Calumet River Terminal Ltd., 10740 S Burley Avenue Chicago, IL 60617

Certified Mail – Return Receipt Requested

June 12, 2014

Bechara Choucair, M.D., Commissioner
Department of Health, City of Chicago
333 S. State Street, Room 200
Chicago, IL 60604

Re: Variance Application
Fugitive Dust Plan
Bulk Material Storage Rules and Regulations
Calumet River Terminal (CRT)
10740 South Burley Avenue, Chicago, IL 60617

Dear Commissioner Choucair,

Enclosed is the Fugitive Dust Plan for Calumet River Terminal's (CRT) terminal located at 10740 South Burley Avenue in Chicago, Illinois. The Fugitive Dust plan was prepared in accordance with the City of Chicago Department of Public Health Article II – Air Pollution Control Rules and Regulations for Control of Emissions from the Handling and Storage of Bulk Material Piles dated March 13, 2014 (CDPH Regulations). Also included is an application for variances from certain CDPH Regulations in accordance with the provisions set forth in Part E(8.0)(2) of the CDPH Regulations.

The CRT receives and stores until shipped, bulk commercial metals, such as ferromanganese alloys, ferrochrome alloys, ferrosilicon, ferrotitanium, ferrozirconium silicon, ferromolybdenum (all of these materials referred to throughout this document as the ferro-alloys), silicomanganese alloys, calcium silicides, manganese ore, Blast Furnace Iron (Pig iron), hot briquetted iron(HBI), and direct reduced iron(DRI). Pig iron, HBI and DRI do not meet the definition of a Bulk Solid Materials (BSM) because they generate little fugitive dust that is too dense to become airborne or be scattered by the wind. Additional information regarding these irons is presented in Exhibit A. The remaining materials handled at the BSM Facility may meet the BSM definition. The ferro-

alloys all are managed within enclosures as described in Exhibit B and the Fugitive Dust Plan. The remaining materials are mainly handled and stored outdoors. The Fugitive Dust Plan describes the location and area potentially affected by the BSM at the CRT facility.

CRT is requesting variances be permanently granted from several of the CDPH Regulations set forth in Parts B, D, and E of the CDPH Regulations in accordance with the provisions set forth in Part E(8.0)(2) of the CDPH Regulations. The regulations, from which CRT requests variances, are discussed below. Descriptions are provided of the activities for which variances are requested.

(1) Part B (3.0)(4)-Fugitive Dust Monitoring

The applicant requests a variance to be exempt from the requirement for installation and maintenance of permanent fugitive dust monitors.

Materials handled at the CRT Facility that meet the BSM definition include alloys of various types of metals. These materials are all very dense, with particles that settle quickly and within the immediate vicinity of a transfer operation, and do not become airborne or scattered by the wind. The densities of these materials range from 114 pounds per cubic foot to as much as 220 pounds per cubic foot. For comparison, the density of bulk petroleum coke is about 48 pounds per cubic foot. Petcoke is friable, and generates fugitive dust, which easily becomes airborne or scattered by the wind.

The Facility is within an industrial region. The nearest residential properties are located over 400 feet east of the Facility. There have never been any community complaints regarding visible emissions from this facility's operations. Facility operations do not result in off-site fugitive dust emissions. Based on historic quantities handled, and on published emission factors, particulate emissions (PM_{10}) from BSM handling operations are negligible and insufficient to generate

opacity greater than 10-percent or fugitive dust visible beyond the property line of the facility [3.0(2)].

Fugitive dust monitoring is intended to detect pollutant concentrations elevated over background levels that can be credited to source emissions. At this location, establishing a reliable background level will be impractical because of a neighboring major source of fugitive dust. Immediately to the south and east of the facility is an active storage operation for petroleum coke, which operates very large storage piles of material that is ¼ to ½ the density of the materials handled by CRT.

