

# **Fugitive Dust Plan**

**S.H. Bell Company**  
10218 South Avenue O  
Chicago, Illinois 60617

**Revised, September 2017**

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## I. Introduction

This Fugitive Dust Plan has been prepared for the S.H. Bell Company (S.H. Bell Co.) Chicago Terminal, located at 10218 South Avenue O, in Chicago, Illinois, in accordance with the City of Chicago Department of Public Health (CDPH) – Rules and Regulation for Bulk Materials Storage, March 13, 2014 (Regulation).

This document, which is an update of the April 2017 Fugitive Dust Plan, meets the Fugitive Dust Plan requirement of Section 3.0(3) of the Regulation. This Fugitive Dust Plan is intended solely for use by CDPH and S.H Bell and cannot be used for any other purpose as it contains information requested by CDPH that is for informational purposes only.

### Certification by Owner

S.H. Bell Co. is the owner/operator of the facility and responsible for execution of this Fugitive Dust Plan. S.H. Bell Co. hereby certifies that all control measures, devices, and technologies have been properly calibrated and maintained, all appropriate facility staff has been trained on the proper application of and operation of all control measures, devices, and technologies. Further, the calculation of maximum indoor and outdoor bulk storage capacity as noted herein in Section II is also certified by the facility owner.

Signature: 

Printed Name: Samuel H. Bell

Title: V.P. / Partner

Date: 13 September 2017

## II. Facility Description

The S.H. Bell Co. Chicago Terminal (the “facility”) consists of the following: an office building; an enclosed jaw crushing/screening plant and screening plant; storage buildings for packaged materials; storage buildings for primary bulk materials; a scale house; barge unloading docks and slips; maintenance shop; packing operations housed inside storage buildings and gravel-covered, landscaped, and asphalt-paved areas.

The entire facility is approximately 25 acres in size with buildings and paved areas constituting more than 95% of the total area. Facility characteristics, as required by Section 3.0(3.a)) of the Regulation are shown on Figures 1 and 2, including approximate locations of:

- Facility boundaries
- Buildings
- Internal roads
- Utilities on facility property
- Roadways within one quarter mile
- Outdoor storage piles
- Control devices, air monitors and the weather station
- Location of primary unloading and transfer operations:
  - Crushing/Screening Plant and Screening Plant
  - Bag Filling with Dust Collector
  - Box Filling with Dust Collector
  - Truck Loading/Unloading
  - Barge Loading/Unloading
  - Railcar Loading/Unloading

Although not specified in this list, each emission unit/source also includes associated transfer points, such as hoppers associated with box and bag filling and the crushing/screening plant. All facility operations are batch processes. The overall duration of each operation is typically based on the amount of material to be handled and may range from less than an hour to across several days, with only intermittent generation of fugitive dust.

### Bulk Solid Material Storage Capacity

Approximate indoor area available for storage

Ryerson: 55,000 square feet

Norcon: 28,000 square feet

Total indoor available storage area: 83,000 square feet

Average material storage: 0.8 tons/square foot

Maximum density of material: 280 lbs/cubic foot

Indoor bulk material storage capacity: 66,400 tons

Approximate outdoor area available for storage (based on 20' setback from water)

Middle slip: 550' x 75' = 41,250 square feet

West of office: 200' x 150' = 30,000 square feet

Southern Corner: ½ (300' x 300') = 45,000 square feet

Total outdoor available area: 116,250 square feet

Average material storage: 1.2 tons/square foot

Maximum density of material: 280 lbs/cubic foot

Outside bulk material storage capacity: 139,000 tons or 37,000 cubic yards

### III. Operations Summary

Materials processed and/or stored at the facility are transported to the facility by barge, rail, and truck. Typical bulk materials currently handled at the facility include: ferro alloys, direct reduced iron (DRI) (not fines), hot briquetted iron (HBI), pig iron, iron ore, and silicon metal.<sup>1</sup> The facility also handles materials that are not bulk materials which do not have the potential to become airborne or scattered by wind, such as graphite electrodes, cast aluminum and steel shapes, including billets, sheet, coil, plates, and slab, packaged materials, and other materials that do not meet the definition of a Bulk Solid Material under Section 2.0(3) of the Regulation.

Ferro alloy materials (bulk or super sacks) that are unloaded are stored within storage buildings or under roof in stall-type bins (Roofed Stall Bins) prior to processing and/or reloading for customer shipment. These materials (alloys) typically cannot be watered, as they lose value if they become wet. Among other problems, wetted steel alloys could create adverse or unintended reactions when used. The maximum indoor storage capacity for bulk materials, including the covered bins, is approximately 66,000 tons. Typically, indoor storage is at 70% capacity. Figure 1 provides a facility layout which shows the location of facility buildings.

For purposes of this Fugitive Dust Plan, "Affected Materials" at S.H. Bell are defined as "ferromanganese materials and other materials with a manganese content (raw material, intermediate, or finished product) that are processed or otherwise handled on site in such a manner that could cause the generation of stack or fugitive emissions containing ferromanganese or manganese compounds. Affected Materials shall not include materials that contain manganese, such as steel ingots, where material is not a source of stack or fugitive emissions containing ferromanganese or manganese compounds."<sup>2</sup>

On average, Affected Materials make up approximately 45% - 60% of the materials handled at the facility. Affected Materials are not stored outdoors.

Bulk materials currently stored outdoors include pig iron, HBI and other non-Affected Materials (aka alloys designated by customer preference). Materials, such as graphite electrodes and cast aluminum and steel shapes, that are not "bulk solid materials" under the Regulation because the material does not have the potential to become airborne or be scattered by wind, are stored outdoors as well. Approximately 25% of the materials handled at the facility, primarily pig iron and alloys, are stored outdoors. S.H. Bell Co. limits the materials that can be stored in outdoor storage piles to those materials that are of predominantly large particle size (greater than ½ inch) and/or materials that can be watered, crusted, and/or tarped. The bulk materials that are stored outdoors are not dusty and are not susceptible to being windblown. Inbound shipments of DRI fines are no longer accepted for storage or re-loading at the facility. The maximum outdoor storage capacity is approximately 140,000 tons. However, typically, outdoor storage piles cover less than half of the available outdoor storage area. The number, size, and composition of outdoor piles vary based on customer requirements and specifications. Figure 1 illustrates the typical location and general size of outdoor storage piles.

Some unloaded bulk and super sack materials are designated for further processing, packaging or both. These process operations include batch crushing, screening, and packaging operations. No crushing or

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<sup>1</sup> This plan will be updated if additional materials are to be handled at the facility.

<sup>2</sup> "Affected Materials" are as defined by the Ohio EPA within prior Director's Final Findings and Orders (DFFO) for S.H. Bell Co.'s Stateline Terminal.

screening or packaging of Affected Materials will occur outdoors. Roadways are swept and watered, with dust suppressant applied as needed. All vehicles do not exceed a speed of 8 miles per hour (mph).

Ongoing regular observation of both the source of fugitive emissions and the nearest property line (based on wind direction) are used to determine if additional control or mitigation measures need to be employed in order to meet the source and property line limits. For purposes of this Plan “Visible Fugitive Dust at Source” is defined as observation of opacity at an operation/activity that approaches the applicable opacity limit.

Details of facility control and monitoring measures are provided in the following sections.

## IV. Control Measures

This section provides a detailed discussion of the control measures employed by the facility to comply with the applicable regulatory requirements in the Regulation and the additional best management practices that go above and beyond the Regulation for the specific operations and activities performed at the facility. Fugitive Dust is prohibited by the Regulation, such that fugitive dust is not visible beyond the perimeter property line of the facility and opacity at any pile, transfer point, roadway, or parking area does not exceed 10%.

The control measures are presented in the following section, organized by activity type/location:

- A. Transfer Points
- B. Transport by Truck
- C. Roadways
- D. Outdoor Storage Piles
- E. Affected Material Storage
- F. Dust Collectors

For clarity, a summary of the regulatory language is followed by the practices and methods S.H. Bell is using to demonstrate compliance. Sections E and F contain additional dust control measures employed by the facility that do not directly fit within the specific regulatory requirements in the Regulation. A description of the specific Operating Procedures (in decision-tree format) employed at the facility to minimize fugitive dust emissions is also provided for each of the specific operations and activities performed at the facility. Table 1 contains a summary of control measures at transfer points. Appendix A contains the General Operating Procedures employed at the facility for dust control that are detailed in the subsequent sections of this Plan.

### A. TRANSFER POINTS

#### Regulatory Requirement:

Section 3.07 of the Regulation (Transfer Points) requires that: All material transfer points need to be maintained such that fugitive dust does not exceed a 10% opacity limit by using one of four options: a) total enclosure, b) water spray system sufficient to control fugitive dust emissions during operations, c) vented to air pollution control equipment, or d) transfer only moist material in a manner that minimizes the exposed drop.

#### Facility Compliance Methods:

The majority of Transfer Points at the facility are controlled by either total enclosure or venting to air pollution control equipment (*i.e.*, a dust collector). The remaining limited number of Transfer Points are controlled through a “water spray system” that is accomplished in one of several methods at the facility: direct application, mobile misters, and dry foggers. Each of these methods sufficiently controls fugitive dust emissions during operations and is further described below.

- Direct application of water to bulk material, using a spray system or water addition such as with a front end loader;



- Use of mobile misters to control fugitive dust; dry fugitive dust particles absorb water droplets from the misters causing them to increase in weight and cohesiveness to cause the particles to settle out of the air; and
- Use of dry fogging unit to control fugitive dust, appropriate for use in freezing temperatures; dry foggers have a special air-atomizing nozzle that produces a dry fog consisting of ultra-fine water droplets which wet the dust particles and increase the weight to allow settling.

The goal of the mobile misters and the dry fogging unit is to create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air. Appendix A contains the General Operating Procedure for positioning and use of the mobile misters and/or dry fogging unit, applicable to their use anywhere in the facility.

The control measures and operating procedures used at each of the Transfer Points at the facility are provided in detail below. Table 1 provides a summary of the controls used at the Transfer Points at the facility. Additionally, activities at outdoor transfer points are also conducted in accordance with the procedures noted in Section IX, High Wind Events, whenever wind speeds exceed 15 mph over two consecutive 5 minute intervals. The control measures and operating procedures are further delineated between Wetted Materials and Dry Materials and Affected Materials and non-Affected Materials where applicable.

“Wetted Materials” are those bulk materials that are permitted to get wet per customer specifications. The facility ensures that Wetted Materials are sufficiently moist to control fugitive dust emissions through the direct application of water to the material prior to and/or while the material is being deposited at the limited number of Transfer Points controlled through a “water spray system.” During freezing conditions, the moisture already existing in the Wetted Materials will freeze and trap fugitive particles.

“Dry Materials” are bulk materials that are not permitted to get wet per customer specifications. For Dry Materials, the facility uses the mobile misters or the dry fogging unit to control fugitive dust emissions when the Dry Materials are being deposited at the limited number of Transfer Points controlled through a “water spray system.” The Dry Materials consist mainly of steel alloys, including the majority (but not all) of Affected Materials received at the facility, which are used by the steel industry. Based on customer demand, the Dry Materials may only be at the facility for as short as 48 hours. Steel alloys cannot get wet because of the high potential for risk of explosion and other catastrophic safety concerns when added to molten metal at a furnace.

## 1. OUTDOOR STORAGE PILES TRANSFER ACTIVITIES

Compliance Method: water spray system

Additional Measures: minimize drop height, outdoor storage limitations

Affected Materials are not stored outdoors. The Facility limits the type of bulk non-Affected Materials that can be stored in outdoor storage piles to the following:

- Wetted Materials that have a predominantly large particle size (greater than ½ inch);
- Dry Materials that have a predominantly large particle size (greater than ½ inch), but only if tarped during storage; and
- Wetted Materials that have a small particle size less than ½ inch in diameter, but only if a very hard cohesive crust forms over the surface of the pile when watered.

The bulk materials that are stored outdoors are not dusty and are not susceptible to being windblown or are tarped.

S.H. Bell Co. in Chicago has restricted the types of materials handled or stored at the facility. As previously committed, inbound shipments of DRI fines are no longer accepted for storage or re-loading at the facility.

The following decision tree diagram (Figure 3) is the operating procedure for **Transfer Activities of Bulk Materials at Outdoor Storage Piles**.

**FIGURE 3. LOADING FROM OUTDOOR STORAGE PILES / OUTDOOR TRUCK LOADING - FUGITIVE DUST CONTROL**

BEGIN MATERIAL LOADING ACTIVITIES:

**Preplan**- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations (i.e., wind alert)

**Preplan** - Check crusting / moisture of material to determine mitigation needs

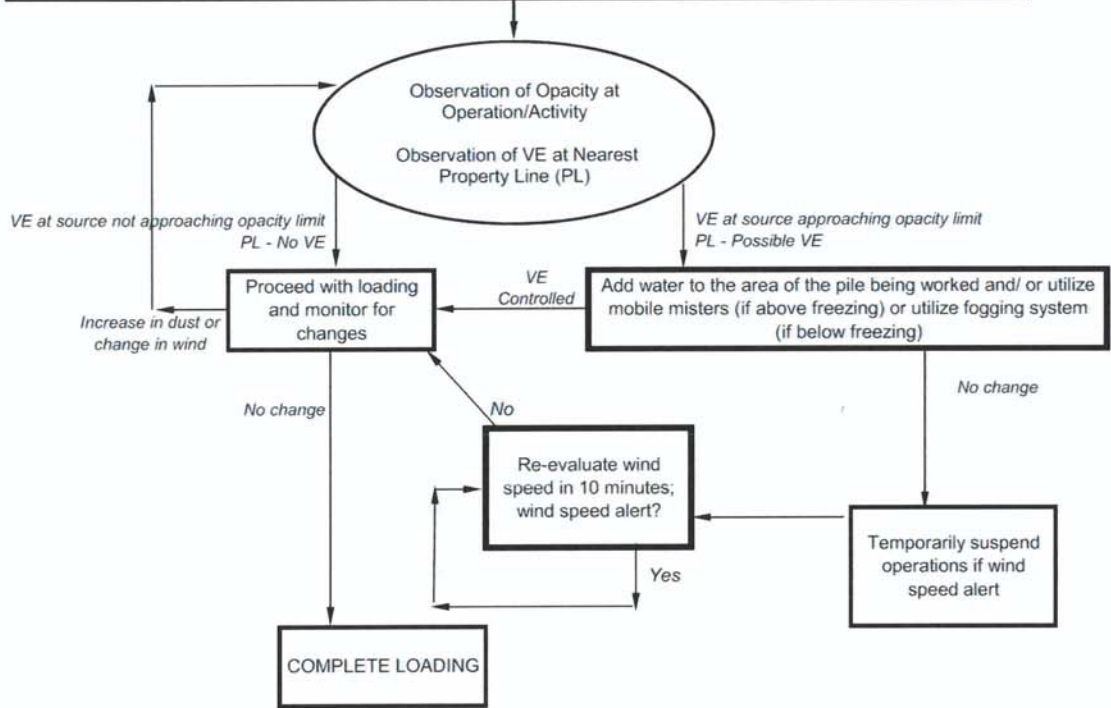
**Preplan**- Position loading operations as favorably as possible, accounting for location within the facility and weather conditions

**Mitigation**- dampen wetted material and/or position mobile misters (if above freezing) and/or use dry fogging system (if above freezing or below freezing) (dry materials) to impact fugitive emissions

**Mitigation**- Adjust position of mobile misters/fogging system throughout loading activities to minimize fugitive emissions when utilized

**Operations Step- WETTED and DRY** Materials stored outside are loaded into trucks with a front end loader/moved with a front end loader **NO AFFECTED MATERIALS ARE STORED OUTDOORS**

**Operations Step**- Drop heights are minimized by the inherent limitation of the front end loader lift height



## 2. TEMPORARY OUTDOOR PILE TRANSFER ACTIVITIES

Compliance Method: water spray system

Additional Measures: minimize drop height

As discussed in the additional transfer point sections below, certain operations require temporary outdoor piles. With the exception of Affected Materials, the above operating procedures (Figure 3) for transfer activities of bulk materials at outdoor storage piles is followed for transfer activities involving temporary outdoor piles.

The facility employs more stringent controls for Affected Materials. Temporary outdoor piles of Affected Materials at the facility are not permitted except for barge loading and truck unloading. Barge loading is an infrequent activity and the more stringent controls for the temporary Affected Materials are detailed below in Section IV.A.6., Barge Loading. Truck unloading of Affected Materials originating from off-site full-size trucks are detailed below in Section IV.A.5, Truck Loading/Unloading.

## 3. CRUSHING/SCREENING

Compliance Method: enclosure

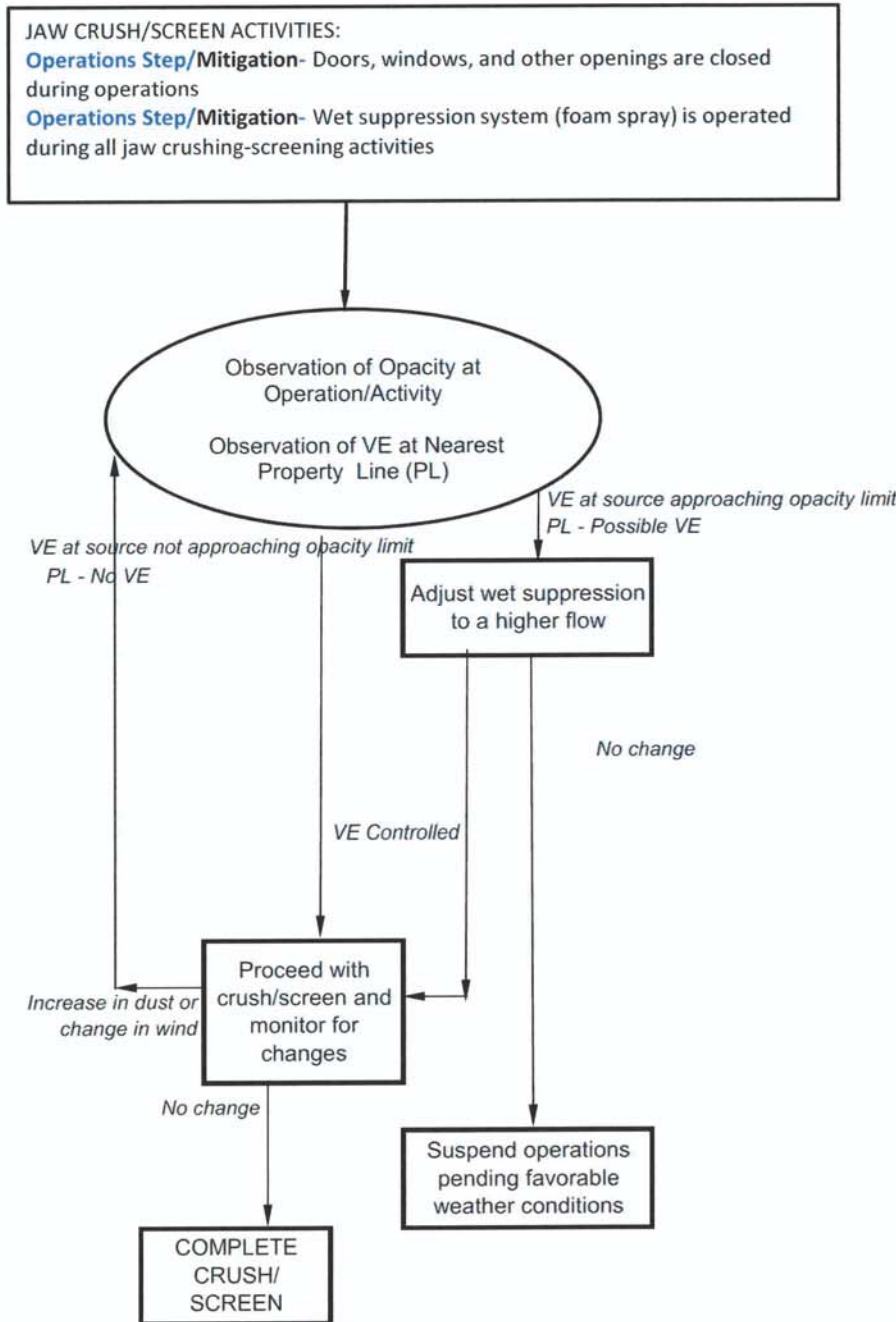
Additional Measures: foam dust suppressant spray system, minimize drop height

There is a crusher/screener and a screener at the facility, both of which are enclosed within a building. Table 1 provides list the enclosed transfer points associated with the crusher/screener and a screener at the facility. On Figure 1, the crusher/screener building is labeled "Processing Area."

Additionally, a foam dust suppressant spray system is operated at the initial drop to the crusher and at the crusher during all jaw crushing/screening operations to reduce fugitive dust emissions from the processed materials. Drop height to the opening of the crusher is minimized by a chute that extends from the bottom of the hopper to the opening of the crusher. There is also a full-length dust curtain at the face of the enclosure to the hopper. Facility personnel are trained to keep doors, windows, and other openings closed during jaw crushing/screening operations.

The following decision tree diagram (Figure 4) is the operating procedure for the **Crusher/Screener** at the facility.

**FIGURE 4. CRUSHING/SCREENING - FUGITIVE DUST CONTROL**



#### 4. BOX SCREENING

Compliance Methods: enclosure, water spray system

Additional Measures: minimize drop height limitation on outdoor activities

Four (4) portable box screeners are used at the facility. Dry Materials are screened inside a facility building unless space is not available. If screening of Dry Materials is performed outdoors, the mobile misters or dry fogging unit will be deployed which will create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air. Wetted Materials may be screened outdoors. Wetted Materials are directly sprayed with water or dampened prior to start of screening if moisture is not sufficient.

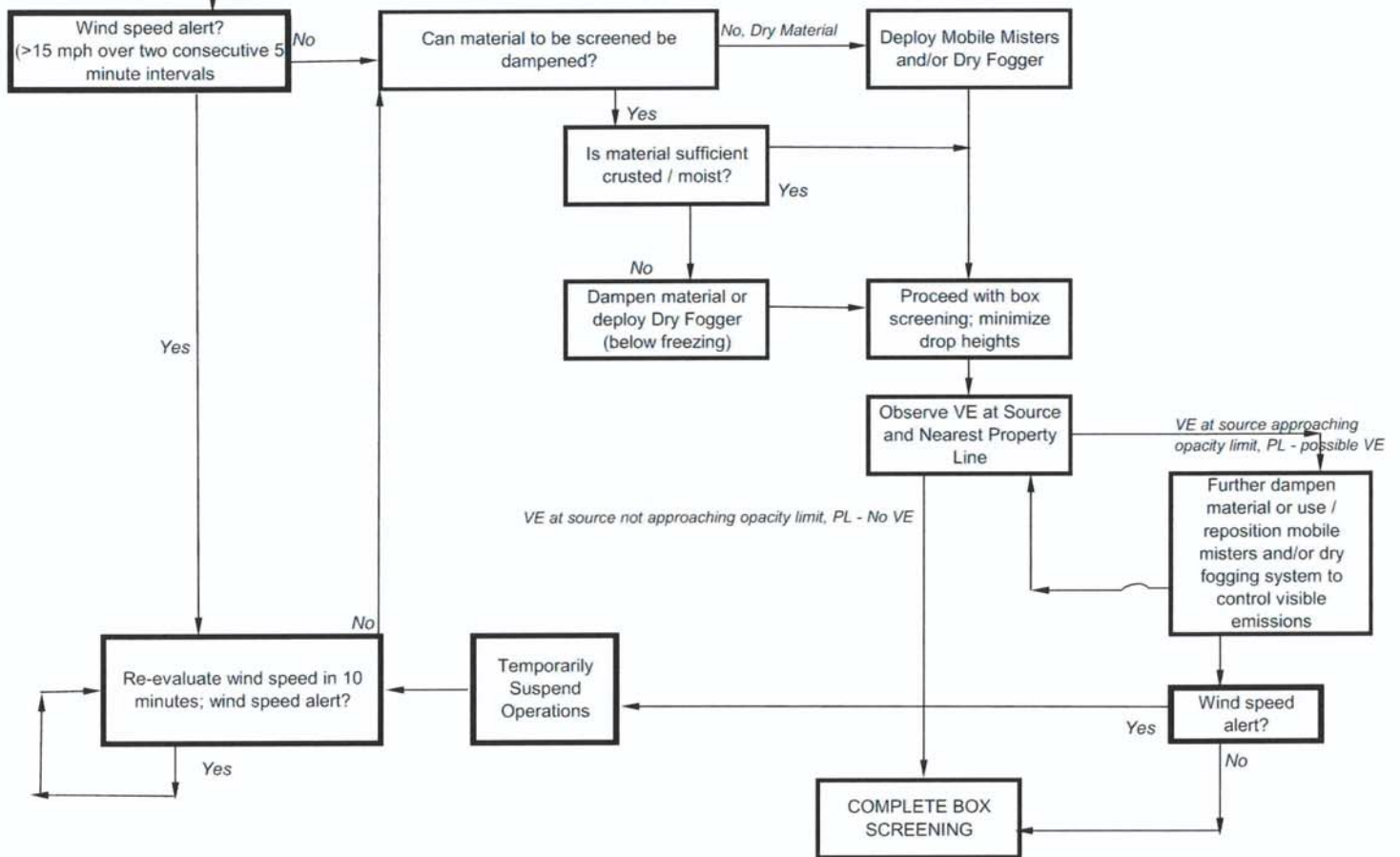
No box screening of Affected Materials is performed outdoors.

The following decision tree diagram (Figure 5) is the operating procedure for **Box Screeners**.

FIGURE 5. BOX SCREENING - FUGITIVE DUST CONTROL

**BOX SCREENING SUMMARY :**  
**Preplan** - If using screen boxes outside, evaluate winds to determine windspeed and direction during screening activities  
**Preplan** - if using screen boxes outside, check crusting/moisture of material  
**Operations Step/Control**- Use of screen boxes for dry materials are conducted indoors, unless space is not available - **AFFECTED MATERIALS ARE SCREENED INDOORS**  
**Operations Step/Mitigation**- Use of screen boxes for dry materials outdoors controlled with mobile misters and/or dry fogging unit  
**Operations Step**- Use of screen boxes for wet materials may be performed outside

FOR USE OF SCREEN BOXES OUTSIDE (NON-AFFECTED MATERIALS)



## 5. TRUCK LOADING/UNLOADING

Compliance Methods: enclosure, water spray system, air pollution control equipment

Additional Measures: minimize drop height, choke feed, limitations on outdoor loading

### Indoor Truck Loading – Dry Materials

Loading operations of Dry Materials (including Affected Materials) involving trucks are completed within an enclosure, either within a loadout shed or within a bulk material storage building. There are two loadout sheds, one at the Norcon building and one at the Ryerson building, the locations of which are shown on Figure 1. These loadout sheds have been renovated, including the construction of upgraded enclosures, installation of metal roll-up garage doors at the entry/exit of each loadout shed, and installation of a 40,000 cfm stationary dust collector at each loadout shed. Loading will not commence until both doors are closed; the dust collector fans will be interlocked to actuate upon closure of both doors. Additional work practice procedures include a minimum one-minute wait time for trucks after loading before the doors are opened to allow fugitive dust to settle and/or be captured.

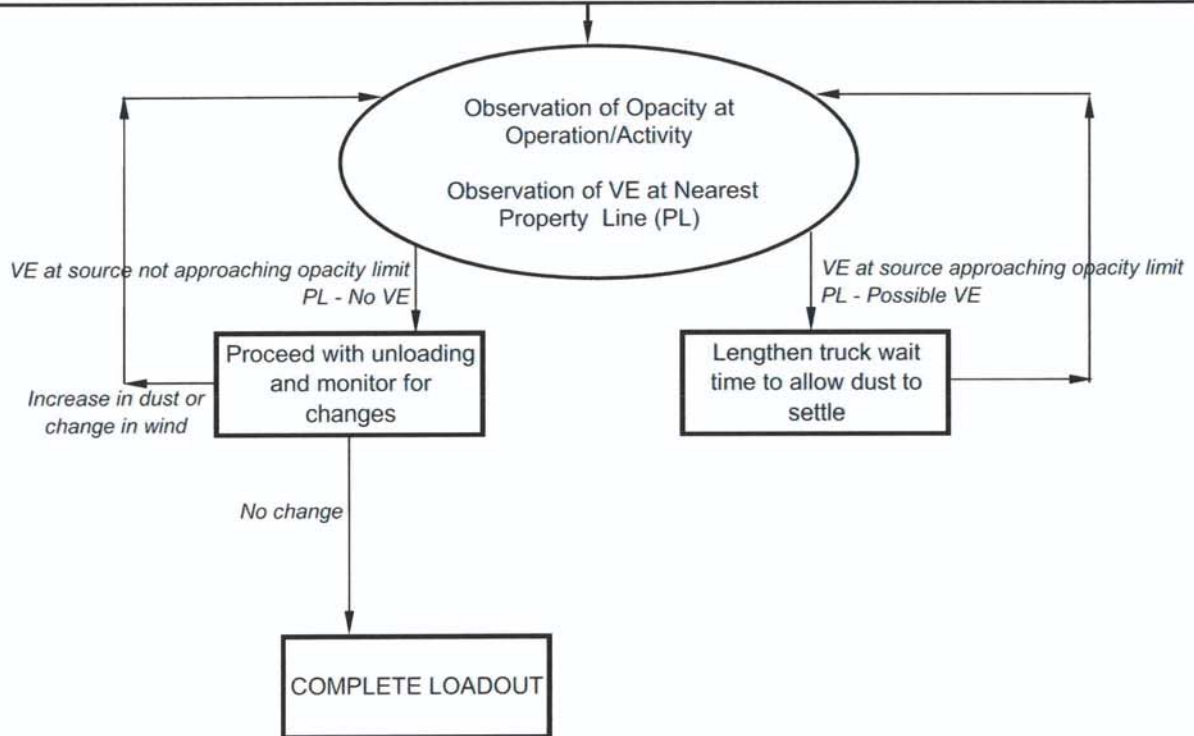
The following decision tree diagram (Figure 6) is the operating procedure for **Indoor Truck Loadout** at the Ryerson and Norcon Buildings.



**FIGURE 6. INDOOR TRUCK LOADOUT - FUGITIVE DUST CONTROL**

**Ryerson and Norcon Buildings**

**BEGIN TRUCK LOADOUT ACTIVITIES:**  
**Operations Step**- Position truck completely within loadout shed  
**Operations Step** - Close entry/exit roll-up garage doors at each end of the loadout shed  
**Control**- Ensure stationary dust collector is turned on and operational; dust collector fans are interlocked to actuate upon closure of both doors  
**Operations Step**- Load material into the truck while minimizing drop height  
**Operations Step**- Ensure that truck driver waits for at least one minute after load is complete to allow for dust settling/capture before driving out of the loadout enclosure  
**Operations Step**- Ensure driver tarps the load after safely clearing the exit of the loadout shed prior to driving through the facility



Outbound Truck Loading from Outdoor Storage Piles –

As noted previously, no Affected Materials are stored outside and the facility limits the Non-Affected Materials that can be stored in the Outdoor Storage Piles to the following:

- Wetted Materials that have a predominantly large particle size (greater than ½ inch);
- Dry Materials that have a predominantly large particle size (greater than ½ inch), but only if tarped during storage; and
- Wetted Materials that have a small particle size less than ½ inch in diameter, but only if a very hard cohesive crust forms over the surface of the pile when watered.

The bulk materials that are stored outdoors are not dusty and are not susceptible to being windblown or are tarped.

Materials stored outdoors are loaded into trucks with a front end loader. Proper loading methods include minimizing material drop heights by placing the hinge pin of the front end loader as near as possible to the top of the side of the truck bed which results in the bottom portion of the bucket being contained inside the truck bed when the material in the bucket is off-loaded. Trucks are not loaded to the full depth of the truck bed to ensure material is contained. Additionally, per the operating procedure below, Wetted Materials are directly sprayed with water or dampened if moisture is not sufficient or the mobile misters or dry fogging unit are deployed prior to and/or during the truck loading.

Figure 3 is the operating procedure for transfer activities of bulk materials at outdoor piles, which is representative of **Outbound Truck Loading** from Outdoor Storage Piles.

**FIGURE 3. LOADING FROM OUTDOOR STORAGE PILES / OUTDOOR TRUCK LOADING - FUGITIVE DUST CONTROL**

**BEGIN MATERIAL LOADING ACTIVITIES:**

**Preplan**- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations (i.e., wind alert)

**Preplan** - Check crusting / moisture of material to determine mitigation needs

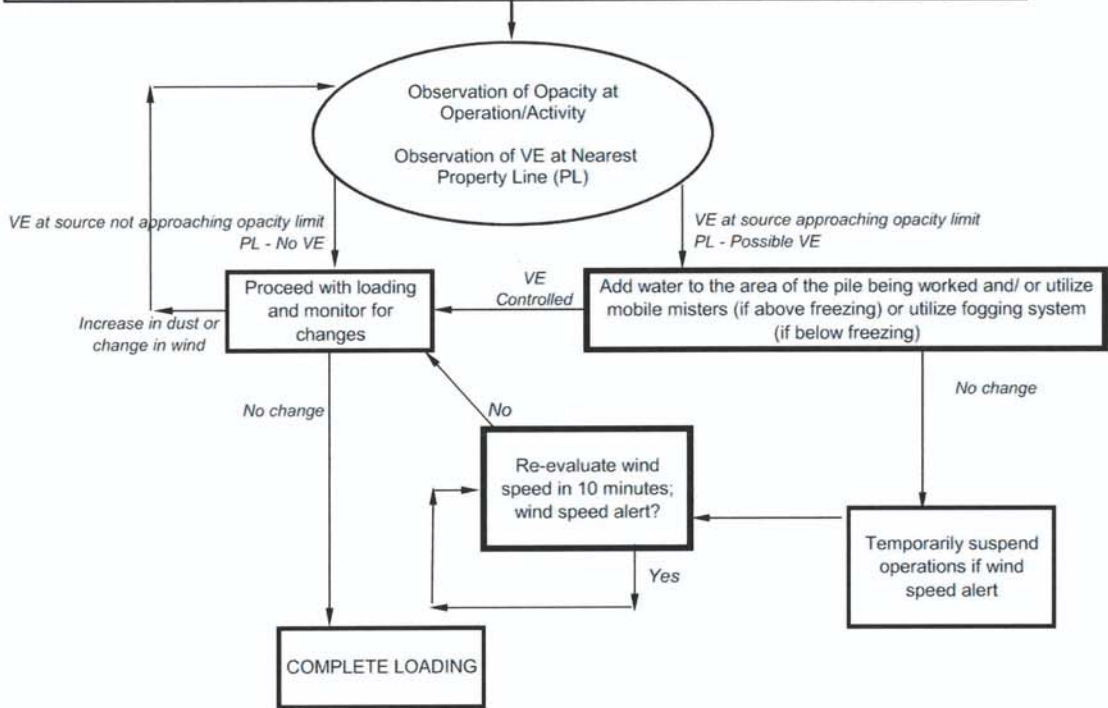
**Preplan**- Position loading operations as favorably as possible, accounting for location within the facility and weather conditions

**Mitigation**- dampen wetted material and/or position mobile misters (if above freezing) and/or use dry fogging system (if above freezing or below freezing) (dry materials) to impact fugitive emissions

**Mitigation**- Adjust position of mobile misters/fogging system throughout loading activities to minimize fugitive emissions when utilized

**Operations Step- WETTED and DRY** Materials stored outside are loaded into trucks with a front end loader/moved with a front end loader **NO AFFECTED MATERIALS ARE STORED OUTDOORS**

**Operations Step**- Drop heights are minimized by the inherent limitation of the front end loader lift height



### Truck Unloading

For truck unloading, Dry Materials (including Affected Materials) carried by in-house drayage trucks are unloaded within a bulk material storage building. Dry Affected Materials may be unloaded outside using a mobile mister or dry fogger for mitigation and then covering the pile with a tarp on a temporary basis.

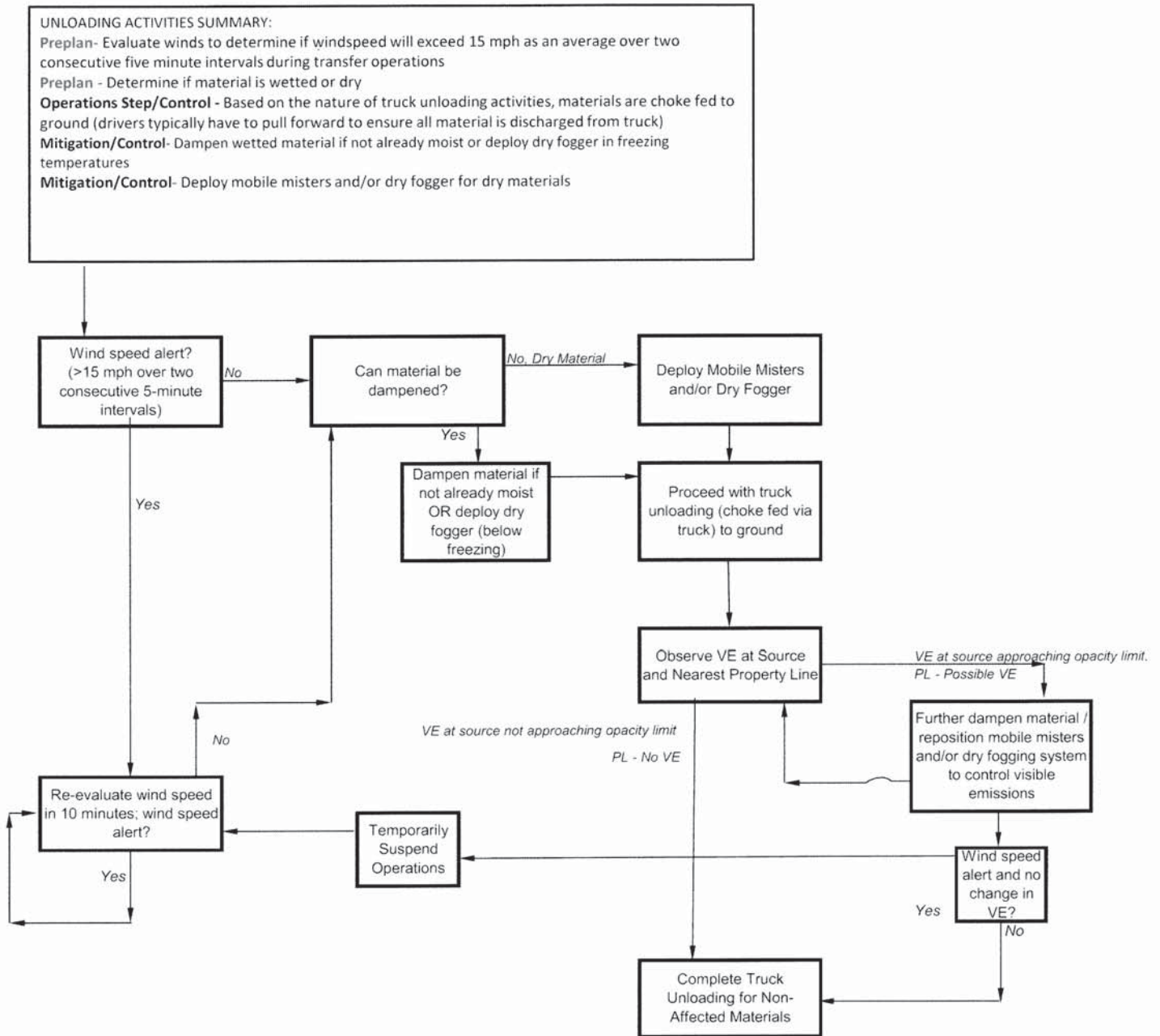
Materials that have a predominantly large particle size (greater than ½ inch) and/or can be watered (Wetted Materials) carried by in-house drayage trucks or that are being delivered from off-site full size trucks that are to be stored outside are unloaded directly to outdoor storage piles.

Full size trucks from off-site that are delivering non-Affected Materials are unloaded to ground in a manner which minimizes drop heights. Based on the nature of the truck unloading process, the material is being choke fed to the ground, and the driver usually has to pull forward to ensure that all material is discharged from the truck. Wetted Material will be dampened in the truck prior to unloading if moisture is not sufficient and a mobile mister or dry fogging unit will be deployed while unloading of Dry Materials.

