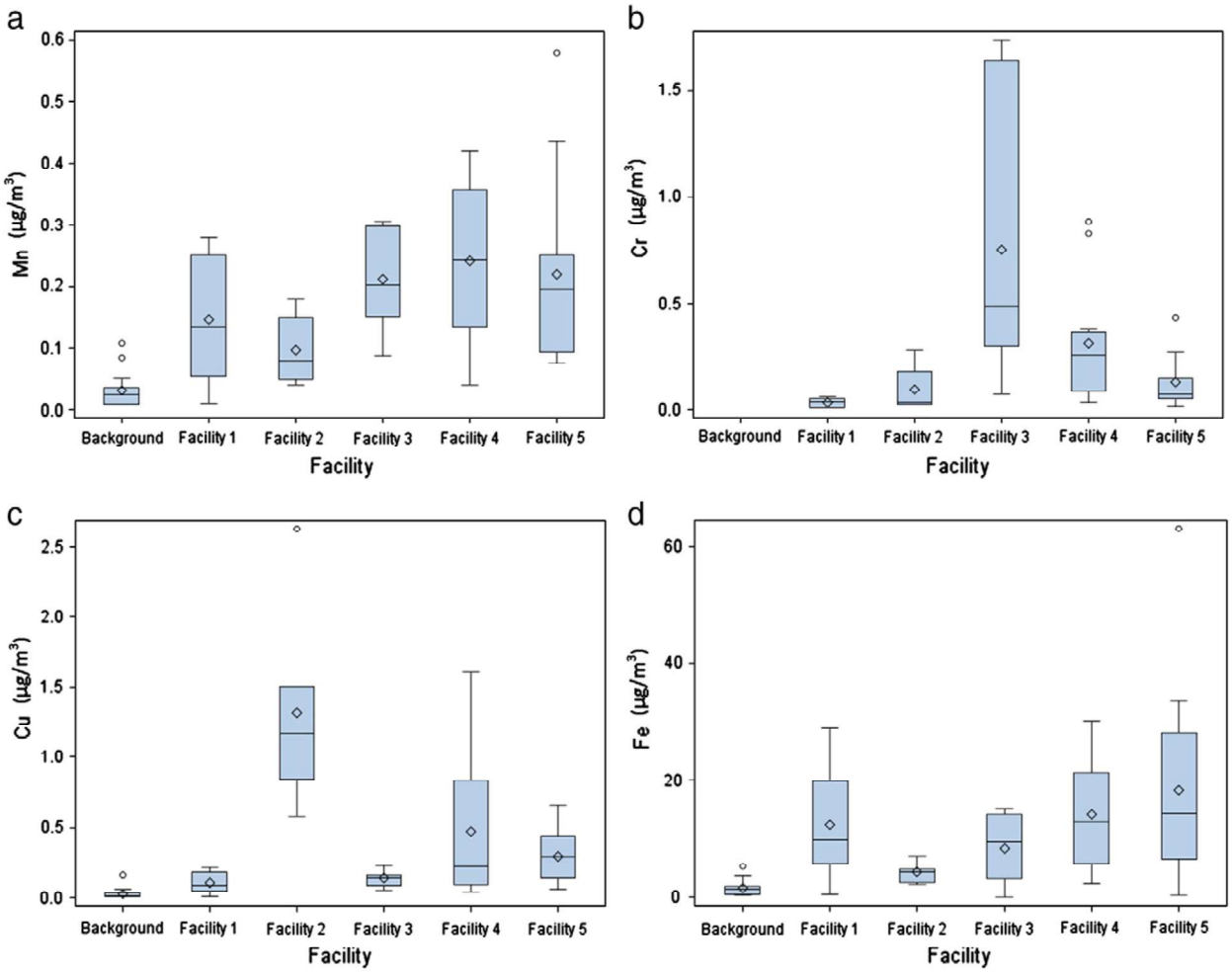

Fig. 2. Distribution plots of most commonly detected metals by location µg/m^3. a) Upper left: Mn b) upper right: Cr c) lower left: Cu d) lower right: Fe.
Circle are outliers defined as 1.5x interquartile range below the 25th percentile and above the 75th percentile.
The length of the box represents the interquartile range (the distance between the 25th and 75th percentiles).
The symbol (diamond) in the box interior represents the group mean.
The horizontal line in the box interior represents the group median.
The vertical lines (whiskers) issuing from the box extend to the group minimum and maximum values that are not outliers.

Table 5 lists each carcinogenic metal found at the facility and not in the background, the inhalation unit risk toxicity value, (IRIS, 2012a,b) the 95th upper confidence limit of the 8 hour mean metal concentrations measured during sampling and the estimate of the annual concentration adjusted based on a range of number of facility operating shifts per workday. The table also lists the corresponding residential inhalation carcinogenic screening level per metal. The number of checks in the table indicates the number of shift schedule weighted concentrations which exceed the screening level (e.g., three checks indicate that the concentration exceeded the screening level for the three shift scenarios presented). Every facility in the study with detectable metals exceeded the screening level for at least one metal over all shift scenarios.

Table 4
Average frequency of detection of metals downwind of metal recycler area sources and background.

Metal	Metal recycler	Background areas
Fe	100	100
Mn	98	64
Cu	96	71
Cr	92	0
Ni	73	0
Pb	69	0
Co	18	0
Cd	6	0
Hg	2	0
Ag	0	0

As a second step, the total risk from the carcinogenic metals emitted at each facility was calculated by summing over the risk each metal at a facility poses (Table 6). This risk value provides a measure of the potential magnitude resulting from exposure to more than one metal, for populations near metal recyclers in Houston.

The risk was calculated as follows:

$$Risk = C_{Annual} \times (EF \times ED \times ET \times IUR)/AT.$$

The concentrations used to calculate the risks above assume a constant wind direction throughout the year. Because wind direction is not constant and the concentrations of these metals were not detected in the background, the actual annual concentrations will be lower when the concentrations from the metal recyclers are averaged with the background. While future research should address longer term monitoring

Table 5
Facility concentrations compared with residential carcinogenic screening levels.

Facility	Metal	Inhalation unit risk (per μg/m^3)	Measured concentration (μg/m^3)	Annual concentration (μg/m^3)[a]			Residential carcinogenic screening level (μg/m^3)	Exceeded
			8 h[b]	1 shift/day	2 shifts/day	3 shifts/day		
1	CrVI[b]	1.20E−02	4.44E−03	1.27E−03	2.54E−03	3.81E−03	2.03E−04	√√√
	Ni	2.40E−04	8.22E−02	2.35E−02	4.70E−02	7.05E−02	1.01E−02	√√√
2	CrVI[b]	1.20E−02	2.88E−02	8.23E−03	1.65E−02	2.47E−02	2.03E−04	√√√
	Ni	2.40E−04	3.82E−01	1.09E−01	2.18E−01	3.27E−01	1.01E−02	√√√
3	CrVI[b]	1.20E−02	1.24E−01	3.54E−02	7.09E−02	1.06E−01	2.03E−04	√√√
	Ni	2.40E−04	5.55E−01	1.59E−01	3.17E−01	4.76E−01	1.01E−02	√√√
	Co	9.00E−03	1.69E−02	4.83E−03	9.66E−03	1.45E−02	2.70E−04	√√√
4	CrVI[b]	1.20E−02	5.23E−02	1.49E−02	2.99E−02	4.48E−02	2.03E−04	√√√
	Ni	2.40E−04	1.09E+00	3.11E−01	6.23E−01	9.34E−01	1.01E−02	√√√
	Co	9.00E−03	1.38E−01	3.94E−02	7.89E−02	1.18E−01	2.70E−04	√√√
5	CrVI[b]	1.20E−02	2.08E−02	5.94E−03	1.19E−02	1.78E−02	2.03E−04	√√√
	Ni	2.40E−04	2.43E−01	6.94E−02	1.39E−01	2.08E−01	1.01E−02	√√√
	Cd	1.80E−03	5.32E−02	1.52E−02	3.04E−02	4.56E−02	1.35E−03	√√√

[a] Assume 6 day work week.
[b] Concentration estimated from CrVI/Cr total ratio.

to better estimate the annual concentration, in the absence of more precise information a simplistic approach is used.

The wind direction history indicates that the prevailing wind direction in Houston is southeasterly, with southeasterly winds occurring approximately 12% of the time (TCEQ, 2012). To approximate the long term metal concentration northwest of a metal recycler, we assumed that the measured metal concentrations downwind from a metal recycling operation occurs 12% of the time and that the background concentrations (0 metal concentration) occurs the remaining 88% of the time. Taking 12% of total risk in Table 7 provides a range spanning risk posed from constant downwind to 12% of the year downwind.

These risk estimates, are used to frame the potential risk to residents, and do not represent personal exposure. While there are limitations to this comparison, the results provide a means of informing regulators regarding the relative rank of potential health threat of sources in the city. The estimated increased cancer risks range from 1 case in 1,000,000 to 8 cases in 10,000 depending upon the facility, the operating schedule and the wind direction.

4. Discussion and conclusions

In response to community complaints regarding smoke and dust nuisance, we detected metals in ambient air off-site of metal recyclers at concentration levels of potential concern for increased carcinogenic risk. These metals were not detected at background locations. After accounting for wind direction and the number of shifts that could operate a year, the total risk from these area sources ranged from an increased cancer risk 1 case in 1,000,000 to 8 cases in 10,000 depending upon the facility.

Table 6
Human health risk for residential exposure to facility concentrations.

	Metal	Carcinogenic risk from metal concentrations		
		1 shift/day	2 shifts/day	3 shifts/day
Facility 1	CrVI[a]	6.25E−06	1.25E−05	1.87E−05
	Ni	2.33E−06	4.65E−06	6.98E−06
	Total	8.57E−06	1.71E−05	2.57E−05
Facility 2	CrVI[a]	4.05E−05	8.11E−05	1.22E−04
	Ni	1.08E−05	2.16E−05	3.24E−05
	Total	5.13E−05	1.03E−04	1.54E−04
Facility 3	CrVI[a]	1.75E−04	3.49E−04	5.24E−04
	Ni	1.57E−05	3.14E−05	4.71E−05
	Co	1.79E−05	3.58E−05	5.37E−05
	Total	2.08E−04	4.16E−04	6.24E−04
Facility 4	CrVI[a]	7.49E−05	1.50E−04	2.25E−04
	Ni	3.08E−05	6.17E−05	9.25E−05
	Co	1.46E−04	2.92E−04	4.38E−04
	Total	2.52E−04	5.03E−04	7.55E−04
Facility 5	CrVI[a]	2.93E−05	5.86E−05	8.78E−05
	Ni	6.87E−06	1.37E−05	2.06E−05
	Cd	1.13E−05	2.25E−05	3.38E−05
	Total	4.74E−05	9.48E−05	1.42E−04

[a] Concentration estimated from CrVI/Cr total ratio.

4.1. National Air Toxic Assessment

The EPA uses the National Air Toxic Assessment (NATA) (Technology Transfer Network, 2012a) as a screening tool that state, local, and tribal agencies may use to prioritize pollutants, identify areas of concern, and develop a better understanding of the risks posed from air pollution to residents at the census tract level (Pechan and Associates Inc., 2006; Technology Transfer Network, 2012b). NATA is developed using the National Emission Inventory (NEI). Area source emissions like metal recyclers that are not reported for the NEI at the source level are referred to in NEI and NATA as non-point sources. A review of the non-point source categories used by NATA and the NEI indicates that metal recycler emissions were not included in the NEI and therefore not reflected in NATA.

4.2. Plausibility of findings

Are these findings plausible given the physical process? *Yes*. Little information on emissions from torch metal cutting exists in the literature but emissions from metal welding have been well studied. The processes are physically similar enough to glean some understanding of what types of emissions may be expected from metal cutting from what is known about metal welding. Generally, gas welding torches have two tubes of oxygen and fuel and cutting torches have three tubes of oxygen, fuel, and another oxygen tube controlled by a blast

Table 7
Total risk ranges by facility for prevailing downwind locations.

Shifts/day	Facility 1	Facility 2	Facility 3	Facility 4	Facility 5
1	8.57E−06 to 1.03E−06	5.13E−05 to 6.16E−06	2.08E−04 to 2.50E−05	2.52E−04 to 3.02E−05	4.74E−05 to 5.69E−06
2	1.71E−05 to 2.06E−06	1.03E−04 to 1.23E−05	4.16E−04 to 4.99E−05	5.03E−04 to 6.04E−05	9.48E−05 to 1.14E−05
3	2.57E−05 to 3.09E−06	1.54E−04 to 1.85E−05	6.24E−04 to 7.49E−05	7.55E−04 to 9.06E−05	1.42E−04 to 1.71E-05

trigger. The oxygen blast trigger is used to increase the torch flame to cut through thick metals (Finch, 2007). The body of the torch and the nozzle direction is at an obtuse angle for welding and a 90° angle for cutting. The former is designed for precision and the latter for power.

From research on emissions from welding, we can expect torch metal cutting to generate particulate matter of Cr, CrVI, Mn, Ni and Pb in at least two size modes (Serageldin and Reeves, 2009). Our study detected these metals in addition to Co.

A strong time series correlation between two air contaminants indicates there is a common source. The strong time series correlations for Fe and Mn concentrations were expected because we expect the metal recyclers to conduct a significant amount of torch cutting of steel. We know that the primary constituent of steel is Fe, while Mn is one of the more common constituents found in steel alloys.

Of special interest is information regarding CrVI because it is highly toxic, reflects the highest risk in our preliminary findings and limited concentration information exists compared with other metals (EPA, 1994), perhaps because it requires special sampling and analysis techniques. Depending upon the welding method, the ratio of CrVI/Cr generated in air varies: 55% for shielded metal arc welding, 5% for gas metal arc welding, 10% for flux core arc welding and 0.05% for submerged arc welding (In The Chromium File, 2002). Our preliminary findings indicate the percentage of Cr that is CrVI in ambient air is 10% (0.042 μg/m^3/0.396 μg/m^3). The ratios we are seeing from metal cutting are consistent with those found in arc welding.

Although not previously studied, given the similarity in the welding and torch metal cutting processes and what is known about emissions from welding, the concentrations we are seeing from metal recyclers are quite plausible.

4.3. Implications

This is the first evidence that an important and growing industry necessary for sustainable development, metal recyclers, may pose a significant human health risk. Citizen complaints about smoke and dust from metal recycling facilities led to a monitoring study by the City of Houston. Carcinogenic metal concentrations downwind of these facilities proved to be at levels which may potentially impact the health of the local community. Further study is warranted to better understand the metal air pollution levels in the community and if necessary, to evaluate the feasibility of emission controls and identify operational improvements and best management practices for this industry. As is likely true in other big cities with industrial operations, the local government focus in Houston has been largely committed to monitoring control of major source emissions and, although not within the local government jurisdiction, mobile source emissions are continually tracked because together mobile and major source emissions account for the vast majority of ambient air contamination in the city. In light of this study, while we continue to acknowledge that the majority of emissions stem from major and mobile sources, we now better recognize the need to examine area sources posing a neighborhood level, but significant risk.

4.4. Limitations

The data used in this study collected by the City of Houston in response to citizen complaints of smoke and dust are not the product of funded research. Consequently, the data collection and sampling analysis were limited to the City's capabilities. The data were limited to TSP samples collected outside the fence at one physical location per facility for 8 hour duration at between 6 and 13 different sampling periods per facility. Future research should include sampling at more locations throughout the neighborhood, more frequently throughout the year, for longer durations and smaller particulate matter size fractions. In addition, CrVI should be collected at each facility.

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Exhibit 9.

World Health Organization
REGIONAL OFFICE FOR Europe

HEALTH EFFECTS OF PARTICULATE MATTER

Policy implications for countries in eastern Europe, Caucasus and central Asia

Abstract

This paper summarizes the evidence about the health effects of air pollution from particulate matter and their implications for policy-makers, with the aim of stimulating the development of more effective strategies to reduce air pollution and its health effects in the countries of eastern Europe, the Caucasus and central Asia.

Keywords
AIR POLLUTION - adverse effects
ENVIRONMENT AND PUBLIC HEALTH
ENVIRONMENTAL POLLUTANTS
HEALTH POLICY
PARTICULATE MATTER - analysis
POLICY MAKING

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Contents

Acknowledgements II

Abbreviations II

Introduction and context 2

What is particulate matter? 2

Where does PM come from? 3

What are the levels of and trends in PM in the WHO European Region ? 4

What are the health effects of PM? 6

What is the burden of disease related to exposure to PM? 7

WHO AQGs 8

Evidence on effects of air quality improvements 9

Follow-up to the Harvard Six Cities Study, United States 9

Short-term decrease in industrial emissions, United States 9

Respiratory health studies and air pollution abatement measures, Switzerland 10

Air quality management and policy 11

Conclusions 12

References 13

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Convention on Long-Range Transboundary Air Pollution

Abbreviations

AQG	air quality guidelines
EECCA	eastern Europe, the Caucasus and central Asia
PAH	polycyclic aromatic hydrocarbon
PM	particulate matter
UNECE	United Nations Economic Commission for Europe

Introduction and context

In most countries in the region covered by the United Nations Economic Commission for Europe (UNECE), ambient air quality has improved considerably in the last few decades. This has been achieved by a range of measures to reduce harmful air emissions, including those stipulated by the various protocols under the Convention on Long-range Transboundary Air Pollution *(1)*. There is, however, convincing evidence that current levels of air pollution still pose a considerable risk to the environment and to human health.

Recently, the Executive Body of the Convention has adopted amendments to the Convention's 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone. Following years of negotiations, the approved revised text of the Protocol now specifies national emission reduction commitments for main air pollutants to be achieved by the UNECE Parties by 2020 and beyond. The revised Protocol includes, for the first time, commitments to reduce the emission of fine particulate matter ($PM_{2.5}$). Furthermore, black carbon or soot is now included in the revision as an important component of $PM_{2.5}$. Black carbon is an air pollutant which both affects health and contributes to climate change *(2)*.

What is particulate matter?

PM is a widespread air pollutant, consisting of a mixture of solid and liquid particles suspended in the air.

Commonly used indicators describing PM that are relevant to health refer to the mass concentration of particles with a diameter of less than 10 µm (PM_{10}) and of particles with a diameter of less than 2.5 µm ($PM_{2.5}$). $PM_{2.5}$, often called fine PM, also comprises ultrafine particles having a diameter of less than 0.1 µm. In most locations in Europe, $PM_{2.5}$ constitutes 50–70% of PM_{10}.

PM between 0.1 µm and 1 µm in diameter can remain in the atmosphere for days or weeks and thus be subject to long-range transboundary transport in the air.

PM is a mixture with physical and chemical characteristics varying by location. Common chemical constituents of PM include sulfates, nitrates, ammonium, other inorganic ions such as ions of sodium, potassium, calcium, magnesium and chloride, organic and elemental carbon, crustal material, particle-bound water, metals (including cadmium, copper, nickel, vanadium and zinc) and polycyclic aromatic hydrocarbons (PAH). In addition, biological components such as allergens and microbial compounds are found in PM.

Where does PM come from?

Particles can either be directly emitted into the air (primary PM) or be formed in the atmosphere from gaseous precursors such as sulfur dioxide, oxides of nitrogen, ammonia and non-methane volatile organic compounds (secondary particles).

Primary PM and the precursor gases can have both man-made (anthropogenic) and natural (non-anthropogenic) sources.

Anthropogenic sources include combustion engines (both diesel and petrol), solid-fuel (coal, lignite, heavy oil and biomass) combustion for energy production in households and industry, other industrial activities (building, mining, manufacture of cement, ceramic and bricks, and smelting), and erosion of the pavement by road traffic and abrasion of brakes and tyres. Agriculture is the main source of ammonium.

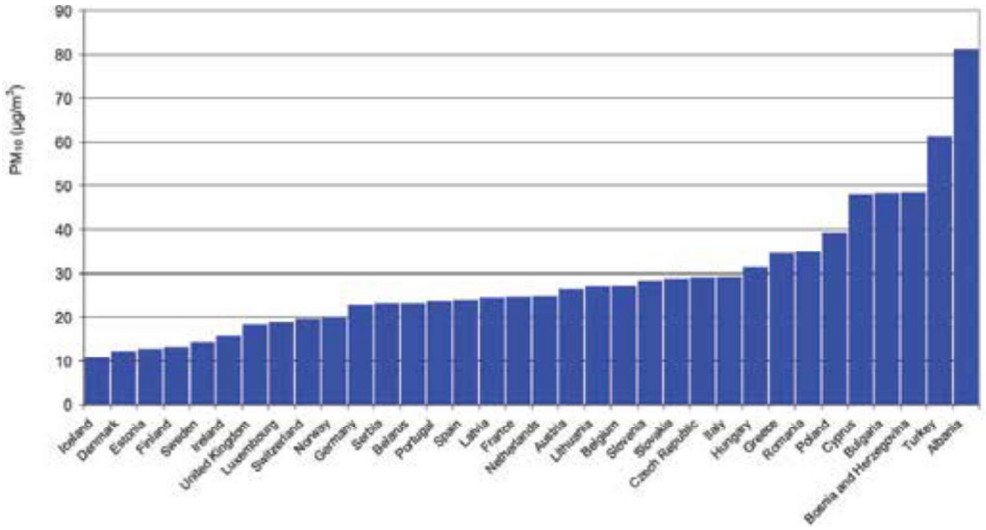
Secondary particles are formed in the air through chemical reactions of gaseous pollutants. They are products of atmospheric transformation of nitrogen oxides (mainly emitted by traffic and some industrial processes) and sulfur dioxide resulting from the combustion of sulfur-containing fuels. Secondary particles are mostly found in fine PM.

Soil and dust re-suspension is also a contributing source of PM, particularly in arid areas or during episodes of long-range transport of dust, for example from the Sahara to southern Europe.

What are the levels of and trends in PM in the WHO European Region[1] ?

The WHO Environment and Health Information System (ENHIS), which is based to a large extent on data submitted by European Union (EU) member states to the European Environment Agency AirBase *(3)*, includes PM_{10} monitoring data from urban and suburban background locations. Fig. 1 presents the population exposure, expressed as annual mean concentration of PM_{10}, weighted by the population in cities with data, in 403 cities in 34 WHO European Member States for 2010. In only 9 of these 34 Member States, PM_{10} levels in at least some cities are below the annual WHO air quality guideline (AQG) level of 20 $\mu g/m^3$. Almost 83% of the population of the cities for which PM data exist is exposed to, PM_{10} levels exceeding the AQG levels. Although this proportion remains high, it is an improvement compared to previous years, with average PM_{10} levels slowly decreasing in most countries in the last decade.

Fig. 1.
Population-weighted annual mean PM_{10} in cities by WHO European Member State, 2010



Source: WHO Regional Office for Europe *(4)*.

On the other hand, monitoring of PM_{10} and $PM_{2.5}$ is very limited in countries in eastern Europe, the Caucasus and central Asia (EECCA), with only a small number of monitoring

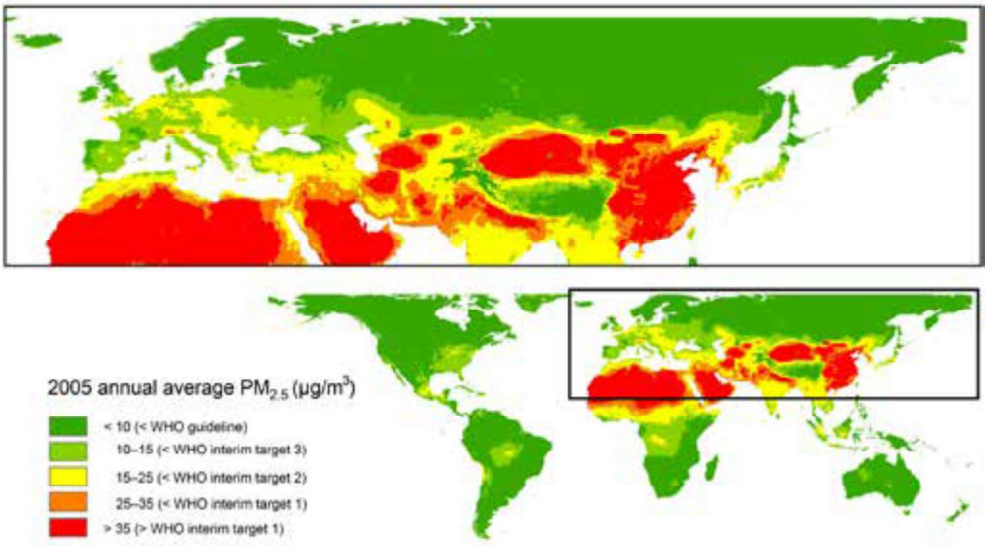
1 The WHO European Region includes 53 countries stretching from the Atlantic Ocean to the Pacific Ocean, with a population of almost 900 million people.

stations in Belarus, the Russian Federation (Moscow) and Uzbekistan (one in Tashkent and one in Nukus). Initial data from the two Uzbek cities indicate that PM_{10} and $PM_{2.5}$ levels are high in comparison with most of the other cities with PM monitoring in the Region. While the levels in Nukus may be affected by dust storms (which are frequent in that area), various combustion sources may be predominant in Tashkent.

The proper assessment of levels of and trends in PM in EECCA countries requires PM_{10} and/or $PM_{2.5}$ monitoring in more locations in those countries. The assessment of PM concentrations requires continuous monitoring conducted for 24 hours daily for 365 days a year, with standardized methods or methods equivalent to the standard. Quantitative knowledge about sources and levels of and trends in emissions of primary particles and precursor gases plays an important role in finding the best control strategy for reducing risks.

In view of the scarcity of ground-level data for PM, remote (satellite) sensing combined with modelling and existing surface measurements has recently been used for the assessment of population exposure at country level. Recent estimates have been published for $PM_{2.5}$ concentrations using this technology as part of the Global Burden of Diseases, Injuries and Risk Factors Project *(5)* (see Fig. 2). Further development of these methods and their precision depends to a large extent on the availability of surface measurements in all regions of the world.

Fig. 2.
Estimated 2005 annual average $PM_{2.5}$ concentrations (µg/m^3), presented according to the WHO AQG and interim target values



Source: Michael Brauer, personal communication based on *(5)*.

What are the health effects of PM?

PM_{10} and $PM_{2.5}$ include inhalable particles that are small enough to penetrate the thoracic region of the respiratory system. The health effects of inhalable PM are well documented. They are due to exposure over both the short term (hours, days) and long term (months, years) and include:

- respiratory and cardiovascular morbidity, such as aggravation of asthma, respiratory symptoms and an increase in hospital admissions;
- mortality from cardiovascular and respiratory diseases and from lung cancer.

There is good evidence of the effects of short-term exposure to PM_{10} on respiratory health, but for mortality, and especially as a consequence of long-term exposure, $PM_{2.5}$ is a stronger risk factor than the coarse part of PM_{10} (particles in the 2.5–10 µm range). All-cause daily mortality is estimated to increase by 0.2–0.6% per 10 µg/m^3 of PM_{10} *(6,7)*. Long-term exposure to $PM_{2.5}$ is associated with an increase in the long-term risk of cardiopulmonary mortality by 6–13% per 10 µg/m^3 of $PM_{2.5}$ *(8–10)*.

Susceptible groups with pre-existing lung or heart disease, as well as elderly people and children, are particularly vulnerable. For example, exposure to PM affects lung development in children, including reversible deficits in lung function as well as chronically reduced lung growth rate and a deficit in long-term lung function *(4)*. There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur. The exposure is ubiquitous and involuntary, increasing the significance of this determinant of health.

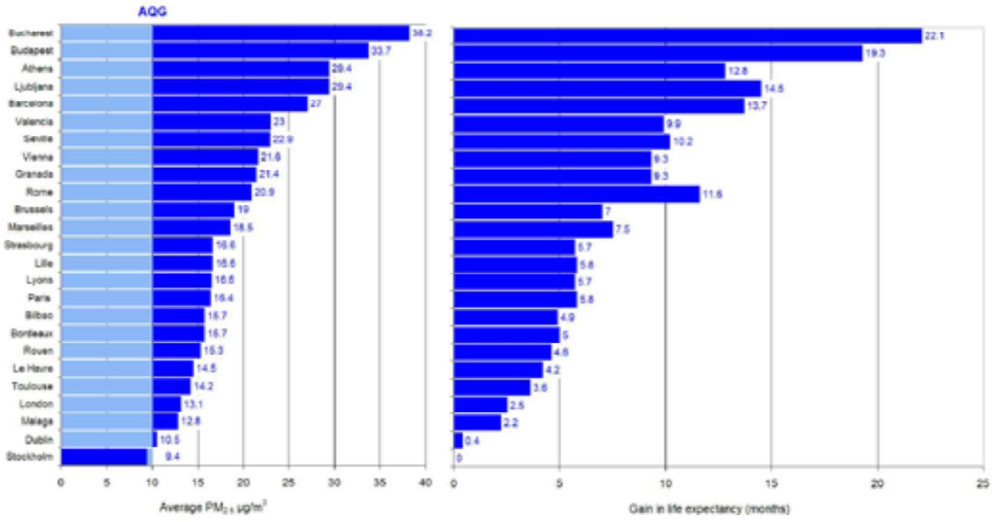
At present, at the population level, there is not enough evidence to identify differences in the effects of particles with different chemical compositions or emanating from various sources *(11)*. It should be noted, however, that the evidence for the hazardous nature of combustion-related PM (from both mobile and stationary sources) is more consistent than that for PM from other sources *(12)*. The black carbon part of $PM_{2.5}$, which results from incomplete combustion, has attracted the attention of the air quality community owing to the evidence for its contribution to detrimental effects on health as well as on climate. Many components of PM attached to black carbon are currently seen as responsible for health effects, for instance organics such as PAHs that are known carcinogens and directly toxic to the cells, as well as metals and inorganic salts. Recently, the exhaust from diesel engines (consisting mostly of particles) was classified by the International Agency for Research on Cancer as carcinogenic (Group 1) to humans *(13)*. This list also includes some PAHs and related exposures, as well as the household use of solid fuels *(14,15)*.

What is the burden of disease related to exposure to PM?

It is estimated that approximately 3% of cardiopulmonary and 5% of lung cancer deaths are attributable to PM globally. In the European Region, this proportion is 1–3% and 2–5%, respectively, in various subregions *(16)*. Results emerging from a recent study indicate that the burden of disease related to ambient air pollution may be even higher. This study estimates that in 2010, ambient air pollution, as annual $PM_{2.5}$, accounted for 3.1 million deaths and around 3.1% of global disability-adjusted life years *(17)*.

Exposure to $PM_{2.5}$ reduces the life expectancy of the population of the Region by about 8.6 months on average. Results from the scientific project Improving Knowledge and Communication for Decision-making on Air Pollution and Health in Europe (Aphekom), which uses traditional health impact assessment methods, indicate that average life expectancy in the most polluted cities could be increased by approximately 20 months if the long-term $PM_{2.5}$ concentration was reduced to the WHO (AQG) annual level (Fig. 3).

Fig. 3.
Predicted average gain in life expectancy (months) for people aged 30 years for a reduction in average annual levels of $PM_{2.5}$ down to the WHO AQG annual mean level of 10µg/m^3 in 25 European cities participating in the Aphekom project



Source: based on Medina *(18)*.

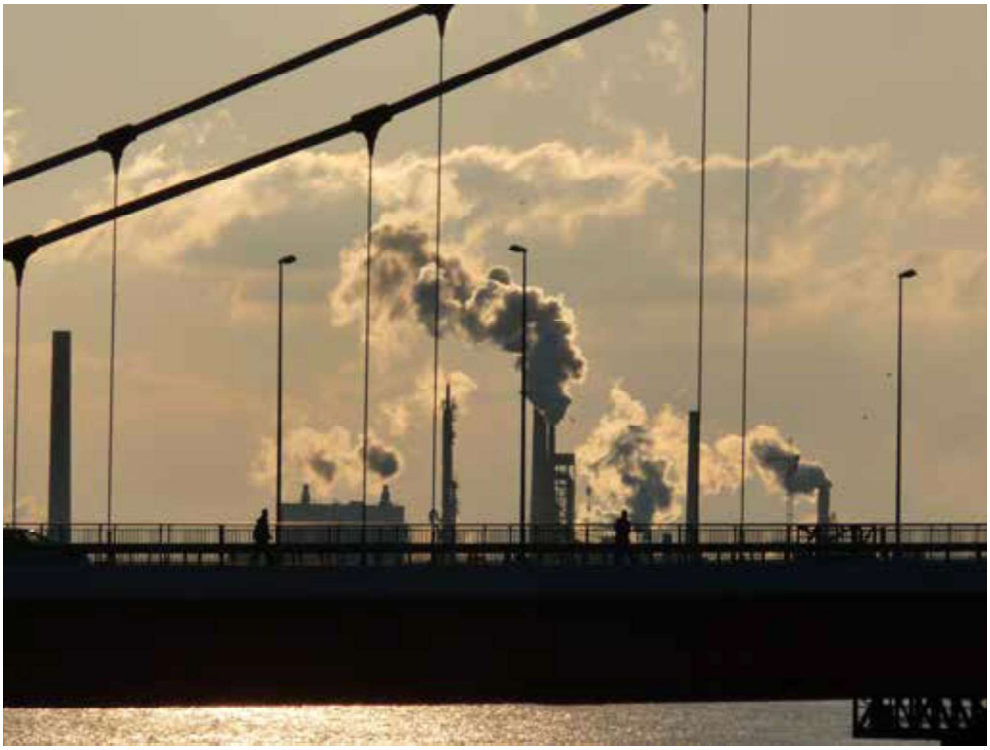
WHO AQGs

WHO last revised its AQG values for PM in 2005, as follows:

- for $PM_{2.5}$: 10 µg/m^3 for the annual average and 25 µg/m^3 for the 24-hour mean (not to be exceeded for more than 3 days/year);
- for PM_{10}: 20 µg/m^3 for the annual average and 50 µg/m^3 for the 24-hour mean.

In addition to these guideline values, the AQGs provide interim targets for each air pollutant, aimed at promoting a gradual shift to lower concentrations in highly polluted locations. If these targets were to be achieved, significant reductions in risks for acute and chronic health effects from air pollution could be expected. Progress towards the guideline values should, however, be the ultimate objective. As no threshold for PM has been identified below which no damage to health is observed, the recommended values should be regarded as representing acceptable and achievable objectives to minimize health effects in the context of local constraints, capabilities and public health priorities.

WHO is currently developing indoor air guidelines for household combustion of fuels for cooking, heating and lighting. These will provide recommendations for household fuels and technologies that will enable progress towards the AQGs.



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Evidence on effects of air quality improvements

There is consistent evidence that lower air pollution levels following a sustained, long-term intervention result in health benefits for the population, with improvements in population health occurring soon (a few years) after the reduction in pollution. Several successful interventions and accountability studies have been evaluated *(19,20)*. A few examples are summarized below.

Follow-up to the Harvard Six Cities Study, United States

A group of adults living in six cities in the United States was followed from 1974 to 2009 in order to estimate the effects of air pollution on mortality. Overall, $PM_{2.5}$ concentrations had decreased to below 15 µg/m^3 by 2000 (except in one city where levels were below 18 µg/m^3). The main finding was that a 2.5 µg/m^3 decrease in the annual average level of $PM_{2.5}$ was associated with a 3.5% reduction in all-cause mortality *(21–23)*. Results show associations between chronic exposure to $PM_{2.5}$ and all-cause, cardiovascular and lung cancer mortality, with health effects seen at any PM concentration. Results suggest that the critical period of exposure to $PM_{2.5}$ for the associated health effects is one year for all-cause mortality, implying that health improvements can be expected to start almost immediately after a reduction in air pollution. In a related study, but using different data, it was demonstrated that the reduction in fine particulate air pollution in the United States in the 1980s and 1990s accounted for as much as 15% of the 2.7-year overall increase in life expectancy that had occurred in that period *(24)*.

Short-term decrease in industrial emissions, United States

A copper smelter strike in 1967–1968 in four states, and the closure and reopening of a steel mill in Utah Valley in 1986–1987, are two examples of unplanned events which had a positive impact on health by decreasing air pollution concentrations in specific areas. The copper smelter strike led to a 60% drop in regional sulfur dioxide concentrations over eight months and was associated with a 2.5% decrease in mortality *(25)*. In the Utah Valley, the closure of the steel mill, which was the primary source of PM_{10} in the area, lasted for 13 months and led to a decrease in PM_{10} levels of approximately 50% during the closure in winter compared to the previous winter when the mill was operating. Hospital admissions for children were approximately three times lower and bronchitis and asthma admissions were halved when the mill was closed *(26)*. Furthermore, the reported 3.2% drop in daily numbers of deaths was associated with a simultaneous fall in PM_{10} levels of approximately 15 µg/m^3 while the steel mill was closed, the strongest association being with respiratory deaths *(27)*.

Respiratory health studies and air pollution abatement measures, Switzerland

The Swiss Study on Air Pollution and Lung Diseases in Adults assessed lung diseases in adults from eight Swiss communities in 1991 and again in 2002. Overall exposure to outdoor PM_{10} estimated at each individual's residence fell by an average of 6.2 µg/m^3 over the study period, to reach a range of approximately 5 µg/m^3 to 35 µg/m^3 in 2002, depending on the community. This reduction in particle levels was associated with attenuated age-related annual declines in various lung function parameters. The falling PM_{10} levels were also associated with fewer reports of respiratory symptoms such as regular cough, chronic cough or phlegm, and wheezing and breathlessness *(28,29)*. As part of a separate investigation, children from nine Swiss communities were followed between 1992 and 2001 as part of the Swiss Study on Childhood Allergy and Respiratory Symptoms with respect to Air Pollution, Climate and Pollen. Falling levels of regional PM_{10} were associated with a declining prevalence of various respiratory symptoms, including chronic cough, bronchitis, common cold, nocturnal dry cough and conjunctivitis symptoms *(30)*. These findings suggest that modest as well as drastic improvements in ambient air quality are beneficial for respiratory health in both children and adults.

These examples of successful interventions show that decreased levels of particulate air pollution can substantially diminish total, respiratory and cardiovascular death rates. Benefits can be expected at almost any reduction in levels of air pollution, which suggests that further policy efforts that reduce fine PM air pollution are likely to have continuing favourable effects on public health.

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Air quality management and policy

Up to 80% of particulate air pollution in EECCA countries can be reduced with currently available technologies *(31)*. The reduction of outdoor air pollutants in general, and PM in particular, requires concerted action by public authorities, industry and individuals at national, regional and even international levels. Responsible authorities with a vested interest in air pollution management include the environment, transport, land planning, public health, housing and energy sectors. Since the burden of air pollution on health is significant at even relatively low concentrations, the effective management of air quality is necessary to reduce health risks to a minimum.

The development and exchange of information on policies, strategies and technical measures to reduce emissions are part of the fundamental principles of the Convention on Long-range Transboundary Air Pollution. The Working Group on Strategies and Reviews of the Convention, and in particular its Expert Group on Techno-economic Issues *(32)*, maintains the database of information on control technologies for air pollution abatement and their costs. An example of its work is provided by the Group's 2010 report summarizing progress in work to reduce dust emissions from small combustion installations *(33)*.

There are co-benefits to addressing particulate air pollution that go beyond just the positive impact on health. For example, reductions in black carbon emissions from the strategic mitigation of combustion sources will also simultaneously reduce global warming *(34)*.

Finally, integrated policies on urban planning and transport can encourage the use of cleaner modes of transport and lead to changes in individual behaviour by promoting walking, cycling and increased commuting by public transport. These policies contribute to cleaner air while promoting physical activity and largely benefiting public health.

Conclusions

PM is a widespread air pollutant, present wherever people live.

The health effects of PM_{10} and $PM_{2.5}$ are well documented. There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur.

Since even at relatively low concentrations the burden of air pollution on health is significant, effective management of air quality aiming to achieve WHO AQG levels is necessary to reduce health risks to a minimum.

Monitoring of PM_{10} and/or $PM_{2.5}$ needs to be improved in many countries to assess population exposure and to assist local authorities in establishing plans for improving air quality.

There is evidence that decreased levels of particulate air pollution following a sustained intervention result in health benefits for the population assessed. These benefits can be seen with almost any decrease in level of PM. The health and economic impacts of inaction should be assessed.

Particulate air pollution can be reduced using current technologies.

Interventions resulting in a reduction in the health effects of air pollution range from regulatory measures (stricter air quality standards, limits for emissions from various sources), structural changes (such as reducing energy consumption, especially that based on combustion sources, changing modes of transport, land use planning) as well as behavioural changes by individuals by, for example, using cleaner modes of transport or household energy sources.

There are important potential co-benefits of integrating climate change and air pollution management strategies, as evidenced by the importance of the PM indicator and climate change contributor black carbon.

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The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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Exhibit 10.

Metal Recycling Industry Project

- Metal Recycling Industry Project (PDF, 577KB, 33pg.)
- Preventing Lead Exposure During Metal Recycling

Executive Summary

Significant Findings

- Significant lead exposure occurred when torch cutting not only painted metals, but also unpainted metals and new steel;
- Lead contamination was found in bathrooms and lunchrooms, and on workers' hands prior to eating;
- Metal recycling companies did not recognize potential sources of lead exposure (such as new steel) and underestimated the degree of exposure; and
- Metal recycling companies that we visited made substantial improvements to their lead protection programs after receiving information and technical guidance.

Background and Methods

Metal recycling workers can be exposed to lead, a known industrial hazard, while performing typical metal recycling tasks. The New York State Department of Health's (NYSDOH) Bureau of Occupational Health (BOH) launched a Metal Recycling Industry Project (MRIP) in June 2000. The goals of the project were to 1) collect information on metal recycling operations and processes from a representative survey population, 2) identify and evaluate metal recycling workers' exposures to lead and other hazardous metals and 3) propose feasible and effective measures to reduce the exposures if needed. The information collected and the preventive measures formulated during the survey are currently being used to develop worker educational and training materials that will be disseminated to the industry and to other stakeholders.

The project had two components: a mail survey and on-site industrial hygiene (IH) evaluations. The mail survey portion was completed at the end of September 2000 and the on-site evaluations completed in February 2001. We additionally conducted a telephone survey in 2005 to collect updated information from the companies that received our on-site evaluations. The follow-up telephone survey was completed in June 2005.

During the mail survey, questionnaires were sent to 224 metal recycling facilities in New York State and 101 (45%) completed responses were received. BOH industrial hygienists conducted on-site industrial hygiene (IH) evaluations at eight facilities that responded to the mail survey and indicated an interest in the evaluation. Each on-site evaluation included a walk-through survey, safety and health program review, personal air monitoring and collection of surface dust samples. A written evaluation report was provided to each facility. Seven of the eight facilities that received the IH evaluations completed the telephone follow-up survey in 2005 (one company was no longer in business).

Results and Discussion

At the time of our survey, companies reported recycling assorted metals such as aluminum, iron, copper, brass, steel, stainless steel, and tin. Workers reportedly performed tasks included sorting, shearing, baling, saw cutting and torch cutting of metal. Among the surveyed companies, 60 (59%) reported performing torch cutting, an operation expected to generate excessive quantities of airborne lead particulates that pose a high health risk to the workers. Despite this, when the companies were asked to assess the likelihood of employee lead exposures at their facilities, 72 (71%) stated that their employees were unlikely or definitely not exposed to lead at work.

Two of the eight companies that received an on-site evaluation required workers to use respiratory protection only when cutting galvanized or painted metals. The companies' decisions were based on the assumption that lead only existed in painted or galvanized steels. However, our personal air monitoring results demonstrated otherwise: workers may be exposed to sufficiently high concentrations of lead when cutting unpainted metal, steel without galvanized coating and even new steel. Three of the six personal air samples that were collected from the workers who performed torch cutting had average lead concentrations over sample time exceeding the Occupational Safety and Health Administration (OSHA)'s Permissible Exposure Limit (PEL) for lead. Two samples were obtained when the workers were torch cutting unpainted steel. In fact, one of the workers was cutting new steel from a local fabrication shop.

Lead is one of the elemental metals that are commonly used as an additive in the steel making process to improve the machinability of the steel. Although the quantity of lead contained in these steels is small - typically ranging from 0.15 to 0.35%, torch cutting can release substantial amount of lead fume as demonstrated by our air monitoring results.

We also found personal air lead levels during sample time in excess of the OSHA PEL during auto radiator disassembly at one facility.

Only 10% of the 101 companies that responded to the survey reported performing personal air monitoring to assess employee lead exposures. Of the 101 companies, forty-five (45%) companies did not provide their workers with any respiratory protection; twenty-eight (28%) provided only disposable dust masks. Of the 60 companies that performed torch cutting, twenty-four (40%) companies provided their workers with half-face or full-face air purifying respirators (APR). Sixty percent (60%) of the companies that had torch cutting operations did not provide workers with any respiratory protection or provided only disposable dust masks.

