of custody, calibration certificates, results summaries, calculations and spreadsheets, quality assurance data, diagrams, cyclonic flow data and a copy of the approved test protocol and related correspondence.

Protocol prepared by:



Tyson Houchin, QSTI
District Manager

Protocol reviewed by:



Thomas Weber, QSTI
Client Project Manager

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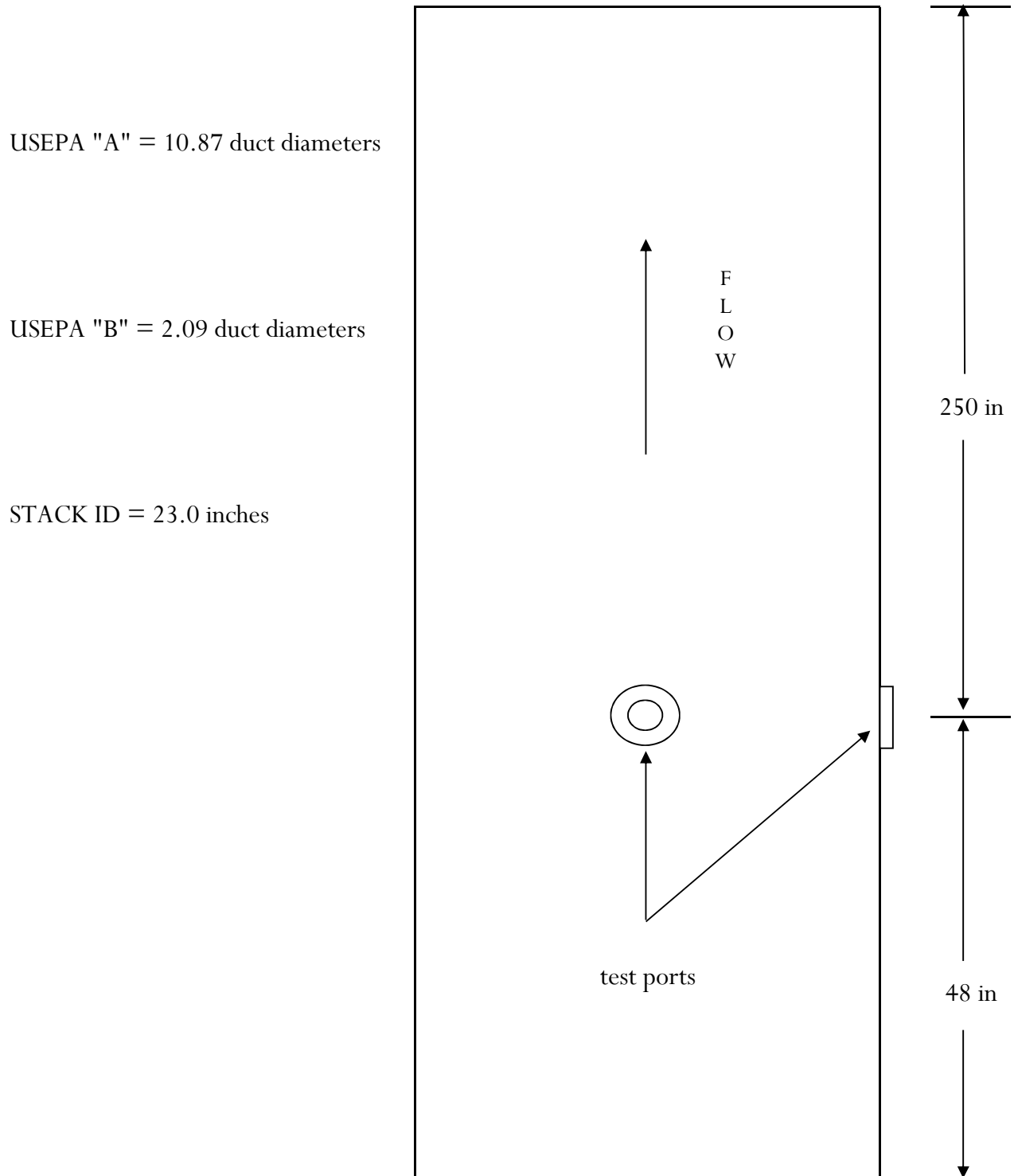
ATTACHMENT 1:

SAMPLE LOCATION SCHEMATICS

Aluf Plastics (016-AQS-149228)