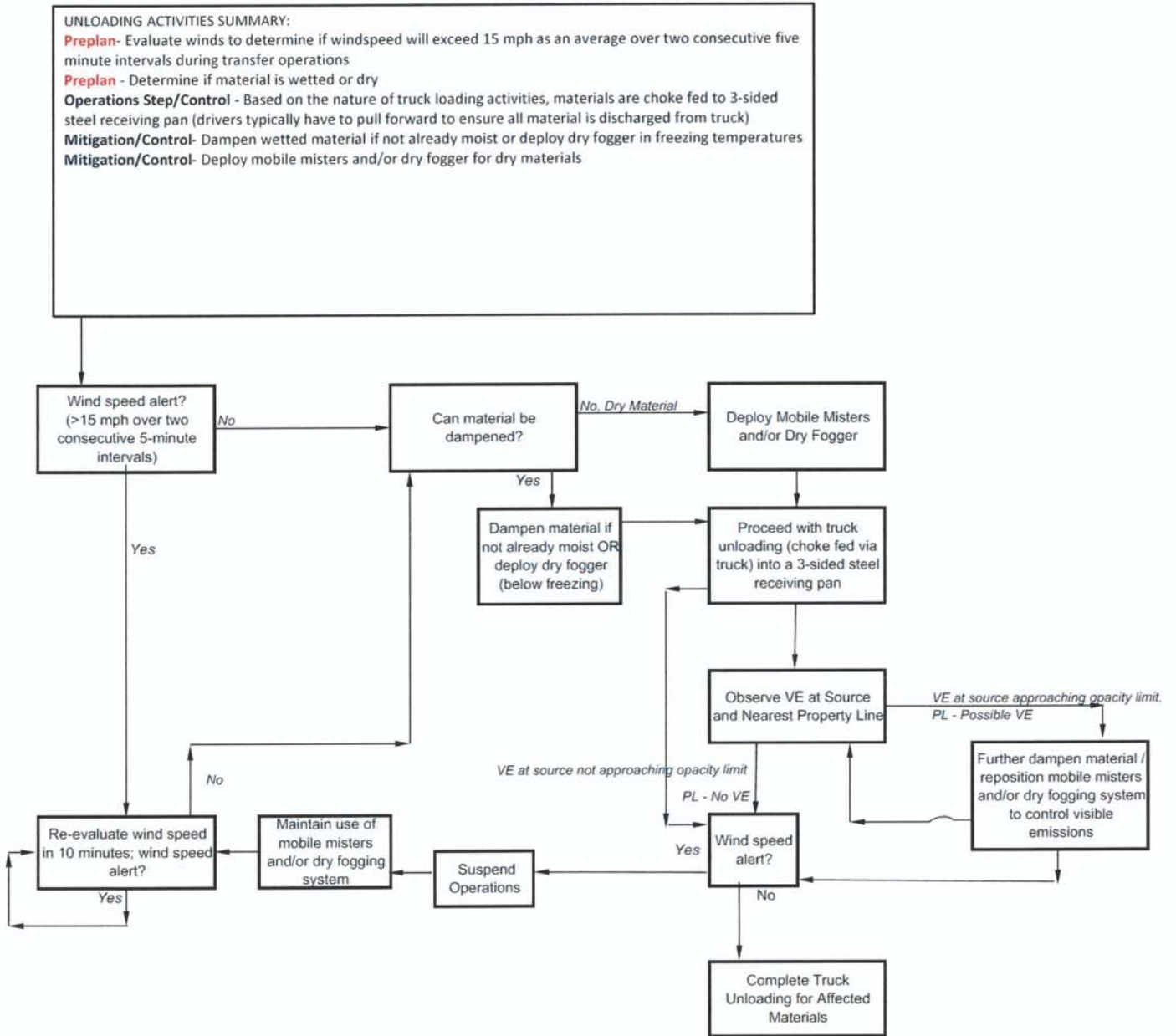
The facility employs more stringent controls for Affected Materials. Full size trucks from off-site, that are delivering Affected Materials, are choke fed to three-sided steel receiving pans, while deploying a mobile mister or dry fogger. Based on the nature of the truck unloading process, the material is being choke fed to the receiving pan, and the driver usually has to pull forward to ensure that all material is discharged from the truck. Unloading of Affected Materials to receiving pans is automatically suspended during high wind events.

The following decision tree diagrams (Figures 7a and 7b) represent the operating procedures for **Truck Unloading from Off-Site Full Size Trucks** for non-Affected Materials and Affected Materials, respectively.

**FIGURE 7a. BULK FULL-SIZE TRUCK UNLOADING (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**



**FIGURE 7b. BULK FULL-SIZE TRUCK UNLOADING (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**



## 6. BARGE UNLOADING/LOADING

Compliance Methods: water spray system

Additional Measures: enclosure, air pollution control equipment, minimize drop height, more stringent controls for Affected Materials

### Barge Unloading – Bulk Materials (non-Affected Materials)

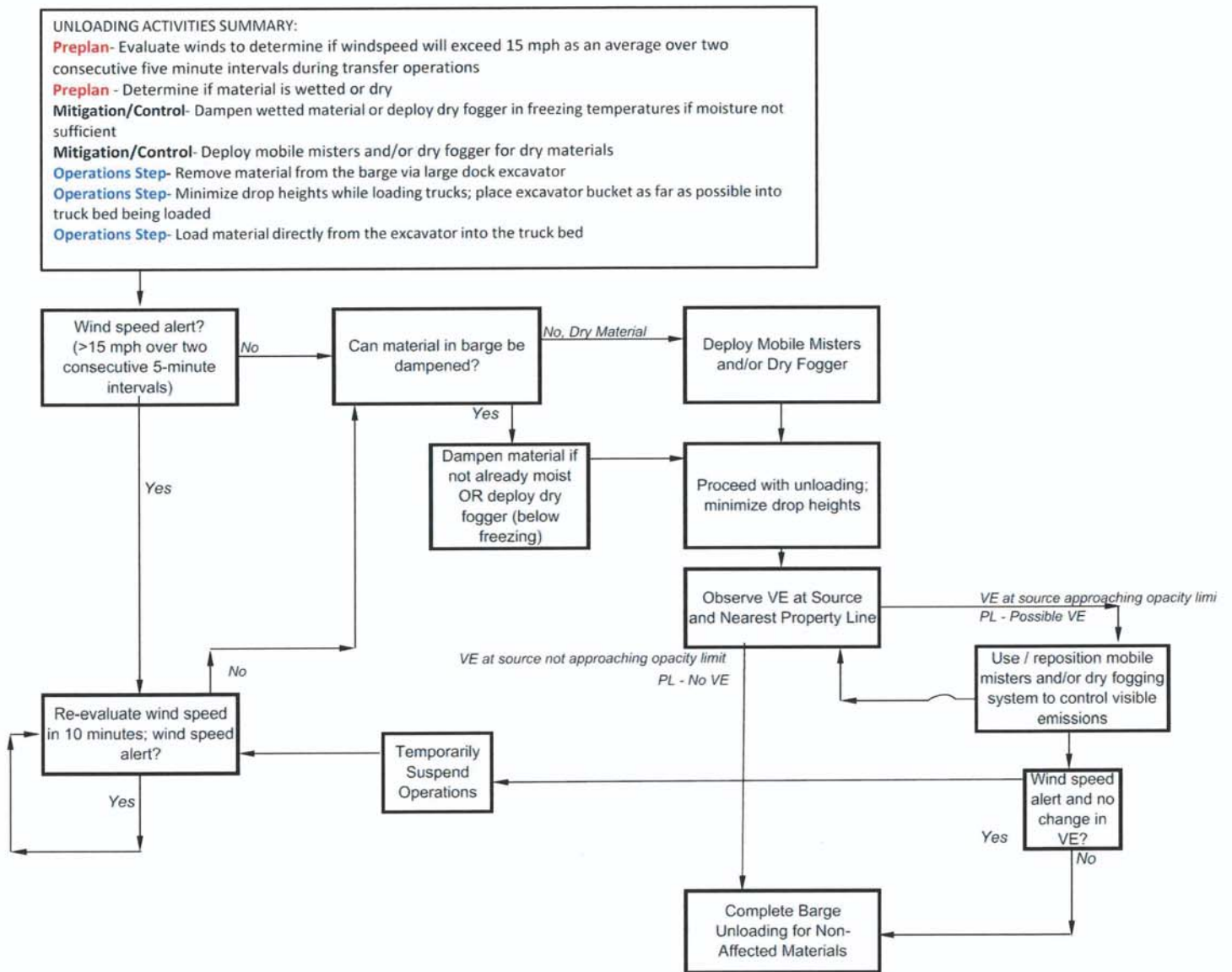
Barge unloading operations of non-Affected Materials that are Dry Materials are completed so as to minimize drop height to reduce fugitive dust emissions. If excess wind speed is observed, the facility manager will consult the on-site met station to determine wind speeds at the facility and determine if loading/unloading operations should be temporarily suspended. Due to the range of movement of the equipment required for barge unloading (there is not a fixed swing location for the excavator from the barge to a waiting truck), as well as the size of the barges (200 feet in length), and the need to reposition the barge during unloading activities, enclosure of barge unloading activities is not feasible.

The non-Affected Materials are unloaded directly to truck beds with a large dock excavator, adhering to barge unloading procedures as illustrated in Figure 8a below that are designed to reduce fugitive particulate emissions. Key mitigation actions include placing the excavator bucket as far as possible into the truck bed being loaded, in turn minimizing drop height of the bucket to truck transfer. Additionally, when unloading Dry Materials from a barge, the mobile misters or dry fogging unit will be deployed during unloading activities, which will create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

Wetted Materials are directly sprayed with water or dampened prior to start of unloading the barge if moisture is not sufficient. In freezing temperatures, in the rare event that moisture is not sufficient, the dry fogging system will be deployed and appropriately positioned as a dust mitigation measure while unloading, which will cause a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

The following diagram (Figure 8a) is the operating procedure for **Barge Unloading - Bulk Materials (non-Affected Materials)**.

**FIGURE 8a. BULK BARGE UNLOADING (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**





### *Barge Unloading – Bulk Materials (Affected Materials)*

The facility employs more stringent controls for barge unloading operations of Affected Materials. All barges of Affected Materials arriving at the facility are covered with stackable fiberglass lids, stackable metal lids, or sliding metal lids. The lids cannot be removed and barge unloading of Affected Materials cannot start during High Wind Conditions (as defined by the Regulation); the lids can only be removed and barge unloading can only start when High Wind Conditions are not occurring. If the material in the barge is wetted, then all the lids may be removed from the barge. Additionally, the facility will suspend unloading of Affected Materials from the barge when High Wind Conditions occur and will only be able to resume when High Wind Conditions are not occurring.

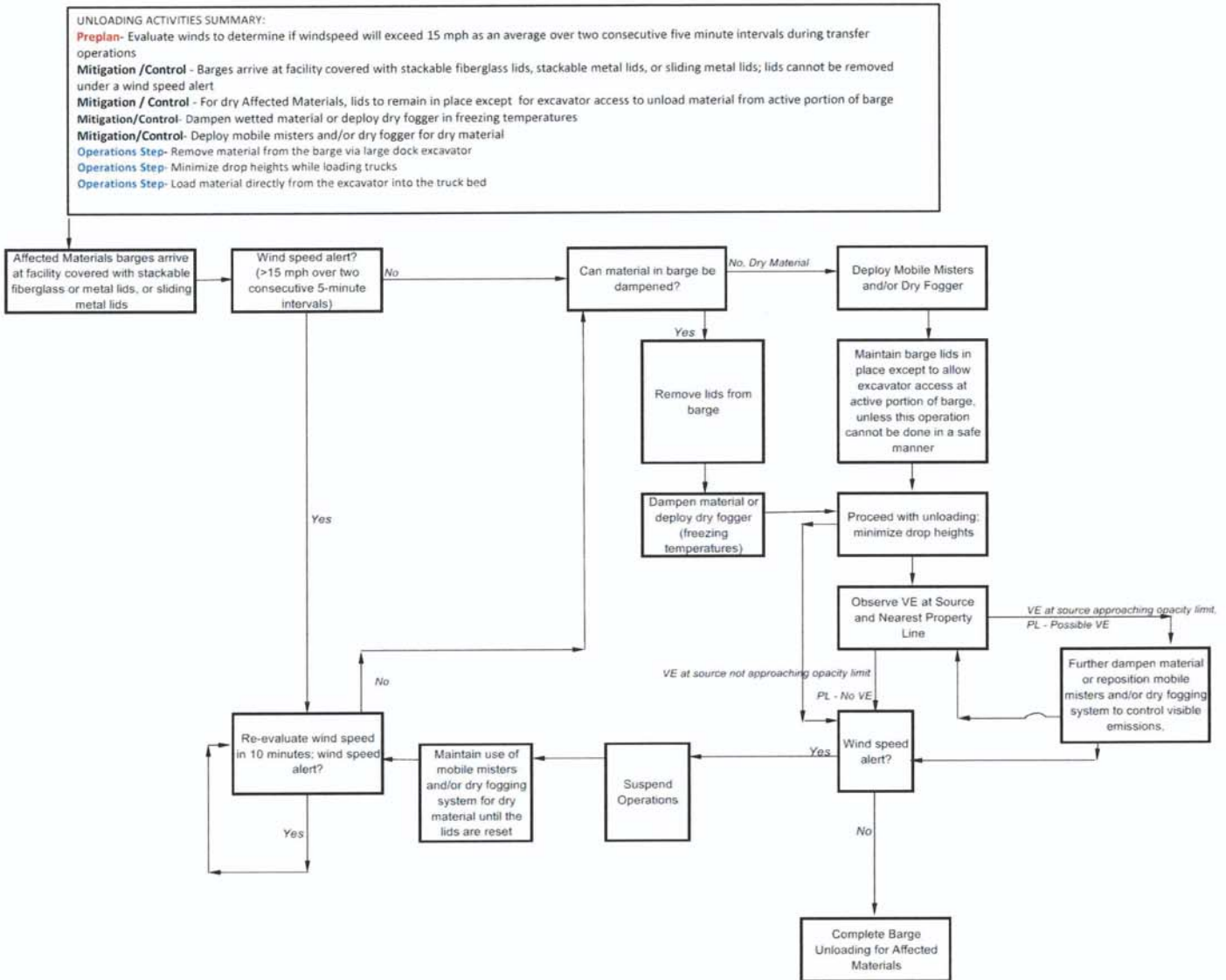
If allowed by the customer, Affected Materials will be wetted once the lids are removed and prior to the start of unloading the barge. The facility will ensure that the wetted Affected Materials have sufficient moisture to prevent fugitive dust when barge unloading operations are suspended during High Wind Conditions. In freezing temperatures, in the rare event that moisture is not sufficient, the dry fogging system will be deployed and appropriately positioned as a dust mitigation measure, which will cause a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

If the customer requires that the Affected Materials remain dry, the lids on the barges will remain in place except when the lids are removed to allow excavators to unload the material from that portion of the barge unless this operation cannot be done in a safe manner. Additionally, the mobile misters or the dry fogging unit will be deployed during any unloading of dry Affected Materials and also when barge unloading operations are suspended during High Wind Conditions until the lids are placed back on the barge. The mobile misters/dry fogging unit will be positioned based on the wind direction to create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

All Affected Materials are unloaded directly to truck beds with a large dock excavator, adhering to barge unloading procedures as illustrated in Figure 8b below designed to reduce fugitive particulate emissions. Key mitigation actions include placing the excavator bucket as far as possible into the truck bed being loaded, in turn minimizing drop height of the bucket to truck transfer.

The following diagram (Figure 8b) is the operating procedure for **Barge Unloading – Bulk Materials (Affected Materials)**.

FIGURE 8b. BULK BARGE UNLOADING (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL



### Barge Unloading – Super Sacks Converted to Bulk

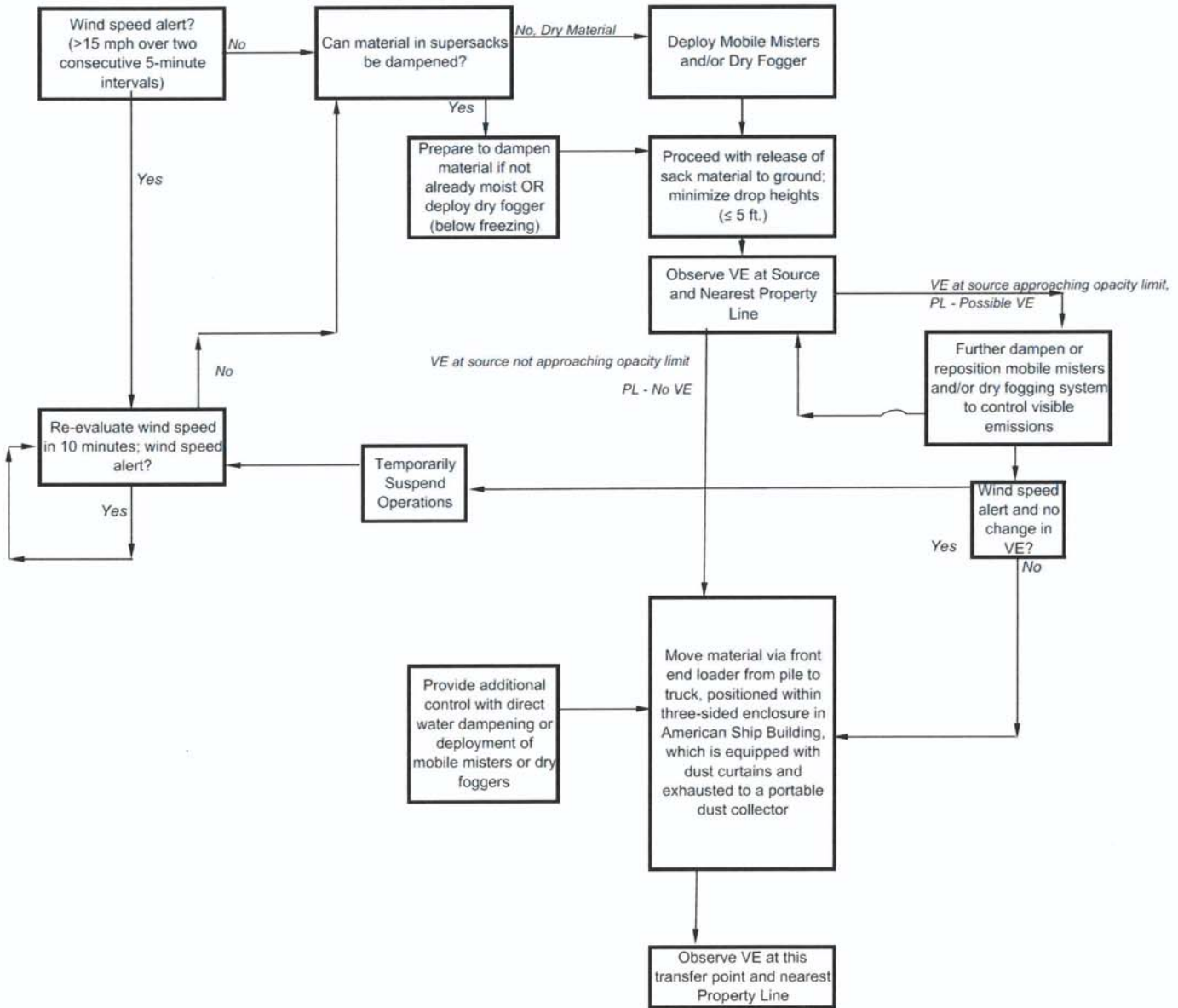
When super sacks of non-Affected Materials that are to be converted to bulk are unloaded from a barge, the sack material is first released to a pile at the dock. During the conversion to bulk, Wetted Materials are dampened if moisture is not sufficient and the mobile misters or the dry fogging system are deployed for Dry Materials according to the procedures as illustrated in Figure 8c below. The drop height of the material from the sack to the ground or pile is minimized to approximately 5 feet or less. Material is then moved from the pile to a truck. The truck is positioned in a three-sided enclosure located at the northeast corner of the American Ship Building, which is equipped with dust curtains and exhausted to a portable dust collector. During truck loading, front end loader drop heights are minimized by placing the hinge pin of the bucket as near as possible to the top of the side of the truck which results in the bottom portion of the bucket being contained inside the truck bed when the material in the bucket is off-loaded. Trucks are not loaded to the full depth of the truck bed to ensure material is contained. Additional control is provided by mobile misters or water dampening according to the procedures as illustrated in Figure 8c below.

All super sacks of Affected Materials arriving by barge are not opened outdoors at the dock and are transported from the barge directly to storage inside a building.

The following diagram (Figure 8c) is the operating procedure for **Barge Unloading – Super Sacks**.

**FIGURE 8c. SACK BARGE UNLOADING (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**

**UNLOADING ACTIVITIES SUMMARY:**  
**Preplan**- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
**Preplan** - Determine if material is wetted or dry  
**Mitigation/Control**- Dampen wetted material or deploy dry fogger in freezing temperatures at sack release to ground transfer point (at dock)  
**Mitigation/Control**- Deploy mobile misters and/or dry fogger for dry materials at sack release to ground transfer point (at dock)  
**Operations Step**- Remove supersacks from the barge via large dock excavator  
**Operations Step**- Release sack material to ground while minimizing drop heights;  
**Operations Step**- Load material (via front end loader) from pile to truck positioned within three-sided enclosure within American Ship Building, which is equipped with a portable dust collector  
**Mitigation/Control**- Dampen wetted material or deploy dry fogger in freezing temperatures at front end loader to truck transfer point  
**Mitigation/Control**- Deploy mobile misters and/or dry fogger for dry materials at front end loader to truck transfer point  
**Control**- Ensure portable dust collector is turned on and operational

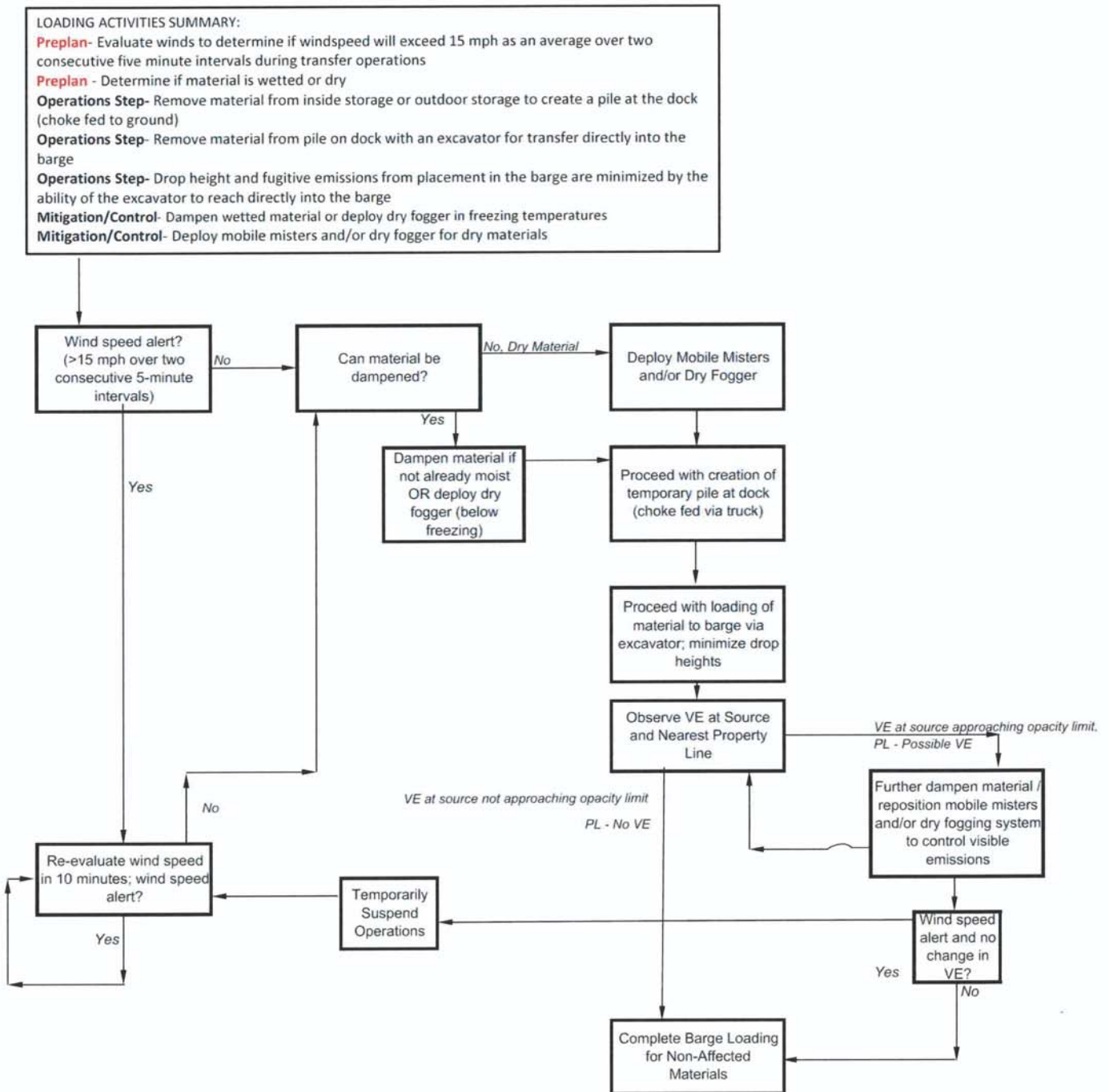


*Barge Loading (Non-Affected Materials)*

Barge loading is an infrequent activity. On the occasions when S.H. Bell Co. does load barges of non-Affected Materials, it uses an excavator to load the bulk material and minimize emissions. Bulk barges are loaded with material originating from either indoor or outdoor storage. The truck containing material to be loaded will drive to the appropriate location near the barge to create a temporary pile. Based on the nature of transfer of material from the truck, there is no need to minimize drop height as the material is choke fed to the ground; the driver typically has to pull forward in order to ensure that all material is discharged from the truck. From the temporary pile, a dock excavator scoops material from the dock and places it directly into the barge hold. The excavator has sufficient boom length to reach the barge bottom, minimizing drop height and any fugitive emissions. Wetted Materials are dampened if moisture is not sufficient and mobile misters or the dry fogging unit is utilized for Dry Materials according to the procedures as illustrated in Figure 8d below.

The following diagram (Figure 8d) is the operating procedure for **Barge Loading (Non-Affected Materials)**.

**FIGURE 8d. BULK BARGE LOADING (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**



### Barge Loading (Affected Materials)

Although an infrequent activity, the facility employs more stringent controls for barge loading operations of Affected Materials. Barge loading of Affected Materials cannot start during High Wind Conditions and can only start when High Wind Conditions are not occurring. Additionally, the facility will suspend loading of Affected Materials from the barge during High Wind Conditions and will only be able to resume when High Wind Conditions are not occurring.

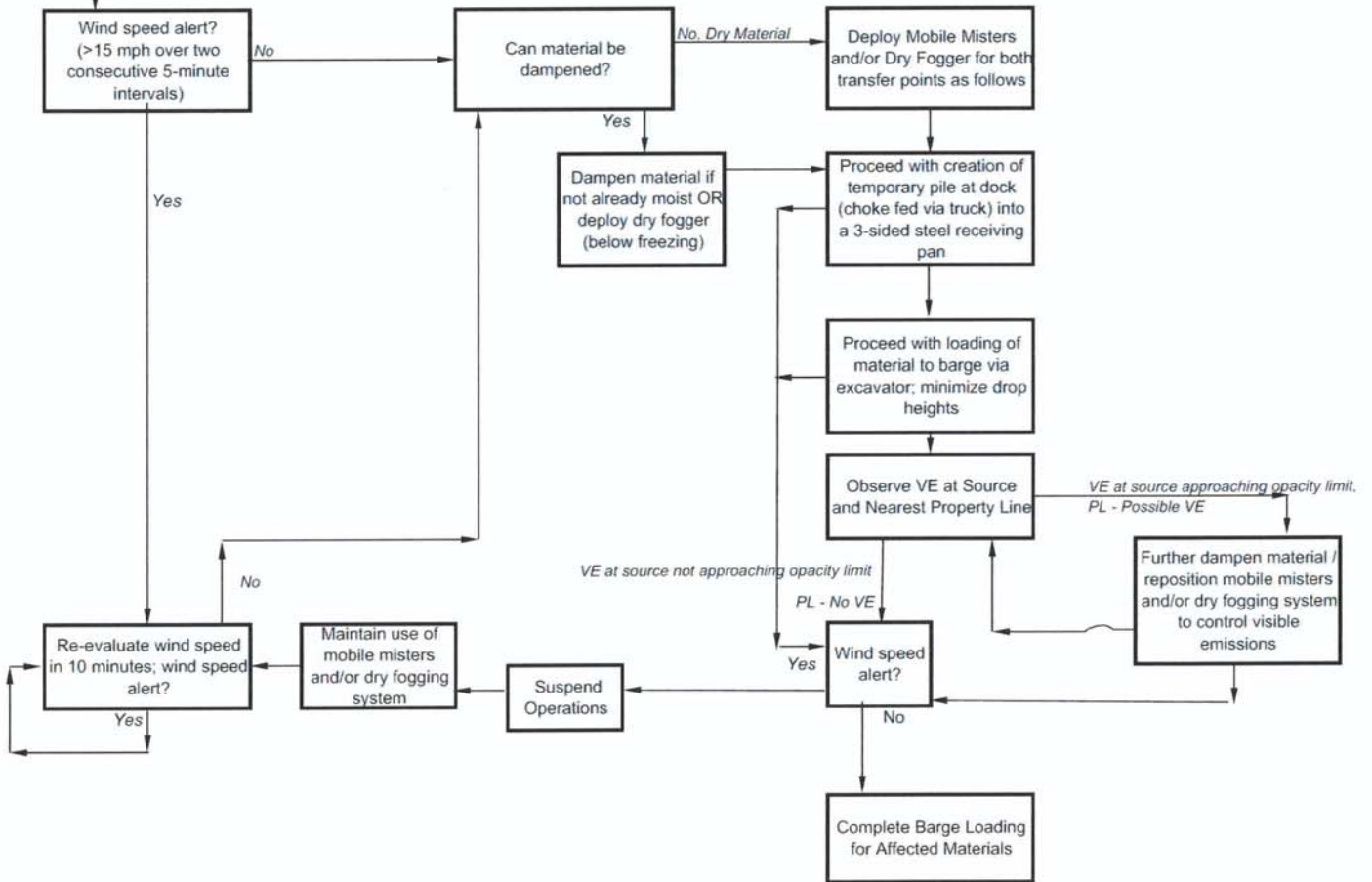
The truck containing Affected Material to be loaded will drive to the appropriate location near the barge. The truck will then unload the Affected Materials to a 3-sided steel receiving pan and based on the nature of transfer of material from the truck, the material is choke fed to the ground and the driver typically has to pull forward in order to ensure that all material is discharged from the truck. During the transfer of Dry Material from the truck, mobile misters or the dry fogging system will be positioned based on the wind direction to create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air. Wetted Materials will be directly dampened if moisture content is not sufficient.

From the steel receiving pan, a dock excavator scoops material from the dock and places it directly into the barge hold. The excavator has sufficient boom length to reach the barge bottom, minimizing drop height and any fugitive emissions. During the loading of the barge, mobile misters or the dry fogging system will be positioned for Dry Materials based on the wind direction to create a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

The following diagram (Figure 8e) is the operating procedure for **Barge Loading (Affected Materials)**.

**FIGURE 8e. BULK BARGE LOADING (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL**

**LOADING ACTIVITIES SUMMARY:**  
**Preplan**- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
**Preplan** - Determine if material is wetted or dry  
**Operations Step**- Remove material from inside storage or outdoor storage to create a pile at the dock (choke fed via truck to 3-sided steel receiving pan)  
**Operations Step**- Remove material from receiving pan with an excavator for transfer directly into the barge  
**Operations Step**- Drop height and fugitive emissions from placement in the barge are minimized by the ability of the excavator to reach directly into the barge  
**Mitigation/Control**- Dampen wetted material or deploy dry fogger in freezing temperatures (both transfer points)  
**Mitigation/Control**- Deploy mobile misters and/or dry fogger for dry materials (both transfer points)





## 7. RAILCAR UNLOADING/LOADING

Compliance Methods: enclosure, water spray system.

Additional Measures: air pollution control equipment, minimize drop height choke feed

### Bottom Unloading Railcars

Railcars can be unloaded via bottom discharge into a below grade pit that is partially covered by the railcar and which functions like choke feeding. The pit is below ground level, accessible by a steep ramp, and walled off on the three other sides, which significantly shields the unloading operation from the wind. There is no need to minimize drop heights as material cannot be discharged from the railcar until there is space available in the covered pit (choke feeding). Material is moved from the pit to storage via front end loader. Wetted Materials are dampened if moisture is not sufficient and mobile misters or the dry fogging unit is utilized for all materials at the initial bottom discharge transfer point and Dry Materials for subsequent transfer via front end loader according to the procedures as illustrated in Figure 9a and 9b below. Unloading is suspended during High Wind Conditions for Affected Materials.

The following decision tree diagrams (Figures 9a and 9b) are the operating procedures for **Railcar Unloading - Bottom Unload** for non-Affected Materials and Affected Materials, respectively.

FIGURE 9a. BOTTOM UNLOADING RAILCARS (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

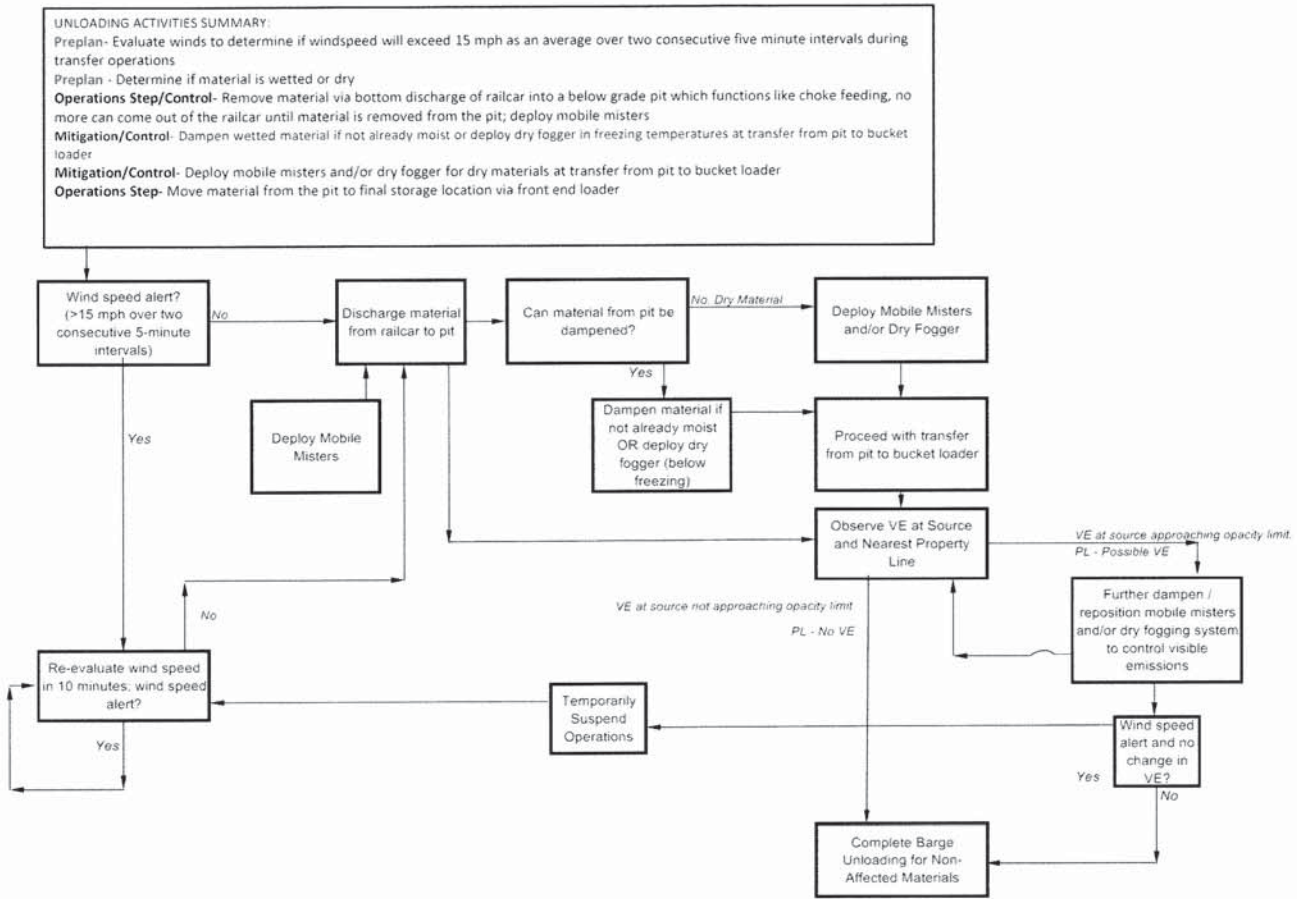
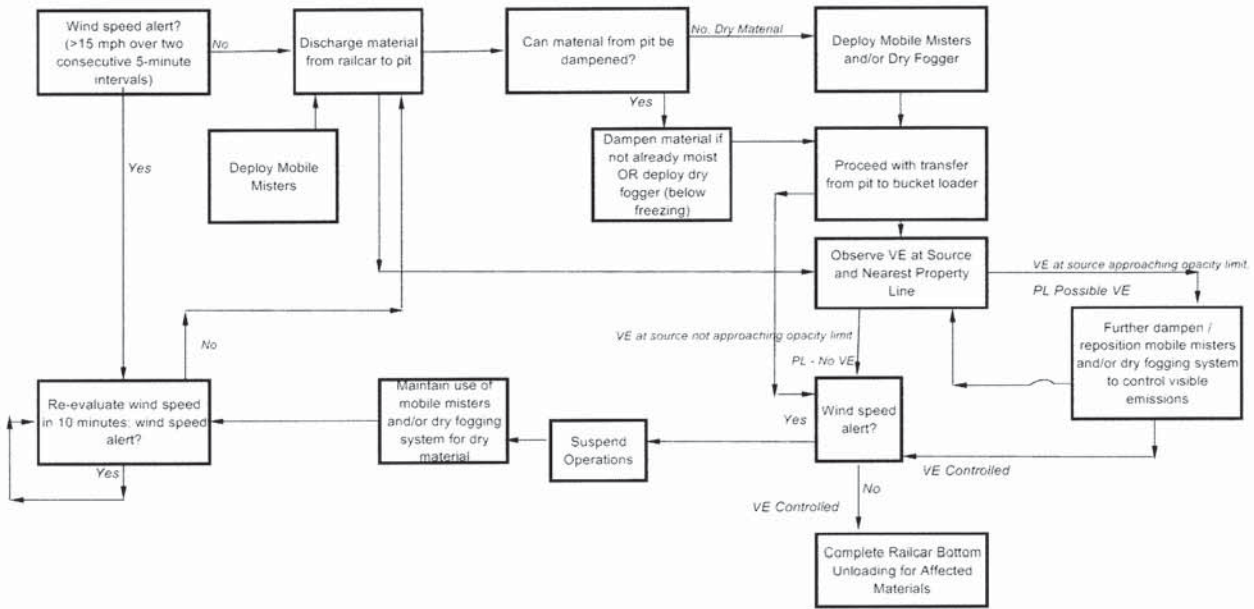


FIGURE 9b. BOTTOM UNLOADING RAILCARS (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

**UNLOADING ACTIVITIES SUMMARY:**  
 Preplan- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
 Preplan - Determine if material is wetted or dry  
**Operations Step/Control-** Remove material via bottom discharge of railcar into a below grade pit which functions like choke feeding, no more can come out of the railcar until material is removed from the pit; deploy mobile misters  
**Mitigation/Control-** Dampen wetted material if not already moist or deploy dry fogger in freezing temperatures at transfer from pit to bucket loader  
**Mitigation/Control-** Deploy mobile misters and/or dry fogger for dry materials at transfer from pit to bucket loader  
**Operations Step-** Move material from the pit to final storage location via front end loader



### Box Car Unloading

Box cars are unloaded using a skid steer into an unloading box enclosure. A portable dust collector is being added for use at the hopper enclosure. Unloading is suspended during High Wind Conditions for Affected Materials. Wetted Materials are dampened if moisture is not sufficient and mobile misters or the dry fogging unit is utilized for Dry Materials according to the procedures as illustrated in Figures 9c and 9d below.