Fifteen (15%) companies reported that they provided blood lead testing for their employees at least once. This was slightly higher (18%) among the companies that reported torch cutting. With regard to frequency of biological monitoring, four (4%) of the companies reported that they offered blood lead testing annually, six (6%) semiannually, and two (2%) quarterly.

More than 70% of the wipe samples collected in lunchrooms and bathrooms at the eight metal recycling sites had lead dust concentrations exceeding the Environmental Protection Agency (EPA) clearance threshold for homes following lead remediation projects. Lead was also found in wipe samples collected from the hands of workers who held different job titles, including a yard supervisor, a torch cutter, a driver, a sorter, and a laborer in a facility's new steel shop. These samples were collected after the workers washed their hands to eat lunch.

The telephone follow up survey found that the facilities have made improvements in providing workers with personal protective equipment (PPE) and hygiene facilities. The survey also found that owners of metal recycling companies did not understand the prevalence of occupational lead exposures associated with metal recycling activities.

Recommendations

We recommend that the governmental agencies, metal recycling trade organizations, safety and health professionals, workers' compensation carriers and other stakeholders work together to educate employers of the metal recycling industry and raise their awareness of occupational lead exposure in the trade.

We also encourage employers within the metal recycling industry to adopt the following to reduce workers' lead exposures:

- Institute a biological monitoring program for all employees potentially exposed to lead;
- Implement engineering controls such as replacing torch cutting with shearing to reduce workers' lead exposures;
- Implement employee lead training programs;

- Conduct personal air monitoring to assess workers' airborne lead exposures and the adequacy of respiratory protection;
- Provide appropriate respiratory protection to all workers who perform torch cutting, radiator disassembly or other tasks associated with high airborne lead exposures;
- Require employees to thoroughly clean their respirators daily;
- Provide hygiene facilities, such as a clean lunch room, a locker room with separate "clean" and "dirty" lockers and a shower facility;
- Prohibit eating, drinking, and smoking in work areas where lead contamination may occur; and
- Perform routine housekeeping to reduce surface lead dust accumulation throughout the facility.

Introduction

A typical metal recycling facility recycles a variety of materials, including ferrous and nonferrous scrap metals, vehicles and parts, communication cables, radiators, and batteries. The recycling process includes receiving, sorting, processing, packaging, storing and shipping the materials or metals to other facilities where they can be reused or reprocessed. Sorting is either done manually or by machines such as shaker beds, cranes, or magnets. Large scrap metal parts are cut with shears or torches into smaller pieces. The scrap metal is then compressed and packaged, commonly by balers for storage and transportation.

Lead is a ubiquitous metal, and a known environmental and industrial hazard *(1)*. Many of the materials being recycled, such as batteries, radiators, and metals contain lead. It may be in the coatings on the scrap metal (lead-based paint or galvanized coatings) *(2)*. It may also be present in the metal as an additive, alloy element or contaminant *(3, 4, 5, 6)*. When metal recycling workers cut, shear, bale or sort scrap metals, they can be exposed to lead dust and fume.

Lead can be absorbed into the body by inhalation (breathing) and ingestion (eating) *(7)*. Once lead gets into the body, it travels in the blood to the "soft tissues" such as the liver, kidneys, lungs, brain, spleen, muscles, and heart before it moves to the bones and teeth where it may stay for decades *(8)*. Elevated blood lead levels in adults can damage the cardiovascular, central nervous, reproductive, hematologic, and renal systems *(7)*. The mean blood lead level (BLL) of adults in the United States is less than three micrograms of lead per deciliter of whole blood (μg/dL) *(9)*. The U.S. Department of Health and Human Services recommends that BLLs among all adults be less than 25 μg/dL *(9)*. According to the U.S. Occupational Safety and Health Administration's (OSHA) lead standard for general industry, a worker must be removed from further lead exposure when the worker's BLL is at or above 60 μg/dL or the average of the worker's last three BLLs is at or above 50 μg/dL[1] *(7)*. The worker cannot return to work unless his or her BLL is reduced to below 40 μg/dL[1].

The Bureau of Occupational Health (BOH) of the New York State Department of Health (NYSDOH) maintains a Heavy Metals Registry (HMR) to identify adults who have elevated biological indicators (blood or urine) of lead and other heavy metals. BOH staff work with the individuals reported to the HMR to determine the source of exposure and to prevent or reduce further intake of the metals. If the source of exposure is work related or in a work environment, the BOH industrial hygienists may work with the employers to develop and implement controls to reduce the workers' occupational exposures.

According to Census data, there were approximately 6,300 workers in the metal recycling industry in New York State in 2000. From 1990 to 2000, the HMR received reports of elevated BLLs for 65 individuals working in metal recycling companies. Of those reported, 25 had blood lead levels above 40 μg/dL, and three had blood lead levels above 100 μg/dL. Given the reports of elevated BLLs in metal recycling workers and these reports likely underrepresented the extent of the problem (since many scrap metal workers may not be tested), a Metal Recycling Industry Project (MRIP) was initiated in June 2000.

The goals of the project were to collect information on metal recycling operations and processes from a representative survey population, to identify and evaluate workers' exposures to lead and selected other hazardous metals during metal recycling processes and to propose feasible and effective measures to reduce the

exposures. BOH staff worked with the Institute of Scrap Recycling Industries, Inc. (ISRI), a metal recycling industry trade association in Washington DC, in developing the project. The project had two components: a mail survey and on-site industrial hygiene (IH) evaluations. The mail survey portion was completed at the end of September 2000 and the on-site evaluations were completed in February 2001. Additionally, we conducted a telephone survey in June 2005 to collect updated information on the companies that received our IH on-site evaluations.

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[1] OSHA used the unit if micrograms of lead per 100 grams of blood (μg/100g) for blood lead level in its lead standard for general industry (29CFR1910.1025). According to OSHA, the units of μg/dL and μg/100g are essentially the same (see 29CFR1910.1025: Appendix A, II, B (3)).

Methods

Mail Survey

A survey questionnaire was designed to gather information on company operations, potential employee lead exposures, biological monitoring programs, control measures e.g. engineering controls, personal protective equipment (PPE), employee training, and housekeeping. ISRI provided valuable input in formulating the questionnaire. In an effort to maximize the response rate, we kept the survey brief, limiting it to 19 multiple choice or short answer questions.

The yellow pages provided by several internet websites were used to compile a list of potential survey participants, including all listings from the following categories: "Scrap Metals", "Process & Recycle", "Scrap Metals & Iron (wholesale)", and "Steel-used". A total of 355 companies were identified. A cover letter explaining the nature and objectives of the survey was sent with the questionnaire to each of the 355 companies in June 2000. Companies that did not respond within three weeks after the initial mailing were contacted via telephone to attempt to complete the survey. Of the 355 companies, 131 were removed from the survey for one or more of the following reasons: (1) not having a valid mailing address or phone number; (2) not in business; or (3) not in the metal recycling business. The final survey population was thus reduced to 224 companies that were active and in the metal recycling business. A total of 101 companies completed the survey either by mail or by phone, resulting in a response rate of 45%. The remaining (123) declined to participate.

On-site Industrial Hygiene Evaluations

Ten (10%) of the facilities that answered the mail survey also requested on-site evaluations from the BOH industrial hygiene group. One of these companies only agreed to a preliminary walk-through; another was in the electronics recycling business (not a typical metal recycling operation). The results of the on-site IH evaluations of the eight remaining facilities are presented in this report.

During each on-site evaluation, BOH industrial hygienists conducted a walk-through survey to observe recycling processes and employees' work activities, reviewed company lead safety programs, performed personal air monitoring, and collected surface dust samples. We also performed a thorough review of the eight companies' biological monitoring activities and their blood lead monitoring data that had been reported to the HMR. The focus of these site visits was to identify and evaluate occupational exposure to lead and other metals. Other safety and health hazards were not within the scope of the site visits. Therefore, the on-site assessments should not be viewed as a complete hazard evaluation for a specific facility or for the industry.

Personal breathing zone (PBZ) air samples were collected to measure employees' exposures to lead and other selected metals, such as cadmium, cobalt and nickel. These samples were collected during the performance of the various job tasks, such as sorting metal, driving forklifts, operating shears and balers, torch-cutting metal, and crushing cars. Sampling was task-specific (collected only during the performance of a single task) and

generally lasted the duration of the task. For tasks performed all day, sample duration was limited to half of the shift.

The sampling train consisted of a personal sampling pump (Ametek Model 2500 Constant Flow Sampler), Tygon tubing and a close-faced 37 millimeter (mm) filter cassette containing a 0.8 micron (m) mixed cellulose ester filter (MCEF) with a backup pad. The cassette was clipped onto a worker's lapel. If a worker wore a face shield, the MCEF cassette was placed outside the face shield. The pump was calibrated before and after sampling with a primary flow meter (Gilibrator) at a flow rate of two liters per minute (LPM). Pump start and stop times were recorded to the nearest minute. One to two field blanks were submitted for each batch of PBZ air samples.

Surface dust samples were also collected to assess the extent of surface contamination by lead dust in non-production areas throughout each facility. Areas sampled included surfaces in lunchrooms, bathrooms, and locker rooms. The samples were collected by wiping an area of 100 square centimeters (cm^2) with an individual "baby wipe". At one facility, we collected wipes from workers' hands. This was done by thoroughly wiping the palm and fingers of one hand with an individual "baby wipe".

All of the personal air samples and wipe samples were analyzed by the Wadsworth Laboratory of the NYSDOH. National Institute for Occupational Safety and Health (NIOSH) Method 7082, flame atomic absorption spectrophotometry (FAAS) *(10)*, was used for analyzing all lead samples. NIOSH Method 7300, Inductively Coupled Argon Plasma-Atomic Emission Spectroscopy (ICP-AES) *(10)*, was used to analyze samples for other metals.

An individualized report including a survey summary and recommendations on reducing and controlling workers' lead exposures was sent to each of the eight facilities that received site visits.

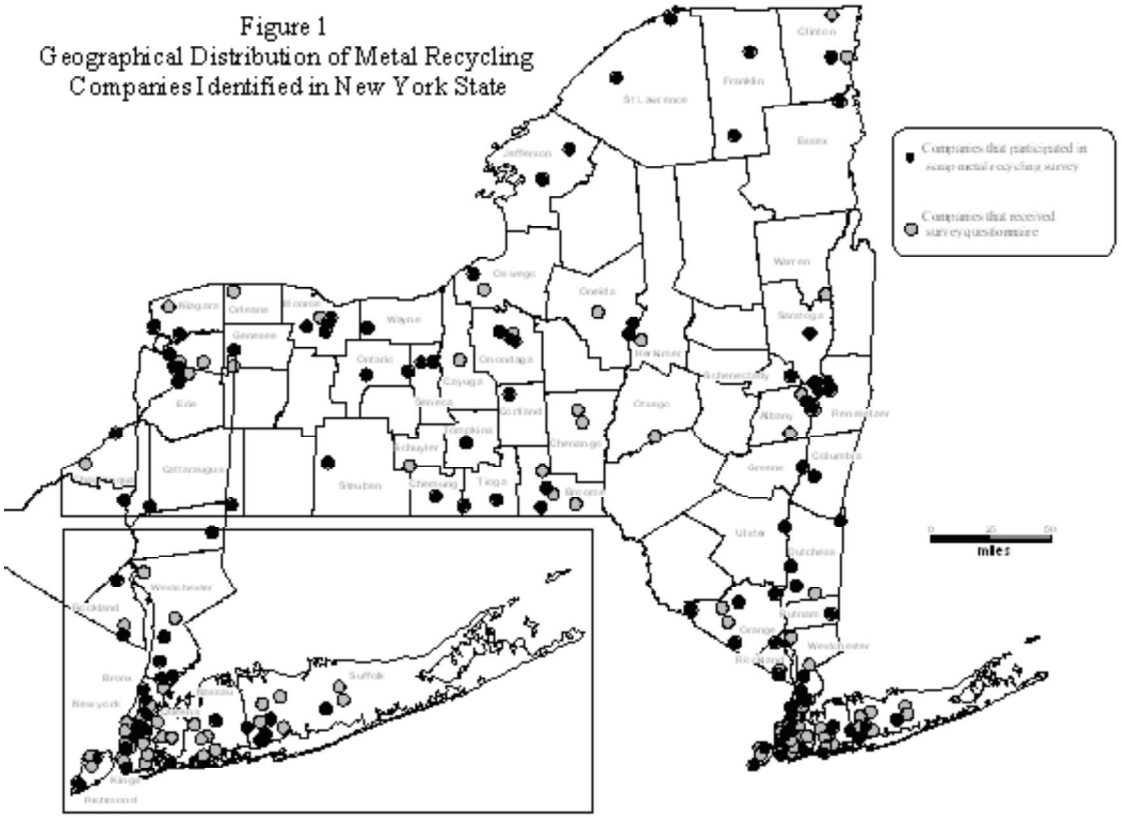
In May 2005, five years after completion of the IH on-site evaluations, BOH conducted a follow-up telephone survey to collect updated information from the eight facilities. The questionnaire was designed to collect information on current company production status and preventive measures adopted by the companies to control and reduce workers lead exposures. One company was no longer in business; the remaining seven facilities completed the telephone survey.

Results

Mail Survey

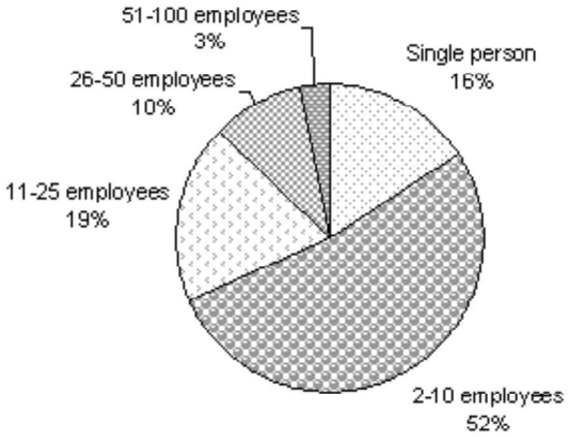
The geographical distribution of the metal recycling companies identified in New York State by the survey is illustrated in Figure 1. The companies that received survey questionnaires and those that participated in the survey are indicated with different symbols in the figure. The participation rate was not consistent throughout the state. While the overall participation rate was 45%, the rate downstate (New York City plus Long Island) was only 26%, and the rate for the rest of state was 57%.

Figure 1
Geographical Distribution of Metal Recycling Companies Identified in New York State



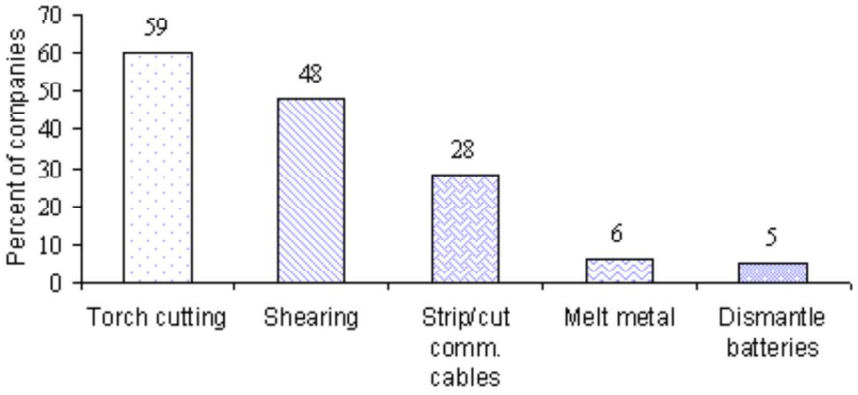
Among the 101 companies that responded to the survey, most were small facilities; 16 (16%) reported that they were a single person operation and 53 (52%) reported that they had 2-10 employees (see Figure 2). Only 3 (3%) had more than 50 employees. The surveyed companies reported that they recycled aluminum, iron, copper, brass, steel, stainless steel, and tin.

Figure 2. Number of employees in participating companies



Forty-eight (48%) companies belonged to one or more statewide or national trade associations, such as ISRI, New York Recyclers, Empire Metal Merchants or Auto Recyclers' Association of New York.

Figure 3. Metal recycling operations performed by the participating companies



Sixty (59%) survey respondents reported performing torch cutting, a task that has the potential for significant lead dust or fume exposure (Figure 3) *(11)*. The companies also reported shearing metal, stripping or cutting communication cables, melting metal and dismantling batteries. These tasks are also likely to carry a potential for lead exposure. When asked to assess the likelihood of employee lead exposures at their facility, however, 72 (71%) of the companies responded that their employees were unlikely or definitely not exposed to lead at work (Figure 4).

Figure 4. Employers' self-reported likelihood of employee lead exposure at their facilities

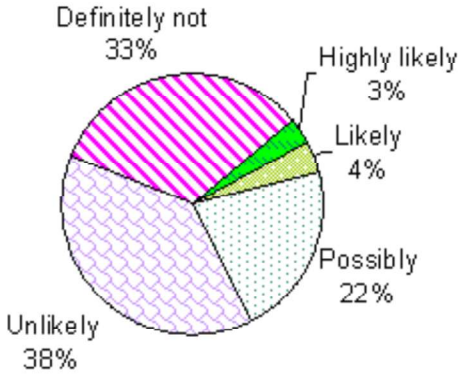


Table 1 presents the lead hazard awareness level (likelihood of employee lead exposures as reported by the company owner) in relation to the percentage of these companies that reportedly conducted personal air monitoring. Only 10% of the surveyed companies reported performing personal air monitoring to assess employee lead exposures. Of the 60 companies that performed torch cutting, only eight (13%) reported conducting personal air monitoring. Of the 72 companies that considered the likelihood of their employee lead exposure as "unlikely" or "definitely not", only one company reported performing personal air monitoring.

Table 1. Number of companies that reported conducting personal air monitoring in relation to their lead hazard awareness levels

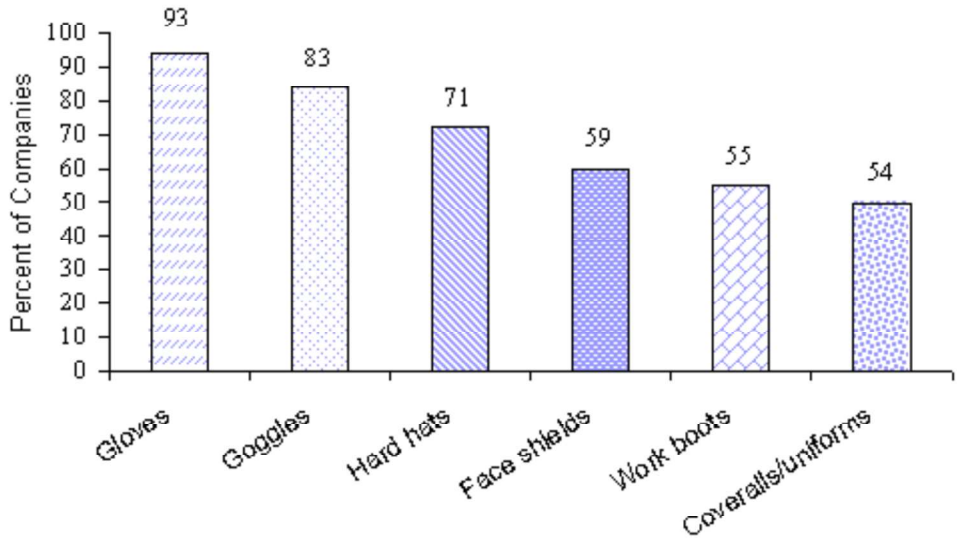
Reported likelihood of employee lead exposure	Number of companies	Number of companies reporting conducting personal air monitoring	Percentage (%)
Highly likely	3	3	100
Likely	4	2	50
Possible	22	4	18

Unlikely	39	0	0
Definitely not	33	1	3

Of the 101 companies that responded to the survey, forty-five (45%) companies did not provide their workers with any respiratory protection and twenty-eight (28%) provided only disposable dust masks. Of the 60 companies that performed torch cutting, twenty-four (40%) companies provided their workers with half-face or full-face air purifying respirators (APR). Sixty percent (60%) of the companies that had torch cutting operations did not provide workers with any respiratory protection or provided only disposable dust masks.

With regard to other personal protective equipment, 94 (93%) of the 101 survey respondents provided their employees with gloves, 84 (83%) provided goggles, 72 (71%) hard hats, 60 (59%) face shields, 55 (54%) work shoes/boots, and 50 (50%) uniforms (Figure 5).

Figure 5. Personal protective equipment provided by the surveyed companies



With regard to hygiene facilities, 68 (67%) of the 101 survey respondents reported that they had lunchrooms, 81 (80%) had wash stations, 21 (21%) had showers, and 49 (49%) had lockers available.

We inquired about whether the companies had a biomonitoring program for lead. Of the 101 respondents, 15 (15%) reported that they provided blood lead testing for their employees at least once (Table 2). Eleven (18%) of the sixty companies that performed torch cutting reported having provided workers with blood lead monitoring at least once. With regard to frequency of biomonitoring, four (4%) of the companies reported that they offered blood lead testing annually, six (6%) semiannually, and 2 (2%) quarterly. The likelihood of having a biological monitoring program in place increased with the self-reported likelihood of employee lead exposure (Table 3).

Table 2. Biological monitoring reported by participating companies

	Total Number	**Companies Offered Biomonitoring**	**Percentage (%)**
Total survey population	101	15	15
Companies that torch cut	60	11	18

Table 3. Number of companies that reported providing biological monitoring in relation to their self-reported likelihood of lead exposure

Reported Likelihood of Lead Exposure	**Number of companies**	**Reported providing biomonitoring**

Highly likely	3	3 (100%)
Likely	4	2 (50%)
Possibly	22	5 (23%)
Unlikely	39	4 (10%)
Definitely not	33	1 (3%)

On-Site Industrial Hygiene Evaluations

Of the eight facilities that received IH on-site evaluations, employment ranged from four to sixty workers. Seven facilities belonged to trade associations. Six were ISRI members and one was a member of the Automotive Recyclers' Association of New York.

Two facilities recycled automobiles in addition to other scrap metals. Seven sites had torch cutting operations, seven sheared metal, four stripped communication cables, and one disassembled radiators. Overall, the eight facilities appeared representative of the mail surveyed population in terms of the types of metal recycling tasks performed by the workers.

Table 4 summarizes the employers' assessment of the likelihood of lead exposure in the workplace, whether torch cutting was conducted, and the availability of the key elements of a lead safety program at each facility. All but two companies reported that occupational lead exposures were at least possible while recycling scrap metals. Seven facilities reported performing torch cutting either weekly or monthly. One of the seven companies did not provide any respiratory protection to the torch cutters, three provided only disposable dust masks, and the remaining three provided half-face or full-face air purifying respirators (APR) with P100 (high efficiency particulate air-HEPA) filters to the workers. Two of the three companies that provided APR also provided qualitative respirator fit testing for the employees.

Table 4. Summary of employers' assessment of the likelihood of occupational lead exposures, torch cutting activity and the availability of key elements of a lead safety program

Facility	Reported Likelihood of Lead Exposure	Perform Torch Cutting	Respirator Protection	Respirator fit testing	Bio-monitoring	Showers	Require Change Clothing
G	Highly likely	No	No[1]		Yes	Yes	Yes
C	Likely	Yes	Dust mask	No	No	No	No
D	Likely	Yes	½ APR + P100, dust mask	Yes	Yes	Yes	No
A	Possibly	Yes	No		No	No	No
B	Possibly	Yes	Full APR + P100	Yes	Yes	No	Yes
E	Possibly	Yes	½ APR + P100, sup. air	No	Yes	No	No
F	Unlikely	Yes	Dust mask	No	No	No	No
H	Unlikely	Yes	Dust mask	No	No	No	Yes

[1] *Respiratory protection was not needed at site G based on the personal air monitoring results.*

Of the eight facilities visited, two (D and G) had showers available. Three (B, G and H) required their employees to change into their work clothes before the beginning of the work shift and to change back to their street clothes after work.

Air Sampling Results

A total of 27 personal air samples were collected during the eight industrial hygiene site visits. Eighteen samples were analyzed for lead only, eight were analyzed for cadmium and lead and one sample was analyzed for cadmium, cobalt, lead and nickel. The monitoring was done to evaluate workers' exposures as they performed typical metal recycling tasks. Neither cadmium nor cobalt was detected in the samples. Nickel was detected in Sample No. 5 when the worker was cutting new plate steel and the concentration during sample time was 8.1 micrograms of nickel per cubic meter of air ($\mu g/m^3$). This level is well below the OSHA's Permissible Exposure Limit (PEL) of 1000 $\mu g/m^3$, that is based on an 8-hour time weighted average (TWA) exposure *(12)*. NIOSH recommends that workers' 8-hour TWA exposure to nickel should not exceed 15 $\mu g/m^3$ *(13)*. The American Conference of Governmental Industrial Hygienists (ACGIH) has established a TWA threshold limit value (TLV) for nickel as 1500 $\mu g/m^3$ *(14)*.

The results of the personal air monitoring for lead are presented in Table 5. OSHA requires an employer to comply with the General Industry Lead Standard (29CFR1910.1025). The OSHA action level (AL) is defined as an airborne concentration of lead of 30 $\mu g/m^3$ averaged over an 8-hour period. If the OSHA AL is exceeded, employee personal air monitoring, medical surveillance and employee training are mandated. OSHA also established a PEL of 50 $\mu g/m^3$ based on an 8-hour TWA exposure. Employers are required by OSHA to keep workers' airborne lead exposures below the PEL through implementing engineering controls and providing personal protective equipment. Both NIOSH and ACGIH have recommended 50 $\mu g/m^3$ as a TWA lead exposure limit *(13, 14)*.

Personal air samples were collected on six torch cutters (Samples 1-6) at five facilities. Five of the six torch cutters used oxy-propane torches and one used an oxy-acetylene torch. The materials that were cut during the monitoring included painted machine parts, unpainted highway guard rails, unpainted new plate steel, aluminum and copper. Sample times ranged from 89 to 172 minutes. The time-weighted average of lead concentrations during the sample time (Sample Time TWA) ranged from below the laboratory's limit of detection (LOD) to 320 $\mu g/m^3$. If these workers performed essentially the same tasks as being monitored during their entire eight-hour work shift, the Sample Time TWA would be equivalent to the workers' 8-hour TWA exposures and would be compared with the OSHA PEL.

The lead concentrations for the torch cutters (Samples 4 and 5) at facility B and H were the highest: 250 $\mu g/m^3$ and 320 $\mu g/m^3$ respectively. Both workers' exposures during their sample time (166 minutes and 124 minutes respectively) exceeded the OSHA PEL. If these workers had no additional lead exposure during the duration of their 8-hour shift, the 8-hour TWAs for the torch cutters at facility B and facility H would be 86 $\mu g/m^3$ and 83 $\mu g/m^3$, respectively. At facility H, the workers were reported to perform torch cutting usually up to six hours a day; the 8-hour TWA for such a worker with the sampled concentration would be 240 $\mu g/m^3$ or 4.8 times the OSHA PEL.

Table 5. Personal air sampling results

Sample ID Number	Site ID	Job Description	Materials being Cut	Sample Time (min.)	Lead[1] Concentration ($\mu g/m^3$)	Respiratory Protection	Compare TWA exposure in sample time with PEL
1	F	Torch cutting	Unpainted new plate metal	133	2	No	<PEL
2	D	Torch cutting	Assorted scrap metal	145	29	No	<PEL
<3				<89	<110		
<4				<166	<250		
<5				<124	<320		
6	D	Torch	Nonferrous	172	<11 [2]	No	<PEL

		cutting	metal				
7	C	Operating a baler		192	16	No	<PEL
8	D	Operating a baler		191	<11 [2]	No	<PEL
9	B	Operating a crane		169	<1 [2]	No	<PEL
10	F	Operating a crane		135	<1 [2]	No	<PEL
11	D	Operating a forklift		167	<11 [2]	No	<PEL
<12				<119	<67		
<13				<32	<210		
14	H	Sorting copper		164	13	No	<PEL
15	H	Sorting brass		146	<1 [2]	No	<PEL
16	C	Operating a shear		203	13	No	<PEL
17	C	Operating a shear		202	18	No	<PEL
18	E	Manual sorting scrap		150	3	No	<PEL
19	F	Sorting in warehouse		141	3	No	<PEL
20	G	Sorting in yard		121	5	No	<PEL
21	G	Sorting in yard		121	6	No	<PEL
22	A	Sorting nonferrous		136	7	No	<PEL
23	D	Sorting scrap		192	<11 [2]	No	<PEL
24	E	Welding		250	4.9	No	<PEL
<25				<41	<578		
26	C	Dumping wheel weights		22	<20 [2]	No	<PEL
27	C	Repairing a saw		56	<9 [2]	No	<PEL

[1] For each set of personal air samples, a minimum of one blank field blank samples was collected and all lead concentrations reported were blank corrected.

[2] The concentration of lead in this sample was below the laboratory's limit of detection (LOD).

Although six facilities indicated that the workers were provided with some kind of respiratory device (see Table 4), only one (Facility B) provided its torch cutter with respiratory protection (a full-face APR with dual P100

HEPA cartridges) at the time of the monitoring. The other torch cutters, including the one at Facility H whose exposure exceeded the OSHA PEL, were not wearing any respiratory protection during sample time.

Table 5 also presents the personal air sample results collected from 21 workers who performed metal recycling tasks other than torch cutting. While the lead concentrations measured during most of the tasks were low or even below the LOD, two samples taken during radiator disassembly and the one obtained during sandblasting exceeded the OSHA PEL during the sample time.

At facility H, two workers (Samples 12 and 13) were monitored while they disassembled auto radiators. Their tasks involved separating steel support pieces from the radiators using a hatchet and a pneumatic chisel. The air lead concentrations for the two workers were 67 $\mu g/m^3$ (worker 012) and 210 $\mu g/m^3$ (worker 013) during the sampling periods of 119 minutes and 32 minutes respectively. Neither of the workers wore respiratory protection.

Facility E had a maintenance/welding shop where workers repaired and refinished vehicles and equipment. The abrasive blaster was reported sandblasting an average of four to six hours a day. Based on the air monitoring results, the blaster's 8-hour TWA would be 289 $\mu g/m^3$ if he blasted four hours a day, assuming that he had no additional lead exposure during the other four hours of his shift. The blaster wore a supplied air blasting hood with continuous flow while he was being monitored.

Wipe Sampling Results

A total of 40 wipe samples were collected to evaluate surface contamination in non-production areas at the eight facilities. The sample results for lunchrooms, bathrooms and miscellaneous surfaces are reported in Tables 6, 7 and 8 respectively.

Sixteen wipe samples taken from lunchrooms in six metal recycling facilities had lead dust concentrations ranging from below the LOD (<45 $\mu g/ft^2$) up to 1,710 micrograms of lead per square foot ($\mu g/ft^2$) (see Table 6). The mean lead dust concentration on the surfaces in lunchrooms was 221 $\mu g/ft^2$ and the median was 89.1 $\mu g/ft^2$.

Table 6. Lunchroom surface sample results for lead

Sample ID	Site ID	Surfaces	Concentration [1] ($\mu g/ft^2$)
1	D	Coffee counter	88.2
2	F	Coffee pot	108
3	H	Locker	<45 [2]
4	B	Lunch table	<45 [2]
5	D	Lunch table	162
6	E	Lunch table	810
7	F	Lunch table	1710
8	G	Lunch table	<45 [2]
9	F	Microwave oven	135
10	G	Microwave oven	<45 [2]
11	D	Microwave oven dial	189
12	B	Microwave oven front panel	<45 [2]
13	H	Microwave oven top	189
14	D	Refrigerator handle	56.7
15	B	Table	90
16	G	Window ledge	<45 [2]

[1] For each set of wipe samples collected at a facility, a minimum of one blank field blank samples was collected and all lead concentrations reported were blank corrected.

[2]The concentration of lead in this sample was below the laboratory's limit of detection (LOD).

The lead dust concentrations of the fourteen wipe samples from bathrooms in six facilities ranged from below LOD to 2070 $\mu g/ft^2$ on a paper towel dispenser (Table 7). The mean concentration was 465 $\mu g/ft^2$ and median 189 $\mu g/ft^2$.

Table 7. Bathroom surfaces' sample results for lead

Sample ID	Site ID	Surfaces	Concentration ($\mu g/ft^2$)[1]
17	F	First aid kit box	162
18	E	Paper towel dispenser front	<45 [2]
19	B	Paper towel dispenser, handle	71
20	F	Shelf	324
21	A	Sink	216
22	E	Sink	351
23	A	Storage shelf	162
24	C	Toilet tank	1260
25	F	Toilet tank	<45 [2]
26	H	Toilet top	45.9
27	H	Towel dispenser (in non ferrous area)	153
28	H	Towel dispenser (in ferrous area)	2070
29	E	Urinal top	990
30	E	Washing machine	702

[1] For each set of wipe samples collected at a facility, a minimum of one blank field blank samples was collected and all lead concentrations reported were blank corrected.

[2] The concentration of lead in this sample was below the laboratory's limit of detection (LOD).

Table 8 presents the results of the ten wipe samples collected from surfaces in a variety of locations other than bathrooms and lunchrooms. The highest level found was

23,400 $\mu g/ft^2$ on a microwave oven in an aluminum room where workers processed scrap aluminum and stored and ate their lunches.

Table 8. Miscellaneous surface sample results for lead

Sample ID	Site ID	Surfaces	Location	Concentration [1] ($\mu g/ft^2$)
31	H	Microwave oven	Aluminum room	23400
32	D	Locker door	Clean locker room	126
33	D	Locker top	Clean locker room	4500
34	D	Cubby	Locker room	135
35	H	Microwave oven	Locker room	<45 [2]
36	G	Refrigerator top	Locker room	144
37	C	Desk	Office	1080
38	C	Locker	Office	<45 [2]
39	A	Vending machine	Outdoor	243

40	G	Shelf	Shower room	216

[1]For each set of wipe samples collected at a facility, a minimum of one blank field blank samples was collected and all lead concentrations reported were blank corrected.

[2]The concentration of lead in this sample was below the laboratory's limit of detection (LOD).

During one of the site visits (Site B), we also collected wipe samples from workers' hands. Five wipe samples were collected after the workers washed their hands just before their lunch break. These workers performed different job duties with varied airborne lead exposures. The results are reported as micrograms of lead per hand (μg/hand) in Table 9. Lead was positively identified from all five workers' hands. The hand wipe samples were to demonstrate that workers may be exposed to lead through hand to mouth contamination regardless of their assigned jobs and the extent of airborne lead exposures, and they could ingest lead if they did not wash their hands well.

Table 9. Hand wipe results collected at site B for lead

Sample ID	Job title	Lead Concentration [1] (μg/ hand)
W1	Yard supervisor	12
W2	Crane operator	15
W3	Torch cutter	140
W4	Sorting, non-ferrous metal shop	34
W5	Worker, new steel shop	19

[1]For each set of wipe samples collected at a facility, a minimum of one blank field blank samples was collected and all lead concentrations reported were blank corrected.

Workers' Blood Lead Monitoring Data

At the time of our site visits, there were approximately 100 workers at the eight sites sorting, shearing, baling and cutting scrap metals. HMR data indicated that 20 (20%) of these workers received a total of 55 blood lead tests in 2000. Some of the tests were administered by workers' private physicians rather than through company biological monitoring programs. Table 10 summarizes the eight facilities' biological monitoring status at the time of our site visits. Four sites A, C, F and H did not provide workers with blood lead tests. According to our personal air monitoring results, the torch cutters of companies A and H were exposed to airborne lead fume and dust exceeding the OSHA PEL during sample time.

Table 10. Summary of blood lead monitoring status in 2000 of the eight companies for the metal recycling yard workers

Site ID	Number of yard workers	Number of workers tested	Job titles of workers tested	Number of tests	BLL range (μg/dL)	BLL Mean (μg/dL)	BLL Median (μg/dL)	Frequency of testing
A	7	0	NA[1]	0	NA	NA	NA	NA
B	15	2	Torch cutter	12	27-161	64	49	Followed doctor's recommendations
C	7	0	NA	0	NA	NA	NA	NA
D	23	13	Torch cutter, ferrous and nonferrous yard labor	29	10-41	16	14	Baseline and semi-annual testing
E	12	1	Maintenance mechanic	1	17	17	17	No company set frequency

F	5	0	NA	0	NA	NA	NA	NA
G	4	4	Metal recycling labor	13	18-40	29	28	Semi-annual testing
H	27	0	NA	0	NA	NA		NA

[1] *Not applicable*.

Four facilities (B, D, E and G) provided blood lead monitoring for some of their yard workers during the year of 2000. Company B had two torch cutters and one of them became ill after cutting bridge steel for a few months. The worker went to see his personal physician who tested the worker's blood lead level. His initial BLL was 121 μg/dL, which is severely elevated. The company had neither performed personal air monitoring to assess the worker's airborne lead exposure, nor provided any lead awareness training to the torch cutters prior to assigning them the torch cutting job. The worker had been provided with a full-face air-purifying respirator with P100 cartridges, although he was not fit tested and the respirator did not fit well. After consulting with the BOH industrial hygiene staff, Company B began providing blood lead testing for its two torch cutters in 2000. A total of 12 tests were provided that year; the torch cutters' BLL ranged from 27 to 161 μg/dL and the mean BLL was 64 μg/dL.

In responding to a torch cutter's elevated blood lead level of 41 μg/dL, Site D offered its thirteen yard workers with baseline and semiannual blood lead tests in 2000. A total of 29 blood lead tests were administered and the mean BLL was 16 μg/dL.

Facility G did not have a torch cutting operation; four workers sorted, sheared, and baled scrap metals. The facility did not have a biological monitoring program until 1996 when two workers found out that their children had elevated blood lead levels. Of the workers' children, a 23 month-old had a BLL of 25 μg/dL and a 13 month-old had a BLL of 27 μg/dL. The Centers for Disease Control and Prevention (CDC) defines an elevated BLL as 10 μg/dL for children younger than six years-old *(15)*. The two workers subsequently requested blood lead tests through their personal physicians; their initial blood lead levels were 26 μg/dL and 53 μg/dL, respectively. Based on the information gathered through the employee interviews and from the company, the BOH determined that the likely cause of the children's elevated blood lead was take-home lead from the fathers' metal recycling work. Following BOH's recommendations, Facility G started providing routine blood lead monitoring for all four employees in 1997.

At Facility G, the workers' main routes of lead intake was ingestion according to the results of the personal air monitoring. To reduce workers' exposures to lead dust through hand to mouth contamination, the BOH industrial hygiene staff recommended that the facility provide workers with a locker room with separate "dirty" and "clean" lockers, a lunchroom that was separated from the work area, and a shower room. Facility G completed the construction and the workers started using the hygiene facilities in April 2000. The workers changed into work clothes at the beginning of their work shift, showered at the end of a workday and changed into their street clothes before leaving for home. During their lunch break, the workers removed the outer layer of their work uniforms and boots, put on clean slippers, washed their hands and then entered the lunchroom for lunch in their under shirts and pants. These measures effectively reduced the employees' lead exposures as reflected in the reduction of the workers' blood lead levels. One worker whose blood lead level had been above 40 μg/dL since 1997 had a BLL below 30 μg/dL for the first time in 2000. The workers' mean BLL in 1997 was 42 μg/dL; it declined to 29 μg/dL in 2000. The workers' mean BLL was 25 μg/dL in 2005.

During the five years (from 2001 to 2005) after our site visits, facilities B, D and G continued monitoring their yard workers blood lead levels. The number of workers being monitored, and the number of tests administered at each facility varied every year, and the testing frequencies at each facility were not consistent over the time. Among the three facilities, the number of people being tested every year ranged from one to six and the number of annual tests administered ranged from two to sixteen. There were no clear statistical trends demonstrated by the BLL data among the three facilities.

Although both Sites E and F had on-going torch cutting operations, neither provided regular blood lead testing to the workers who had lead exposures. Site E had one worker tested twice while Site F provided three workers with a total of five blood lead tests during the five years following our site visits.

Follow-up Telephone Survey

The follow-up survey found that the seven facilities still recycled the same types of materials and metals as reported during the initial survey. However, three of the seven companies reported that they increased shearing operations as a substitute for torch cutting to reduce workers' lead exposures.

Two facility representatives stated that they provided torch cutters with better respiratory protection. One of the two companies upgraded the torch cutters' respirators from half-face APR to full-face APR with P100 filters. The other facility replaced the torch cutter's disposable dust mask with a half-face APR with P100 filters and provided respirator fit testing.

According to the follow-up telephone survey, the surveyed facilities reported across the board improvements in providing employees with personal protective equipment and hygiene facilities such as lunchrooms, lockers and showers. The number of facilities that provided employee lunchrooms increased from two to four. Two more companies provided workers with lockers and showers. The reported improvement could not be verified since no on-site evaluations were conducted.

When asked whether workers would be exposed to lead while cutting new steel, six facility representatives answered no. When asked whether workers would be exposed to lead while cutting unpainted scrap, four company representatives answered no.

Discussion

Employee Airborne Lead Exposures

It is important to recognize when reviewing the personal air sample results that monitoring occurred on only one day at each facility. The work conditions and contaminant concentrations could vary significantly from day-to-day or even during a work shift. Some factors that can influence workers' airborne lead exposures in the various scrap yard operations include: the types of metal (composition and coating) being processed, the amounts of those metals, the condition of the equipment and the machinery involved, the skills and techniques of the persons who conducted the tasks, and the weather. The air sampling results are representative only to the extent that the conditions on the day of monitoring were "typical" of that job.

For workers who do more than one job during a typical 8-hour shift, one needs to monitor the exposure they receive while performing each task to determine their total exposure for the work shift. The formula for calculating an 8-hour TWA that involves different tasks with varied exposures is "$C_1T_1+C_2T_2+C_3T_3+\ldots)/480$" *(12)* . "$C_1$" represents the lead concentration for the first task performed, "C_2" the concentration for the second task, etc. "T_1" represents the time (in minutes) that the first task is performed, "T_2" is the time for the second task, etc.

Among all the typical metal recycling tasks, torch cutting showed the greatest potential for serious lead exposure (see Table 5). When asked to assess lead hazards associated with torch cutting different scrap metals during the survey, the majority of the companies considered that unpainted metal presented less lead hazards and new steel presented none. The survey found that some companies only require workers to use respirators when cutting galvanized steel (lead is a common impurity in zinc that is used for galvanizing steel) or painted metals (lead-based paint). The companies' decision was based on the assumption that lead only existed in painted or galvanized coatings.

However, lead is one of the elemental metals that are commonly used as an additive by steelmakers to enhance the steel's machinability *(16)*. For example, Grade 12L14, a free-machining steel widely used throughout the world, contains up to 0.35 percent (%) lead by weight *(4,5,16)*. Lead is used in the manufacturing of other ferrous and non-ferrous metals or alloys for its unique characteristics *(5)*. Torch cutting these metals can release substantial amounts of lead fume and dust as demonstrated by our air monitoring results. Two of the samples (ID #004 and #005) had sufficiently high lead concentrations that, even if the workers were exposed to no lead for the remainder of their work shift, their 8-hour TWA would still exceed the OSHA PEL. Both workers were cutting unpainted steel; the worker (#005) at facility H was cutting new steel from a local fabrication shop.

Scrap comes to recycling facilities from a variety of sources and the exact content or composition of the materials being processed by metal recycling workers are usually unknown. Given the difficulty in predicting the specific and precise lead and other toxic metal contents in any metal, a good industrial hygiene practice is for workers to wear respiratory protection during torch cutting of any scrap metal.

Besides torch cutting, radiator disassembly is also a relatively high-risk operation and workers can be potentially exposed to lead levels exceeding the OSHA PEL.

The workers who performed sorting, shearing, baling and moving metal with vehicles were exposed to relatively low airborne concentrations (from below LOD up to 18 $\mu g/m^3$). Although the air lead concentrations during these operations may be influenced by the factors that were discussed in the first paragraph of the Discussion section, the monitoring results in this study did not exceed the OSHA action level (AL) of 30 $\mu g/m^3$ for general industry *(7)*. For the workers who performed these operations, the employers should focus on minimizing ingestion of lead through hand to mouth contamination.

Surface Lead Contamination and Workers Exposures Through Ingestion

During metal recycling processes, lead dust can be generated and dispersed through the air, eventually settling on surfaces both inside and outside the work area, and on workers' exposed hair, skin, clothes and shoes. Lead can accumulate on surfaces over time if the facility is not kept clean of lead dust. When surfaces have lead dust on them, a worker may touch those surfaces, and then may pick up food, a cigarette, or touch his mouth with his hand. This can result in the accidental ingestion (eating) of lead, which is then absorbed into the body.