Orangeburg, NY

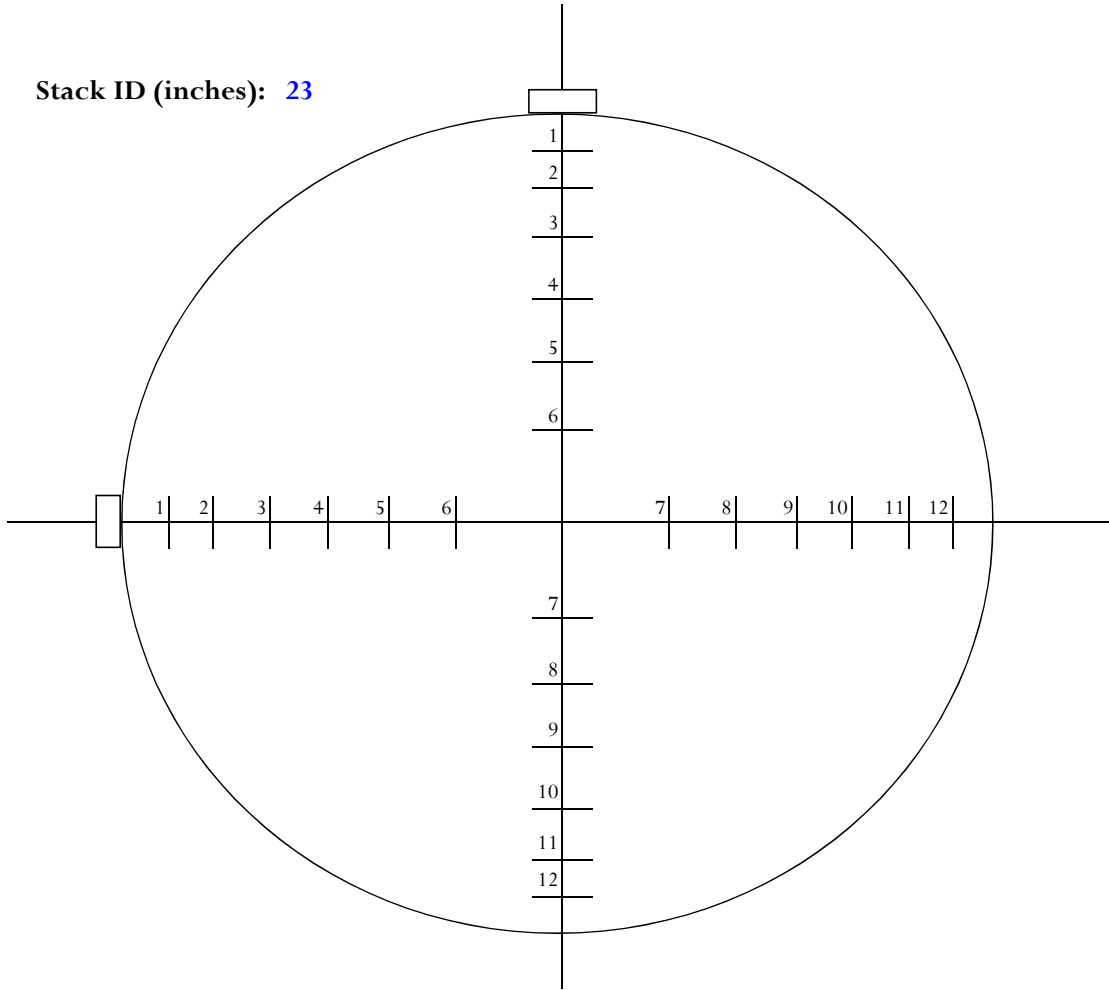
IBC LD No. 1 Outlet



Not drawn to scale

Location of Traverse Points
Aluf Plastics (016-AQS-149228)
IBC LD No. 1 Outlet

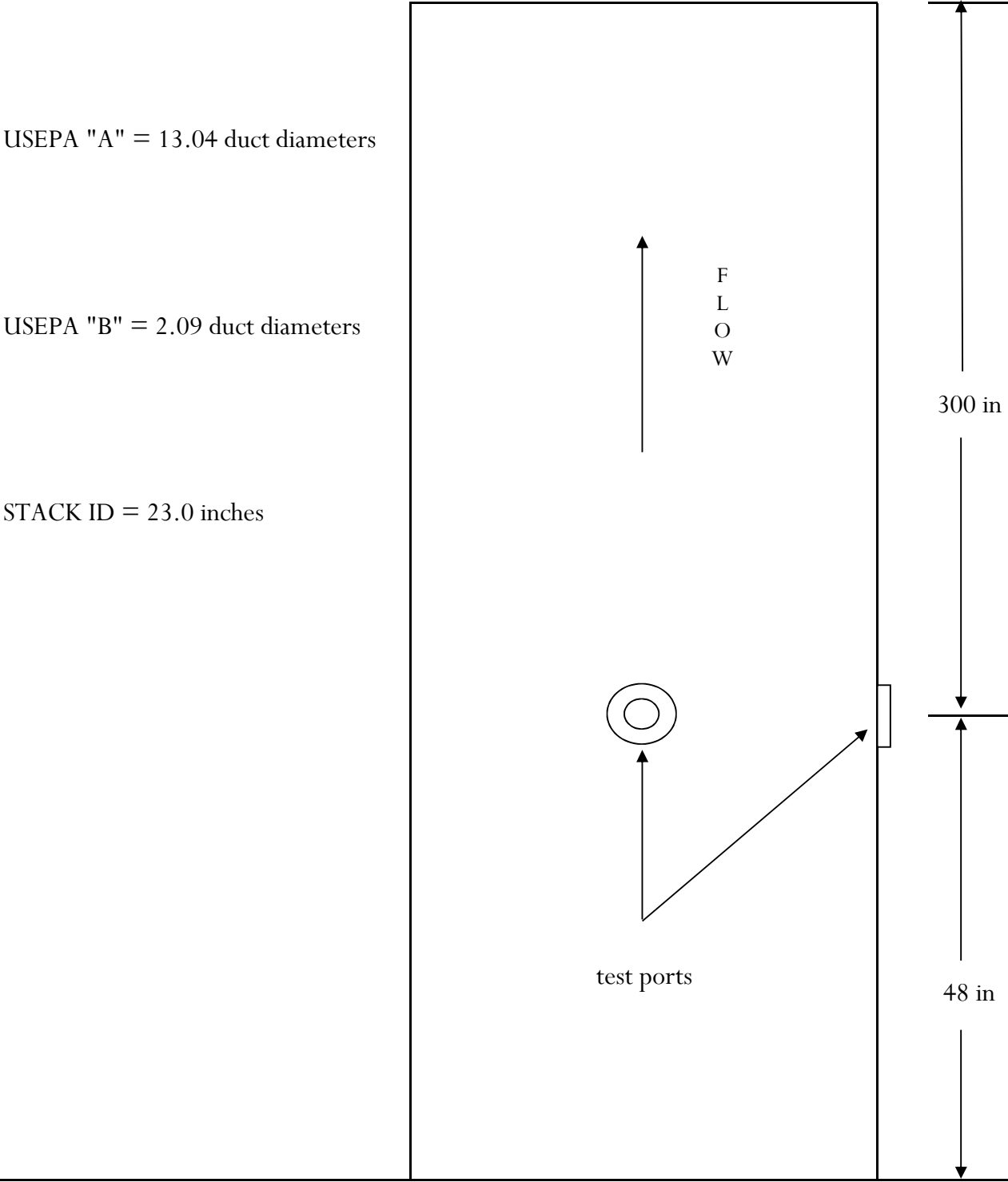
Stack ID (inches): 23



Drawings not to scale.