The following decision tree diagrams (Figures 9c and 9d) are the operating procedures for **Railcar Unloading - Box Car Unload** for non-Affected Materials and Affected Materials, respectively.

FIGURE 9c. RAILCAR UNLOADING - BOX CARS (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

UNLOADING ACTIVITIES SUMMARY:  
**Preplan** - Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
**Preplan** - Determine if material is wetted or dry  
**Mitigation** - Dampen wetted material if not already moist or deploy dry fogger in freezing temperatures  
**Mitigation** - Position mobile misters and/or dry fogging unit to address fugitive emissions for dry material  
**Operations Step** - Remove material via skid steer from box car  
**Operations Step** - Load material from skid steer into unloading box enclosure and remove with front end loader  
**Mitigation/Control** - Utilize unloading box enclosure for initial material transfer

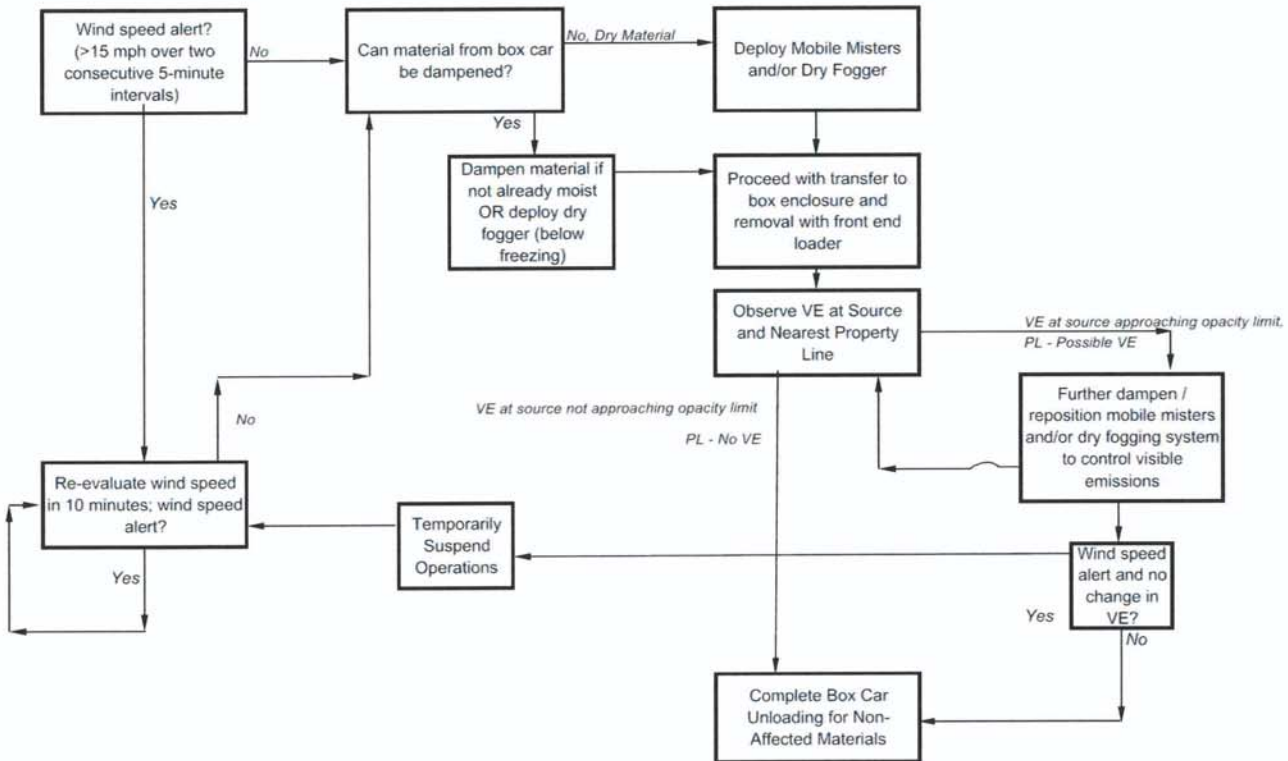
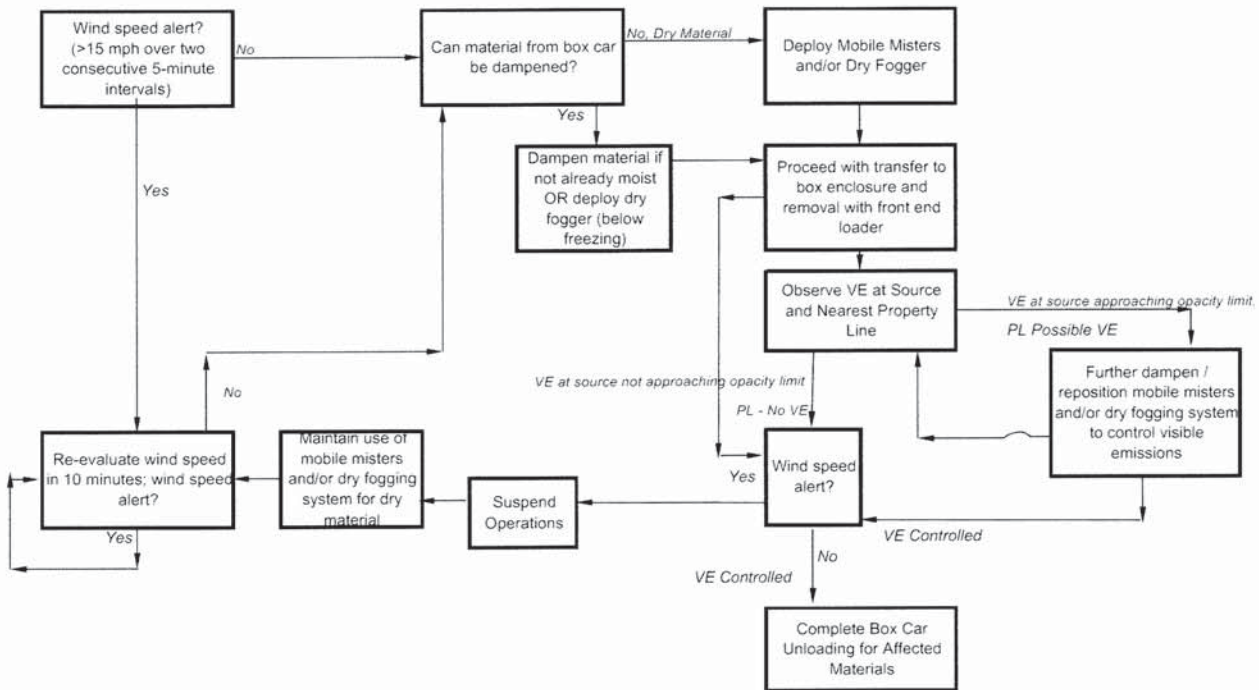


FIGURE 9d. RAILCAR UNLOADING - BOX CARS (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

**UNLOADING ACTIVITIES SUMMARY:**  
**Preplan** - Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
**Preplan** - Determine if material is wetted or dry  
**Mitigation** - Dampen wetted material if not already moist or deploy dry fogger in freezing temperatures  
**Mitigation** - Position mobile misters and/or dry fogging unit to address fugitive emissions for dry material  
**Operations Step** - Remove material via skid steer from box car  
**Operations Step** - Load material from skid steer into unloading box enclosure and remove with front end loader  
**Mitigation/Control** - Utilize unloading box enclosure for initial material transfer



Railcar Loading – Covered Hopper Railcars

Covered hopper (CHOP) railcars are loaded with material removed from either indoor or outdoor storage. Material is choke fed from a front end loader into the rail conveyor hopper which then feeds the material onto the covered inclined belt conveyor. The conveyor, covered as required by Section 3.0(6) of the Regulation, is positioned and field adjusted to minimize the drop height from the top of the conveyor into the railcar. The conveyor height is adjustable and is set to a height just above the railcar with the spout extending into the railcar compartment. A loading spout/sock is used at the transfer point to transfer material from the conveyor to the railcar in order to prevent dust and material loss; the loading spout/sock extends approximately one foot into the railcar through the hopper opening on the top of the railcar. Wetted Materials are dampened if moisture is not sufficient and mobile misters or the dry fogging unit is utilized for Dry Materials according to the procedures as illustrated in Figures 9e and 9f below.

The following decision tree diagrams (Figures 9e and 9f) is the operating procedure for **Railcar Loading - CHOP Railcars**.

FIGURE 9e. RAILCAR LOADING - COVERED HOPPER RAILCARS (NON-AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

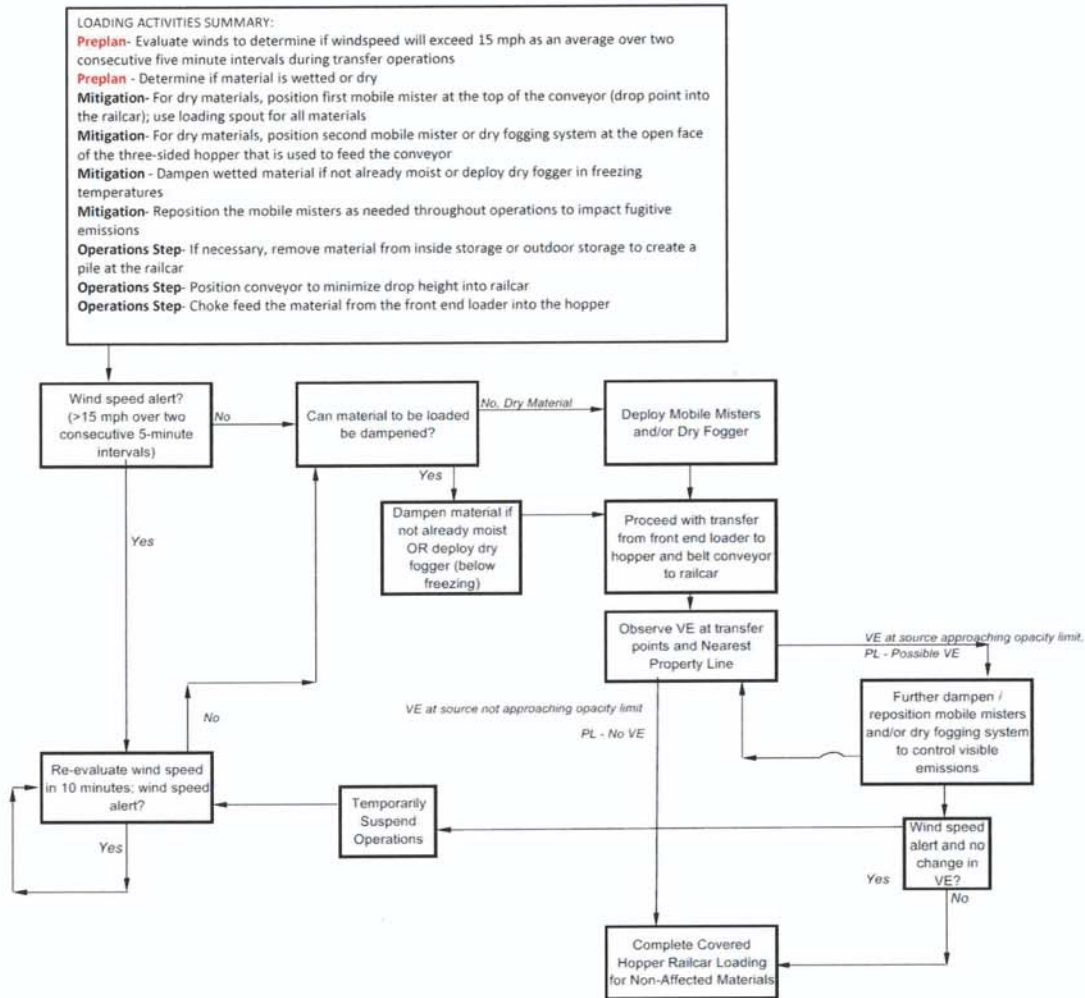
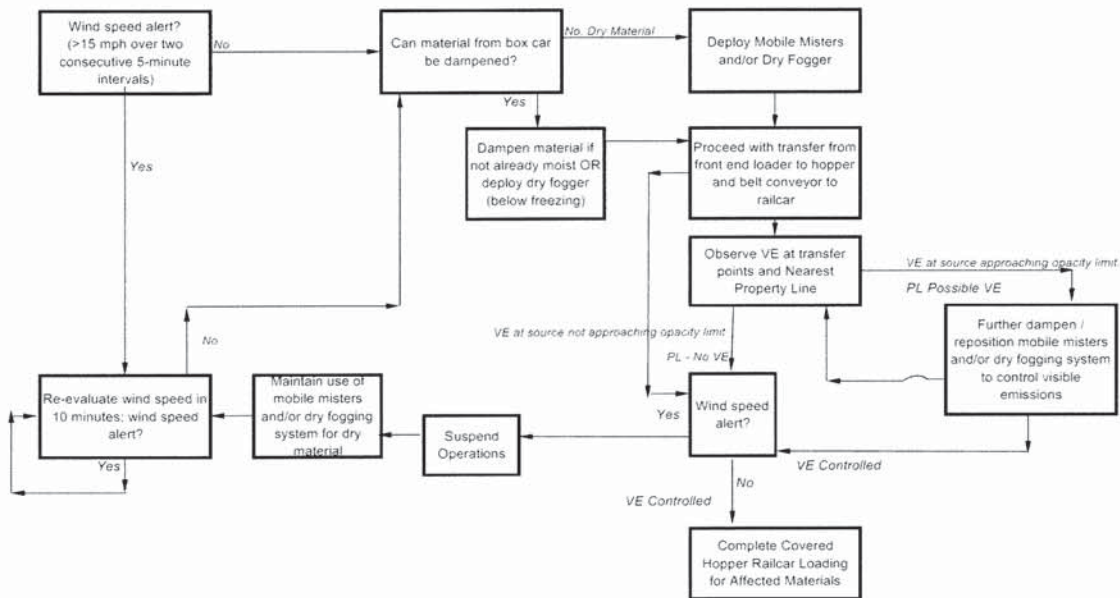




FIGURE 9f. RAILCAR LOADING - COVERED HOPPER RAILCARS (AFFECTED MATERIALS) - FUGITIVE DUST CONTROL

**LOADING ACTIVITIES SUMMARY:**  
 Preplan - Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations  
 Preplan - Determine if material is wetted or dry  
**Mitigation** - For dry materials, position first mobile mister at the top of the conveyor (drop point into the railcar); use loading spout for all materials  
**Mitigation** - For dry materials, position second mobile mister or dry fogging system at the open face of the three-sided hopper that is used to feed the conveyor  
**Mitigation** - Dampen wetted material or deploy dry fogger in freezing temperatures  
**Mitigation** - Reposition the mobile misters as needed throughout operations to impact fugitive emissions  
**Operations Step** - If necessary, remove material from inside storage or outdoor storage to create a pile at the railcar  
**Operations Step** - Position conveyor to minimize drop height into railcar  
**Operations Step** - Choke feed the material from the front end loader into the hopper



### Railcar Loading – Open Top Railcars

Only Wetted Material is permitted in Open Top Railcars and such material will be dampened prior to loading if moisture is not sufficient. In freezing temperatures, in the rare event that moisture is not sufficient, the dry fogging system will be deployed and appropriately positioned as a dust mitigation measure while unloading, which will cause a curtain or cloud that encapsulates fugitive particulate matter and causes the fugitive particulate matter to settle out of the air.

Open top rail cars are loaded directly with a front end loader, which allows drop height to be minimized more than through use of a conveyor. Drop height is minimized by placing the hinge pin of the bucket as near as possible to the top of the side of the railcar which results in the bottom portion of the bucket being contained inside the railcar when the material in the bucket is off-loaded.

The following decision tree diagram (Figure 9g) is the operating procedure for **Railcar Loading – Open Top Railcars**.

**FIGURE 9g. RAILCAR LOADING - OPEN TOP RAILCARS (WETTED MATERIALS) - FUGITIVE DUST CONTROL AFFECTED AND NON-AFFECTED MATERIALS**

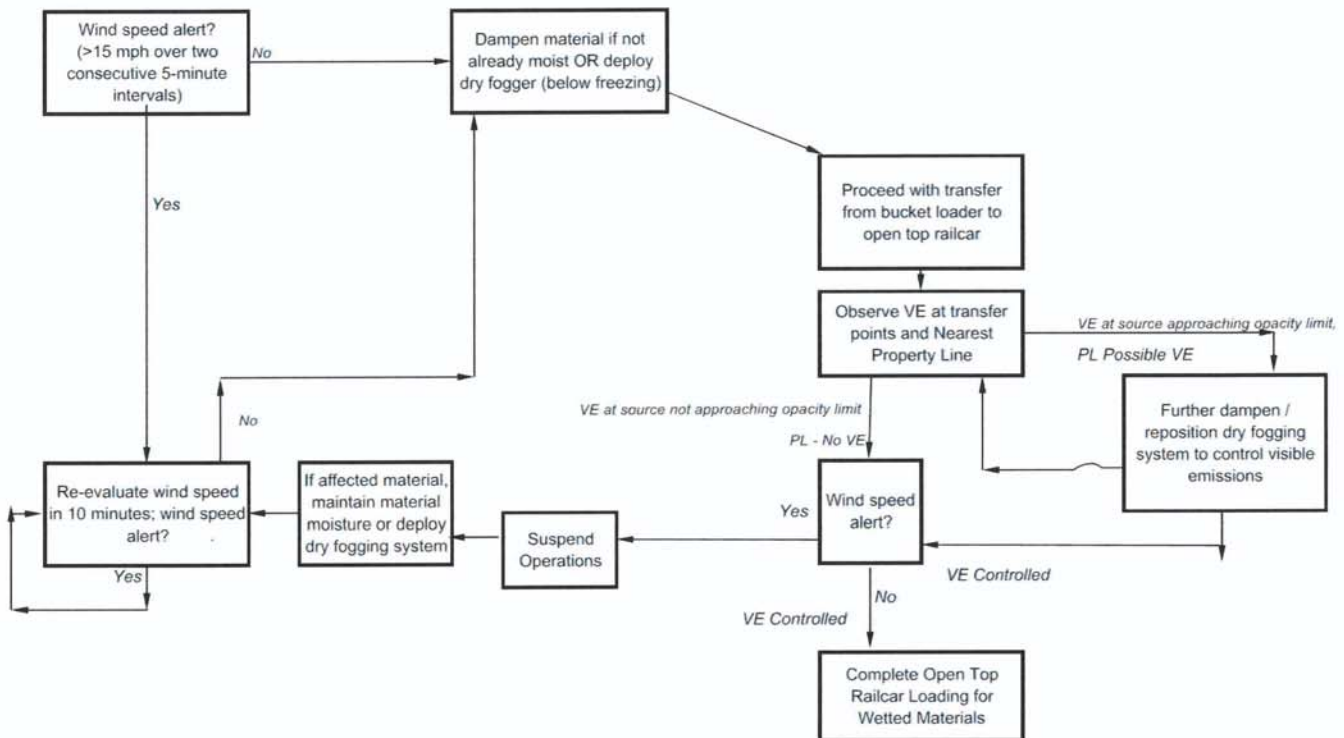
**LOADING ACTIVITIES SUMMARY:**

**Preplan**- Evaluate winds to determine if windspeed will exceed 15 mph as an average over two consecutive five minute intervals during transfer operations

**Mitigation/Control**- Dampen wetted materials or deploy dry fogger in freezing temperatures prior to loading

**Operations Step**- If necessary, remove material from inside storage or outdoor storage to create a pile at the railcar

**Operations Step**- Transfer material from bucket loader into the railcar; drop height of material is minimized by operating procedure for bucket placement



## 8. BAG AND BOX FILLING OPERATIONS

### *Compliance Methods: enclosure, air pollution control*

The box filling operation is performed under roof, in the Covered Dock (shown on Figure 1), with fugitive emissions from the filling operation captured and directed to a dedicated dust collector. The bag filling operation is located inside the Bowstring Building (shown on Figure 1), with fugitive emissions from the operation captured and directed to a dedicated dust collector. The initial drop to each hopper is performed by front end loader within an enclosure which provides control of fugitive emissions; the box filling operation maintains a pickup point to a dust collector at the initial drop. The bag filling operation has a sliding door that covers the open face of the hopper when not in use; the box filling operation has dust curtains which cover the face of the hopper.

## B. TRANSPORT BY TRUCK

### Regulatory Requirement:

The applicable requirements at Section 3.0(8) of the Regulation addresses Transport by Truck as follows:

- All vehicles must adhere to a posted speed limit of no more than 8 mph.
- All outgoing material transport trucks are cleaned so that there is no loose material on the exterior tire surface and the material removed by truck cleaning is collected.
- All outgoing material transport trucks pass through a wheel wash station and pass over rumble strips unless other measures are specified to ensure that the trucks will not cause any track-out of materials onto the public way.

### Facility Compliance Methods:

- The maximum speed limit for all vehicles at S.H. Bell Co. is 8 mph.
- Physical barriers prevent transport trucks from accessing unpaved areas.
- Chemical dust suppressant is applied at a minimum of once per month.
- Daily road sweeping / watering with ongoing monitoring and recordkeeping of same as described more below in Section C, Roadways.
- Sweeping of the truck route from Avenue N up to South 100<sup>th</sup> Street, unless the external routes are determined to be free and clear of material from the facility.
- All outgoing material transport trucks are cleaned by rumble strips at the inbound and outbound truck scales to remove loose material.
- Truck tires are observed at the weigh scale upon departure to assure material is not tracked out.
- Roads are also inspected for material track-out as further described below in Section C, Roadways.
- Towards the end of the last shift, visual inspection of internal roads is made and additional sweeping is made at any areas that have debris based on the visual inspection.
- Towards the end of the last shift, one final sweeping of ingress and egress routes of the facility is made regardless of the results of the visual inspection.

The procedures identified above effectively ensure that material trackout from the facility does not occur. Wheel wash stations are only necessary when trucks are traveling on unpaved roads, and as noted above, the transport trucks are physically prohibited from accessing the few unpaved areas at the facility. Monthly chemical dust suppressant applications and the daily watering/sweeping schedule, including final sweeps at the end of the day, also help ensure that material does not accumulate on the paved roads that could attach itself to transport truck tires in the first place. Additionally, the rumble strips installed at the

inbound and outbound truck scales knock off any of the wet material that may have accumulated on the transport truck tires (as noted previously and discussed in detail in Section C below, the facility frequently waters and/or applies dust suppressant to roads). The wet material that is knocked off from the wheels is accumulated in a pan/pit below the rumble strips. Truck tires are observed at the weigh scale upon departure to assure material is not tracked out. Roads are also inspected for material track-out as further described below in Section C. Accordingly, the combination of the facility's road sweeping / watering schedule with ongoing monitoring and recordkeeping of same, the limit of access to the few unpaved areas, as well as the rumble strips installed at the truck scales ensures control equivalent to a wheel wash station such that trucks will not cause any track-out of materials onto the public way.

Regulatory Requirement:

Section 3.0(9)(a) of the Regulation (Vehicle Covering and Other Dust Control) requires that truck trailers need to be covered before leaving the facility.

Facility Compliance Methods:<sup>3</sup>

All semi-trucks carrying materials out of the facility are covered, using the cover supplied by the truck owner/operator that meets the cover requirements in Section 3.09(a) of the Regulation. Trucks loaded within a loadout shed are covered once the truck has safely cleared the exit of the loadout shed. Trucks loaded from outdoor storage piles are covered immediately upon completion of material loading.

### **C. ROADWAYS**

Regulatory Requirement:

Section 3.0(14) of the Regulation requires that all internal roads used for transporting or moving material shall be paved and maintained, with a durable material that is not susceptible to becoming windborne, and in a manner sufficient to bar the expected level of traffic at the facility.

Facility Compliance Method:

All internal roads at the facility that are used for transporting or moving material are paved in accordance with Section 3.0(14) of the Regulation.

Regulatory Requirement:

The regulatory requirement at Section 3.0(15) of the Chicago Bulk Materials Regulation, Roadway Cleaning, includes use of a street sweeper with a water spray and vacuum system, sweeping to be performed so that not more than 4 hours elapses between each street sweeper cleaning or after every 100 truck material receipts or dispatches, but not less than one time daily when the facility is open for business,

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<sup>3</sup> The facility uses in-house drayage trucks (straight trucks with a 13' dump bed) for internal transport within the facility and which do not leave the facility with bulk material. Accordingly, the in-house drayage trucks are not subject to the cover requirements in Section 3.0(9)(a) of the Regulation. The in-house drayage trucks are not owned by S.H. Bell Co., but are contracted through a broker on a sporadic basis. As a best practice, the in-house drayage trucks do not exceed an 8 mph speed limit and a minimum of six inches of freeboard is maintained for all loads, both of which effectively prevent any potential fugitive dust or spillage during internal transport. To date, S.H. Bell Co. has not been able to identify any contractors/carriers that provide the required types of drayage trucks with covers or tarps. S.H. Bell Co. is working with the broker to investigate contractors that may supply trucks with covers or tarps, and if so, will give preferential treatment to those contractors going forward.

unless the roads are free and clear of any material transported to or from the facility, and recordkeeping of the sweeping.

Facility Compliance Methods:

S.H. Bell Co.'s street sweeper meets the requirements of Section 3.0(15)(a) of the Regulation as it is equipped with both a water spray and vacuum system.

The Facility's street sweeping schedule complies with Section 3.0(15)(b)-(c) of the Regulation which requires that sweeping be performed so that not more than 4 hours elapses between each street sweeper cleaning or after every 100 truck material receipts or dispatches, but not less than one time daily when the facility is open for business, unless the roads are free and clear of any material transported to or from the facility. The Facility documents the street sweeping and whether the roads are free and clear of any material transported to or from the facility on a daily basis during facility operations. A sweeper with a water spray bar and vacuum system is used for roadway sweeping.

Additionally, as noted in Section B, towards the end of the last shift, visual inspection of internal roads is made and additional sweeping is done at any areas that have debris based on the visual inspection. Further, towards the end of the last shift, one final sweeping of ingress and egress routes of the facility is made regardless of the results of the visual inspection.

S.H. Bell Co. also sweeps the truck route (Avenue N up to South 100<sup>th</sup> Street) which is within one-quarter mile of the facility, unless the external routes are determined to be free and clear of material from the Chicago Terminal.

Paved roads are also sprayed daily during working shifts, unless observed pavement condition indicates it is unnecessary and/or chemical suppressants are in use. Following a precipitation event and drying of the yard, sweeping will typically precede the application of dust suppressant. Otherwise, the performance of the dust suppressant in terms of binding and pavement adherence may be less than desired. Application equipment is equipped with a spray bar.

Additional watering/chemical suppressant application above and beyond the requirements of the Regulation is dependent upon observed conditions which are documented in the recordkeeping logs. For example, less watering may be required in cooler, calm conditions whereas additional watering may be required in hot, dry conditions. All roads are also sprayed when warranted by visual observation and at least on a monthly basis with a dust suppressant for the purpose of reducing fugitive dust emissions caused by wind or vehicular/equipment traffic. In the winter, salt will be applied to the roadways during working shifts when warranted to prevent icing while reducing potential fugitive emissions. Only two small segments of unpaved road exist at the facility and access to these segments is physically limited.

Regulatory Requirement:

Section 3.0(10) of the Regulation notes that vehicles cannot leak material or liquid onto internal road or waterway. Section 3.0(16) requires that areas not normally used for storage be free of any spilled or misplaced material.

Facility Compliance Methods:

In the rare event that bulk material leaks from cracks in a truck bed or otherwise leaks from a truck onto an internal road, the road will be cleaned within one hour according to the procedures provided above. Any areas not regularly used for storage of bulk materials will be kept free of any spilled or misplaced material and to the extent present will be removed by the end of a regular working shift. In the unique

circumstance where there is a material leak or spill that does create airborne dust or is otherwise hazardous, the facility will take immediate remedial measures. Any material that has the potential to leak or spill into a waterway will be cleaned immediately.

#### **D. OUTDOOR STORAGE PILES**

No Affected Materials are stored outdoors. The Facility limits the type of bulk non-Affected Materials that can be stored in outdoor storage piles to the following:

- Wetted Materials that have a predominantly large particle size (greater than ½ inch);
- Dry Materials that have a predominantly large particle size (greater than ½ inch), but only if tarped during storage; and
- Wetted Materials that have a small particle size less than ½ inch in diameter, but only if a very hard cohesive crust forms over the surface of the pile when watered.

The bulk materials that are stored outdoors are not dusty and are not susceptible to being windblown or are otherwise tarped.

##### Regulatory Requirement:

The regulatory requirement at Section 5.0 of the Regulation addresses Outdoor Storage Pile requirements, including pile height limits (Section 5.0(2)) and required setbacks from waterways (Section 5.0(3)).

##### Facility Compliance Methods:

S.H. Bell Company requested and received a variance from this requirement from the City of Chicago on October 17, 2016, for a modified setback of 20 feet. This modified setback, in conjunction with current storm water pollution prevention practices as included in the facility's Storm Water Pollution Prevention Plan (SWPPP), effectively provides protection of waterways. This modified setback only pertains to limited areas of the facility, namely the strip of land adjacent to the Middle Slip and the southwestern shoreline as indicated in Figure 1 (Facility Diagram). The maximum pile height allowed is 30 feet; based on the inherent limitations of the equipment used to construct piles, pile heights at the facility are limited to heights between 16 and 30 feet.

Further protection of waterways is achieved by storing only non-water soluble materials outside, absorbent materials are used along the perimeter of outdoor storage areas, and barriers between the site and the river prevent materials from falling, blowing or running off into waterways. In areas near the water, piles consist of materials that are primarily greater than ½" diameter in size.

##### Regulatory Requirement:

Section 5.0(4) of the Regulation requires disturbance of outdoor storage piles be suspended during High Wind Conditions unless alternate measures are implemented to effectively control dust.

##### Facility Compliance Method:

The procedures for High Wind Conditions are provided in Section IX, including criteria for suspending operations for outdoor storage piles.

Regulatory Requirement:

Dust suppressant systems are addressed in Section 5.0(5) of the Regulation, which notes that dust suppressant systems must be operable and able to dispense water, water-based solutions, and/or chemical stabilizers, including when the temperature falls below freezing. If the dust suppressant system becomes inoperable, disturbance of outdoor storage piles which are controlled by the inoperable portion must be suspended until the system is operable again.

Facility Compliance Method:

All outdoor storage piles are continually observed throughout the day and a recorded inspection of active piles is performed at least daily to ensure no fugitive dust is generated. Wetted Materials that have a predominantly large particle size (greater than ½ inch) are sprayed with water if moisture is not sufficient to ensure that there is no fugitive dust generated or are tarped when no material transfer is occurring. Materials stored outdoors and which consist of particles one-half inch in size or less are sprayed daily (weather permitting) with water, until crusted and firm or are tarped when no material transfer is occurring. Pile crusting refers to watering the pile until the material is fused, creating a cohesive layer over the pile such that the surface withstands direct pressure, preventing any of the material from becoming airborne or scattered by the wind. Crusting is similar to how granulated sugar will crust when dampened. In freezing temperatures, the surface of the pile is generally frozen preventing fugitive emissions as the moisture in the pile is sufficient to encapsulate particles. Dry fogging is available for use in freezing temperatures. If both the mobile misters and the dry fogging system are unavailable for use, then no active disturbance of the piles will take place.

The number, size, and composition of outdoor piles vary based on customer requirements. Figure 1 illustrates the typical location and general size of outdoor storage piles.

**E. Affected Material Storage**

No Affected Materials are stored outdoors.

All Affected Materials small-particle piles are stored fully indoors within the bulk material storage buildings. S.H. Bell sweeps the aisles and waters the doorways (weather permitting) of the indoor bulk storage buildings (Norcon and Ryerson buildings) when warranted by a visual observation to prevent Affected Materials from exiting the indoor bulk storage buildings and also (1) at least once per shift when an indoor storage building is in use for handling and/or processing Affected Materials; and (2) at least once per operating day for indoor bulk storage buildings in use for storing Affected Materials.

Large material (predominantly greater than ½ inch diameter material) piles of Affected Materials are not stored outdoors and are stored either indoors within the bulk material storage buildings or in roofed material storage bins, which consist of three-sided, roofed, paved areas and are designed to prevent exposure to wind (the "Roofed Stall Bins"). The Roofed Stall Bins that store large particle Affected Materials will be renovated such that there is no longer one side that is always open to the outdoors. When material transfer activities of large particle Affected Materials are performed, misters or foggers will be used at the point where fugitive dust may be anticipated to emanate. Transfer activities of Affected Materials will be suspended during high wind events. A chemical dust suppressant is sprayed in front of the Roofed Stall Bins when warranted by visual observation and at least on a monthly basis. No small-particle Affected Materials are stored within the Roofed Stall Bins.



## F. DUST COLLECTORS

There are five dust collectors currently in use at the facility:

- Norcon Loadout Dust Collector
- Ryerson Loadout Dust Collector
- Box Filling Dust Collector
- Bag Filling Dust Collector
- Portable Dust Collector

Each of these dust collectors is inspected daily when in operation according to specific operational and maintenance requirements. The daily and weekly inspection items, as well as semi-annual maintenance items, are tailored to the type and configuration of each dust collector. As applicable, these items include, but are not limited to, the following:

### Daily Inspection

- Differential pressure
- Check operation of pressure gage
- Functioning of filter cleaning system
- Check for unusual fan noise or vibration
- Proper functioning of fan
- Check for visible stack emissions
- Check that hopper is empty
- Hopper discharge device(s) operating
- Check fan and drive belts
- Check compressor functioning
- Check hoses and fittings for leaks
- Check pulse air system manifold for condensation
- Drain condensation from air receiver
- Material collection valve operational and normally closed
- Material collection container in good repair and emptied as required
- Filter media access doors closed and secured

### Weekly Inspection

- Check fan and drive belts

### Semi-Annual Maintenance

- Inspect fan drive belt

- Lubricate fan bearings
- Change filters (as required)
- Inspect tube sheet condition
- Change material collection container

Records are kept of the daily inspections of each dust collector. Facility personnel perform the inspections as well as any needed operation and maintenance. Any maintenance performed is also recorded. Spare parts for the dust collectors are maintained on site. If during the inspection of the dust collector, it is determined that the dust collector is faulty or not operational, an alternate control measure (as applicable) is instituted, in addition to the contingency measures outlined in Section VIII, until the control device is functional.

## V. Description of Truck Routes

The Regulation requires a description of the truck routes within one quarter mile of the perimeter of the facility be included in this plan. Figure 2 shows the roadways in the direct vicinity of the facility and highlights those which are used by trucks coming to and leaving from the facility.

All trucks enter and leave the facility over the truck scales at the northeastern corner of the property. Trucks enter from the intersection of South Avenue N and East 100<sup>th</sup> Street. These two roads are the most used access roads by truck traffic into the facility. Trucks coming from the west will typically travel east along East 100<sup>th</sup> Street and then travel south along South Avenue N to the facility entrance. Trucks leaving the facility and heading west will follow the reverse of this route. Trucks coming from the east will typically travel northwest along Indianapolis Boulevard to East 100<sup>th</sup> Street and head west, turning south to travel along South Avenue N to the facility entrance. Trucks leaving the facility and heading east will follow the reverse of this route.

All roads used by trucks entering or leaving the facility are paved - South Avenue N, East 100<sup>th</sup> Street, and Indianapolis Boulevard. The City of Chicago regularly sweeps roads in the vicinity of the facility and S.H. Bell Co. has included the truck routes within one quarter mile of the perimeter of the facility (Avenue N up to East 100<sup>th</sup> Street) in their roadway sweeping activities. Current dust control measures employed on roadways, as described above, including sweeping, dust suppression, tarping, and a maximum vehicle speed of 8 mph acts to prevent the amount of loose material carried out of the facility by trucks.

## VI. Dust Suppressant Application Summary

The following summarizes the use of dust suppressants at the facility:

Location	Suppressant Type	Application Frequency
Paved areas	Water	Minimum once daily during working shifts, unless pavement is noted to be controlled (e.g., already wet from rain) or unless one of the two following alternatives are in use:
	Chemical Dust Suppressant	At least once per month
	Salt	When warranted in freezing conditions
Outdoor small-particle piles	Water	Minimum once daily during working shifts, or until crusted/firm
Operations at outdoor storage piles	Water	Whenever operations are performed, per the operating procedures described above
Crusher/screener	Water/suppressant	Whenever operations are performed at hopper above crusher
Railcar Loading / Unloading	Water	Whenever materials are loaded or unloaded via railcar per the operating procedures described above in Section IV
Barge Loading / Unloading	Water	Whenever materials are loaded or unloaded per the operating procedures described above in Section IV
Multiple locations	Mobile Misters	Per the operating procedures described above in Section IV when temperatures are above freezing
Multiple locations	Dry Fogging System	Per the operating procedures described above in Section IV when temperatures are above and below freezing

## VII. Dust Surveillance and Monitoring Plan

The dust control strategy at the facility is a proactive approach as outlined in this Fugitive Dust Plan, including documented observations and real-time corrections as required. Visible emissions are monitored and managed at the source of fugitive emissions so as to maintain no visible emissions at the property line. The facility deploys equipment and manpower as needed to immediately correct or otherwise mitigate dust or housekeeping issues and meet internal housekeeping goals and standards. The facility's strategy provides the ability to assess and mitigate unforeseen challenges brought about by "present conditions" in a manner that is prudent and expedient for the identified conditions or situation. Additionally, continuous Federal Equivalent Method (FEM) PM10 source monitors as required by Section 3.0(3)(f)(i) of the Regulation are installed at the locations shown on Figure 1.

### A. Daily Monitoring and Action Plan

Facility operations are characteristic of batch processing, with the duration of each operation typically based on the amount of material to be handled. The intermittent nature of operations is incompatible with a rigid schedule of observations. Therefore, on a daily basis, when the source is in operation, a facility general condition review is completed at the beginning of the shift, mid-day, and at the end of the shift to evaluate transportation routes, building entrances and exits for general condition and housekeeping status. The appropriate resources, including manpower and equipment, are dispatched to remedy any noted deficiencies.

The daily production plan is then reviewed with the Terminal Manager to generally plan the fugitive emission observations for the day. The following items are evaluated prior to start of facility activities:

- Review updated weather forecast for the day in order to anticipate any adjustments in control measures;
- Equipment deployment and work practice adjustments based on an objective review (assessment) of conditions present at the start of work activity to match controls to conditions present or otherwise anticipated conditions;
- Anticipate periods of high volume truck loading/unloading to coordinate other terminal activities to allow for increased observations;
- Plan for any rail or barge loading or unloading, as the nature of those activities has the potential for sustained fugitive emissions, to include the following:
  - Series of consecutive observations to validate opacity at excavator to truck transfer work site as well as no visible emissions at the property line in proximity to the unloading activity at the 70-foot Dock, 200-ft Dock, or Dry Dock;
  - Emission mitigation/control activities adjusted for identified conditions, including wind direction, duration, and speed as well as the observed duration of fugitive emissions and plume duration and direction, and possible containment of fugitive emissions.

Adjustments to daily observations are made when there is a change in wind conditions, a change in operating plan/schedule, implementation of corrective action, etc.

## **B. Visual Emissions Inspections**

In addition to ongoing observations for Fugitive Dust at the Source and VE near the property line as described above Section IV in the Operating Procedures for active operations at the facility, the facility implements a Visual Emissions Inspections program that also goes above and beyond the requirements in the Regulations. At least three times per working shift, visible emissions are observed both at the point of generation for each active operation as well as at the property line closest to each active operation that is not controlled by total enclosure or a dust collector. For active operations controlled by total enclosure or a dust collector, a daily visible emissions inspection is undertaken of the processing enclosure egress points and the dust collector exhaust stack. The intermittent nature of active operations at the facility is incompatible with a rigid schedule of observations, however, more frequent inspections are generally performed at outdoor activities such as barge unloading, truck unloading, and working outdoor piles.

The visual emissions inspection are made and documented by facility personnel who are Method 9 certified and familiar with operations and the historical associated visible emissions under normal operating conditions. Visible emissions at the point of generation are observed to determine the presence or absence of Fugitive Dust at the Source and VE near the property line. The criteria for observing visible emissions at the nearest property line based on wind direction is presence / absence and the criteria for Fugitive Dust at the Source is the observation of opacity at an operation / activity that approaches the applicable opacity limit. Corrective measures including additional control are implemented at the point of generation, and are adjusted as needed for current conditions, including wind direction and speed.