The OSHA General Industry Lead Standard *(7)* contains housekeeping provisions that address the issue of surface contamination, but there are currently no threshold levels of surface contamination included in the OSHA standards. The United States Environmental Protection Agency (EPA) has defined dangerous levels of lead dust in deteriorated paint, settled dust on floors and window sills, and soil *(17)*. Although the EPA standard is often used as a reference when evaluating surface dust accumulation and the effectiveness of housekeeping, it should be noted that the EPA levels are principally intended to protect young children in the home, and may not be directly applicable to an industrial setting. Under the EPA's recent (2000) standard, the threshold concentration for floors is 40 $\mu g/ft^2$, for interior window sills is 250 $\mu g/ft^2$ and for window troughs is 400 $\mu g/ft^2$.

Many of the wipe samples that were collected on lunchroom surfaces during the site visits had measurable levels of lead dust. Given that food and beverages are consumed in those areas, this represents a risk of lead ingestion. Some of the samples obtained in the restrooms indicate similar concern. For example, finding a concentration of 2070 $\mu g/ft^2$ on a towel dispenser is problematic, given that a worker may touch his mouth or face after obtaining a towel.

In one of the facilities, some workers took their lunch break in the "aluminum room", where aluminum was sorted, sheared and baled. A microwave oven placed in the aluminum room was used by the workers to heat their lunches. The lead dust concentration on top of the microwave was very elevated at 23,400 $\mu g/ft^2$. It was recommended to the company that eating, drinking, and smoking in that area (and other lead work areas) be prohibited.

It is critical that workers wash their hands thoroughly before eating, drinking or smoking in order to minimize their risk of ingesting lead. Practicing good personal hygiene requires involvement of both management and workers. At the facility where the hand wipes were collected, certain work areas were considered by both management and employees as "clean" and "lead free", such as the "new steel" shop where only new steel was processed and handled. Hand washing was not required by management for the workers who worked in those areas or who did not perform torch cutting. All the hand wipe samples were collected after workers washed their hands and were ready to eat their lunches. The highest lead dust accumulation (140 μg) was found on a torch cutter's hand. The worker in the "new steel" shop had 19 μg of lead dust on his hand. The supervisor who did not do yard work had 12 μg of lead dust on his hand. The hand wipe sample results demonstrated that there was no such area as "clean" and "lead free" in a metal recycling facility, and that all metal recycling tasks present a potential hazard for lead ingestion. Practicing correct hand washing technique is one way to reduce ingestion of lead.

The lead dust that settled on workers' clothes and shoes can also pose a hazard. Even if a lunchroom is completely separate from all production areas, workers can track lead into the room if they don't clean the lead dust off their work clothes before entering the lunchroom. The dust should be removed with a high efficiency particulate air (HEPA) vacuum (not with compressed air) to avoid dispersing lead dust into the air.

In addition to regular cleaning, one facility (Site G) required all of its employees to remove the outer layer of their work uniforms and boots, put on clean slippers, wash their hands and then enter the lunchroom to eat in their under shirts and pants. By doing that, they were able to keep the concentration of lead dust on their lunchroom surfaces below the analytical detection limit (Table 6).

Workers can also inadvertently bring lead dust home on their clothes and in their hair, potentially exposing family members to lead. Most vulnerable are young children less than two years of age. Such take-home exposures can and should be minimized. A shower facility with separate "clean" and "dirty" lockers can help prevent cross contamination between the workplace and workers' homes. With this system, a worker leaves the production area, enters the "dirty" locker room, removes his clothes, showers, and goes directly into the "clean" locker room before donning clean clothes, getting into his vehicle and traveling home after work.

Biological Monitoring for Lead

Our mail survey found that 85% of the metal recycling companies did not provide workers with biological monitoring for lead. Since the survey question did not differentiate between routine, on-going biological monitoring for lead that was part of a company lead safety program and sporadic or one-time blood lead testing, the percentage of the companies without regular biological monitoring for lead could be even higher.

Among the companies that provided blood lead testing, few initiated the biological monitoring for lead proactively. Some companies provided minimum testing in responding to OSHA citations, while others only started monitoring their workers' blood lead levels after a worker or workers' family members (including children) were diagnosed with lead poisoning by the workers' private physicians.

Most companies that offered blood lead testing only had their torch cutters tested. Very few companies provided blood lead testing to the workers who performed metal recycling tasks other than torch cutting such as sorting, baling and shearing. The HMR data showed that workers could have lead poisoning through ingestion while handling scrap metals by hand. Workers can also inadvertently bring lead dust home and poison their family members, including children who are more susceptible to lead poisoning (as it happened at Facility G).

The BLL data of Facilities B, D and E that mainly monitored torch cutters' blood lead levels did not demonstrate clear statistical trends during the five years following the BOH on-site consultations. This may be due to the limited numbers of workers being tested, limited number of tests administered on each worker annually and inconsistent testing frequencies. Overall, the metal recycling industry as a whole has not integrated biological monitoring for lead into its routine safety and health programs.

Air monitoring can only determine workers' airborne lead exposures. Biological monitoring can assess workers' exposures to lead through both inhalation and ingestion. Symptoms of lead poisoning may be subtle and non-specific at early stages of lead poisoning; timely blood lead monitoring can offer early detection. Workers elevated blood lead levels may indicate problems in engineering controls, personal protective equipment, personal hygiene or housekeeping. Early detection of workers' elevated blood lead levels can lead to prompt industrial hygiene intervention that can prevent further exposures and protect workers from suffering irreversible health effects.

Worker Exposures to Other Metals

In addition to lead, metal recycling workers may be exposed to other metals. A NIOSH study found that besides lead, torch cutters were also exposed to elevated levels of arsenic, cadmium, copper, iron and nickel fumes and dusts *(18)*. Our personal air samples did not find significant airborne exposures to cobalt and cadmium. One worker was exposed to nickel at a concentration of 8.1 $\mu g/m^3$ while torch cutting new steel that came from a local fabricating shop. Although this level is well below the OSHA PEL of 1000 $\mu g/m^3$ and ACGIH TWA of 1500 $\mu g/m^3$, it is more than half of the Threshold Limit Value (TLV) of 15 $\mu g/m^3$ recommended by NIOSH. Nickel is often combined with other metals to form alloys. The U.S. Department of Health and Human Services (DHHS) has determined that nickel metal may reasonably be anticipated to be a carcinogen *(19)*. The general control measures for occupational lead exposures discussed above would also be used to control exposures to nickel and other metals during metal recycling processes.

Employer Awareness of Workplace Lead Exposures

Our survey found that the greater the employer's awareness of workplace lead exposures, the greater the likelihood that the employer will conduct personal air monitoring (Table 1) and implement a biological monitoring program (Table 3).

Based on our survey results, metal recycling workers are exposed to lead on a daily bases from both inhalation and ingestion. However, of the 101 companies that completed our survey, 72 (71%) of them considered that occupational lead exposure was unlikely to or definitely did not occur at their facilities. These survey results demonstrate that efforts should be made to increase the awareness on the part of scrap yard owners as to the prevalence, extent and magnitude of occupational lead exposures in the metal recycling trade.

Conclusions

Metal recycling workers can be exposed to lead through both inhalation and ingestion while performing typical metal recycling tasks. Torch cutting and radiator disassembly may generate lead dust and fume concentrations exceeding the OSHA PEL. New or unpainted steel is not "clean" or "lead free". Torch cutters' airborne lead exposures can exceed the OSHA PEL even while cutting steel that may mistakenly be assumed to be lead-free.

Ingestion is a significant potential route of lead exposure for all workers at a metal recycling facility. It is prudent to assume that all of the scrap metal handling areas and adjacent support areas, such as lunchrooms, bathrooms, and offices have lead surface contamination. Workers' hands can be contaminated with lead dust even when they work in so called "non-lead" areas, such as a new steel shop. Personal air monitoring cannot assess the extent of the workers' lead exposure through ingestion. The only method that can assess exposure in this situation is biological monitoring (conducting regular blood lead testing).

Owners of metal recycling companies did not understand the widespread nature of occupational lead exposures in their facilities and the importance of biological monitoring. The majority of the metal recycling companies in New York State are either single person operations or have less than 10 employees (see Figure 2). Educating this population presents a special challenge, since these small companies may have limited occupational safety and health resources.

Recommendations

1. Governmental agencies, metal recycling industry trade organizations, safety and health professionals, workers' compensation carriers and other stakeholders should work together to help educate the employers of the metal recycling industry and raise their awareness of occupational lead exposure in the trade. The effort should be focused on developing effective educational materials and intervention strategies, disseminating the materials to the target population, and evaluating the effectiveness of the education materials through follow up surveys.

2. The first and best strategy is to control the hazard at its source, and engineering controls are generally recommended to achieve that goal *(20)*. Employers should eliminate workplace hazards or reduce exposure to hazards by implementing engineering controls to the extent feasible. The following engineering controls may be adopted to reduce workers' exposures to metals while performing typical metal recycling tasks:

    - Replace torch cutting with other cutting methods that generate less lead fume and dust, such as shearing; and
    - Provide local exhaust ventilation to the workers who disassemble radiators. Employers may want to refer to the ACGIH Industrial Ventilation manual for examples of local exhaust hood designs *(21)*.

3. Employers should provide employees with lead training on a regular basis, preferably annually. Workers should be informed of the hazards of lead exposure, correct methods for using respiratory protection, good personal hygiene, the benefits of biological monitoring, and the dangers of contaminating their homes with lead from work. The workers should also learn the proper techniques and practices to minimize lead exposure for each job assignment.

4. Employers should institute a biological monitoring program for all employees potentially exposed to lead. The metal recycling companies are encouraged to follow the guidelines developed by the New York State Occupational Health Clinic Network (OHCN) *(22)*. These guidelines, originally developed for the construction industry exceed OSHA biological monitoring requirement for the general industry and offer an early detection of blood lead poisoning:

    - Initial blood lead test before beginning work involving lead;
    - Blood lead test every month in the following circumstances:
        - For the first three months of work; or
        - If the previous blood lead level was greater than 25 μg/dL; or
        - If the previous blood lead level was at least 50 μg/dL (*a follow-up test within two weeks and medical removal is strongly recommended);* or
        - If an increase of at least 10 μg/dL from the previous test is observed;
    - Blood lead test every two months in the following circumstances:
        - When the blood lead level remains below 25 μg/dL for three months; and
        - If an increase less than 10 μg/dL from the previous test is observed;
    - Blood lead test every six months in the following circumstances:
        - When the blood lead levels remain below 25 μg/dL for six months; and
        - If an increase less than 10 μg/dL from the previous test is observed.

    The employee blood lead test results may be charted and recorded in a graph or a spreadsheet format that is easily understood and can offer a historical perspective to the worker and the company. The companies could utilize the spreadsheet to look for trends and to perform hazard evaluation for specific jobs.

5. Engineering controls should be implemented first to reduce workers' airborne lead exposures to the lowest feasible. Torch cutters should be wearing respirators whenever they cut, since their exposures vary significantly.

Each facility should develop and implement a written respiratory protection program. The employees who perform torch cutting, radiator disassembly, and any other tasks that could subject them to significant lead exposures should be placed in the program. The workers should wear at least half-face respirators with dual P100 (HEPA) cartridges whenever they torch cut, or disassemble radiators. An employee who is required to use a respirator should receive a medical evaluation, a respirator fit test, and training on respirator usage and maintenance, as per the OSHA Respirator Standard (29CFR1910.134) and OSHA lead standard (29CFR1910.1025)

6. The interior and exterior surfaces of workers' respirators and other personal protective equipment should be cleaned daily to prevent lead dust contamination and subsequent lead ingestion by the workers who use the PPE. A sink with cleaning supplies should be available for this purpose.

7. Employers should provide clean lunchrooms separate from the production areas. Workers should store food and drink in the lunchrooms. A locker room with separate "clean" and "dirty" areas should be available to allow workers to store their work and street clothes and shoes separately to avoid cross contamination. Showers should be available for the workers who perform tasks that emit high levels of lead dust and fume. Workers should shower and change to their clean clothing and shoes after their work shift to prevent "take-home" lead.

8. Workers should not eat, drink, or smoke in any work area where there is potential contamination with lead dust. Signs clearly prohibiting such activities should be posted prominently in those areas. Employees should clean the dust off their clothes with a HEPA vacuum (and ideally remove their outer clothing) before taking a lunch break. All the production employees should be instructed to wash their faces and hands before eating, drinking, smoking, or taking breaks.

   Employers should provide a brush and hand soap for hand washing. Workers should learn and practice good hand washing techniques, such as rubbing and scrubbing with a brush vigorously, and rinsing with a copious quantity of water.

   Employees who perform certain tasks with significant lead exposures, such as torch cutting and radiator disassembling, should shower at the end of their shift. All employees with lead exposures should change into work clothes and shoes at the beginning of their work shift and back into street clothes and shoes afterwards to avoid exposing their family members to "take home" lead. Work clothes should be stored and laundered separately to avoid cross contamination.

9. The lunchrooms and bathrooms should be cleaned daily to reduce lead dust accumulation. A HEPA filter vacuum should be used to clean floors. Wet methods can prevent surface dusts from becoming airborne. Dry sweeping should be prohibited. Cleaning should be done with detergent and water.

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May 22, 2020

City of Chicago, Department of Public Health
Attn: Environmental Permitting and Inspections
333 South State Street, Room 200 Chicago, IL 60604

Re: Comments on Amended Rules For Large Recycling Facilities

To Whom It May Concern,

With thanks for the opportunity to comment on the Chicago Department of Public Health's ("CDPH") amended Proposed Rules for Large Recycling Facilities, these comments are submitted on behalf of the Natural Resources Defense Council and our 3 million members and activists, including approximately 10,000 members and activists in the City of Chicago, including those who reside on the Southeast Side in close proximity to metals recycling facilities and along the I-55 corridor. The Southeast Environmental Task Force and the Southeast Side Coalition to Ban Petcoke support these comments as well; NRDC supports comments being submitted by these two partners as well.

At the outset, we note the continuing and ever-more pressing need for regulations and enforcement that address the many sources of pollution from recycling facilities and their impacts on environmental justice communities in particular. The events of this past year since the Chicago Department of Public Health ("CDPH") first proposed its regulations for large recycling facilities have brought a slew of pollution events and violations at city recycling facilities, culminating recently in a massive explosion that flattened part of a facility and blew out its primary air pollution control equipment (ironically installed as part of a settlement agreement over violations of state and federal environmental laws). The Southeast Side is grappling not only with environmental issues from recycling facilities already in its community and the highest levels of some airborne heavy metals in the state, but also the specter of even more harmful facilities descending next to its homes, schools, parks, and river. More generally, the COVID-19 pandemic has resulted in gross disparities in health outcomes, including deaths, for those most vulnerable in our society. Emerging studies indicate that living in areas with polluted air is linked to greater mortality rates from COVID-19. In short, these rules, and the City's commitment to protect its residents, are needed now more than ever.

We reiterate that while we welcome CDPH's regulations for large recycling facilities – which close loop holes in city regulations, step up where the Illinois Environmental Protection Agency ("IEPA") has failed in its protection of environmental justice communities, and begin the oversight and accountability process – environmental regulations are only one piece of the needed reforms. Regulating individual industries on the back end without addressing distributive siting issues and cumulative impacts is not enough. We look forward to further working with CDPH and other committed city staff and stakeholders at this higher level to ensure a clean, safe, productive and equitable Chicago for all residents.

Our comments on CDPH's amended regulations for large recycling facilities are provided below. We note that these comments should not be taken as endorsement of provisions not raised, given CDPH's directive to focus our comments in this round on issues not previously addressed. We also note that given the limited timeframe for review and its falling during a particularly strained time for our city and world, we reserve the right to raise additional issues about the regulations once we have time to fully digest the final-final regulations and as we learn from implementation together.

POLLUTION FROM AND ENVIRONMENTAL VIOLATIONS BY CHICAGO METALS RECYCLERS SINCE JUNE 2019

CDPH is only too familiar with the many community complaints about metals recycling facilities in the last year, given the agency's inspection and enforcement work since last June. We summarize it and prior enforcement history briefly here both for the benefit of others less familiar and to ensure a more complete rulemaking record. We note that our focus in the last year has been on facilities at two locations and that the historic record is likely impacted by failures to inspect and enforce against actual violations, and thus this summary likely does not reflect a complete accounting of the environmental issues at recycling facilities within the city. In addition, this accounting supports a number of our specific comments on the amended regulations provided below.

Since June of 2019, CDPH has issued at least 37 citations for violations of the municipal code by recycling facilities at 1909 N Clifton and 11600 S Burley (see Table 1 attached to these comments, information compiled from data downloaded from the City's inspection and enforcement databases on May 22, 2020, data which is in turn attached as Exhibits A, B, C, and D to these comments). At least one of these citations led to a finding of liability – Reserve Marine Terminals was held liable for violating its permit when an inspection conducted on June 2019 noted fugitive dust emissions and failure to operate dust controls.

The vast majority of these citations have not moved to hearings due to the impacts of COVID-19. Many citations were issued between December 2019 and March 2020, with hearings scheduled for Spring and Summer of 2020, which have all been pushed back due to the virus. Many of the still pending citations refer to General Iron/II's failure to control dust, unauthorized emissions from the shredder, and unauthorized release of auto fluff – topics taken up in our and our partners' comments on the proposed rules and below on the amended rules.

In the past, CDPH has found recycling facilities at 1909 N Clifton and 11600 S Burley liable for violating air pollution regulations. (See Table 2 below.) Violations dated 6/21/2010, 9/28/2009, and 1/2/2002 led to liability findings for releasing unauthorized emissions and/or failure to control dust, consistent with issues that appear to persist today. In addition to the citations listed below, there have been numerous citations for violations at these facilities over the years that are

included in the City's enforcement and inspection databases, but have no publicly listed liability finding by CDPH.

COMMENTS ON AMENDED RULES FOR LARGE RECYCLING FACILITIES

Section 2, Definitions

"**Facility.**" CDPH should prohibit segmenting or inappropriate circumvention by clarifying that the definition of a "Facility" includes all structures, equipment and ancillary fixtures on land that are used to Process, Store, or Recycle materials and that "belong to the same industrial grouping; and (2) are located on one or more contiguous or adjacent properties; and (3) are under the control of the same person," consistent with federal air law, regulations and guidance defining "facility" and what constitutes a "single source." Otherwise, recycling operations with individually and collectively significant impacts on communities could escape the more stringent requirements of CDPH's regulations by segmenting or breaking up their operations to fall under the 1,000 tons per day threshold for rule applicability. For example, according to CDPH in a meeting with SE Side representatives, Reserve Marine Terminal ("RMT") would on its own fall under the 1,000 ton per day threshold for a Large Recycling Facility, despite the fact that RMT is part of the "single source" consisting of 3-4 other co-located recycling facilities at 11600 S Burley and a proposed additional facility at the same site, along with what appears to be yet another proposed Class IV facility immediately adjacent to this "campus" (and despite the fact that RMT has been found liable for fugitive dust violations, which would otherwise qualify it as a "Consequential Facility"). Such an outcome would also potentially introduce inconsistencies between CDPH and IEPA regulation and/or enforcement.

Relatedly, CDPH should adopt limits on the total size and capacity of recycling sources, applying this "single source" definition of a facility and taking into account the relative distribution of recycling facilities within the city and any disparate impacts on disadvantaged communities (see our prior comments on the proposed rules regarding the existing and worsening aggregation of metals facilities more generally in communities like the SE Side). Aggregation of multiple co-located and/or adjacent facilities - which is already happening on the SE Side with the relocation of General Iron and the proposal of a fifth or possibly sixth (depending on the use and ownership of the still unidentified-parcel at 11600 S Burley) facility between S Avenue O and S Burley adjacent to Rowan Park, can pose a significant and disproportionate threat to public health, especially where there is little to no buffer between the facility and sensitive uses. The Department of Planning and Development should similarly develop size/capacity limits and buffer requirements for such facilities for adoption in the zoning code.

"**Expansion.**" CDPH should confirm that addition of recycling capacity that meets this 3-pronged test for "Facility" will be considered an "Expansion" under the rules if it otherwise meets the horizontal boundary and vertical limits defining an Expansion. Such "Expansion," in

turn, may result in a facility that previously fell below the Large Recycling Facility or Consequential Facility thresholds qualifying as Large or Consequential.

We also object to removal of an increase in capacity without an increase in horizontal boundary or vertical limit as grounds for triggering the more rigorous Expansion requirements. The amended rules remove increases in capacity that do not include an increase in a facility's horizontal boundary or vertical limit as constituting an Expansion, and instead considers such increases in capacity as Modifications that need only seek permit amendments. CDPH does not further explain this change in the responsiveness document (see pages 6-7). We reiterate our prior comments to the City in other contexts that increases in capacity that do not involve footprint or similar vertical increases should trigger enhanced requirements and/or prohibitions, given the potential for significantly increased impacts from such increases in capacity. Regardless, CDPH should clarify in the responsiveness document that Existing Facilities seeking modifications that would result in the Facility meeting the criteria for a Consequential Facility shall be considered "New" and "Consequential" for purposes of the rules and include any necessary changes to the amended rules to effect this intent. [Note that this change is also related to the above comment on considering adjacent, inter-related operations as a single facility/source - the capacity/throughput of RMT and the other S Burley recyclers would undoubtedly increase as a result of the proposed addition of General III, so ensuring applicability of the rules' most stringent requirements to these facilities is critical.]
We also reiterate our above comment that the Department of Planning and Development should develop zoning-side limits to prevent aggregation of especially large recycling operations where such operations would pose a disproportionate threat to health, safety, and welfare.

"**Large Facility**." There appears to be a missing comma between "1,000 tons or more per day of Recyclable Material" and "operates a metal Shredder."

"**Consequential Facility**." We object to removal of torch-cutting, welding, or heating of metals as an independent criterion for qualifying as a Consequential Facility. The Houston study we submitted with our comments on the proposed rule supports that torch cutting alone can yield disturbingly high levels of toxic heavy metals, in particular but not limited to hexavalent chromium. CDPH characterizes this study as concluding that "additional investigation was warranted." (responsiveness doc at 53). In fact, a follow-up study of Houston metals facilities by the UTHealth School of Public Health identified significantly elevated cancer risks (up 24 in a million) from the Allied Alloys facility, and appears to attribute those risks to torch cutting based on the voluntary mitigation steps noted in the community report, which include "added additional processing equipment to reduce torch cutting" and "outsourced majority of torch cutting while evaluating other technology to further reduce metals emissions."

These mitigation steps - specifically how other additional processing may substitute for torch cutting or that outsourcing may be necessary to reduce harmful emissions from torch cutting - also demonstrate that torch cutting should be included as an independent basis for designating a facility as Consequential, such that the facility is required to fully evaluate its torch cutting as a part of its larger operations and total impacts, and modify operations across its facility accordingly. We also reiterate and bolster our comment that based on these studies, CDPH (and DPD) should prohibit or severely limit outdoor torch cutting in or adjacent to residential areas as soon as possible.

"Modification." See above re Expansion.

"**Staging.**" See below comment on Section 4 regarding stockpiles and staging.

(Section 3 and) Section 4, Operating Standards

Outdoor Stockpiles Heights and Barriers (Section 4.4)

Barriers. CDPH should clarify which, if any, types of stockpiles will no longer need to use 3-sided barriers as proposed. (CDPH says general rules already require Class V to use barriers anyway, but does not say which kind of barriers these are.)

ASR. CDPH rejected requiring full enclosure of ASR stockpiles, analogizing to petcoke re % fines and potential to become windborne. (responsiveness document at 53) The percent fines is not an appropriate metric of ASR's potential to become windborne. ASR is a low-density material whose very informal name - "fluff" - describes that it is very likely to become windborne and disperse. In addition, CDPH's response completely omits that (a) evidence exists from General Iron that ASR is escaping the facility in significant quantities and that ASR was a significant source of fugitive dust at the Northern Metals plant in MN, per our prior comments, and (b) the hazard profile of ASR likely significantly exceeds that of petcoke, again rendering simple % fines an inappropriate/inadequate basis for rejecting full enclosure. Finally, CDPH asserts that any "offsite deposition" of ASR that does occur will be cleaned up by sweeping requirements imposed on the facility. This response ignores that the General Iron Lincoln Park evidence supports that ASR is ending up (a) on land at or more than a mile from the facility, well outside any required sweeping area, and (b) in the river immediately adjacent to the facility, which cannot be swept. For these reasons, we reiterate and bolster our comment that CDPH should require all ASR, and particularly untreated ASR, to be kept at all times in full enclosures (either enclosed conveyors or fully enclosed building structures, depending on the stage of ASR handling).

ASR should be excluded from Staging (if that concept is retained) and be required to be handled in enclosures at all times. For similar reasons, CDPH should clarify that staging provisions that create essentially a more relaxed carve out from the storage stockpile provisions (but see

comment below) do NOT apply to ASR that will be further processed on site. Instead, CDPH should require full enclosure of all ASR held onsite for any amount of time, including ASR that will be further processed at the site. This is especially necessary because it appears that untreated ASR - the form of ASR with the highest toxicity potential - would otherwise qualify for the more relaxed staging requirements. (We note that the amended rules retain a distinction that "post-processed" ASR shall be stored in "bunkers," with post-processed newly defined as "after all Processing has been completed." We reiterate that initial stage ASR and/or untreated ASR, which appears may NOT qualify as "post-processed" under this new definition, pose the potentially greatest toxicity level among forms of ASR and so would again be left out of even the bunker requirement. This is a side note because, per our comment here, all forms of ASR should be handled/stored/staged in enclosures at all times.)

Staging. CDPH should either eliminate the concept of Staging from the amended rules or significant increase the control requirements that apply to Staging. The Staging concept inappropriately focuses on the relatively limited duration of any given material in a stockpile and on that basis allows relaxed height limits. However, the piles themselves will exist permanently though the exact material in the pile will turnover. Moreover, the constant turnover and working of the piles means that Staging stockpiles have much greater potential for emissions than Storage stockpiles as currently defined. Thus, CDPH should NOT create a height limit carve out for Staging stockpiles or allow consideration of unlimited height variances for stockpiles (i.e., no variance should be allowed over a certain height). If CDPH retains the Staging concept, it should adopt more stringent requirements for such areas, such as enhanced barriers, siting buffers, and other fugitive dust measures to minimize the impact of Staging to offsite areas, including waterways.

If CDPH retains the Staging concept, it should also clarify that any Staging is limited to a "Staging Area." Currently, Section 4.4.2 simply allows the height of stockpiles in Staging Areas to exceed the otherwise applicable height limit of 30 feet, but does not clearly state that such Staging stockpiles *must* be located within an authorized Staging area. (The definitions for Staging and Staging Area similarly do not appear to clearly create the requirement that all Staging occur in an authorized Staging Area only.)

CDPH should also clarify that the Storage-stockpiling requirements apply to all material in piles from unloading that are being held longer than the allowed staging time, as well as to all materials awaiting loading onto vehicles that will not undergo further processing at the site prior to vehicle loading. Finally, CDPH should clarify how a facility and the agency will determine compliance with the holding time requirement.

Air Quality Impact Assessment (Section 3.9.21) and Air Quality Standards and Monitoring (Section 4.7).

The amended rules only mandate PM10 modeling and substitute air sensors for regulatory-quality monitors. CDPH's justification for the limited modeling and monitoring requirements in the amended rules appears to be a fairness one, that they would impose a greater cost on Consequential Facilities than the city's other dust rules impose on other types of operators. It is not clear to us that this is the case, given the more rigorous air monitoring requirements in the other dust rules, in particular for manganese handlers. Moreover, the dialing back of the monitoring requirements in the amended recycling rules to only require sensors instead of regulatory-grade monitors likely tips the balance in the other direction in favor of large recycling facilities. Rather than back away from regulatory grade monitors for this sector, CDPH should require other dust-generating facilities to do dispersion modeling and real-time reporting to level costs across industries and better assure protection of communities. And as discussed below, CDPH's limiting the universe of recycling facilities that qualify as Consequential and thus are subject to air modeling and monitoring requirements means that facilities subject to the modeling and monitoring requirements are likely to be able to bear the costs of a more protective regime. Additional comments on modeling and monitoring, including means for reducing costs while retaining regulatory grade monitors as a core part of the rule, are below.

Air dispersion modeling. Modeling is not a sufficient substitute for monitoring, either baseline onsite monitoring prior to addition of recycling capacity (through a new/expanded/modified facility) or subsequent monitoring of facility operations to assess health impacts and ensure compliance with the rules' performance standards. Experience (including the Houston study's comparison of NATA-based health risks versus health risks from actual monitoring data) has shown that modeling exercises vastly underestimate actual air quality impacts, especially where fugitives are at issue. CDPH should retain and enhance all monitoring requirements.

Regarding modeling, air toxics modeling should be required, not solely PM10. Again experience (with monitoring of manganese-handling facilities in Chicago and the Minnesota Pollution Control Agency's Minneapolis air monitoring[1]) has shown that PM10 monitoring is insufficient to assess air quality impacts and health risks from toxic heavy metals, one of the primary concerns regarding metals facilities' air/health impacts. This is because PM10 levels can be relatively low, but air toxics/heavy metals high if such metals constitute a relatively large fraction of particles in the air (as is expected to be the case here). However, CDPH should not require use of Wisconsin's air toxics rules as did GIII and IEPA in the current permitting, as there are more valid, robust and protective approaches available, including from states like Michigan, Texas and California, among others. We also note that, if IEPA continues to require

[1] Data available at https://www.pca.state.mn.us/air/north-minneapolis-air-monitoring-results

air quality modeling of proposed new synthetic minor source metals facilities (which it should), CDPH's requiring such air toxics modeling will impose little to no additional cost on facilities.

For meteorological data, CDPH should not presumptively allow use of airport data, especially with regards to areas like the Calumet where there are likely unique surface conditions due to Lake Michigan and/or the River and from which we have a robust set of available meteorological data. Instead, the City should compile the available onsite met data from the multiple existing monitoring efforts within the city (KCBX, SH Bell, Watco, Chicago Port Railroad, to name a few) and process this data to create a usable general met data set for modeling. CDPH could seek a modest increase in its permitting fees to cover the cost of compiling and processing this met data to then provide to applicants.

Air monitoring. We object to CDPH's replacing the requirement for regulatory-grade air monitors with a requirement for air sensors. EPA's guidance explicitly says that Tier III air sensors do not yield regulatory quality data, and should be used simply to identify impacts for further investigation. In addition, use of air sensors does not yield data that can directly and on its own be used to assess whether a facility is complying with legal requirements to protect the NAAQS and not otherwise pose air pollution/health risks. Furthermore, it is not clear that air sensors will deliver data that is sufficiently precise/unbiased to implement the Reportable Action Level ("RAL") concept, e.g., will the relative imprecision of Tier III air sensors give facilities an argument that the RAL is not in fact triggered by data collected by those sensors?

CDPH's only proffered basis for substituting sensors for regulatory-quality monitors is cost. Reducing costs is an inappropriate basis for this substitution for several reasons. First, as noted above, on a fairness basis metals recyclers should not bear lower monitoring costs than other dust-creating facilities (and see above why costs spent on modeling should not be viewed as offsetting monitoring costs). Second and also as noted above, CDPH has already further narrowed the definition of Consequential Facility that triggers the monitoring requirement, such that the number of recycling facilities subject to the monitoring requirements is small and such facilities are likely larger and better-resourced and so can and should bear the cost of regulatory monitoring. Finally, regulatory monitors can be leased rather than purchased, further reducing the cost to facilities. CDPH does not provide any cost analysis to support a decision that Consequential Facilities cannot reasonably bear the cost of regulatory monitors; indeed, General Iron has contributed more to political campaigns over the years than it would likely cost to install and operate regulatory-quality PM10 and metals monitors at the proposed GIII site. In addition, numerous facilities in the City have implemented regulatory-grade monitoring in the past several years, demonstrating that regulatory-grade monitoring is economically feasible.

If CDPH can substantiate that regulatory PM10 and metals monitoring would impose a disproportionate and unduly burdensome cost on Consequential Facilities, it has other ways for

mitigating those costs besides allowing low-cost, less precise sensors on the front end. For example, CDPH could reduce the initial monitoring period (ensuring that monitoring covers the most active periods and/or periods expected to generate the greatest emissions) such that regulatory-grade monitoring can be done with leased equipment at a cost less than purchase, then allow use of air sensors moving forward IF this initial regulatory-grade monitoring has shown that the facility does not pose a risk of adverse air quality impacts. (We note that if CDPH uses such an approach, it should also allow for/require reinstallation of regulatory-grade monitors if/when sensors subsequently indicate an air quality problem.)

If CDPH persists in retaining air sensors in lieu of regulatory-grade monitors, it should reduce the RAL to well below 150 ug/m3 to account for the relative imprecision of air sensors. We advocate for retaining the 50 ug/m3 RAL. CDPH's justification for tripling the RAL to a level that itself would indicate a violation of the NAAQS appears to be that only at this already-violating-the-NAAQS level can an operator figure out what of its operations and activities is causing the problem. (Responsiveness document at 50.) We have several questions/critiques about this analysis. First and foremost, this choice of a such a high RAL ignores any preventive, health-based justification, which to us is the primary driver for the whole RAL concept. Whether a facility can identify the specific contributing sources or activities is a secondary consideration – if emissions at the monitors approach the PM10 NAAQS, the facility should first have to cease operations across the board to protect public health. Second, it is unclear to us how it was determined if an Operator can identify the source of emissions. It seems like an operator might have a self-interest in claiming the inability to identify a contributing source, such that it is never held accountable for such sources or activities. Relatedly, an operator that has little experience being aware of and controlling its fugitive emissions might be a poor identifier of contributing costs at the beginning of this exercise; this lack of familiarity with PM10 contributors is not a justification for relaxing the RAL.

In addition, similar to our last comment, if CDPH persists in requiring only sensors on the front end, it should include a requirement that facilities whose air sensors indicate an adverse impact on air quality install regulatory-grade monitors (i.e., "ramp up" monitoring).

Material Handling, Paved Surfaces (4.11)

Since submission of our prior comments on the rules, we have undertaken a detailed review of chronic paving issues at several recycling facilities that appear to employ solely asphalt-type paving instead of concrete or other available materials that can better withstand the working conditions of a recycling facility, like rubber or plastic sheeting. This review was conducted using CDPH's publically available inspection database (our results are available upon request, noting that CDPH has the underlying data in its hands). The review identified multiple recycling facilities that have failed to maintain intact paved areas over the course of years, including

admissions by facility operators that such maintenance is virtually impossible given the heavy machinery and constant working at the site. Such chronically broken pavement inhibits or outright prevents pollution control for protecting air, soil and water, a substantial concern given the reports of significant metallic fines at these same facilities as documented in the inspection database and as is to be expected at such recycling facilities. Thus, CDPH should strengthen its paving requirements to mandate use of concrete for new/expanded facilities, with possible allowance for rubber or plastic type surfaces, and at least the latter for all other large recycling facilities. Asphalt alone should not be permitted.

Shredder and Shredder Enclosure (4.12)

CDPH should require full enclosure of shredders, rather than simply that shredders be "enclosed." Experience from the Northern Metals case in Minneapolis shows that openings in the shredder enclosure can be a source of significant, uncontrolled fugitive dust and inhibit the effectiveness of any control device on the shredder. The language of the shredder enclosure provision should include minimum design requirements, including a directive to minimize air emissions to the greatest degree feasible (rather than design directives solely geared towards withstanding explosions and able to deflect objects).

Pavement Maintenance and Cleaning (4.14)

See above comment on Paved Surfaces. Also see above comment on handling of ASR. If CDPH persists with allowing less than full enclosure of ASR, it must at minimum require more robust community clean-up of the ASR that will inevitably disperse, including clean-up of an area significantly greater than the current area required to be cleaned under the amended rules and consistent with reported dispersal patterns of ASR. It is our understanding that such community-wide regular clean-up is required in certain landfill contexts.

CONCLUSION

In closing, we appreciate CDPH's intent to address the many impacts of recycling facilities on public health, and strongly encourage the agency to strengthen the rules in the above ways to this end.

Meleah A. Geertsma

/s/ Meleah A. Geertsma
Senior Attorney, Environmental Justice
Natural Resources Defense Council
20 N. Wacker Drive, Suite 1600
Chicago, IL 60606

GERDAU

Material Safety Data Sheet

Material Name: ASR

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Name: Composite material.
Product Use: Star Process, recycling through mechanical separation.
Synonyms: Shredder Residue (SR); Automobile Shredder Residue (ASR); Shredder Heavy Fraction; Dense Media Feedstock; Aluminum Breakage; Aluminum Sweeps; "Rock and Wire"

Manufacturer Information

Gerdau Long Steel North America
4221 West Boy Scout Blvd.
Suite 600
Tampa, FL 33607

Phone: (800) 876-3626

Emergency # 800-424-9300 CHEMTREC

* * * Section 2 - Hazards Identification * * *

Emergency Overview

This is generally a non-combustible, non-reactive solid material. Certain residues, coating, and hydrocarbon components may render this mixture combustible. Processing of the product for some final uses can include formation of dusts, particulates or fumes which may present certain health hazards. Generation of large quantities of airborne dusts and particulates may produce a fire hazard. Molten metal may react violently with water. Exposure to powder or dusts may be irritating to eyes and skin.

Potential Health Effects: Eyes

Dust or powder may cause irritation and/or inflammation to the eye tissue. Rubbing may cause abrasion of cornea.

Potential Health Effects: Skin

Product may contain levels of components that may cause allergic skin reactions. Dust or powder may irritate the skin. This product may produce skin abrasions, lesions, or cuts.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely; however if ingested may cause gastrointestinal disturbances, abdominal pain, fever, vomiting, and diarrhea. Ingestion of large amounts of product may produce more serious toxicities including: shock, metabolic acidosis, decreased white blood cell count, neurological damage, cardiovascular shock, anemia, liver damage, renal failure, lethargy and coma.

Potential Health Effects: Inhalation

Product may contain levels of components that may cause allergic respiratory sensitization and cancer. Normal use of this product should not generate fumes. Dusts, vapors, and fumes generated during processing may irritate the respiratory system. Severe acute overexposure or chronic overexposure to dusts or processing fumes may produce more serious toxicities including: siderosis, lung damage, weakness, anorexia, impairment of sleep and vision, personality changes, blood formation effects, nervous and circulatory system damage, kidney damage, and may pose a reproductive hazard.

HMIS Ratings: Health: 1 **Fire:** 0 **HMIS Reactivity** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 3 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
7429-90-5	Aluminum	0-100
7440-44-0	Carbon	0-90
7440-66-6	Zinc	0-50
7440-50-8	Copper	0-50
7440-70-2	Calcium	0-40
7440-21-3	Silicon	0-20
7439-89-6	Iron	0-20
7440-47-3	Chromium	0-5
7439-92-1	Lead	0-5

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

1314-13-2	Zinc oxide	<1
7439-96-5	Manganese	<1
7440-02-0	Nickel	0-2
7440-31-5	Tin	0-1
7440-43-9	Cadmium	<0.1
7440-38-2	Arsenic	<0.1
7440-42-8	Boron	<0.1
7440-32-6	Titanium	<0.1
7440-48-4	Cobalt	<0.1
7440-62-2	Vanadium	<0.1
7440-67-7	Zirconium	<0.1
7439-98-7	Molybdenum	0-0.2
7440-03-1	Niobium	<0.1

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of mechanical abrasions and cuts, seek medical attention.

First Aid: Skin

For skin contact, wash immediately with soap and water. Cuts or abrasions should be treated promptly with thorough cleansing of the affected area.

First Aid: Ingestion

Seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

First Aid: Inhalation

Remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. Seek medical attention immediately.

* * * Section 5 - Fire Fighting Measures * * *

General Fire Hazards

See Section 9 for Flammability Properties.
Dust accumulation from this product may present an explosion hazard in the presence of an ignition source.
Coatings and oil residue on the product may enhance flammability. Keep product damp to minimize fire hazards.
Avoid welding near product.

Hazardous Combustion Products

Fire or thermal processing may release products of hydrocarbon decomposition and metal fumes.

Extinguishing Media

Dry chemical, soda ash, sand. Molten metal may react violently with water.

Fire Fighting Equipment/Instructions

Fire fighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Fire fighters should avoid inhaling any combustion products.

NFPA Ratings: Health: 1 **Fire:** 0 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

If the product is regulated as a PCB Bulk Product Waste, it must be completely contained on-site. If significant concentrations of dusts or particulates are generated, eliminate sources of ignition.

Clean-Up Procedures

If the product is regulated as a PCB Bulk Product Waste, it must be completely contained and collected in appropriate containers, or returned to product storage.

Evacuation Procedures

None necessary.

Special Procedures

This material may be regulated as a PCB Bulk Product Waste.

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Avoid inhaling dusts or vapors produced during thermal processing. Avoid eye and excessive skin contact. Use only with adequate ventilation. As with all chemicals, good industrial hygiene practices should be followed when handling this material. Special care must be taken to avoid buildup of dusts.

Storage Procedures

Keep this material in a well-ventilated area. Keep this material slightly damp to avoid fire hazards.

* * * Section 8 - Exposure Controls / Personal Protection * * *

A: Component Exposure Limits

Aluminum (7429-90-5)

ACGIH: 1 mg/m3 TWA (respirable fraction)
OSHA: 15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)

Copper (7440-50-8)

ACGIH: 0.2 mg/m3 TWA (fume); 1 mg/m3 TWA (dust and mist, as Cu)
OSHA: 0.1 mg/m3 TWA (dust, fume, mists, as Cu)
NIOSH: 1 mg/m3 TWA (dust and mist)

Silicon (7440-21-3)

OSHA: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
NIOSH: 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable dust)

Chromium (7440-47-3)

ACGIH: 0.5 mg/m3 TWA
OSHA: 1 mg/m3 TWA
NIOSH: 0.5 mg/m3 TWA

Lead (7439-92-1)

ACGIH: 0.05 mg/m3 TWA
OSHA: 50 µg/m3 TWA (as Pb); 30 µg/m3 Action Level (as Pb, Poison - see 29 CFR 1910.1025)
NIOSH: 0.050 mg/m3 TWA

Zinc oxide (1314-13-2)

ACGIH: 2 mg/m3 TWA (respirable fraction)
10 mg/m3 STEL (respirable fraction)
OSHA: 5 mg/m3 TWA (fume); 10 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction)
10 mg/m3 STEL (fume)
NIOSH: 5 mg/m3 TWA (dust and fume)
10 mg/m3 STEL (fume)
15 mg/m3 Ceiling (dust)

Manganese (7439-96-5)

ACGIH: 0.2 mg/m3 TWA
OSHA: 1 mg/m3 TWA (fume)
3 mg/m3 STEL (fume)
5 mg/m3 Ceiling
NIOSH: 1 mg/m3 TWA (fume)
3 mg/m3 STEL

Nickel (7440-02-0)

ACGIH: 1.5 mg/m3 TWA (inhalable fraction)
OSHA: 1 mg/m3 TWA
NIOSH: 0.015 mg/m3 TWA

Tin (7440-31-5)
ACGIH: 2 mg/m3 TWA
OSHA: 2 mg/m3 TWA
NIOSH: 2 mg/m3 TWA

Cadmium (7440-43-9)
ACGIH: 0.01 mg/m3 TWA; 0.002 mg/m3 TWA (respirable fraction)
OSHA: 2.5 µg/m3 Action Level; 5 µg/m3 TWA (Do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney disease. see 29 CFR 1910.1027)

Molybdenum (7439-98-7)
ACGIH: 10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction)
OSHA: 10 mg/m3 TWA

Cobalt (7440-48-4)
ACGIH: 0.02 mg/m3 TWA
OSHA: 0.05 mg/m3 TWA (dust and fume)
NIOSH: 0.05 mg/m3 TWA (dust and fume)

Vanadium (7440-62-2)
OSHA: 0.05 mg/m3 TWA (respirable dust, as V2O5); 0.05 mg/m3 TWA (fume, as V2O5)
NIOSH: 1 mg/m3 TWA (dust, listed under Ferrovanadium dust)
3 mg/m3 STEL (dust, listed under Ferrovanadium dust)

Arsenic (7440-38-2)
ACGIH: 0.01 mg/m3 TWA
OSHA: 0.5 mg/m3 TWA
NIOSH: 0.002 mg/m3 Ceiling (15 min)

Zirconium (7440-67-7)
ACGIH: 5 mg/m3 TWA
10 mg/m3 STEL
OSHA: 5 mg/m3 TWA
10 mg/m3 STEL
NIOSH: 5 mg/m3 TWA
10 mg/m3 STEL

Engineering Controls

Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields.