Traverse Point	Percent of Stack ID	Distance from Stack Wall (inches)
1	2.1%	2/4
2	6.7%	1 2/4
3	11.8%	2 3/4
4	17.7%	4
5	25.0%	5 3/4
6	35.6%	8 1/4
7	64.4%	14 3/4
8	75.0%	17 1/4
9	82.3%	19
10	88.2%	20 1/4
11	93.3%	21 2/4
12	97.9%	22 2/4

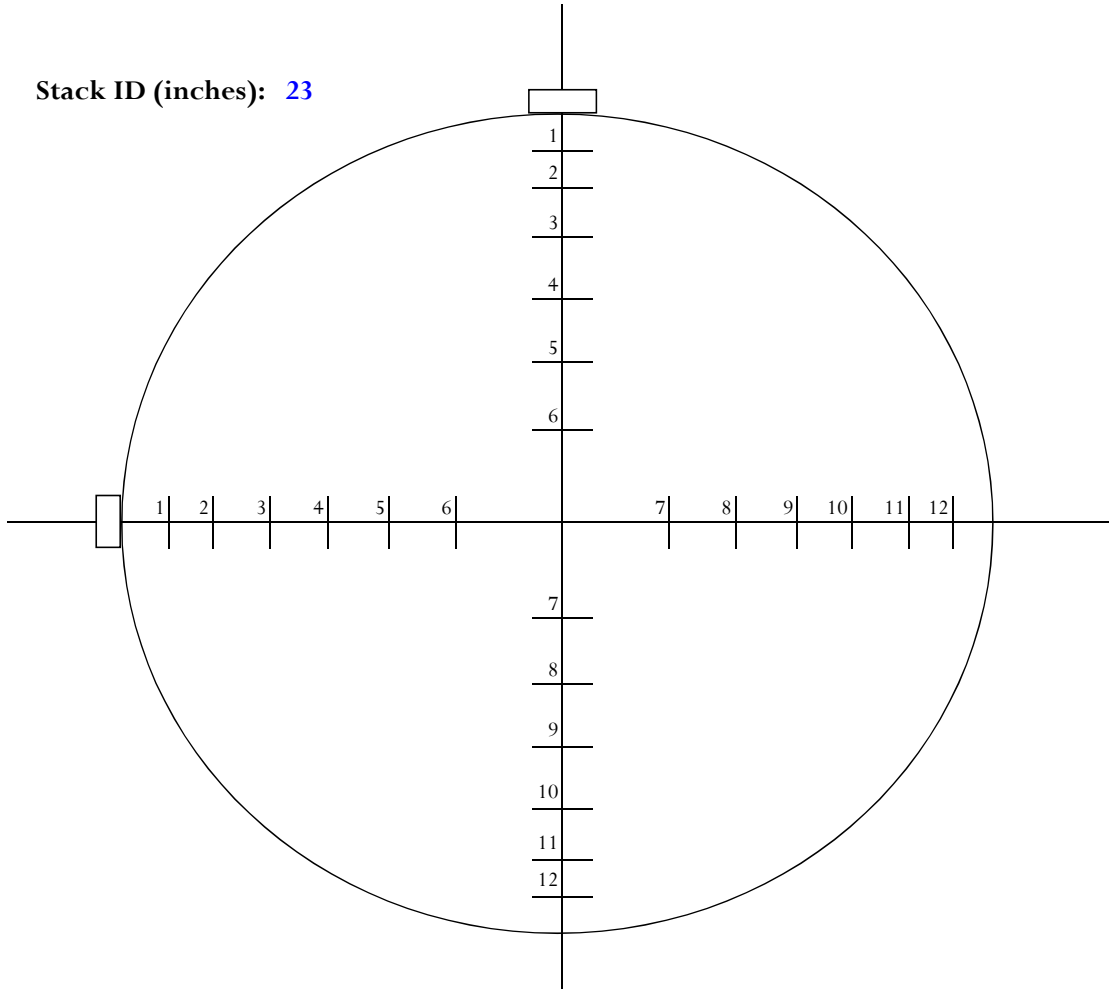
Aluf Plastics (016-AQS-149228)
Orangeburg, NY
IBC LD No. 2 Outlet