Area background levels have been demonstrated by Illinois Environmental Protection Agency (IEPA) testing to be elevated by this neighboring source to levels well above normal background. The neighboring facility reports PM_{10} measured by site monitors that approach and sometimes exceed the National Ambient Air Quality Standard of 150 micrograms per cubic meter (µg/m3). It will be impossible for fugitive dust monitors at CRT to detect small incremental fugitive dust emissions with such a large background source of fugitive dust immediately next door.

As described in the Fugitive Dust Plan, facility operations will achieve ordinance goals by implementing best management practices to ensure that under no condition does opacity exceed 10-percent nor will fugitive dust be visible beyond the property line of the facility [3.0(2)].

The regulation requiring monitoring imposes an unreasonable hardship of excessive cost and resource commitment. At this location, the presence of a large neighboring source of fugitive dust makes a requirement for monitoring technologically impractical. Application of best management practices is a more reasonable approach where minimal bulk solid materials are stored outside, and there are no receptors. Implementation of the Fugitive Dust Plan will assure the goals of the BSM regulations are met.

(2) Part B (3.0)(5)-Wind Monitoring

The applicant requests a variance to be exempt from the requirement for the facility to operate a permanent device to monitor wind speed and direction.

Information from such a device is useful in event the facility maintained large piles of BSM and installed PM_{10} monitors. The Facility unloads BSM either indoors, in the storage yard or at the dock, and stages them either indoors or in piles in the paved yard area. The facility has on-line access to real-time wind speed and direction information from Midway Airport and the Water Intake Crib, which is considered representative of the area of the CRT facility. Per the Fugitive Dust Plan, during episodes of High Wind Conditions, as defined in the City of Chicago's Fugitive Dust Regulations, exterior BSM transfer operations will be discontinued.

(3) Part B (3.0)(7) - Transfer Points

The applicant requests a variance to be exempt from the Transfer Point requirement [3.0(7)(d)] to transfer only Moist Material [2.0(15)] with moisture content of at least 3-percent by weight. Much of the materials handled are ferroalloys that are utilized in the steel manufacturing process. If this material is wet when utilized, the moisture content will create a reaction with the molten metals, which is considered a significant safety hazard. Therefore, this material must be stored inside the building, protected from the rain, and transferred in/out of covered conveyances in a dry state.

The Fugitive Dust Plan describes best management practices to maintain compliance with the opacity limit of 10-percent and no fugitive dust visible beyond the property line of the facility. [3.0(2)]. Transfers are conducted using dozers or front end loaders that will minimize drop distances. All transfers of the ferro-alloy material to and from trucks are conducted inside the

building enclosure. Material brought in by covered barge is unloaded to the paved dock area by end loader and immediately transferred into the building. Low drop height is practiced in the unloading, and the paved surface is cleaned with a street sweeper once the material has been moved into the building. Again, based on the density of this material, there will not be windborne particulate matter that will exceed the 10-percent opacity limit. PM_{10} emissions from transfer of ferroalloys have been estimated using quantities and emission factors calculated using AP-42 (Exhibit B). Calculated emissions are negligible and insufficient to generate opacity greater than 10-percent or fugitive dust visible beyond the property line of the facility. [3.0(2)].

(4) Part B (3.0(8)(d) - Transport

The applicant requests a variance to be exempt from Transport requirement [3.0(8)(d)] for wheel wash and rumble strips that will shake off loose material and dust.

Under the Fugitive Dust Plan, equivalent best management practices are documented, including visual inspection of exiting trucks at the scale and routine street sweeping in the yard and in the building. BSMs are valuable products owned by third parties and are not managed in a manner that allows such track-out loss or leakage. Dry materials do not have a propensity to agglomerate on vehicles or tires. The Plan describes procedures, and inspections are implemented to ensure trucks will not cause track-out of bulk solid materials to public streets.