Personal Protective Equipment: Skin

Use impervious gloves.

Personal Protective Equipment: Respiratory

When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH/MSHA approved respiratory protection must be provided.

Personal Protective Equipment: General

Use good industrial hygiene practices in handling this material.

* * * Section 9 - Physical & Chemical Properties * * *

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

Appearance:	Depends on scrap composition.	**Odor:**	NA
Physical State:	Solid	**pH:**	NA
Vapor Pressure:	NA	**Vapor Density:**	NA
Boiling Point:	NA	**Melting Point:**	NA
Solubility (H2O):	Insoluble	**Specific Gravity:**	NA
Evaporation Rate:	NA	**VOC:**	NA
Octanol/H2O Coeff.:		**Flash Point:**	NA
Flash Point Method:	NA	**Upper Flammability Limit (UFL):**	NA
Lower Flammability Limit (LFL):	NA	**Burning Rate:**	NA
Auto Ignition:	NA		

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

In case of fire, molten metal may react violently with water.

Incompatibility

None under normal use.

Hazardous Decomposition

Decomposition of this product may yield metallic oxides.

Possibility of Hazardous Reactions

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Dose Effects

A: General Product Information

Operations or fire which supply sufficient energy to the product (i.e. welding, high speed grinding or melting) can release dust or fumes which may make components of the product biologically available. Exposure to dusts or fumes from some metals including iron, zinc, manganese, chromium, cobalt and copper can produce a condition known as metal fume fever. Iron dust can irritate the eyes and respiratory tract by mechanical action. Acute iron poisoning may involve hemorrhagic vomiting and diarrhea, abdominal pain, acidosis, coagulaopathy, shock, coma and convulsions followed by hepatic and renal failure and perhaps cardiovascular collapse. Chronic inhalation of iron has resulted in mottling of the lungs, a condition referred to as siderosis. Zinc poisoning can cause anemia, lethargy and dizziness. Early signs of manganese poisoning are sluggishness, loss of appetite, sleepiness, weakness in the legs, uncontrollable laughter, hallucinations, delusions, spastic or slow gait, speech impairment, aggressiveness, tremor, mask-like faces, and clumsy movements. May also result in CNS effects, anemia and lung damage.

Aluminum soluble compounds, when ingested or inhaled, may have neurotoxic effects evidently due to the metal binding to nervous tissue. Chronic overexposure to aluminum can result in lung damage and has been associated with asthma-like syndrome. Accumulation of aluminum in the body may result in neurological damage, anemia and bone softening. With acute exposure, arsenic can cause damage to mucous membranes and skin, and is a severe eye and respiratory tract irritant. Arsenic can also cause severe gastrointestinal damage, muscle cramps, cardiac abnormalities, anemia, decreased white blood cell count, and enlargement of the liver. Ingestion of boron in humans can cause gastrointestinal effects. There are also reports of effects of boron on the liver and kidney. Systemic effects from ingestion of nickel include capillary damage, kidney damage, myocardial weakness and central nervous system depression. Allergic skin sensitization reactions are the most frequent effect of exposure to nickel compounds. Exposure to nickel compounds may also result in allergic lung sensitization. Exposure to copper fume or dust can cause respiratory tract irritation, hemolytic anemia and allergic contact dermatitis. Lead has been found to have toxic effects on both the central and peripheral nervous systems. Acute exposure to lead may cause acute encephalopathy which is accompanied by the symptoms of ataxis, coma, and convulsions. As toxicity progresses, symptoms of peripheral neuropathy can develop, as well as some cases of irreversible kidney damage. Effects of overexposure to cobalt include lung effects (irritation, fibrosis, asthma, pneumoconiosis), goiter and cardiovascular effects (cardiomyopathy), and allergic skin and lung sensitization reactions. Dusts and fumes from this product may cause cancer, reproductive and/or birth defects. Cadmium is a cancer suspect agent. May cause lung, kidney and liver damage. Causes digestive and respiratory tract irritation. May cause reproductive and fetal effect.

B: Component Analysis - LD50/LC50

Carbon (7440-44-0)
Oral LD50 Rat: >10000 mg/kg

Iron (7439-89-6)
Oral LD50 Rat: 984 mg/kg

Silicon (7440-21-3)
Oral LD50 Rat: 3160 mg/kg

Zinc oxide (1314-13-2)
Oral LD50 Rat: >5000 mg/kg

Manganese (7439-96-5)
Oral LD50 Rat: 9 g/kg

Nickel (7440-02-0)
Oral LD50 Rat: >9000 mg/kg

Cadmium (7440-43-9)
Oral LD50 Rat: 2330 mg/kg; Inhalation LC50 Rabbit:8 mg/L/4H

Cobalt (7440-48-4)
Inhalation LC50 Rat: >10 mg/L/1H; Oral LD50 Rat:6170 mg/kg

Arsenic (7440-38-2)
Oral LD50 Rat: 763 mg/kg

Boron (7440-42-8)
Oral LD50 Rat: 650 mg/kg

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

Carcinogenicity

A: General Product Information

Although some lead salts have produced tumors in animals, the evidence is insufficient to determine the carcinogenicity of lead in humans. Inorganic arsenic can produce lung, skin and lymphatic cancer with long term occupational exposure above the established limits. A significant excess of lung cancer mortality was seen in a study of hard metal workers with at least one year of cobalt exposure. The carcinogenic effect of nickel has been well documented in occupationally exposed nickel refinery workers. Lung and nasal cancers were the predominant forms of cancer in the exposed workers. Studies indicate workers exposed to cadmium have an increased rate of prostate and respiratory tract cancer.

B: Component Carcinogenicity

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Chromium (7440-47-3)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Monograph 49 [1990] (listed under Chromium and Chromium compounds), Supplement 7 [1987] (Group 3 (not classifiable))

Lead (7439-92-1)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
OSHA: 50 µg/m3 TWA (as Pb); 30 µg/m3 Action Level (as Pb, Poison - see 29 CFR 1910.1025)
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 87 [2006] evaluates inorganic lead compounds as Group 2A and organic lead compounds as Group 3. (Group 2A (probably carcinogenic to humans))

Nickel (7440-02-0)

ACGIH: A5 - Not Suspected as a Human Carcinogen
NIOSH: potential occupational carcinogen
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Monograph 49 [1990], Supplement 7 [1987] (Group 2B (possibly carcinogenic to humans))

Cadmium (7440-43-9)

ACGIH: A2 - Suspected Human Carcinogen
OSHA: 2.5 µg/m3 Action Level; 5 µg/m3 TWA (Do not eat, drink or chew tobacco or gum or apply cosmetics in regulated areas. Carcinogen - dust can cause lung and kidney disease. see 29 CFR 1910.1027)
NIOSH: potential occupational carcinogen
NTP: Known Human Carcinogen (Select Carcinogen)
IARC: Monograph 58 [1993], Supplement 7 [1987] (Group 1 (carcinogenic to humans))

Cobalt (7440-48-4)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
IARC: Monograph 86 [2006] (without tungsten carbide), Monograph 52 [1991] (Group 2B (possibly carcinogenic to humans))

Arsenic (7440-38-2)

ACGIH: A1 - Confirmed Human Carcinogen
NIOSH: potential occupational carcinogen
IARC: Monograph 84 [2004] (in drinking water), Supplement 7 [1987], Monograph 23 [1980] (Group 1 (carcinogenic to humans))

Zirconium (7440-67-7)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Mutagenicity

Aluminum and cobalt have been shown to increase the number of sister chromatid exchanges. Nickel inhibited DNA repair and induced transformation in experimental assays.

Teratogenicity

Manganese and aluminum have been shown to have teratogenic effects. Manganese, copper and nickel have been reported to have adverse reproductive effects in experimental animals. Copper and nickel have been shown to be fetotoxic in experimental animals. Excessive zinc levels have been reported to be associated with increased risk for neural tube defects. Lead has a wide variety of reproductive effects in humans. It can affect the male and female reproductive organs as well as egg and sperm production and development. Lead can also cause neurodevelopmental debilitations in children from both prenatal and postnatal exposures.

Neurological Effects

Chronic overexposure to manganese compounds may result in CNS effects such as weakness, sleepiness, emotional instability and spastic gait. These effects can be permanent. Symptoms of lead toxicity include behavioral disturbances including irritability, restlessness, insomnia, and other sleep disturbances, fatigue, vertigo, headache, poor memory, tremor, depression, and apathy. In acute lead encephalopathy, neurological damage can be permanent. Inhalation of fine aluminum particles has produced progressive encephalopathy, followed by dementia and convulsions.

Other Toxicological Information

Under normal conditions of handling, the likelihood of inhaling or ingesting amounts necessary for these effects to occur is very small.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Copper (7440-50-8)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	23 µg/L	
96 Hr LC50 Oncorhynchus mykiss	13.8 µg/L	
96 Hr LC50 Lepomis macrochirus	236 µg/L	
72 Hr EC50 Scenedesmus subspicatus	120 µg/L	
96 Hr EC50 water flea	10 µg/L	
96 Hr EC50 water flea	200 µg/L	

Zinc (7440-66-6)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	6.4 mg/L	
96 Hr EC50 Selenastrum capricornutum	30 µg/L	
72 Hr EC50 water flea	5 µg/L	

Iron (7439-89-6)

Test & Species		Conditions
96 Hr LC50 Morone saxatilis	13.6 mg/L [static]	

Lead (7439-92-1)

Test & Species		Conditions
96 Hr LC50 Pimephales promelas	6.5 mg/L	
48 Hr EC50 water flea	600 µg/L	

Nickel (7440-02-0)

Test & Species		Conditions
96 Hr LC50 Oncorhynchus mykiss	31.7 mg/L	adult
96 Hr LC50 Pimephales promelas	3.1 mg/L	
96 Hr LC50 Brachydanio rerio	>100 mg/L	

72 Hr EC50 freshwater algae (4 species)	0.1 mg/L
72 Hr EC50 Selenastrum capricornutum	0.18 mg/L
96 Hr EC50 water flea	510 µg/L

Cadmium (7440-43-9)

Test & Species		Conditions
96 Hr LC50 Oncorhynchus mykiss	0.0013 mg/L	swimup
96 Hr EC50 water flea	9.9 µg/L	

Cobalt (7440-48-4)

Test & Species		Conditions
96 Hr LC50 Brachydanio rerio	>100 mg/L [static]	

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

Component Waste Numbers

Chromium (7440-47-3)
RCRA: 5.0 mg/L regulatory level

Lead (7439-92-1)
RCRA: 5.0 mg/L regulatory level

Cadmium (7440-43-9)
RCRA: 1.0 mg/L regulatory level

Arsenic (7440-38-2)
RCRA: 5.0 mg/L regulatory level

Disposal Instructions

Byproducts and residues from this product may be reprocessed or recycled. Whatever cannot be recycled should be managed in an appropriate and approved waste disposal facility. Dispose in accordance to local, state, and federal regulations.
See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

* * * Section 14 - Transportation Information * * *

US DOT Information

Shipping Name: Not Regulated

TDG Information

Shipping Name: Not Regulated

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Aluminum (7429-90-5)
SARA 313: 1.0 % de minimis concentration (dust or fume only)

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

Copper (7440-50-8)
SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Zinc (7440-66-6)
SARA 313: 1.0 % de minimis concentration (dust or fume only)
CERCLA: 1000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the solid metal released is larger than 100 micrometers)

Chromium (7440-47-3)
SARA 313: 1.0 % de minimis concentration
CERCLA: 5000 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 2270 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Lead (7439-92-1)
SARA 313: 0.1 % Supplier notification limit; 0.1 % de minimis concentration (when contained in stainless steel, brass, or bronze)
CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Nickel (7440-02-0)
SARA 313: 0.1 % de minimis concentration
CERCLA: 100 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 45.4 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Cadmium (7440-43-9)
CERCLA: 10 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 4.54 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers)

Arsenic (7440-38-2)
CERCLA: 1 lb final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is larger than 100 micrometers); 0.454 kg final RQ (no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal release is larger than 100 micrometers)

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

B: Component Marine Pollutants

This material contains one or more of the following chemicals required by US DOT to be identified as marine pollutants.

Component	CAS #	
Copper	7440-50-8	DOT regulated severe marine pollutant

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Aluminum	7429-90-5	Yes	Yes	Yes	Yes	Yes	Yes
Carbon	7440-44-0	No	No	No	No	No	Yes
Copper	7440-50-8	Yes	Yes	Yes	Yes	Yes	Yes
Zinc	7440-66-6	Yes	Yes	No	Yes	Yes	Yes
Calcium	7440-70-2	Yes	Yes	No	Yes	Yes	Yes
Iron	7439-89-6	Yes	No	No	No	No	No
Silicon	7440-21-3	No	Yes	Yes	Yes	Yes	Yes
Chromium	7440-47-3	Yes	Yes	Yes	Yes	Yes	Yes
Lead	7439-92-1	Yes	Yes	Yes	Yes	Yes	Yes
Zinc oxide	1314-13-2	Yes	Yes	Yes	Yes	Yes	Yes
Manganese	7439-96-5	Yes	Yes	Yes	Yes	Yes	Yes
Nickel	7440-02-0	Yes	Yes	Yes	Yes	Yes	Yes
Tin	7440-31-5	Yes	Yes	Yes	Yes	Yes	Yes
Cadmium	7440-43-9	Yes	Yes	Yes	Yes	Yes	Yes
Molybdenum	7439-98-7	Yes	Yes	Yes	Yes	Yes	Yes
Cobalt	7440-48-4	Yes	Yes	Yes	Yes	Yes	Yes
Titanium	7440-32-6	Yes	No	No	Yes	No	No
Vanadium	7440-62-2	Yes	Yes	No	Yes	Yes	No
Arsenic	7440-38-2	Yes	Yes	Yes	Yes	Yes	Yes
Zirconium	7440-67-7	Yes	Yes	No	Yes	Yes	Yes
Boron	7440-42-8	No	No	No	Yes	No	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

WARNING! This product contains a chemical known to the state of California to cause cancer.
WARNING! This product contains a chemical known to the state of California to cause reproductive/developmental effects.

Material Safety Data Sheet

Material Name: ASR **ID: GER-11**

Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Aluminum	7429-90-5	1 %
Copper	7440-50-8	1 %
Chromium	7440-47-3	0.1 %
Lead	7439-92-1	0.1 %
Nickel	7440-02-0	0.1 %

Additional Regulatory Information

A: General Product Information

No information available for the product.

B: Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC
Aluminum	7429-90-5	Yes	DSL	EINECS
Carbon	7440-44-0	Yes	DSL	EINECS
Copper	7440-50-8	Yes	DSL	EINECS
Zinc	7440-66-6	Yes	DSL	EINECS
Calcium	7440-70-2	Yes	DSL	EINECS
Iron	7439-89-6	Yes	DSL	EINECS
Silicon	7440-21-3	Yes	DSL	EINECS
Chromium	7440-47-3	Yes	DSL	EINECS
Lead	7439-92-1	Yes	DSL	EINECS
Zinc oxide	1314-13-2	Yes	DSL	EINECS
Manganese	7439-96-5	Yes	DSL	EINECS
Nickel	7440-02-0	Yes	DSL	EINECS
Tin	7440-31-5	Yes	DSL	EINECS
Cadmium	7440-43-9	Yes	DSL	EINECS
Molybdenum	7439-98-7	Yes	DSL	EINECS
Niobium	7440-03-1	Yes	DSL	EINECS
Cobalt	7440-48-4	Yes	DSL	EINECS
Titanium	7440-32-6	Yes	DSL	EINECS
Vanadium	7440-62-2	Yes	DSL	EINECS
Arsenic	7440-38-2	Yes	DSL	EINECS
Zirconium	7440-67-7	Yes	DSL	EINECS
Boron	7440-42-8	Yes	DSL	EINECS

* * * Section 16 - Other Information * * *

Other Information

Reasonable care has been taken in the preparation of this information, but the manufacturer makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The manufacturer makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; ADG = Australian Code for the Transport of Dangerous Goods by Road and Rail; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; AS = Standards Australia; DFG = Deutsche Forschungsgemeinschaft; DOT = Department of Transportation; DSL = Domestic Substances List; EEC = European Economic Community; EINECS = European Inventory of Existing Commercial Chemical Substances; ELINCS = European List of Notified Chemical Substances; EU = European Union; HMIS = Hazardous Materials Identification System; IARC = International Agency for Research on Cancer; IMO = International Maritime Organization; IATA = International Air Transport Association; MAK = Maximum Concentration Value in the Workplace; NDSL = Non-Domestic Substances List; NFPA = National Fire Protection Association; NOHSC = National Occupational Health & Safety Commission; NTP = National Toxicology Program; STEL = Short-term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TSCA = Toxic Substances Control Act; TWA = Time Weighted Average

Clearing the Air

Shredder plant operators have several options when taking steps to control dust and emissions.

February 2, 2011

Auto Shredding (/news/category/Auto-Shredding)

With emission control standards becoming more stringent, many shredder plant operations are taking a more proactive approach to air emissions. The metal recycling industry has matured and grown during the past several decades. With growth comes increased regulatory pressures and public scrutiny. It is important to review past practices, implementing new procedures and technology as needed to handle future emission challenges.

The recycling of end-of-life vehicles (ELVs) and other obsolete consumer products is a well-established industry with many economic and environmental benefits. Each year, as many as 30 million ELVs are processed worldwide through an infrastructure that typically concludes when the bulk of the vehicle ends up in a metal shredding facility. It is estimated that there are some 700 such facilities worldwide.

The environmental benefits of recycling metals vs. production from raw materials are well-documented. The energy required to recycle aluminum is 1/20th of that required for production of virgin metal, according to Alcoa Recycling. Along with these energy savings comes a decrease in greenhouse gas emissions. Even though the net environmental benefits of recycling ELVs are clear, it is important to recognize that the recycling process is not without environmental concerns.

Concerns include vibration, noise, stormwater run-off, waste disposal and air emissions. Each of these concerns must be addressed through detailed study and application of appropriate technology to minimize impact. The intent of this article is to focus on air emission problems and solutions around the scrap yard.

Particle Matters

As material that will become shredder feedstock is delivered to the scrap facility it is off-loaded and sorted into the appropriate areas based on scrap type. This process has the potential to generate dust as the incoming scrap is moved from pile to pile. This is particularly true when the incoming scrap has a high dirt content.

The shredder feedstock is loaded onto the infeed conveyor where it is conveyed to a feed ramp. Feedstock is then fed into the shredding chamber using a roller feeding device. As the feedstock enters the chamber it is struck by rapidly rotating hammers, which rip and deform the material until the particle size has been reduced sufficiently to fall through sizing grids around the circumference of the chamber. During the shredder process, any dirt and dust contained within the feed material can be liberated and carried into the air. In addition, as the material is pulverized, additional dust is created.

As the shredded material exits the shredder it is conveyed through various arrangements of downstream equipment. There are many process flow alternatives designed to produce a clean shredded ferrous product. Options include magnetic separation only, air sifting (Z-box) followed by magnetic separation and magnetic separation followed by air sifting. Regardless of configuration, the potential exists for dust emissions. It is important to note that emissions are an inherent part of most process equipment, even when there is not a typical source, such as a stack or chimney.

The shredded ferrous material is ultimately conveyed and stored in large stockpiles. There is potential for significant dust generation as the shredded steel falls from the end of the stacking conveyor. Large drop distances are also potential problem areas at various other material transfer points within the plant.

Auto shredder residue (ASR) is the mix of materials remaining after the ferrous fraction has been removed. This material is typically sized (with trommels and screens) before being conveyed to eddy current separators and air-ejection sensor sorters for nonferrous metal recovery. The remaining material is then stored, waiting for transport either to an off-site specialized sorting facility or to the landfill. The light dusty nature of ASR creates great potential for fugitive dust in this area of the plant.

Water and Foam

The injection of water and foam are commonly used dust-suppression strategies. This technology is utilized in many process industries, including coal mining, aggregate crushing and metals recycling.

Water injection systems (WIS) are designed to assist in dust emission control by injecting water into the shredder box during operation. The injected water turns into steam when it contacts the hot shredded fragments inside the shredder chamber. Particulate dust reduction then takes place as airborne steam droplets capture dust particles.

In addition to dust suppression, the system also reduces the frequency and magnitude of explosions within the shredding chamber. The steam generated by the WIS lowers the oxygen concentration inside the mill.

It is important that the shredder is fed in a consistent manner to provide plenty of material to fill the shredding chamber.

Foam injection is similar to water injection in that the foam is injected into the shredding chamber with the purpose of capturing emissions at the source. The foam injection system often consists of a mixing/pumping unit and piping system. The mixing unit mixes a custom chemical with water and air to produce the foam, which is then pumped to strategic locations within the shredder.

Foam-injection systems are typically run continuously without any feedback from the shredding equipment. This is in contrast to WIS, which typically varies water flow based on system feedback. The foam systems have a consistent amount of foam flowing into the shredder regardless of the shredder load. For this reason, the foam systems tend to perform better in shredders lacking consistent feed.

Both WIS and foam injection systems have the potential for wet and “sticky” material if they are not correctly configured to specific operating conditions.

Vacuum Technology

Dry shredder emission control involves extensive dust-collection equipment with vacuum points at and around the shredder. Vacuum air from the shredder is conveyed through a network of ducts and air emission-control devices. Typical control equipment includes cyclones, scrubbers and bag houses filters. These systems must be designed to handle very large dust volumes and shredder explosions.

In Europe, the prevailing technique involves suction from the top section of the shredder. This method provides for effective evacuation of the shredder chamber. However, sometimes it can be too aggressive, leading to excessive material suction, which can

lead to clogged duct work and loss of metals. In addition, there is a greater risk of secondary explosions within downstream emission control equipment, as fumes that rise to the top section of the shredder are carried to control vessels and ignited by sparks.

Other methods of dust extraction around the shredder have also been successfully implemented. Two common locations for secondary dust extraction include the shredder discharge hood and the area above the shredder inlet. Suction from these locations provides some of the benefits of suction from the shredding chamber with less risk of clogging and secondary explosions. Several shredders are operating currently with a combination of suction locations.

The dust-laden air stream is typically introduced to a high-efficiency cyclone as the primary control device. The cyclone is designed to remove a large portion of the particulate through centrifugal force as the air spirals through the cyclone cone. The captured particulates are discharged through a rotary air lock while the exiting air continues on to additional control devices such as filters or wet scrubbers.

The air stream typically continues on to some form of wet scrubber. Wet scrubbers today are usually a form of venturi design and offer high collection efficiency (99 percent or greater into the submicron range) and the added benefit of safety against hot embers, which can cause fires within bag houses. The wet scrubbing process comes with operational drawbacks, namely high power consumption (often more than 500 horsepower) and process water disposal.

Shredder Emission Control Trends

Regulatory and public scrutiny of shredder operations varies widely. Many existing shredder permits cover only particulate matter (PM) concerns without addressing hazardous air pollutants (HAPs). Leading environmental consultants today are seeing more requests by authorities to identify and handle any HAP emissions for new permits.

Evaluation of potential contaminants such as metals (lead), volatile organic compounds (VOCs, such as benzene), poly-nuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) are required. For the most part, agencies have been satisfied with promises to implement strict institutional controls (material acceptance plans, vehicle inspection and pre-shred processing) to remove chemicals of concern from the shredder feed.

It is clear that the outcomes of any stack tests are somewhat arbitrary and highly dependent on the condition of material being fed

into the shredder. Automobiles that do not have fluids drained will emit VOCs and PAHs, batteries will produce lead, and transformers or old capacitors will exhibit PCBs emissions. An effective pre-shred screening procedure is the best defense to HAPs.

There is an increasing trend within the shredding industry to be proactive to environmental concerns. This is evident in the increase of indoor facilities and installation of advanced shredder suction systems on some shredders in California. These air systems are designed to address VOCs in addition to PM.

As the shredding industry evolves and environmental regulations expand, the use of advanced control equipment will become more common.

The author is vice president of technology with Metso Minerals Industries Inc. in its San Antonio office. He can be contacted at **scott.mcglothlin@metso.com**.

EDITORIAL VIDEO

(/paper-market-report-june-2020-video.aspx)

Paper Market Report: June 2020 (/paper-market-report-june-2020-video.aspx)

October 16, 2017

City of Chicago, Department of Public Health
Attn: Environmental Permitting and Inspections
333 South State Street, Room 200
Chicago, IL 60604

Re: Watco Transloading, LLC Variance Request

To Whom It May Concern:

Thank you for the opportunity to comment on the July 31, 2017 request of Watco Transloading LLC for a variance ("Request") from the Chicago Department of Public Health's ("CDPH") Rules and Regulations for Control of Emissions from the Handling and Storage of Bulk Material Piles ("Rules"). These comments are submitted on behalf of the Natural Resources Defense Council ("NRDC") and our more than 11,000 members and activists in the City of Chicago ("City"), including those who reside on the Southeast Side in the Calumet area, as well as the Southeast Environmental Task Force ("SETF"), an active community group dedicated to improving the Calumet neighborhood's environment; and the Southeast Side Coalition to Ban Petcoke ("SSCBP"), a community group fighting for a healthy, thriving neighborhood free of petroleum coke, manganese, and other toxins. Please note that some of the named groups have submitted additional, separate comments that address specific areas of concern or interest.

Introduction

For the reasons set forth below, the Request – which renews the prior owner-operator's recently denied request to avoid critical monitoring for particulate matter ("PM") – is incomplete and otherwise fails to demonstrate that the requested variance will not have an adverse impact on the community and environment. Watco's own opacity testing results demonstrate that it cannot consistently control the site's dust in a manner that is protective of public health and require CDPH to deny Watco's Request.

Indeed, CDPH must do more to protect the community from neurotoxic manganese dust by banning handling of the substance in close proximity to residential neighborhoods. U.S. EPA considers the area surrounding Watco an environmentally overburdened community, and its high levels of exposure to particulate matter, air toxics and other respiratory hazards place it in the top 95% in the state of Illinois.[1] Existing data from S.H. Bell's monitoring and Watco's opacity testing support the need for CDPH to take immediate action to protect public health. If CDPH won't act immediately to ban

[1] *See* U.S. EPA Website, "Environmental Issues in Southeast Chicago," https://www.epa.gov/il/environmental-issues-southeast-chicago.

manganese in this densely populated community, we call upon CDPH to promptly complete the manganese assessment, that we understand is underway, and move quickly to update the Rules and recommend land use code changes as needed to protect public health. In addition, CDPH must at a minimum require additional monitoring and robust additional controls at Watco due to its handling of manganese and proximity to residential neighborhoods. These measures should include, but are not limited to, installation of at least one filter-based metals monitor, storage of all manganese-containing materials inside, and conducting of all manganese handling/transfer activities indoors as well. While neurotoxic manganese dust was not at the front of people's minds during adoption of the Rules, controlling this community hazard is well within CDPH's general authority and the Rules themselves.[2]

In support of this Request, Watco submits information that actually reinforces the appropriateness of rejecting a variance without any further analysis: Its own opacity test results demonstrate a violation of the City's 10% opacity limit during barge-to-truck operations.[3] This unwitting reporting of a violation illustrates the company's lack of familiarity with the City's Rules and blind eye to their history. Moreover, these are the test results conducted and submitted by the company and submitted to bolster its Request; the actual dust levels are likely even higher when the facility is not putting on a "beauty show" to bolster its variance application, both with regards to the barge-to-truck operations and other outdoor operations such as truck unloading. This test data alone justifies denying Watco's Request.

However, also missing from the record is an updated fugitive dust plan that commits Watco to following the various dust control measures described in its variance Request. CDPH at minimum should not grant a variance before the company provides such a critical piece of the puzzle, and should provide additional opportunity for public comment if and when the company provides the required dust plan.

We also highlight a disturbing theme in the Request: Watco cherry picks data and engages in analytic sleight of hand in an effort to downplay the scale of its operations, discredit reasonable interpretations of evidence of its dust impacts, in particular manganese, and most offensively misrepresent the size and nature of the impacted community. In one part of the Request, the company highlights certain data to make its case; in another, it ignores the same data that would weigh against the point it attempts to

[2] *See* Rules Section 3.0(1), "[t]he Department reserves the right to impose dust control requirements, in addition to the requirements set forth in these Rules and Regulations, as conditions of the Facility's certificate of operation, if the Commissioner finds that the Facility has failed to control fugitive dust." This is in keeping with the broad authority afforded CDPH to protect air under Section 2-112-160 of the Municipal Code to develop "any rules necessary to implement . . . the Air Pollution Control Ordinance." *See* Dust Rules.

[3] Request at 18.

make. This disingenuous positioning detracts from Watco's credibility and casts the company in a negative light more generally.

The Request not only misleads CDPH, but in so doing also fails to describe elements required for a variance under Section 8.0(2) and Section 3.0(4) of the City's Dust Rules:

- Volume: In describing its operations,[4] Watco downplays the sheer volume of material that it handles by comparing itself to competitor S.H. Bell on a percentage basis;
- Affected Community: In describing the impacted community, Watco narrows its focus to the 60633 zip code and the annual prevailing southerly wind, while omitting the fenceline community immediately to the south of Watco and ignoring the strong northerly winds that prevail at certain times of year, and it omits reference to the socioeconomic status of the surrounding communities; and
- Adverse Impacts: In describing whether the facility poses an adverse impact on the surrounding community, Watco relies on a small percentage of data points for other sources of manganese in the area and claims they make the case that Watco is not a source at all.

Add to these shortcomings a failure to demonstrate that the cost of installing and operating the monitors would be an arbitrary and unreasonable hardship on a subsidiary of one of the largest rail and transloading companies in the U.S., a company based in Kansas with international operations as well as operations throughout the U.S., and the need for the City to deny the Request is clear.

The regulatory background against which Watco makes its Request is also relevant to the City's determination. Several years into implementation of the Rules, we have seen many companies initially submit variance requests moaning about the burden on their facilities of various control and monitoring requirements, with a number ultimately conceding that they actually can comply after all. For example, Watco itself demonstrates that Kinder Morgan's attempt to avoid the weather station requirement was rightly denied by the City.[5] S.H. Bell similarly retracted several variance requests that it initially submitted to the City.[6] S.H. Bell and KCBX resisted installing continuous PM and metals monitors and claimed to control their dust robustly – only to have those monitors identify levels of PM and metals that pose hazards to the surrounding community once installed.[7]

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[4] Section 8.0(2)(b) and (c).
[5] Watco thus has already agreed to incur one of the costs associated with PM monitoring.
[6] Ex. 1, Letter from Kim Walberg, Attorney for S.H. Bell, to Otis Omenazu, Chief Air Engineer, CDPH, Response to January 26, 2015 Request for Additional Information, March 3, 2015, at 2-3, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/SHBellResReqAddlInfo332015.pdf.
[7] *See* Ex. 2, ATSDR, Health Consultation, Review of Analysis of Particulate Matter and Metal Exposures in Air, KCBX, August 22, 2016, available at https://www.atsdr.cdc.gov/hac/pha/KCBXPetroleumCoke/KCBX_Petroleum%20Coke_HC_508.pdf.

Similarly, the S.H. Bell experience in East Liverpool demonstrates that manganese dust impacts are much greater at communities closer to the facility. And S.H. Bell acknowledges that evaluation of the monitoring data led the company to identify areas for additional controls, further demonstrating the value of this information.[8]

In sum, experience to date demonstrates that the baseline requirements of the City's Rules are the minimum requirements needed to protect public health, and variances from these requests should only be granted in the truly exceptional case that a company meets the high standard for a variance. The utility of the PM monitoring data in particular has been made clear by this history. Indeed, experience with the Rules shows the need for strengthening, not diluting, them. Watco's Request for a variance thus should be denied.

CDPH Must Deny the Applicant's Request to Avoid Installing PM Monitors

Background: City's Dust Rules and Variance Process

The City has ample authority to address the health risks posed by Watco's operations. The Commissioner has broad authority and responsibility to protect public health and the environment by regulating activities that have the potential to cause windborne dust; this authority extends to activities, associated with the material handling and storage, that CDPH deemed likely to create airborne dust: bulldozing and grading, material dropping operations, equipment travel on the surfaces of stockpiles, and vehicle travel on paved roads.[9] Under the City's Dust Rules, CDPH appropriately requires that facilities have the capacity to prevent, detect and respond to potential releases of windborne material. To this end, CDPH mandates the development and implementation of a proactive fugitive dust plan. Every fugitive dust plan must contain some required elements, but CDPH also expressly allows flexibility for businesses to develop plans that make the most sense based on their unique operations.[10] However, the actual success of a fugitive dust plan is not left to guesswork. For CDPH, the most reliable means to demonstrate the success of a fugitive dust plan for operators, regulators and residents is through uniform, empirically verifiable PM monitoring.

[8] Ex. 3, Letter from Kim Walberg, Attorney for S.H. Bell, to Dr. Julie Morita, Commissioner, CDPH, S.H. Bell Company, 10218 South Avenue O September 2017 Revised Fugitive Dust Plan, September 13, 2017 ("S.H. Bell September 2017 Letter").

[9] Ex. 4, City of Chicago Department of Public Health, Official Response to Public Comments on the Proposed Rules and Regulations For The Handling and Storage of Bulk Material Piles, March 13, 2014, at 3-4, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/CityofChicagoResponsetoCommentsReceivedonBulkMaterialRules.pdf.

[10] *Id.* at 21.

It is not an exaggeration to state that PM monitoring is the lynchpin of the CDPH protocol. As stated by CDPH:

> The requirement for fugitive dust monitoring is a critical component of the regulations to ensure that the facility's dust control measures are working. CDPH inspectors cannot observe facility operations on a daily basis. And facility workers who are occupied in doing their jobs may not always realize when there is a dust problem. Therefore, the PM monitors are important for alerting facility operators when there might be an issue with their dust control systems. They are also important to ensure compliance with the fugitive dust prohibition, as well as to give neighbors a level of comfort in knowing the air is being monitored.[11]

Because of the importance of PM monitoring, the variance standard for avoiding this critical measure is the most difficult of any requirement in the CDPH regulations.

In response to concerns we raised during the development of the variance process rules,[12] the City added requirements for variance applications, included an opportunity for public comment and criteria for reviewing the variance application.[13] Under the improved variance process, the Commissioner is empowered to hold applicants' demonstrations to high standards and to pay close attention to the interests of the public articulated through their written comments.

In our past variance comments, we provided additional general comments to guide the City's review of variance requests. We emphasized the shortcomings in historic efforts to assess and control fugitive dust, and the need for the City to demand robust demonstrations from variance requestors. We also highlighted that some increased costs to comply with the Rules, above and beyond past obligations, are to be expected and should not themselves be considered an undue burden. With several years of requests and a number of CDPH variance determinations in those years, we are disappointed by the delay in issuing some determinations. At the same time, we are heartened by the line that the City has drawn in denying a number of determinations and rejecting unsupported and unjustified requests, most notably KCBX's request for a variance regarding indoor storage of petcoke and coal and S.H. Bell's request to avoid PM monitoring.

Standard for Obtaining Variance from PM Monitoring Requirements

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[11] *Id.* at 23.

[12] Ex. 5, Comments of NRDC et al. on CDPH's Proposed Rules and Regulations for the Handling and Storage of Bulk Material Piles, 2014, at 38-40, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/PetCoke_Public_Comments/NRDC_SETF_Alliance_for_the_Great_Lakes_ELPC_Faith_in_Place_RHAMC_and_Sierra_Club_Recvd_2-7-14.pdf.

[13] Section 8.0.

Section 8.0(2) of the Dust Rules provides the requirements for a variance request which include in relevant part:

- A description of the process or activity for which the variance is requested including pertinent data on location, size and the population and the geographic area affected by, or potentially affected by, the process or activity.
- The quantity and types of materials used in the process or activity in connection with which the variance is requested, as appropriate.
- A demonstration that the issuance of the variance will not create a public nuisance or adversely impact the surrounding area, surrounding environment, or surrounding property uses.
- A statement explaining:
    a. Why compliance with the regulations imposes an arbitrary or unreasonable hardship;
    b. Why compliance cannot be accomplished during the required timeframe due to events beyond the Facility Owner or Operator's control such as permitting delays or natural disasters; or
    c. Why the proposed alternative measure is preferable.
- A discussion of alternate methods of compliance and of the factors influencing the choice of applying for a variance.[14]

In addition to the exacting variance standards in Section 8.0, the standard for a variance from PM monitoring is also addressed in Section 3.0(4), which establishes the following threshold criteria:

> Unless…the Facility Owner or Operator establishes that the Facility's operations do not result in off-site fugitive dust emissions, the Facility Owner or Operator must install, operate, and maintain, according to manufacturer's specifications, permanent, continuous Federal Equivalent Method (FEM) real-time PM 10 monitors around the perimeter of the facility…

Simply, the applicant in this case must establish its operations do not result in off-site fugitive dust emissions as a result of any of its activities – *e.g.*, bulldozing and grading, material dropping operations, equipment travel on the surfaces of stockpiles, and vehicle travel on paved roads. The applicant must establish that these kinds of operations do not result in off-site fugitive dust emissions over the full range of weather and operating conditions. The applicant must establish "no off-site fugitive dust emissions" for every compass point around the perimeter of its facility, be it a waterway, public road, or residential neighborhood. If an applicant fails to establish "no fugitive off-site dust

[14] Dust Rules, Section 8.0(2).

emissions," it cannot be granted a variance from the requirement to establish a PM monitoring system in accordance with the regulations.

The stringency of this standard is evident in the City's denial of two out of three other requests to avoid PM monitoring,[15] with permission to forego such monitoring granted only to Gulf Sulphur Services to date based on the CDPH's finding regarding the "unique nature of prilled sulphur" that "results in a reduced chance of creating fugitive dust as compared to other materials."[16] While Watco seeks to reverse CDPH's rejection of its predecessor Kinder Morgan's attempts to avoid PM monitoring, that effort should fail.

In light of CDPH's approach – operational flexibility but a mandatory requirement to monitor – Watco's Request for a variance from PM monitoring is ill-conceived. From our perspective, the applicant must operate a PM monitoring system now and take measures to prevent off-site fugitive dust emissions. If these measures prove effective in eliminating fugitive off site dust emissions at some point in the future, this would be the point at which a variance request could be considered, not before.

For Watco, this does not mean a variance is impossible; instead, it means the applicant cannot meet this exacting standard now. Without irony, we would point out that the best way for the applicant to attempt to demonstrate that there are no off-site fugitive dust emissions is to establish the PM monitoring network now required by the regulations. Following site improvements, if PM monitoring establishes that there are "no off-site fugitive dust emissions" over a representative period of time and range of conditions, then this is the point at which to seek a variance from an ongoing obligation to continue this monitoring. The monitoring would establish an objective empirical basis for the variance that would have credibility for regulators, other regulated entities and residents.

In the meantime, in the event the monitoring system detects off-site dust emissions not anticipated by the applicant, it will provide a basis for further refinement of its fugitive dust plan. Indeed, in its recent submission of a revised fugitive dust plan following CDPH's rejection of its prior plan and U.S. EPA's Notice of Violation, S.H. Bell

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[15] *See* Ex. 6, 7, and 8, CDPH Determinations on variance requests from Kinder Morgan, S.H. Bell, and Gulf Sulphur, respectively, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/2017/CDPHDeterVarReqKinderMorgan_5032017.pdf, https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/CDPHDeterVarReqSHBellCo10172016.pdf, and https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/CDPHDeterVarReqfromGulfSulphurSrvcs_8152016.pdf.

[16] Ex. 8, CDPH Gulf Sulphur variance determination at 1-4. We note that we continue to take issue with CDPH's grant of the PM monitoring variance to Gulf Sulphur based on the concerns articulated in our variance comments of June 2014, and reference the agency's determination solely to support that a variance from PM monitoring requirements is the rare exception rather than the norm.

discusses the role that PM monitoring data played in its identification of its box filling operation as requiring additional dust controls, terming its process "data drive evaluation."[17] This type of empirically based, data-driven objective analysis has been sorely missing in dust control writ large, and is a major achievement of the City's Rules that CDPH should uphold. In any event, it is much more likely that the task of developing and implementing a fugitive dust plan will be taken seriously if the results are verified by perimeter PM monitors, operated according to a uniform regulatory protocol.

Impacts of Manganese on Public Health

We incorporate by reference our prior comments on the threats to public health from manganese dust.[18] In sum, manganese is a potent neurotoxin that at higher exposures results in Parkinson-like symptoms and at lower exposures more subtle negative impacts to motor coordination and cognitive functions.

In addition, while few studies to date have looked in-depth at the impacts of acute exposures to manganese on humans due to challenges in assessing exposures and measuring outcomes, there is reason to believe that acute exposures to elevated manganese also have negative impacts on people's neurological systems. According to the Agency for Toxic Substances and Disease Research's Toxicological Profile for Manganese, "[r]eports of human exposure at acute and intermediate durations (i.e., 15–364 days) indicate adverse respiratory and neurological effects," though the reports consist of anecdotal case studies and lack quantitative exposure values needed for derivation of an acute screening level.[19] The toxicological profile also discusses animal studies in which short-term exposures to elevated manganese levels resulted in measurable neurological outcomes, *e.g.*, "a spectrum of exposure-related changes in biochemical markers of neurotoxicity in various regions of the exposed monkeys."[20] Recently published research on the impact of exposure to manganese fumes among welders, in addition, shows an approximately linear dose-response curve.[21] Thus, CDPH should not only be concerned with annual and longer-term exposure to elevated manganese, but also shorter term daily and monthly exposures, such as those seen with the varying activity levels at bulk material handlers in Chicago.

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[17] Ex. 3.
[18] Ex. 9, Comments of NRDC, SETF, and SSCBP on S.H. Bell's December 2016 Variance Request, January 11, 2017, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/PubCom_NatlNursesUnitedIl_Com_SHBellVarReq_1-11-17.pdf.
[19] Ex. 10, ATSDR Toxicological Profile for Manganese, September 2012, at 20, available at https://www.atsdr.cdc.gov/toxprofiles/tp151.pdf.
[20] *Id.* at 21.
[21] *See* Ex. 11, Racette B., et al., Dose-dependent progression of parkinsonism in manganese-exposed welders, *Neurology*, January 24, 2017, Vol. 88, No. 4, 344-351.

Impacted Community, Section 8.0(2)(b)

Turning to the Request to avoid PM monitoring, Watco falls far short in describing the impacted community by looking solely at the population density within the facility's own zip code. Section 8.0(2)(b) requires the variance request or to set forth "pertinent data… on the population and geographic area affected by, or potentially affected by, the process or activity." Given that Watco is seeking to avoid entirely PM monitoring around its perimeter, and that there are residential communities in several directions downwind of the facility, Watco should have provided a more complete accounting of the surrounding area than a brief reference to a single, largely irrelevant zip code.

A proper accounting of the community impacted by a variance request is critical at the outset. The number of people in an area and their sensitivity to the health threat at issue, either due to age or other physical factors or socioeconomic status, are critical concerns from a public health perspective. The acknowledgement that this is an environmental justice community relates to the cumulative exposures and disease susceptibility, but also to the appropriateness of permitting a company to add to the community's environmental burden by avoiding required pollution reduction measures. Watco's attempted description fails entirely to provide an accurate picture of the impacted community, and disturbingly demonstrates at best a lack of awareness of its community neighbors and at worst an intentional downplaying of their existence.

Watco's facility operates on the north side of 126th Street, which is the dividing line between an industrial area and a densely populated residential neighborhood commonly called Avalon Trails or Hegewisch to the south in the direction of strong northerly winds. Residential streets – Saginaw, Marquette, Manistee and Muskegon – are directly south across 126th Street. Youth baseball fields are located to the southwest, also on the other side of 126th Street. The Calumet River, which is used extensively by recreational watercraft, is to the north.

Further north, in the direction of the southerly prevailing wind, is the densely populated East Side neighborhood. The eastern boundary of the larger Watco property is Indian Creek, which is fed from Wolf Lake, and flows through the Hyde Lake wetland and then to the Calumet River. Further to the east but less than a mile from the facility, in the direction of strong winds during winter and early spring.

Looking at the census tracts comprising Hegewisch and the East Side, the populated area within 2-4 miles of the facility contains nearly 27,000 residents.[22] Children aged 9 and under, in their critical developmental years, represent roughly 10-17% of this population depending on tract; women of child-bearing age similarly number in the thousands.

[22] Population for tracts 5501, 5502, 5203, 5204, 5205, and 5026 from the 2010 Census, available at https://www.census.gov/2010census/popmap/.

Census tracts 5206 and 5205 – the southern portion of the East Side that Watco recognizes as being upwind of the prevailing south wind from the direction of the facility – alone are home to about 18,000 people, with relative densities of approximately 6,700 and 11,200 people per square mile. While a similar tract-level analysis for Hegeswich is difficult because a significant portion of census tracts 5501 and 5502 consists of open and green/recreational space,[23] the areas to the immediate South and Southeast of the Watco site within these tracts are similarly densely populated.