Not drawn to scale

Location of Traverse Points
Aluf Plastics (016-AQS-149228)
IBC LD No. 2 Outlet

Stack ID (inches): 23



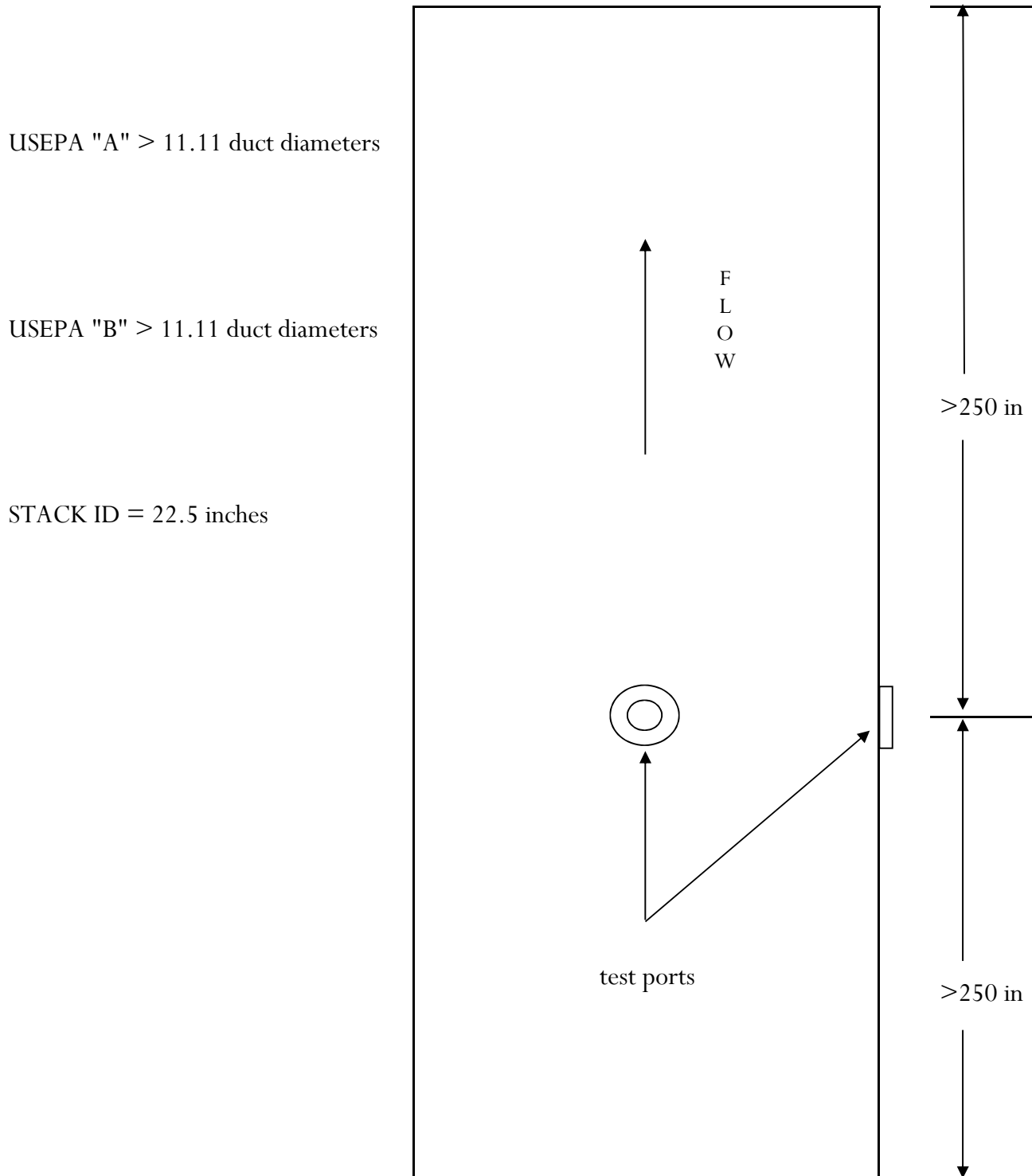
Drawings not to scale.

Traverse Point	Percent of Stack ID	Distance from Stack Wall (inches)
1	2.1%	2/4
2	6.7%	1 2/4
3	11.8%	2 3/4
4	17.7%	4
5	25.0%	5 3/4
6	35.6%	8 1/4
7	64.4%	14 3/4
8	75.0%	17 1/4
9	82.3%	19
10	88.2%	20 1/4
11	93.3%	21 2/4
12	97.9%	22 2/4

Aluf Plastics (016-AQS-149228)