(5) Part B (8.0)(2) Additional Requirements of the Variance Application

This section addresses additional requirements of the variance application under Section 8, Item 2, c) through i).

c) The quantity and types of materials subject to variance are described in the Fugitive Dust Plan and in Exhibits A and B.

d) This variance request demonstrates that Calumet river Terminals' BSM activities create negligible fugitive dust emissions that are insufficient to generate opacity greater than 10-percent or fugitive dust visible beyond the property line of the facility [3.0(2)]. The facility is also remote from receptors in residential areas. Issuing the variances cannot create a public nuisance or adversely impact the surrounding area, environment or property uses.

e)(i) The regulation requiring monitoring imposes an unreasonable hardship in excessive cost and resource commitment for a small company with a workforce of only five employees. Monitoring is inappropriate where most BSM is maintained indoors and cannot generate emissions visible at the property line or fugitive dust above background levels. Application of best management practices is a prudent approach where most bulk solid materials are not stored outside, and there are no receptors. At this location, the presence of a neighboring large source of fugitive dust also makes a requirement for particulate monitoring unreasonable.

e)(ii) This variance application does not claim timeframe constraints such as permitting delays or force majeure.

e)(iii) Proposed alternative measures are preferable because they accomplish the objectives of the ordinance, including assurance that there are no impacts to human health or the environment. They eliminate unreasonable measures causing a competitive disadvantage to a vital contributor of jobs and investment to the south side of Chicago, an area targeted by the City for economic renewal and reinvestment.

f) The Fugitive Dust Plan describes compliance and best management practices. The facility is conforming to this plan and is in compliance with the Ordinance, with the exception of those variances requested.

g) Alternate methods of compliance and factors influencing the choice of applying for a variance are described herein, in Exhibits A and B, and in the Fugitive Dust Plan.

h) The applicant is Calumet River Terminal, and their authorized representative since 2008 has been Mr. Frank McNicholas, Manager.

i) Not applicable.

Compliance Program

The Fugitive Dust Plan sets forth the compliance program, best management practices and demonstration that facility management of bulk storage materials will not adversely impact the surrounding area, environment or property uses. CRT's variance application is limited to regulations under Parts B, D, or E. The facility has never managed materials regulated under Part C. CRT proposes reasonable conditions as set forth in the Fugitive Dust Plan. CRT understands a variance issued by the Commissioner may be revoked if *"operation of the Facility is creating a public nuisance or otherwise adversely impacting the surrounding area, surrounding environment, or surrounding property uses."*

Change in Operations

CRT commits to providing a 30-day advance notification for any expansion or change in operations subject to a variance issued by the Commissioner.
We are now operating under the procedures described in the Fugitive Dust Plan. We manage only heavy, metallic, BSM at the Facility. Materials are managed within enclosures or under procedures to minimize Fugitive Dust as set forth in the Plan.

Thank you for your attention to this matter. Please contact me if you have any questions or wish to have a Health Department representative visit the Facility.

Sincerely,

Frank McNicholas, Manager
Calumet River Terminal

Attachments: Exhibit A – Blast Furnace Iron
Exhibit B – Fugitive Dust Emissions
Fugitive Dust Plan

Exhibit A - Iron

Handling of Blast Furnace Iron (BFI, also known as Pig Iron), Hot Briquetted Iron (HBI) or Direct Reduced Iron (DRI) at the Calumet River Terminal (CRT) Facility should not be regulated because it:

1) Is not susceptible to becoming windborne.
2) Does not conform to the definition of BSM.
3) Amounts managed are below de minimis amounts.
4) A variance will not create a public nuisance or adverse impacts.

"Iron blast furnaces produce molten iron (pig iron) that can be cast (molded) into products; however, the majority of pig iron is used as the mineral feedstock for steel production. The modern blast furnace consists of a refractory-lined steel shaft in which a charge is continuously added to the top through a gas seal. The charge consists primarily of iron ore, sinter, or pellets; coke; and limestone or dolomite. Iron and steel scrap may be added in small amounts. Near the bottom of the furnace, preheated air is blown in. Coke is combusted in the furnace to produce carbon monoxide which reduces the iron ore to iron. Silica and alumina in the ore and coke ash are fluxed with limestone to form a slag that absorbs much of the sulfur from the charge. Molten iron and slag are intermittently tapped from the hearth at the bottom. The slag is drawn off and processed. The product, pig iron, is removed and typically cooled, then transported to a steel mill operation for further processing in either an electric arc furnace or a basic oxygen furnace."
(Reference 1)