According to information derived from the demographic feature of U.S. EPA's ECHO database, there are 3,780 people who live within a one-mile radius of the applicant's facility. More than 50% of the people who live within this one-mile radius are Hispanic (48.41%) or African-American (2.59%). U.S. EPA's ECHO database also indicates a total of 1,385 households in this one mile radius, with a total population of 962 children 17 years and younger.

The above figures are in stark contrast to Watco's sole focus on the 60633 zip code, with its population density of around 1,200 people per square mile,[24] and are more consistent with the population density of Chicago as a whole. Watco's zip code focus and comparison to the City writ large is misleading with respect to the impacted geography and population because a sizable portion of the 60633 zip code consists of non-residential areas located further away from the facility, rendering its overall density relatively low as compared to other parts of the City and more importantly the area around the facility.

Moreover, 60633 ironically does *not* contain the dense East Side area to the north of the facility that Watco *does* flag as being downwind between the facility and the monitors at Washington High School and in U.S. EPA's 2015 Xact Study.[25] And the majority of land in the 60633 zip code is located to the East of the facility, an area that receives relatively little wind from the facility's direction as demonstrated by the wind rose provided by Watco. The only direct acknowledgment of the Avon Trails/Hegewisch community to its south, in the direction of the strong north winds that cross the Watco site many months of the year (as taken up in more detail below), is a brief reference to the residences closest to the facility,[26] without further description of the dense community and the recreational ball fields immediately next door to Watco.

Nor does Watco provide any information on the demographics of the impacted population, ignoring that portions qualify as environmental justice communities. For

[23] This comment on residential density is meant to highlight shortcomings in the metrics that Watco chooses to describe the impacted community, and not to discount the importance of protecting air quality in open spaces and recreational areas as well, especially for children.
[24] Request at 3.
[25] *See* Request at 27.
[26] Request at 3.

example, census tracts 5206 and 5203 to the north of Watco are approximately 80% Hispanic, with annual household incomes of approximately $40,000.

Watco thus falls far short in describing "the population and geographic area affected by, or potentially affected by, the process or activity" at issue in the variance request.

Process or Activity for which the Variance is Requested, Quantity and Types of Materials Used in the Process or Activity, Sections 8.0(2)(b) and (c)

Watco also misses the mark in describing the process or activity for which the variance is requested, as well as the quantity and types of materials used in the process or activity, by downplaying the scale of its manganese operations and failing to provide detailed information on materials to CDPH. Sections 8.0(2)(b) and (c) require Watco to submit this key information as part of its variance request.

First, Watco attempts to minimize the scale of its manganese operations by comparing the percentage of manganese-containing materials that it handles to the higher percentage handled by S.H. Bell. Watco highlights that "only approximately 29% of the materials handled at the site contain manganese" compared with S.H. Bell's disclosure to U.S. EPA that "typically 90% of the materials stored at its facility contain manganese."[27] However, Watco reports having indoor storage capacity that is nearly five times S.H. Bell's total indoor and outdoor storage capacity combined (as reported in its April and September 2017 fugitive dust plans) – 885,509 tons of indoor storage at Watco[28] versus 66,400 tons of indoor storage and 140,000 tons of outdoor storage at S.H. Bell.[29] Thus, while neither company provides a clear picture of how much manganese dust-generating materials it handles and how (both claim trade secret protection for detailed information on products handled), it is not at all clear that Watco engages in lower volume, lower frequency manganese activities than S.H. Bell.

Second, Watco incorrectly asserts that it is "exempted" from providing detailed inventory information to CDPH about the names and tonnages of materials used at its facility, because that information constitutes confidential trade secrets and provision to the Department "would risk [its] release."[30] The Rules expressly require a fugitive dust plan to include "a description of the Facility's operations, including a list of all Bulk Solid Materials handled at the Facility."[31] The variance provision, in turn, requires the

[27] Request at 4, citing CDPH's Determination on Variance Request, October 17, 2016, in turn referencing U.S. EPA's Notice of Violation from July 2014.
[28] *Id.* Watco also reports have an additional 111,000 square feet of outdoor storage capacity.
[29] Ex. 12, S.H. Bell, Fugitive Dust Plan, Revised, April 2017, at 2 and Ex. 13, S.H. Bell, Fugitive Dust Plan, Revised, September 2017 (excerpt), at 2. We note that S.H. Bell appears to have changed its policy for storage of "Affected Materials" of ½ inch or smaller diameter, committing to only store such materials within bulk material storage buildings. *See* Ex. 3, S.H. Bell September 2017 Letter, at 7.
[30] *See* Request at 4.
[31] Rules at 3.0(3)(b).

requester to provide, "in detail," "the quantity and types of materials used in the process or activity" at issue in the Request.[32] Nothing in the Chicago code provision cited by Watco allows the company to withhold that information from CDPH in the first instance.

The company points to Section 11-4-310 of the Municipal Code of Chicago in support of its claim of exemption.[33] The purpose of Section 11-4-310 is to protect trade secrets that have already been disclosed to CDPH; it operates on the assumption that information containing trade secrets will necessarily be provided to CDPH. Section 11-4-310(b) gives the commissioner authority to determine the validity of a trade secret, and devise measures to protect the trade secret. Section 11-4-310(a) states that the government must shield confidential information from the public. If businesses could claim exemptions to disclosing trade secrets to the CDPH, the protections and procedures outlined in Section 11-4-310 would be meaningless.

In addition, it is not clear that a description of materials being handled and the tonnages being handled, as required by the Rules, do in fact constitute protected trade secret information that the City may not disclose to the public. Section 11-4-120 of the Municipal Code defines a trade secret as "any scientific or technical information…or business plan which is secret in that it has not been published or disseminated or otherwise become a matter of general public knowledge, and which has competitive value." The City's zoning regulations require handlers of coal and petroleum coke to report monthly tonnage information for each of these materials.[34] KCBX has complied with this requirement for several years without to our knowledge claiming trade secret protection, and the City has disclosed the reported information upon Request by the public. Thus, information on the types of materials and tonnages handled by KCBX is a matter of general public knowledge, and so weighs against granting trade secret status to parallel information from Watco (or S.H. Bell).

Watco's Own Opacity Testing Demonstrates that the Company Violated the Rules' Opacity Limit During Barge Unloading Activities

As noted above, Watco's own opacity testing demonstrates that the PM monitors are needed and the variance request should be denied. Watco submits as part of its Request opacity testing data showing that the facility's barge-to-truck operations were in violation of the Rules' 10% opacity limit earlier this year. Notably, CDPH cited concerns with dust

[32] Rules at 8.0(2)(c).
[33] Request at 4, fnt. 3.
[34] Chicago Zoning Ordinance and Land Use Ordinance, 17-9-0117-B(5).

from exactly these operations in denying Kinder Morgan's variance request.[35] Moreover, as the testing was done at the facility's own initiative, it is very likely that the results reflect best-case site conditions for emissions; presumably, other violations from similar operations have and will continue to occur. Watco thus has failed to meet the high burden of demonstrating that it qualifies for a variance from the PM monitoring requirements. Not only should CDPH deny the Request, but to ensure that such violations do not occur in the future, it should require that all such transfers occur indoors.

Watco is apparently unaware that the Rules contain a 10% opacity limit on dust from "any Bulk Solid Material storage pile, Transfer Point, roadway or parking area" within a regulated facility.[36] The barge-to-truck operations at issue qualify as a transfer point subject to this limitation. In submitting its own opacity testing data, the company represents that the high-wind operations tested "did not generate non-compliant dust levels," citing only to the 20% opacity limit contained in the state regulations.[37] This misstep not only demonstrates the company's inadequate knowledge of the regulations, but also of the regulatory history: The 10% limit was adopted in large part in recognition that the existing state 20% limit was inadequate to protect city neighborhoods from adjacent dust-generating facilities. At 17.75% opacity,[38] the company-measured levels are well above the City's 10% limit.

In addition, even higher opacity levels likely occur when the facility is not taking every precaution to produce test results supporting its variance application. As we have highlighted many times, the problem with outdoor operations that depend on consistent, stringent adherence to work practices for dust control is that actual practices are likely to fall short of the mark. Higher opacity levels than those in Watco's proffered tests are also likely because winds at the site at times exceed the 21 mph speeds measured during the testing. Finally, we were not able to find any description of the materials being transferred during the tests in Watco's Request, which begs the question of whether Watco tested materials that are more likely to create dust (such as fine manganese materials that cannot be watered) or some other material that does not pose as significant a dust risk.

The location of the opacity violations further supports that barge-to-truck operations are resulting in off-site fugitive dust emissions, and thus that Watco has failed to meet its burden to avoid PM monitoring.[39] The "barge loadout area" is located along the North border of the site, on the Calumet River and immediately next to another warehouse

[35] Ex. 6 at 11.
[36] Section 3.0(2)(b).
[37] Request at 18, citing to 35 Ill. Admin. Code 212.316.
[38] Request at 18 and Appendix G, test results for 8:15 a.m. start time.
[39] *See* Section 3.0(4).

facility.[40] While we were not able to clearly discern the location of the tested operations from the opacity test results or Watco's discussion of them, it is reasonable to assume that the barge-to-truck operations tested occurred very close to the dock and so to the facility's fenceline on both the North and East borders. The combination of excess measured opacity and a testing location near the fenceline supports that the facility's operations are resulting in off-site fugitive dust emissions.

Finally, the results of the barge-to-truck loading operations create significant concern that similarly high opacity levels are occurring from truck transfers at Watco that involve tipping the truck container back and unloading material to an outdoor pad, with subsequent movements by smaller trucks or front-end loaders.[41] Watco provides no indication that the materials handled in this manner are not expected to generate dust; for example, the Request does not offer opacity testing results for this area. Additionally, the use of a front-end loader in particular creates concerns about dust creation, given the relatively open bucket that is responsible for moving the material. It is also not clear whether there is any kind of wall or screening around the concrete pad to control dust to some degree, based on Images 9 to 11 in the Request. Nor is there any indication that Watco is considering a "dry fog" system for this outdoor concrete transfer pad, as it describes for the barge loading area.[42] The likelihood of high opacity at these operations combined with the lack of proposed controls again supports rejection of Watco's variance Request.

Watco Fails to Show that Compliance will Pose an Arbitrary and Unreasonable Hardship

Watco argues that installation of PM monitors would constitute an arbitrary and unreasonable hardship under Rule 8.0 (2)(e) of the Air Pollution Control Rules and Regulations.[43] It suggests supposed alternative monitoring methods that it claims would represent a more "reasonable financial and human-resources burden." Watco's claim parallels that made by S.H. Bell in 2016, and despite these claims, CDPH required S.H. Bell to install PM monitors.[44] Here, Watco's request not only fails to explain why the differences between itself and S.H. Bell warrant CDPH coming to a different conclusion on PM monitoring, but also fails entirely to acknowledge the substantial financial resources of the company as a whole. While Section 8.0(2)(e) does not lay out additional guidance on what constitutes an arbitrary and unreasonable

[40] *See* Appendix E.
[41] Request at 14.
[42] Request at 21.
[43] Rule 8.0(2)(e).
[44] Ex. 14. Letter from Kim Walberg, Attorney for S.H. Bell to Dr. Julie Morita, Commissioner, CDPH, Request for Variation from 90 Day Compliance, December 2, 2016 at 1-2, available at https://www.cityofchicago.org/content/dam/city/depts/cdph/general/VarianceRequestfromS.H.BellCo._10218S.Ave.O_12-2-2016.pdf.

hardship, 8.03(b) specifies that the Commissioner may deny a variance request if it is incomplete. Watco certainly does not provide adequate information to support this assertion.

Financial burden. Installing the PM monitors is not a financial hardship for Watco. In 2016, S.H. Bell, a family-owned company that grosses between $500,000 to $1 million, with approximately 29-50 employees,[45] was ordered to install PM monitors. (In its variance request, S.H. Bell also asserted that it had a net operating loss of $500,000 in 2016.) Despite the fact that S.H. Bell had already tried other measures to address dust emissions, CDPH mandated the company to install the PM monitors.
Watco Companies, LLC, the parent company of Watco Transloading, grossed approximately $638 million in 2016.[46] According to the company's website and other public sources, it is one of the largest short line railroad and transloading companies in the United States, with operations overseas as well.[47] Watco's acquisition of 20 terminals from Kinder Morgan – including the facility at issue here – was backed by SkyKnight Capital, an investment firm with ties to Crowley Maritime, in turn one of the largest maritime businesses in the U.S.[48] According to articles on the acquisition, Watco is in growth mode, with significant new expansion initiatives underway.[49] The company thus can clearly afford to install PM monitors at its Chicago facility as required by the Rules, and has failed to provide any evidence to the contrary.

Alternative and current dust mitigation measures. All of the alternative measures proposed by Watco are measures that are independently required by the Dust Rules and cannot take the place of the PM monitor requirement. Indeed, as CDPH pointed out when it denied Kinder Morgan's variance request, permanent monitors operate continuously and measure and record dust emissions in a way that the other dust mitigation measures do not.[50] Watco also claims that given its prior activity to ensure that dust emissions did not harm the community, the PM monitors would impose an unnecessary and arbitrary burden because Watco has already engaged in preventative measures, and alternative methods are available. In its variance request in 2016, S.H. Bell outlined its plans to install "baghouses" at their facility to collect dust, and asked the CDPH to postpone its mandate for PM monitor installation until these baghouses could be installed. Nonetheless, CDPH denied a variance and required S.H. Bell to install PM monitors irrespective of the status of the baghouses.

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[45] *See* Ex. 15, S.H. Bell business profile on manta.com, https://www.manta.com/c/mm2j3jm/s-h-bell-company, accessed October 11, 2017.
[46] *See* Ex. 16, "Moody's changes Watco's ratings outlook to negative, affirms B1 Corporate Family Rating," moodys.com, March 31, 2017, available at https://www.moodys.com/research/Moodys-changes-Watcos-ratings-outlook-to-negative-affirms-B1-Corporate--PR_364279.
[47] *See*, *e.g.*, Ex. 17, "About Us," Watco Companies, available at https://www.watcocompanies.com/about/company/, accessed October 11, 2017.
[48] *See* Ex. 18, "Watco to acquire 20 U.S. bulk terminals from Kinder Morgan," *American Shipper*, November 11, 2016, available at http://www.americanshipper.com/main/news/watco-to-acquire-20-us-bulk-terminals-from-kinder-66012.aspx.
[49] *See id.*
[50] CDPH Determination: Kinder Morgan Variance Request, 11 (May 3, 2017), available at the MRL is now five years old, and thus may not adequately account for research conducted since then, or research in the pipeline or under development.

Furthermore, S.H. Bell had allocated $1.2 million to "robust" and "enhanced" dust control measures from May 2014 to December 2016;[51] still, after only four months of PM10 monitoring, the fenceline monitoring data show an average manganese concentration of 0.32 µg/m^3,[52] which exceeds the inhalation minimal risk level (MRL) for chronic exposure by 0.02.[53] These excessive monthly averages occurred despite S.H. Bell taking numerous "extensive dust control measures"[54] to improve dust emissions, including using monsoons; applying sprays on roads; hiring someone to oversee daily dust observations; using a wet sweeper truck; using a dry fog system; and installing a meteorological station to observe and monitor weather conditions.[55]

Further Evidence Supports that Watco is a Significant Source of Manganese on the Southeast Side that Adversely Impacts the Surrounding Area

In addition to misrepresenting the impacted community, downplaying the scale of its operations and submitting its own best-case testing data showing a violation of the Rules, Watco fails to demonstrate that it is not a significant source of manganese in the surrounding community through its overly selective analysis of existing data and nearby facilities. It thus fails to meet its burden of showing that the "Facility's operations do not result in off-site fugitive dust emissions"[56] and that "issuance of the variance will not create a public nuisance or adversely impact the surrounding area, surrounding environment, or surrounding property uses."[57] Everyone agrees that there are other known sources of manganese in the area – but Watco stretches the truth when it claims that the Xact study provides no evidence that its facility is a significant source of manganese in the community.

In particular, Watco distorts and inconsistently references data on wind direction to serve its interests. It also draws inappropriately broad conclusions about its lack of responsibility for manganese in the air from data that simply show there are likely other sources as well.

Wind strength and direction. With respect to wind strength and direction, while the predominant wind looking at an annual wind rose is from the South/Southwest, Watco omits that there is also a strong North/Northeast wind that traverses the facility a good portion of the year. This North/Northeast wind can be seen from the KCBX wind rose

[51] Ex. 14 at 2-3.
[52] Ex. 19, U.S. EPA, Notice of Violation, S.H. Bell Company, Chicago, Illinois, August 7, 2017 at 5, available at https://www.epa.gov/sites/production/files/2017-08/documents/sh-bell-chicago-nov-20170807-5pp.pdf.
[53] *Id.* At 4.
[54] Ex. 14 at 4-5.
[55] *Id.*
[56] Section 3.0(4).
[57] Section 8.0(2)(d).

that the company provides,[58] the study period wind rose in the Xact study,[59] and monthly Midway wind roses.[60] Moreover, the North/Northeast wind is predominant over the South/Southwest wind in the spring and early summer months (March-May) when bulk handling operations in this area historically are more active than during the winter or late fall.[61] Wind speeds during these periods reach in excess of 20 mph, well above levels considered high winds under the Rules.[62] From June to September when operations are still strong, the North/Northeast wind drops off but is still notable; it only really diminishes from October to January when operations slow as well (and during this period when the wind is more from the South, wind speeds overall are lower). Also, there is a strong West/Northwest wind starting in October and carrying through spring, that likely results in dust blowing into Hegeswich and the Wolf Lake recreational areas. There is no monitoring data from these adjacent areas that experience significant winds from the facility, hence Watco has failed to establish that it does not result in offsite fugitive dust emissions in these areas.

Other manganese sources. Nor has Watco "refute[d]"[63] U.S. EPA's conclusion that the facility is the main contributing source of manganese in the area. Watco states that "[o]bserved manganese levels have a negative correlation with activity at the Facility."[64] In support of this statement, Watco points to only three instances out of 34, or about 9%, when the top 1% monitored levels did not coincide with activity at the Watco facility. Such a low percentage of instances does not "refute" that Watco is a main source of the high readings detected in the study overall or generally establish a negative correlation between the high readings and activity at the site. Watco goes on to assert that "[t]here are also many hourly manganese concentrations in Table 3 where the wind direction at the time of the hourly manganese is inconsistent with the Kinder Morgan facility being the source."[65] Watco does not explain how this conclusion fits with U.S. EPA's finding that "[t]he majority of these peak periods had winds emanating from the area of Kinder Morgan." While Watco omits any specific analysis of this point, we reviewed Table 3 and found that 11 of 34 readings show wind directions greater than 220 degrees or less than 180 degrees, a rough approximation for winds not blowing from Watco's direction (notably, two of these readings overlap with two of the three readings during which Watco was not operating). Again this analysis leaves the vast majority of 1% readings

[58] Request at 28, Figure 3 (meteorological data from KCBX South Terminal monitor).
[59] Appendix D at 4 of 13.
[60] Ex. 20, Iowa Environmental Mesonet, Iowa State University, Wind Roses for Midway Airport, December 1995 to August 2016, available at http://mesonet.agron.iastate.edu/sites/windrose.phtml?station=MDW&network=IL_ASOS.
[61] *Id*.
[62] Section 2.0(12).
[63] Request at 30-31.
[64] *Id.* at 30.
[65] *Id.* at 31.

occurring during Watco operating times, when the wind was coming from the direction of Watco.

Other notable issues with Watco's attempts to discredit U.S. EPA's Xact study:

1. The company on the one hand claims U.S. EPA's Xact study cannot be used to attribute any problems to its facility, then turns around and says data from the co-located monitor at Washington High School reflects dust control measures that the company and Kinder Morgan have made.[66] Watco cannot have it both ways – the company is clearly a significant contributor to air pollution levels measured at Washington High School and Rowan Park, and there is good reason to believe it contributes to even higher levels of manganese at its South fenceline, given Northerly winds.
2. In attempting to point to other sources of manganese in the area as explaining the elevated manganese levels at the Xact and Washington High School monitors, Watco ironically focuses on the Defense Logistics Agency ("DLA") facility with outdoor manganese piles that is "only" approximately 2 miles from the monitors. However, Watco omits that there is very little wind in the area blowing from the East, the direction in which the DLA facility is located relative to these monitors, as seen from the wind roses cited in the Request and these comments. Given this distance between the facility and monitors, and the lack of Easterly winds in the area, it is doubtful that the levels measured at these two monitors are explained by the DLA facility. This is not to say that we are unconcerned by the DLA facility's outdoor manganese storage, but that Watco cannot point to the facility to escape responsibility and avoid PM monitoring.
3. In addition, while there is a downward trend in PM10 and manganese discernable from the Washington High School annual average data, the data also shows significant variability from year-to-year, with some years taking a significant jump from prior years. Moreover, we independently graphed the manganese data from the monitor, which shows reason for concern with manganese emissions in particular.[67] Annual average manganese levels at the Washington High School monitor went *up* between 2014 and 2015 following the City's adoption of its Rules (this increase is also seen in the graph

[66] *Compare* Request at 28 ("the EPA Metals Study did not provide evidence that the manganese containing dust came from the Kinder Morgan facility") and 31("From the long-term Illinois EPA PM-10 monitoring results [from the Washington High School monitor located in close proximity to the Xact Study monitor], a reasonable inference can be drawn that steps taken previously by Kinder Morgan and additional steps more recently by Watco at the Facility have reduced the fugitive dust emissions to a level that supports granting this variance request").

[67] Ex. 21, Graph of Manganese Data from Washington High School, compiled from hazardous air pollutant data available on U.S. EPA's website, https://www.epa.gov/outdoor-air-quality-data/monitor-values-report-hazardous-air-pollutants, accessed September 21, 2017.

provided by Watco[68]). In addition, though annual average levels subsequently decreased between 2015 and 2016, there is a notable upturn in 2017 manganese levels to date from the 2016 average, in contrast to the downward slope presented in Watco's manganese graph.[69] This upturn is also evident in the 90th and 95th percentile measures, shown in our graph. This data continues to support that monitoring closer to the facility at its fenceline is needed and justified. In addition, the annual averages from the Washington High School monitor fail to convey the significant differences in manganese concentrations in the shorter term that can occur with varying operations at facilities like Watco. Data from S.H. Bell to date shows some monthly averages well above the MRL, as well as significant spikes in manganese on an even shorter term.[70] These shorter term high levels are of concern from a health perspective as discussed above, and again show why fenceline monitoring is needed at Watco.

4. The company goes on at length complaining about U.S. EPA's treatment of the MRL and RfC in the Xact Study.[71] However, U.S. EPA fully acknowledged the MRL in its analysis and used the MRL as its primary metric, along with its discussion of the RfC.[72] It is belittling to CDPH for the company to state that this entirely straightforward discussion of the two screening levels "caused the Department to misconstrue the underlying data presented in the U.S. EPA Metals Study in its denial of the Kinder Morgan variance request."[73] Rather, it is Watco who misconstrues or misrepresents a purpose of the Xact Study, which was to flag elevated levels of manganese and the likely sources of them for further investigation through additional monitoring closer to the identified sources.[74] Indeed, the Xact Study clearly

[68] Request at 26.
[69] When we revisited U.S. EPA's website on October 6, 2017, the reported 2017 year-to-date mean for manganese at the Washington High School monitor was 0.0735 ug/m^3. This level is an increase from the 2016 mean of 0.06834 ug/m^3, and is significantly greater than the 2017 year-to-date mean provided by Watco of about 0.05 ug/m^3. Recognizing that the October year-to-date mean for 2017 likely includes several more months of relatively higher manganese emissions over the summer following the seasonal patterns in the area, this discrepancy at least calls into question whether there is a reliable downturn in manganese emissions and concentrations in the community, and so weighs against Watco's variance Request to avoid monitoring.
[70] Ex. 22, S.H. Bell, Filter-based Monitor (S4) Data From the FRM Monitor, March through July 2017, available at https://www.epa.gov/il/sh-bell-chicago-air-monitoring-data.
[71] Request at 23.
[72] In addition, with respect to the RfC, the mere fact that an uncertainty factor of 1000 is less common does not in itself render it inappropriate. Moreover, assuming Watco's numbers are correct, 32% of RfCs employed uncertainty factors of 1000, hardly rendering them exceptional.
[73] Request at 25.
[74] Appendix D at 2, recognizing that manganese levels were below the ATSDR's MRL, the U.S. EPA's "currently recommended" threshold. As we have pointed out before, the MRL is likely not protective of human health because it MRL is now five years old, and thus may not adequately account for research conducted since then that demonstrates that lower and lower levels of manganese exposure pose a risk

states that "[f]ollow-up monitoring closer to the fenceline of the main Mn-contributing facility [Watco] may be useful to characterize the maximum exposure level in the community. There are residences and a park immediately south of [Watco] that may be experiencing metals concentrations significantly higher than what was measured in this study."[75] CDPH cites exactly this passage in its rejection of Kinder Morgan's PM monitoring variance request, along with concerns about the outdoor transfer of manganese-containing materials from barges prior to indoor storage – as noted above, the very operations that Watco's opacity testing results show has violated the Rules' opacity limit.[76]

5. Watco assumes that if the measured levels in the Xact Study and at the Washington High School monitor are below the MRL, it is dispositive of the existence of a manganese problem and/or the need for fenceline monitoring. In fact, the Xact and Washington High School monitors are relatively far away from Watco's fenceline. As we have seen from S.H. Bell's Chicago monitoring and levels at the Washington High School and KCBX monitors, as well as with experience in East Liverpool,[77] levels of manganese can be significantly higher closer to the fenceline. Thus, U.S. EPA appropriately concluded in the Xact Study that monitoring closer to the facility could be helpful in characterizing exposures to the community. Nor do these monitors capture potential impacts to residents to the South, discussed elsewhere in these comments.
6. In trying to support its conclusion that the U.S. EPA Xact Study results "do not indicate there is any adverse impact on the surrounding area," Watco also discusses the KCBX and S.H. Bell monitors, concluding that both show "no harmful health impacts" from manganese.[78] However, one week after Watco submitted its application, U.S. EPA issued a Notice of Violation to S.H. Bell citing a four-month manganese average of 0.32 ug/m^3, well above the average of 0.22 ug/m^3 cited by Watco, and alleging a violation of the Illinois State Implementation Plan's prohibition on air pollution.[79] In addition, the KCBX monitors were not installed specifically due to manganese concerns, and even then data from the monitors showed manganese levels significant enough to

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to human health. NRDC, SETF, SSCBP, et. al, Comment re S.H. Bell Variance Request (July 7, 2017). Also, the risks associated with short-term manganese exposure are not reflected in the chronic MRL.

[75] *Id.*

[76] *See* Ex. 6, CDPH Kinder Morgan variance decision at 8 and 11.

[77] *See* Ex. 23, Letter from Michelle Colledge, ATSDR, to Ed Nam, Acting Dir, Air and Radiation Division, U.S. EPA, September 22, 2016, at 3, Table 2 (showing progressively higher manganese monitoring results closer to the facility fenceline), available at https://www.atsdr.cdc.gov/HAC/pha/SHBell/SH_Bell_LHC_to_ARD_Region_5_v_9-22-16_508.pdf.

[78] Request at 25, fnt. 23.

[79] Ex. 19.

trigger a closer look based on the non-cancer risk/hazard index for the 95th UCL mean concentration. That closer look indicated a source between the two KCBX facilities, and the subsequent monitoring at S.H. Bell to date has registered significantly higher manganese levels than those seen at KCBX, again supporting that facilities like S.H. Bell and Watco can pose manganese health risks to fenceline communities and should not be allowed to avoid monitoring.

7. Finally, Watco's reference to the "typical manganese concentration in an urban area" in critiquing the Xact Study[80] also fails to make its case to avoid monitoring. Indeed, non-trivial urban background levels of manganese make the opposite case: that facility-specific emissions above background are of MORE concern because they add to already-elevated levels. Watco cannot avoid responsibility for locating in an urban industrialized area by claiming its contribution to pollution should be considered less egregious because others around it also pollute the air.

Department's December 2016 Inspection Report

Watco asserts that when CDPH rejected Kinder Morgan's variance request, it relied, in part, on a December 2016 inspection, and argues that (1) it has corrected the some of the issues cited in the December 2016 inspection, (2) the inspector misunderstood the operating procedures at the facility, leading to erroneous conclusions about dust management practices, and (3) dust present on the internal facility roads is not evidence that dust emissions are leaving the Facility.[81] Despite Watco's efforts to distract CDPH from the ongoing fugitive dust issues, the December 2016 inspection report documents fugitive dust emissions and other activities that likely cause additional fugitive dust emissions. CDPH must deny the Request to avoid installing PM monitors, because the monitors will provide CDPH with critical information to evaluate fugitive dust emissions. Moreover, Watco has failed to show that the fugitive dust emissions will not pose a nuisance or adversely impact the surrounding area.

The December 2016 inspection report found and documented with photos several compliance issues at the Kinder Morgan facility:[82]

1. Dry and dusty access roads
2. No sweeper or water truck in operation during the inspection
3. A daily log that lacked information about water application to the roads
4. Track-out on 126th Street
5. Absence of a 30 foot height pole designed to gauge the height of the bulk material pile
6. Truck wheels picking up and dispersing dust
7. Absence of a berm at the river edge

[80] Request at 30.
[81] Request at 2.
[82] Request at Appendix I.

In rejecting Kinder Morgan's request for a variance with regard to the installation of PM monitors, CDPH concluded that Kinder Morgan's operational practices did not effectively control dust.[83] CDPH specifically highlighted the tracking out and truck wheels picking up and dispersing dust documented in the December 2016 inspection. It also noted that the detection of manganese dust downwind from the Kinder Morgan facility constituted a strong indicator that the fugitive dust was leaving the facility. Watco does not address the concerns of track out or truck wheels picking up and dispersing dust and, most importantly, as demonstrated in the extensive comments above, has not otherwise shown that its activities do not result in fugitive dust emissions offsite.

Conclusion

CDPH must deny the Request because Watco has not and cannot meet the variance standard for escaping PM monitoring. As a preliminary matter, Watco's opacity testing reveals that it has substantially exceeded the 10% standard with its reported 17.75% opacity, and there is good reason to believe that this result is not an isolated incident for outdoor transfer operation. Such outdoor transfer operations appear to happen frequently, given the volume of material handled by Watco going from barge to truck and truck to storage.

In addition to the opacity violation, Watco has filed an incomplete variance request that fails to show that Watco has controlled dust emissions so that the facility will not impact the surrounding community. Watco's description of its operations downplays the sheer volume of material that it handles by comparing itself to competitor S.H. Bell on a *percentage* basis, and omits critical information on amounts and types of materials handled. Watco again misleads when it describes the impacted community too narrowly and omits the fenceline community to the south of the facility. The Request also leaves out key information about the socioeconomic status of the surrounding community; this is an environmental justice community that has been unduly burdened with environmental harm. Granting the request would be an unjustified step back in the City's progress towards addressing the cumulative environmental burdens on this community.

The Request attempts to erase the adverse impacts of its operations by claiming that the results of U.S. EPA's Xact Study point to other sources of manganese and implying that the existence of other sources negates its role as a source of manganese; this disingenuous argument should be rejected out of hand considering the available data and likely impacts to the community immediately south of Watco. Similarly, while Watco and S.H. Bell have advanced the argument that their manganese emissions are not impacting public health, they have no evidence of that and the manganese emissions at S.H. Bell's facility were significant enough that they exceeded the ATSDR's MRL and led U.S. EPA to

[83] Ex. 6 at 11.

issue a notice of violation (and ATSDR recently confirmed that shorter-term exposures to elevated levels of manganese, such as we are seeing with seasonal operations at facilities on the Southeast Side, are of concern from a public health perspective). Moreover, Watco argues that the December 2016 Inspection Report reflected a flawed understanding and did not show fugitive dust emissions, but the relatively recent report specifically documented track out and trucks picking up and dispersing dust. Monitoring at the Watco facility is critical so that CDPH can determine the extent that manganese dust is leaving the facility through trucks and other routes, and better understand the exposures in the community.

Finally, the Request fails to show that the PM Monitor installation will impose an arbitrary and unreasonable hardship especially when the cost of the monitors appears to be a drop in the bucket as compared to Watco's overall budget and the expenditures to date do not prove that monitoring is unnecessary. Moreover, the amount of money that Watco has spent on dust controls to date is a much less important consideration with respect to PM monitoring: The central question is whether the site continues to have operations that pose a high risk of dangerous dust levels. The company's opacity data and the City's inspection report, among the other evidence discussed above, answers this question with a yes.

For these reasons, we urge CDPH to deny the renewed variance request.

Thank for your consideration,

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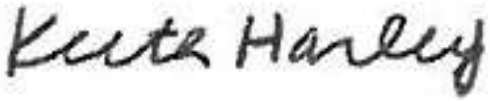

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June 28, 2019

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Re: Watco Terminal and Port Services April 24, 2019 Variance Request

To Whom It May Concern:

Thank you for the opportunity to comment on the April 24, 2019 variance request submitted by Watco Terminal and Port Services ("Watco") for its Chicago Ferro Terminal located at 2926 126th Street, Chicago, IL. Watco seeks a variance from the Chicago Department of Public Health's ("CDPH") Rules and Regulations for the Control of Emissions from the Handling and Storage of Bulk Material Piles, Part D ("Dust Rules").[1] These comments are submitted on behalf of the Southeast Side Coalition to Ban Petcoke ("SSCBP"), a community group fighting for a healthy, thriving neighborhood free of manganese, petroleum coke, and other toxins; the Southeast Environmental Task Force ("SETF"), a community group dedicated to improving the Calumet neighborhood's environment; and the Natural Resources Defense Council ("NRDC"), and its thousands of members and activists in the City of Chicago, including residents of the Southeast Side.

I. Introduction

CDPH should deny Watco's variance request, because Watco has failed to demonstrate that the requested variance from the Dust Rules—for materials that contain less than 2% manganese—will not have an adverse impact on the community and the environment. As we have explained in many previously submitted comment letters, this community is an environmentally overburdened community with levels of

[1] Rules and Regulations for the Control of Emissions from the Handling and Storage of Bulk Material Piles, Part D (2019), https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/Control_EmissionsfromHandling&StoringBulkMaterials_January2019.pdf.

exposures to air toxics and other respiratory hazards that are among the highest in the State of Illinois.[2]

We have consistently called for a ban of manganese because the City of Chicago should not allow the community to be subjected to neurotoxic manganese any longer. The City issued a ban on new manganese facilities and prohibited the expansion of existing manganese facilities.[3] Although it has not yet issued a ban on existing manganese facilities, CDPH recognized the need for more regulation of the handling and storage of neurotoxic manganese when it amended the Dust Rules on January 25, 2019. After accepting comments on the scope of the rules, CDPH expressly included all manganese, regardless of the concentration of manganese, in the Dust Rules' definition of Manganese-Bearing Bulk Material ("MBM").[4] CDPH indicated that a company could apply for a variance for materials with lower manganese content, but stated that a company seeking such a variance must "submit supporting documentation that persuasively demonstrates why there should be an exemption;" indeed, only by requiring this documentation could "CDPH and the public can be assured that such an exemption will not create a public nuisance or adversely impact the surrounding area..."[5]

In support of its variance request, Watco asserts: (1) it will no longer handle manganese with concentrations exceeding 2%; (2) it has taken steps to control manganese dust, (3) Federal Reference Monitor ("FRM" or "metals monitoring") data is below the 0.3 ug/m^3 MRL, and (4) the application of the Dust Rules to materials containing less than 2% of manganese "imposes an arbitrary and unreasonable hardship."[6] However, Watco's arguments are undermined by its poor compliance track record, its inaccurate description of the impacted community, and its unsubstantiated claim of hardship. Watco has failed to demonstrate that an exemption will not adversely

[2] See, e.g., NRDC SETF SSCBP Comments on Watco Variance Request 10.16.17 (citing to USEPA Website, "Environmental Issues in Southeast Chicago," https://www.epa.gov/il/environmental-issues-southeast-chicago).
[3] Municipal Code of Chicago § 17-9-0117-D ("Manganese Ordinance").
[4] Manganese Bearing Bulk Material is defined as "any ferrous manganese, manganese silicate, manganese alloy, manganese ore, or any other material form which manganese is extracted or emitted or otherwise becomes airborne." Rules and Regulations for the Control of Emissions from the Handling and Storage of Bulk Material Piles, Part A(2)(14) (2019).
[5] CDPH Official Response to Public Comments on Proposed Amendment to Rules, 4 (January 25, 2019), available at https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/CDPH_Resp_Com_BulkMaterialAmendments_January2019.pdf.
[6] Variance Request from Watco Terminal and Port Services ("Watco 2019 Variance Request,"), 7-8 (April 24, 2019), https://www.chicago.gov/content/dam/city/depts/cdph/InspectionsandPermitting/VarReq_WatcoTerminalandPortServices_4242019.pdf

impact the surrounding area and the community should not be subject to any manganese dust emissions.

II. CDPH Should Deny Watco's Request to Avoid the Dust Rules for Materials with Less than 2% Manganese Because Watco Cannot Meet the Standard for Obtaining a Variance.

A. Watco has a history of dust emission exceedances and poor housekeeping

When CDPH evaluates Watco's request for a variance, it should not do so in a vacuum or rely merely on empty commitments, but should consider this request in the context of Watco's failure to manage manganese dust emissions to date, at times contradicting its own claims of robust control.

The Chicago Ferro Terminal was problematic even before Watco bought it from Kinder Morgan. Indeed, in May 2017, CDPH denied Kinder Morgan's request for a variance from the Particulate Matter (PM) monitor requirements of the Dust Rules, because the company was unable to demonstrate that it was able to suppress fugitive dust.[7]

Conditions at the Chicago Ferro Terminal have continued to pose a public health threat under Watco's ownership. Watco has a record of failing to implement its best management practices ("BMPs"). As CDPH explained in December 2017,

> [n]otwithstanding the expenditures Watco made, and the procedures it has outlined in its BMPs, Watco has not demonstrated that its dust control methods are effective to prevent fugitive dust from leaving the site. In fact, recent inspections found that several of the BMPs were not being implemented.[8]

In particular, CDPH referenced a September 1, 2017 inspection, conducted in conjunction with the United States Environmental Protection Agency ("USEPA"), during which the inspectors observed serious concerns. Fugitive dust emissions were found in multiple places at the Watco facility; Building F's operations were particularly egregious with heavy particulate and fugitive dust emissions, a particulate dust plume of 100 percent from a loaded truck, and a dust plume spanning the entire building.[9] Of particular relevance here, the inspection report explains that the facility manager told the CDPH inspector that Watco staff were not operating the dust collection system

[7] CDPH Determination Letter for Variance Request for Kinder Morgan, 3 (May 3, 2017).
[8] CDPH Determination Letter, 7.
[9] *Id. at 7-8* (referencing the photos attached to the inspection report).

properly. Even though Watco assured CDPH that staff were retrained, the next week inspectors continued to observe problematic dust emissions at Building F.[10]

Despite local and federal attention on these problems, Watco facility's dust emission problems have continued. After its PM monitor variance request was denied in 2017, Watco installed a PM monitor and then was required by USEPA—pursuant to a Clean Air Act Section 114 request—to install a Federal Reference Monitor ("FRM or metals") monitor, USEPA and CDPH continued to identify compliance issues at Watco. On December 12, 2018, CDPH cited Watco with four violations of Dust Rules.[11] On December 18, 2018, USEPA issued a Notice of Violation ("NOV") to Watco for its violations of the Illinois State Implementation Plan ("SIP"); the NOV was based on the first six weeks of FRM monitoring showing an average concentration of 0.416 ug/m^3, which substantially exceeds the 0.3 ug/m^3 health-based standard screening level used by USEPA.

In the aftermath of the NOV from USEPA, CDPH citations, and the issuance of the amended Dust Rules in January 2019, Watco announced in February 2019 that it would no longer handle manganese at its Chicago Ferro Terminal. However, Watco has not provided publicly a timeline for its plan. In its variance request, it indicates that at the time of the request, manganese was being moved inside of Building F, which Watco claims meets the requirements of the amended Dust Rules.[12]

Importantly, problems continue and manganese remains at the site and in the surrounding area. As recently as February 15, 2019, CDPH identified gaps and holes in the walls of Building F.[13] Although its manganese dust emissions have dipped below the 0.3 ug/m^3 MRL, there were several one-day spikes that exceeded the 0.3 ug/m^3 MRL as recently as in April 2019.[14] In addition, USEPA is currently evaluating soil contamination in the community surrounding the Watco facility.

Watco has announced that it will no longer handle manganese and its throughput report for the first quarter of 2019 indicates that it accepted 0 tons of manganese in March 2019. Watco did not report its pig iron throughput or storage, ostensibly employing the 1% manganese content threshold from the throughput reporting requirement.[15] Because Watco did not need to report its pig iron throughput or storage tonnage, it is unclear how much pig iron is at the site. Still, the Q1 2019

[10] *Id. at 8.*

[11] CDPH Citations for Violations of Dust Rules (Exhibit A) (citing Watco for failing to take reasonable precautions to minimize particulate matter/dust, failing to remove spilled material at the end of each work shift, failure to clean leaked material within one hour, and failure to pave internal road used for moving material).

[12] Watco 2019 Variance Request, 1.

[13] Watco 2019 Variance Request, 4; see also CDPH February 15, 2019 Inspection Report (Exhibit B).

[14] EPA Website: Watco Air Monitor Data, available at https://www.epa.gov/il/watco-terminal-and-port-services#data.

[15] Watco Q1 2019 Manganese Throughput Reports (Exhibit C).

throughput report also indicates that Watco is storing as much as 35,000 tons of manganese at the facility.[16]

In light of these facts, CDPH should be wary of promises by Watco to minimize adverse impacts from remaining sources of manganese dust emissions.

B. Watco has not met the standard for issuing a variance

Watco has not met the standard for variance requests set forth in the Dust Rules. First, it offers an inaccurate description of the population potentially affected by the storage of manganese-bearing material. Second, Watco also claims that it has measures in place to prevent adverse impacts, but, as discussed above, its past record should call these claims into question. Third, its claim that the regulation imposes an arbitrary and unreasonable hardship lacks support.

1. Standard

Section 10.0(2) lays out the standard for variance request, including in relevant part:

- A description of the process or activity for which the variance is requested including pertinent data on location, size and the population and the geographic area affected by, or potentially affected by, the process or activity;
- The quantity and types of materials used in the process or activity in connection with which the variance is requested, as appropriate;
- A demonstration that the issuance of the variance will not create a public nuisance or adversely impact the surrounding area, surrounding environment, or surrounding property uses; and
- A statement explaining:
    - Why compliance with the regulations imposes an arbitrary or unreasonable hardship;
    - Why compliance cannot be accomplished during the required timeframe due to events beyond the Facility Owner or Operator's control such as permitting delays or natural disasters; or
    - Why the proposed alternative measure is preferable.[17]

[16] *Id.*
[17] CDPH Dust Rules, § 10.0(2) (2019).

2. Process Description, the Community and the Potential Health Impacts

a. Population

Much like Watco did in its 2017 variance request,[18] its current variance request does not adequately describe the impacted community.[19] Section 10.0(2)(b) requires the variance request to set forth "pertinent data… on the population and geographic area affected by, or potentially affected by, the process or activity." Watco acknowledges that the Avalon Trails neighborhood is located within 300 feet of the terminal; Watco then asserts that because Avalon Trails is one of six Hegewisch communities, it can take the population of Hegewisch and divide it by six to conclude that the impacted population is 1,500.[20] This assertion is flawed for several reasons. First, it is superficial and not logical to assume that the population is divided equally between six areas rather than doing more research on the impacted community. Watco ignores the fact that in response to its 2017 variance request seeking to avoid the installation of PM monitors, CDPH noted,

> [m]ore than 3,700 residents live within a one-mile radius of Watco's facility. Furthermore, densely populated residential streets and youth baseball fields are located directly to the south of the facility on the other side of 126th Street.[21]

Watco ignores the baseball fields and public parks; users of the park will also be exposed to the manganese dust emissions.