Orangeburg, NY

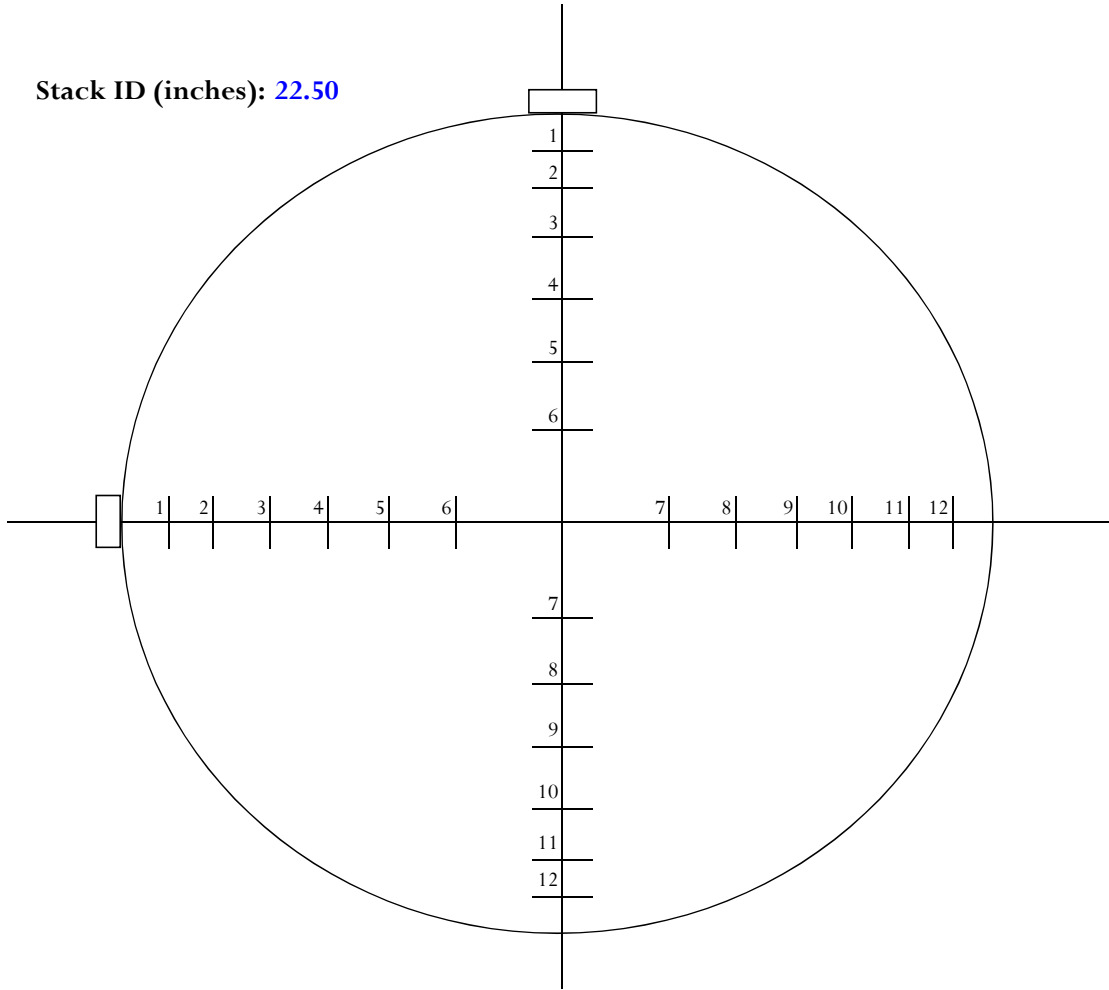
IBC LD No. 3 Outlet



Not drawn to scale

Location of Traverse Points
Aluf Plastics (016-AQS-149228)
IBC LD No. 3 Outlet

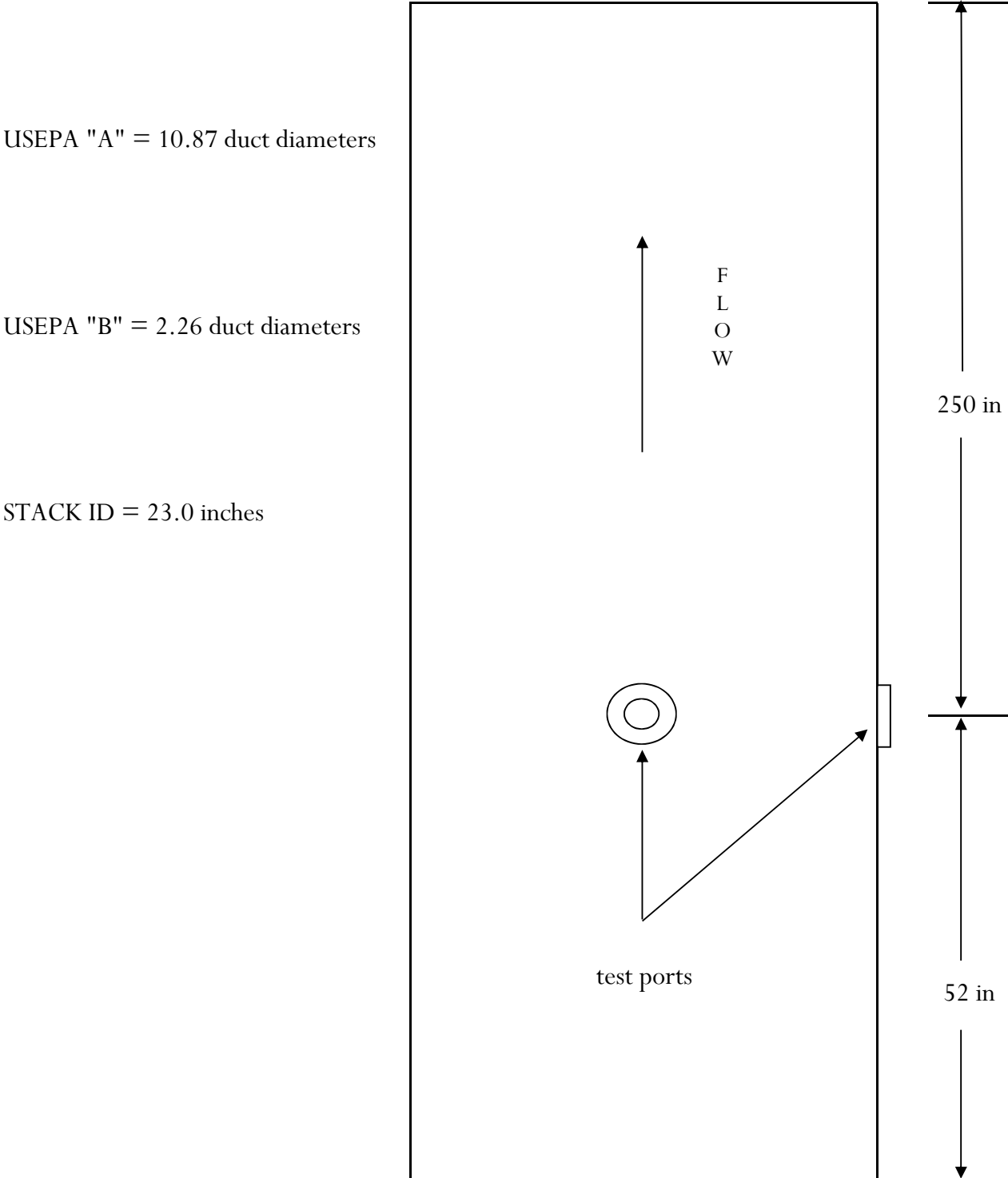
Stack ID (inches): 22.50



Drawings not to scale.

Traverse Point	Percent of Stack ID	Distance from Stack Wall (inches)
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2	6.7%	1 2/4
3	11.8%	2 3/4
4	17.7%	4
5	25.0%	5 3/4
6	35.6%	8
7	64.4%	14 2/4
8	75.0%	17
9	82.3%	18 2/4
10	88.2%	19 3/4
11	93.3%	21
12	97.9%	22