If Fugitive Dust at the Source is observed to be approaching an opacity limit and/or the potential for visible emissions at the property line is noted, the following will be undertaken:

- The appropriateness of controls as outlined in Figures 3-9g will be critiqued by the site management team and amended to resolve a recurrence of similar incident.
- A Method 22 reading will be performed after initial corrective actions. Further periodic visible emission observations will be made during the operation. If the Method 22 reading does not confirm the absence of visible emissions, additional controls will be instituted or the operation will be suspended.
- If the operations are not suspended and further corrective actions are instituted, a Method 9 reading will be performed after completion of the corrective actions. Additional periodic Method 22 observations will be made during the operation.

Initiating corrective action and any subsequent decision to increase the frequency of these observations will be dependent on discussion with the Terminal Manager or his designee and upon circumstances of observed conditions and deviations from the controls scheme as illustrated in the operating procedures in Figures 3 – 9g. When necessary, operating procedures will be amended to reflect best management practices and/or control improvements initiated as a result of a negative observation finding.

## **C. Quarterly Opacity Testing**

Although the Regulation only requires quarterly visible emission evaluations pursuant to 35 IAC 212.107 (Method 22, presence or absence of visible emissions), an individual trained and certified to evaluate

visible emissions will perform quarterly visible emission evaluations in accordance with the measurement method specified in 35 IAC 212.109 (Method 9). Opacity reads will be performed at each of the three source types at the facility:

- outdoor storage pile
- roadway
- material transfer point

For purposes of the reads, the outdoor storage pile that contains the material present in the largest quantity at the terminal on the day of the read and the outdoor storage pile containing the smallest size materials will be selected as the read locations. A roadway segment that has heavy truck vehicle traffic on the day of the read will be observed as the representative location. The material transfer point reads will be taken at barge unloading, truck unloading, railcar unloading, and pile creation to the extent in operation on the day of the read. These opacity read locations are designed to detect the greatest amount of dust emissions.

In general, the opacity reads will be performed on clear days or partly cloudy days to provide the appropriate background contrast for Method 9 reads. The regulation requires testing during a range of weather conditions, noted by the CDPH to include variations in temperature and wind conditions. Quarterly opacity reads will be completed during the second or third week of the last month of each quarter (i.e., March, June, September, and December). The specific day(s) will be selected by the certified reader, whose decision will be in part based on weather conditions, including temperature and wind, on previous days that opacity reads were taken, in order to choose reading days on which opacity readings will be conducted during a range of weather conditions. For example, during at least one of the quarterly opacity reads, the certified reader will endeavor to select specific day(s) with hourly average wind speeds over 10 mph.

Opacity reads will be conducted if the weather conditions are suitable for compliance with US EPA Method 9 requirements. If it is raining, snowing, and/or foggy on the test date such that it would affect the ability to follow the US EPA Method 9 procedure, the testing will either be conducted later in the day, or rescheduled to the next available date.

Opacity reads of the representative storage piles and transfer points will be conducted pursuant to 35 IAC 212.109, which references Method 9, 40 CFR Part 60, Appendix A. In general, EPA Method 9 requires that the observation point for transfer points and piles will be the point of maximum opacity at a 4 foot elevation above the transfer point or pile surface. If no opacity is visible, the readings will be taken at the midpoint of the source. Also in accordance with 35 IAC 212.109, opacity reads of roadways will be performed for a duration of 4 trucks passing. Three readings for each truck pass will be taken at 5-second intervals. The first reading will be at the point of maximum opacity, and the second and third readings shall be made at the same point, with the observer standing at right angles to the plume at least 15 feet away from the plume and observing 4 feet above the surface of the roadway. After four trucks have passed, the 12 readings will be averaged.

## VIII. Dust Monitoring Contingency Plan

The FEM PM10 monitors are installed at the four cardinal points of the facility in accordance with the U.S. EPA-approved monitor siting plan. The FEM PM10 monitors record PM10 on an hourly basis and store the data electronically. An automated system alerts facility personnel of elevated PM10 readings. The system transmits the alerts via email and text message. Upon receipt of an alert, the Terminal Manager or his designee will determine if the Reportable Action Level (RAL) has been exceeded.

Under the Regulation, the RAL is defined as the positive difference between the level of PM10 measured at an upwind monitor(s) and the level of PM10 measured at a downwind monitor(s) that will trigger response activity. The response activities should consist of a range of increasingly aggressive measures appropriate to different levels of exceedance. The regulation further provides that the RAL may vary based on the value of the difference, and based on the concentration of PM10 detected at the downwind monitor(s) at a Facility. This Dust Monitoring Contingency Plan satisfies each of these requirements.

S.H. Bell will utilize a 24-hour average calendar day approach (the "24-Hour Contingency Procedure"), with regards to definition of RAL because it is most justifiable to compare the RAL to the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10. For purposes of this Dust Monitoring Contingency Plan, the RAL is conservatively set below the 24-hour National Ambient Air Quality Standard (NAAQS) for PM10 of 150 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ). Accordingly, under the 24-hour Contingency Procedure, if the positive difference between the upwind monitor(s) and the downwind monitor(s) is greater than  $125 \mu\text{g}/\text{m}^3$  on a calendar day that the facility is operating, a "RAL Event" occurs triggering the requirement to make a report to the City under Section 3.0(4)(d) and to undertake the Response Activities outlined below.

Additionally, S.H. Bell will evaluate hourly PM10 and wind data from the monitors while the facility is operating to determine if there are potentially elevated levels of PM10 at the facility where prudence would dictate implementing the Response Activities below even though it would not be a reportable RAL Event (the "Hourly Contingency Procedure"). Under this Hourly Contingency Procedure, no action is required if the levels from the upwind / downwind monitor difference stay equal to or below  $250 \mu\text{g}/\text{m}^3$  while the facility is operating, which is below the concentration approved by the CDPH in May 2016 for KCBX<sup>4</sup>. If the positive difference between any upwind monitor(s) and the downwind monitor(s) is greater than  $250 \mu\text{g}/\text{m}^3$ , an "Hourly Event" occurs and S.H. Bell will undertake the Response Activities outlined below. An Hourly Event is further characterized as follows in the Response Activities outlined below that results in a range of increasingly aggressive measures appropriate to these different levels of exceedance:

- "Low" Hourly Event:  $250 \mu\text{g}/\text{m}^3 < \text{Upwind/Downwind Concentration Difference} < 500 \mu\text{g}/\text{m}^3$
- "Medium" Hourly Event:  $500 \mu\text{g}/\text{m}^3 \leq \text{Upwind/Downwind Concentration Difference} < 1,000 \mu\text{g}/\text{m}^3$
- "High" Hourly Event:  $1000 \mu\text{g}/\text{m}^3 \leq \text{Upwind/Downwind concentration Difference}$

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<sup>4</sup> The hourly contingency procedure level of  $250 \mu\text{g}/\text{m}^3$  is very conservative. The OSHA Permissible Exposure Limit (PEL) for General Industry and the CAL/OSHA PEL for respirable dust are both  $5 \text{ mg}/\text{m}^3$  ( $5,000 \mu\text{g}/\text{m}^3$ ), which is more than 15 times greater than hourly contingency procedure level.



## Response Activities

Step 1: Investigate suspected on-site activities and on-site sources to determine the potential cause:

- (1) If a RAL Event, submit a written report to the CDPH within 24 hours.
- (2) If an on-site activity or source is identified as having caused a “High” Hourly Event, immediately proceed to Step 4 (Suspend).
- (3) If an onsite activity or source is identified for a RAL Event or a “Low” or “Medium” Hourly Event, proceed to Step 2 (Mitigation).
- (4) If no potential onsite activities or sources are able to be identified for the RAL Event or the Hourly Event, proceed to Step 6 (Record).

Step 2: Mitigation

- a. If a potential onsite activity or source is identified for a RAL event or “Low” Hourly Event, the first and primary response will be water application, whether added directly to material or applied via mobile misters or dry foggers and in accordance with the operating procedures in Figures 3 - 9g and as described in Section IV.
  - i. For an outdoor pile, pile maintenance and housekeeping (rotary brush wet sweep) will be performed and/or targeted water addition (via water truck or front end loader).
  - ii. For material transfer activities, ensure that drop height is minimized, reduce material feed rate and/or choke feeding is used as possible.
  - iii. For roadways, conduct additional sweeping and/or apply targeted water through water truck spray bars and/or apply dust suppressant.
  - iv. For wind direction changes, reposition mobile misters or dry foggers as warranted.
- b. For a “Medium” Hourly Event, if a potential onsite activity or source is identified conduct the following regardless of the onsite activity or source:
  - i. Automatically deploy the mobile misters or the dry fogging unit for Dry Materials.
  - ii. Automatically directly water Wetted Materials.
  - iii. Conduct Method 9 readings at the onsite source,
  - iv. Proceed back to Step 2.a. for further mitigation if the Method 9 reading indicates an exceedance of the applicable opacity limit.
- c. Proceed to Step 3 (Monitor).

Step 3: Monitor

- a. Monitor PM10 readings after mitigation is implemented:
  - i. If the upwind/downwind difference in the monitor at issue in the first hourly reading available to S.H. Bell after completion of mitigation activities in Step 2 is less than or equal to  $250 \mu\text{g}/\text{m}^3$ , proceed to Step 6.
  - ii. If the upwind/downwind difference in the monitor at issue in the first hourly reading available to S.H. Bell after completion of mitigation activities in Step 2 is greater than  $250 \mu\text{g}/\text{m}^3$ , institute additional mitigation activities. If the upwind/downwind difference in the monitor at issue in next hourly reading available to S.H. Bell after completion of the additional mitigation activities continues to exceed  $250 \mu\text{g}/\text{m}^3$ , proceed to Step 4.

**Step 4: Suspend**

Suspend the on-site activity or source identified in Step 1 above and conduct mitigation activities; monitor hourly PM10 levels at the monitor at issue until the upwind/downwind difference in readings is less than or equal to 250  $\mu\text{g}/\text{m}^3$ . In which case, proceed to Step 5.

**Step 5: Restart**

Restart sources/activities suspended under Step 4 when the upwind/downwind difference between the hourly PM10 levels at the monitor at issue is less than or equal to 250  $\mu\text{g}/\text{m}^3$ .

**Step 6: Record**

Record and retain a report that contains PM10 data, meteorological information, time of notification/alert, timing of suspension and restart (if applicable), description of mitigation efforts, and any other pertinent information related to the event.

As part of the base plan described in Section VII, short-term PM10 monitoring values will be known throughout a given day, and the Terminal Manager or his designee will make adjustments to the operating plan /schedule, reposition the mobile misters or dry foggers, apply additional dust suppressant application to roadways, etc. as a response to relatively higher hourly or consecutive hourly PM10 upwind / downwind concentration differences considered to be excursions projecting to a possible RAL Event.

**Contingency Plan for Monitors**

Appendix B contains the Quality Assurance Project Plan (QAPP) for the PM10 monitors and includes operation and maintenance activities associated with the PM10 monitoring program. Any time monitoring equipment has malfunctioned so that readings or data logging is not occurring, the CDPH will be notified within 24 hours. Reporting is not required for maintenance or calibration activities.

If the wind monitor is out of service, web-based local weather data will be used.

If a PM10 monitor is out of service for more than 48 hours, Method 22 opacity readings will be performed daily at the location of the out of service PM10 monitor.

## **IX. High Wind Events**

Wind direction and wind speed data are collected at the onsite meteorological station and stored electronically, as required by Section 3.0(5). The meteorological monitoring system will be calibrated on a semi-annual basis and the wind speed sensors will be swapped and bearings replaced. On an annual basis, the wind direction sensors will be swapped and bearings replaced.

Section 5.0(4) notes that disturbance of outdoor piles, including loading, unloading, and processing, shall be suspended during High Wind Conditions unless alternative measures are implemented to effectively control fugitive dust. As part of production planning, barge unloading and rail unloading activities are generally planned for conditions with anticipated wind speeds of 15 mph or less. Nonetheless, as detailed in Section IV.A, outdoor activities associated with Affected Materials, such as barge loading/unloading, and truck unloading will automatically be suspended for High Wind Conditions. For outdoor activities involving non-Affected Materials, facility personnel will be cognizant of High Wind Conditions, and will suspend these activities if control measures are found to be ineffective in controlling fugitive dust, as per Section 5.0(4).

An alert is provided for “High Wind Conditions,” which consistent with Section 2.0(12) of the Regulations, is when average wind speeds exceed 15 mph over two consecutive five minute intervals of time. The alerts are provided via flashing light on the met station and on an alert light on the met station “live” readout screen. When an alert is received, the following activities are initiated:

### Notification:

- Operators are notified that a high wind alert has occurred.

### Visual Observation:

- Visual monitoring for dust will continue and any required response steps will be performed as outlined in Section IV and Figures 3-17. These figures contain procedures for each type of operation provided in decision tree format which include criteria for determining if temporary suspension of activities is warranted.

## X. Recordkeeping

The following records are kept in accordance with fugitive dust control measures, on the schedule noted below, and maintained for a minimum period of three (3) years from the date the record is created. For daily records, the records are kept daily when the facility is operating.

Area	Item	Recordkeeping Frequency
Paved areas	Condition	Daily
Piles	Condition	Daily
Paved areas	Water/chemical suppressant application	Whenever performed
Paved areas	Sweeping	Daily, whenever performed
Control Devices	Inspection, maintenance and repair	Daily when associated source is in operation
Barge unloading / loading Truck loading / unloading Railcar loading / unloading Crusher / screener	Following proper procedures; corrective actions, VE observations	Whenever performed
Small-particle piles	Water application	Whenever performed
Active piles	Following proper procedures, corrective actions, water application as needed	Whenever performed
PM10 Monitor Records	Difference in PM10 readings, corrective actions as appropriate	Whenever PM10 monitor readings meet the criteria outlined in Section VIII
Meteorological Station Records	Hourly wind direction and wind speed	Continuous/daily
Off-site Areas	Dust presence	Whenever sweeping of external truck routes occurs
Facility wide	Water and/or chemical stabilizer application*	Whenever control measures are used
Facility wide	Instances of suspension of water and/or chemical stabilizer application*	Whenever control measures were not used
Facility wide	Date and time of suspension of operations	Whenever operations are suspended due, in part, to high winds (>15 mph)
Facility wide	Date and time when application of control of any transfer point was suspended	Whenever control was not performed
Facility wide	Results of quarterly opacity readings	Quarterly
Facility wide	Result of presence/absence of VE near property line and Fugitive Dust at the Source	Three per shift minimum per operation not controlled by total enclosure or a dust collector.  Once daily minimum per operation controlled by total enclosure or a dust collector

The facility will also adhere to the manufacturer's recommendations and schedule for inspection, maintenance, and any required testing of the wet suppressant spray systems, mobile misters, dry fogging system, and the street sweeper referenced in Section IV. As noted in Section IV.F, the dust collectors are inspected daily. Routine maintenance and testing of the dust collectors occurs in accordance with manufacturer's recommendations and any applicable permit requirements. The inspection, maintenance, and testing for the PM10 Monitors and the Meteorological Station is provided in the Quality Assurance Project Plan (QAPP) provided at Appendix B.

Responsible personnel for each of these items will vary, but overall responsibility for implementation of the inspection, maintenance, and testing requirements will remain with the Terminal Manager.

Note:

\*For transfer points, vehicles loading, and truck, railcar, and barge loading and unloading, if water and/or chemical stabilizer is applied, the application must be recorded as well as any time when application is suspended for any reason.

## **XI. Training**

Operating facility personnel are trained annually on methods used to reduce fugitive dust emission levels at the facility as indicated by the provisions of this program, including review of this Fugitive Dust Plan, the operating procedures (Appendix A) and recordkeeping requirements. Personnel are trained in monitoring and recordkeeping as required by the responsibilities of their position. New personnel are trained as part of their orientation. Dated records of all employee training are maintained at the facility.

At least two people at the facility maintain EPA Method 9 certification.

## **XII. Program Update**

Facility operations are periodically reviewed in conjunction with this Fugitive Dust Plan. The plan will be updated on an annual basis and submitted to the CDPH for review and approval on or before January 31 each year.

## TABLES

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**Table 1. Summary of Control Measures at Transfer Points  
S.H. Bell Company  
Chicago Terminal**

Emission Source	Transfer Point(s) / Activity	Control Measure(s)				Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment	Additional Control/Mitigation Measures Implemented		
Outdoor Storage Piles Activities (Wetted / Dry, Non-Affected)	Front end loader to truck, barge, or rail or processing operation (receipt, internal transfer, loadout)		X (dampen material and/or position mobile misters and/or dry fogging system)		minimize drop heights	inbound shipments of DRI fines no longer accepted for storage or re-loading	
	Front end loader to hopper/feeder	X				Sliding door closed when not in use	
	Hopper/feeder to weigh hopper	X		X			
Bag Filling Station	Weigh hopper to small storage bag or can	X		X			
	Front end loader to hopper/feeder	X		X		Hopper curtain covering face of hopper	
	Vibratory feeder to box or bulk bag	X		X			
Screen Boxes (Non-Affected Materials)	Front end loader to screen box	X (dry materials to the extent possible)	X (if performed outdoors, material is dampened and/or mobile misters or dry fogging unit used)				
	Screening (first pass through)	X (dry materials to the extent possible)	X (if performed outdoors, material is dampened and/or mobile misters or dry fogging unit used)				
	Screening (second pass through)	X (dry materials to the extent possible)	X (if performed outdoors, material is dampened and/or mobile misters or dry fogging unit used)				

**Table 1. Summary of Control Measures at Transfer Points  
S.H. Bell Company  
Chicago Terminal**

Emission Source	Transfer Point(s) / Activity	Control Measure(s)				Additional Control/Mitigation Measures Implemented	Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment				
Screen Boxes (Affected Materials)	Front end loader to screen box	X						
	Screening (first pass through)	X						
	Screening (second pass through)	X						
Crusher-Screener	Primary Crush	X	X (foam spray)					
	Primary Screen	X						
	Secondary Crush	X	X (foam spray)					
	Secondary Screen	X						
	Front end loader to hopper	X						
	Hopper to Crusher	X	X (foam spray)					
	Crusher to Screen	X						
	Screen to Storage 1	X						
	Screen to Crush 2	X						
	Crush 2 to Screen 2	X						
Screen 2 to Storage 2	X							
Screen 2 to Storage 3	X							

**Table 1. Summary of Control Measures at Transfer Points**  
**S.H. Bell Company**  
**Chicago Terminal**

Emission Source	Transfer Point(s) / Activity	Control Measure(s)				Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment	Additional Control/Mitigation Measures Implemented		
Screener	Primary Screen	X					
	Front end loader to Vibratory Tray	X					
	Vibrator to Bin	X					
	Conveyor to Conveyor	X					
	Screen	X					
	Screen to Bin, top size	X					
	Screen to Bin, mid size	X					
	Screen to Bin, fine size	X					
Product Transfer	Storage bins/outdoor pile to storage piles via front end loader	X (for materials stored indoors, including all affected materials)	X (for non-affected materials stored outdoors, dampen material if moisture not sufficient)		minimize drop height  1) Close entry/exit roll-up garage doors at each end of the loadout sheds, 2) Minimize drop height; 3) driver waits at least one minute after load is complete before exiting loadout enclosure; 4) Tarp load after safely clearing the exit of loadout shed	mobile misters and/or dry fogging system for non-affected dry materials  Only non-affected materials are stored outdoors	
	Loadout sheds (Ryerson / Norcon buildings), front end loader to truck		X (dampen material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry materials)	X (stationary dust collectors)		Lengthen truck wait time if there is VE approaching opacity limit	
	Direct bulk transfer to outbound trucks				minimize drop height		

**Table 1. Summary of Control Measures at Transfer Points  
S.H. Bell Company  
Chicago Terminal**

Emission Source	Transfer Point(s) / Activity	Control Measure(s)			Additional Control/Mitigation Measures Implemented	Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment			
Truck Unloading (Non-Affected Materials)	Truck to ground (outside)		X (for materials stored outdoors, dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry materials)		choke feed; dry materials tarping following initial transfer		
Truck Unloading (Affected Materials)	Truck to 3-sided steel receiving pan		X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry materials)		choke feed		
Barge Unloading - Bulk (Non-Affected Material)	Barge to truck via excavator		X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry materials)		Minimize drop height		
	Truck to storage	X (for materials stored indoors)	X (for outdoor storage, dampen material if moisture not sufficient)		Minimize drop height		
Barge Unloading - Bulk (Affected Material)	Barge to truck via excavator		X (Wetted Materials - dampen if moisture not sufficient, including adding water to barge with water truck or excavator) Dry Materials - mobile misters and/or dry fogging system)		Minimize drop height; maintain barge lids in place for dry material except to allow excavator access at active portion of barge unless presenting a safety risk; suspension during High Wind Conditions		
	Truck to storage	X			Minimize drop height		

Table 1. Summary of Control Measures at Transfer Points

S.H. Bell Company  
Chicago Terminal

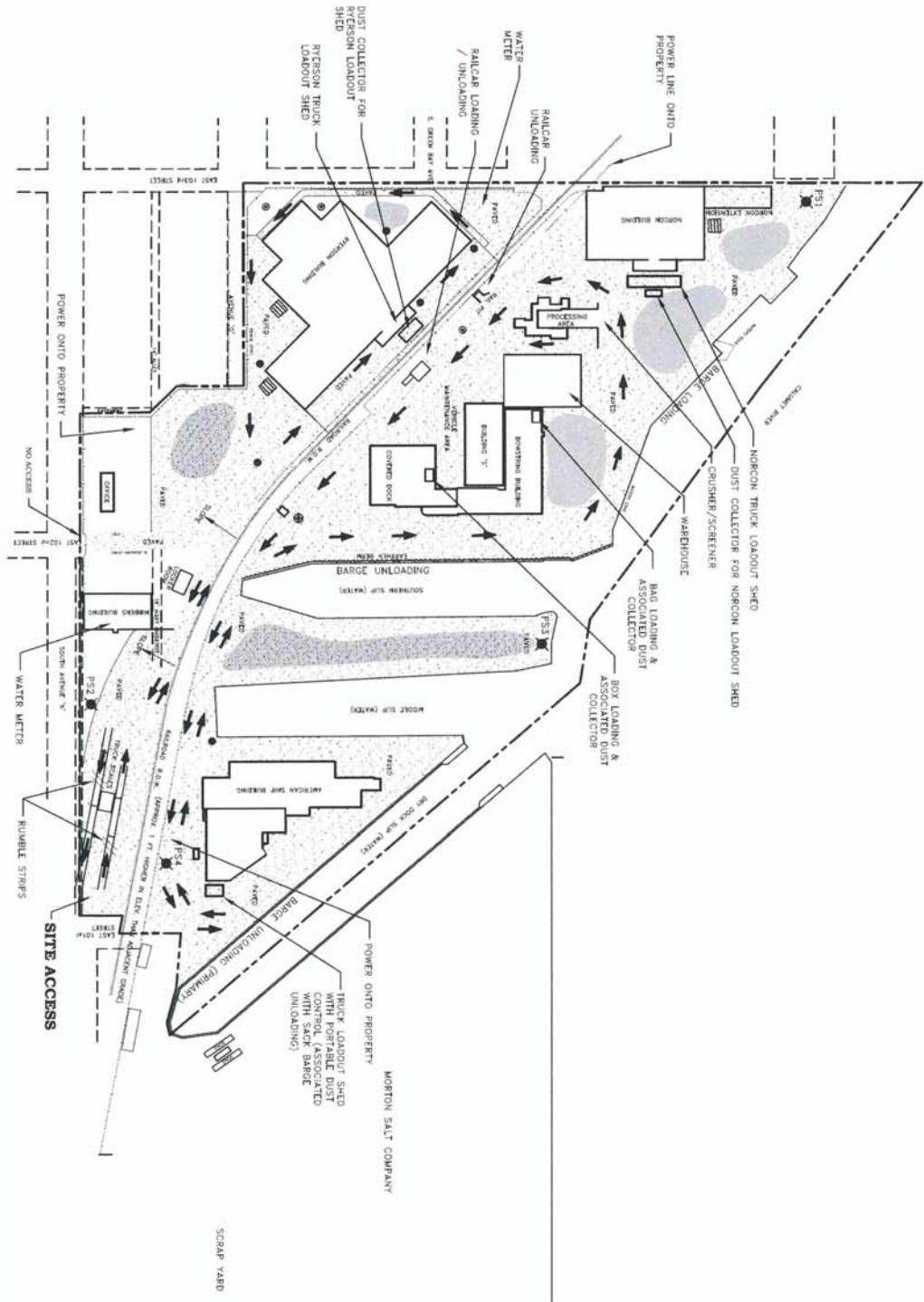
Emission Source	Transfer Point(s) / Activity	Control Measure(s)			Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment		
Barge Unloading - Sacks and Conversion to Bulk (Non-Affected Material)			X (Wetted Materials - dampen if moisture not sufficient, including adding water to barge with water truck or excavator) Dry Materials - mobile misters and/or dry fogging system)			
	Sack material release to pile at dock		X (secondary use of direct dampening and/or mobile misters and/or dry fogging system)	X (primary use of portable dust collector)	Minimize drop height to approximately 5 feet	
Barge Loading (Affected and Non-Affected Material)	Pile to truck via front end loader				Minimize drop height	
	Storage to dock (ground for non-affected material, 3-sided steel receiving pan for affected material)		X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)			
Barge Loading (Affected and Non-Affected Material)			X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)		choke feed	
	Excavator to barge				Minimize drop height (ability of excavator to reach directly into bottom of barge); High Wind Conditions for affected materials	
Railcar Unloading - Bottom unload (Affected and Non-Affected Materials)	Railcar to pit pile (bottom unload)		X (deploy mobile misters)		Choke feed	
	Pit to storage via front end loader		X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)			

**Table 1. Summary of Control Measures at Transfer Points  
S.H. Bell Company  
Chicago Terminal**

Emission Source	Transfer Point(s) / Activity	Control Measure(s)				Additional Control/Mitigation Measures Implemented	Alternative Control Measure	Additional Comments
		Enclosure	Water Spray System	Vented to Air Pollution Control Equipment				
Railcar Unloading - Box cars (Affected and Non- Affected Materials)	Skid steer to box enclosure		X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)					
	Material removal via front end loader	X	X (dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)					
Railcar Loading - Covered hopper railcars (Affected and Non-Affected Materials)	Front end loader to hopper / belt conveyor		X (primary: dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)					
	Belt conveyor to railcar		X (primary: dampen wetted material if moisture not sufficient; deploy mobile misters and/or dry fogging system for dry material)		choke feed		primary: loading spout / sock; minimize drop height	
Railcar Loading - Open top railcars	Front end loader to railcar		X (dampen material with water truck or front end loader if moisture not sufficient or deploy dry fogging system in sub freezing temperatures)				minimize drop height	

## FIGURES

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- KEY**  
(ALL LOCATIONS APPROXIMATE)
- APPROXIMATE FACILITY BOUNDARY
  - TYPICAL BULK STORAGE PILE LOCATIONS (MIN. 20 FT SETBACK)
  - TYPICAL TRAFFIC PATTERNS
  - COVERED MANHOLE
  - ⊕ INLET TO COMBINED SEWER
  - ⊙ WIND SPEED MONITOR
  - ▭ PRIMARY AREAS OF TRUCK UNLOADING
  - PS2 FEM PM10 MONITOR

SCRAP YARD

THE INFORMATION ON THIS SHEET WAS TAKEN FROM:  
 SHEET "A" BY CHAS. E. WILSON, INC.  
 DATED FEB. 24, 1984  
 AND FROM  
 "SITE PLAN" BY CHAS. E. WILSON, INC.  
 DATED JAN. 6, 1988

GRAPHIC SCALE  
 (IN FEET)  
 1" = 200'

**FACILITY DIAGRAM**

Chicago Terminal  
 S.H. Bell Company  
 Chicago, IL

PROJECT NUMBER: 3410140990

DATE: 10/23/14

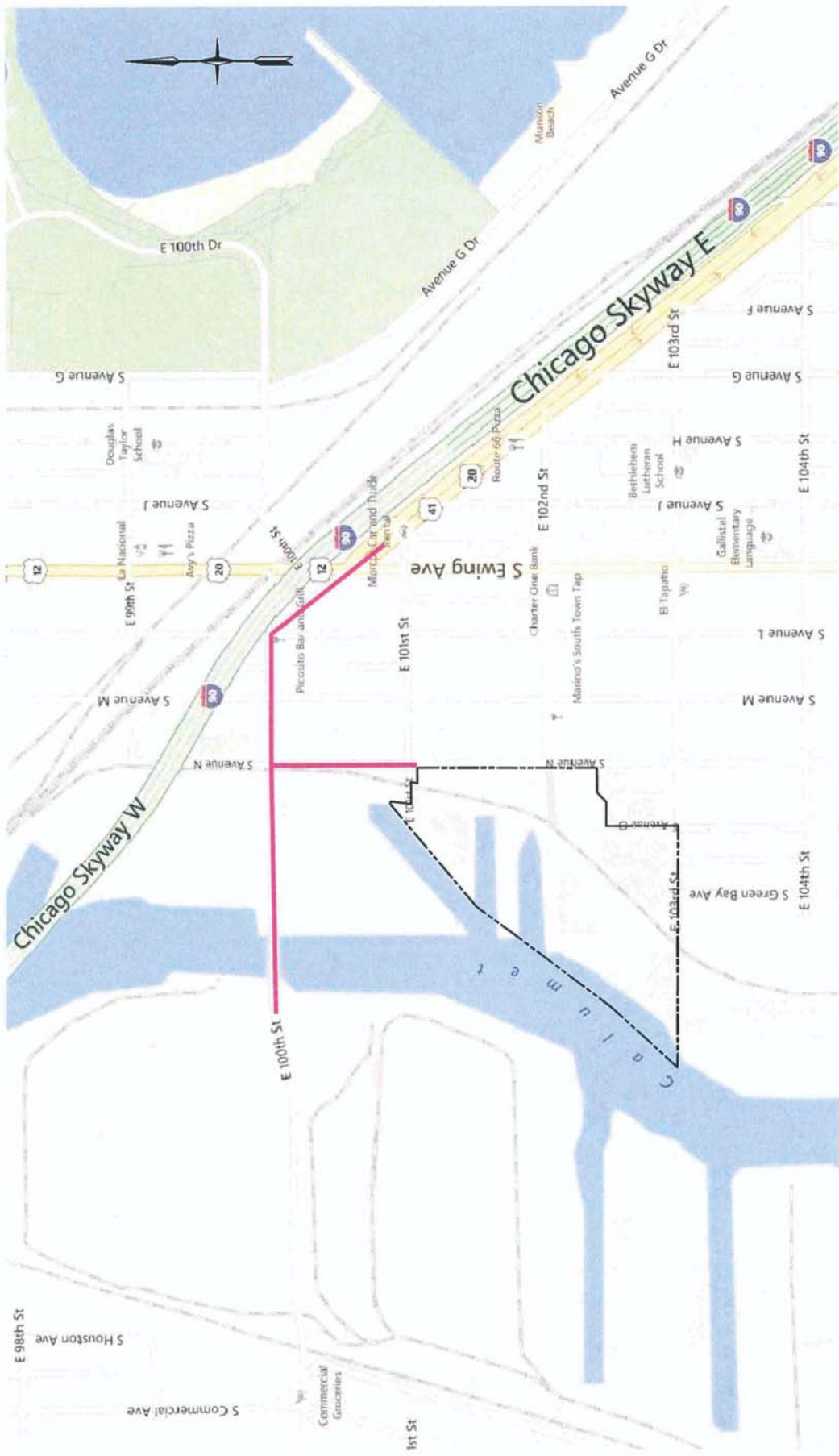
DESIGNER: dmec Foster Wheeler

APPROVED: KP

ISSUED DATE: 09/13/17

FIGURE 1





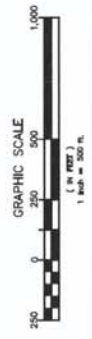
**FIGURE 2**

**ROADWAY LOCATION MAP**  
 Chicago Terminal  
 S.H. Bell Company  
 Chicago, IL

**DATE:** 10/23/14  
**APPROVED:** KJP  
**PROJECT NUMBER:** 3410140990  
**DATE:** 04/03/17

**CLIENT:** GAP

**CONSULTANTS:**  
 amec  
 foster  
 wheeler

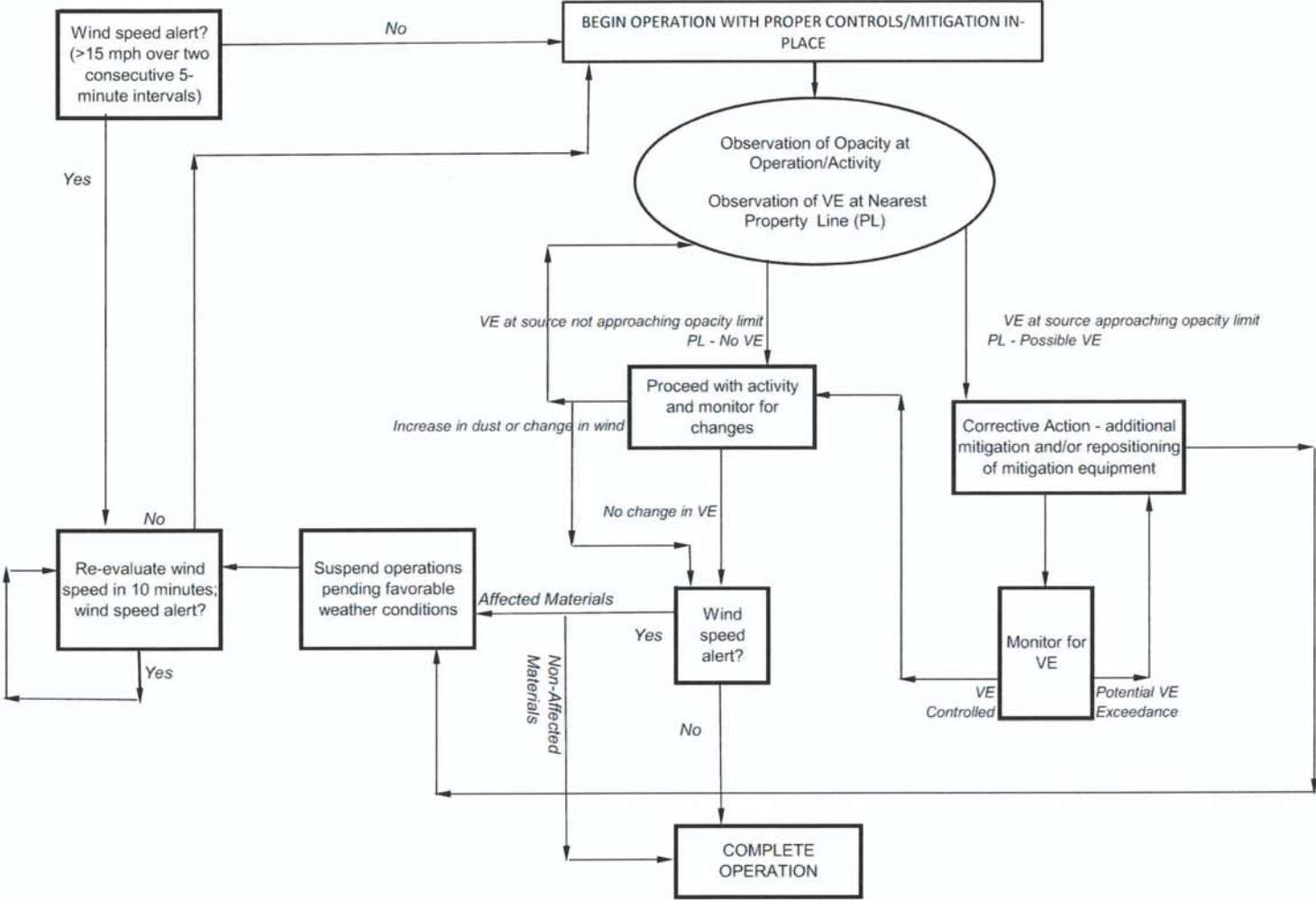


## APPENDIX A

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### General Operating Procedures

**APPENDIX A  
GENERAL OPERATING PROCEDURES FOR FUGITIVE DUST CONTROL / MITIGATION**



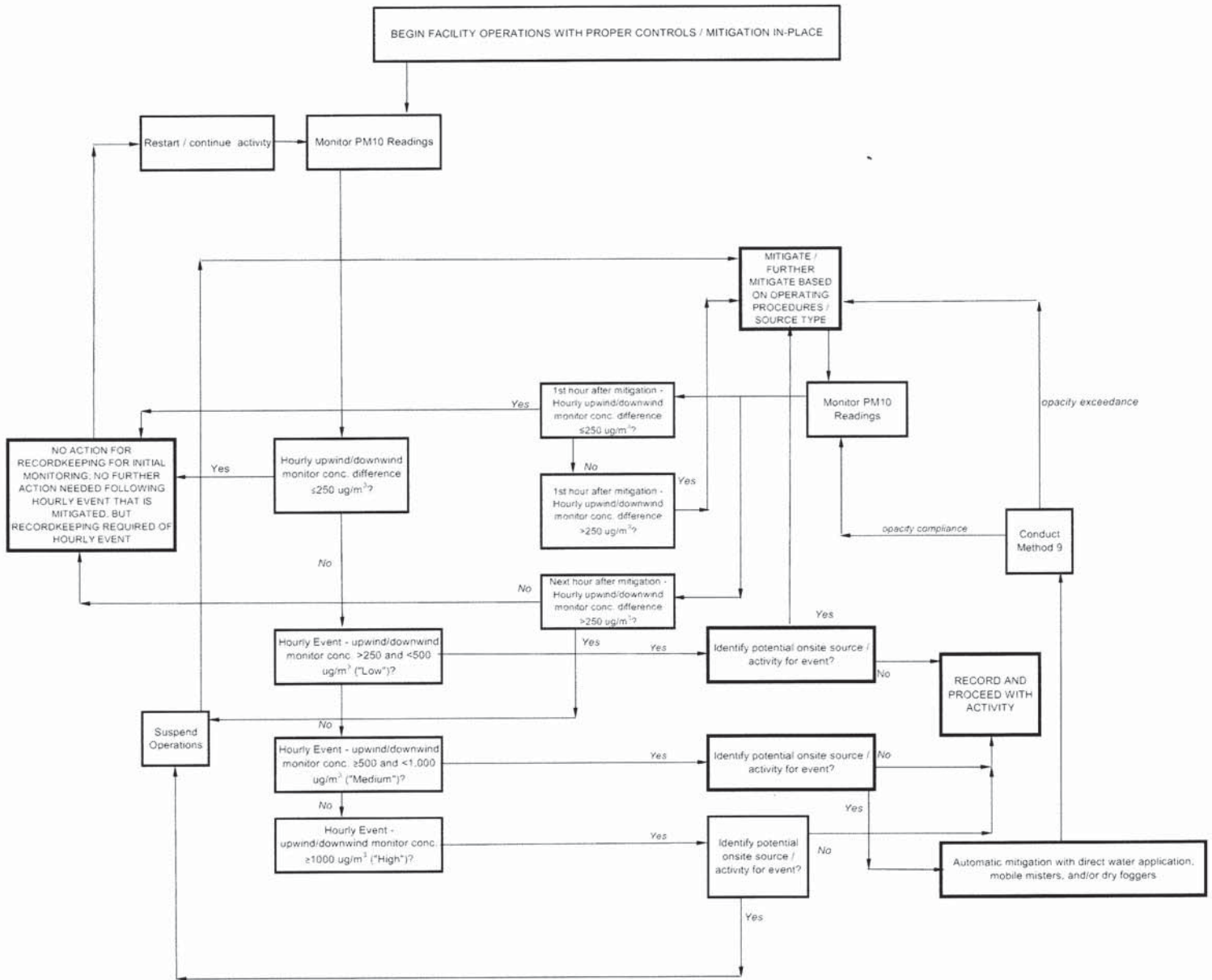
## APPENDIX A

### OPERATION OF MOBILE MISTERS / DRY FOGGING UNITS

**OBJECTIVE:** Provide a curtain or cloud of mist or fog to intercept, knockdown and/or contain fugitive dust

- SETUP:**
1. Position mister/fogger away from the work activity or area of fugitive emission generation so as not to impede the work activity and also to prevent wetting the material (when addition of moisture is not allowed per customer specifications).
  2. Use the wind direction and speed to guide the initial setup location, anticipating the behavior of the fugitive emissions (e.g., fast moving, slow moving, loft, etc.) and the direction of spray for best vertical and horizontal coverage. Sometimes the best location will be to position the spray into the wind to allow the action of the wind to disperse the mist or fog.
  3. Turn on the mister or fogger and water supply, as appropriate.
  4. Adjust the spray position vertically and horizontally to achieve a satisfactory spray/fog pattern; satisfactory coverage of the fugitive emission is achieved when visible dust is not observed down wind of the cloud/curtain.
  5. Observe for breakthrough downwind. If noted, adjust the spray pattern and/or orientation to increase vertical and/or horizontal coverage.