Second, as we noted in our comments on Watco's 2017 Variance Request,

> [m]ore than 50% of the people who live within this one-mile radius are Hispanic (48.41%) or African-American (2.59%). U.S. EPA's ECHO database also indicates a total of 1,385 households in this one mile radius, with a total population of 962 children 17 years and younger.[22]

This is an environmental justice community. As we have explained in our previous comments, Watco's population description ignores a critical public health consideration: the likely sensitivity of this population to this public health threat--either due to age or other physical factors or sociodemographic status.[23] The fact that this is an environmentally overburdened community should be considered when evaluating the

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[18] Watco Request for Variance from Section 3.0(4), 3 (July 31, 2017), available at https://www.chicago.gov/content/dam/city/depts/cdph/environmental_health_and_food/VarReqfromWatcoTransloadingLLC_2926E126thSt.pdf.
[19] See NRDC SETF SSCBP Comments on Watco Variance Request, 9-10 (October 10, 2017).
[20] Watco 2019 Variance Request, 2.
[21] CDPH Determination Letter Addressing Watco's Variance Request, 7 (December 20, 2017).
[22] NRDC et al Comments on Watco Variance Request, 10. (October 10, 2017).
[23] *Id.* at 9.

appropriateness of allowing Watco to add to the community's environmental burden by avoiding the requirements of the amended Dust Rules.

Watco thus falls short in describing "the population and geographic area affected by, or potentially affected by, the process or activity" at issue in the variance request. This is particularly concerning considering that CDPH's response to Watco's 2017 Variance Request made clear how it evaluates the impacted community in question.

b. Manganese

We incorporate by reference our prior comments on the threats to public health from chronic and acute exposures to manganese dust,[24] and note that more recent studies and reports provide further support that manganese is detrimental to health, particularly in women and children.[25] As we have explained before, "manganese is a potent neurotoxin that at higher exposures results in Parkinson-like symptoms and at lower exposures more subtle negative impacts to motor coordination and cognitive functions."[26] As USEPA explained recently, in its memorandum supporting the time-critical action to undertake soil excavation near the S.H. Bell facility, "exposure to high levels of manganese in the air can cause damage to the brain, lung irritation and reproductive effects."[27]

According to the Agency for Toxic Substances and Disease Research's Toxicological Profile for Manganese, "[r]eports of human exposure at acute and intermediate durations (*i.e.*, 15–364 days) indicate adverse respiratory and neurological effects," though the reports consist of anecdotal case studies and lack quantitative

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[24] Comments of NRDC, SETF, and SSCBP on S.H. Bell's December 2016 Variance Request, 4-5, 20 (January 11, 2017), https://www.cityofchicago.org/content/dam/city/depts/cdph/environmental_health_and_food/PubCom_NatlNursesUnitedIl_Com_SHBellVarReq_1-11-17.pdf.

[25] See, e.g., Lee, et al., "Growth parameters at birth mediate the relationship between prenatal manganese exposure and cognitive test scores among a cohort of 2- to 3-year old Bangladeshi Children," International Journal of Epidemiology, 1169-1179 (August 2018), abstract available at https://www.ncbi.nlm.nih.gov/pubmed/29733356; Rodrigues, et al., "Airborne manganese exposure and neurobehavior in school-aged children living near a ferro-manganese alloy plant," 78 Environmental Research 66-77 (November 2018), https://www.sciencedirect.com/science/article/pii/S0013935118303694; Haynes, et al, "Impact of air manganese on child neurodevelopment in East Liverpool, Ohio," Neurotoxicology, 94-102 (January 2018), abstract available at https://www.ncbi.nlm.nih.gov/pubmed/28888663; see also Carvalho, et al., "Elevated airborne manganese and low executive function in school-aged children in Brazil," 45 Neurotoxicology 301-308 (2014), https://www.sciencedirect.com/science/article/pii/S0013935118303694.

[26] *Id.*

[27] USEPA Region 5, "Action Memorandum: Request for Approval and Funding for a Time-Critical Removal Action at the S.H. Bell Site, Chicago, Cook County, IL," 5-6 (May 24, 2019) (Exhibit D).

exposure values needed for derivation of an acute screening level.[28] The toxicological profile also discusses animal studies in which short-term exposures to elevated manganese levels resulted in measurable neurological outcomes, *e.g.*, "a spectrum of exposure-related changes in biochemical markers of neurotoxicity in various regions of the exposed monkeys."[29]

Thus, as we have explained before, CDPH should be concerned with both annual and longer-term exposure to elevated manganese, and shorter-term daily and monthly exposures typical of the varying activity levels at bulk material handlers in Chicago. As discussed below, Watco has had spikes in its manganese dust emissions that could have adverse impacts on the surrounding community.

c. Minimization of Adverse Impacts

Section 10.02(d) of the Dust Rules requires that entities seeking a variance demonstrate that the issuance of the variance "will not create a public nuisance or adversely impact the surrounding area, environment, or property uses."[30] As discussed above, more than 3,700 residents live within a one-mile radius of Watco. In addition to the nearby densely populated residential area, two baseball fields sit in close proximity to the Watco facility. Watco argues that there are minimal adverse impacts from its handling of manganese bearing material with less than 2% manganese, because (1) it is phasing out its handling of manganese bearing materials with more than 2% of manganese, and (2) its manganese bearing materials with less than 2% of manganese are not contributing to manganese fugitive dust emissions. These arguments are inadequate.

i. <u>Phase-out of manganese handling</u>

Watco's decision to phase out handling manganese is an important recognition of the need to do more to eliminate public exposure to manganese—but it should not dictate the outcome of the request for the variance for manganese bearing material with less than 2% of manganese. First, although Watco made the announcement in February 2019, it has not indicated publicly when it will stop receiving any manganese and when it will remove all the existing manganese at the facility; Watco is not under any legally enforceable obligation to stop handling such material.[31] Thus, the community has no reassurances that Watco will definitely reduce the amount of these higher content materials that it is handling and that the adverse impacts of its operations will lessen. Second, the manganese stored at the site in the past may still cause significant impacts moving forward; it is possible that past outdoor handling of manganese has left

[28] *Id. (citing* ATSDR Toxicological Profile for Manganese, September 2012, at 20, available at https://www.atsdr.cdc.gov/toxprofiles/tp151.pdf).
[29] ATSDR Toxicological Profile for Manganese, at 21.
[30] Dust Rules, § 10.02(d).
[31] See Exhibit C. Watco's Q1 2019 throughput report indicates that it received zero tons of manganese in March, however, it still maintains as much as 35,000 tons of manganese at the site.

residual manganese on the grounds of the facility that may be picked up by wind and blown into the community.

As recently as April 2019, Watco had four days—April 3, April 9, April 12, and April 15[32]—where in its manganese dust emissions exceeded the Manganese Limit ("ML") established in the Dust Rules.[33] The table below is an excerpt from Watco's Compliance Tracker report;[34] it shows that on each of the days with emissions above the ML, Watco was loading manganese onto trucks. These spikes are particularly notable considering that it recorded 0 tons of manganese received during that period. Until all of the manganese is gone from the facility, it is possible that Watco will continue to have exceedances of the dust rules.

Sample Date	Manganese (Mn) Result ug/m^3	Exceedance (Y/N)	Activity Description	Wind Direction (avg)	Avg Wind Speed (mph)
4.3.19	.706	yes	Loaded 19 manganese bulk truck loads; loaded 33 other bulk loads; filled 25 sacks of manganese in package department; no rail	236.11 WSW	7.22 mph
4.9.19	.395	yes	Loaded 10 manganese bulk truck loads; loaded 31 other bulk loads; filled 11 sacks of manganese in pacakge department; no rail	150.85 ESE	7.96 mph
4.12.19	.462	yes	Loaded 9 manganese bulk truck loads; loaded 32 other bulk loads; filled 11 sacks of manganese in package department; no rail	235.82 WSW	14.94 mph
4.15.2019	.621	yes	Loaded 9 manganese bulk truck loads; loaded 37 other bulk loads; filled 14 sacks of manganese in package department; no rail	245.98 WSW	7.89 mph

Moreover, manganese dust emissions have been emitted from the Watco facility for years, likely at far higher levels than have occurred since monitoring began (given the additional controls that Watco put in place before commencing monitoring), and have likely contaminated residential properties and public parks. Indeed, USEPA is currently sampling soil in the surrounding area to determine whether manganese concentrations present in the soil require remediation. The likelihood of soil

[32] Letter from Shonta' Moore, Corporate Environmental Manager, Watco Companies to USEPA Compliance Tracker, Air Enforcement Branch (April 20, 2019) (Exhibit E).
[33] Section 2.0(16) of the Dust Rules defines ML as "the concentration of manganese equal to or greater than 0.30 micrograms per cubic meter as averaged over a rolling three-month period." Dust Rules, supra.
[34] Exhibit E at 4.

contamination in the surrounding area—which may well be attributable to Watco's operations—also should weigh in favor of requiring Watco to minimize any and all future manganese emissions, including those from relatively low-content manganese materials.

Inspections of the facility over several years have shown continued problems with implementation of the best management practices. Most recently, and as mentioned in Watco's variance request, a February 15, 2019 inspection revealed "some small holes and gaps" in the walls of Building F.[35] Although Watco notes that it has taken steps since February 15 to fill in holes and gaps, it is unclear whether CDPH has revisited the facility to confirm or otherwise confirmed that the problems have been fixed. Unless CDPH has confirmed the needed repairs, Watco's explanation sounds all too familiar. It previously indicated steps it had taken to reduce particulate matter emissions, but when inspectors returned they found that the problem remained. Until CDPH returns to the Watco facility to confirm that the holes and gaps have been filled and checks on other Dust Rule compliance issues, it should not rely on these statements.

ii. Pig Iron and other manganese bearing materials with less than 2% manganese

Inadequate description of quantity

CDPH should view with caution Watco's arguments suggesting that dust emissions from pig iron should not be a concern under the Dust Rules. As a preliminary matter, Watco's description of the materials and quantities being stored outside is confusing. Watco states,

> [a]t present, materials stored outside consist of approximately 85% pig iron and approximately 15% iron ore slag. The small amount of iron ore slag (6,000 to 7,000 tons) stored outside has been constant for several years and is not a material typically handled by the Terminal. Pig iron will continue to represent the bulk of the material stored outside. However, as indoor storage capacity allows, the intent is to store more pig iron indoors than has been the case before, thus further reducing the potential for MBM dust emissions.[36]

Watco does not indicate the quantity of pig iron being stored, although it states that 7,000 tons of iron ore slag represents 15% of the total tonnage being stored outside and pig iron represents 85% of the total tonnage.[37] If these percentages and the iron ore slag tonnage is correct, then the outdoor storage of pig iron may be approximately 39,666 tons. But, in another portion of the variance

[35] Watco 2019 Variance Request, 4.
[36] Watco 2019 Variance Request, 3.
[37] *Id.*

request, Watco indicates that the total outdoor capacity is 161,731 tons; Watco does not indicate if its outdoor storage is at full capacity and does not explain its plans.[38] Thus, the company leaves open the possibility that Watco could greatly increase its pig iron handling, thereby increasing its manganese dust potential beyond pig iron's current contribution to monitored amounts.

More confusion is created by Watco's description of the iron ore. First, Watco provides the following:

> The small amount of iron ore slag (6,000 to 7,000 tons) stored outside has been constant for several years and is not a material typically handled by the Terminal.[39]

As an initial and pressing matter, CDPH should investigate Watco's iron ore slag storage. It is unclear from this description if Watco is storing a waste on site, which explains why the amount has been constant, or whether this is a product that it handles and sends to end users. Even if Watco is handling rather than storing the iron ore slag, other questions emerge because Watco later seems to refer to the same material as iron ore fines.[40] The term "fines" raises concern that the iron ore on site has significant dust potential. Watco must clarify what material it is storing and the respective percentage of manganese for each material. Then, CDPH should consider the likelihood of each material to create dust emissions or cause harm to the surrounding community.

Dust emissions remain a concern

Watco also argues that pig iron's natural densities minimize its potential to create dust. This is a familiar argument and one that failed before. In the context of evaluating Kinder Morgan's 2014 variance request, CDPH considered the pig iron stored at this same site and stated, "it is commonly understood that pig iron has the potential to produce dust."[41] Kinder Morgan acknowledged that fugitive dust from pig iron can be created when the product is physically handled.[42] It is our understanding that such dust occurs because pig iron is a relatively brittle substance, and so that physical knocking of chunks of pig iron against each other causes fines that can become airborne. Watco has not recognized let alone attempted to characterize this dust potential from pig iron, and therefore has not met its burden. This physical potential for dust, combined with Watco's outdoor storage potential and outdoor handling methods (along with past poor implementation of controls), indicates that manganese dust from pig iron storage and handling has the potential to be significant.

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[38] *Id.* at 4. Note that Watco's throughput reports also do not indicate how much pig iron is being stored at the facility.
[39] Watco 2019 Variance Request, 4.
[40] *Id. at 4.*
[41] CDPH Determination Letter, Kinder Morgan Variance, 10 (May 3, 2017) (quoting Kinder Morgan Additional Information, 6 (March 2, 2015)).
[42] *Id.* (quoting Kinder Morgan Variance Request, 12 (June 11, 2014)).

Watco also suggests that dust emissions are minimized by the fact that its outdoor pig iron piles are smaller than allowed under the Dust Rules;[43] it says that they are walled on three sides and "only" go three feet above the wall. Although keeping pile heights small is a useful tool in reducing fugitive dust generally, CDPH has already determined that it is not an adequate measure to control fugitive emissions from MBM, due to the risks associated with this neurotoxin. Further, as noted above, pig iron is very brittle and such storage in piles, with significant amounts of exposed material moved around by construction vehicles, may well contribute to it breaking apart and creating manganese dust. CDPH should reject the claim that pig iron does not create dust and does not pose a concern.

d. Arbitrary and Unreasonable Hardship

Watco has not adequately demonstrated hardship, but instead, relies almost exclusively on an assertion that recent monitoring levels fall below the ML established in the Dust Rules.[44] Watco claims that the application of the Dust Rules to its manganese-bearing materials with less than 2% of manganese "imposes an arbitrary and unreasonable hardship because the Terminal has already demonstrated compliance with the ML using the existing, enhanced dust control measures."[45] Watco also states that "[f]ully enclosing the Terminal operation would require a very large capital investment estimated at many millions of dollars."[46]

While Section 10.0(2)(e) of the Dust Rules does not lay out additional guidance on what constitutes an arbitrary and unreasonable hardship, Section 10.03(b) specifies that the Commissioner may deny a variance request if it is incomplete.[47] Here, Watco does not provide adequate information to support its assertions. The ML is not the only measure of compliance with the Dust Rules. The amended Dust Rules presume that manganese dust emissions *above* the 0.3 ug/m^3 MRL constitute a public nuisance, but they do not preclude a determination that manganese dust emissions *below* the 0.3 ug/m^3 MRL constitute a nuisance. And, although there has been a downward trend in manganese dust emissions, as discussed above, the data showed spikes as recently as April 2019. As discussed above, there is evidence in the health literature that levels below the MRL are of significant concern to community health, and thus indicative of a nuisance.[48]

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[43] Watco is referencing the height limit for outdoor bulk material storage for materials other than coke or manganese. See Dust Rules, supra at § 7.0(2).
[44] Dust Rules, § 2.0(16), supra.
[45] Watco 2019 Variance Request, 7.
[46] *Id.*
[47] Dust Rules, supra at Section 10.0(3).
[48] Haynes E. N., et al. 2017. *Impact of Air Manganese on Child Neurodevelopment in East Liverpool, Ohio.* 26 June 2019. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5809274/>

Moreover, even before CDPH amended the Dust Rules to add the ML, it contemplated that fugitive dust emissions could cause a nuisance or adversely impact the community. The addition of the ML to the Dust Rules is designed to reinforce and supplement the existing controls, not supplant them. Past air monitoring data and recorded violations of the Dust Rules make evident that fugitive dust emissions have left the Watco facility and likely caused adverse impacts or a nuisance; it is likely that USEPA's soil sampling will demonstrate that surrounding soils are also contaminated with manganese. As USEPA explained in the context of soil contamination near S.H. Bell's facility, the presence of high levels of manganese in soil pose a risk to the community as the contamination may migrate through walking across properties and tracking it, winds blowing the material, runoff from rains and more.[49]

On the issue of cost, Watco does not provide any detail or support for its claim that storing all manganese bearing materials inside will cost many millions of dollars. Watco also fails entirely to acknowledge the substantial financial resources of the company as a whole.

III. Conclusion

CDPH must deny the variance request because Watco has not and cannot meet the variance standard for escaping the amended Dust Rule requirements for manganese bearing materials. The Watco facility's history of compliance problems and current site conditions undercut its claims that it will prevent an adverse impact to the community. There is no certainty or legal obligation around Watco's plans to eliminate all high content manganese at the site. Moreover, Watco has repeatedly shown an inability to implement the required fugitive dust prevention measures—as indicated by CDPH's February 15, 2019 inspection report and the spikes in manganese dust emissions in April 2019. The current investigation into potential off-site soil contamination may also reveal a continued threat to the community.

The variance request also fails to show that the application of the Dust Rules to manganese bearing materials with less than 2% of manganese will impose an arbitrary and unreasonable hardship; Watco has provided no support for its assertions about the cost of compliance.

Variances should not be given lightly. Watco has not provided the needed information to support its variance request. Watco has not assured the public that an exemption will not adversely impact the surrounding area and the community should not be subject to any manganese dust emissions.

[49] Exhibit D at 7.

Thank you for your consideration,

/s/ Nancy C. Loeb and Debbie Chizewer
On behalf of the Southeast Side Coalition to Ban Petcoke
Nancy C. Loeb, Director
Debbie Chizewer, Montgomery Foundation Environmental Law Fellow
Environmental Advocacy Clinic
Northwestern Pritzker School of Law

/s/ Keith Harley
On behalf of the Southeast Environmental Task Force
Keith Harley
Director, Chicago Environmental Legal Clinic
Chicago Legal Clinic
Chicago-Kent College of Law

/s/ Meleah Geerstma
Meleah Geerstma
Senior Attorney
Natural Resources Defense Council

R 006871

ADMINISTRATIVE NOTICE OF ORDINANCE VIOLATION

In the City of Chicago Department of Administrative Hearings
City of Chicago, a Municipal Corporation, Petitioner, vs.

Respondent if Chicago Business, use name on license	Last Name, First Name	MI
WATCO COMPANIES		

Resp. Address No.	Dir.	Street Name	ST Suffix	Apt./Ste.
2926	E	126TH PL		

City	State	ZIP
CHICAGO	(•) IL ( ) Other:	60617

Person Served if other than the respondent	Last Name, First Name	MI
CAUDLE	STEVE	

Phone	Acct. No. or DREV No. on business license
7736468010	

Identification	DLN State	D.O.B. (M/D/Y)
( ) DLN/ID ( ) Other	( ) IL ( ) Other:	/ /

Height	Weight	Sex	Race	Eyes	Hair	Service Request Number
/						

Officer, Investigator, Inspector, and/or Complainant on oath states that the Respondent did then and there violate the following section(s) of the Municipal Code of Chicago:

E0000342761 5

COUNT		OTHER: TITLE CHA.SEC.	RULE
	DUMPING ON REAL ESTATE WITHOUT A PERMIT 7-28-440		
	OPERATING A FACILITY WITHOUT A PERMIT ( ) 11-4-030		
1	HANDLING OF MATERIAL SUSCEPTIBLE TO BECOMING WINDBORNE (a) 11-4-760 (a)		
	TREATMENT AND DISPOSAL OF SOLID OR LIQUID WASTE 11-4-1500		
	SANDBLASTING, GRINDING, CHEMICAL WASHING VIOLATION ( ) 11-4-2190		
	RECYCLING FACILITY PERMIT 11-4-2520		
	CONSTRUCTION SITE CLEANLINESS ( ) 13-32-125(2)		
2		11-4-1703.0(16)	

Offense (if other): VIOLATION OF BULK MATERIAL RULE

COUNT	OTHER: TITLE CHA.SEC.	RULE
	– –	

Offense (if other):

You Must Describe Actions for Each Count below:

Count 1 In That: RSP. FAILED TO TAKE REASONABLE PRECAUTIONS TO MINIMIZE PARTICULATE MATTER/DUST

Count 2 In That: RSP. FAILED TO REMOVE SPILLED MATERIAL BY THE END OF EACH WORK SHIFT.

Violation Location Nos.	Dir.	Street Name In the City of Chicago, County of Cook	ST Suffix
2926.	E	126TH PL	

Vio. Date: Mo/Day	Year	Time of Violation	Notice Date: Mo/Day if different than Vio. Date	Year of Notice
12 12	2018	03 : 10 ( ) AM (•) PM	12 13	2018

Complainant's Name if not issuing officer, investigator, or inspector

Public Health (Environment) Version 10-24-15

Unit	Star / Badge	Signature of issuing officer, investigator or inspector
PdI	82	X

Administrative Hearing Appearance

IMPORTANT: You must appear for a mandatory hearing on:

Date: Mo/Day	Year	Time	at:	Room No.
02 07	2019	01 : 00 ( ) AM (•) PM	[X] 400 W. Superior	112

FAILURE TO APPEAR may result in the imposition of a fine not to exceed the maximum penalties for each violation as specified in the Municipal Code of Chicago plus costs, restitution, and fees. Failure to comply with the administrative law judge's order may result in the issuance of additional sanctions.

I acknowledge receipt of this notice.
Signature of Respondent or Person Served: X

E

Comments

DEPARTMENT OF ADMINISTRATIVE HEARING COPY

R 006872

ADMINISTRATIVE NOTICE OF ORDINANCE VIOLATION

In the City of Chicago Department of Administrative Hearings
City of Chicago, a Municipal Corporation, Petitioner, vs.

Respondent *if Chicago Business, use name on license*: WATCO COMPANIES | Last Name, First Name | MI

Resp. Address No.: 2926 | Dir.: E | Street Name: 126TH PL | ST Suffix | Apt./Ste.

City: CHICAGO | State: (•) IL ( ) Other: | ZIP: 60617

Person Served *if other than the respondent*: CAUDLE STEVE | Last Name, First Name | MI

Phone: 7736468010 | Acct. No. *or* DREV No. *on business license*

Identification: ( ) DLN/ID ( ) Other | DLN State: ( ) IL ( ) Other: | D.O.B. (M/D/Y): / /

Height	Weight	Sex	Race	Eyes	Hair	Service Request Number
/						

Officer, Investigator, Inspector, and/or Complainant on oath states that the Respondent did then and there violate the following section(s) of the Municipal Code of Chicago:

E000034278 17

COUNT		COUNT	OTHER: TITLE CHA SEC.	RULE
	DUMPING ON REAL ESTATE WITHOUT A PERMIT 7-28-440	1	11-4-770	3.0(10)
	OPERATING A FACILITY WITHOUT A PERMIT ( ) 11-4-030	Offense (if other):	VIOLATION OF BULK MATERIAL RULE	
	HANDLING OF MATERIAL SUSCEPTIBLE TO BECOMING WINDBORNE ( ) 11-4-760			
	TREATMENT AND DISPOSAL OF SOLID OR LIQUID WASTE 11-4-1500	COUNT	OTHER: TITLE CHA SEC.	RULE
	SANDBLASTING, GRINDING, CHEMICAL WASHING VIOLATION ( ) 11-4-2190	2	11-4-770	3.0(4)
	RECYCLING FACILITY PERMIT 11-4-2520	Offense (if other):	VIOLATION OF BULK MATERIAL RULE	
	CONSTRUCTION SITE CLEANLINESS ( ) 13-32-125(2)			

You Must Describe Actions for Each Count below:

Count 1 In That: RSP. FAILED TO CLEAN LEAKED MATERIAL WITHIN ONE HOUR.

Count 2 In That: RSP. FAILED TO PAVE INTERNAL ROAD USED FOR MOVING MATERIAL.

Violation Location Nos.: 2926. | Dir.: E | Street Name *in the City of Chicago, County of Cook*: 126TH PL | ST Suffix

Vio. Date: Mo/Day: 12 12 | Year: 2018 | Time of Violation: 03:10 ( ) AM (•) PM | Notice Date: Mo/Day *if different than Vio. Date*: 12 13 | Year of Notice: 2018

Complainant's Name *if not issuing officer, investigator, or inspector* | Public Health (Environment) Version 10-24-15

Unit: P&T | Star / Badge: 82 | Signature of Issuing officer, investigator, or inspector: X

Administrative Hearing Appearance

IMPORTANT: You must appear for a mandatory hearing on:

Date: Mo/Day: 02 07 | Year: 2019 | Time: 01:00 ( ) AM (•) PM | at: (X) 400 W. Superior | Room No.: 112

FAILURE TO APPEAR may result in the imposition of a fine not to exceed the maximum penalties for each violation as specified in the Municipal Code of Chicago plus costs, restitution, and fees. Failure to comply with the administrative law judge's order may result in the issuance of additional sanctions.

I acknowledge receipt of this notice. *Signature of Respondent or Person Served:* X | E

Comments

DEPARTMENT OF ADMINISTRATIVE HEARING COPY

CITY OF CHICAGO

R 006873

DEPARTMENT OF PUBLIC HEALTH
PERMITTING AND ENFORCEMENT

NARRATIVE EVALUATION

INSPECTION DATE: 02/15/2019
SITE NAME: WATCO COMPANIES
SITE ADDRESS: 2926 E 126TH ST, CHICAGO, IL 60633
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2:26 pm
EMPLOYEE:EMMANUEL ADESANYA

COUNTY:COOK / CHICAGO
INSPECTION #: 1358292

SUMMARY

I carried out the routine inspection of Watco Terminal & Port Services (Watco Companies). Michael Enos (CDPH environmental engineer) was with me during this inspection. Today was mostly cloudy, temperature: high 32 degree F, low 8 degree F, wind: West at 14 mph and gust 25 mph, according to Weather Underground. Upon arrival we met Steve Caudle (The Facility Terminal Manager); and Chuck Shaffer (Operations Manager); they both took us around the facility for today's inspection, after a brief meeting. Summary of the facility PROCESS DESCRIPTION, according to Steve: The Chicago Watco Terminal & Port Services Facility is a specialty warehouse and Marine loading/unloading terminal that receives, stores, and loads dry-bulk material for the iron and steel industry. The products are: Ferrous Alloy, FeSi, SiMn, HCFM (high carbon manganese), Iron ore slag magnesite, HCFC (high carbon ferrous chrome), and pig iron. Products are received by the Terminal by barge, truck, and rail. Processing operations include crushing, screening, packaging and bagging of customer products.

Today's inspection revealed the following:
1) I observed accumulation of material on the ground at the Processor (area where there are crushing and screening operations). At the Processor according to Steve the following materials can be crushed and screened: Silicon Manganese (SiMn); High Carbon Ferro Chrome (HCFC); CAL Flux Slag, FE Phos, and 75% Ferrous Silicon (75% FeSi); The accumulated material appeared to have been there for sometime (Please see photo #s 03, 04, & 05);
2) I observed Accumulation of material outside, around the Processor building, it appeared the accumulated material has been there for longer time (Please see photo #s 01, & 02);
3) While on the roof of the processor building; I observed accumulation of material all around conveyor, on top of the conveyor and on the roof of processor building (Please see photo #s 07, 08 & 9);
4) I observed openings on the wall, and doors (Please see photo #s 22, 23, 24, 25, 26, 27, 28, and 29);
5) I observed conveyor not completely enclosed (Please see photo # 06);
6) I observed building F north door wide opened, and many holes on walls (Please see photo #s 30, 31, 32, 33, 34, 35, 36, 37, 38, and 39);
7) I observed bagging building south door wide opened and openings on the walls and door (Please see photo #s 40, 41, 42, 43, 44, 45, 46 and 47);
8) I observed semi/truck on unpaved internal road, with tire tracks all over the internal road (Please see photo #s 15, 16, 20 & 21),
9) I observed tire tracks on unpaved internal road leading to the maintenance shed/building (Please see photo # 17).

See the attachments.

REPORT COMPLETED?	☑ YES	☐ NO	NOV ISSUED?	☐ YES	☑ NO
INVESTIGATION COMPLETED?	☑ YES	☐ NO	ATTACHMENTS?	☑ YES	☐ NO

I, EMMANUEL ADESANYA, an employee of the City of Chicago, Department of Public Health, declare that I have conducted an inspection of the above mentioned property on the date indicated. I further declare that the observations set forth on the report are true and accurate.

82

STAR #

SIGNATURE

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS:

COMMENTS:

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #31 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #32 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #33 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #34 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #35 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #36 Direction: SE Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #37 Direction: SW Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #38 Direction: SW Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #39 Direction: SW Comments: Opening on building F, where heavy loading of manganese occurs.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #40 Direction: SE Comments: South door of bagging building is always kept opened.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #41 Direction: NE Comments: Openings on walls of building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #42 Direction: NW Comments: Wide opening on wall, where exhaust fan was once installed. This is the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #43 Direction: NW Comments: Opening on wall, where exhaust fan was removed, at the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #44 Direction: NW Comments: Opening on wall, at the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #45 Direction: NW Comments: Opening on wall, at the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #46 Direction: North Comments: Opening on wall, at the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #47 Direction: NE Comments: Opening on wall and door, at the building where bagging takes place.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #48 Direction: NE Comments: Unpaved parts of the facility near the bagging building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #49 Direction: NE Comments: Unpaved parts of the facility near the Calumet river.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #50 Direction: NE Comments: Door on the north end of building F is always kept opened during loading and unloading operations.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #51 Direction: NW Comments: Barge unloading of manganese.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo #52 Direction: NW Comments: Barge unloading of manganese.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo# 26 Direction: SE Comments: Openings on doors.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo# 27 Direction: SE Comments: Big opening on door.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#01 Direction: SE Comments: accumulation of particulate dust around the processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#02 Direction: SW Comments: accumulation of particulate dust around the processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#03 Direction: SE Comments: accumulation of particulate dust inside the processor building, with resultant migration all around the building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#04 Direction: SE Comments: accumulation of particulate dust inside the processor building, under the conveyor, with resultant migration all around the building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#05 Direction: SE Comments: accumulation of particulate dust inside the processor building, under the conveyor, with resultant migration all around the building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#06 Direction: SE Comments: The conveyor, with dust all over it, underneath it and on top of it.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#07 Direction: SE Comments: Particulate dust accumulation all over and around the conveyor, on the roof/upper floor of the processor.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#08 Direction: NW Comments: Particulate dust accumulation on the roof of the processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#09 Direction: NE Comments: Particulate dust accumulation all over around the conveyor, and on the roof of the processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#10 Direction: North Comments: The processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#11 Direction: NW Comments: The processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#12 Direction: SE Comments: Particulate dust accumulation and opening around the processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#13 Direction: North Comments: Particulate dust migrating around the dust collector drums.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#14 Direction: SW Comments: Particulate dust migrating all around processor building.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#15 Direction: North Comments: Semi truck observed on the unpaved road, the road is unpaved, muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#16 Direction: SE Comments: Semi truck observed on the unpaved road, the road is unpaved, muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#17 Direction: NW Comments: Observed unpaved road, the road is muddy and with tire tracks, leading to maintenance shed, where welding, steel cutting and other maintenance work occur.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#18 Direction: SE Comments: I observed unpaved road, the road is muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#19 Direction: East Comments: I observed unpaved road, the road is muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#20 Direction: SE Comments: I observed unpaved road, the road is muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#21 Direction: SE Comments: I observed unpaved road, the road is muddy and with tire tracks.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#22 Direction: NW Comments: I observed openings on doors and walls where particulate dust and other materials could escape.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#22 Direction: NW Comments: I observed openings on doors and walls where particulate dust could escape.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#24 Direction: NW Comments: I observed openings on doors and walls where particulate dust could escape.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#25 Direction: SE Comments: I observed openings on doors.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#28 Direction: SE Comments: I observed openings on doors.

DATE: 02/15/2019
SITE: 2926 E 126TH ST
SITE CODE: WATCO COMPANIES
PERMIT #: ENVAIR113986

TIME: 2/15/2019 2:26:00PM
INSPECTOR: EMMANUEL ADESANYA
COUNTY: COOK / CHICAGO
INSPECTION #: 1358292

COMMENTS: Photo#30 Direction: SW Comments: I observed north door of building F left opened.

CITY OF CHICAGO

OTHER CDPH PERMITS

Permit Number	Permit Type	Expiration Date
ENVAIR118546	ENV_AIR	
ENVAIR129614	ENV_AIR	
ENVAIR679463	ENV_AIR	
ENVAIR698813	ENV_AIR	
ENVAIR698834	ENV_AIR	

Quarterly Non-Packaged Manganese-Bearing Material Operation Reporting Form
Form20180820

Pursuant to Section 17-9-0117-D of the Municipal Code of the City of Chicago, Owners and operators of manganese-bearing material operation uses shall report and certify, on a quarterly basis, to the Department of Planning and Development the amount of non-packaged manganese-bearing material received, shipped, and stored at their site, in the content and format presented in this form. This form contains formulas and must be filled-out electronically using Adobe's Acrobat software or Reader software. The latest version of Acrobat Reader may be downloaded for free at https://get.adobe.com/reader/otherversions/.

Section 1. Reporting Period

Year: 2019

- (●) 1st Quarter, Form due by April 30
- ( ) 2nd Quarter, Form due by July 31
- ( ) 3rd Quarter, Form due by October 31
- ( ) 4th Quarter, Form due by January 31

Section 2. Monthly Quantities

Month: **January**

Material Name	Form	Transport Mode In	Transport Mode Out	Density tons/yard	Percent Manganese	Received tons	Shipped tons	Max. Stored tons	Throughput tons
Ferro Manganese	Lumps	Truck	Truck	3.38	64.00%	484	8,294	35,002.00	4,389
Ferro Manganese	Lumps	Rail	Rail	3.38	64.00%	0	97	0.00	49
Ferro Manganese	Lumps	Barge/Boat	Truck	3.38	64.00%	1,402	0	0.00	701
			Total			**1,886**	**8,391**	**35,002**	**5,139**

All back-up information used in the preparation and completion of this form shall be maintained for a minimum of three years and shall be submitted to the Department of Planning and Development upon request.

Quarterly Non-Packaged Manganese-Bearing Material Operation Reporting Form
Form20180820

Month **February**

Material Name	Form	Transport Mode In	Transport Mode Out	Density tons/yard	Percent Manganese	Received tons	Shipped tons	Max. Stored tons	Throughput tons
Ferro Manganese	Lumps	Truck	Truck	3.38	64.00%	308	7,392	33,152.00	3,850
Ferro Manganese	Lumps	Rail	Rail	3.38	64.00%	94	0	0.00	47
Ferro Manganese	Lumps	Barge/Boat	Truck	3.38	64.00%	1,467	0	0.00	734
				Total		**1,869**	**7,392**	**33,152**	**4,631**

Month **March**

Material Name	Form	Transport Mode In	Transport Mode Out	Density tons/yard	Percent Manganese	Received tons	Shipped tons	Max. Stored tons	Throughput tons
Ferro Manganese	Lumps	Truck	Truck	3.38	64.00%	0	9,130		4,565
				Total		**0**	**9,130**		**4,565**

Section 3. Quarterly Summary

Throughput tons	Throughput yards	Maximum Stored tons	Maximum Stored yards	Manganese Throughput tons	Manganese Throughput yards
14,334	4,243	35,002	10,356	9,174	600

All back-up information used in the preparation and completion of this form shall be maintained for a minimum of three years and shall be submitted to the Department of Planning and Development upon request.

Quarterly Non-Packaged Manganese-Bearing Material Operation Reporting Form
Form20180820

Section 4. Certification

First	Steve	Last Name	Caudle
Title	Terminal Manager	Company	Watco Companies
Address	2926 East 126th		
City	Chicago	State	Illinois
Zip Code	60633		
Phone Number	+1 (773) 646-8005	Email	steven.caudle@watcocompanies.com

☒ By clicking on the box, I certify under penalty of law that I am duly authorized to complete and submit this form, and that all the information provided herein and attached hereto is true, accurate, and complete.

Signed By

All back-up information used in the preparation and completion of this form shall be maintained for a minimum of three years and shall be submitted to the Department of Planning and Development upon request.

Quarterly Non-Packaged Manganese-Bearing Material Operation Reporting Form

Instructions

This form contains formulas and must be filled-out electronically using Adobe's Acrobat software or Reader software. The latest version of Acrobat Reader may be downloaded for free at https://get.adobe.com/reader/otherversions/.
Once completed, the form must be signed and emailed to manganese@cityofchicago.org.

Section 1. Reporting Period

Year - Enter the year being reported. Default is current year minus 90 calendar days.
Quarter - Select the quarter being reported. Default is the previous calendar quarter.

Section 2. Material Quantities

For each month, enter all the requested information for every form of non-packaged manganese bearing material handled at your site.

Month - Select the month from drop down field. The default is based on the Quarter selected in Section 1.

Material Name - In this column, select or enter the chemical or trade name of the non-packaged manganese bearing material.

Form - In this column, enter the physical form of the non-packaged manganese bearing material.

Transport Mode (in/Out) - In this column, select or enter the mode (Barge/Boat, Rail, Truck,etc.) used to transport the non-packaged manganese bearing material. "In" means inbound and "out" means outbound.

Density - In this column, enter the density of the non-packaged manganese bearing material in tons per cubic yard.

Percent Manganese - Enter in decimal fraction the percentage of manganese the non-packaged manganese bearing material contains.

Received - In this column, enter the total tonnage of the non-packaged manganese bearing material received at your site over the period being reported.

Shipped - In this column, enter the total tonnage of the non-packaged manganese bearing material shipped out of your site over the period being reported.

Stored - In this column, enter the maximum daily tonnage of the non-packaged manganese bearing material at your site for the month being reported.

Section 3. Quarterly Summary

The fields in this section are automatically calculated.

Section 4. Certification

Provide the company name, address, city, state and zip code of the site handling the non-packaged manganese bearing material. Also, provide the first name, last name, title, email, and phone number of the person completing the form. This person must be qualified in properly gathering and evaluating the information being provided, and is duly authorized by the company.

Certification checkbox - This checkbox must be checked to acknowledge that the person submitting the information is authorized and that the information being submitted is true, accurate, and complete.

Signature - Provide a hand-written or digital signature of the person completing the form.

Quarterly Non-Packaged Manganese-Bearing Material Operation Reporting Form

Definitions:

Manganese-bearing material. Ferrous manganese, manganese silicate, manganese alloy, manganese ore, or any other material from which manganese is extracted or emitted or otherwise becomes airborne. The term "manganese-bearing material" does not include any material which contains an amount of manganese that is less than 1 percent by weight.

Manganese. A hard, brittle, grayish-white, metallic element, whose symbol is Mn, atomic weight is 54.938 and atomic number is 25, and which is used chiefly as an alloying agent in steel.

Manganese-bearing material operation use. Any activity, including, but not limited to, the storing, loading, unloading, stockpiling, handling on-site, blending, mixing, crushing, screening, breaking, wet or dry cleaning, thermal drying, chemically treating or any other processing of manganese-bearing material, or any improvement or development associated therewith.

Non-packaged. Not fully enclosed to prevent the possibility of any dust escaping from the package the entire time the material is in the possession of the owner or operator.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MAY 24 2019

REPLY TO THE ATTENTION OF:

MEMORANDUM

SUBJECT: ACTION MEMORANDUM - Request for Approval and Funding of a Time-Critical Removal Action at the S.H. Bell Site, Chicago, Cook County, Illinois (Site ID # C5LE)

FROM: Bradley Benning, On-Scene Coordinator (OSC)
Emergency Response Branch 2/Emergency Response Section 3

THRU: Samuel Borries, Chief
Emergency Response Branch 2

TO: Douglas Ballotti, Director for
Superfund & Emergency Management Division

I. PURPOSE

The purpose of this Action Memorandum is to request and document your approval to expend up to $1,286,611 to conduct a time-critical removal action at the S.H. Bell Site ("Site"), in Chicago, Cook County, Illinois (Figure 1). The time-critical removal action proposed herein is necessary to mitigate threats to public health, welfare, and the environment posed by the presence of uncontrolled hazardous substances at the Site. There are no nationally significant, or precedent-setting issues associated with the proposed response at this non-National Priority List (NPL) site.

This Action Memorandum serves as approval for expenditures by the U.S. Environmental Protection Agency, as the lead technical agency, to take actions described herein to abate the imminent and substantial endangerment posed by the hazardous substances at the Site. The proposed removal of the hazardous substances will be taken pursuant to Section 104(a)(1) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9604(a)(1), and Section 300.415 of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.415.

II. SITE CONDITIONS AND BACKGROUND

CERCLIS ID: C5LE
RCRA ID: ILN000507938
State ID: NA
Category: Time-Critical Removal Action
Site Location: 10218 South Avenue O, Cook County, Illinois 60617, and the surrounding neighborhood directly east from the Calumet River to Ewing Ave. and from 100th Street north to 104th Street south.

A. Site Description

The S.H. Bell Site, located in Chicago, Cook County, Illinois consists of the S.H. Bell facility at 10218 South Avenue O, Chicago, as well as surrounding residential areas between the Calumet River and South Avenue M, and from 100th Street north to 104th Street south. EPA anticipates limited additional residential sampling within this area following the start of this removal action.

S.H. Bell's South Chicago facility consists of an approximately 23.34-acre commodities warehousing facility known as the Chicago Commodities Warehouse. The facility is a U.S. Customs bonded warehouse that provides supply chain warehousing, distribution, and fulfillment services to mining companies as well as producers, marketing agents, traders, and distributors of metal, mineral, and semi-finished industrial material commodities ("Commodities"). The Commodities are used as raw materials in manufacturing, *e.g.,* steel production and metal castings production, and most are imported internationally. At its core, the facility receives and stores Commodities and ships them at the owners' direction to intended end users, the majority being domestic steel mills and foundries. S.H. Bell's clients, and not S.H. Bell, own the Commodities.

Specifically, at the facility, S.H. Bell provides its clients, namely, the mining companies as well as the producers, marketing agents, traders, and distributors of the commodities, warehouse and distribution services that include: unloading and reloading by barge, rail, or truck; storage; inventory recordkeeping and management; order fulfillment; re-packaging; labeling; carrier scheduling and, less often, value-added services that include inventory sizing to meet end-user specifications, inventory blending, and custom packaging and labeling.

1. Removal Site Evaluation

Determining Potential Area of Concern
In November 2013, in response to residents' concerns about pet-coke stockpiles at the KCBX facility nearby, the City required the KCBX facility to install air monitors at the stockpile location. The air monitoring began in February 2014, with results indicating elevated levels of manganese. The S.H. Bell facility was implicated as a possible source of the manganese emissions. The City requested assistance from EPA to conduct air monitoring at the S.H. Bell facility.

In April 2014, EPA began investigating fugitive dust and manganese issues at the S.H. Bell facility. In March 2015, EPA requested that the facility install perimeter air monitors to determine if emissions were exceeding State or Federal regulations. S.H. Bell refused the request and a Stipulated Settlement and Final Consent Order was entered in December 2016, requiring compliance by installing the monitors and taking specific operational steps to reduce fugitive dust emissions. The monitors were installed and operational in March 2017.

In August 2017, EPA issued a Notice of Violation under the Clean Air Act to the S.H. Bell facility. EPA determined manganese emissions at the facility exceeded the health-based screening level. Air monitoring data from March through June 2017, showed an average concentration of 0.32 ug/m3 of manganese. The minimal risk level for chronic inhalation exposure to manganese is 0.3 ug/m3.

Due to possible aerial deposition of S.H. Bell facility manganese in the community, the City identified a residential zone directly east of the facility that was sampled January through March 2018. The City hired a contractor to collect samples on the City's right-of-way, at 27 locations within the sampling zone. The average manganese level in zone samples was 3,275 mg/kg and three samples exceeded the Removal Management Level (RML) of 5,500 mg/kg. Twenty samples exceeded the Illinois EPA Soil Remediation Objective of 1,600 mg/kg.

In April 2018, the Chicago Department of Public Health requested that EPA conduct a removal site evaluation to determine the full scope of the issue and take appropriate action.

In May 2018, EPA initiated residential soil sampling in an area of concern identified by the City. EPA participated in numerous public meetings, sent mailings, and conducted door-to door visits to inform residents of the sampling opportunity. The sampling universe was approximately 400-500 homes. EPA received 123 access agreements, 108 were within the area of concern, and 104 homes were eventually sampled.

Typical sample protocol was to collect samples from 0-6 inches and 6-12 inches. A five-point composite was collected at each depth within the front and back yard. If a garden was present, that was also sampled. Samples were analyzed for total metals screen, which would also detect other toxic metals such as arsenic, cadmium, and lead.

In November 2018, sampling activities were completed. Validated sample results were sent to all property owners and tenants. EPA and the Agency for Toxic Substances and Disease Registry (ATSDR) evaluated the results to determine whether manganese levels in the soil posed an unacceptable health risk to the residents. Five residences were identified with manganese concentrations in surficial soil above the RML of 5,500 mg/kg. The highest surficial concentration of manganese observed during the EPA residential sampling in May to November 2018 was 7,900 mg/kg

Lead was identified in numerous samples, and it appears to be widespread throughout the sample area. The Southeast side of Chicago historically was home to numerous industries such as steel mills and smelters. Elevated lead concentrations are typical throughout the Southeast side. This action memo will only address the manganese contamination attributed to the S.H. Bell Site.