BFI is comprised of iron (94-percent) and carbon (5-percent) with minor amounts of manganese, phosphorous, silicon, sulfur, and traces of other metals. In its molten state it can produce fumes and particulates; but at ambient conditions it is stable and does not generate significant dusts or particulate matter; its density is 7.0. The composition of both HBI and DRI are similar, mainly 90+% iron, ~5% carbon, and traces of carbon, phosphorous or sulphur. During storage and shipping, oxides of iron (rust) form at the surface of these materials and the oxide particles may

slough or scale off of the larger piece during handling. Up to 0.5% weight percent of iron oxide scale that may form and separate from the BFI, HBI or DRI.

Particle size of iron oxide scale is above 30 micrometers, dense, and not mobilized by wind as particulate matter (PM_{10}). This material does not conform to the definition of fugitive dust: "*any solid particulate matter that becomes airborne*". Trace particles which may become airborne, are too heavy to remain in suspension and cannot travel to the property line (US Environmental Protection Agency (USEPA), Reference 3) defines total suspended particulate (TSP) and suspended particulate (SP) as particulate matter with an aerodynamic diameters of 100 micrometers or less and no greater than 30 micrometers, respectively. For high volume PM_{10} samplers, a cut point of >30 micrometers is applied; larger particles are not monitored. USEPA reports that for a wind speed of 10 miles per hour (mph), particles of 100 micrometers settle within 20-30 feet; and those of 30-100 micrometers within a few hundred feet. This means the subject material cannot cause adverse impacts at residential properties, which are located over 1,000 feet from the west storage yard and loading/unloading areas in a direct wind due to the following:

1) Because of its physical properties, Pig Iron, HBI or DRI, nor iron oxide scale from these iron forms do not constitute "substances susceptible to being windborne" (Section 11-4-770).
2) None of these substances conforms to the definition of Bulk Solid Material (BSM) (Reference 2). None is an ore, coke or coal. While each is a material that is "used as an ingredient in a manufacturing process", none "may become air borne or scattered by the wind". This is primarily due to their high specific gravity and large particle size (>100 micron).
3) The iron oxide scale is incidental to handling but it is not a waste. The iron oxide scale is shipped separately to the customer and never accumulated at this facility in amount approaching the de minimis volume of 25 cubic yards. For iron oxide scale, this would be about 150 tons; the maximum amount of iron oxide scale is expected to always be under 100 tons.
4) Handling BFI, DRI or HBI will not create a public nuisance or adverse impacts. These materials are three of numerous metals handled at the facility with no history of complaints or visible emissions. No residential receptor is within 1,000 feet of the outdoor unloading/loading areas. All adjacent property use is industrial.

Exhibit B Particulate Emission Calculations for Fugitive Dust

Activity Description - Bulk solid materials (BSM) managed are a variety of metal alloys in a variety of grain sizes. These materials arrive in bulk by truck, and rarely by barge, and are unloaded either indoors or in the paved yard at the southwest end of the facility. If unloaded outdoors, they are temporarily staged in piles and then transferred by front loader to either areas within the building or to outdoor bins designated by concrete blocks.

Ferro-alloy materials normally arrive in shipments by truck, with occasional deliveries (eight to ten per year) in 1,500-ton deliveries by barge. Ninety five-percent of the ferro-alloy materials ship out in covered trucks. Five-percent ships in large shipping bags (supersacks). Within the building, ferro-alloys may be loaded into supersacks, small bags or large cans prior to shipment. Some of the ferro-alloy materials are occasionally crushed to a smaller particle size in equipment that is used inside the building, and has no exterior exhaust. The bagging and crushing equipment is operated in such a manner as to contain fines within the units for transfer to packaging. The only exhaust from the building are the open doors at each end and vent fans at the peak of the roof, 65 feet above the working floor of the building. The bulk densities of the ferroalloys handled vary based on aggregate size and void spaces, but are well above 100 pounds per cubic foot of material.