**APPENDIX A**  
**Reportable Action Level (RAL) - Hourly Contingency Procedure**



## APPENDIX B

---

Quality Assurance Project Plan (QAPP) for PM10 Monitoring



## **Quality Assurance Project Plan**

**S. H. Bell Company**

**Chicago, Illinois**

**Revision 0**

**(March 24, 2017)**

**Prepared for:**

**S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617**

**Prepared by:**

**Consolidated Analytical Systems, Inc.  
201 S. Miami Avenue  
Cleveland, OH 45002**



## Quality Assurance Project Plan

**S. H. Bell Company**

**Chicago, Illinois**

**Revision 0**

**(March 24, 2017)**

**Prepared for:**

**S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617**

**Prepared by:**

**Consolidated Analytical Systems, Inc.  
201 S. Miami Avenue  
Cleveland, OH 45002**

Approved by:

\_\_\_\_\_  
*CAS Project Manager*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*S.H. Bell Company Representative*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*USEPA Region 5 Representative*

\_\_\_\_\_  
*Date*

\_\_\_\_\_  
*CAS Quality Assurance Project Officer*

\_\_\_\_\_  
*Date*



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## A. PROJECT MANAGEMENT

This Quality Assurance Project Plan (QAPP) documents the policies and procedures to be implemented at the S.H. Bell Company facility in Chicago, Illinois to meet the United States Environmental Protection Agency (USEPA) guidelines for conducting environmental monitoring programs. This QAPP has been prepared in accordance with the guidance outlined in USEPA's "EPA Guidance for Quality Assurance Project Plans", (USEPA, 2002) and "EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations," (USEPA, 2001). The purpose of this document is to describe the sampling and analytical methods that will be used to gather the monitoring data, and the procedures employed to assess, control, and document the data quality.

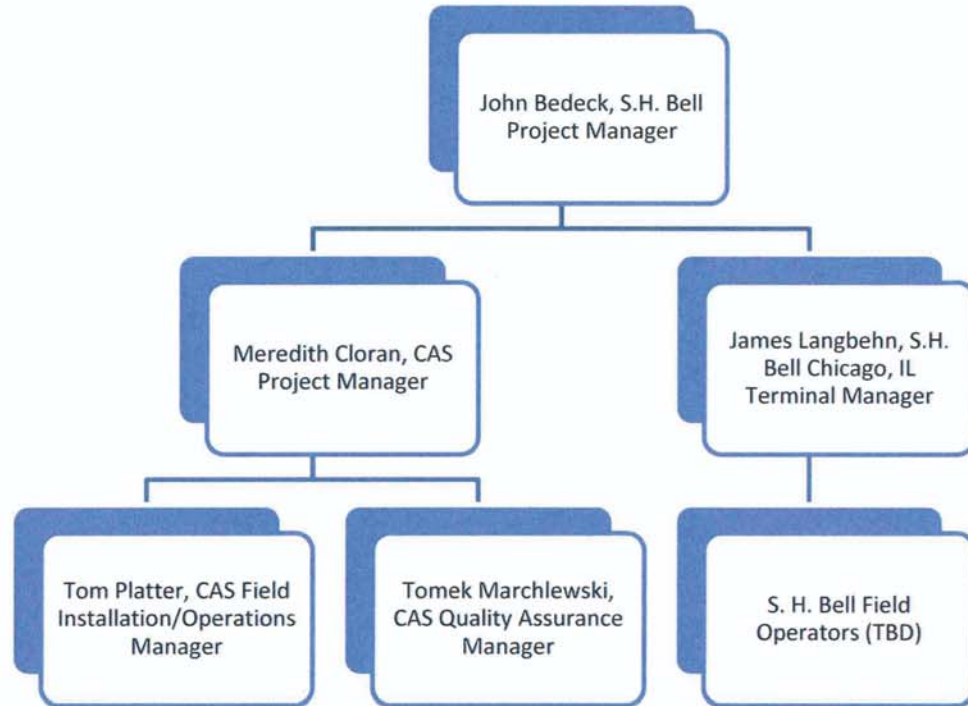
Following this format, this QAPP is divided into five sections with the following contents:

- **Section A – Project Management** – Provides a description of the project organization, administrative functions, and goals, as well as an overview of the project approach.
- **Section B – Measurement and Data Acquisition** – Provides a detailed description of all the elements of the monitoring strategy and methods, including the methods for sampling, sample handling, analytical methods, quality control, instrument calibration, and data management;
- **Section C – Assessment and Oversight** – Provides a description of the procedures that will be used to assess and report on the QA/QC elements employed in the project;
- **Section D – Data Validation and Usability** – Provides a description of the methods that will be used for data review, verification, and validation; and
- **Section E – References** – Provides references to applicable regulatory and method specific documents that form the basis for obtaining the measurement data.

### A1 Project/Task Organization

The organizational structure for the air monitoring program at the S.H. Bell facility in Chicago, Illinois and a description of the responsibilities of those within it are described in this section. Figure A-1 shows key personnel and team roles, including the S. H. Bell Project Manager, the CAS Project Manager, the S.H. Bell Field Installation/Operations Manager, and the CAS Quality Assurance Officer. Key individuals and their responsibilities are identified below:

**Figure A-1. Project Organizational Chart**



**S.H. Bell Project Manager** – The principal contact person for S.H. Bell Company is Mr. John Bedeck (or his designee). Mr. Bedeck’s responsibilities include the following:

- Provide direct oversight of the S.H. Bell monitoring project
- Serve as USEPA’s communication contact for all activities at the S.H. Bell Chicago, Illinois facility
- Any changes to the scope of the monitoring program will be made only with the written approval of the S.H. Bell Project Manager and review by EPA Region 5
- Review and submit monthly monitoring reports to USEPA

**S.H. Bell Chicago, Illinois Terminal Manager** – The S.H. Bell Chicago, Illinois Terminal Manager is Mr. James Langbehn (or his designee). Mr. Langbehn’s responsibilities include the following:

- Provide oversight of monitoring activities conducted at the S.H. Bell Chicago, Illinois facility
- Coordinate on-site record keeping, including site visits, operator activities, and monitoring system conditions and corrective actions

- Report exceedences and corrective actions to USEPA Region 5
- Maintain records of S.H. Bell operations (such as dates and duration of material unloading and processing)
- Notify USEPA of any barge unloading operations of direct reduced iron
- Record observations of possible interferences at nearby facilities

**CAS Project Manager** – Ms. Meredith Cloran is the CAS Project Manager. Ms. Cloran's responsibilities include the following:

- Communicate with S.H. Bell to ensure the full implementation of the QAPP and notification of general corrective actions
- Oversee day to-day project activities, including ensuring the proper execution of the monitoring work and tracking the project budget.
- Provide the primary leadership of the CAS project team members and coordination with the contract laboratory.
- Ensure QAPP objectives are met in accordance with USEPA requirements
- Develop and ensure QA/QC procedures and Standard Operating Procedures are followed
- Report non-confirming conditions to S.H. Bell and follow up corrective actions taken using appropriate documentation procedures.
- Prepare monthly reports for S.H. Bell's review and submittal to USEPA

**CAS Field Installation/Operations Manager** – Mr. Tom Platter is the CAS Field Installation and Operations Manager. He is responsible for the following items:

- Integrate and install the monitoring equipment
- Perform site set-up and calibration
- Oversee performance of monthly maintenance visits and quarterly audits
- Train field staff to collect field parameters and samples (including filters for laboratory analysis)
- Assemble data records from field technicians and ensure the collection of valid measurement data.
- Assemble data records from field technicians

- Report non-confirming conditions to CAS Project Manager and follow up corrective actions taken using appropriate documentation procedures.

**CAS Quality Assurance Manager** – Mr. Tomek Marchlewski is the CAS Project QA Manager. He is responsible for the following tasks:

- Oversee remote monitoring
- Perform data validation activities as needed
- Verify required QC activities are performed and that measurement quality objectives are met as prescribed in this QAPP
- Verify data and flags from continuous monitors
- Review laboratory analytical data packages
- Prepare report information in appropriate format
- Report non-confirming conditions to CAS Project Manager and follow up corrective actions taken using appropriate documentation procedures.

**S.H. Bell Field Operators** – Several S.H. Bell employees provide operations support tasks as described below (each have been trained by the CAS Field Installation/Operation Manager and their activities are overseen by the S.H. Bell Terminal Manager:

- Collect manual samples
- Record relevant field data

## A2 Problem Definition and Background

S.H. Bell has been asked to provide information to the United States Environmental Protection Agency (USEPA) under Section 114 of the Clean Air Act (CAA), 42 U.S.C. Section 7414(a) (USEPA, 2015), herein referred to as the Request for Information (RFI). To meet this request, S.H. Bell has submitted, and USEPA Region 5 Air and Radiation Division has approved proposed monitoring site locations for Federal Equivalent Method (FEM) real-time PM10 monitoring and Federal Reference Method (FRM) PM10 filter-based monitoring as well as wind speed and direction monitoring. Per the requirements of the RFI, S.H. Bell will conduct PM10 and meteorological monitoring for a period of one year from the date of installation (noted to be: February 28, 2017) and will submit reports of monthly data to USEPA (S.H. Bell Company, 2016-2017 "Siting Plan"). A copy of the Siting Plan is attached to this QAPP for reference as Appendix D.

In addition, the RFI requires a 10-meter meteorological station be operated at the S.H. Bell facility to measure and record wind speed and direction through the area during the one-year study period. The meteorological station is located near the center of the S.H. Bell Chicago

facility as shown on Figure B-1. The meteorological monitors meet the specifications of USEPA's Quality Assurance Handbook for Air Pollution Measurement Systems Volume IV: Meteorological Measurements Version 2.0 (Final) (USEPA, 2008). The meteorological station is equipped to record the following meteorological parameters:

- Wind Speed
- Wind Direction
- Ambient Temperature
- Barometric Pressure

### **A3 Project/Task Description and Schedule**

This project is conducted to provide air quality and meteorological data from four monitoring sites located around the S.H. Bell Chicago, Illinois facility.

The monitoring stations incorporate continuous Federal Equivalent Method (FEM) real-time PM10 monitors, data loggers, and Federal Reference Method (FRM) PM10 filter-based monitors as outlined in the Siting Plan (S.H. Bell, 2016-2017) – included as Appendix D of this document. Continuous (FEM) monitors are operated to obtain hourly continuous average data. Filter-based FRM monitors are operated to follow the USEPA's 3-day Monitoring Schedule for 2017 (included as Appendix C). PM10 filters collected from the FRM filter-based monitors undergo both gravimetric analysis and determination of lead and toxic metals (arsenic, cadmium, chromium, manganese, nickel, and vanadium) at an off-site laboratory in accordance with FRM/FEM laboratory methods (see Section B for additional detail on laboratory analysis). The meteorological conditions are also continuously measured and are stored in an onsite data logger as five-minute averages. Please note that as of the date of this QAPP, meteorological equipment is operating separately from the PM10 sampling network, until such time as it can be integrated into the monitoring network. S.H. Bell will append the QAPP following integration of the meteorological data into the CAS-operated data acquisition system. Meteorological equipment (wind speed and wind direction equipment and data logger) was initially installed at the S.H. Bell facility in 2014. The system was updated in December 2016 to include temperature and barometric pressure sensors integrated with the meteorological data logger.

The commissioning of the particulate monitoring stations took place February 27-28, 2017. The first filter-based FRM sample was collected March 2, 2017, and additional samples are to be collected in accordance with USEPA's 3-day Monitoring Schedule (See Appendix C). Deliverables for the project include the following items:

1. This QAPP;
2. Hourly data from each continuous monitor and the meteorological monitoring site (in ASCII comma-delimited files) and laboratory data from filter-based sample analysis (in laboratory reporting format) provided to EPA on CD every month; and
3. Monthly data submittal of items detailed in Item 2 above submitted to EPA by email within 14 days of the end of the month being reported for a period of one year. Please see Section B7 for additional detail.

#### A4 Data Quality Objectives and Criteria for Measurement Data

The EPA has developed a Data Quality Objective (DQO) process for use in the planning of environmental measurement projects. The DQO process has been used in the preparation of this QAPP and in the planning for this project. The results of the 7-step DQO process are shown in Figure A-2. The benefits of the DQO process are that it prompts a statement of the problem or issue, identifies the decision(s) to be made and the inputs needed to make the decision(s), and specifies a decision rule.

Following the DQO process, a set of quality criteria is defined for the measurement data. For this project, those criteria are given in Table A-1. These criteria are designed to provide accurate measurements of PM10 and determination of lead and toxic metals (arsenic, cadmium, chromium, manganese, nickel, and vanadium). The criteria for meteorological data measurements are patterned after the onsite regulatory meteorological monitoring guidance published by EPA (USEPA, 2008).

#### A5 Documentation and Records

The dataset created for this monitoring program will consist of these components stored for a minimum of five years in the project database:

- The hourly PM10 data from each of the four monitoring sites (from FRM continuous monitors);
- The laboratory analyses of manual samples (from FEM filter-based monitors) for PM10 gravimetric mass and select metals; and
- The 5-minute average wind speed, wind direction, ambient temperature, and barometric pressure at the meteorological monitoring site.

The following sources of information will support these data:

- Station log books (in hard copy and electronic format);
- Calibration and maintenance records for all measurement systems;



- Laboratory reports with quality control results;
- Operational information collected internally by each monitor or sampler;
- Data validation and editing instructions; and
- QA audits of field operations and monitor performance.

**Table A-1. DQO Process for S.H. Bell Company Chicago, IL Project**

STEP 1	State the Problem	S. H. Bell has agreed to establish a program to conduct both FEM real-time PM10 monitoring at four monitoring locations and FRM PM10 filter-based monitoring at one monitoring location to determine on-site or off-site (whether upwind and/or downwind) contributions, if any, to the monitors. Additional manual sampling is needed to provide speciation data for metals and PM10.
STEP 2	Identify the Decision	An ambient air monitoring program conducted at the areas identified by predominant wind flow and potential for community impact. The speciation data will be used to assist in possible determination of PM10 sources.
STEP 3	Identify the Inputs to the Decision	Measurements of PM10 concentrations will be made at four (4) locations as 1-hour averages. Meteorological data (wind speed, wind direction, ambient temperature, barometric pressure) will be collected on a 5-minute basis at the existing meteorological station located in the central portion of the S.H. Bell Facility. Speciation samples will be obtained from two instruments located at monitoring station S4 (See Figure B-2).
STEP 4	Define the Study	The sampling locations and frequency of sampling are defined in Section B of the QAPP document.
STEP 5	Develop a Decision Rule	S.H. Bell will use the reported concentration levels and meteorological data to help assess net facility impacts and upwind background.
STEP 6	Specify the Limits of Decision Error	Calibration of the monitoring equipment will be conducted as specified in EPA guidance documents and quality control limits will conform to guidance. See Tables A-1 and A-2.
STEP 7	Optimize the Design	If the current system does not conform to the required QA/QC protocols, S.H. Bell will initiate corrective action to bring the program into conformance.

**Table A-2. Quality Criteria for Measurement Data**

<b>1. Measurements of PM<sub>10</sub> using EPA Federal Equivalent Method (FEM) Monitor (BAM-1020, EQPM-0798-122)</b>	
Sensitivity	Lower Detection Limit <4.8 µg/m <sup>3</sup> 2σ, 1-hour average
Accuracy	Meets EPA Class III FEM Standard for additive and multiplicative bias; flow rate measurement accuracy ±4% at 16.7 LPM
Range	1 – 1000 µg/m <sup>3</sup>
Completeness	75% sample capture rate or better quarterly for each monitor at each site (with the exception of Acts of God, loss of power, scheduled calibration/audit events, or other situations over which neither S.H. Bell nor their monitoring contractor have control)
Cycle Time	One hour
<b>2. Measurements of Metals using EPA Method IO-3.5 (ICP-MS)</b>	
Accuracy	±20% for analytical results above the reporting limit
Precision	±10% for analytical pairs above the reporting limit
Completeness	80% or better quarterly for each sampler (with the exception of Acts of God, loss of power, or other situations over which neither S.H. Bell nor their monitoring contractor have control)
<b>3. Measurements of PM<sub>10</sub> using EPA Federal Reference Method (FRM) Sampler (Tisch Environmental TE-6070 DV-BL, Federal Reference Number RFPS-0202-141)</b>	
Accuracy	Flow rate measurement accuracy ±7% of the calculated Qa [Orifice] (USEPA, 1999a)
Precision	N/A
Completeness	75% sample capture rate or better quarterly for each sampler (with the exception of Acts of God, loss of power, or other situations over which neither S.H. Bell nor their monitoring contractor have control)
<b>3. Measurements of Meteorological Parameters using weather instruments (Climatronics/MetOne Wind Speed, Wind Direction, Temperature, Barometric Pressure)</b>	
System Accuracy	TBD*
Precision	EPA methodology does not provide for assessment of measurement precision
Completeness	90% or better quarterly for meteorological data based on hourly averages with a minimum 75% completeness of 5-minute data to construct a valid hourly average (with the exception of Acts of God, loss of power, scheduled calibration/audit events, or other situations over which neither S.H. Bell nor their monitoring contractor have control)*

\*As of the date of this QAPP, meteorological equipment is operating separately from the PM10 sampling network, until such time as it can be integrated into the monitoring network. S.H. Bell will append the QAPP following integration of the meteorological data into the CAS-operated data acquisition system.

## **B. MEASUREMENT DATA ACQUISITION**

### **B1 Sampling Process Design**

S.H. Bell will establish four monitoring sites at its Chicago, Illinois facility in accordance with the requirements detailed in USEPA's Section 114(a) request. Details of the source area, sampling methods, sample handling, analytical methods, Quality Control (QC), instrument testing and calibration and data management are described in the following sections.

#### **B1.1 Source Environment Description**

S.H. Bell's Chicago, Illinois facility is located in south Chicago, approximately 13 miles south of the city center, in the community of East Side between Lake Michigan and the Calumet River. The S.H. Bell facility is located approximately ½ mile west of Lake Michigan and is bordered to the west by the Calumet River. The elevation of the area is approximately 590' above sea level, and terrain is relatively flat.

The local land use categories include refining and heavy industry in the corridor along the Calumet River. Surrounding areas to the east and south are primarily residential. Minor river ports and canals are present in the area and provide access to Lake Michigan.

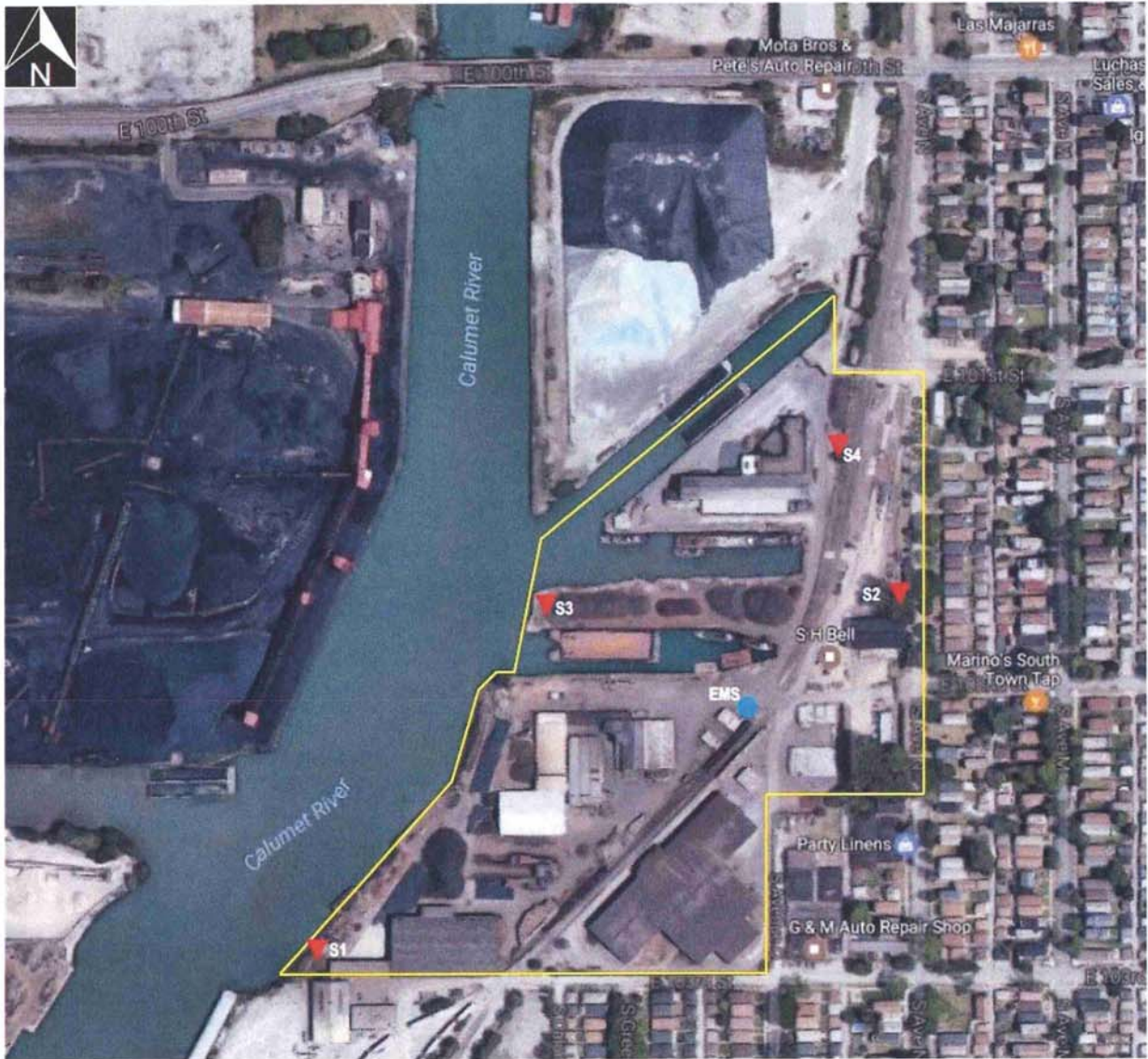
The climate of the area where the Terminals are located is characterized by cold winters and warm summers with occasional heat waves. The average temperature in January is 22° F and the average temperature in July is 73.3° F, although 90° summer days are not uncommon.

The annual average snowfall in winter is 37.5" and the annual average precipitation total is about the same. The proximity of S.H. Bell to Lake Michigan's southernmost tip brings wind effects year-round. Annual wind roses for the S.H. Bell facility indicate a strong NW component. In general, the predominant wind direction in the vicinity of the site is from southwest to northeast. (See Figure B-2).

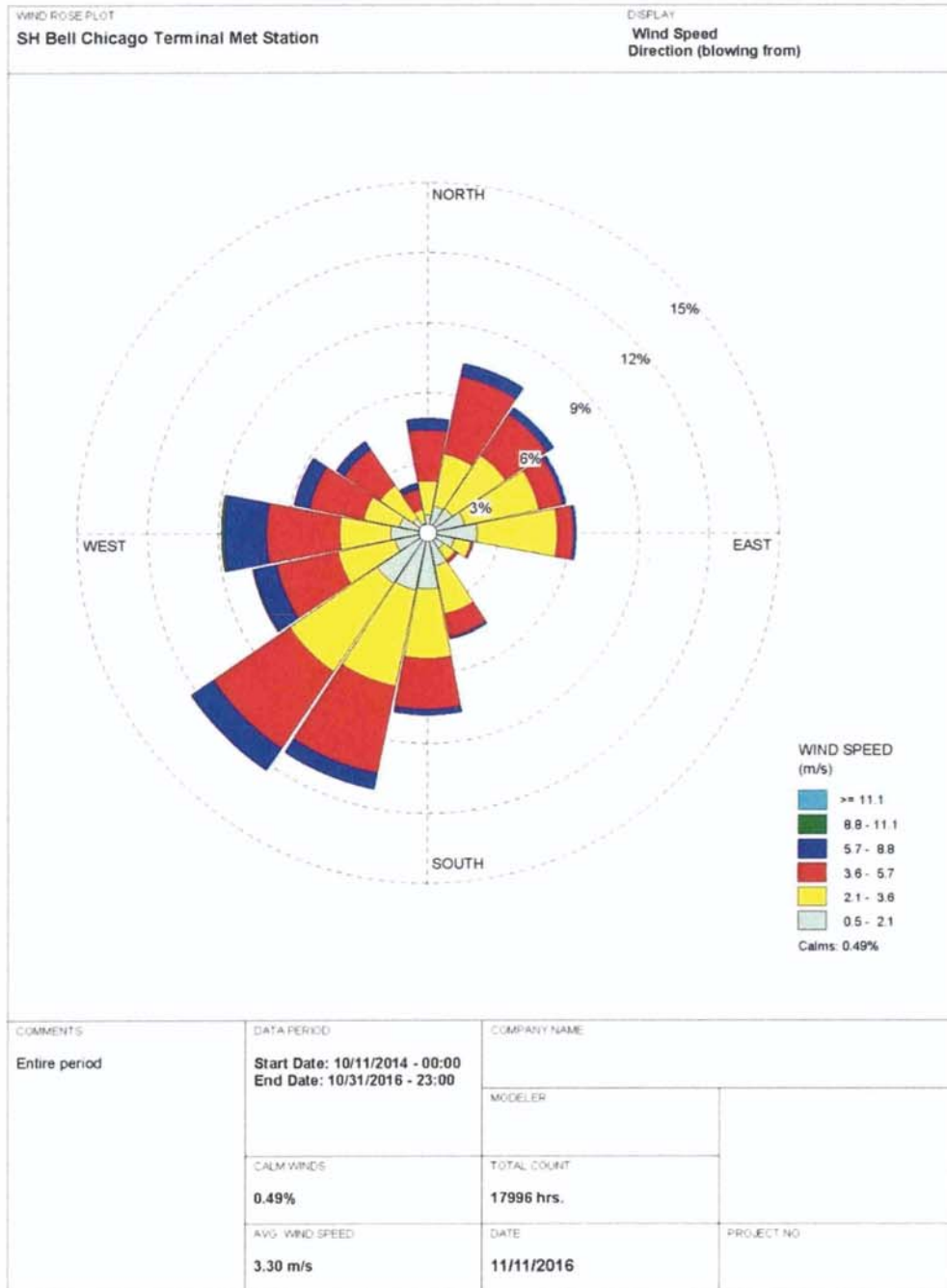
#### **B1.2 Monitor Site Description**

Figure B-2 shows the locations of the monitoring stations S.H. Bell will operate as part of this program. The yellow outline indicates the approximate property boundaries. An example historical wind rose plot from the S.H. Bell facility is shown in Figure B-2. Table B-1 lists the monitoring network configuration by site.

Figure B-1: Monitoring Site Locations for the S.H. Bell Chicago Facility



**Figure B-2: Historical Wind Rose Data (October 2014 thru October 2016) for S.H. Bell Chicago Facility**



## B2 Sampling Methods Requirements

Sample collection methods are presented in this section as are sample documentation and control requirements that are applicable to the network. Three types of sampling methods have been identified for the S.H. Bell monitoring network. Hard copies of equipment manuals are kept on-site at the S.H. Bell facility inside each equipment shelter at S1, S2, S3, and S4. Electronic copies of the manuals are also stored on the CAS project server maintained at CAS's Cleves, Ohio facility.

**Table B-1. S.H. Bell Monitoring Network Configuration by Site**

Monitoring Site ID	Approximate Location		Monitoring Equipment
	Northing	Easting	
S1	41.708239	-87.544058	BAM-1020 monitor for PM10 (Continuous FEM)
S2	41.710553	-87.539204	BAM-1020 monitor for PM10 (Continuous FEM)
S3	41.710552	-87.542043	BAM-1020 monitor for PM10 (Continuous FEM) Agilaire 8872 Datalogger
S4	41.711541	-87.539607	BAM-1020 monitor for PM10 (Continuous FEM) Two (2) Tisch Environmental HiVol 6070 DV-BL Filter-Based FRM PM10 Monitors
EMS (Existing Monitoring Station)	41.709841	-87.540376	Meteorological monitors (Climatronics: Wind Speed, Wind Direction, Temperature, Barometric Pressure, Data Logger)

### B2.1 Sample Collection Methods

#### *BAM-1020 FEM PM<sub>10</sub>*

The PM10 continuous monitors collect ambient particulate matter samples through a size-selective inlet that is designed to allow only particles with an aerodynamic diameter <10 μm to pass through to the measurement apparatus. PM10 is measured using the MetOne Instruments Model BAM-1020 (EPA designated Class III Federal Equivalent Method EQPM-0798-122).

At the beginning of each sample hour, a small 14C (carbon-14) element emits a constant source of high-energy electrons (known as beta rays) through a spot of clean filter tape. These beta rays are detected and counted by a sensitive scintillation detector to determine a zero reading. The BAM-1020 then advances this spot of tape to the sample nozzle, where a vacuum pump pulls a measured and controlled amount of outside air through the filter tape, loading it with ambient dust. At the end of the sample hour, this dust spot is placed back between the beta source and the detector, thereby causing an attenuation of the beta ray signal which is used to determine the mass of the particulate matter on the filter tape.

This mass is used to calculate the volumetric concentration of particulate matter in ambient air.

Specifications for the BAM-1020 are provided in Table B-2. The operation, calibration, and maintenance requirements of the BAM unit are outlined in the MetOne BAM-1020 manual "BAM 1020 Particulate Monitor Operations Manual, BAM-1020-9800, Rev H" (MetOne 2008). A hard copy of the BAM-1020 manual is kept in each of the four monitoring station buildings at S.H. Bell monitoring sites where they operate (S1, S2, S3, and S4). In addition, an electronic copy of the manual is available to all project team members in the Tech Info folder of the S.H. Bell client folder on the CAS Cleves server. The sample inlet height is approximately 3 meters, within the 2-7 meter inlet height specification.

**Table B-2. BAM-1020 Specification**

Parameter	Specification
Range	1 - 1000 µg/m <sup>3</sup>
Sensitivity Std Deviation (σ; 1 hr)	<2.4 µg/m <sup>3</sup>
Flow Rate	16.7 liters/ minute (LPM)
Beta Source	Carbon-14; 60µCi ±15 µCi
Operating Temperature*	0° to 50°C
Humidity Control	Active control inlet heater; 35% RH setpoint
Analog Output	0-1 VDC std; selectable voltage and current ranges
Memory	182 days @ 1 record/hour

\*Operating temperature inside the equipment shelter

### *Tisch Environmental HiVol 6070 DV-BL Filter-Based FRM PM10*

The Tisch Environmental Hi-Vol PM10 FRM samplers collect ambient particulate matter samples through a size-selective inlet that is designed to allow only particles with an aerodynamic diameter <10 µm to pass through to the measurement apparatus. PM10 is measured using the Tisch Environmental Model 6070 DV-BL sequential sampler (EPA designated Federal Reference Method RFPs-0202-141). Specifications for the Model 6070 DV-BL are provided in Table B-3. The operation, calibration, and maintenance of the unit is in accordance with the August 10, 2010 revision of the Tisch Environmental, Inc Operations Manual for 6000-Series PM10 High Volume Air Samplers (Tisch, 2010). A hard copy of the Tisch Environmental Manual is kept in the monitoring station buildings at S.H. Bell monitoring site S4. In addition, an electronic copy of the manual is available to all project team members in the Tech Info folder of the S.H. Bell client folder on the CAS Cleves server. The sample inlet height will be approximately 60 inches from the platform.

**Table B-3. Tisch Environmental 6070 DV-BL Specification**

Parameter	Specification
Particle Size	PM10
Flow Range	40 cubic feet per minute
Filter Size	8" x 10"
Federal Reference Method	RFPS-0202-141
Flow Control	Volumetric
Motor Type	Brushless
Timer	Digital, 11 day

### *Meteorological Measurements*

An existing 10-meter meteorological tower was installed at the S.H. Bell Chicago facility in 2014. The tower is equipped with wind speed, wind direction, temperature and barometric pressure monitors. The tower continuously measures and records wind speed and wind direction at one-hour intervals. S.H. Bell is able to correlate 1-hour and 24-hour ambient PM10 measurements with wind speed and wind direction data to determine source direction and the effects of wind speed on PM10 concentrations. The meteorological tower also includes calibrated ambient temperature and pressure instrumentation to determine corrected (actual) PM10 concentrations as recorded by the monitors. As of the date of this QAPP, the meteorological equipment is operating separately from the PM10 sampling network, until such time as it can be integrated into the monitoring network. The meteorological monitoring tower remote data collection, archiving, and monthly reporting will be performed monthly S.H. Bell. S.H. Bell will append this QAPP with additional detail regarding the meteorological equipment once it has been integrated into the PM10 sampling network. Table B-4 lists specifications for meteorological sensors.

Each meteorological monitor is wired into a Climatronics data logger with a network interface module at the meteorological tower. The data logger program for the meteorological equipment is LoggerNet. Meteorological monitoring tower remote data collection, archiving, and reporting will be performed monthly by S.H. Bell. Data will be archived and edited as necessary. Reports with hourly average meteorological data including wind speed, and wind direction will be provided to USEPA by S.H. Bell monthly. Semi-annual calibrations of the meteorological monitoring system will be performed by Murray and Trettel, Inc. NIST-traceable test equipment will be used during calibration. Wind speed sensors will be swapped and bearings replaced every 6 months. Wind direction sensors will be swapped and bearings replaced every 12 months. Completed calibration logs will be provided to S.H. Bell.



**Table B-4. Meteorological System Components**

<b>Components</b>	<b>Climatronics/MetOne* Part Number)</b>
Wind Speed Sensor (2)	100075S
Wind Direction (2)	100076S
Platinum Temperature Probe	T-200A*
Six Plate Radiation Shield	5980*
Barometric Pressure Sensor	102663-2*
Crossarm	101994-1
External Heaters	101235-G1
Heater AC Cable	101255-40
Wind Cable	100605-40
Data Logger in Enclosure	102700-G1
Battery Back-Up Power Supply	101139
AC Surge Protector	415
Signal Line Surge Protector	101904
Network Link Interface	CNL201
Windows Data Logger Software	LOGGNET
Tower Kit – 34'	970895
Full Height Grounding Kit	100924

\*Denotes MetOne part number. All others are Climatronics part numbers

Additional measurements of ambient temperature and barometric pressure will be collected from each BAM-1020 unit using onboard sensors, which enable them to calculate the correct flow rates for PM10 monitoring. Sensors will be sited according to EPA guidelines.

### *Shelters*

Temperature controlled shelters (CAS 9004 series) with an equivalent insulation value of R-25 will be installed at each of the four monitoring sites (S1, S2, S3, and S4). Each shelter is equipped with a commercial-grade climate control system. All internal wiring meets or exceeds National Electrical Code (NEC). Each shelter is equipped with a sample inlet flange through which the BAM-1020 inlet tubing is routed. Roof flange also accommodates the BAM-1020 temperature/pressure data signal cable.

### *Data Systems and Software*

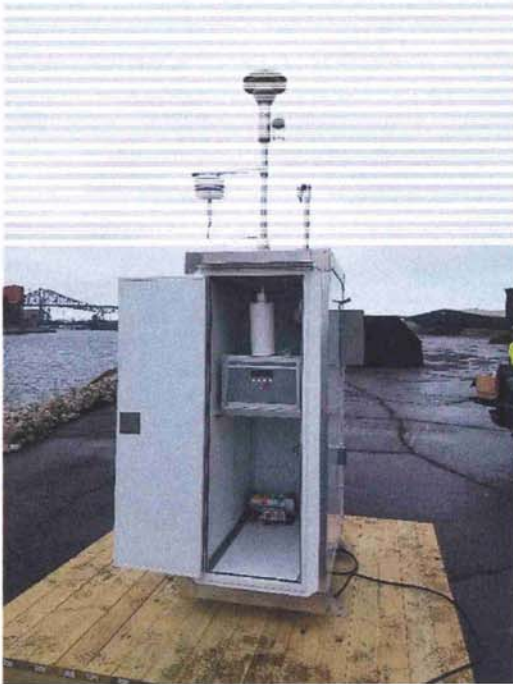
The BAM-1020 units have onboard data logging capability of up to six months, so data values and diagnostic information are readily accessible. Agilaire’s AirVision software is used to communicate with the BAM-1020s.

An Agilaire Model 8872 data logger is located at monitoring site S3. It is connected to the other three monitoring sites (S1, S2, and S4) with the use of radio modems to receive data from the BAM-1020 FEM monitors. The radio modem at S3 is a base unit that receives communication from the other remote radio modems at S1, S2, and S4. Data from the

Agilaire 8872 data logger is transmitted via cellular modem to AirVision (the Agilaire data reporting and validation package), which is hosted on the CAS server in Cleves, Ohio. Figure B-3 provides an overview of shelter configurations at the four monitoring sites

Each meteorological monitor is wired into a Climatronics data logger with a network interface module at the meteorological tower. The data logger program for the meteorological equipment is LoggerNet.

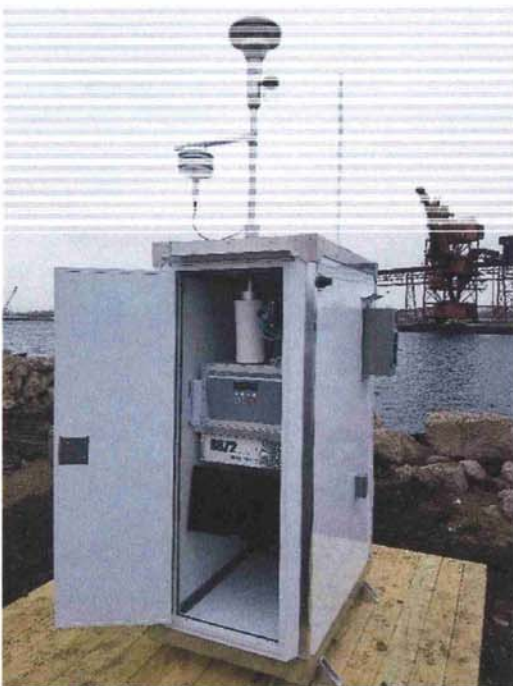
**Figure B-3. Overview of Shelter Configurations**



**S1 (Monitoring Site 1)**



**S2 (Monitoring Site 2)**



**S3 (Monitoring Site 3)**



**S4 (Monitoring Site 4)**

All datalogger, monitor, and sampler time settings will be set within  $\pm 60$  seconds of the site technician's reference time obtained from a local cell phone network and checked at least once every 30 days. Instrument clocks that are more or less than 60 seconds from the reference clock shall be reset to within 60 seconds of the reference clock. Records of resets will be recorded in the appropriate site logbooks housed at each of the monitoring sites.

## **B2.2 Sample Documentation and Control Requirements**

Field operation records include site visit and maintenance logs, checklists, chain of custody forms, continuous monitor calibration documents, high-volume sampler calibration and flow verification records, and meteorological calibration documents. All of these records are in electronic form, as spreadsheets or text files. All field operation records are returned at least monthly to the CAS project manager for inclusion in the project files. The automatic data polling systems for the continuous monitoring network is password protected and only CAS team members have access. Sample checklists and calibration documents are presented in Appendix A and an example chain of custody form for laboratory samples is presented in Appendix B. The chain of custody protocol will follow the general guidance of Section 8 of Volume II of the EPA QA Handbook and sample specific requirements for storage and handling in each applicable analytical method.