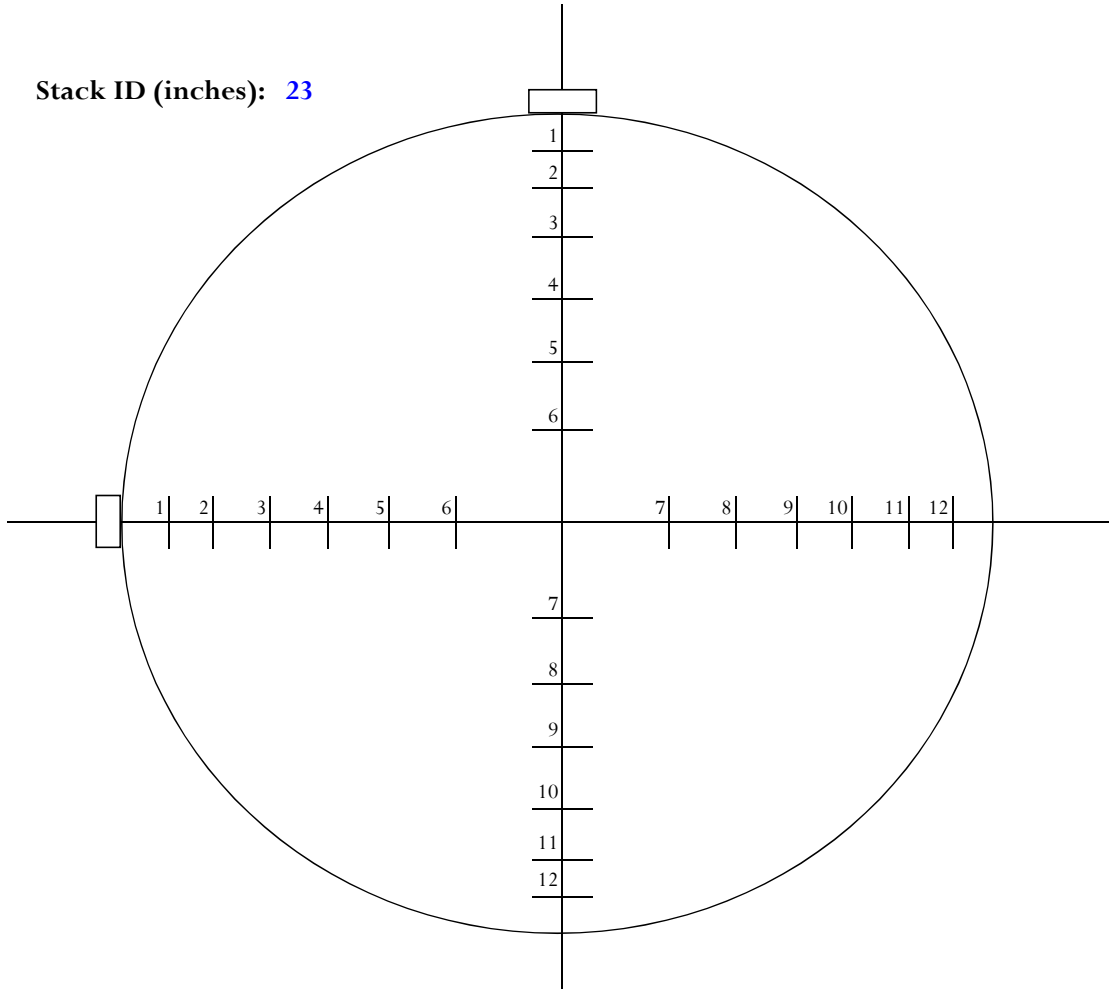
Aluf Plastics (016-AQS-149228)
Orangeburg, NY
IBC Retail Outlet