2. Physical location

The S.H. Bell Site, located in Chicago, Cook County, Illinois consists of the S.H. Bell facility at 10218 South Avenue O, Chicago, as well as surrounding residential areas between the Calumet River and Ewing Ave. and from 100th Street north to 104th Street south (Figures 1 and 2). The S.H. Bell facility is 23.34 acres, contains numerous buildings utilized for warehouse storage and packaging. The facility is in a residential and commercial area. It is bounded to the north by City of Chicago Public Works property; to the east by a residential neighborhood; to the south by residential and industrial property; and to the west by the Calumet River. The residential area of concern consists of the properties primarily to the east and south of the facility but has yet to be fully defined.

EPA conducted an Environmental Justice (EJ) analysis for the Site (Attachment 1). Screening of the surrounding area used Region 5's EJ Screen Tool (which applies the interim version of the national EJ Strategic Enforcement Assessment Tool (EJSEAT)). Region 5 has reviewed environmental and demographic data for the area surrounding the Site and determined that there is a high potential for EJ concerns at this location.

3. Site Characteristics

The S.H. Bell facility provides warehouse and distribution services that include: unloading and reloading by barge, rail, or truck; storage; inventory recordkeeping and management; order fulfillment; re-packaging; labeling; carrier scheduling and, value-added services that include inventory sizing to meet end-user specifications, inventory blending, and custom packaging and labeling. In addition to numerous buildings, the facility contains a rail spur and three channels off the Calumet River for barge transportation.

The residential area east and south of the facility is a densely populated area, consisting of mostly single-family homes built during the early 20th century. Most of the homes have smaller yards, with areas averaging 500-1,000 square feet. This area is mixed with commercial buildings along Ewing Avenue. There are churches, schools, and daycares located around the area.

4. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

EPA documented a release of hazardous substances, pollutants, or contaminants in the soil in residential areas at the Site. Manganese is a hazardous substance, as defined at Section 101(14) of CERCLA, 42 U.S.C. § 9601(14). *See* 40 C.F.R. § 302.4. Manganese levels at the surface of the soil exceed the residential EPA RML of 5,500 mg/kg. This time-critical removal action is addressing manganese-contaminated particles released from the S.H. Bell facility during its operations into the adjacent neighborhood. This residential contamination was documented previously in the Removal Site Evaluation section. The highest surficial concentration of manganese observed during the EPA residential sampling was 7,900 mg/kg. The highest surficial concentration in a residential right-of-way identified by the City's sampling in January and March 2018 was 13,000 mg/kg.

5. NPL status

This Site is not on the NPL and has not been proposed for listing at this time.

6. Maps, pictures and other graphic representations

Figure 1: Site Location Map
Figure 2: Site Layout Map

Table 1: Occupied Residential Sampling Results (***Redacted***)

B. Other Actions to Date

1. Previous actions

EPA began investigating fugitive dust and manganese air issues at S.H. Bell's Chicago facility in 2014. Due to EPA's efforts, S.H. Bell installed air pollution control equipment, implemented an enhanced fugitive dust plan, and installed air quality monitors to measure PM10 (particulate matter) and pollutants, including manganese. In August 2017, EPA issued a Notice of Violation under the Clean Air Act to the facility. The Agency determined manganese emissions exceeded the minimal risk level for chronic inhalation exposure. Since August 2017, there has been a decrease in manganese emissions measured at the facility.

2. Current actions

EPA continues to inspect the Chicago facility to confirm S.H. Bell is complying with federal and state air requirements. EPA continues to perform outreach activities including fact sheets and community meetings and anticipates additional requests for sampling will continue to come in from the neighborhood.

C. State and Local Authorities' Roles

1. State and local actions to date

In November 2013, in response to residents' concerns about pet-coke stockpiles at the KCBX facility nearby, the City of Chicago required the KCBX facility to install air monitors at the stockpile location. The air monitoring began in February 2014, with results indicating elevated levels of manganese. The S.H. Bell facility was implicated as a possible source of the manganese. The City requested assistance from EPA to conduct air monitoring at the S.H. Bell facility.

Due to possible aerial deposition of manganese in the community, the City identified a residential zone directly east of the facility that was sampled in January through March 2018. The City hired a contractor to collect samples at 27 locations within the zone, on City right-of-way property. The average manganese level was 3,275 milligrams per kilograms (mg/kg) and

three samples exceeded the RML of 5,500 mg/kg. Twenty samples exceeded the Illinois EPA Soil Remediation Objective of 1,600 mg/kg.

In April 2018, the Chicago Department of Public Health requested that EPA conduct a removal site evaluation to determine the full scope of the issue and take appropriate action.

The City of Chicago through local ordinances prevented the construction of any new similar facilities and stopped current facilities from expanding. The City is updating its Bulk Materials Ordinance to ensure its laws meet the needs of the community.

2. Potential for continued state/local response

EPA is coordinating with various local, state, and other federal agencies regarding the Site. These agencies include the City of Chicago, Illinois EPA, and the ATSDR. EPA is providing data to its partner agencies and coordinating discussions about assessment and remediation at the Site. The partner agencies will continue to assist with community outreach.

III. THREATS TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

EPA's removal site evaluation indicates that conditions at the Site present an imminent and substantial threat to the public health, or welfare, and the environment and meet the criteria for a time-critical removal action as provided for in 40 C.F.R. § 300.415(b)(1), based on factors in § 300.415(b)(2) of the NCP. These factors include, but are not limited to, the following:

§ 300.415(b)(2)(i) - Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants:

Certain residential properties at the Site are contaminated with manganese in soil that exceeds RMLs in the top six inches. Manganese is a hazardous substance as defined at Section 101(14) of CERCLA. Potential exposure through these pathways could cause imminent endangerment to human health, welfare, or the environment.

As noted above, of the 104 occupied residential properties sampled, 5 of the properties had surficial concentrations that exceeded the EPA RML of 5,500 mg/kg for manganese. The highest manganese concentration found at the surface of one of the residential properties was 7,900 mg/kg.

ATSDR states that manganese is an essential nutrient, and that eating a small amount of it each day is important to stay healthy. The most common health problems in workers exposed to high levels of manganese involve the nervous system. These health effects include behavioral changes and other nervous system effects, which include movements that may become slow and clumsy. Other less severe nervous system effects such as slowed hand movements have been observed in some workers exposed to lower concentrations in the work place. Exposure to high levels of manganese in air can cause damage to the brain, lung irritation and reproductive effects.

Nervous system and reproductive effects have been observed in animals after high oral doses of manganese.

Exposure may occur from direct ingestion of soil, soil tracked on shoes, and inhalation of dust and soil particles from the yard. The known hazardous substance at the Site (manganese) exists in the soil of residential properties. The manganese in soil is unsecured and has no containment. Manganese has the potential to be released from these residential properties by means such as tracking, surface runoff, and wind dispersion. These potential releases may be increased in areas where soil isn't covered by grass or other means.

§ 300.415(b)(2)(iv) - High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate:

As stated previously, surface soils at certain residential properties at the Site exceed RMLs established by the EPA for manganese, which is a listed hazardous substance.

Residents at the Site may cause the high levels of manganese to migrate into other areas including inside the home by walking through and tracking in, gardening, play, and other residential activities, especially in areas where the soil lacks vegetation or other cover. Other means of migration may include routine construction activities.

§ 300.415(b)(2)(v) - Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released:

The manganese contamination at Site residential properties exists in the soil, which is exposed to the elements without proper containment. Release could occur from high winds dispersing surface particulate matter containing manganese, resulting in exposure to residents, including sensitive populations, within the Site. Grass cover is generally lighter in the early spring and fall, allowing more potential tracking of contaminated soil. Rain or thundershowers may cause the outdoor manganese to migrate via surface runoff.

300.415(b)(2)(vii) - The availability of other appropriate federal or state response mechanisms to respond to the release:

At this time, no local or State agencies have the resources to respond to the immediate threat.

IV. ENDANGERMENT DETERMINATION

Given Site conditions, the nature of the known and suspected hazardous substances at the Site, and the potential exposure pathways described in Sections II and III above, actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response actions selected in this Action Memorandum, may present an imminent and substantial endangerment to public health, welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The response actions described in this memorandum directly address actual or potential releases of hazardous substances at the Site, which may pose an imminent and substantial endangerment to public health, or welfare, or the environment. Removal activities on-site will include:

a) Development and implementation of site-specific work plans, health and safety plan, and emergency contingency plan;
b) Development and implementation of a sampling and analysis plan including air monitoring;
c) Implementing dust control measures to ensure worker and public health protection;
d) Provide for site security measures, as necessary;
e) Establish and maintain staging and stockpile area(s), as necessary;
f) Excavation of soil at residences where manganese concentrations are equal to or exceed 5,500 mg/kg at the surface, as determined by EPA sampling. To eliminate any direct contact and inhalation threats, soil will be excavated to a depth not to exceed 24 inches below ground surface. EPA may stop excavation prior to 24 inches at a location, if the Illinois Remediation Goal of 1,600 mg/kg is achieved there;
g) Replacement of excavated soil with clean soil;
h) If contaminated soil is identified at a depth greater than approximately 24 inches below ground surface, a visual barrier such as orange construction fencing, or landscape fabric will be placed above the contaminated soil and beneath the clean backfill soil;
i) Restoration of each property to as close to practicable to its pre-removal condition;
j) Staging, treatment as necessary, transportation, and disposal off-site of any hazardous substances, pollutants and contaminants at a CERCLA-approved disposal facility in accordance with EPA's Off-Site Rule (40 C.F.R. § 300.440); and
k) Taking any other response actions to address any release or threatened release of a hazardous substance, pollutant and contaminant that the EPA OSC determines may pose an imminent and substantial endangerment to the public health or the environment.

The exact number of properties requiring time-critical removal action is currently unknown. As of the November 2018 validated sampling results, five properties were identified. The actual number of properties subject to removal action may change due to additional properties within the Site boundaries being sampled during the removal action at the request of the homeowner. The City's right-of-way sampling data identified an additional two properties that were not sampled as part of EPA's removal site evaluation that potentially may have manganese concentrations above the EPA's RML. EPA will reach out to these homeowners and attempt to sample their yards. EPA estimates that it may ultimately remediate up to 15 properties and has built that cost and activity into the scope of this Action Memo. This estimate is based on the percentage of properties discovered in previous sampling, extrapolated to the number of properties in the current area of concern.

The response action proposed herein will mitigate the threats at the Site by properly identifying, consolidating, and packaging hazardous substances and materials on-Site. The consolidated materials will be removed and ultimately disposed off-Site. Site activities may also include security, perimeter air monitoring, and decontamination on the Site, as needed to complete the removal action. This response action will be conducted in accordance with Section 104(a)(1) of CERCLA, 42 U.S.C. § 9604(a)(1) and Section 300.415 of the NCP, 40 C.F.R. § 300.415, to abate or eliminate the immediate threat posed to public health and/or the environment by the presence of the hazardous substances.

The removal action will be conducted in a manner not inconsistent with the NCP. If necessary, post-removal site control may be conducted consistent with the provisions of Section 300.415(l) of the NCP.

2. Contribution to remedial performance

The proposed action will not impede future remedial actions based on available information.

3. Engineering Evaluation/Cost Analysis (EE/CA)

Not Applicable.

4. Applicable or relevant and appropriate requirements (ARARs)

EPA will comply with applicable or relevant and appropriate requirements (ARARs) of federal and State law identified in a timely manner, to the extent practicable considering the exigencies of the situation. On April 11, 2019, EPA sent an email request to Jerry Willman of Illinois EPA requesting any State of Illinois ARARs that may apply. Illinois EPA has identified its State Soil Remediation Goal for manganese (1,600 mg/kg) as an ARAR. EPA will consider and implement the submitted ARARs, as appropriate.

While it is not strictly an ARAR, all hazardous substances removed off-site pursuant to this removal action for treatment, storage, and disposal will be treated, stored, or disposed of at a facility in compliance, as the EPA determines, with the EPA Off-Site Rule, 40 C.F.R. § 300.440.

5. Project schedule

Given the assumption of 15 properties requiring excavation, EPA estimates that the project will take approximately 80 working days.

6. Estimated costs

REMOVAL ACTION PROJECT CEILING ESTIMATE	
Extramural Costs:	
Regional Removal Allowance Costs:	$940,776
Other Extramural Costs Not Funded from the Regional Allowance:	
Total START, including multiplier costs	$131,400
Subtotal Extramural Costs	$1,072,176
Extramural Costs Contingency (20% of Subtotal)	$214,435
TOTAL REMOVAL ACTION PROJECT CEILING	$1,286,611

The response actions described in this memorandum directly address the actual or threatened release of hazardous substances, pollutants or contaminants at the Site which may pose an imminent and substantial endangerment to public health or welfare or to the environment. These response actions do not impose a burden on affected property disproportionate to the extent to which that property contributes to the conditions being addressed.

All hazardous substances, pollutants or contaminants removed off-site pursuant to this removal action for treatment, storage and disposal shall be treated, stored, or disposed at a facility in compliance, as determined by EPA, with the EPA Off-Site Rule, 40 C.F.R. § 300.440.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Given Site conditions, the nature of the hazardous substances on-site, the potential exposure pathways to nearby populations described in Sections II, III, and IV above, and the actual or threatened release of hazardous substances from the Site, failing to take or delaying action may present an imminent and substantial endangerment to public health, welfare or the environment.

VII. OUTSTANDING POLICY ISSUES

None

VIII. ENFORCEMENT

For administrative purposes, information concerning the enforcement strategy for this site is contained in the Enforcement Confidential Addendum.

The total EPA costs for this removal action based on full-cost accounting practices that will be eligible for cost recovery are estimated to be $2,083,175[1].

($1,286,611.49 + $54,000) + (55.39% x $1,340,611) = $2,083,175

IX. RECOMMENDATION

This decision document represents the selected removal action for the S.H. Bell Site in Chicago, Cook County, Illinois. This document has been developed in accordance with CERCLA as amended and is not inconsistent with the NCP. This decision is based on the Administrative Record for the Site, see Attachment III. Conditions at the Site meet the NCP criteria at 40 C.F.R. § 300.415(b)(2) for a time-critical removal action, and I recommend your approval.

The total removal project ceiling, if approved, will be $1,286,611. Of this, an estimated $1,155,211 may be used for the cleanup contractor costs. You may indicate your decision by signing below.

APPROVE: _____ for _____ DATE: 5/24/19
Douglas Ballotti, Director
Superfund & Emergency Management Division

DISAPPROVE: _____ DATE: _____
Douglas Ballotti, Director
Superfund & Emergency Management Division

Enforcement Addendum

Figures:
Figure 1: Site Location Map
Figure 2: Site Layout Map

[1] Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgement interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States right to cost recovery.

Tables:
Table 1: Summary of Sample Results at Occupied Residential Properties for Manganese

Attachments:
I: Environmental Justice (EJ) Screen
II: Detailed Cleanup Contractor Estimate
III: Administrative Record Index
IV: Independent Government Cost Estimate (IGCE)

cc: S. Ridenour, U.S. EPA, 5104A/B517F (Ridenour.Steve@epa.gov)
L. Nelson, U.S. DOI, w/o Enf. Addendum, (Lindy_Nelson@ios.doi.gov)
J. Willman, IEPA w/o Enf. Addendum (jerry.willman @illinois.gov)

BCC PAGE HAS BEEN REDACTED

NOT RELEVANT TO SELECTION

OF REMOVAL ACTION

ENFORCEMENT ADDENDUM

HAS BEEN REDACTED – THREE PAGES

ENFORCEMENT CONFIDENTIAL

NOT SUBJECT TO DISCOVERY

FOIA EXEMPT

NOT RELEVANT TO SELECTION

OF REMOVAL ACTION

Figure 1
Site Location
S. H. Bell Site, Chicago, IL

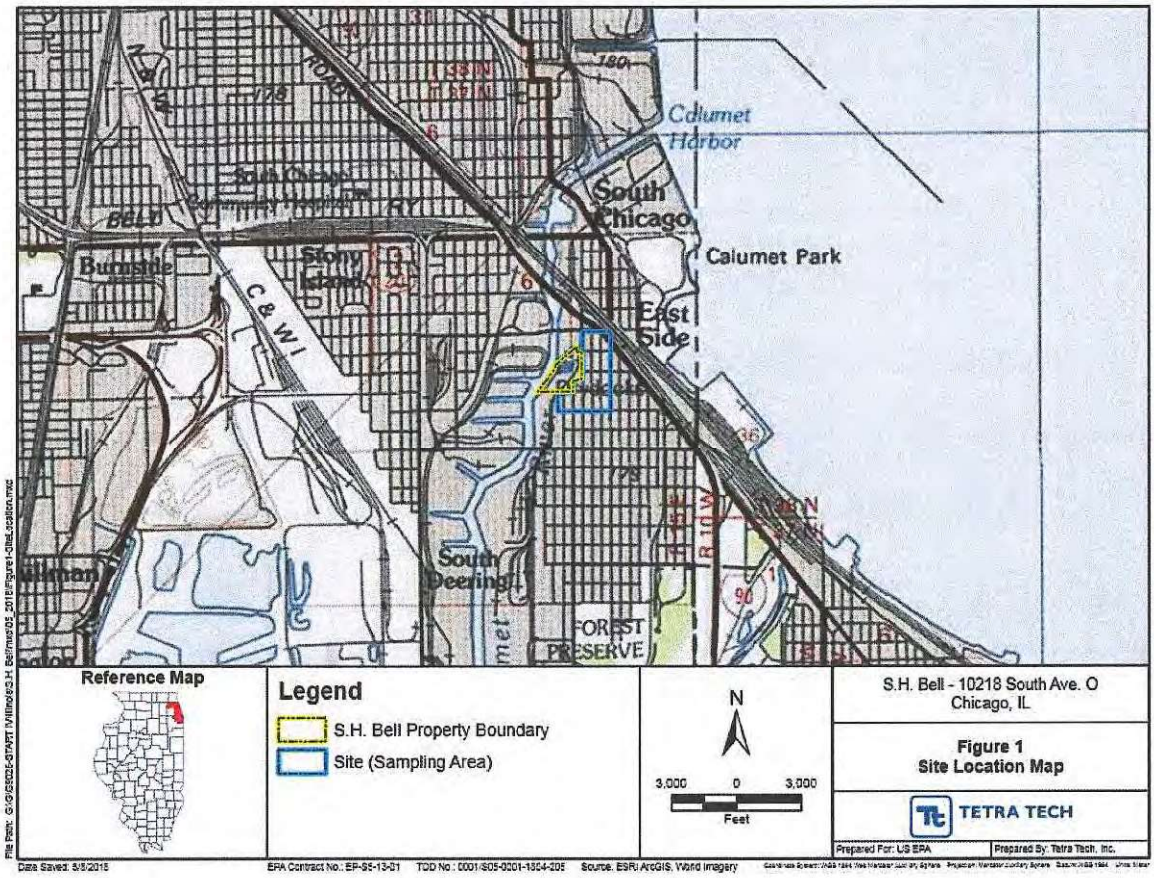


Figure 2
Site Layout map
S.H. Bell Site, Chicago, IL

Table 1
Occupied Residential Sample Results May thru November 2018
S.H. Bell Site, Chicago, IL

Residential samples that equaled or exceeded the Manganese RML of 5500 mg/kg

Property	Result
SHB-1289-FY-0006-180524	7900 mg/kg
SHB-1041-FY-0006-180625	5500 mg/kg
SHB-1579-BY-0006-180625	5600 mg/kg
SHB-1749-BY-0612-180726	5800 mg/kg
SHB-1305-FY-0006-180802	6400 mg/kg

ATTACHMENT I

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

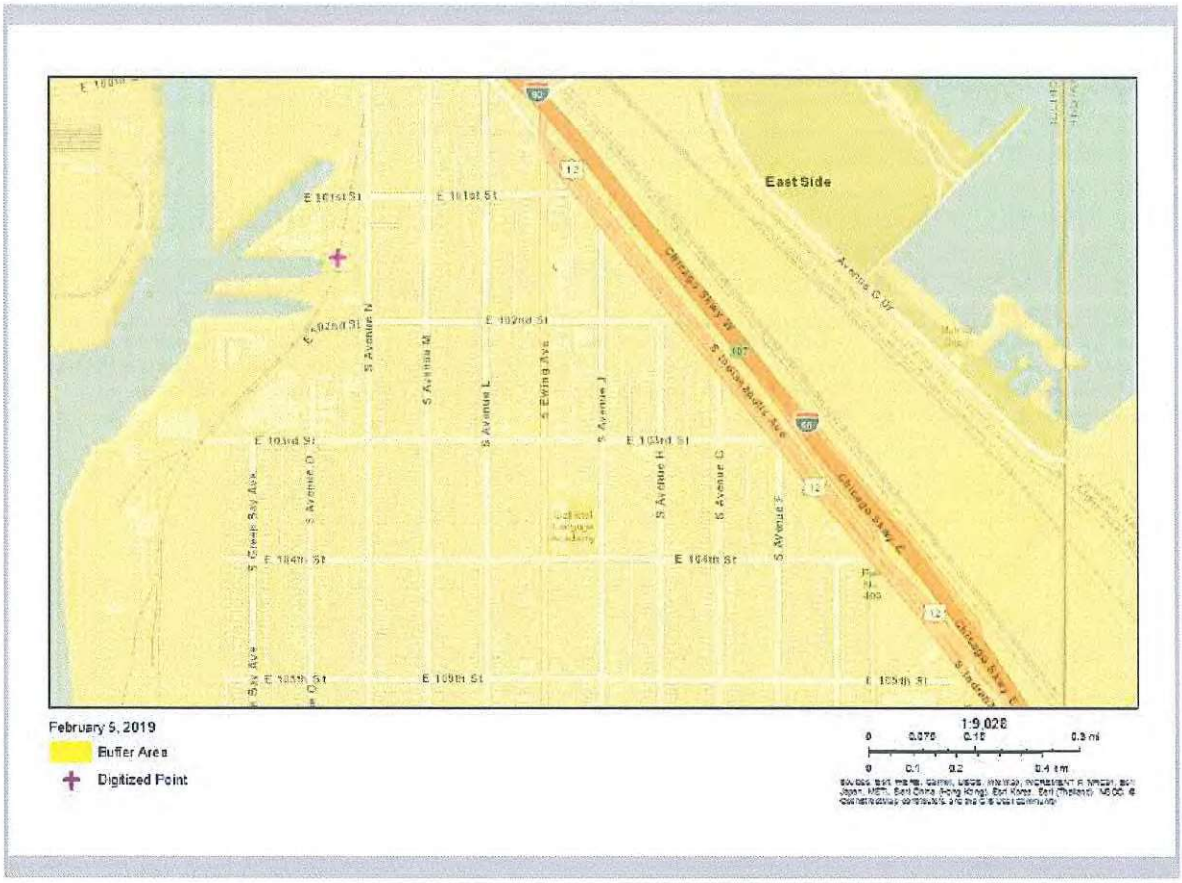
Environmental Justice (EJ) Screen for S.H. Bell Site
Chicago, Cook County, Illinois

EPA United States Environmental Protection Agency

EJSCREEN Report (Version 2018)

1 mile Ring Centered at 41.710998,-87.539569, ILLINOIS, EPA Region 5

Approximate Population: 17,234
Input Area (sq. miles): 3.14
SH Bell



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

United States Environmental Protection Agency

EJSCREEN Report (Version 2018)

1 mile Ring Centered at 41.710998,-87.539569, ILLINOIS, EPA Region 5

Approximate Population: 17,234

Input Area (sq. miles): 3.14

SH Bell

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m³)	13.2	12.1	93	10.8	98	9.53	97
Ozone (ppb)	43.8	43.3	75	42.6	70	42.5	65
NATA* Diesel PM (µg/m³)	1.7	1.28	78	0.932	90-95th	0.938	80-90th
NATA* Cancer Risk (lifetime risk per million)	39	36	75	34	70-80th	40	<50th
NATA* Respiratory Hazard Index	2	1.9	63	1.7	70-80th	1.8	60-70th
Traffic Proximity and Volume (daily traffic count/distance to road)	700	510	84	370	87	600	83
Lead Paint Indicator (% Pre-1960 Housing)	0.87	0.41	92	0.38	93	0.29	95
Superfund Proximity (site count/km distance)	0.24	0.091	95	0.12	90	0.12	89
RMP Proximity (facility count/km distance)	1.9	1.1	82	0.81	88	0.72	90
Hazardous Waste Proximity (facility count/km distance)	2.4	2.1	71	1.5	80	4.3	80
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.0049	0.44	52	4.2	68	30	76
Demographic Indicators							
Demographic Index	72%	34%	89	28%	93	36%	90
Minority Population	88%	38%	87	25%	93	38%	89
Low Income Population	56%	31%	84	32%	85	34%	82
Linguistically Isolated Population	13%	5%	86	2%	94	4%	87
Population With Less Than High School Education	34%	12%	93	10%	96	13%	92
Population Under 5 years of age	6%	6%	52	6%	54	6%	51
Population over 64 years of age	9%	14%	32	15%	25	14%	29

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

EJSCREEN Report (Version 2018)

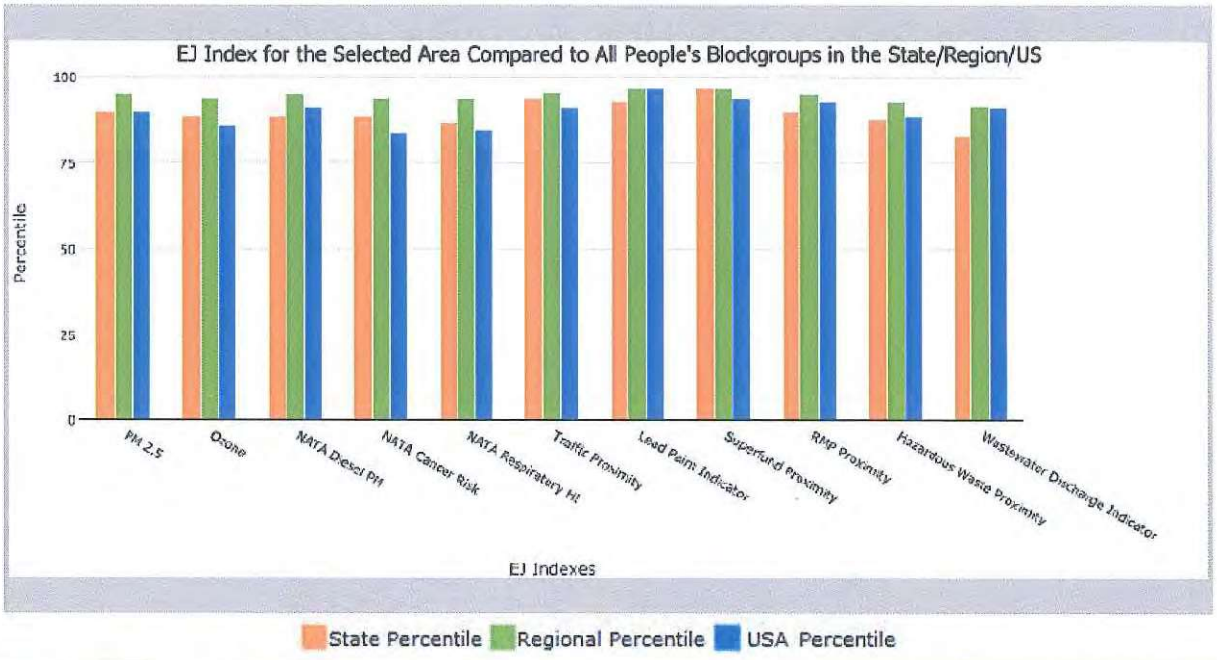
1 mile Ring Centered at 41.710998,-87.539569, ILLINOIS, EPA Region 5

Approximate Population: 17,234

Input Area (sq. miles): 3.14

SH Bell

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	90	95	90
EJ Index for Ozone	89	94	86
EJ Index for NATA* Diesel PM	89	95	91
EJ Index for NATA* Air Toxics Cancer Risk	89	94	84
EJ Index for NATA* Respiratory Hazard Index	87	94	85
EJ Index for Traffic Proximity and Volume	94	96	91
EJ Index for Lead Paint Indicator	93	97	97
EJ Index for Superfund Proximity	97	97	94
EJ Index for RMP Proximity	90	95	93
EJ Index for Hazardous Waste Proximity	88	93	89
EJ Index for Wastewater Discharge Indicator	83	92	91



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

ATTACHMENT II

DETAILED CONTRACTOR ESTIMATE

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OF REMOVAL ACTION

ATTACHMENT III

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMOVAL ACTION

ADMINISTRATIVE RECORD

S.H. BELL SITE
CHICAGO, IL

No.	Date	Author	Recipient	Title
1	4/16/18	CPHD	EPA	Site Referral
2	1/18	CPHD	EPA	Sampling Results
3	6/28/18	U.S. Congress	EPA	Request for Investigation
4	9/17	EPA	Residents	EPA Fact Sheet
5	5/18	EPA	Residents	EPA Fact Sheets
6	2/6/19	TetraTech	EPA	Site Assessment Report
7	8/7/17	EPA	SH Bell	Notice of Violation
8	-	B. Benning OSC	EPA	Action Memorandum

ATTACHMENT IV

INDEPENDENT GOVERNMENT COST

ESTIMATE HAS BEEN REDACTED –

TWO PAGES

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OF REMOVAL ACTION

R 006930
315 West 3rd Street
Pittsburg, KS 66762
Phone: 620-231-2230
Fax: 620-231-0812

April 20, 2019

Attn: Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency Region 5
77 W. Jackson Boulevard
Chicago, Illinois 60604

Dear Sir/Madam:

Watco Terminal and Port Services (WTPS) is submitting the April 2019 FRM monitoring data for the Chicago Ferro facility. Please find the attached filter analysis compiled by Trinity Consultants, the Weather Station Data, and the Loading and Unloading activities performed at the facility.

Watco would like to point out the following observations as they relate to the results of the laboratory analysis:

- There were four (4) days where the 0.3 µg/m^3 manganese threshold limit was exceeded:
    - April 3, 2019, April 9, 2019, April 12, 2019, and April 15, 2019
- Further investigation was conducted for these dates. Please see the Attachment I: Supporting Documentation for an explanation of all activities at the terminal, the wind speed and direction, and the total trucks loaded out.
- Watco is continuing to investigate all instances of exceedances to determine contributing factors.

R 006931
315 West 3rd Street
Pittsburg, KS 66762
Phone: 620-231-2230
Fax: 620-231-0812

If you have any questions regarding this document or any of the attachments, please contact Shonta' Moore, Environmental Manager with Watco Companies, LLC at (832) 302-6055 or shonta.moore@watcocompanies.com.

Sincerely,

Shonta' Moore, REM
Corporate Environmental Manager – Air

R 006932
315 West 3rd Street
Pittsburg, KS 66762
Phone: 620-231-2230
Fax: 620-231-0812

Attachment I:
Supporting Documentation

Sample Date	Manganese (Mn) Result ng/m^3	Exceedance (Y/N)	Activity Description	Wind Direction (avg)	Avg Wind Speed (mph)
4.3.19	706	yes	Loaded 19 manganese bulk truck loads; loaded 33 other bulk loads; filled 25 sacks of manganese in package department; no rail	236.11 WSW	7.22 mph
4.6.19	135	no	Terminal Closed	115.42 ESE	3.82 mph
4.9.19	395	yes	Loaded 10 manganese bulk truck loads; loaded 31 other bulk loads; filled 11 sacks of manganese in pacakge department; no rail	150.85 ESE	7.96 mph
4.12.19	462	yes	Loaded 9 manganese bulk truck loads; loaded 32 other bulk loads; filled 11 sacks of manganese in package department; no rail	235.82 WSW	14.94 mph
4.15.19	621	yes	Loaded 9 manganese bulk truck loads; loaded 37 other bulk loads; filled 14 sacks of manganese in package department; no rail	245.98 WSW	7.89 mph
4.18.19	321	yes	Loaded 18 manganese bulk truck loads; loaded 25 other bulk loads	156.03 SSE	8.67 mph
4.21.19	ND	no	Terminal Closed	188.63 S	7.08 mph
4.24.19	118	no	No barge; Loaded 19 Mn bulk truck loads; Loaded 23 other bulk loads	78.99 ENE	4.01 mph
4.27.19	ND	no	Terminal Closed	59.91 ENE	10.38 mph
4.30.19	ND	no	Loaded 5 manganese bulk truck loads; loaded 22 other bulk loads; filled 11 super sacks SIMn in pacage department	58.99 ENE	8.21 mph

Average (ng/m^3)	394.00
Average (µg/m^3)	0.394

R 006934
315 West 3rd Street
Pittsburg, KS 66762
Phone: 620-231-2230
Fax: 620-231-0812

Attachment II:
April 2019 Data Report

Customer First – Safety Always!

PARTICULATE (PM_{10}), METALS, AND METEOROLOGICAL MONITORING DATA REPORT WATCO'S CHICAGO FERRO TERMINAL APRIL 2019

Prepared By:

MSI Trinity
4525 Wasatch Blvd.
Suite 200
Salt Lake City, Utah 84124

Watco Terminal & Port Services
2926 E. 126th Street
Chicago, Illinois 60633

May 2019

Trinity Consultants

Environmental solutions delivered uncommonly well

TABLE OF CONTENTS

1. INTRODUCTION 1-1

1.1 Monitoring Station Description 1-1

1.2 Monitoring Equipment 1-3

2. DATA SUMMARY 2-1

2.1 PM_{10} and Metals Concentration Data 2-1

2.2 Horizontal Wind Direction and Wind Speed 2-1

2.3 Data Recovery 2-1

3. QUALITY CONTROL 3-1

FIGURES

1.1 Google Earth Image Showing PM_{10} and Meteorological Monitoring Locations 1-2

1.2 Photograph of PM_{10} Sampling Location 1-2

1.3 Photograph of Meteorological Tower on Building D 1-3

2.1 Wind Rose, April 1 –April 30, 2019 2-1

TABLES

1-1 PM_{10} and Meteorological Sampling Locations 1-1

2-1 PM_{10} Concentration Results in Micrograms per Cubic Meter from April 1 –April 30, 2019 2-1

2-2 Metal Concentration Results in Nanograms per Cubic Meter from April 1 –April 30, 2019 2-1

APPENDICES

A PM_{10} Concentration Data

B Metals Concentration Data

C Hourly Wind Speed and Wind Direction Data

1. INTRODUCTION

This report, prepared for Watco Terminal & Port Services by MSI Trinity Consultants, summarizes PM_{10}, Arsenic (As), Cadmium (Cd), Chromium (Cr), Lead (Pb), Manganese (Mn), Nickel (Ni), and Vanadium (V) metals and wind data for the period April 1 through April 30, 2019 that are being collected at monitoring stations operated by Watco at the Chicago Ferro Terminal. The purpose for the air quality and meteorological measurements is in response to a May 15, 2018 request made from EPA under Section 114(a) of the Clean Air Act in an effort to determine if Watco's emission sources are in compliance with the Clean Air Act and the Illinois State Implementation Program.

The Chicago Ferro Terminal is located near the intersection of E. 126th street and S. Carondolet Ave in Chicago, Illinois. The air quality monitoring station, located in the facility office building area, collects ambient filter-based particulate matter less than 10 (PM_{10}) concentration data. Since the nature of the dust principally contains lead and the toxic metals, these filters are analyzed for the metals listed above. At the meteorological station which is located atop building "D", continuous measurements of wind speed and wind direction are recorded.

1.1 MONITORING STATION DESCRIPTION

On September 5, 2018, a Met One Inc. Model E-SEQ-FRM filter-based PM_{10} sampler was installed at the Chicago Ferro Terminal to document and record respirable PM_{10} concentrations. Official PM_{10} monitoring began on September 17, 2018. The meteorological monitoring station consisting of a wind speed and wind direction sensor was installed prior to September 2018 by Watco at the Chicago Ferro Terminal. The sampling locations of the PM_{10} and meteorological monitoring equipment in latitude and longitude and in UTM coordinates are presented in Table 1-1. Figure 1.1 presents a Google Earth image showing the PM_{10} and meteorological sampling locations. Figures 1.2 and 1.3 present photographs of the PM_{10} sampler and meteorological measurement system.

Table 1-1 PM_{10} and Meteorological Sampling Locations

	Meteorological	Air Quality
Latitude (WGS84)	41°40'7.65"N	41°40'5.69"N
Longitude (WGS84)	87°33'19.90"W	87°33'11.68"W
UTM Easting (m) (NAD83)	453754.62	453944.31
UTM Northing (m) (NAD83)	4613152.66	4613090.99
Elevation (m-msl)	178.3	178.3

Figure 1.1 Google Earth Image Showing PM_{10} and Meteorological Monitoring Locations

Figure 1.2 Photograph of PM_{10} Sampling Location

Figure 1.3 Photograph of Meteorological Tower on Building D

1.2 MONITORING EQUIPMENT

At the PM_{10} sampling location, a Met One E-SEQ-FRM filter-based sampler, which is a candidate EPA federal reference method for PM_{10}, is operated. In this unit, a sample stream passes through filter cassettes containing a 47 mm diameter sample filter. A mass flow controller downstream of the filter controls the flow rate at a constant volumetric level. The sampler is configured to collect 24-hour (midnight to midnight) samples every three days in accordance with the schedule adopted by EPA. The Met One 034B Wind Sensor, attached to tripod mast, combines wind speed and direction measurements in a single sensing unit. Wind measurements are recorded continuously.

2. DATA SUMMARY

This section of the report summarizes the PM_{10} and metals concentration data, and wind data results for April 1 through April 30, 2019. PM_{10} and metal concentration filter results, and hourly wind speed and direction data are tabulated in the appendices. For the meteorological measurements, the appendix tables display the hourly average of measurements recorded in the hour "ending"; that is, the first hour of the day is labeled 01, meaning the hour beginning at 00:00:01 and ending at 01:00:00 a.m. The second hour is labeled 02, meaning the values collected from 01:00:01 a.m. to 02:00:00 a.m.

Gravimetric and metals analysis results were provided by Intermountain Laboratories (IML). For the determination of metals (As, Cd, Cr, Pb, Mn, Ni, and V) on PM air filters, EPA's IO Compendium Method IO-3.5: "Determination of Metals in Ambient Particulate Matter Using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)" was utilized by the analytical laboratory.

2.1 PM_{10} AND METALS CONCENTRATION DATA

The three-day PM_{10} filter sampling results, in micrograms per cubic meter ($\mu g/m^3$), and sampling information for the April 1 through April 30 monitoring period are presented in Table 2-1 and Appendix A. Metals concentrations, in nanograms per cubic meter (ng/m^3) and corrected to standard temperature and pressure (STP), for the April 1 through April 30 monitoring period are presented in Table 2-2 and Appendix B.

Table 2-1 PM_{10} Concentration Results in Micrograms per Cubic Meter from April 1 through April 30, 2019

Sampling Date	Filter Number	Net Weight (mg)	Elapsed Time (min)	LTP PM_{10} Conc. ($\mu g/m^3$)	STP PM_{10} Conc. ($\mu g/m^3$)	Comments
04/03/19	P2954583	0.6947	1440	28.9	27.7	
04/06/19	P2954584	1.4316	1440	59.6	57.9	
04/09/19	P2954585	0.9372	1440	39.0	38.5	
04/12/19	P2954586	0.5349	1440	22.2	21.6	
04/15/19	P2954588	0.4621	1440	19.2	18.4	
04/18/19	P2954589	0.3318	1440	13.8	13.5	
04/21/19	P2954590	0.3979	1440	16.5	16.4	
04/24/19	P2954591	0.8648	1440	36.0	35.2	
04/27/19	P2954592	0.1142	1440	4.7	4.5	
04/30/19	P2954593	0.2702	1440	11.2	10.7	

Table 2-2 Metal Concentration Results in Nanograms per Cubic Meter from April 1 through April 30, 2019

Sampling Date	Filter Number	As[1] (ng/m³)	Cd[1] (ng/m³)	Cr[1] (ng/m³)	Pb[1] (ng/m³)	Mn[1] (ng/m³)	Ni[1] (ng/m³)	V[1] (ng/m³)
04/03/19	P2954583	0	0	0	4.05	706	0	0
04/06/19	P2954584	8.73	0	0	20.1	135	0	0
04/09/19	P2954585	2.23	0	0	11.1	395	0	0
04/12/19	P2954586	0	0	0	2.35	462	0	0
04/15/19	P2954588	0	0	0	2.63	621	0	0
04/18/19	P2954589	0	0	0	2.6	321	0	0
04/21/19	P2954590	2.26	0	0	3.64	0	0	0
04/24/19	P2954591	2.94	0	0	19	118	0	0
04/27/19	P2954592	0	0	0	0	0	0	0
04/30/19	P2954593	0	0	0	3.33	0	0	0

[1] Corrected to standard temperature and pressure (0°C and 760 mmHg)

2.2 HORIZONTAL WIND DIRECTION AND WIND SPEED

Figure 2.1 presents a diagram of the joint frequency of occurrence distributions (wind rose) of wind speed and wind direction for April 1 through April 30, 2019. Hourly wind speed and wind direction data for April 2019 are presented in Appendix C.

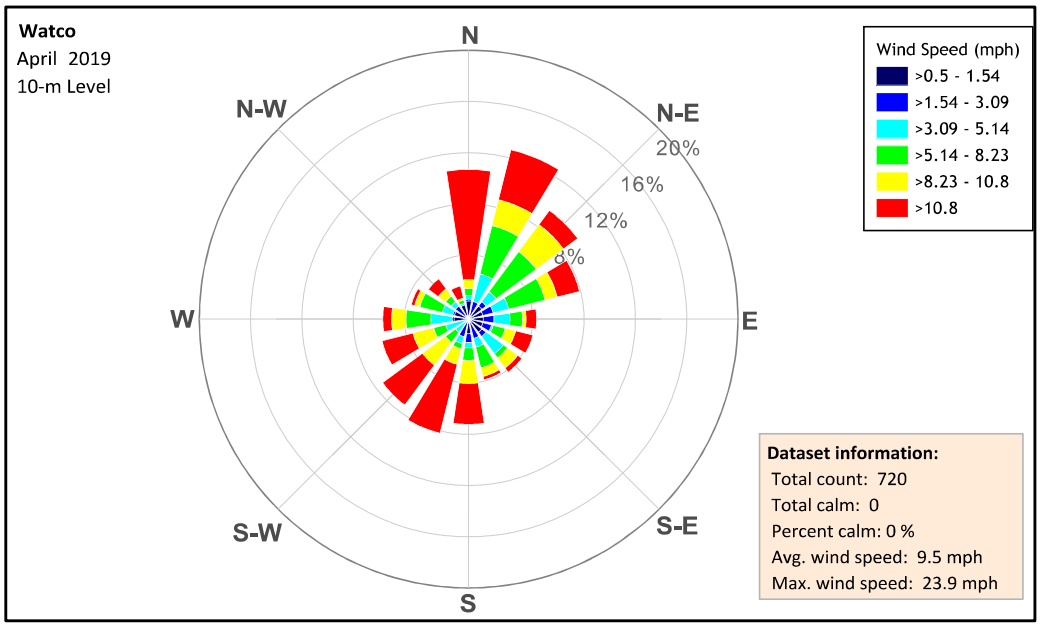

Figure 2.1 Wind Rose, April 1 through April 30, 2019

The predominant wind during April 2019 was from the north-northeast. Reported wind directions represent the directions **from which** the wind is blowing. During April, there were no calm periods. The percentage of wind speeds that were not calm but were less than 5.14 miles per hour (mph) were 21.5 percent. The percentage of wind that were greater than 10.8 mph was 36.8 percent. The maximum wind gust in April at the Watco monitoring station was 41.7 mph.

2.3 DATA RECOVERY

The data recovery for the PM_{10} sampler for the April 1 through April 30, 2019 monitoring period, in percent possible, was 100%.

3. QUALITY CONTROL

Visual inspection of the PM_{10} monitoring station occurs monthly since the Met One E-SEQ-FRM sampler holds 16 filters. At this time, the site technician performs any required maintenance. Monthly, the site operator performs flow checks on the Met One E-SEQ-FRM sampler. Calibration of the PM_{10} equipment occurs quarterly, when changes are made to the sampler, or when problems require it.

The meteorological data are accessed from the Stevens-connect.com website. Meteorological equipment calibrations will be performed when problems are noted and semi-annually. Sensors which do not meet calibration specifications or fail performance audits are repaired and recalibrated.