## **B3 Analytical Methods Requirements**

The monitoring program will collect 24-hour PM10 filter samples from the Tisch Environmental High Volume Filter-Based FRM PM10 monitors that will undergo both gravimetric analysis and determination of lead and toxic metals. To optimize the sampling schedule, CAS will operate two Tisch Environmental Model 6070 DV-BL PM10 samplers at monitoring site S4. These samplers will operate from midnight to midnight, every three days, according to USEPA's 3-day sampling schedule. The USEPA's 2017 3-day sampling schedule is included as Appendix C. The first sample date is set for March 2, 2017. Particulate matter is collected on numbered, pre-weighted 8" x 10" filters supplied by Intermountain Laboratories in Sheridan, Wyoming. Samples will be collected approximately weekly, after every 1-3 sample events as determined by the sampling schedule and S.H. Bell's operating hours and returned to the Intermountain Laboratories in Sheridan, Wyoming for gravimetric analysis and determination of lead and toxic metals.

Intermountain Laboratories will initially perform a gravimetric analysis of the filters to determine PM10 mass concentration using USEPA Compendium Method IO-2.1 (USEPA, 1999a). The mass concentrations produced should provide a general indication of measurement agreement with the BAM-1020 continuous monitors at each of the S.H. Bell Chicago facility's four monitoring sites.

Following gravimetric analysis, for the determination of lead and toxic metals (arsenic, cadmium, chromium, manganese, nickel, and vanadium), filters are extracted using microwave or hot acid, then analyzed by inductively coupled plasma/mass spectrometry (ICP/MS). Intermountain Laboratories performs the extraction procedure in accordance with USEPA’s Inorganic Compendium Method IO-3.1 (USEPA, 1999b). Intermountain Laboratories performs the determination of metals by ICP/MS in accordance with USEPA’s Inorganic Compendium Method IO-3.5 (USEPA, 1999c). The estimated Method Detection Limit (MDL) for each of the target metals is listed in Table B-5.

**Table B-5. Estimated Method Detection Limits for Target Metals**

<b>Metal</b>	<b>Method Detection Limit (in ng/m<sup>3</sup>)</b>
Arsenic	0.52
Cadmium	0.10
Chromium	0.26
Lead	0.10
Manganese	0.26
Nickel	0.52
Vanadium	0.52

\*ng/m<sup>3</sup> – nanograms per cubic meter

Laboratory records include sample cassette IDs imprinted on the filter support screens, chain-of-custody forms matching cassette ID to sample ID, raw data files from the analysis, QC check data, analysis reports, and electronic data files for transmittal to the project database. The laboratory is responsible for maintaining these records, and long-term archival of records is accomplished using a well-defined laboratory procedure. Each time that the lab receives field samples, sample login e-mail verification is sent to the data management task leader, as a scanned Adobe Acrobat file of the chain-of custody form.

An important consideration of the analytical work is the treatment of data at low concentrations near the method detection limit for the laboratory. Each laboratory has two boundaries within its S.H. Bell reporting protocol: the Method Detection Limit (MDL) and the Reporting Limit (RL). Each target compound on the S.H. Bell list has a unique MDL and RL. The RL is typically five times higher than the MDL, and results reported within this concentration range between MDL and RL are flagged as such. The precision and accuracy specifications are applicable to measurement data at or above the RL, and lower concentration data are possibly outside the quality specifications and should be treated accordingly by data users. The laboratory analysis conditions, such as sample or digestate volume can vary slightly from sample to sample, so these numbers are not absolute.

## B4 Quality Control Requirements

The quality control (QC) methods employed in the S.H. Bell Chicago monitoring network are described in this section. Field QC efforts are described in Section B4.1 and lab QC efforts are described in Section B4.2.

### B4.1 Field Quality Control

Field quality control encompasses several areas of concern. The tasks required of the field technician to promote quality are as follows (calibration tasks are discussed in Section B5):

#### *Documentation*

The operator will maintain a file of site information that will include site visit and maintenance logs, operator checklists and calibration data. A logbook and field forms are kept in the monitoring equipment shelters at each of the S.H. Bell Chicago monitoring stations (S1, S2, S3, and S4). Copies of this documentation will be forwarded to the project team at least monthly, and these items will be retained in the project files. Submittal via electronic mail is acceptable. Examples of the calibration data sheets and operator checklists are presented in Appendix A.

#### *PM10 Continuous Monitor Checks (BAM-1020)*

Monthly leak check, quarterly flow rate check and temperature/pressure transducer checks, and yearly 72-hour zero checks will be performed on the BAM-1020s. In addition, leak checks and flow or temperature/pressure checks will also be performed after any major maintenance, as recommended in the BAM-1020 manual. Additional maintenance checks are listed on the monthly QC spreadsheet used for this project (an example is shown in Appendix A).

#### *High-Volume PM10 Monitor Checks (TE 6070 DV-BL)*

Appendix B includes a sample Chain-of-Custody (COC) form and sample Particulate Sampler Field Envelope for the contract laboratory performing gravimetric analysis and determination of lead and toxic metals (Intermountain Laboratories). Five-point multi-point calibrations will be performed on the TE 6070 DV-BLs annually, and single point flow verifications will be performed quarterly. Checks will be recorded on a QC spreadsheet. Additional maintenance checks are listed on the monthly QC spreadsheet used for this project (an example is shown in Appendix A).

#### *Meteorological Equipment Checks*

The field technician will visually inspect the meteorological equipment at each visit (approximately weekly) for signs of deterioration or damage. Any damage will be reported to Murray and Trettel, Inc., the meteorological equipment contractor. The meteorological

sensors will be calibrated with NIST-traceable test equipment, which will be provided to S.H. Bell. The field technician will also review recent data and compare it to local weather reports or National Weather Service conditions for the area.

All sensors are initially calibrated and certified by the instrument manufacturer and then compared to a traceable standard under ambient conditions every six months when deployed to the field.

The ambient temperature and barometric pressure sensor outputs will be compared to traceable temperature and pressure standards of known accuracy every six months with the meteorological system calibration. The monthly check for the onboard temperature and pressure sensors for the BAM is documented on the BAM QC form, since the temperature and pressure readings are critical to subsequent PM10 mass calculations. A summary of service checks is provided in the BAM manual (refer to Section 7 of the manual).

### *Shelter Checks*

The shelter's role in quality control is to provide a temperature-controlled environment in which the monitoring equipment can operate at optimum performance. Monitors and data loggers must be housed in a shelter capable of fulfilling the following requirements:

- The shelter must protect the instrumentation from precipitation and excessive dust and dirt, provide third wire grounding as in modern electrical codes, meet federal Occupational Safety and Health Administration regulations, and be cleaned regularly to prevent a buildup of dust.
- The shelter must protect the instrumentation from any environmental stress such as vibration, corrosive chemicals, intense light, or radiation.

## **B4.2 Laboratory Quality Control**

The following lists present some of the common quality control procedures required by the methods for each type of analysis. Specific quality control measures are provided in the laboratory SOP documents kept on file and available via request at Intermountain Laboratories.

### *Gravimetric Analyses*

Laboratory quality control for gravimetric mass analyses by USEPA Compendium Method IO-3.1 includes the following:

- Use media that meet the requirements for sampling presented in IO Method IO-3.1 Section 4.
- Equilibrate media under the temperature and humidity control requirements of the Method before weighing.

- Use the same microbalance for pre- and post-sampling weighing events.
- Calibrate the microbalance using Class S standard weights.
- After every tenth weighing, re-zero the balance and perform a standard weight check.
- Reweigh 10% of the samples using a different analyst.

### *Metals Analyses*

Laboratory quality control procedures for metals analyses by USEPA Compendium Method IO-3.5 includes the following:

- Use at least two calibration standards, and one calibration blank while performing initial calibration.
- While performing calibration verification checks, use calibration standards from a different vendor.
- Analyze a calibration blank before each run.
- Run interference check standards through the analyzer.
- Use continuing calibration standards to check the response of the instrument, as required, depending on the number of filters in a batch.
- A reagent blank should be tested.
- Laboratory control spikes should be used after each batch of samples.
- Analyze a matrix spike during each run.
- Test a duplicate or spike duplicate after testing a group of samples.



### *Sample Naming Convention*

CAS will be using the following sample naming convention to create unique sample identification (ID) designations for each field sample collected during the S.H. Bell monitoring study. Samples will be identified using the following format:

## **AABBB-MMDDYY-V**

Where:

- **AA** is the collection location; S1 for Site 1, S2 for Site 2, S3 for Site 3, and S4 for Site 4
- **BBB** is the instrument #, HV1 for High-Volume Sampler #1, and HV2 for High-Volume Sampler #2
- **MMDDYY** is the sample month, day, and year
- **V** is the type of sample; R indicates a routine sample and B indicates a trip blank

For example, S4HV1-030817-R represents a regular sample collected on March 8, 2017 at High-Volume Sampler # 1 at Monitoring Site S4.

### **B4.3 Equipment Testing, Inspection, and Maintenance**

Specific tasks for periodic testing, inspection, and maintenance are required for the air sampling and monitoring equipment to provide sufficient quality control to remain within the manufacturer's operating specifications and ensure that the project quality goals are met. Initial system integration testing and verification of each instrument and sampler was performed at the CAS facility in Cleves, Ohio prior to deployment to the field. Additional setup tasks, operational checks and verifications were performed during commissioning of the particulate monitoring stations February 27-28, 2017. The maintenance tasks are summarized for each type of equipment below. These activities must be documented in the site visit logbook kept at each of the S.H. Bell Chicago monitoring locations. The field operations task leader should provide a schedule for all activities and checklists to the field technician. Common consumable parts are maintained in the field technician's possession at the S.H. Bell Chicago facility. Additional parts may be obtained from CAS facility located in Cleves, Ohio. Less common replacement parts and consumables are available for expedited delivery to site via common carrier.

#### *PM10 Continuous Monitor Maintenance (BAM-1020)*

Each BAM-1020 PM10 monitor requires periodic maintenance as specified by the manufacturer. Instrument Manuals are provided at each of the S.H. Bell Chicago monitoring sites, and detail the required periodic maintenance tasks (Refer to Section 7.1 of the BAM-1020 manual). To assure proper instrument functionality, the maintenance tasks and schedule must be followed and performed at prescribed intervals or in response to an

identified decrease in instrument performance. At minimum, the Continuous PM10 monitor requires the following maintenance:

- nozzle and vane cleaning,
- leak check
- one-point flow system check
- capstan shaft and pinch roller tire cleaning
- PM10 inlet particle trap cleaning
- inspection of filter tape
- checking error logs
- checking real-time clock

### *High-Volume PM10 Maintenance (TE 6070 DV-BL)*

Maintenance of the High Volume PM10 Samplers, TE-6070 DV-BL, is to be performed in accordance with the procedures outlined in in the Operations Manual (Refer to Routing Maintenance Section). Manufacturer prescribed routine maintenance includes the following items (Refer to Sampler Operation Section for procedures and maintenance tasks):

- inspection of all gaskets and seals
- inspection of filter screen and removal of any foreign objects
- inspection of filter media holder
- inspect elapsed time indicator
- clean any excess dirt

Additional quarterly maintenance includes:

- cleaning of the inlet and motor/housing gaskets

### *Meteorological System Maintenance*

The operator must perform an inspection of the tower and associated equipment and perform maintenance activities regularly. The inspection should include verifying the functionality of the wind vane and anemometer and verifying that the temperature/pressure aspirator shield fin set is free from debris. A visual inspection of the signal cables and fastening hardware should be conducted at three-month intervals and during either a system calibration or audit.

## **B4.4 Acceptance Requirements for Supplies and Consumables**

Instrument spare parts, replacement parts and consumables are obtained either directly from the original equipment manufacturer (OEM), authorized distributor, or from a scientific equipment/ materials vendor whose products meet or exceed the OEM specifications or are commonly available (i.e. silicone grease). Contact the CAS Service Department for any parts and/or consumables associated with the PM10 monitoring instrumentation.

## **B5 Instrument Calibration and Frequency**

This section describes the calibration methodology and frequency for each type of measurement conducted in the S.H. Bell PM10 monitoring network.

### **B5.1 Calibration Requirements for PM10 Continuous Monitors (BAM-1020)**

Each BAM-1020 unit deployed to the field carries a factory calibration. Copies of the Certificate of Calibration are included in the 3-ring binders at each of the S.H. Bell Chicago monitoring sites.

During the first quarterly maintenance, the BAM-1020 is subjected to the Background Zero Test (BKGD). The zero-correction check is a 72 hour test utilizing a zero-filter kit installed in place of the PM10 sample inlet heat. Refer to Manual for detailed procedure. Upon completion of the BKGD, a new zero offset value is updates in the monitor's firmware. Subsequent BKGD tests are performed during the Annual Service visits or after major repairs but not less frequently than every 12 months.

Annual Three Point Flow System Calibration. All flow calibrations require a traceable reference flow meter and must include measurements for flow, temperature and pressure in one unit. Each flow calibration process should include an initial leak check, nozzle and vane cleaning, final leak check, three-point flow check (15.0, 18.4 and 16.7 LPM) and calibration if required. Refer to Manual Sections 5.4 - 5.8 for procedures.

The Filter Relative Humidity (RH), Filter Temperature Sensor Test and Smart Heater Test should be performed annually. Refer to Instrument Manual for procedures.

Additional checks include the Beta detector count rate and dark count test check, zero background check, span foil check and should be performed annually.

Factory recalibration is not required except for units sent in for major repairs.

## **B5.2 Calibration Requirements for High-Volume PM10 Samplers (TE 6070 DV-BL)**

Flow Verification/Calibration of the TE-6070DV-BL is to be performed upon initial installation, then quarterly and after any motor maintenance.

The TE-5028 is the preferred method to calibrate PM10 High Volume Air Samplers. It simulates change in the resistance by rotating the knob on the top of the calibrator. The infinite resolution lets the technician select the desired flow resistance. The TE-5028 calibration kit includes: 30" slack tube water manometer, adapter plate, 3' piece of tubing, and TE-5028A orifice with flow calibration certificate. Each annual calibration consists of five points, of which three must be within 36 to 44 CFM.

After calibration, the calculated % difference of calibrator versus sampler flow rates must be within +/-4%. Refer to Sampler Manual, Calibration Procedure for TE-6070DV-BL for complete calibration procedure, including the initial leak check requirement.

## **B5.3 Calibration Procedures for Meteorological Monitors**

Meteorological sensors are calibrated in accordance with the EPA guidance and performed not less frequently than annually. Verifications and Calibrations will be performed in accordance with the manufacturer procedures as listed in the sensor manuals. Additional calibrations will be performed following any sensor repair or replacement.

## **B6 Data Acquisition Requirements**

The BAM-1020 instruments produce signals which are transmitted to the Agilaire 8872 data acquisition system via radio modem, where the signals are digitized and converted to engineering units and stored in electronic memory. The BAM 1020 units are polled hourly by the Agilaire 8872 data acquisition system located at S3. The data is then polled hourly via the AirVision server, housed at the CAS facility in Cleves, Ohio.

Data collected from S.H. Bell Chicago will be reviewed daily. Computerized inspection and visual inspection of these data will be performed daily using AirVision software. Values that fall outside of prescribed limits (Tables B-6, B-7, and B-8) will be evaluated by a data reviewer and corrections to data will be documented. Abnormal data values or problems will be reported as soon as possible to the CAS Project Manager who will initiate corrective action and determine if a special site visit is required.

**Table B-6. Critical Criteria for PM10 Monitoring**

<b>Requirement</b>	<b>Frequency</b>	<b>Acceptance Criteria</b>	<b>Reference</b>	<b>Action</b>
<b>PM10 Continuous (BAM-1020)</b>				
Sampling Period	Every 24 hours of operation	1440 minutes ± 60 minutes midnight to midnight local standard time	40 CFR Part 50, App. J Section 9.15	Verify prior to sampling
One Point Flow Rate Verification	1/month	≤±7% of transfer standard	40 CFR Part 58, App. A Section 3.2.3 3) Method 2.10 Table 3-1	If values outside acceptance criteria, leak-check/recheck flow
<b>PM10 Filter-Based (TE 6070 DV-BL)</b>				
Sampling Period	All filters	1440 minutes ± 60 minutes midnight to midnight local standard time	40 CFR Part 50, App. J Section 7.1.5	Verify prior to sampling
One Point Flow Rate Verification	1/3 months	≤±7% of transfer standard and 10% from design	40 CFR Part 58, App. A Section 3.2.3 3) Method 2.11 sec 3.5.1, Table 2-1	If values outside acceptance criteria, inspect/recheck flow

**Table B-7. Operational Criteria for PM10 Monitoring**

Requirement	Frequency	Acceptance Criteria	Reference	Action
<b>PM10 Continuous (BAM-1020)</b>				
System Leak Check	Within 5 days of beginning sampling; 1/month	1.0 SLPM	Method 2.11 sec 2.3.2	Check O-Rings Check Vacuum line to pump Inspect Nozzle
Multi-Point Flow Rate Verification	1/year following startup	3 of 4 cal points within + 10% of design	40 CFR Part 50 App J sec 8.0 2 and Method 2.10 Sec 2.2.4	If values outside acceptance criteria, leak-check/recheck
Semi-Annual Flow Rate Audit	1/6 months	16.67 SLPM ± 10%	40 CFR Part 58, App A, sec 3.2.4 and Method 2.10 Sec 7.1.5	Check O-Rings Check Vacuum line to pump Inspect Nozzle
Inlet/Downtube Cleaning	1/3 months	Clean	Method 2.10 sec 6.1.2	
<b>PM10 Filter-Based (TE 6070 DV-BL)</b>				
Multi-point flow rate Verification/Calibration	1/yr	3 of 4 cal points within + 10% of design	1, 2 and 3) Method 2.11 sec 2.3.2	Points outside acceptance criteria are repeated. If still outside, consult manufacturer's manual
Field Temp M-point Verification	at installation, then 1/yr	+ 2°C	1,2 and 3) Recommendation	
Semi Annual Flow Rate Audit	1/6 mo	+ 7% of transfer standard and 10% from design	1 and 2) 40 CFR Part 58, App A, sec 3.3.3 3) Method 2.11 sec 7 Table 7-1	Tighten VFC device to blower. Check for leaks at the orifice plate
Maintenance of Impactor Plate	1/month	Clean/Re-grease	Manufacturer recommendation	
Manufacturer-Recommended Maintenance	per manufacturers' SOP	per manufacturers' SOP	NA	

**Table B-8. Systematic Criteria for PM10 Monitoring**

Requirement	Frequency	Acceptance Criteria	Reference	Action
<b>PM10 Continuous (BAM-1020)</b>				
Sampler/Monitor	NA	Meets requirements listed in FRM/FEM/ARM designation	40 CFR Part 58 App C Section 2.1 NA 40 CFR Part 53 & FRM/FEM method list	
Siting	1/year	Meets siting criteria or waiver documented	40 CFR Part 58 App E, sections 2-5 Recommendation 40 CFR Part 58 App E, sections 2-5	
Data Completeness	24-hour quarterly	23 hours > 75%	Recommendation 40 CFR Part 50 App. K, sec. 2.3	
Reporting Units	all filters	µg/m <sup>3</sup> at standard temperature and pressure (STP)	40 CFR Part 50 App K	
<i>Verification/Calibration Standards and Recertification</i>		<i>All standards should have multi-point certifications against NIST Traceable standards</i>		
Flow Rate Transfer Std.	1/yr	+ 2% of NIST-traceable Std.	1,2 and 3) 40 CFR Part 50 App J sec 7.3	
Field Thermometer	1/yr	+ 0.1° C resolution, + 0.1° C accuracy	1,2 and 3) Method 2.10 section 1.1.2	
Field Barometer	1/yr	+ 1 mm Hg resolution, + 5 mm Hg accuracy	1,2 and 3) Method 2.10 section 1.1.2	
Clock/timer Verification	1/6 mo	15 min/day	1,2 and 3) Method 2.10 sec 9	

**Table B-8. Systematic Criteria for PM10 Monitoring (Continued)**

Requirement	Frequency	Acceptance Criteria	Reference	Action
<b>PM10 Filter-Based (TE 6070 DV-BL)</b>				
Sampler/Monitor	NA	Meets requirements listed in FRM/FEM/ARM designation	40 CFR Part 58 App C, Section 2.1 NA 40 CFR Part 53 & FRM/FEM method list	
Siting	1/year	Meets siting criteria or waiver documented	40 CFR Part 58 App E, sections 2-5 Recommendation 40 CFR Part 58 App E, sections 2-5	
Data Completeness	quarterly	> 75%	1,2 and 3) 40 CFR Part 50 App. K, sec. 2.3b & c	
Reporting Units	all filters	µg/m <sup>3</sup> at standard temperature and pressure	1,2 and 3) 40 CFR Part 50 App K sec. 1	
<i>Precision</i>				
Single analyzer	1/3 mo.	Coefficient of variation (CV) < 10% > 15 µg/m <sup>3</sup>	1,2 and 3) Recommendation	
Single analyzer	1/ yr	CV < 10% > 15 µg/m <sup>3</sup>	1,2 and 3) Recommendation	
<i>Verification/Calibration Standards and Recertification</i>				
Flow Rate Transfer Std.	1/yr	+ 2% of NIST-traceable Std.	40 CFR Part 50, App.J sec 7.3 Method 2.11 Sec 1.1.3 40 CFR Part 50, App.J sec 7.3	
Field Thermometer	1/yr	+ 0.1° C resolution, + 0.5° C accuracy	1,2 and 3) Method 2.11 Sec 1.1.2	
Field Barometer	1/yr	+ 1 mm Hg resolution, + 5 mm Hg accuracy	1,2 and 3) Method 2.11 Sec 1.1.2	
Clock/timer Verification	4/year	5 min/mo	recommendation	



## B7 Data Management

The proper management of all data is critical to assuring the quality and usability of the monitoring results. As such, procedures have been implemented to ensure robust data acquisition, validation, reduction, reporting, and storage of electronic data. PM10 monitoring data will be recorded and stored at the site using an Agilaire Model 8872 data logger. PM10 data will be retrieved from the monitoring site hourly via internet connection to the CAS AirVision file server. In addition, the monitoring site can be called from any computer having the correct software and the IP address and appropriate credentials.

All electronic calculations and statistical analyses will be performed using standard software (Microsoft Excel), Air Vision, and the software associated with the Agilaire Model 8872 data logger. All project documentation, records, data, and reports will be stored for at least five years following project completion. The data are stored on the server at Consolidated Analytical Systems which are backed up nightly and are archived on and offsite.

PM10 data will be reviewed routinely by the CAS Data Manager assigned to this project. The CAS Data Manager reports directly to the CAS Project Manager. These data will be subjected to several levels of quality control, validation and quality assurance as discussed in Section D. Validated data are compiled into the final database for further analysis and report preparation. The final database is processed and stored on the Consolidated Analytical Systems server and then archived on various storage media and maintained in duplicate in more than one location for protection.

The Data Manager will archive data on the network of Consolidated Analytical Systems and on secured servers which are backed up nightly and archived on and off-site.

### *PM10 Continuous Monitor (BAM-1020) Data Reporting*

The PM10 hourly concentrations from continuous monitors will be reported on a monthly basis in accordance with the USEPA Region 5 RFI dated March 9, 2015 (USEPA, 2015, Appendix B, 18), within 14 days of the end of the month in which it was collected (i.e., continuous data collected March 1-31, 2017 will be reported by April 14, 2017).

### *High-Volume PM10 (TE 6070 DV-BL) Data Reporting*

Reporting of the data from the PM10 filter-based samplers which undergo gravimetric analysis and determination of lead and toxic metals specified in the USEPA Region 5 RFI dated March 9, 2015 (USEPA, 2015, Appendix B, 4.e), will be in the format submitted by the contract laboratory.

Below is an example timeline detailing the sample collection and reporting process for filter-based samples. Please note that sampler pick-up for the High-Volume PM10s can vary by 2 days (e.g., if the sampler finishes collecting on a Friday at Midnight, the filter pick up will not be until Monday morning based on S.H. Bell's normal business operation hours).

- Days 0-6 - Samples are collected from S4HV1 and S4HV2 in accordance with the USEPA 3-day sampling schedule (Appendix C)
- Day 7 - On the first business day following the completion of the sampling events, the two samples are collected (one from S4HV1 and one from S4HV2).
- Day 8 - Samples are shipped to Intermountain Laboratories in Sheridan, Wyoming
- Day 9 - Transport to laboratory
- Day 10 - Laboratory check in
- Day 11-12 - Filter conditioning (pre-gravimetric analysis)
- Day 13-18 - ICP/MS analysis
- Day 19-20 - Report preparation by the laboratory
- Day 20-25 - CAS receipt and review and final QA/QC of the data
- Day 26 – Reporting\*

\*Note: Date received after the 26<sup>th</sup> will be included with the high-volume data for the following month.

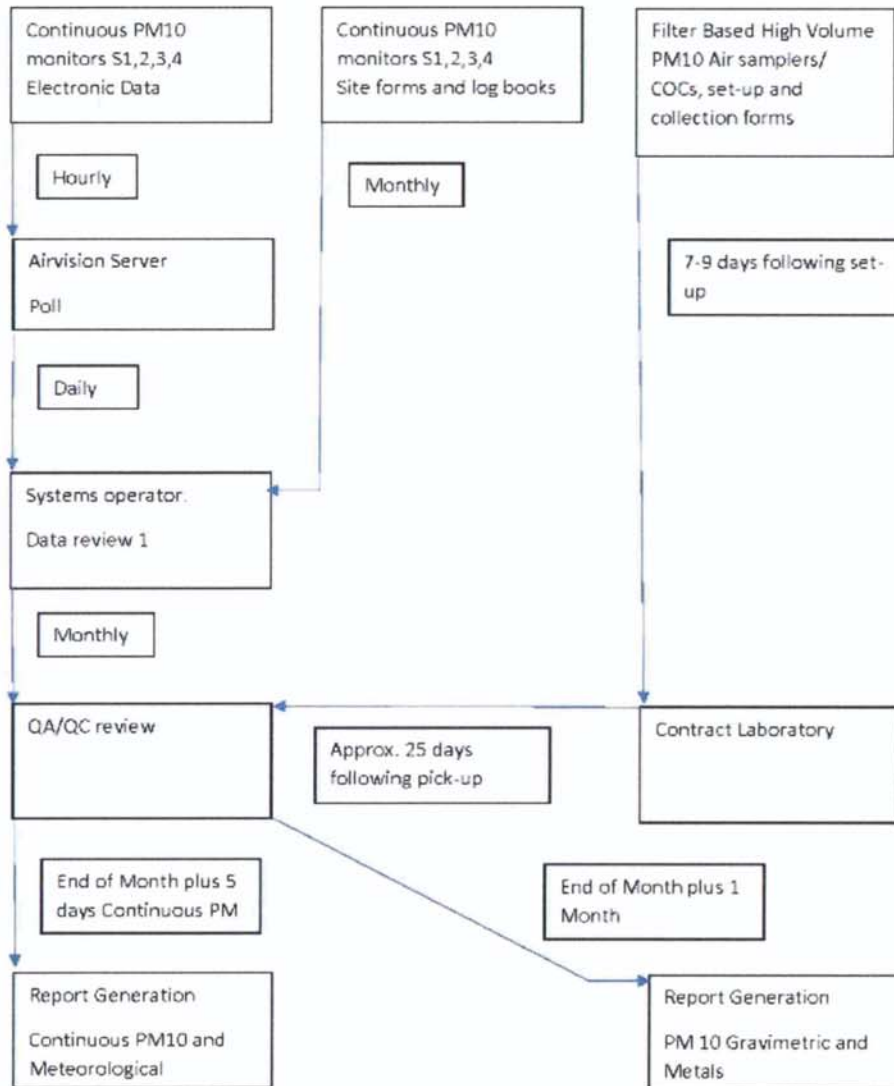
The appropriate reporting submittal schedule would be

- April 14, 2017 – Continuous PM10 data (March 1-31, 2017 sampling)
- May 1, 2017 – High-Volume PM10 data (March 1-31, 2017 sampling)
- May 14, 2017 – Continuous PM10 data (April 1-30, 2017 sampling)
- June 1, 2017 – High-Volume PM10 data (April 1-30, 2017 sampling)
- June 14, 2017 – Continuous PM10 data (May 1-31, 2017 sampling)
- June 1, 2017 – High-Volume PM10 data (May 1-31, 2017 sampling)

Data may also be marked with a qualifier code (Null Code) to denote suspect or invalid data if necessary.

Figure B-4 presents the data flow path for collecting, storing, and managing all data generated in the network.

**Figure B-4. Data Management Tasks for S.H. Bell Chicago Monitoring Network**



## C. ASSESSMENT AND OVERSIGHT

### C1 Assessment and Response Actions

The project team includes a quality assurance (QA) specialist who is responsible for independent assessment of the measurement efforts. This individual may be part of the same corporate organization as the project team, but performs no duties or holds no interests in the operation of any of the monitoring sites and networks that undergo audits. Assessments conducted for this project are divided into two categories: Technical Systems Audits and Performance Evaluation Audits. Technical audits qualitatively document the degree to which the procedures and processes specified in the QAPP are followed. Performance evaluations quantitatively test the ability of a measurement system to obtain acceptable results. Both provide information regarding the compliance of environmental data collection efforts as described in the QAPP. All performance and technical systems audits are conducted following the guidance documents in the “EPA Quality Assurance Handbook” series, Volumes I, II, and IV.

#### C1.1 Technical Systems Audits

Technical Systems Audits (TSAs) are conducted to determine the project personnel and equipment are functioning as prescribed in the QAPP. TSAs are performed onsite and may examine facilities, equipment, personnel, training, procedures, record keeping data validation, data management and analysis of a measurement system. The audit is conducted employing a checklist as a guide to the major topics to be assessed, and the auditor is free to allot greater amounts of time to any particular area as needed. A checklist is prepared in advance of the audit and is based on information presented in the QAPP and the guidance of the EPA QA Handbook series (USEPA, 2000).

From this assessment, the auditor is able to determine the level of adherence to the specifications relating to quality assurance objectives detailed in the QAPP. This review includes traceability documentation for standards and test equipment used to conduct quality control checks on pollutant monitors and meteorological sensors. Where the specification appears incomplete or inadequate, the auditor should be able to apply EPA guidance document information and personal experience in assessing whether the quality of the monitoring activity will produce defensible data. An example TSA field checklists for a BAM-1020 is presented in Figure C-1.

Figure C-1. Example TSA Checklist for BAM-1020



**BAM-1020 Audit Report**

Customer	
Instrument	
ID/Serial No.	

Audit Performed by	
Date	
Location	

**Flow Audits**

Standard Used	Model	Serial Number	Calibration Date
Flow Reference Standard			
Temperature Standard			
Barometric Pressure Standard			

Leak Check Value	<i>as found</i>	<i>as left</i>
------------------	-----------------	----------------

	<i>as found</i>		<i>as left</i>		N/A
	BAM	Ref. Std.	BAM	Ref. Std.	
Ambient Temperature					
Barometric Pressure					
Flow Rate (Actual Volumetric)					
Flow Rate (EPA Standard)					

**Mechanical Audits**

Note: Mark as found and/or as left box to reflect actions performed.

	<i>as found</i>	<i>as left</i>	
Pump muffler unclogged			
Sample nozzle clean			
Tape support vane clean			
Capstan shaft clean			
Rubber pinch rollers clean			
Chassis ground wire installed			N/A
PM10 particle trap clean			
PM10 drip jar empty			
PM10 bug screen clear			
PM2.5 particle trap clean			
Inlet tube water-tight seal OK			
Inlet tube perpendicular to BAM			

Figure C-1. (continued)



**BAM-1020 Audit Report**

**Setup and Calibration Values**

Parameter	Expected	Found
Clock Time/Date		
RS-232 Baud Rate	9600	
STATION #		
RANGE (mg)	0 - 1.000 mg	
BAM SAMPLE		
MET SAMPLE		
OFFSET		
CONC UNITS	mg/m3	
COUNT TIME (min)		
FLOW RATE		
CONC TYPE	STD	
FLOW TYPE	Actual	
Cv		
Qo		
ABS		
μ sw		
K Factor		
BKGD		
STD TEMP (°C)	-40 °C to 55 °C	
HEATER	Auto	
e1		
Errors	N/A	
AP		
FR1		
FRh		
Password	f1 f2 f3 f4	
Cycle Mode	Standard	
RH Control	yes	
RH Setpoint (%)		
Datalog RH	yes	
Delta-T Control	no	
Delta-T Setpoint (°C)		
Datalog Delta-T	no	

Figure C-1. (continued)



**BAM-1020 Audit Report**

Analog Voltage Output Audit Relevant? : No

DAC Test Screen	BAM Voltage Output (Volts)	Logger Voltage Input (Volts)
0.000 Volts		
0.500 Volts		
1.000 Volts		

Membrane Audit

LAST m (mg)	
ABS (mg)	
Difference (mg)	0
% Difference	#DIV/0!

Flow Control Range

Flow Setpoint	BAM Flow
15.0 LPM	
16.7 LPM	
18.4 LPM	

Last Six Errors in BAM-1020 Error Log

	Error	Date	Time
1			
2			
3			
4			
5			
6			

Notes

-----  
 -----  
 -----

Recommendations

-----  
 -----

Signatures Date

Service Technician		
Reviewer		

## **C1.2 Performance Evaluation Audits**

Continuous PM10 monitor and FRM sampler performance audits consist of a leak check, a flow rate measurement accuracy check, and verification of the temperature and pressure transducer measurement accuracy (for continuous monitors).

Performance audits for meteorological sensors are accomplished by direct comparison with an audit standard. For the wind direction sensor, the output of the sensor with the vane turned to a series of known directions is assessed, as is the orientation of the vane with respect to true north. The wind speed sensor is tested using a traceable certified motor drive unit. The ambient temperature and barometric pressure audits are conducted using collocated audit standards. A digital thermistor unit with certified traceability is used for temperature and a traceable barometer is used to test the site pressure transducer.

## **C2 Reports to Management**

Reports for field performance and technical systems audits include a statement of the scope of the audit, summary presentation of results, and a listing of specific observations or findings related to the specifications under review. The field data and traceability documents for each audit standard employed are included. The auditor should always provide the field technician and/or the operations task leader a list of preliminary findings and recommendations during a debriefing meeting held at the conclusion of the audits. If significant deficiencies are determined that impact the ability of the system to properly function, the CAS Project Manager will be notified immediately. The CAS Project Manager will notify S.H. Bell representatives of the situation. A formal report should be provided to the project team within two weeks of completion of the audits. If there are no corrective action items, the auditor may close the audit. If further action is required, the audit will be classified as open pending verification that the corrective action was completed and the audit specification is being met. This information will be supplied to EPA as part of the standard reporting effort.

The designated project team member will have the responsibility for follow-up on audit recommendations and provide a written response to the findings and communicate the outcome of the corrective action effort. This is typically the Field Installation/Operations Manager for the field network. If the auditor does not receive a response or the response is inadequate, he must communicate the situation to the Project Manager.

Accuracy, precision, and completeness statistics are also computed for each measurement as applicable, per the quality assurance guidance in 40 CFR Part 58, Appendix A. A review of laboratory detection limits will be conducted to ensure that the reported limits meet the nominal values stated in this QAPP. The computations for flow rate measurement accuracy are as described in Volume II and the computations for meteorological measurement accuracy are as described in Volume IV of the EPA QA Handbook (USEPA, 2013 and USEPA, 2008, respectively).



Precision of PM10 measurements between the two methods that are employed is evaluated by least squares regression slope comparison of FEM and FRM PM10 data for sample data pairs <math>60\mu\text{g}/\text{m}^3</math> at S.H. Bell Chicago monitoring Site S4, where these samplers are co-located. Laboratory analysis precision is compared to the method requirements for analytical duplicate analyses.

Completeness is calculated as the ratio of valid samples or hours of data compared to the total planned number of samples or operational hours of data attempted to be collected, expressed as a percentage.

Accuracy data are generated by the audit staff, as the spreadsheet results from measurement audits. Precision data are generated by the data management staff, in the form of statistics created from precision check data, or QC data from the subcontract laboratory as required by the analytical method. Completeness data are also generated by the data management staff, using an automated reporting script integrated into the RAQIS database.

## **D. DATA VALIDATION AND USABILITY**

### **D1 Data Review, Validation, and Verification Requirements**

Data review, validation, and verification procedures are presented in this section. Three types of data are collected for this project: continuous data from PM10 monitors, gravimetric and speciation data from manual samplers, and continuous data from meteorological sensors. Collected data is specific to the function of each device. Daily data review is the responsibility of the data management task leader for the project, in parallel with operations staff. The task leader also performs the routine monthly review and validation functions or delegates and supervises them.

In the event the daily data review indicates any irregularity or elevated result, the reviewer notifies the Project Manager and Data Management task leader. All abnormal data is to be flagged. The data editor gathers all pertinent QC data for the date and time of the result of interest and reports to the project manager regarding the validity of the measured values. This typically occurs within 24 hours of first discovery of the situation. If the measurements are valid, the Project Manager immediately notifies S.H. Bell and provides associated meteorological data so that the client may investigate any potential events or sources that could have contributed to the result of interest.

Analytical laboratory reports for manual samples will be forwarded in electronic format and loaded into the database. The data management task leader is responsible for ensuring that the data are properly loaded and the supporting documentation is in the central project file.

Data will be declared invalid whenever documented evidence exists demonstrating that a monitor, sampler, or meteorological sensor was not collecting data under representative conditions or was malfunctioning. In rare cases where a consistent offset in continuous measurements can be verified, a factor may be applied to the averages in a data set with clear identification of the affected data. The project data documentation files will contain the supporting documentation of the use of and justification for the factor.

Data validation will be performed or supervised for each monthly data set by the data management task leader. The data management task leader will verify that the continuous monitor data and the meteorology measurement data are complete for the month, and then initiate the validation process.

All continuously generated data is stored on the data logging system (DAS) and is transferred via cellular modem during the daily automated network data retrieval routine. The activities involved in validation of the data in general include the following:

- Reviewing all site visit logs, calibration data, audit data, and other relevant information for indications of malfunctioning equipment or instrument maintenance/calibration events;
- Reviewing each laboratory report
- Reviewing all available BAM-1020 performance data
- Examining the continuous PM10 and meteorological data for outliers in the data, unusual persistence, unusually high rates of change, or measurement values that seem incongruous with normal measurement ranges and/or diurnal variations.

Any Suspect data is flagged and subject to further examination and review prior to being invalidated. The cause of abnormal or unavailable data is investigated and determined. The results from all quality control and quality assurance checks are evaluated to determine if the data quality objectives for each measurement are being met. Evidence of measurement bias, external influences on the representativeness of the data, or lack of reproducibility of the measurement data may be cause for the data to be considered invalid.

After the edit and validation review is complete, the editor returns a set of instructions to the data manager for application to the data set. The final edited version of the data is produced and peer reviewed to ensure that the edits were properly applied and that the validation process was consistent with project requirements and applicable guidelines. . A record of the edit instructions is retained in the project files, as is the final data product (Validated Data). Once the project manager has reviewed and approved the edited data set, it is released and reported to the client.

## **D2 Reconciliation with Data Quality Objectives**

Periodically the project progress is evaluated to assess measurement goals and data collection efforts. This evaluation will occur at a minimum on an annual basis. Two areas will be reviewed: the performance of the project in respect to the quality goals specified in the QAPP and the limitations (if any) on the measurement data for their intended use.

### **D2.1 Assessment of Measurement Performance**

As part of the annual review, the performance of the monitoring network will be assessed to determine if the requirements of the data user are met. (client and/or regulatory agency). Key indicators relating to precision, accuracy, completeness, representativeness, and comparability goals for the monitoring effort are evaluated. Specific quantitative measures of precision, accuracy, and completeness are defined for use in estimating the quality of the data set. These measures will be calculated and compared to the goals for the project.

## **D2.2 Data Quality Assessment**

If any of the data quality measures deviate from established performance objectives (e.g., an audit result outside the project specification or a monthly data completeness less than the project goal) the data is not considered useless without further examination. The burden is on the project team to determine the extent to which a quality issue affects the related data, and ultimately how the issue impacts the fitness for use of the data.

A single isolated incident affecting the performance objective does not automatically render the data invalid, but rather reduces the confidence that the measurement is reliable, and indicates that increased quality control measures are needed. Any data confidence question should be appropriately flagged in the database. The data quality objectives are assessed periodically throughout the monitoring effort. A month in which the completeness statistic for a given site is below the objective is cause for concern and corrective action, but if the other months are within the objective the confidence in the complete data set should remain high.