The majority of non-ferroalloy materials are also received by truck, with a small percentage received by barge or rail. They are stored in piles in the west yard on pavement. The piles are created by CRT's bulldozer, and therefore are limited to a possible height of up to 15 feet, and typically are lower. Each pile is in a designated "bay" area to identify its location in the facility's records. Concrete block walls are used to retain the piles on site, and to create a bit of a wind barrier.

Pounds of each product handled, including the ferroalloys, since 2008 were:

Calumet River Terminals - Material On Site (in lbs) by Year							
PRODUCT	**2,008**	**2,009**	**2,010**	**2,011**	**2,012**	**2,013**	**Jan - May 2014**
50% Fe Si					427,840		
75% Fe Si	354,130	274,940	1,332,340	2,026,199	2,599,084	1,113,739	1,509,148
75% L A L Ca		532,340		175,725			
Al Cr Mtl					11,023		
Bauxite						44,944	
Ca Si Haz	156,906	132,276		83,776	44,092		87,300
Ca Si Ba Haz			41,895			87,050	
Ca Carbide				33,600			
Cerium Misch Metal				400			
Elect Mn Mtl	290,031	2,630,771	950,191	92,594	2,333,604	723,126	173,492
Fe Bo			44,092				
Fe Co		12,287		612			
Fe Mo		31,592	72,215	773	37,479		85,979
Fe Ti		212,891	85,981	85,981			
Fe Tungsten			11,023				
Fe Va		12,204			360,429	40,620	519,587
Ni Va							39,066
Fe Zi Si Haz			3,304	63,369	55,115	50,459	
Fe Phos			176,368				396,300
HC Fe Cr	99,340	173,274		1,972,455	1,151,480	138,195	2,944,767
LC Fe Cr	88,184	528,720	479,009	43,220	5,512		
LC FeCr .06C		85,979					
LC Fe Cr .025C			44,093				
LC Fe Cr .10		14,357	971,104		440,520		
LC Fe Cr .15					44,092		
LC Fe Cr .5					44,092		
FeMn		88,184					
HC Fe Mn	258,336	573,600		821,780	156,280	6,753,487	
HC Fe Mn LP		89,540	45,180	436,820	1,135,300	517,780	

Calumet River Terminals - Material On Site (in lbs) by Year							
PRODUCT	**2,008**	**2,009**	**2,010**	**2,011**	**2,012**	**2,013**	**Jan - May 2014**
LC Fe Mn	44,092		451,946			198,290	
LC Fe Mn .10C		10,939	507,265	1,090,240			
LC Fe Mn .5C		199,260	695,512	27,080			
LC Si Mn		704,894		956,886	135,260		
M C Fe Mn	958,881	2,307,822	3,051,103	446,420			
Ni MC Fe Mn			44,092	44,092	88,184	88,184	88,184
ULC Fe Mn	639,336	1,536,735	1,947,148	996,311	46,297	1,739,211	
Si Mn	1,220,551	5,406,949	977,200	137,640	3,407,200	5,019,419	44,020
Mo Ox			44,092	13,228			
Mill Scale	30						
Mn Ore	8,744,370						
Mn Slag	4,169,540						
Lead			2,197,451		904,168		
Ni		39,677	3,200	23,041			
Recarburizer		18,000					
Scrap Ferro Alloys	43,140						
HBI			26,649,922	22,324,270	27,942,852	13,333,860	10,791,960
DRI					9,815,396	439,420	
Iron Briquettes					531,940		
Pig Iron			10,759,230	6,611,220	1,367,620	3,836,900	1,963,080
Total Tons/Yr	**8,533**	**7,809**	**25,792**	**19,254**	**26,542**	**17,062**	**9,321**

Emission Factors - Fugitive dusts from material handling of BSM can be represented by applying published emission factors (AP-42) for particulate matter. Aggregate Handling and Storage Pile emission factors appear in AP-42, Chapter 13.2.4. They are intended to estimate emissions for material handling, wind exposure and traffic. Emissions can vary based on wind speed, type aggregate, silt percentage, and moisture content. A formula is provided to calculate emission factors in pounds per ton managed using these variables. An emissions factor can account for emissions from bagging because these relate to traffic and dropping into a hopper.