APPENDIX A

PM_{10} Concentration Data

PM_{10} Sampler Summary

April 1, 2019 - April 30, 2019

Network: **Trinity - Watco**
Site: Watco
Sampler ID: 1 **AQS ID:**
Sampler Type: Met One E-SEQ-FRM

Date	Filter ID	Concentration (µg/m3) LTP	Concentration (µg/m3) STP	Sample Period (hr:min)	Sample Volume (m3)	Std Volume (m3)	Tare (mg)	Mass Gross (mg)	Net (mg)	Flag	Comments
04/03/19	P2954583	**28.9**	**27.7**	24:00	24.0	25.0	384.8191	385.5138	0.6947		
04/06/19	P2954584	**59.6**	**57.9**	24:00	24.0	24.7	390.0334	391.4650	1.4316		
04/09/19	P2954585	**39.0**	**38.5**	24:00	24.0	24.4	391.0285	391.9657	0.9372		
04/12/19	P2954586	**22.2**	**21.6**	24:00	24.0	24.7	390.8742	391.4091	0.5349		
04/15/19	P2954588	**19.2**	**18.4**	24:00	24.0	25.0	400.2707	400.7328	0.4621		
04/18/19	P2954589	**13.8**	**13.5**	24:00	24.0	24.5	406.0249	406.3567	0.3318		
04/21/19	P2954590	**16.5**	**16.4**	24:00	24.0	24.2	388.5258	388.9237	0.3979		
04/24/19	P2954591	**36.0**	**35.2**	24:00	24.0	24.6	392.6224	393.4872	0.8648		
04/27/19	P2954592	**4.7**	**4.5**	24:00	24.0	25.3	396.9319	397.0461	0.1142		
04/30/19	P2954593	**11.2**	**10.7**	24:00	24.0	25.2	389.2857	389.5559	0.2702		
04/14/19	P2954587		**Field Blank**				393.8846	393.8911	0.0065		

# Valid	Recovery	Average	St. Dev.	Max	Min
10	**100%**	**24.4**	**15.8**	**57.9**	**4.5**

APPENDIX B

Metals Concentration Data

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 5/8/2019

CLIENT: Trinity Consultants
Project: Watco
Lab Order: S1905085

CASE NARRATIVE

Report ID: S1905085001

Samples 2954583 #246, 2954584 #247, 2954585 #248, 2954586 #249, 2954587 #258, 2954588 #259, 2954589 #260, 2954590 #263, 2954591 #266, 2954592 #268 and 2954593 #270 were received on May 3, 2019.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-001
Client Sample ID: 2954583 #246

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/3/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/03/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 1945 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 1945 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 1945 MS	IO-3.5
Lead	100	50		ng/filter	05/07/2019 1945 MS	IO-3.5
Manganese	16900	600		ng/filter	05/07/2019 1945 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 1945 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 1945 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	4.05	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	706	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-002
Client Sample ID: 2954584 #247

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/6/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m³	04/06/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	210	50		ng/filter	05/07/2019 1956 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 1956 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 1956 MS	IO-3.5
Lead	480	50		ng/filter	05/07/2019 1956 MS	IO-3.5
Manganese	3200	600		ng/filter	05/07/2019 1956 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 1956 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 1956 MS	IO-3.5
Filter Metals Concentration						
Arsenic	8.73	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m³	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m³	05/08/2019 1501 JJ	Calculation
Lead	20.1	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Manganese	135	25		ng/m³	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m³	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m³	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945
Your Environmental Monitoring Partner

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-003
Client Sample ID: 2954585 #248

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/9/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m³	04/09/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	50	50		ng/filter	05/07/2019 2008 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2008 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2008 MS	IO-3.5
Lead	270	50		ng/filter	05/07/2019 2008 MS	IO-3.5
Manganese	9500	600		ng/filter	05/07/2019 2008 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2008 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2008 MS	IO-3.5
Filter Metals Concentration						
Arsenic	2.23	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m³	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m³	05/08/2019 1501 JJ	Calculation
Lead	11.1	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Manganese	395	25		ng/m³	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m³	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m³	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-004
Client Sample ID: 2954586 #249

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/12/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m³	04/12/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2032 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2032 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2032 MS	IO-3.5
Lead	60	50		ng/filter	05/07/2019 2032 MS	IO-3.5
Manganese	11100	600		ng/filter	05/07/2019 2032 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2032 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2032 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m³	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m³	05/08/2019 1501 JJ	Calculation
Lead	2.35	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Manganese	462	25		ng/m³	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m³	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m³	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-005
Client Sample ID: 2954587 #258

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/14/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2038 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2038 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2038 MS	IO-3.5
Lead	ND	50		ng/filter	05/07/2019 2038 MS	IO-3.5
Manganese	ND	600		ng/filter	05/07/2019 2038 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2038 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2038 MS	IO-3.5

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-006
Client Sample ID: 2954588 #259

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/15/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m³	04/15/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2044 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2044 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2044 MS	IO-3.5
Lead	60	50		ng/filter	05/07/2019 2044 MS	IO-3.5
Manganese	14900	600		ng/filter	05/07/2019 2044 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2044 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2044 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m³	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m³	05/08/2019 1501 JJ	Calculation
Lead	2.63	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Manganese	621	25		ng/m³	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m³	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m³	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-007
Client Sample ID: 2954589 #260

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/18/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m³	04/18/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2050 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2050 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2050 MS	IO-3.5
Lead	60	50		ng/filter	05/07/2019 2050 MS	IO-3.5
Manganese	7700	600		ng/filter	05/07/2019 2050 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2050 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2050 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m³	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m³	05/08/2019 1501 JJ	Calculation
Lead	2.60	2.08		ng/m³	05/08/2019 1501 JJ	Calculation
Manganese	321	25		ng/m³	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m³	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m³	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-008
Client Sample ID: 2954590 #263

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/21/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/21/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	50	50		ng/filter	05/07/2019 2056 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2056 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2056 MS	IO-3.5
Lead	90	50		ng/filter	05/07/2019 2056 MS	IO-3.5
Manganese	ND	600		ng/filter	05/07/2019 2056 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2056 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2056 MS	IO-3.5
Filter Metals Concentration						
Arsenic	2.26	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	3.64	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	ND	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-009
Client Sample ID: 2954591 #266

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/24/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/24/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	70	50		ng/filter	05/07/2019 2102 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2102 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2102 MS	IO-3.5
Lead	460	50		ng/filter	05/07/2019 2102 MS	IO-3.5
Manganese	2800	600		ng/filter	05/07/2019 2102 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2102 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2102 MS	IO-3.5
Filter Metals Concentration						
Arsenic	2.94	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	19.0	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	118	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-010
Client Sample ID: 2954592 #268

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/27/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/27/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2108 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2108 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2108 MS	IO-3.5
Lead	ND	50		ng/filter	05/07/2019 2108 MS	IO-3.5
Manganese	ND	600		ng/filter	05/07/2019 2108 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2108 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2108 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	ND	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	ND	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-011
Client Sample ID: 2954593 #270

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/30/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/30/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 2114 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 2114 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 2114 MS	IO-3.5
Lead	80	50		ng/filter	05/07/2019 2114 MS	IO-3.5
Manganese	ND	600		ng/filter	05/07/2019 2114 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 2114 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 2114 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	3.33	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	ND	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs

Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page of

All shaded fields must be completed.
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181540

R 006959

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Watco	Watco		

Report Address	Contact Name	Email	Phone
MSI/Trinity	Matt Sloan	msloan@trinityconsultants.com	330-844-6998

Invoice Address	Purchase Order #	Quote #
2926 E 126 St Chicago, IL 60633		

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	ANALYSES / PARAMETERS: Metals	REMARKS
1	51905085-001	4-3-19		2 954 583 -		246	X	
2	002	4-6-19		2 954 584 -		247	X	
3	003	4-9-19		2 954 585 -		248	X	
4	004	4-12-19		2 954 586 -		249	X	
5	005	4-14-19		2 954 587 -		258	X	Field Sample
6	006	4-15-19		2 954 588 -		259	X	
7	007	4-18-19		2 954 589 -		260	X	
8	008	4-21-19		2 954 590 -		263	X	
9	009	4-24-19		2 954 591 -		266	X	
10	010	4-27-19		2 954 592 -		268	X	
11	011	4-30-19		2 954 593 -		270	X	
12								
13								
14								

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	Matt Sloan	5/1/19	3:00 pm	Jayce Burnett - IML	5-3-19	9:00
	Mary Hasinger IML	5/7/19	09:35	Kathy Bopp	5.7.19	9:36

SHIPPING INFO
- [x] UPS
- [ ] Fed Express
- [ ] US Mail
- [ ] Hand Carried
- [ ] Other _____

MATRIX CODES

Water	WT
Soil	SL
Solid	SD
Filter	FT
Other	OT

TURNAROUND TIMES

Check desired service
- [ ] Standard turnaround
- [ ] **RUSH - 5 Working Days**
- [x] **URGENT** - < 2 Working Days

Rush & Urgent Surcharges will be applied

COMPLIANCE INFORMATION

Compliance Monitoring? Y / N
Program (SDWA, NPDES,...)
PWSID / Permit #
Chlorinated? Y / N
Sample Disposal: Lab Client

ADDITIONAL REMARKS

-3.6 Corrected
2054 2 Solid -0.9 Rounded
2 Semi -1.

INTER-MOUNTAIN LABS

Survey Meter # 2-2[illegible]3 R 006960
pH strip lot # HC857466
Thermometer SN# 27130475

Condition Upon Receipt (Attach to COC)

Sample Receipt

1 Number of ice chests/packages received: OTC **ROI?** **Yes** **No**

*Note as "**OTC**" if samples are received over the counter, unpackaged*

2 Temperature of cooler/samples. *(If more than 8 coolers, please write on back)*

Temps Observed (°C):	—							
Temps Corrected (°C):	—							

***Acceptable is: 0.1° to 10°C** for Bacteria; and 0.1° to 6°C for most other water parameters. Samples may not have had adequate time to cool following collection. Indicate ROI (Received on Ice) for iced samples received on the same day as sampled, in addition to temperature at receipt.*

Client contact for temperatures outside method criteria must be documented below.

3	Emission rate of samples for radiochemical analyses < 0.5mR/hr?	**Yes**	**No**	**N/A**
4	COC Number (If applicable): 181540			
5	Do the number of bottles agree with the COC?	**Yes**	**No**	**N/A**
6	Were the samples received intact? *(no broken bottles, leaks, etc.)*	**Yes**	**No**	**N/A**
7	Were the sample custody seals intact?	**Yes**	**No**	**N/A**
8	Is the COC properly completed, legible, and signed?	**Yes**	**No**	

Sample Verification, Labeling & Distribution

1	Were all requested analyses understood and appropriate?	**Yes**	**No**	
2	Did the bottle labels correspond with the COC information?	**Yes**	**No**	
3	Samples collected in method-prescribed containers?	**Yes**	**No**	

4 Sample Preservation:

pH at Receipt:	**Final pH** (if added in lab)**:**	**Preservative/Lot#**	**Date/Time Added:**
_____ Total Metals	_____ Total Metals	HNO_3 _____	_____
_____ Diss Metals	_____ Diss Metals	*Filtered and preserved in metals*	*Filtered and preserved in metals*
_____ Nutrient	_____ Nutrient	H_2SO_4 _____	
_____ Cyanide	_____ Cyanide	NaOH _____	
_____ Sulfide	_____ Sulfide	ZnAcet _____	
_____ Phenol	_____ Phenol	H_2SO_4 _____	
_____ SDWA Rads	_____ SDWA Rads	HNO_3 _____	_____

Preserved samples for Rad analysis accompanied by Field Blank? **Yes** **No**

5	VOA vials have <6mm headspace?	**Yes**	**No**	**N/A**
6	Were all analyses within holding time at the time of receipt?	**Yes**	**No**	
7	Specially requested detection limits (RLs) assigned?	**Yes**	**No**	**N/A**
8	Have rush or project due dates been checked and accepted?	**Yes**	**No**	**N/A**
9	Do samples require subcontracted analyses?	**Yes**	**No**	

If "Yes", which type of subcontracting is required? **General** **Customer-Specified** **Certified**

Sample Receipt, Verification, Login, Labeling & Distribution completed by *(initials)*: KB

Set ID: 519050[illegible]S

Discrepancy Documentation *(use back of sheet for notes on discrepancies)*

Any items listed above with a response of "No" or do not meet specifications must be resolved.

Person Contacted: _____ Method of Contact: __ Phone: _____

Initiated By: _____ Date/Time: _____ __ Email: _____

Problem:

Resolution:

APPENDIX C

Hourly Wind Speed and Wind Direction Data

Watco

10M Unit Vector Wind Speed and Direction in mph for April, 2019

Hr Beg Hr End Day	0 1	1 2	2 3	3 4	4 5	5 6	6 7	7 8	8 9	9 10	10 11	11 12	12 13
1	167/04.9	170/04.3	165/04.3	166/05.5	170/04.2	167/05.9	168/05.4	181/07.9	198/08.5	207/10.6	205/12.8	207/14.4	203/16.0
2	208/11.6	208/11.9	212/13.4	211/12.3	211/12.3	213/12.0	206/09.3	207/10.2	214/12.8	217/11.6	223/11.2	231/13.4	234/16.1
3	236/08.7	236/09.4	242/07.2	263/07.2	273/05.7	273/04.9	248/05.0	268/04.9	303/06.4	277/04.5	287/04.4	080/05.9	068/06.4
4	292/02.2	009/03.1	057/01.4	033/03.8	035/05.0	067/04.4	064/05.8	067/08.2	080/07.9	072/09.1	086/09.7	088/08.5	064/08.2
5	118/06.4	119/07.3	123/06.4	129/05.6	131/03.4	095/02.1	058/02.1	028/03.6	031/02.7	022/03.7	028/03.8	020/04.4	025/03.7
6	150/01.6	187/02.0	179/01.6	212/01.9	276/01.2	119/01.3	360/01.4	338/01.3	089/02.9	061/03.0	032/06.7	038/06.0	037/07.0
7	147/04.8	168/04.4	153/04.4	127/04.0	132/04.8	147/05.2	142/05.0	160/06.9	161/06.8	173/06.7	196/08.8	196/09.8	177/10.4
8	223/04.6	223/03.9	256/04.9	251/04.9	252/04.5	266/03.3	307/03.1	299/03.7	310/04.8	286/04.0	014/05.6	039/06.0	066/05.9
9	310/09.0	001/17.3	009/10.2	027/05.0	052/01.3	283/01.4	309/02.9	316/06.0	003/06.7	029/07.1	040/06.9	056/06.4	057/07.2
10	013/12.3	011/11.9	008/11.2	009/11.7	015/12.4	017/13.1	024/13.8	026/11.4	027/11.4	032/11.3	034/10.8	037/12.2	041/10.7
11	068/14.2	087/13.9	088/13.5	101/16.3	095/14.2	076/12.4	077/13.1	093/14.6	104/15.2	103/12.8	097/11.1	061/08.6	048/09.6
12	282/05.4	253/05.0	197/08.3	206/10.6	249/08.4	233/11.4	230/13.7	220/15.4	225/18.1	230/19.8	223/22.2	224/21.9	219/23.9
13	264/07.1	257/09.5	246/09.0	240/08.9	236/08.1	214/07.4	221/07.7	255/11.8	254/12.8	253/12.5	252/13.5	254/12.7	262/12.8
14	029/12.8	027/13.4	025/14.3	034/13.4	052/13.7	044/12.6	047/15.7	045/14.6	019/14.3	012/14.3	013/15.9	011/14.5	011/09.5
15	337/09.8	344/11.3	309/06.9	288/06.9	280/05.7	275/04.3	273/04.5	283/04.9	267/05.1	259/07.6	253/07.7	258/08.6	257/09.4
16	184/10.0	184/11.2	186/13.7	188/12.2	192/12.3	197/11.8	201/12.1	202/11.9	217/11.4	223/11.9	230/10.8	232/10.4	234/08.8
17	027/07.2	031/07.4	023/06.5	016/04.8	013/04.9	026/06.0	055/04.3	061/03.1	129/02.7	131/04.7	149/09.3	161/11.9	171/13.6
18	205/14.8	212/16.0	214/16.7	229/12.5	215/11.2	224/09.2	277/07.3	271/06.1	280/04.8	281/05.2	284/05.8	277/05.0	278/06.0
19	003/12.9	005/17.1	008/15.9	004/18.0	005/18.0	004/18.5	003/18.9	003/19.8	003/20.1	004/19.4	004/20.1	002/21.1	005/22.5
20	015/13.7	010/12.9	007/15.5	007/16.1	004/18.4	004/18.7	005/18.0	007/17.2	006/17.7	005/18.0	006/18.7	005/17.9	359/19.5
21	198/01.8	195/03.9	206/04.6	222/05.3	211/04.5	201/04.3	184/03.0	174/04.1	186/06.2	185/06.4	197/06.8	230/07.6	216/06.8
22	159/07.3	169/07.5	170/05.9	168/05.8	176/06.4	180/08.4	180/09.6	173/11.0	170/11.4	188/13.0	182/15.9	187/14.6	197/16.7
23	213/17.0	229/11.7	256/12.2	261/12.4	269/09.2	005/11.6	015/08.9	025/09.2	012/09.3	017/07.1	017/08.7	032/07.4	049/08.6
24	139/00.9	093/00.9	034/02.6	075/03.0	073/03.4	063/04.3	063/04.3	073/04.0	098/03.8	095/03.8	074/04.1	035/05.1	062/05.4
25	066/01.8	059/02.7	094/01.9	031/02.1	133/00.7	357/01.1	045/01.4	111/02.2	080/03.8	093/04.6	029/07.0	042/07.5	038/07.6
26	351/21.4	354/18.2	351/13.9	329/12.2	311/08.3	291/06.7	284/08.0	315/13.0	327/15.9	327/16.7	333/16.0	323/13.8	314/15.7
27	322/04.9	026/07.7	023/07.3	027/05.0	021/04.3	048/06.9	065/07.0	069/07.8	065/07.7	071/07.5	092/04.9	106/04.7	093/06.0
28	022/16.3	021/11.9	003/12.1	003/11.5	005/12.4	005/11.7	012/11.7	032/10.9	046/10.3	044/08.6	038/09.9	040/09.6	043/07.3
29	130/04.8	116/07.8	123/08.9	119/07.6	115/09.8	118/12.8	141/09.6	152/08.4	134/08.3	133/10.2	136/10.8	126/11.5	128/07.5
30	046/04.5	041/06.8	055/05.1	049/04.6	038/08.2	010/09.9	020/08.1	032/08.3	022/06.9	035/08.7	033/06.9	031/08.0	033/08.2
MEAN	**156/08.5**	**072/09.1**	**078/08.7**	**020/08.4**	**354/07.9**	**019/08.1**	**023/08.0**	**027/08.7**	**047/09.2**	**046/09.5**	**031/10.2**	**039/10.3**	**045/10.6**
MAX	**351/21.4**	**354/18.2**	**214/16.7**	**004/18.0**	**004/18.4**	**004/18.7**	**003/18.9**	**003/19.8**	**003/20.1**	**230/19.8**	**223/22.2**	**224/21.9**	**219/23.9**
MIN	**139/00.9**	**093/00.9**	**057/01.4**	**212/01.9**	**133/00.7**	**357/01.1**	**045/01.4**	**338/01.3**	**129/02.7**	**061/03.0**	**028/03.8**	**020/04.4**	**025/03.7**

MEANS REQUIRE 75% VALID DATA

MISSING DATA DENOTED BY ---

Watco

10M Unit Vector Wind Speed and Direction in mph for April, 2019

Hr Beg Hr End Day	13 14	14 15	15 16	16 17	17 18	18 19	19 20	20 21	21 22	22 23	23 24	MEAN	MAX SPD	MIN SPD
1	199/16.8	206/17.3	203/16.5	206/16.6	206/15.4	202/14.3	195/11.9	195/11.8	201/11.3	198/11.4	203/11.1	**191/10.8**	**206/17.3**	**170/04.2**
2	230/17.0	244/18.0	251/14.6	258/16.0	261/14.0	255/12.1	259/11.7	259/10.1	257/08.0	239/07.9	233/08.4	**231/12.3**	**244/18.0**	**239/07.9**
3	247/11.4	256/13.0	256/11.7	261/11.4	261/09.4	255/08.6	255/09.8	238/10.3	267/02.5	093/02.1	213/01.8	**257/07.2**	**256/13.0**	**213/01.8**
4	066/07.9	064/07.2	059/06.9	068/06.8	104/11.2	107/12.5	109/11.1	114/08.7	113/09.0	120/08.1	119/07.9	**075/07.3**	**107/12.5**	**057/01.4**
5	032/04.4	033/06.8	041/06.0	056/05.7	053/04.4	089/02.6	007/02.0	029/03.3	048/02.7	115/02.2	039/01.8	**059/04.0**	**119/07.3**	**039/01.8**
6	050/06.6	052/06.3	043/07.7	048/06.6	050/05.7	043/03.3	136/01.9	120/01.8	138/05.1	136/04.6	134/04.4	**083/03.8**	**043/07.7**	**276/01.2**
7	182/09.1	213/13.2	213/13.3	209/14.3	211/15.2	219/14.8	252/10.5	276/09.5	272/07.1	275/05.4	252/05.1	**191/08.3**	**211/15.2**	**127/04.0**
8	060/07.0	099/07.7	092/06.9	091/05.1	220/09.4	219/10.6	216/10.3	215/11.1	218/12.2	234/10.3	258/09.8	**251/06.6**	**218/12.2**	**307/03.1**
9	053/07.2	052/05.4	343/07.0	288/10.3	291/10.3	286/08.2	286/07.5	281/06.5	346/15.4	006/14.2	010/12.4	**351/08.0**	**001/17.3**	**052/01.3**
10	027/11.4	041/13.0	041/11.8	041/13.2	057/14.3	062/15.3	062/13.8	064/14.6	068/14.3	064/14.7	062/14.5	**037/12.7**	**062/15.3**	**041/10.7**
11	049/08.7	106/11.6	120/12.0	128/10.1	133/11.0	131/08.5	131/10.1	131/12.0	172/11.7	231/05.6	123/02.9	**103/11.4**	**101/16.3**	**123/02.9**
12	222/22.6	231/22.0	229/20.8	230/21.4	241/19.1	245/16.4	243/13.3	242/11.2	262/10.5	262/09.5	268/07.9	**236/15.0**	**219/23.9**	**253/05.0**
13	262/12.5	271/10.5	280/08.4	278/07.4	315/08.0	049/09.1	060/07.7	066/08.2	068/07.3	053/07.8	035/08.9	**267/09.6**	**252/13.5**	**264/07.1**
14	019/13.3	017/19.8	009/18.8	005/17.6	002/16.5	353/15.1	336/12.9	310/08.7	303/08.6	312/09.0	316/09.0	**009/13.7**	**017/19.8**	**303/08.6**
15	251/08.1	243/07.4	216/08.4	217/10.4	209/08.3	194/07.2	179/09.6	177/09.0	190/09.7	184/09.0	182/09.5	**246/07.9**	**344/11.3**	**275/04.3**
16	217/09.1	226/09.0	229/08.7	247/09.5	030/08.8	026/11.3	027/09.7	028/08.7	027/06.9	025/06.8	019/08.2	**215/10.2**	**186/13.7**	**025/06.8**
17	178/14.4	169/13.6	178/15.5	179/14.6	180/14.5	188/14.9	192/12.3	194/14.6	202/15.4	203/18.1	206/15.5	**149/10.4**	**203/18.1**	**129/02.7**
18	347/07.1	018/07.1	356/05.1	029/08.5	033/07.5	027/07.9	029/07.3	012/06.9	011/07.7	007/11.7	007/10.0	**310/08.6**	**214/16.7**	**280/04.8**
19	003/20.6	005/20.4	006/22.5	004/21.9	005/21.2	005/22.6	004/20.3	003/20.4	009/17.2	016/14.8	009/13.7	**005/19.1**	**005/22.6**	**003/12.9**
20	358/19.8	004/16.1	009/12.6	007/13.2	007/11.8	010/07.9	355/04.6	341/03.2	166/02.2	163/02.1	060/02.0	**009/13.2**	**358/19.8**	**060/02.0**
21	194/06.6	182/09.0	159/11.0	173/12.7	186/12.3	185/11.8	169/08.5	162/09.3	166/08.3	171/08.3	168/07.1	**188/07.1**	**173/12.7**	**198/01.8**
22	178/19.0	179/17.6	182/15.0	194/17.2	193/14.2	224/09.1	154/06.0	154/07.1	177/08.7	181/12.9	200/16.7	**180/11.5**	**178/19.0**	**168/05.8**
23	054/09.1	058/08.5	080/07.1	089/05.0	099/05.0	128/05.1	137/04.4	147/02.8	183/02.7	169/02.5	179/01.4	**076/07.8**	**213/17.0**	**179/01.4**
24	052/06.9	041/06.9	037/06.7	038/07.2	056/06.0	078/04.7	128/04.2	081/02.9	123/02.5	040/01.8	005/00.9	**068/04.0**	**038/07.2**	**093/00.9**
25	047/08.7	041/08.4	052/08.6	058/06.4	062/04.5	023/04.3	014/04.5	020/04.6	008/08.6	359/15.3	356/19.4	**046/05.7**	**356/19.4**	**133/00.7**
26	305/14.0	303/14.2	312/16.0	310/13.6	312/12.9	301/11.7	307/07.8	286/05.9	280/06.8	284/06.2	295/05.3	**313/12.2**	**351/21.4**	**295/05.3**
27	063/10.0	065/11.5	066/12.4	063/14.5	037/14.2	025/18.9	020/19.1	018/18.5	017/15.9	017/15.4	024/18.0	**046/10.4**	**020/19.1**	**021/04.3**
28	037/06.9	028/09.8	026/08.3	036/08.7	040/09.1	047/09.0	067/09.3	068/09.0	064/07.8	088/03.6	130/02.8	**038/09.5**	**022/16.3**	**130/02.8**
29	132/05.2	181/05.4	242/05.3	281/04.8	284/05.8	280/04.5	293/04.0	263/04.1	267/04.1	309/04.1	015/06.9	**156/07.2**	**118/12.8**	**293/04.0**
30	021/08.6	019/10.3	044/10.6	097/11.1	110/12.8	109/09.8	107/08.6	081/06.8	035/08.0	028/08.0	025/08.6	**045/08.2**	**110/12.8**	**046/04.5**
MEAN	**041/11.0**	**044/11.6**	**028/11.2**	**035/11.4**	**034/11.1**	**055/10.4**	**089/09.2**	**090/08.7**	**187/08.6**	**098/08.4**	**027/08.4**	**043/09.5**		
MAX	**222/22.6**	**231/22.0**	**006/22.5**	**004/21.9**	**005/21.2**	**005/22.6**	**004/20.3**	**003/20.4**	**009/17.2**	**203/18.1**	**356/19.4**		**219/23.9**	
MIN	**032/04.4**	**052/05.4**	**356/05.1**	**281/04.8**	**053/04.4**	**089/02.6**	**136/01.9**	**120/01.8**	**166/02.2**	**040/01.8**	**005/00.9**			**133/00.7**

POSSIBLE NUMBER OF OBSERVATIONS = 720 ACTUAL NUMBER OF OBSERVATIONS = 720 DATA RECOVERY RATE = 100.0%

MONTHLY MEAN = 043/09.5 MAXIMUM WIND SPEED = 23.9 AT 219 DEGREES DATE OF OCCURRENCE = 4/12 AT 1300

MEANS REQUIRE 75% VALID DATA MISSING DATA DENOTED BY ---

Watco

10M Joint Frequency Distribution for April, 2019

Percentage frequency of occurence of hourly wind velocities for all stability classes

Wind Direction		Wind Speed (mph) OVER 0.5	1.54 - 3.09	3.09 - 5.14	5.14 - 8.23	8.23 - 10.8	OVER 10.8	TOTAL	AVG SPEED
N	348.75 - 11.25	0.4	0.1	0.3	0.6	0.7	8.6	**10.7**	**14.7**
NNE	11.25 - 33.75	0.0	0.4	2.2	3.9	1.9	4.0	**12.5**	**9.0**
NE	33.75 - 56.25	0.3	0.4	1.0	3.9	2.8	1.4	**9.7**	**7.8**
ENE	56.25 - 78.75	0.1	0.8	1.2	2.9	1.0	1.8	**7.9**	**7.8**
E	78.75 - 101.25	0.1	0.8	1.2	1.0	0.3	0.8	**4.3**	**6.5**
ESE	101.25 - 123.75	0.1	0.7	0.1	1.0	0.8	1.4	**4.2**	**8.4**
SE	123.75 - 146.25	0.3	0.4	1.7	0.4	1.0	0.4	**4.2**	**6.1**
SSE	146.25 - 168.75	0.0	0.6	0.7	1.7	0.7	0.3	**3.9**	**6.2**
S	168.75 - 191.25	0.1	0.7	0.4	1.0	1.8	3.2	**7.2**	**9.8**
SSW	191.25 - 213.75	0.0	0.4	0.6	0.4	1.2	5.6	**8.2**	**11.7**
SW	213.75 - 236.25	0.0	0.0	0.3	1.0	2.2	3.9	**7.4**	**12.2**
WSW	236.25 - 258.75	0.0	0.0	0.8	1.0	1.7	2.5	**6.0**	**10.2**
W	258.75 - 281.25	0.1	0.1	1.7	1.9	1.1	0.7	**5.7**	**7.1**
WNW	281.25 - 303.75	0.1	0.1	0.8	1.8	0.4	0.3	**3.6**	**6.5**
NW	303.75 - 326.25	0.0	0.3	0.4	0.6	0.7	1.0	**2.9**	**9.1**
NNW	326.25 - 348.75	0.1	0.0	0.1	0.3	0.1	1.0	**1.7**	**10.7**
	CALM							**0.0**	
	TOTAL	**1.9**	**6.0**	**13.6**	**23.2**	**18.5**	**36.8**	**100.0**	**9.5**

TOTAL NUMBER OF OBSERVATIONS = 720

POSSIBLE NUMBER OF OBSERVATIONS = 720

DATA RECOVERY = 100.0%

Watco

10M WIND GUST in mph for APRIL, 2019

Hr Beg / Hr End / Day	0 / 1	1 / 2	2 / 3	3 / 4	4 / 5	5 / 6	6 / 7	7 / 8	8 / 9	9 / 10	10 / 11	11 / 12	12 / 13	13 / 14	14 / 15	15 / 16	16 / 17	17 / 18	18 / 19	19 / 20	20 / 21	21 / 22	22 / 23	23 / 24	MEAN	MAX	MIN
1	8.4	7.8	7.8	9.0	7.2	9.6	10.7	12.5	14.3	18.5	20.9	25.0	28.6	27.4	31.0	27.4	26.2	28.0	23.9	22.1	21.5	19.1	21.5	19.7	**18.7**	**31.0**	**7.2**
2	19.1	20.3	20.3	19.7	21.5	19.1	16.7	16.7	20.3	17.3	20.9	25.0	28.0	28.6	29.8	27.4	30.4	26.8	24.4	23.3	17.3	13.1	13.1	14.3	**21.4**	**30.4**	**13.1**
3	15.5	16.7	13.1	15.5	11.3	9.6	7.8	9.0	12.5	10.7	9.6	11.3	14.9	21.5	23.9	21.5	20.9	19.1	19.1	19.7	18.5	8.4	4.2	3.6	**14.1**	**23.9**	**3.6**
4	5.4	5.4	3.0	10.2	8.4	7.8	11.3	13.7	14.3	15.5	18.5	17.9	14.9	13.7	13.1	12.5	11.9	22.1	25.0	20.3	16.1	19.1	16.7	16.1	**13.9**	**25.0**	**3.0**
5	13.7	13.7	11.9	9.6	8.4	6.6	4.2	5.4	4.8	6.0	6.0	7.2	7.2	7.8	11.3	8.4	9.0	7.2	5.4	4.2	7.8	5.4	4.2	3.6	**7.5**	**13.7**	**3.6**
6	3.6	3.6	4.2	4.2	3.0	3.6	3.0	3.6	6.0	8.4	10.2	9.0	10.7	10.7	10.7	11.9	10.7	10.2	6.0	4.2	4.2	10.2	10.2	9.6	**7.2**	**11.9**	**3.0**
7	9.6	7.2	8.4	6.6	10.2	10.7	9.6	12.5	13.1	11.9	14.9	16.7	17.9	17.3	22.7	25.0	23.9	29.8	25.6	20.9	19.1	16.7	10.7	9.6	**15.4**	**29.8**	**6.6**
8	7.8	8.4	7.8	9.0	7.8	6.6	6.6	6.6	8.4	8.4	9.6	9.6	11.3	12.5	14.9	11.9	9.0	17.3	18.5	16.1	17.3	19.7	17.3	17.9	**11.7**	**19.7**	**6.6**
9	17.9	32.2	22.7	9.6	3.6	3.0	6.0	11.9	11.9	11.9	10.7	11.3	14.9	13.1	9.6	18.5	21.5	20.3	15.5	16.7	10.2	39.3	26.8	25.6	**16.0**	**39.3**	**3.0**
10	23.3	20.9	20.3	20.9	22.7	22.7	23.3	20.9	17.9	18.5	17.9	19.1	19.7	19.1	20.9	20.9	23.3	26.8	26.8	25.6	25.6	25.6	23.9	24.4	**22.1**	**26.8**	**17.9**
11	25.0	26.2	25.0	28.0	29.8	22.7	22.7	27.4	25.6	22.1	18.5	14.3	14.9	15.5	22.1	23.3	19.1	25.0	14.9	21.5	25.0	26.8	16.7	7.8	**21.7**	**29.8**	**7.8**
12	10.7	14.3	15.5	19.7	19.1	19.1	25.6	27.4	32.8	35.2	37.0	37.0	41.7	41.1	39.9	37.6	35.8	34.6	29.2	26.8	22.1	23.9	16.7	18.5	**27.6**	**41.7**	**10.7**
13	14.9	19.7	15.5	16.7	14.9	11.3	14.9	25.6	22.1	21.5	23.3	21.5	23.3	24.4	20.9	16.1	14.3	16.1	17.3	14.9	15.5	12.5	14.3	15.5	**17.8**	**25.6**	**11.3**
14	22.7	22.7	23.3	25.0	25.0	26.8	31.6	28.6	23.9	23.9	26.8	29.2	25.0	31.0	33.4	34.0	37.0	30.4	29.2	27.4	16.7	17.3	16.1	16.1	**26.0**	**37.0**	**16.1**
15	22.1	21.5	11.9	13.1	9.6	7.8	8.4	9.6	10.2	13.7	14.9	14.3	16.7	15.5	14.9	17.9	17.9	16.1	14.9	16.7	15.5	17.3	16.1	15.5	**14.7**	**22.1**	**7.8**
16	18.5	22.7	27.4	22.1	23.9	20.3	20.3	22.1	20.9	20.9	20.3	20.3	16.7	16.7	20.9	17.9	17.9	15.5	18.5	16.1	16.7	12.5	10.7	13.1	**18.9**	**27.4**	**10.7**
17	13.1	14.9	9.6	7.2	9.6	9.6	7.2	5.4	6.0	10.7	18.5	19.1	23.3	30.4	25.6	25.6	25.6	28.0	28.0	25.0	27.4	28.6	32.8	28.0	**19.1**	**32.8**	**5.4**
18	26.8	26.8	28.6	23.9	22.7	17.3	14.9	11.9	9.0	10.7	13.7	9.6	11.3	13.7	12.5	11.3	13.7	11.9	13.1	11.3	11.3	14.3	23.9	17.9	**15.9**	**28.6**	**9.0**
19	23.3	29.8	30.4	33.4	34.6	34.0	35.2	34.0	35.8	34.6	34.0	37.6	39.3	37.0	37.0	38.7	37.6	38.1	36.4	34.0	35.8	28.6	27.4	24.4	**33.8**	**39.3**	**23.3**
20	23.3	24.4	26.8	29.8	31.0	31.0	32.8	30.4	35.2	30.4	32.8	29.8	33.4	35.2	28.6	20.9	24.4	23.3	17.3	11.3	9.0	4.2	4.2	5.4	**24.0**	**35.2**	**4.2**
21	4.2	6.6	9.0	9.6	7.8	7.8	4.8	9.0	10.2	12.5	13.7	14.3	14.9	16.1	16.1	22.1	22.1	22.1	22.7	16.1	17.3	16.1	14.3	13.1	**13.4**	**22.7**	**4.2**
22	12.5	11.9	10.2	10.2	11.3	14.9	17.3	17.9	18.5	25.6	27.4	26.2	29.8	36.4	31.0	30.4	30.4	26.8	21.5	11.3	13.1	17.3	24.4	29.2	**21.1**	**36.4**	**10.2**
23	29.2	22.1	24.4	25.0	19.7	20.3	16.7	16.1	15.5	12.5	14.3	13.7	14.3	14.3	13.7	11.9	10.2	9.0	9.0	7.8	6.0	4.8	4.8	3.0	**14.1**	**29.2**	**3.0**
24	2.4	2.4	6.0	6.6	7.2	8.4	9.0	7.2	7.2	7.2	6.6	7.8	9.6	13.1	10.7	10.7	11.3	10.2	9.6	7.2	6.6	6.0	3.6	3.0	**7.5**	**13.1**	**2.4**
25	4.2	4.2	4.2	4.8	1.8	3.0	3.6	6.0	7.8	9.6	11.3	11.9	12.5	13.1	13.1	13.1	11.3	8.4	7.8	7.8	10.2	17.9	35.2	38.1	**10.9**	**38.1**	**1.8**
26	39.9	41.1	26.8	25.6	15.5	13.7	19.1	31.0	31.6	28.6	27.4	30.4	31.6	32.8	26.8	31.0	29.8	26.2	23.3	17.3	10.2	11.3	11.3	10.7	**24.7**	**41.1**	**10.2**
27	13.7	11.3	12.5	8.4	6.6	11.9	12.5	13.1	12.5	11.9	9.6	9.0	10.7	18.5	21.5	22.7	24.4	24.4	32.2	33.4	32.2	26.8	26.2	29.2	**18.1**	**33.4**	**6.6**
28	29.8	20.9	21.5	19.7	21.5	22.1	18.5	18.5	19.1	16.1	18.5	16.7	12.5	13.1	14.9	13.1	14.9	13.7	15.5	16.7	16.1	15.5	7.2	6.6	**16.8**	**29.8**	**6.6**
29	10.7	14.9	18.5	16.1	19.7	22.7	17.9	16.7	19.7	19.7	21.5	21.5	15.5	11.9	9.0	10.2	9.0	9.6	9.6	8.4	8.4	7.8	7.8	13.7	**14.2**	**22.7**	**7.8**
30	9.0	13.1	9.0	10.2	14.3	17.3	14.9	13.7	17.9	17.3	14.3	13.7	13.1	14.9	23.3	25.0	22.7	24.4	20.3	18.5	15.5	11.9	13.1	14.3	**15.9**	**25.0**	**9.0**
MEAN	**16.0**	**16.9**	**15.9**	**15.6**	**15.0**	**14.7**	**14.9**	**16.1**	**16.8**	**17.1**	**18.1**	**18.3**	**19.3**	**20.5**	**20.8**	**20.6**	**20.5**	**20.7**	**19.4**	**17.4**	**16.3**	**16.6**	**15.8**	**15.6**	**17.5**		
MAX	**39.9**	**41.1**	**30.4**	**33.4**	**34.6**	**34.0**	**35.2**	**34.0**	**35.8**	**35.2**	**37.0**	**37.6**	**41.7**	**41.1**	**39.9**	**38.7**	**37.6**	**38.1**	**36.4**	**34.0**	**35.8**	**39.3**	**35.2**	**38.1**		**41.7**	
MIN	**2.4**	**2.4**	**3.0**	**4.2**	**1.8**	**3.0**	**3.0**	**3.6**	**4.8**	**6.0**	**6.0**	**7.2**	**7.2**	**7.8**	**9.0**	**8.4**	**9.0**	**7.2**	**5.4**	**4.2**	**4.2**	**4.2**	**3.6**	**3.0**			**1.8**

POSSIBLE NUMBER OF OBSERVATIONS = 720 ACTUAL NUMBER OF OBSERVATIONS = 720 DATA RECOVERY RATE = 100.0%

MONTHLY MEAN = 17.5 mph

MAXIMUM 10M WIND GUST = 41.7 mph DATE OF OCCURRENCE = 4/12 AT 1300 MAXIMUM DAILY MEAN = 33.8 mph DATE OF OCCURRENCE = 4/19

MINIMUM 10M WIND GUST = 1.8 mph DATE OF OCCURRENCE = 4/25 AT 0500 MINUMUM DAILY MEAN = 7.2 mph DATE OF OCCURRENCE = 4/6

MEANS REQUIRE 75% VALID DATA MISSING DATA DENOTED BY ---

R 006966
315 West 3rd Street
Pittsburg, KS 66762
Phone: 620-231-2230
Fax: 620-231-0812

Attachment III:
Inter-Mountain Labs (IML) Sample Report

Inter-Mountain Labs
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Date: 5/8/2019

CLIENT: Trinity Consultants
Project: Watco
Lab Order: S1905085

CASE NARRATIVE

Report ID: S1905085001

Samples 2954583 #246, 2954584 #247, 2954585 #248, 2954586 #249, 2954587 #258, 2954588 #259, 2954589 #260, 2954590 #263, 2954591 #266, 2954592 #268 and 2954593 #270 were received on May 3, 2019.

All samples were received and analyzed within the EPA recommended holding times, except those noted below in this case narrative. Samples were analyzed using the methods outlined in the following references:

"Standard Methods For The Examination of Water and Wastewater", approved method versions
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition
40 CFR Parts 136 and 141
40 CFR Part 50, Appendices B, J, L, and O
Methods indicated in the Methods Update Rule published in the Federal Register Friday, May 18, 2012
ASTM approved and recognized standards

All Quality Control parameters met the acceptance criteria defined by EPA and Inter-Mountain Laboratories except as indicated in this case narrative.

Reviewed by: John M. Jacobs
John Jacobs, Project Manager

Inter-Mountain Labs
Your Environmental Monitoring Partner
1673 Terra Avenue, Sheridan, Wyoming 82801 ph: (307) 672-8945

Sample Analysis Report

CLIENT: Trinity Consultants
4525 Wasatch Blvd.
Suite 200
Salt Lake City, UT 84124

Project: Watco
Lab ID: S1905085-001
Client Sample ID: 2954583 #246

Date Reported: 5/8/2019
Report ID: S1905085001

Work Order: S1905085
Collection Date: 4/3/2019
Date Received: 5/3/2019 9:00:00 AM
Sampler: MS
Matrix: Filter
COC: 181540

Analyses	Result	RL	Qual	Units	Date Analyzed/Init	Method
Field						
Actual Volume	24.0			m^3	04/03/2019 0000	Field
IO-3.5 Teflon Filters						
Arsenic	ND	50		ng/filter	05/07/2019 1945 MS	IO-3.5
Cadmium	ND	1000		ng/filter	05/07/2019 1945 MS	IO-3.5
Chromium	ND	1500		ng/filter	05/07/2019 1945 MS	IO-3.5
Lead	100	50		ng/filter	05/07/2019 1945 MS	IO-3.5
Manganese	16900	600		ng/filter	05/07/2019 1945 MS	IO-3.5
Nickel	ND	1300		ng/filter	05/07/2019 1945 MS	IO-3.5
Vanadium	ND	2450		ng/filter	05/07/2019 1945 MS	IO-3.5
Filter Metals Concentration						
Arsenic	ND	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Cadmium	ND	41.7		ng/m^3	05/08/2019 1501 JJ	Calculation
Chromium	ND	62.5		ng/m^3	05/08/2019 1501 JJ	Calculation
Lead	4.05	2.08		ng/m^3	05/08/2019 1501 JJ	Calculation
Manganese	706	25		ng/m^3	05/08/2019 1501 JJ	Calculation
Nickel	ND	54.2		ng/m^3	05/08/2019 1501 JJ	Calculation
Vanadium	ND	102		ng/m^3	05/08/2019 1501 JJ	Calculation

These results apply only to the samples tested.

Qualifiers:

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
H	Holding times for preparation or analysis exceeded
L	Analyzed by another laboratory
ND	Not Detected at the Reporting Limit
S	Spike Recovery outside accepted recovery limits
X	Matrix Effect

RL - Reporting Limit

C	Calculated Value
G	Analyzed at IML Gillette laboratory
J	Analyte detected below quantitation limits
M	Value exceeds Monthly Ave or MCL or is less than LCL
O	Outside the Range of Dilutions
U	Analysis reported under the reporting limit

Reviewed by: John M. Jacobs
John Jacobs, Project Manager