Any potential limitations of the validated data set will be identified and communicated. The project team will present all known or potential limitations on the data with each data submittal, and will clearly flag any such data so that users may determine if the data should be used for a particular conclusion or decision.

## E. REFERENCES

MetOne (2008), *BAM 1020 Particulate Monitor Operations Manual, BAM-1020-9800, Rev H*, MetOne Instruments, Inc., Grants Pass, OR.

S.H. Bell Company 2016 – 2017. “*Response to Request to Provide Information Pursuant to the Clean Air Act, Appendix B, PM10 Monitors and Siting, Proposed Monitoring Sites and Locations*”, January 4, 2017. (Monitoring Plan), *Amendments and revisions as noted below:*

- 01/11/2017 – USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request for clarification to proposed monitoring site selection)
- 01/18/2017 – S.H. Bell Letter “Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection”
- 01/25/2017 – Conference Call between USEPA Region 5 and S.H. Bell (request for evaluation of PS2, PS2.1, PS2.2, and PS2.3)
- 01/30/2017 – S.H. Bell S. Letter Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection (Response to 01/25/2017 conference call requesting written evaluation of PS2, PS2.1, PS2.2, PS2.3)
- 02/02/2017 – Conference Call between USEPA Region 5, the City of Chicago, S.H. Bell, Eckert Seamans Cherin & Mellot, LLC and Consolidated Analytical Systems, Inc. (request to re-evaluated alternative proposed monitoring site PS2.2)
- 02/06/2017 – S.H. Bell Letter “Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection” (Re-Evaluation of alternative proposed site PS2.2)
- 02/07/2017 - USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request to locate proposed monitoring site PS2.2)
- 02/10/2017 – S.H. Bell Letter “Response to February 7, 2017 Email Request to Locate Proposed Monitoring Site PS2.2”
- 02/13/2017 – USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request to resubmit S.H. Bell siting plan for approval)
- 02/24/2017 - USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago S. Avenue O Terminal - QAAP” (providing links to be researched in the development of the site specific QAPP)
- 03/02/2017 - USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago S. Avenue O Terminal – Monitoring and Siting” (approval of the S.H. Bell Siting Plan)
- 03/10/2017 – S.H. Bell Letter “Letter Updates to S.H. Bell’s December 30, 2016 Response to: Request to Provide Information Pursuant to the Clean Air Act Appendix B, PM10 Monitors and Siting Proposed Monitoring Sites and Locations”

(Tisch Environmental, Inc. 2010), *OPERATIONS MANUAL, TE-6000 Series TE-6070, TE-6070-BL, TE-6070D, TE-6070D-BL TE-6070V, TE-6070V-BL, TE-6070DV, TE-6070DV-BL, PM10, Particulate Matter 10 Microns and less High Volume Air Sampler, U.S. EPA Federal Reference Number RFPS-0202-141*”, Tisch Environmental, Inc., Village of Cleves, OH, August 10, 2010.

(USEPA, 1994) – United States Environmental Protection Agency, “*Quality Assurance Handbook for Air Pollution Measurement Systems, Volume 1 -- A Field Guide to Environmental Quality Assurance*”, EPA-600/R-94/038a, April 1994.

(USEPA, 1999a) – United States Environmental Protection Agency, Office of Research and Development, Cincinnati, Ohio “*Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-2.1, Sampling of Ambient Air for Total Suspended Particulate Matter (SPM) and PM10 Using High Volume (HV) Sampler*”, EPA/625/R-96/010a., June 1999.

(USEPA, 1999b) – United States Environmental Protection Agency, Office of Research and Development, Cincinnati, Ohio “*Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.1, Selection, Preparation and Extraction of Filter Material*”, EPA/625/R-96/010a, June 1999.

(USEPA, 1999c) – United States Environmental Protection Agency, Office of Research and Development, Cincinnati, Ohio “*Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, Compendium Method IO-3.5, Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass (ICP-MS) Spectroscopy*”, EPA/625/R-96/010a., June 1999.

(USEPA, 2000a) – United States Environmental Protection Agency, “*Guidance on Technical Audits and Related Assessments for Environmental Data Operations, EPA QA/G-7 Final*”, EPA/625/R-99/080a., January 2000.

(USEPA, 2000b) – United States Environmental Protection Agency, “*On-Site Meteorological Program Guidance for Regulatory Modeling Applications*”, EPA 454/R-99-005, February 2000.

(USEPA, 2001) – United States Environmental Protection Agency, “*EPA Requirements for Quality Assurance Project Plans*”, EPA QA/R-5, March 2001.,

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(USEPA, 2008) – United States Environmental Protection Agency, “*Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV – Meteorological Measurements Version 2.0 (Final)*”, EPA-454/B-08-002, March 2008.

(USEPA, 2013) – United States Environmental Protection Agency, “*Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II -- Ambient Air Quality Monitoring Program*”, EPA-454/B-13-003, May 2013.

(USEPA, 2015) – United States Environmental Protection Agency Region 5, “*Request to Provide Information Pursuant to the Clean Air Act*”, March 9, 2015.

## **Appendix A: Example Calibration Data Spreadsheets and Operator Checklists**



**TE-6070V Sample Worksheet  
(Using G-Factor)**

Customer Co./Org.	S.H. Bell
Customer Contact	Jim Langbehn
Project No.	17-3007
Instrument Model	TE-6070V
ID/Serial No.	
Instrument Site	S4
Sample ID	
VFC G-Factor	0.0251890900

Date	
Technician Initials	
Location	Chicago, IL
Sample Start Date	
Sample End Date	
Service	Sample
Filter Number	

**Ambient Conditions Set-up**

Temp (deg F):			Clean Filter ΔP	
Ta (deg K):	255		Barometric Press (in Hg):	
Ta (deg C):	-17.8		Pa (mm Hg):	0.0

**Ambient Conditions Sample**

Temp (deg F):			Loaded Filter ΔP	
Ta (deg K):	255		Barometric Press (in Hg):	
Ta (deg C):	-17.8		Pa (mm Hg):	0.0

**Calculate Total Air Volume Using G-Factor**

Enter Average Temperature During Sampling Duration (Deg F)	
Average Temperature During Sampling Duration (Deg K)	255.22
Enter Average Barometric Pressure During Sampling Duration (In Hg)	
Average Barometric Pressure During Sampling (mm Hg)	0.00
Enter Clean Filter Sampler Inches of Water	
Enter Dirty Filter Sampler Inches of Water	
Average Filter Sampler (mm Hg)	#DIV/0!
Enter Total Runtime in Hours (xx.xx)	

Po/Pa #DIV/0!

Calculated Flow Rate (m3/min) #DIV/0!

Total Flow (m3) #DIV/0!

**Calculations**

$$\text{Calibrator Flow (Qa)} = 1/\text{Slope} * (\text{SQRT}(\text{H2O} * (\text{Ta}/\text{Pa})) - \text{Intercept})$$

$$\text{Pressure Ratio (Po/Pa)} = 1 - \text{Pf}/\text{Pa}$$

$$\% \text{ Difference} = (\text{Look Up Flow} - \text{Calibrator Flow}) / \text{Calibrator Flow} * 100$$

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

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## TE-6070V Sampler Calibration Worksheet (Using G-Factor)

Customer Co./Org.	S.H. Bell
Customer Contact	Jim Langbehn
Project No.	17-3007
Instrument Model	TE-6070V
ID/Serial No.	P10244BL
Instrument Site	S4
VFC G-Factor	0.0251890900

Date	March 1, 2017
Technician Initials	
Location	Chicago, IL
Time of arrival	8:00
Time of departure	17:00
Service	Calibration

Ambient Conditions			
Temp (°F)	44.2	BP (in Hg)	28.94
Ta (°K)	280	Pa (mm Hg):	734.3
Ta (°C)	6.8		

Calibration Orifice	
Make	Tisch
Model	TE-5028A
Serial #:	3303
Qa Slope (m):	0.93771
Qa Int (b):	0.00061
Calibration Due Date:	03/01/17

Calibration Information							
Run Number	Orifice "H2O"	Qa m3/min	Sampler "H2O"	Pf mm Hg	Po/Pa	Calculated m3/min	% of Diff
1	1.50	0.806	2.80	5.226	0.993	1.188	47.42
2	1.50	0.806	3.30	6.159	0.992	1.186	47.30
3	1.50	0.806	3.40	6.345	0.991	1.186	47.17
4	1.40	0.778	4.70	8.771	0.988	1.182	51.91
5	1.40	0.778	6.00	11.198	0.985	1.178	51.27

Calculate Total Air Volume Using G-Factor	
Enter Average Temperature During Sampling Duration (Deg F)	62.00
Average Temperature During Sampling Duration (Deg K)	289.67
Enter Average Barometric Pressure During Sampling Duration (In Hg)	29.40
Average Barometric Pressure During Sampling (mm Hg)	746.76
Enter Clean Filter Sampler Inches of Water	13.30
Enter Dirty Filter Sampler Inches of Water	14.00
Average Filter Sampler (mm Hg)	25.47
Enter Total Runtime in Hours (xx.xx)	24.00
	Po/Pa 0.966
	Calculated Flow Rate (m3/min) 1.172
	Total Flow (m3) 1687.68

**Calculations**

Calibrator Flow (Qa) = 1/Slope\*(SQRT(H2O\*(Ta/Pa))-Intercept)  
 Pressure Ratio (Po/Pa) = 1-Pf/Pa  
 % Difference = (Look Up Flow-Calibrator Flow)/Calibrator Flow\*100

**NOTE: Ensure calibration orifice has been certified within 12 months of use**

## **Appendix B: Example Chain-of-Custody Form**



**Inter-Mountain Labs**  
 Sheridan, WY and Gillette, WY

**- CHAIN OF CUSTODY RECORD -**

All shaded fields must be completed.

#WEB 10101

This is a legal document; any misrepresentation may be construed as fraud.

Client Name <b>Consolidated Analytical Systems (CAS)</b>		Project Identification S.H. Bell - Chicago, IL		Sampler (Signature/Attestation of Authenticity)		Telephone # 513-542-1200	
Report Address 201 S. Miami Avenue Cleveland, OH 45002		Contact Name Meredith Cloran		Email mcloran@cas-en.com			
Invoice Address 201 S. Miami Avenue Cleveland, OH 45002		Purchase Order # 17-2507		Quote # CAS1702231			
ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	REMARKS
1		03/02/17		S4HV1-030217-R	FT	1	See Field Envelope
2		03/05/17		S4HV2-030517-R	FT	1	See Field Envelope
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							

LAB COMMENTS		DATE	TIME	Received By (Signature/Printed)	DATE	TIME

SHIPPING INFO		MATRIX CODES		TURN AROUND TIMES		COMPLIANCE INFORMATION		ADDITIONAL REMARKS	
<input checked="" type="checkbox"/> UPS	Water	WT	Water	Check desired service	Compliance Monitoring?	Y	Collected 03/07/17		
<input type="checkbox"/> FedEx	Soil	SL	Soil	<input checked="" type="checkbox"/> Standard turnaround	Program (SDWA, NPDES,...)	CAA 114a	Field conditions at collection:		
<input type="checkbox"/> USPS	Solid	SD	Solid	<input type="checkbox"/> RUSH - 5 Working Days	PWSID / Permit #				
<input type="checkbox"/> Hand Carried	Filter	FT	Filter	<input type="checkbox"/> URGENT - < 2 Working Days	Chlorinated?	N			
<input type="checkbox"/> Other	Other	OT	Other	<i>Rush &amp; Urgent Surcharges will be applied</i>	Sample Disposal: Lab	x	Client		



IML Air Science  
555 Absaraka  
Sheridan, WY 82801  
(307) 674-7506  
www.imlairscience.com

## Particulate Sampler Field Envelope

Network \_\_\_\_\_

Sampler ID \_\_\_\_\_

Filter Number \_\_\_\_\_

Sample Date \_\_\_\_\_

Time Off \_\_\_\_\_

Time On \_\_\_\_\_

Run Time \_\_\_\_\_

Tech. \_\_\_\_\_

**P**STG

$\Delta P$ on	$\Delta P$ off

*units*

Comments:

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## **Appendix C: USEPA (3-day) Sampling Schedule, 2017**

# EPA Sampling Schedule

# 2017

## Important Dates

## Notes

3-Day schedule is shown in orange, green, and purple

6-Day schedule is shown in green and purple

12-Day schedule is shown in purple

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### January

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### February

S	M	T	W	T	F	S
				1	2	3
	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

### March

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

### April

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

### May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

### June

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

### July

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

### August

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

### September

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

### October

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

### November

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

### December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

## **Appendix D: s.H. Bell Siting Plan**



January 4, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Katharine Owens ([Owens.katharine@epa.gov](mailto:Owens.katharine@epa.gov)), Nicole Contello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)),  
George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Response to: Request to Provide Information Pursuant to the  
Clean Air Act  
Appendix B, PM<sub>10</sub> Monitors and Siting  
Proposed Monitoring Sites and Locations**

Dear Ms. Owens:

S.H. Bell is pleased to submit this response to USEPA Region 5 Air and Radiation Division's Request to Provide Information Pursuant to the Clean Air Act dated March 9, 2015. This response addresses Appendix B Items 2 and 3, PM<sub>10</sub> Monitors and Siting.

#### **PM<sub>10</sub> MONITORS AND SITING**

##### Appendix B. 2

**Question:** Within 30 days of receipt of this information request, SHB shall submit proposed monitoring site locations for continuous Federal Equivalent Method (FEM) real-time PM<sub>10</sub> monitoring and Federal Reference Method (FRM) PM<sub>10</sub> filter-based monitoring at the facility for EPA review and approval prior to establishing the monitoring sites.

**Response:** A site location and vicinity map of the S.H. Bell facility located at 10218 South Avenue O, Chicago, Illinois 60617 is attached as Figure 1. Proposed monitoring site locations for FEM real-time PM<sub>10</sub> monitoring and FRM PM<sub>10</sub> filter-based monitoring are shown on Figure 2. Rationale for site selection is detailed below. Historical wind rose data is included in Attachment 1.

##### Appendix B. 3

**Question:** Within 30 days of receipt of this request, SHB shall submit to EPA a map showing the property lines of the facility, the location of nearby residences and industrial properties and proposed locations of monitoring sites.



Response: A site location map of the S.H. Bell facility located at 10218 South Avenue O, Chicago, Illinois 60617 and the surrounding area (including nearby residences and industrial properties) is attached as Figure 1. Proposed monitoring site locations for FEM real-time PM<sub>10</sub> monitoring and FRM PM<sub>10</sub> filter-based monitoring are shown on Figure 2.

## MONITORING SITE SELECTION RATIONALE

S.H. Bell has selected four proposed monitoring locations as shown on Figure 2. Proposed monitoring locations are identified as PS1, PS2, PS3, and PS4. The S.H. Bell facility has an existing meteorological tower, denoted as ESM on Figure 2. Each of the four proposed monitoring locations (PS1, PS2, PS3, and PS4) will have FEM real-time PM<sub>10</sub> monitors. One of the four proposed monitoring sites, PS4, which is located at the furthest downwind location on the S.H. Bell property, will also have an FRM PM<sub>10</sub> filter-based monitor. Meteorological data will be collected at the existing meteorological tower.

Probe siting information and site configuration for the proposed monitoring locations were selected in accordance with 40 CFR Part 58, Appendix E. Because of the urban nature of the S.H. Bell facility, particular attention is given to the following sections of the siting criteria:

- 2. Horizontal and Vertical Placement

Microscale Pb, PM<sub>10</sub>, PM<sub>10-2.5</sub>, and PM<sub>2.5</sub> sites are required to have sampler inlets between 2 and 7 meters above ground level.

The probe or at least 90 percent of the monitoring path must be at least 1 meter vertically or horizontally away from any supporting structure, walls, parapets, penthouses, etc., and away from dusty or dirty areas. If the probe or a significant portion of the monitoring path is located near the side of a building or wall, then it should be located on the windward side of the building relative to the prevailing wind direction during the season of highest concentration potential for the pollutant being measured.

- 4. Spacing From Obstructions

- a. Buildings and other obstacles may possibly scavenge SO<sub>2</sub>, O<sub>3</sub>, or NO<sub>2</sub>, and can act to restrict airflow for any pollutant. To avoid this interference, the probe, inlet, or at least 90 percent of the monitoring path must have unrestricted airflow and be located away from obstacles. The distance from the obstacle to the probe, inlet, or monitoring path must be at least twice the height that the obstacle protrudes above the probe, inlet, or monitoring path. An exception to this requirement can be made for measurements taken in street canyons or at source-oriented sites where buildings and other structures are unavoidable.

- b. Generally, a probe or monitoring path located near or along a vertical wall is undesirable because air moving along the wall may be subject to possible removal mechanisms. A probe, inlet, or monitoring path must have unrestricted airflow in an arc of at least 180 degrees. This arc must include the predominant wind direction for the season of greatest pollutant concentration potential. For particle sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.

**Table E-4 of Appendix E to Part 58 —Summary of Probe and Monitoring Path Siting Criteria (in particular Notes 3, 4, 5, and 8).**

Pollutant	Scale (maximum monitoring path length, meters)	Height from ground to probe, inlet or 80% of monitoring path 1 (meters)	Horizontal and vertical distance from supporting structures 2 to probe, inlet or 90% of monitoring path1 (meters)	Distance from trees to probe, inlet or 90% of monitoring path 1 (meters)	Distance from roadways to probe, inlet or monitoring path 1 (meters)
SO <sub>2</sub> 3 4 5 6	Middle (300 m) Neighborhood Urban, and Regional (1 km)	2-15	>1	>10	N/A.
CO 4 5 7	Micro [downtown or street canyon sites], micro [near-road sites], middle (300 m) and Neighborhood (1 km)	2.5-3.5; 2-7; 2-15	>1	>10	2-10 for downtown areas or street canyon microscale; ≤50 for near-road microscale; see Table E-2 of this appendix for middle and neighborhood scales.
O <sub>3</sub> 3 4 5	Middle (300 m) Neighborhood, Urban, and Regional (1 km)	2-15	>1	>10	See Table E-1 of this appendix for all scales.
NO <sub>x</sub> 3 4 5	Micro (Near-road [50-300 m])	2-7 (micro);	>1	>10	≤50 for near-road micro-scale.
	Middle (300 m)	2-15 (all other scales)			
	Neighborhood, Urban, and Regional (1 km)				See Table E-1 of this appendix for all other scales.
Ozone precursors (for PAMS) 3 4 5	Neighborhood and Urban (1 km)	2-15	>1	>10	See Table E-4 of this appendix for all scales.
PM, Pb 3 4 5 8	Micro, Middle, Neighborhood, Urban and Regional	2-7 (micro); 2-7 (middle PM <sub>10-2.5</sub> ); 2-7 for near-road; 2-15 (all other scales)	>2 (all scales, horizontal distance only)	>10 (all scales)	2-10 (micro); see Figure E-1 of this appendix for all other scales. ≤50 for near-road.

N/A - Not applicable

1 Monitoring path for open path analyzers is applicable only to middle or neighborhood scale CO monitoring, middle, neighborhood, urban, and regional scale NO<sub>x</sub> monitoring, and all applicable scales for monitoring SO<sub>2</sub>, O<sub>3</sub>, and O<sub>3</sub> precursors.

2 When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

3 Should be greater than 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction

4 Distance from sampler, probe, or 90 percent of monitoring path to obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path. Sites not meeting this criterion may be classified as middle scale (see text).

5 Must have unrestricted airflow 270 degrees around the probe or sampler; 180 degrees if the probe is on the side of a building or a wall.

6 The probe, sampler, or monitoring path should be away from minor sources, such as furnace or incineration flues. The separation distance is dependent on the height of the minor source's emission point (such as a flue), the type of fuel or waste burned, and the quality of the fuel (sulfur, ash, or lead content). This criterion is designed to avoid undue influences from minor sources.

7 For micro-scale CO monitoring sites, the probe must be >10 meters from a street intersection and preferably at a midblock location.

8 Collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates greater than 200 liters/min or at least 1 meter apart for samplers having flow rates less than 200 liters/min to preclude airflow interference, unless a waiver is in place as approved by the Regional Administrator pursuant to section 3 of Appendix A.

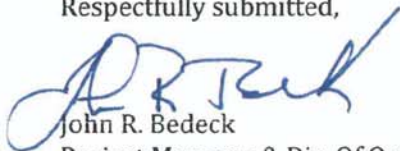
## SUMMARY

S.H. Bell looks forward to USEPA's review and approval of responses to Appendix B questions 2 and 3 and to installing, operating, and maintaining ambient monitoring sites at the facility upon your approval of the proposed plan. Should you have any questions about the proposed monitoring locations, please let me know.

## CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck  
Project Manager & Dir. Of Quality  
S.H. Bell Company

Prepared by:  
Consolidated Analytical Systems, Inc.

Figure 1  
Site Location and Vicinity Map  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

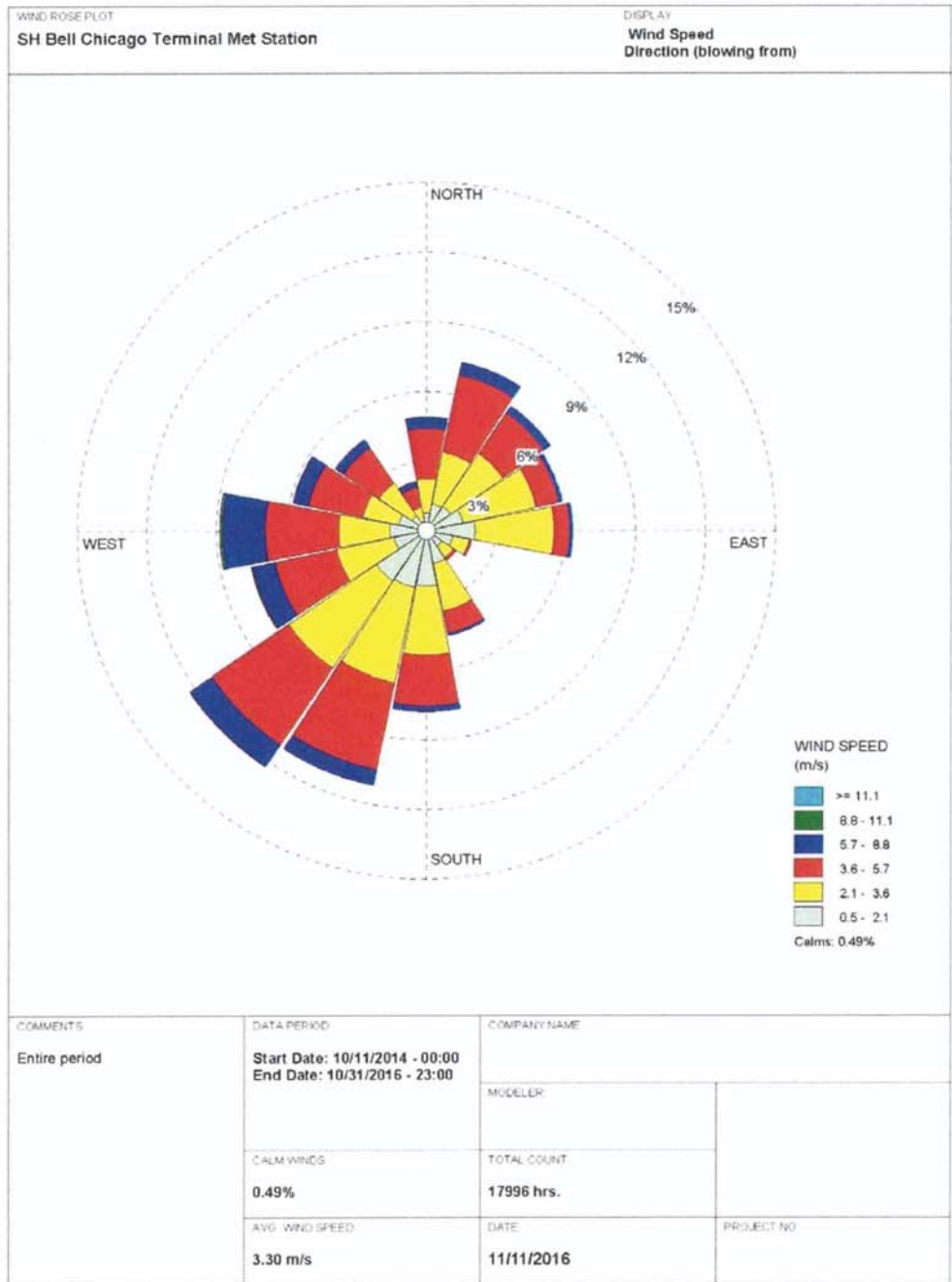


Figure 2  
Proposed and Existing Monitoring Locations  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Site ID	Latitude	Longitude
PS1	41.708264	-87.544006
PS2	41.708291	-87.540184
PS3	41.710494	-87.542090
PS4	41.711527	-87.539628
EMS	41.709861	-87.539692

Attachment 1  
 Historical Wind Rose Data (October 2014 thru October 2016)  
 S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





January 18, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Nicole Cantello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)), George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Response to January 12, 2017 Email Request to Provide  
Justification for Monitor Site Selection**

Dear Ms. Cantello:

S.H. Bell is pleased to submit this response to USEPA Region 5 Air and Radiation Division's Request for clarifications to proposed monitoring site selection dated January 12, 2017. This response addresses questions posed in your email "S.H. Bell Company Chicago S. Avenue O Terminal - Monitoring and Siting" dated January 12, 2017.

Question: Could you provide a justification for your choice of location for each monitor site?

Response: The monitoring locations proposed were selected with two goals in mind: 1) meet USEPA siting criteria (40 CFR Part 58, Appendix E), and 2) collect data that provides an accurate representation of particulate matter (PM) concentrations across the site, with respect to predominant wind direction. The predominant wind direction in the vicinity of the site is from southwest to northeast – see attached Site Location Maps and historical wind rose data from October 2014 – October 2016. Proposed Site 1 (PS1) is proposed to be located at the southwesternmost corner (upwind) of the property in order to determine concentrations of PM that may be entering the site from offsite sources. The site is surrounded by industrial properties along the Calumet River. PS4 is proposed for the northeasternmost corner (downwind) of the property to most accurately reflect PM concentrations in air mass leaving the site; thereby helping determine impact to adjacent and surrounding properties and receptors. PS2 is located at the southeast corner of the property, nearest adjacent residential areas to measure potential impact to offsite receptors. Site PS3 was selected to provide 360 degrees of data capture given the other three proposed site locations.

Question: We view the location of SH Bell's main office to be a prime siting location and would like to understand why SH Bell did not propose that location. Could you please indicate whether SH Bell considered the main office site (which already has an electricity source) as a siting location for monitors?

Response: The location near the main office does not provide 270 degrees of clearance required to meet USEPA siting criteria. Additionally, several trees are located in this area and would require removal. The height of the trees and the effective drip line of the trees that are present both on and off SH Bell property would adversely affect air flow, which violates USEPA siting criteria. Also, a berm is located near the main office building which would adversely affect representative air flow from reaching the inlet to the PM monitor.

Question: Did SH Bell consider a site between the two buildings on the southern facility border? EPA's preference would be to merge the two monitors on the southern border and locate one monitor there, and to use the main office location as the site for one FRM monitor and one FEM monitor.

Response: Please see response to #1 above. Based on site configuration and historical wind rose data, SH Bell believes the most representative locations to monitor PM concentrations in air mass entering and exiting the site are at locations PS1 and PS4. The location on the southern property boundary is also located adjacent to an active rail line; therefore, this location was omitted from consideration as a monitoring site.

## **SUMMARY**

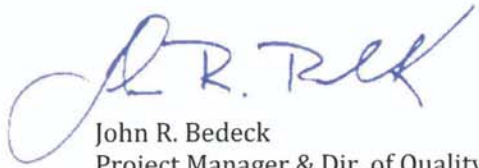
S.H. Bell looks forward to USEPA's review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the proposed monitoring locations, please let me know.

## **CERTIFICATION**

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.



Respectfully submitted,

A handwritten signature in blue ink, appearing to read "J.R. Bedeck". The signature is fluid and cursive, with a large initial "J" and "R" and a stylized "Bedeck".

John R. Bedeck  
Project Manager & Dir. of Quality  
S.H. Bell Company

Prepared by:  
Consolidated Analytical Systems, Inc.

Figure 1  
Site Location and Vicinity Map  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

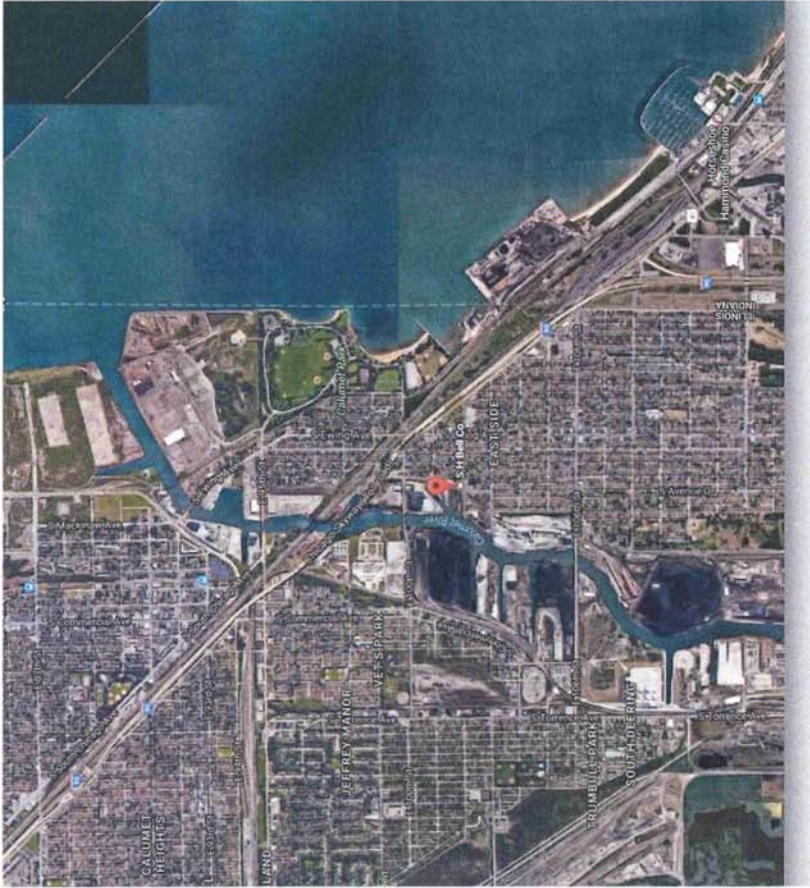
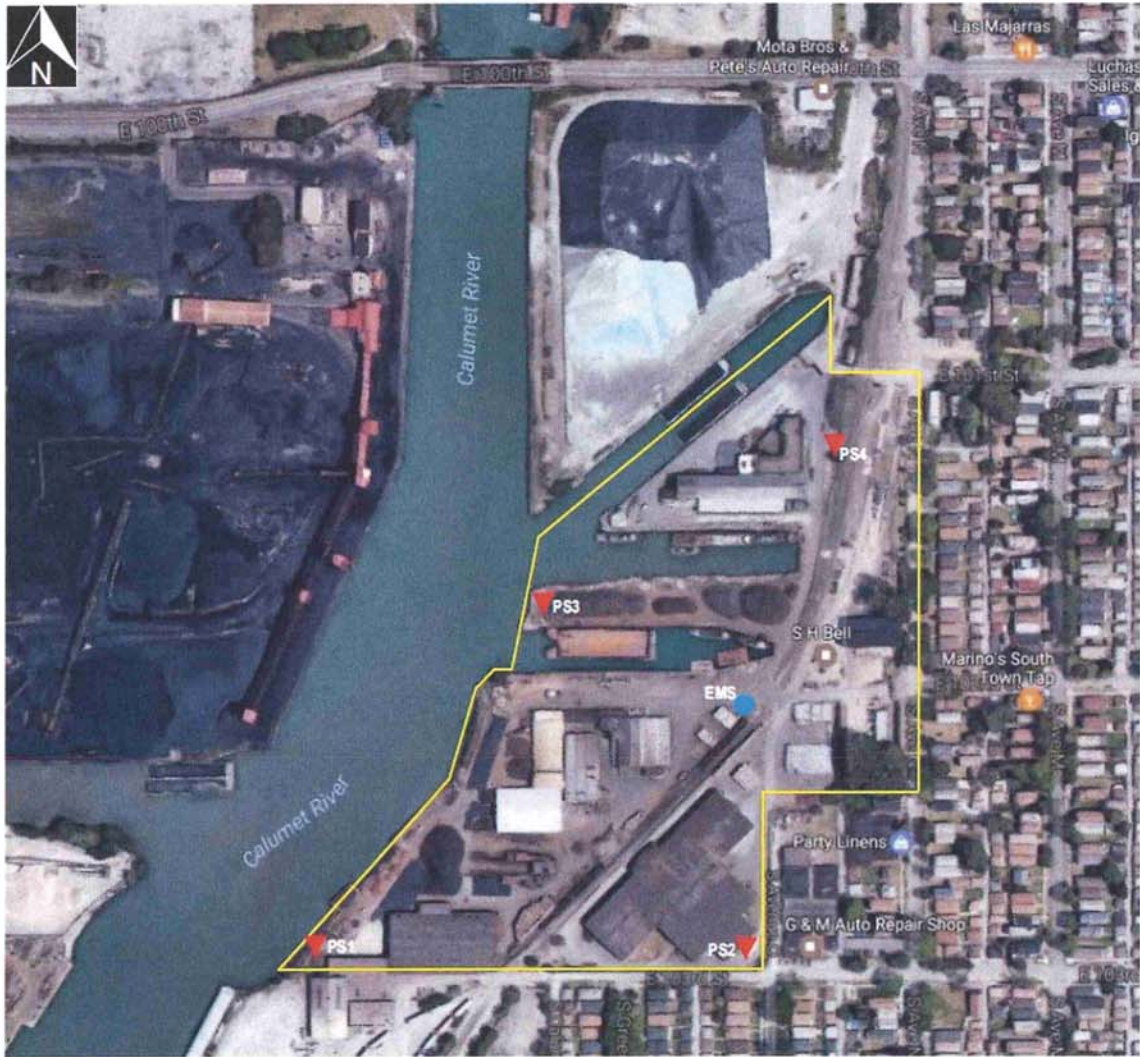
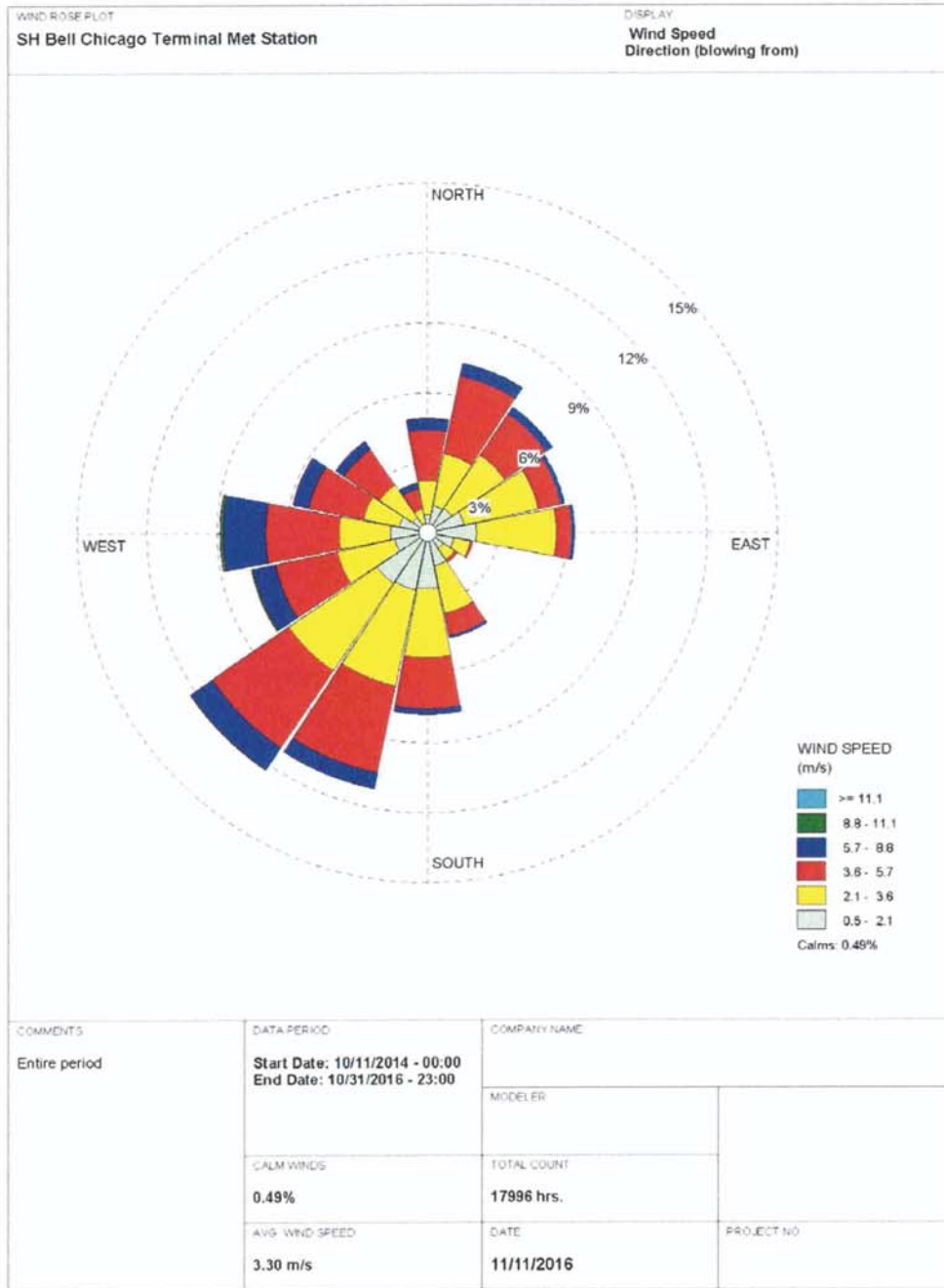


Figure 2  
Proposed and Existing Monitoring Locations  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Site ID	Latitude	Longitude
PS1	41.708264	-87.544006
PS2	41.708291	-87.540184
PS3	41.710494	-87.542090
PS4	41.711527	-87.539628
EMS	41.709861	-87.539692

Attachment 1  
 Historical Wind Rose Data (October 2014 thru October 2016)  
 S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





January 30, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Nicole Cantello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)), George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Response to January 12, 2017 Email Request to Provide  
Justification for Monitor Site Selection**

Dear Ms. Cantello:

Per the conference call between USEPA Region 5 Air and Radiation Division and S.H. Bell on January 25, 2017, S.H. Bell and our contractors have completed an evaluation of the attributes of current Proposed Monitoring Site 2 (PS2) and three additional areas on the S.H. Bell property. Our evaluation is detailed below. Consideration was given to determine if a suitable monitoring site could be installed or developed at each of these sites consistent with USEPA siting criteria guidelines outlined in 40CFRPart 58, Appendix E. Alternative locations are named as follows, see attached Figure 1 for locations of the monitoring sites on the S.H. Bell property and Figures 2-5 for site layouts of each of the proposed sites :

1. PS2 is S.H. Bell's original proposed location for PS2
2. PS2.1 is the S.H. Bell site office
3. PS2.2 is an area north of the S.H. Bell high bay
4. PS2.3 is a bulk material storage area located approximately 100 feet west of the S.H. Bell site office. This site was not proposed as a monitoring location by Region 5, but was considered during our original evaluation of proposed site monitoring locations.

**PS2.1 (Office Location/Figure 2):**

The office location consists of an office trailer, associated gravel parking lot and wooded area. A gravel parking area is located adjacent to the west of the building. The parking area is bound to the west by a vegetated earthen berm. A densely wooded area is located adjacent to the south of the building. The property boundary is located just east of the office building. A gated entrance and road deck are adjacent to the north of the office building.

