

# Exhibit 1

# Petcoke-Coal Test Results

David L. MacIntosh, Sc.D., C.I.H.,  
Chief Science Officer

January 13, 2014



ENVIRONMENTAL HEALTH  
& ENGINEERING, INC.



# Findings

- No evidence of petcoke or coal on surfaces or in soil of East Side and South Deering neighborhoods based on indicators identified by testing petcoke and coal\*
- Supporting Information
  - Composition of soil in East Side and South Deering neighborhoods similar to control neighborhoods, and was not different in any statistically significant way from levels in soil in the City of Chicago as reported by the U.S. Geological Survey or from background levels reported by the State of Illinois Environmental Protection Agency Tiered Approach for Corrective Action (TACO) program
  - Signature heavy metals and PAHs for petcoke and coal not found on surfaces sampled

\* This presentation focuses on two key indicators of petcoke and coal: the vanadium to nickel ratio, and polynuclear aromatic hydrocarbon (PAH) ratios. Other indicators include vanadium, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, 1-chloronaphthalene, benzo(a)pyrene, benzo(g,h,i)perylene, dibenz(a,h)anthracene; proximity to petcoke/coal terminals; and markers of transportation-related impacts (e.g., lead, proximity to roads, railroads, and asphalt)

# Polynuclear Aromatic Hydrocarbon Profiles



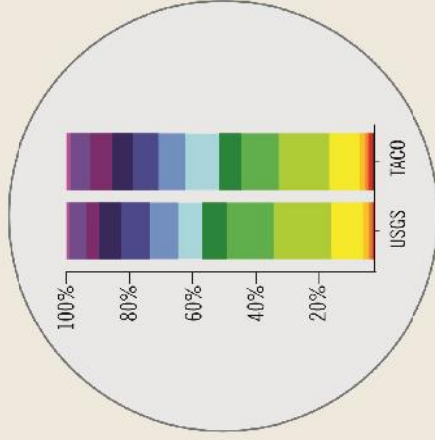
## WHAT ARE POLYNUCLEAR AROMATIC HYDROCARBONS?

Polynuclear aromatic hydrocarbons are a group of chemicals that occur naturally in coal and crude oil. Forest fires and volcanoes produce PAHs naturally as well.

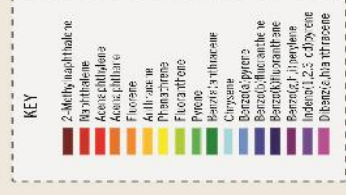
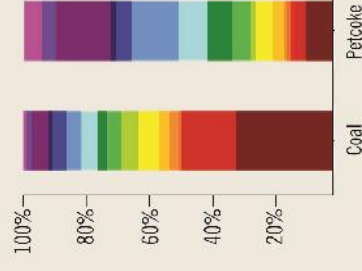
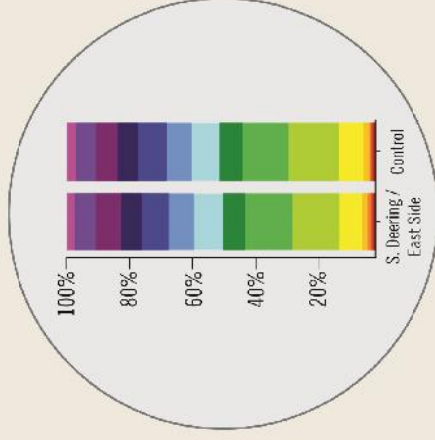
PAHs also are present in products made from fossil fuels, such as home heating oil, kerosene, gasoline, diesel fuel, and asphalt. PAHs are released into air and made whenever fossil fuels, petroleum products, wood, garbage, and other organic substances are burned. PAHs are widespread in soil, air, and water throughout the United States and the world.