Not drawn to scale

Location of Traverse Points
Aluf Plastics (016-AQS-149228)
IBC Retail Outlet

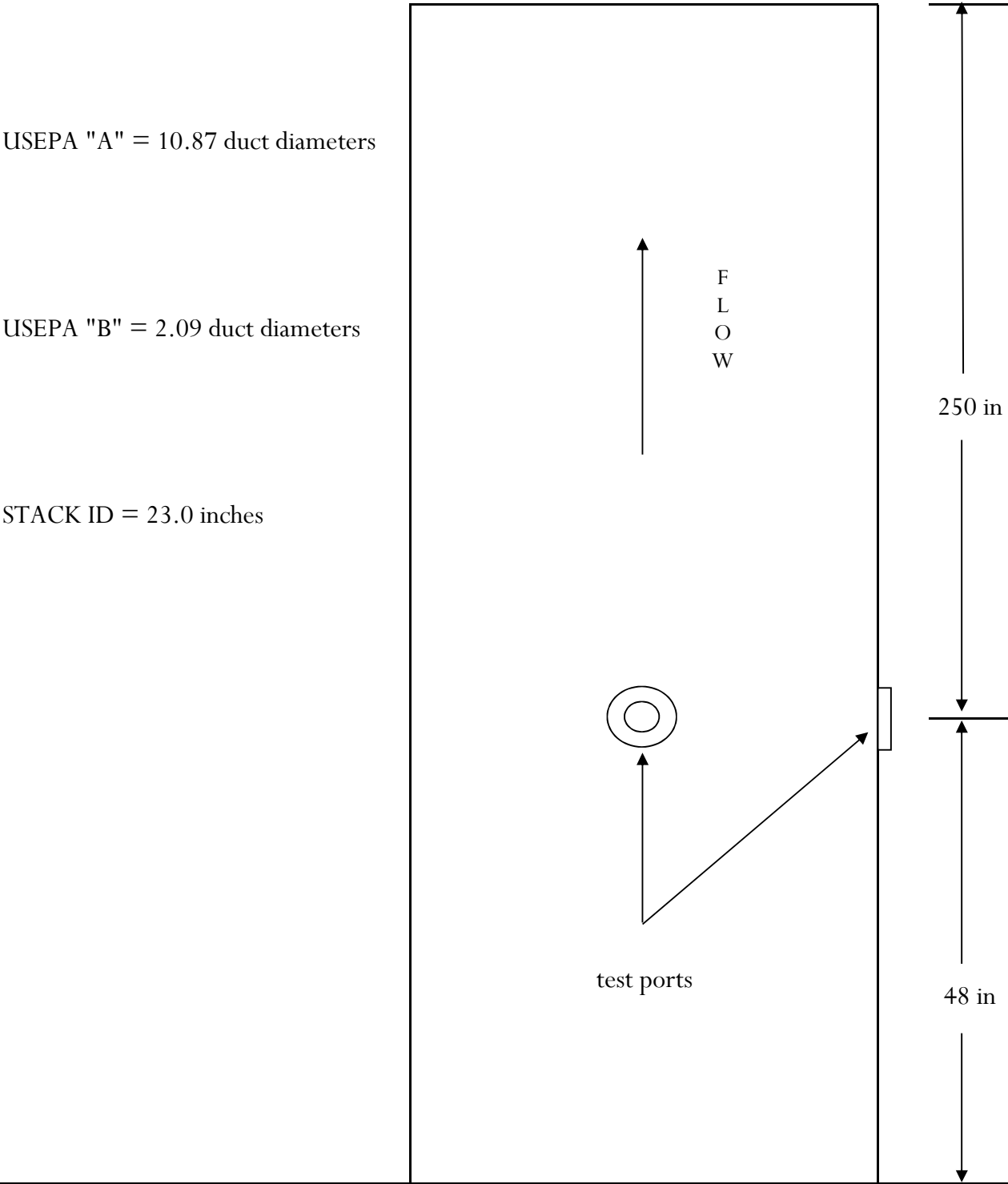
Stack ID (inches): 23



Drawings not to scale.

Traverse Point	Percent of Stack ID	Distance from Stack Wall (inches)
1	2.1%	2/4
2	6.7%	1 2/4
3	11.8%	2 3/4
4	17.7%	4
5	25.0%	5 3/4
6	35.6%	8 1/4
7	64.4%	14 3/4
8	75.0%	17 1/4
9	82.3%	19
10	88.2%	20 1/4
11	93.3%	21 2/4
12	97.9%	22 2/4

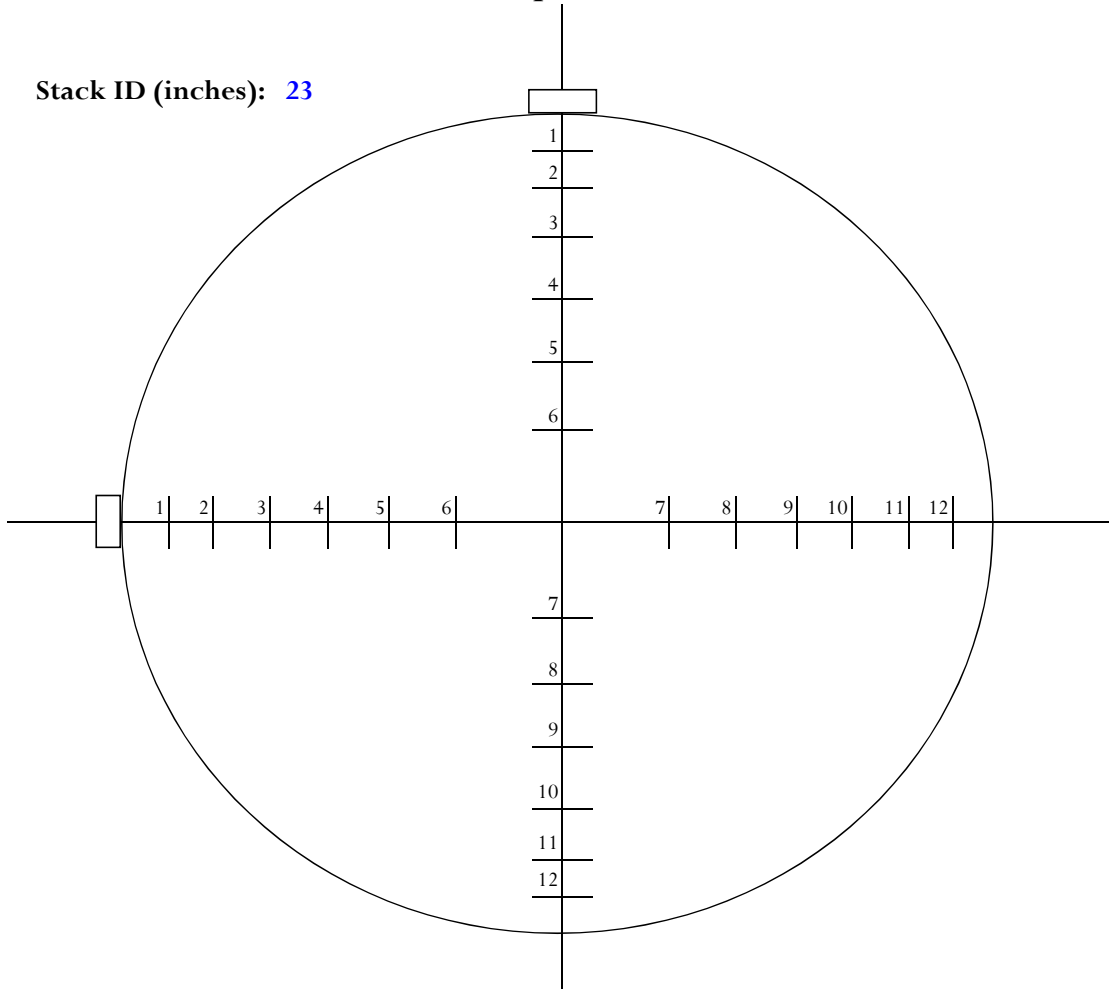
Aluf Plastics (016-AQS-149228)
Orangeburg, NY
IBC Repro Outlet



Not drawn to scale

Location of Traverse Points
Aluf Plastics (016-AQS-149228)
IBC Repo Outlet

Stack ID (inches): 23



Drawings not to scale.