In order to meet the USEPA siting requirements for spacing from an obstruction and distance from a road surface, the only potential monitoring location at this site would be to the south of the office building, in the wooded area. S.H. Bell deemed this location unacceptable for several reasons:

1. Clearing of the site and the trees would be difficult due to the size of the trees as well as the location of the trees with respect to the road surface (S Ave N), which is located outside of the S.H. Bell property boundary. Additionally, the time required to complete the tree removal process would likely impact the operational date.
2. Based on the prevailing wind direction from the southwest, air to the inlet at this site would have to travel over the vegetated berm located west of the trees and office causing uplift of particulate matter, potentially severe enough to travel over the intake of the continuous particulate analyzer.
3. A brick structure is located offsite south of the trees that would restrict airflow from the primary wind direction.
4. The existing trees act as a vegetative barrier for particle matter exiting the property onto the surrounding receptors.

### **PS2.2 (North of High Bay/Figure 3)**

The high bay is an approximately 40 foot high structure with associated parking and a road deck directly to the south, a road deck to the west, the property boundary to the east, trees directly to the north (on and off S.H. Bell property), and a narrow triangular mixed-use storage and parking area to the north.

S.H. Bell could not identify a location that meet the siting requirement for spacing from an obstruction and distance from a road surface. When evaluating this area, several key issues were considered, including:

1. The minimum site location distance from the building is approximately 68' (assuming 2 meter inlet height), assuming no additional obstructions
2. An offsite tree row parallel to S Ave N, runs north from the high bay to the facility entrance located near E 101st St. Tree heights in this area range 15 to 25 feet.
3. The exiting road deck runs from the Northwest corner of the high bay to the Northeast. Minimum site location would need to be 2 meters from this road surface.
4. An onsite berm parallel to S Ave N, runs north from the high bay to the facility entrance located near E 101st St.

### **PS2.3 (Bulk Material Storage Area/Figure 4):**

The Bulk Material Storage Area location is a material storage area with a road deck directly to the west, a vegetated berm to the east, the S.H. Bell property boundary to the south, and a road deck to the north.

S.H. Bell could not identify a location that meets the siting requirement for spacing from an obstruction and distance from a road surface at this location. When evaluating this area, several key issues were considered, including:

1. The area is regularly used for bulk storage of materials being received, stored, and loaded.
2. The storage piles vary in height, affecting airflow, consistency, and direction
3. No reserved footprint for the siting location is present in the area

**PS2 (Initial Proposed PS2/Figure 5):**

S.H. Bell maintains the best cardinal point location for a southerly and easterly airflow is represented by the initially proposed PS2.

An additional site evaluation has confirmed this site has several key attributes that exceed minimum siting requirements, including:

1. The road surfaces near the site allow for a minimum clear distance of greater than 2 meters from the road deck located on S.H. Bell property, E 103rd, and S Avenue O.
2. The proposed location is approximately 60' from the nearby building which is approximately 20' high. Assuming a 2 meter inlet height, the site could be located approximately 28' from the building, assuming no additional obstructions.
3. No vegetative (i.e., vegetated berms or trees) or other obstructions are present that are not easily removed. (note: a small vegetative obstruction will be removed along the fence line).

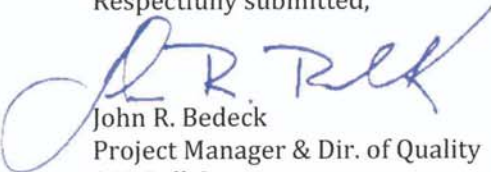
**SUMMARY**

S.H. Bell looks forward to USEPA's review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the evaluation, please let me know.

**CERTIFICATION**

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck  
Project Manager & Dir. of Quality  
S.H. Bell Company

Prepared by:  
Consolidated Analytical Systems, Inc.

Figure 1  
Proposed Site PS2 Locations  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

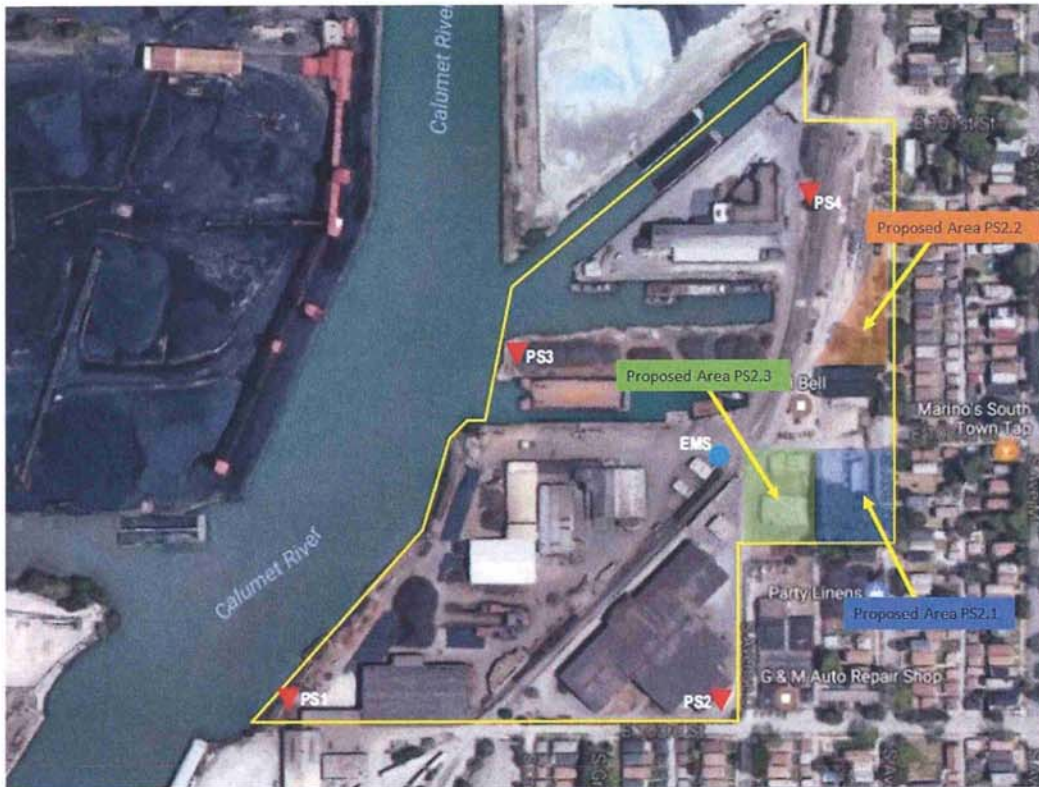




Figure 2  
PS2.1 (Office Area) Site Layout  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





February 6, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Nicole Cantello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)), George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Response to January 12, 2017 Email Request to Provide  
Justification for Monitor Site Selection**

Dear Ms. Cantello:

Per the direction of USEPA Region 5 during the conference call held February 2, 2017 between USEPA Region 5 Air and Radiation Division; The City of Chicago; S.H. Bell; S.H. Bell's counsel, Eckert Seamans Cherin & Mellott, LLC; and S.H. Bell's contractor, Consolidated Analytical Systems, Inc., S.H. Bell and its contractor have completed a re-evaluation of the attributes of alternative Proposed Monitoring Site 2.2 (PS2.2). This re-evaluation was completed because USEPA Region 5 stated that the initially proposed PS2 location was unacceptable to meet its objectives for this monitoring program. Key points from our re-evaluation are detailed below. Consideration was again given to determine if a suitable monitoring site could be installed or developed at PS2.2 that would be consistent with USEPA siting criteria guidelines outlined in 40CFRPart 58, Appendix E.

S.H. Bell maintains the best cardinal point location for a southerly and easterly airflow is represented by the initially proposed PS2. However, at the direction of USEPA Region 5 Air and Radiation Division S.H. Bell will move site location PS2 to USEPA Region 5's preferred alternative location of PS2.2 even though some deviations from USEPA siting guidance outlined in 40CFRPart 58, Appendix E will be required. Deviations are listed below in section PS2.2.

Please note, locations PS1, PS3, and PS4 have been determined to be acceptable monitoring site locations by USEPA Region 5 and only the location of PS2 is being re-evaluated. See attached Figure 1 for locations of the proposed monitoring sites on the S.H. Bell property and Figures 2-4 for photographs of site attributes at PS 2.2. Alternative locations are named as follows,

1. PS2 is S.H. Bell's original proposed location for PS2
2. PS2.2 is an area north of the S.H. Bell high bay

**PS2.2 (North of High Bay/Figure 2)**

The high bay is an approximately 40 foot high structure with associated parking and a road deck directly to the south, a road deck to the west, the property boundary to the east, trees directly to the

north (on and off S.H. Bell property), and a narrow triangular mixed-use storage and parking area to the north.

S.H. Bell could not identify a location that meets the complete siting requirements for spacing from an obstruction when evaluating this area and it is our understanding that USEPA will grant an exception to place the FEM instrumentation at this location – see Figure 3 for site features. In an email dated February 2, 2017 from Nicole Cantello at USEPA Region 5 to Eckert Seamens, USEPA Region 5 provided reference to 40CFR Part 58, Appendix E, Section 4 (Spacing from Obstructions) and highlighted the excerpt stating: “An exception to this requirement can be made for measurements taken in street canyons or at source-oriented sites where buildings and other structures are unavoidable.” When placing a monitor at this location, the high bay will be considered an “unavoidable structure.” When evaluating this area, several key issues were considered, including:

1. The minimum site location distance from the building is approximately 68’ (assuming 2 meter inlet height), assuming no additional obstructions. S.H. Bell will place the monitor as far as physically possible from the high bay. However, based on other site constraints in this area (detailed below), it may not be possible to place the monitor the full 68’ away.
2. A row of trees bounds the S.H. Bell property to the east. The row of trees is located off of the S.H. Bell property and runs north-south, parallel to S. Ave N, extending from the high bay north to the facility entrance located near E 101st St. Tree heights in this area range 15 to 25 feet.
3. The exiting road deck runs from the Northwest corner of the high bay to the Northeast (see Figure 2). The road is heavily used during business hours, and diesel trucks idle on the nearby scales. Minimum site location would need to be 2 meters from this road surface. S.H. Bell will place the monitor as far away as possible from the road deck and truck scales in order to avoid potential influence of particulate matter from the roadway and trucks.
4. Several large (approximately 60 foot high) trees are located adjacent to the north of the high bay building (Figure 4). These trees will need to be removed in order to site the monitor at PS2.2 without interference from the trees.

### **Additional Considerations**

Following installation and start-up of the monitors, if it is determined that the concentrations at location PS2.2 are not representative of site conditions due to the influence of airflow around the high bay (based on data collected from the other three monitoring sites) S.H. Bell reserves the right to move location PS2.2 to a more representative monitoring location area along the eastern border of the S.H. Bell property.

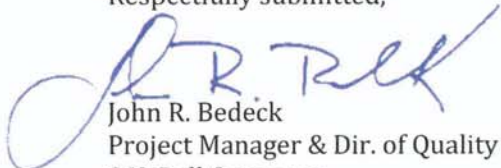
### **SUMMARY**

S.H. Bell looks forward to USEPA’s review and approval of responses to questions regarding monitoring site selection. Should you have any additional questions about the evaluation, please let me know.

## CERTIFICATION

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck  
Project Manager & Dir. of Quality  
S.H. Bell Company

Prepared by:  
Consolidated Analytical Systems, Inc.

Figure 1  
Proposed Monitoring Site Locations  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

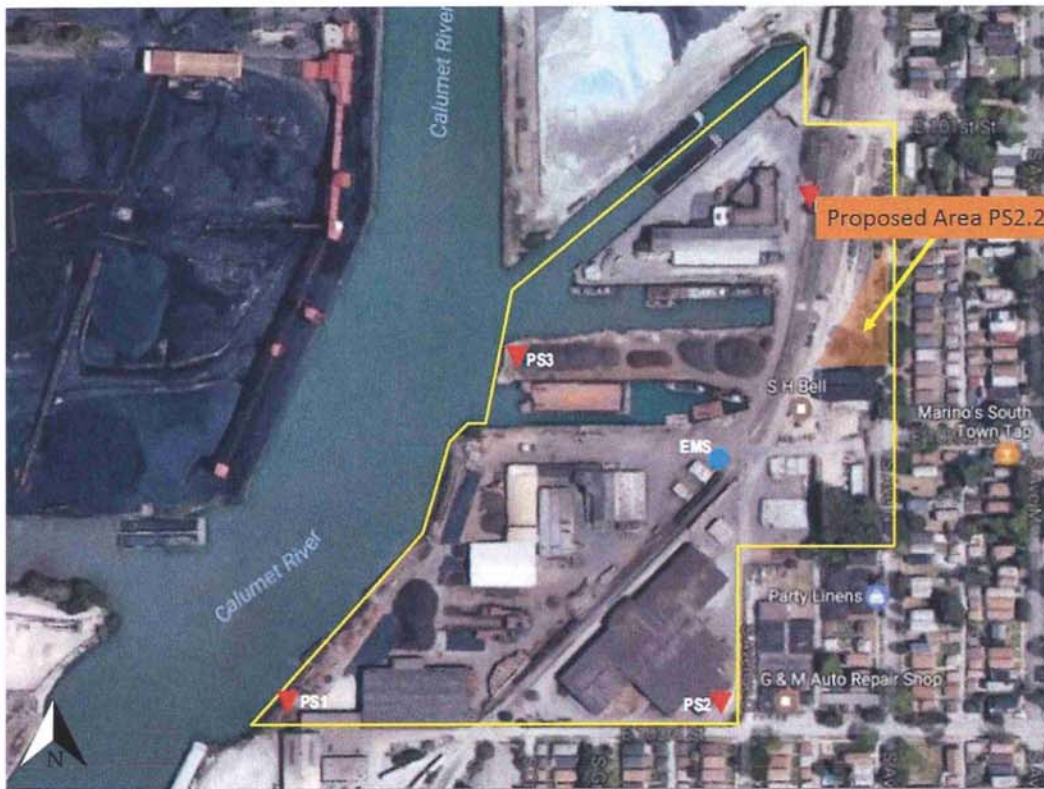


Figure 2  
Aerial View of Proposed Site PS2.2 (High Bay) Monitoring Location  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 3  
PS2.2 (High Bay) Site Layout  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

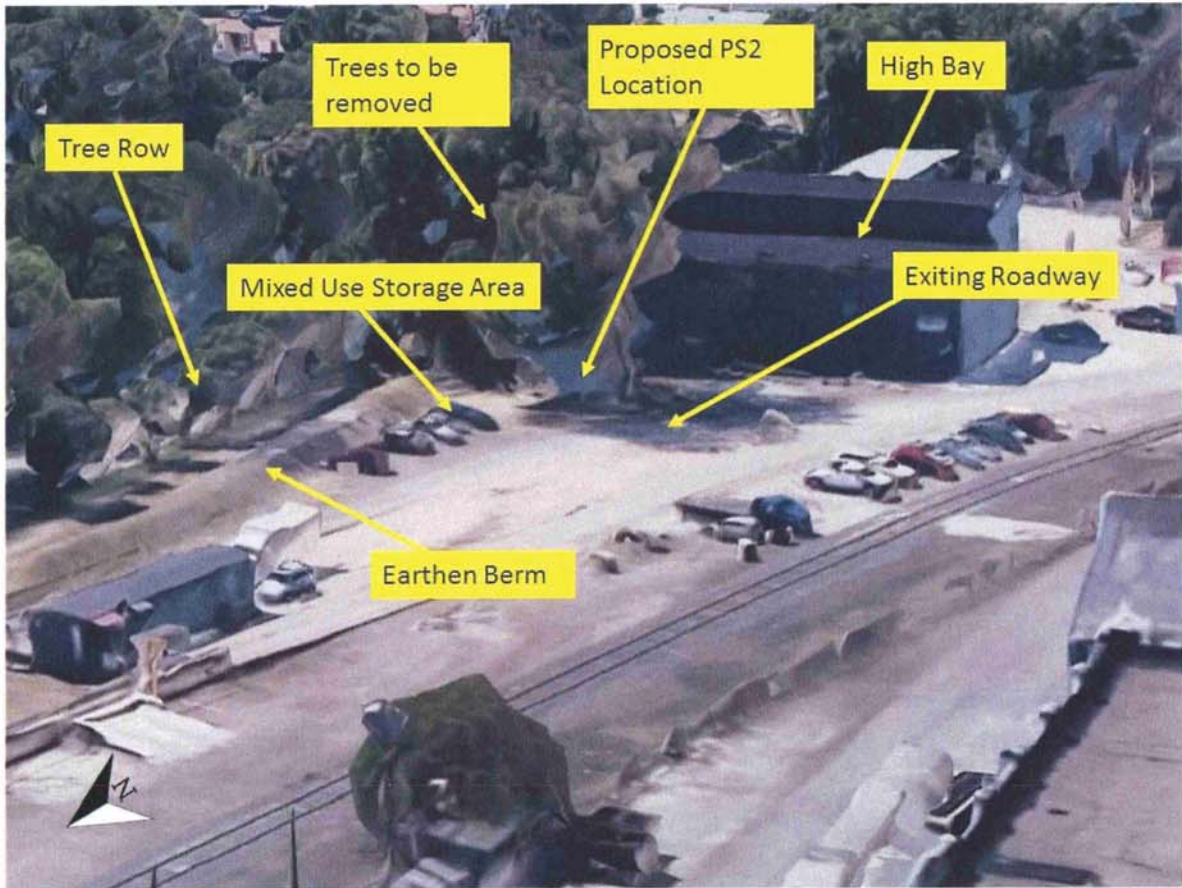


Figure 4  
View to West of PS2.2 from S. Ave N on eastern property boundary.  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Note: High Bay building is visible on the left side of the frame



Figure 3  
PS2.2 (North of High Bay) Site Layout  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Figure 4  
PS2.3 (Bulk Material Storage Area) Site Layout  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617

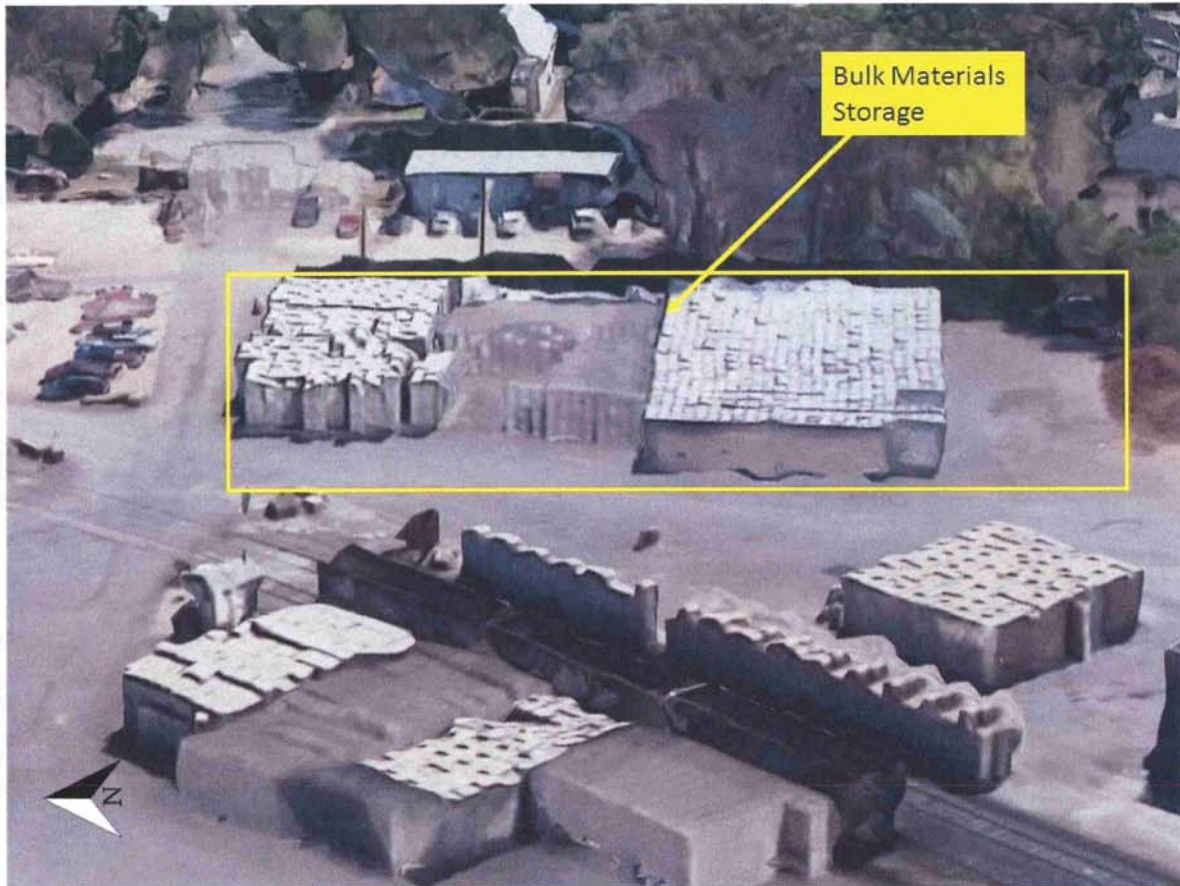
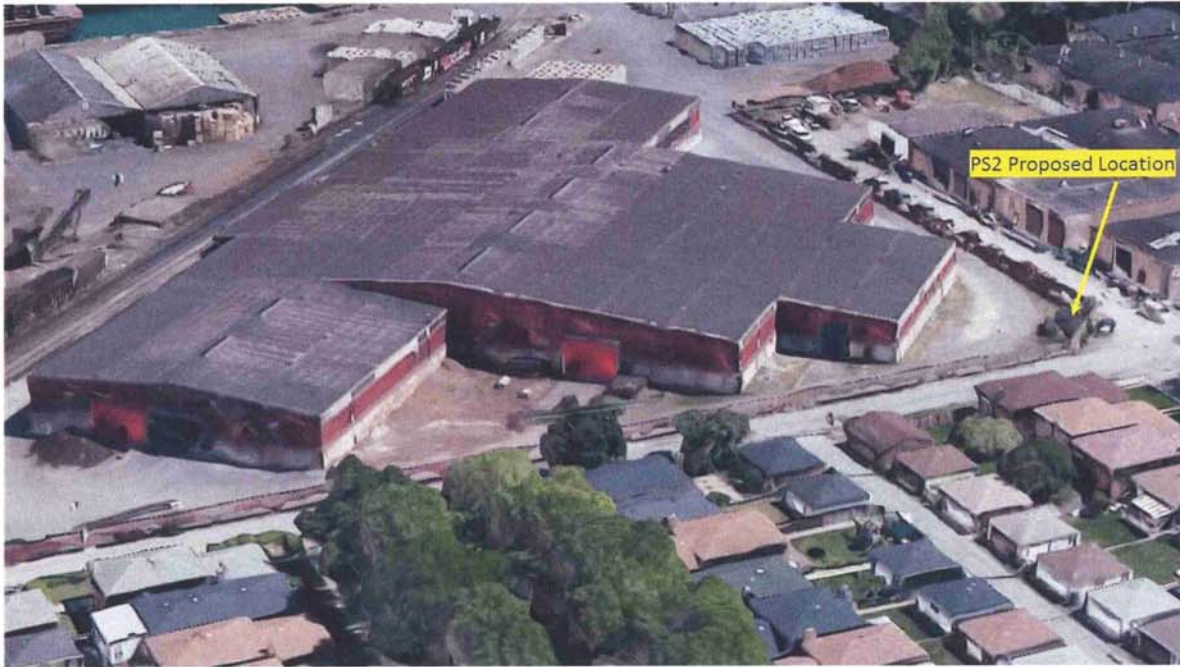


Figure 5  
PS2 (Initial Proposed PS2) Site Layout  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617





February 10, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Nicole Cantello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)), George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Response to February 7, 2017 Email Request to Relocate  
Proposed Monitoring Site PS2.2**

Dear Ms. Cantello:

This letter is a response to USEPA Region 5's February 7, 2017 email request to relocate proposed monitoring site PS2.2.

Monitor Location

During the February 2, 2017 conference call between USEPA Region 5, the City of Chicago, and S.H. Bell and its counsel and contractor (Eckert Seamans Cherin & Mellot and CAS, respectively) to discuss the additional proposed PS2 monitoring locations PS2.1, PS2.2, and PS2.3, the following items were discussed in open conversation:

- PS2.1 and PS2.3 were deemed to be unsuitable monitoring locations.
- PS2.2 was determined to be the most suitable monitoring location, even though all USEPA siting criteria conditions (as outlined in 40 CFR Part 58 Appendix E) could not be met. Rationale for seeking exemptions to USEPA siting criteria was reviewed by all parties on the call. USEPA agreed to provide S.H. Bell with additional guidance on exemptions to siting criteria to use as rationale for placing the monitor at PS2.2.
- Parties discussed placement of the monitor within the general area of the proposed PS2.2 area.
  - Specifically, the area in the northern portion of the PS2.2 alternative location adjacent to the road deck and weigh station was discussed. After discussion (notably between Mr. Seth Cloran of CAS and Mr. Patrick Miller of USEPA Region 5), this area was determined to be unsuitable due to its proximity to the road deck and weigh station where bulk material haulers (primarily diesel-fuel vehicles) idle.

However, in its February 7, 2017 e-mail correspondence, USEPA Region 5 recommended placement of the monitor within a blue-shaded area in the northern portion of the PS2.2 alternative location adjacent to the road deck and weigh station.

S.H. Bell is seeking clarification regarding USEPA Region 5's intended monitor location. A summary of the rationale for locating PS2.2 in the orange outlined area rather than the blue outlined area identified in USEPA Region 5's email is presented below (see Figure 1 for reference). The western portion of the blue-shaded area would be located close to a road deck and weigh station where bulk material haulers (primarily diesel-fueled vehicles) idle at the approach to the scale house. Having a monitor this close has the potential to influence the monitor as a point source measurement, which would:

- Not be representative of the PM10 concentrations that nearby receptors would be potentially exposed to, and
- Not be representative of the S.H Bell PM10 contribution to the ambient air mass.
- Additionally, the blue-shaded area identified by USEPA Region 5 in its February 7, 2017 email is currently used as a parking lot for S.H Bell employees and contractors, and thus, placing the monitor in this location will negatively impact operations of the facility, which makes this area unsuitable as a monitor location.

Further, the eastern portion of the blue-shaded area recommended by USEPA Region 5 is located next to a vegetated berm and tree row (located off S.H. Bell property). These obstacles could potentially generate an inlet aspiration area which could result in PM concentrations which are not representative of the actual S.H Bell contribution to the particulate in the ambient air mass.

In summary, compounding the deviations from USEPA siting criteria will increase the negative impacts of the efficacy of the data produced from the monitoring locations.

#### Monitor Platform

During the February 2, 2017 conference call, no mention of placing the monitor on an elevated platform was made. However, in its February 7, 2017 email USEPA Region 5 recommended placing the monitor on a platform. In regards to the request for a "monitor raised on a platform", S.H. Bell contends:

- Placing one (PS2.2) of the four Particulate monitor inlets on a platform with a higher distance from ground level, while the other three approved monitoring locations (PS1, PS3, PS4) are aspirating air at the same relative height from ground level is not advised. S.H Bell has selected our monitoring locations to provide uniformity across our facility; the placement of one of the particulate monitors on a significantly elevated platform has the potential to negatively influence the uniformity of data being collected by the monitor to determine the source/site contribution to the ambient air mass.

#### **S.H. BELL RECOMMENDATION:**

In order to collect the most representative and scientifically defensible data at the S.H. Bell facility, S.H. Bell proposes the particulate monitor at site PS2.2 be placed at an approximate location between 20' and 40' from the northern wall of the High Bay, at a location between 40' and 50' from the centerline of the tree row running north/south on the S.H Bell property side (west) of S Ave N. To provide uniformity of monitoring stations across the S.H. Bell facility, the monitor at PS2.2 should be placed at the same height from ground level as other monitors at the site.

## **SUMMARY**

S.H. Bell looks forward to USEPA Region 5's clarification on this matter and to beginning monitoring.

## **INCORPORATION BY REFERENCE**

Documentation of discussions held to date regarding monitoring site locations at the S.H. Bell facility are documented below. Previous communications are incorporated by reference.

By way of background, this is USEPA Region 5's fourth request to re-evaluate/re-locate the initially proposed PS2 monitoring site location, which were previously made in a January 12, 2017 e-mail from Nicole Cantello and in conference calls on January 25, 2017 and on February 2, 2017. S.H. Bell has promptly responded to all of USEPA Region 5's requests in this regard. Notably, S.H. Bell's February 6, 2017 letter re-evaluated the alternative site location PS2.2 when USEPA stated that the initially proposed PS2 monitoring location was unacceptable as it did not meet its objective for this monitoring program. The initially proposed PS2 monitoring location is the only location that meets all USEPA siting criteria. At the direction of USEPA Region 5 during a February 2, 2017 conference call, S.H. Bell evaluated moving the monitor site location PS2 to USEPA Region 5's preferred alternative location of PS2.2 even though multiple deviations from USEPA siting criteria will be required. Notably, the PS2.2 alternative location was specified to USEPA in a letter dated January 30, 2017 that was in response to USEPA's request to evaluate alternative locations on the eastern site of the facility.

## **CERTIFICATION**

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck  
Project Manager & Dir. Of Quality  
S.H. Bell Company

Prepared by:  
Consolidated Analytical Systems, Inc.

Figure 1  
Proposed Monitoring Site Location  
S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617







February 14, 2017

United States Environmental Protection Agency, Region 5  
Air and Radiation Division  
Attn: Nicole Contello ([Cantello.nicole@epa.gov](mailto:Cantello.nicole@epa.gov)), George T. Czerniak, and [R5enforcement@epa.gov](mailto:R5enforcement@epa.gov)  
77 W. Jackson Blvd  
Chicago, IL 60604

**RE: S.H. Bell Company  
10218 South Avenue O  
Chicago, Illinois 60617  
Letter Update to S.H. Bell's December 30, 2016 Response to:  
Request to Provide Information Pursuant to the Clean Air Act  
Appendix B, PM<sub>10</sub> Monitors and Siting  
Proposed Monitoring Sites and Locations**

Dear Ms. Cantello:

S.H. Bell is pleased to submit this update to our December 30, 2016, response to USEPA Region 5 Air and Radiation Division's Request to Provide Information Pursuant to the Clean Air Act dated March 9, 2015. Specifically, this letter report documents the location change for proposed monitoring location PS2 determined during a series of telephone discussions, emails, and letter reports between USEPA Region 5, the City of Chicago, S.H. Bell, S.H. Bell's counsel Eckert, Seamans, Cherin & Mellott, LLC, and S.H. Bell's air monitoring contractor Consolidated Analytical Systems, Inc., as documented below. The final proposed monitoring locations PS1, PS2, PS3, and PS4 are shown on Figure 1.

#### **INCORPORATION BY REFERENCE**

- 12/30/2016 – S.H. Bell “Response to Request to Provide Information Pursuant to the Clean Air Act, Appendix B, PM<sub>10</sub> Monitors and Siting, Proposed Monitoring Sites and Locations”
- 01/11/2017 – USEPA Region 5 Email from Nicole Cantello “S.H. Bell Company Chicago, S. Avenue O Terminal – Monitoring and Siting” (request for clarification to proposed monitoring site selection)
- 01/18/2017 – S.H. Bell Letter “Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection”
- 01/25/2017 – Conference Call between USEPA Region 5 and S.H. Bell (request for evaluation of PS2, PS2.1, PS2.2, and PS2.3)
- 01/30/2017 – S.H. Bell S. Letter Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection (Response to 01/25/2017 conference call requesting written evaluation of PS2, PS2.1, PS2.2, PS2.3)
- 02/02/2017 – Conference Call between USEPA Region 5, the City of Chicago, S.H. Bell, Eckert Seamans Cherin & Mellot, LLC and Consolidated Analytical Systems, Inc. (request to re-evaluated alternative proposed monitoring site PS2.2)

- 02/06/2017 - S.H. Bell Letter "Response to January 12, 2017 (sic) Email Request to Provide Justification for Monitor Site Selection" (Re-Evaluation of alternative proposed site PS2.2)
- 02/07/2017 - USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago, S. Avenue O Terminal - Monitoring and Siting" (request to locate proposed monitoring site PS2.2)
- 02/10/2017 - S.H. Bell Letter "Response to February 7, 2017 Email Request to Locate Proposed Monitoring Site PS2.2"
- 02/13/2017 - USEPA Region 5 Email from Nicole Cantello "S.H. Bell Company Chicago, S. Avenue O Terminal - Monitoring and Siting" (request to resubmit S.H. Bell siting plan for approval)

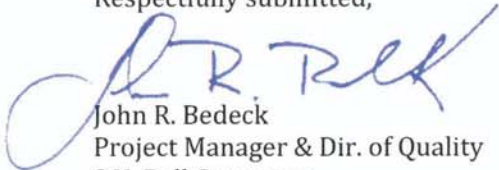
## **SUMMARY**

S.H. Bell looks forward to installing, operating, and maintaining ambient monitoring sites at the facility upon your approval of the proposed plan. Should you have any questions about the proposed monitoring locations, please let me know.

## **CERTIFICATION**

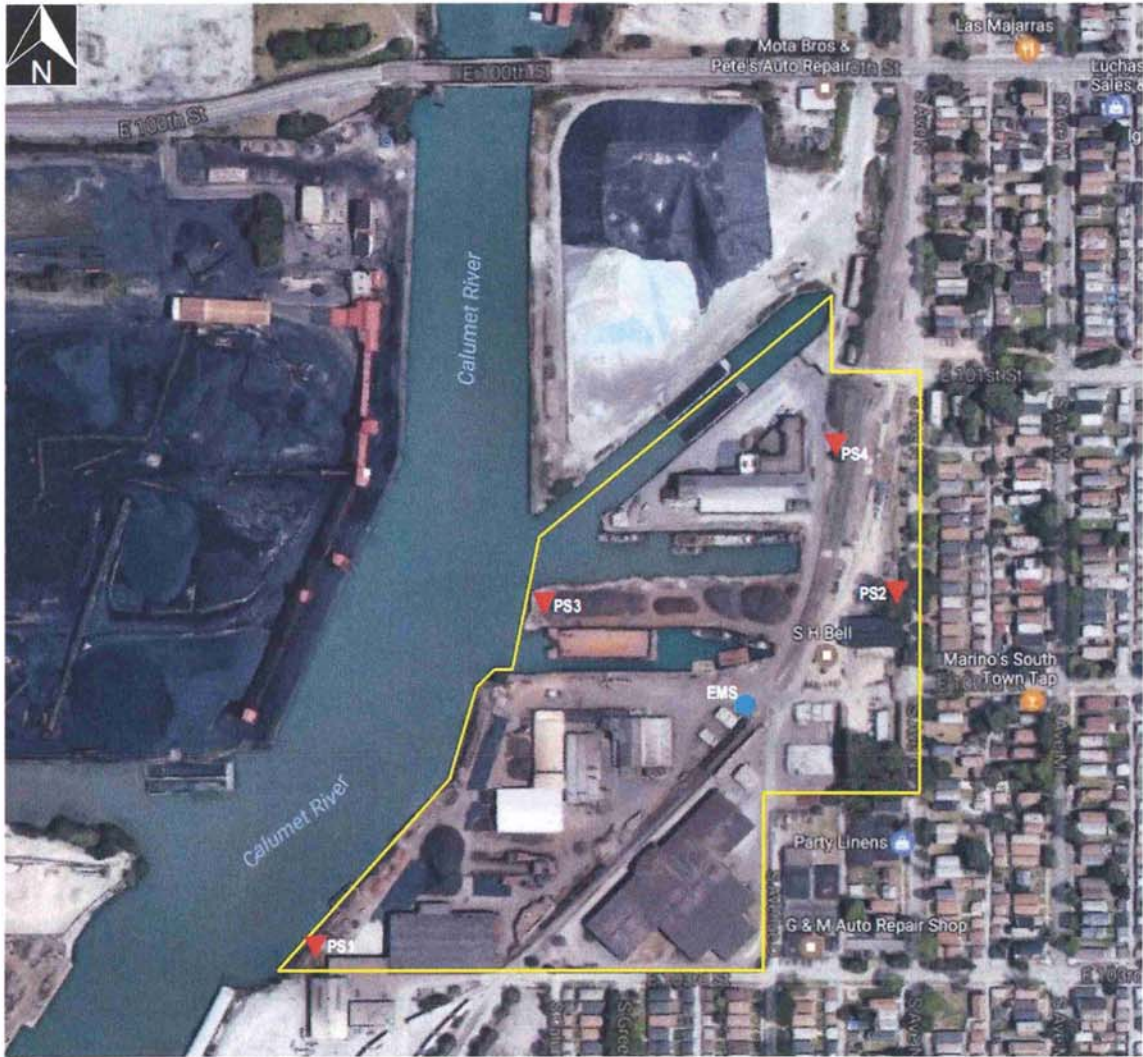
I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 1(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

Respectfully submitted,



John R. Bedeck  
Project Manager & Dir. of Quality  
S.H. Bell Company

Figure 1  
 Proposed and Existing Monitoring Locations  
 S.H. Bell Facility, 10218 South Avenue O, Chicago, Illinois 60617



Site ID	Latitude	Longitude
PS1	41.708264	-87.544006
PS2	41.710537	-87.539158
PS3	41.710494	-87.542090
PS4	41.711527	-87.539628
EMS	41.709861	-87.539692

## APPENDIX C

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### Fugitive Dust Plan Fact Sheet

## **Fugitive Dust Plan Fact Sheet S.H. Bell Company Chicago Terminal**

### Description of Operation:

The S.H. Bell Co. Chicago Terminal handles, processes, and stores materials that are transported to and from the facility by barge, rail, and truck. The facility handles bulk materials including ferro alloys, direct reduced iron (DRI) (not fines), hot briquetted iron (HBI), pig iron, iron ore, and silicon metal as well as non-bulk materials which do not have the potential to become airborne or scattered by wind, such as graphite electrodes and cast aluminum and steel shapes. Our Fugitive Dust Plan fully meets all the requirements under the City's Bulk Material Regulations and exceeds them in certain areas. The following is a description of the various dust control measures.

### Dust Control Measures and Equipment:

Various dust control measures and equipment are used to address potential dust emissions, including:

- Manganese-containing materials ("Affected Materials") are not stored outdoors.
- Controls for material transfer points:
  - water spray systems that include direct application to material, mobile misters, and dry foggers
  - total enclosure
  - dust collectors for box and bag filling, truck loadout sheds, and portable dust collectors for use at various other transfer points
- Detailed operating procedures for each operation/transfer point, with specific dust control procedures based on material type – Dry Materials/Wetted Materials and Affected Materials and non-Affected Materials.
- Wet suppressant spray system and enclosure for jaw crushing/screening operations; no outdoor screening of Affected Materials.
- Covered conveyor for rail loading.

### Roadway Dust and Track-Out Prevention:

- All internal roads that trucks travel on are paved.
- Maximum vehicle speed of 8 mph.
- Daily road sweeping/watering on all internal roads.
- Street sweeper equipped with a water spray and vacuum system.
- Minimum monthly chemical dust suppressant application.
- All outgoing material transport trucks are tarped and are cleaned by rumble strips.
- Public roads are inspected for material track-out and are cleaned if track-out is found.

### Fugitive Dust Measurements:

The following fugitive dust measurement actions are used:

- Four (4) continuous PM10 monitors placed within the fence line at the Facility.
- Meteorological Station to monitor and log wind speed and wind direction and to provide alerts of high wind events.
- Daily observations for fugitive dust at least once per shift for each active operation controlled by total enclosure or dust collector at both the operation and nearest property line (based on wind direction); observations at least three times per working shift for outdoor activities such as barge unloading, truck unloading, and working outdoor piles.
- Quarterly Method 9 opacity reads performed by a certified professional on outdoor storage piles, roadways, and material transfer points.

### Contingency Plans:

The Facility has developed contingency plans to respond to various potential fugitive dust conditions.

- Respond to elevated visible dust:
  - Immediate deployment of applicable additional controls such as the mobile misters/dry fogging system.
  - Increased observations for visible dust.
  - If necessary, the activities at the source will be suspended pending favorable weather conditions.
- Respond to high wind events:
  - Automated alert system to notify personnel of high wind events;
  - Automatic suspension of outdoor activities involving Affected Materials, such as barge and truck unloading.
  - Employ additional control measures for non-Affected Material operations and suspend activities if additional control is found to be ineffective.
- Respond to elevated PM10 monitor readings:
  - Automated alert system to notify personnel of alert conditions.
  - Investigate to determine suspected source(s).
  - Increasingly aggressive mitigation efforts based on the level of alert.
  - Suspension of suspected source activity if warranted.