Particulate emissions from aggregate handling (drop operations) can be estimated using an emission factor calculated based on particle size, wind speed and moisture content (AP-42 13.2.4.3, Equation 1, Attached). Maximum case emission factor can be based on low moisture content and average 24-hour wind speeds. The emission factor can be applied to each drop in the material handling cycle. In this case, separate calculations for PM emissions (PM_{10}) from traffic on paved roads are not needed because on-site travel distances are short and speeds are low. The silt content of the bulk material is typically less than 5-percent and within the range of sources on which the emission factor equation was derived (0.44 to 19-percent).

For equation (1) the emission factor is calculated as:
$E = (0.35)(0.0032)(4.17)/(1) = 0.00467$ pound PM_{10} per ton of bulk material

Where:

Particle size multiplier, $K = 0.35$ for PM_{10}
Mean wind speed, $U = 15$ miles per hour
Moisture content, $M = 2\%$

Emission Calculations – Rounding up the calculated emission factor to 0.005 pound per ton, PM_{10} emissions in pounds per year from each drop operation can be calculated as:

Total Material Handled by Year							
	2,008	**2,009**	**2,010**	**2,011**	**2,012**	**2,013**	**Jan - May 2014**
Tons Per Year	8,533	7,809	25,792	19,254	26,542	17,062	9,321
Annual PM Emissions, lb/yr (@ 0.005 lb/ton)	43	39	129	96	133	85	47

Note that these calculations include the weight of the Pig Iron, HBI and DRI, assuming they will have similar emissions to all other materials handled, which has been shown to not be the case. Including two to three drops or transfers for all material handled would amount to 500 to 750 pounds of PM_{10} per year. This is a negligible amount; Illinois Environmental Protection

Agency (IEPA) does not require an air permit for a facility with total PM_{10} below 10,000 pounds per year. Decreasing moisture content or increasing average wind speed would not have a material effect on emissions. As most operations occur indoors and a large portion of outdoor operations are for the Handling of Blast Furnace Iron (BFI, also known as Pig Iron), Hot Briquetted Iron (HBI) and Direct Reduced Iron (DRI), the calculated emissions are overstated.

Particulate emissions can also be calculated per transfer. A typical loading event for a material involves moving it by front end loader from where it is stored to a truck, dropping it over the side into the truck bed. A typical loading event is one truck receiving 22 tons of material. Loading one truck takes about ten minutes, resulting in a drop rate of 132 tons per hour and emissions per single loading event of 0.11 pounds. This is a negligible amount. The high density of the material means that fines do not mobilize and dusts settle quickly in the vicinity of the drop area. Such activities cannot under any conditions generate opacity greater than 10-percent or fugitive dust visible beyond the property line of the facility. [3.0(2)]. Truck beds of the ferroalloys are covered with a tarp.

Unloading events have low emissions because there are only two drops occurring outside of enclosures for the non-ferro-alloy materials, and all drops for the ferro-alloys occur inside the building. Likewise, bagging and crushing events have negligible fugitive dust emissions because they occur within the enclosure. These events can under no conditions generate opacity greater than 10-percent or fugitive dust visible beyond the property line of the facility [3.0(2)].

REFERENCES

(1) http://www.epa.gov/osw/nonhaz/industrial/special/mining/minedock/id/id4-iro.pdf

(2) http://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/CoCRegulationsforBulkMaterialsSigned.pdf

(3) AP-42 Chapter 13-2 Fugitive Dust Sources (1/95)