Traverse Point	Percent of Stack ID	Distance from Stack Wall (inches)
1	2.1%	2/4
2	6.7%	1 2/4
3	11.8%	2 3/4
4	17.7%	4
5	25.0%	5 3/4
6	35.6%	8 1/4
7	64.4%	14 3/4
8	75.0%	17 1/4
9	82.3%	19
10	88.2%	20 1/4
11	93.3%	21 2/4
12	97.9%	22 2/4

ATTACHMENT 2:

ADDITIONAL COMPOUNDS FROM NYSDEC

(Mr. Syed Mehdi dated April 3, 2017)

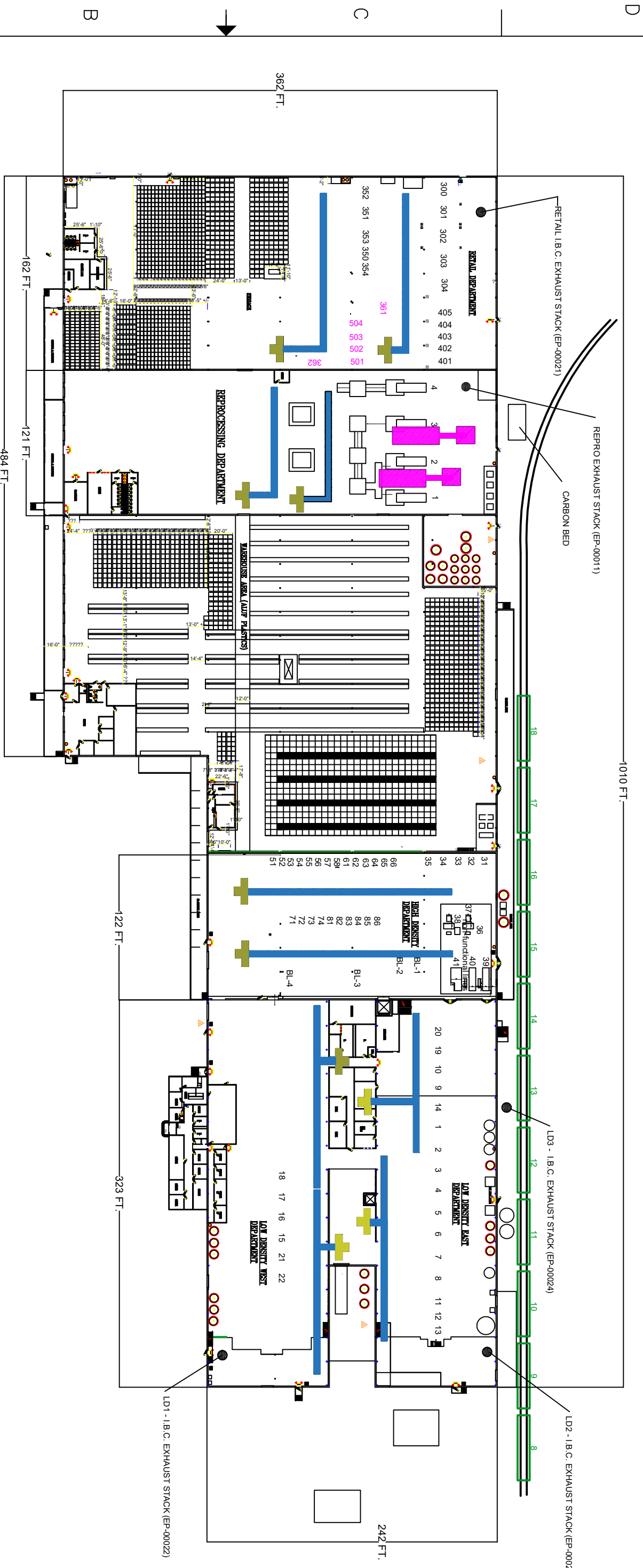
List of Odorous Compounds:

CAS #	Chemical
4170-30-3	2-Butenal
75-07-0	Acetaldehyde
100-52-7	Benzaldehyde
529-20-4	Benzaldehyde, 2-methyl
620-23-5	Benzaldehyde, 3-methyl
104-87-0	Benzaldehyde, 4-methyl
123-72-8	Butanal
590-86-3	Butanal, 3-methyl
50-00-0	Formaldehyde
66-25-1	Hexanal
110-62-3	Pentanal
123-38-6	Propanal
124-13-0	Octanal
124-19-6	Nonanal
2463-53-8	2-Nonenal
39770-04-2	8-Nonenal
112-31-2	Decanal
589-38-8	3-hexanone
107-87-9	2-pentanone
106-35-4	3-heptanone

ATTACHMENT 3:

ALUF PLASTICS BUILDING VENTILATION SCHEMATIC

ZONE	REV	DESCRIPTION	REVISIONS	DATE	APPROVED



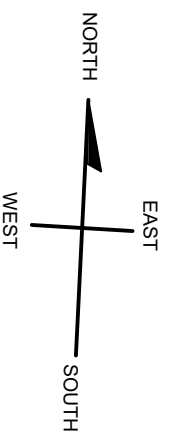
- LEGEND**
- 300 = EXTRUSION LINE OR BAG LINE I.D. NUMBER
 - [Pink Box] = BUILDING FILTERED EXHAUST
 - [Green Box] = BUILDING FILTERED MAKE-UP AIR HANDLER
 - [Blue Box] = BUILDING MAKE-UP AIR DUCT
 - [Pink Box] = BUILDING EXHAUST AIR DUCT
 - [Black Dot] = PROCESS FILTERED EXHAUST STACK LOCATION

BUILDING DIMENSIONS:

TOTAL FLOOR SPACE = 377,760 SQ. FT.
 MAIN FLOOR SPACE = 300,720 SQ. FT.
 BASEMENT FLOOR SPACE = 77,040 SQ. FT.

INTERIOR VOLUMES:

RETAIL ROOM = 1,440,000 CU. FT.
 REPROCESSING ROOM = 1,080,000 CU. FT.
 MAIN WAREHOUSE = 2,296,000 CU. FT.
 HIGH DENSITY ROOM = 726,000 CU. FT.
 LOW DENSITY ROOMS = 2,688,000 CU. FT.
 BASEMENT = 770,400 CU. FT.



BUILDING VENTILATION PROPOSAL



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 Orangeburg, NY 10962
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 www.alufplastics.com

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DRAWN BY: A. LAWSON	
DATE: 02/14/2017	SCALE: 1" = 10'-0"
PROJECT NO. 17-0080-AL	SHEET 0

****This is the last page of the protocol****