Source: adapted from the Illinois Department of Public Health

## GREATER CHICAGO AREA

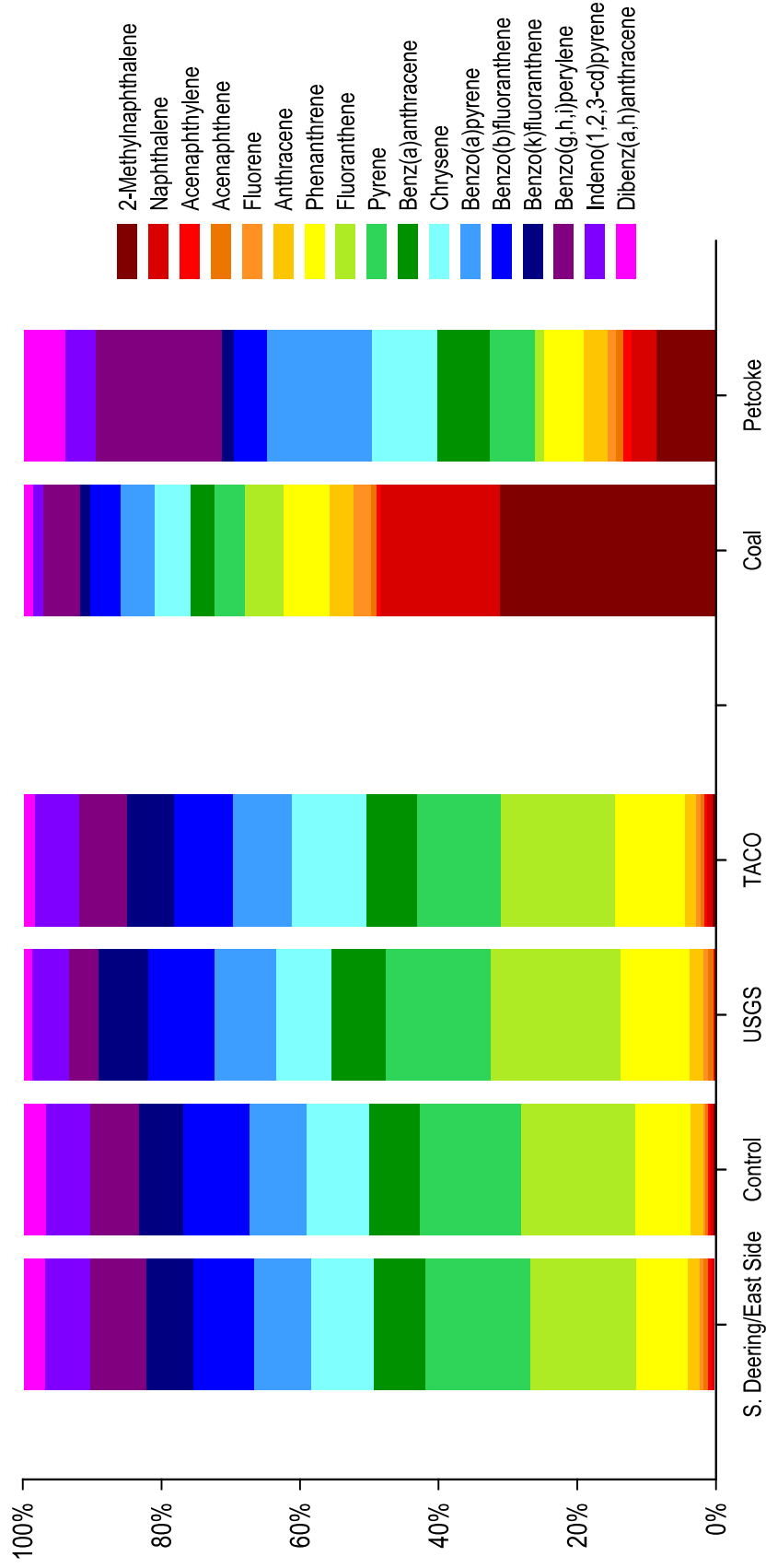


## SAMPLED NEIGHBORHOODS - ABUTTING COAL SITES AND CONTROLS



Soil of South Deering and East Side neighborhoods is similar to the rest of Chicago, and different from coal and petcoke.

# PAH Profiles

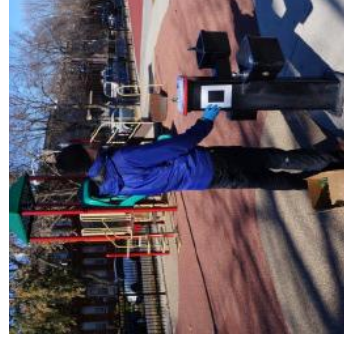
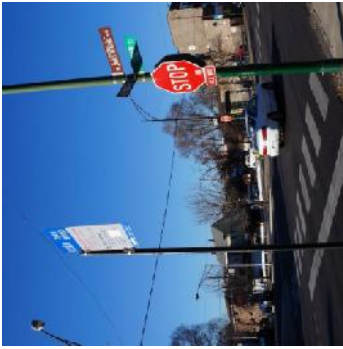


# Study Outline

- Conducted an investigation with the objective of examining surfaces and soil in the East Side and South Deering neighborhoods for the presence of petcoke and coal.
- Examined the soil and surfaces for chemical indicators (signatures) of petcoke and coal, including certain metal (vanadium to nickel) and polynuclear aromatic hydrocarbon (PAHs) ratios.
- Samples were collected and tested in accordance with ASTM and EPA methods by independent environmental professionals and laboratories.
- Collected 69 samples of soil and surface dust in late November-early December 2013 from the East Side and South Deering neighborhoods and control areas.
  - Publicly accessible locations: parks and rights of way
  - Many locations near the petcoke/coal terminals
  - Benches, bleachers, bus stop shelters, sides of storage buildings, and green space
  - Selected to be representative of homes, buildings and yards on private property

# Snapshot of Sampling Locations

A	B	C	D	E	F
ID	Location Type	Location Description	Surface Type	Description	Area
1	110 Bus Stop	Michigan & 115th Street	Metal	Bus sign pole	Control
2	60 Intersection	107th Street & S. Hoxie Street	Metal	Stop sign	S. Deering / East Side
3	20 Park	Camulet Park	Metal	Vertical bar	S. Deering / East Side
4	85 Park	Rowan Park	Painted wood	Bench	S. Deering / East Side
5	107 Park	Langston Hughes Elementary	Metal	Bench	Control
6	55 Bus Stop	3033 E 106th Street	Metal	Bent bus sign	S. Deering / East Side
7	98 Bus Stop	Ewing & 102nd Street	Metal	Bus sign	S. Deering / East Side
8	76 Bus Stop	Avenue C & 109th Street	Metal	Bus stop	S. Deering / East Side
9	102 Park	Burnside Park	Painted wood	Bench	Control
10	37 Park	Trumbull Park	Painted wood	Bench	S. Deering / East Side
11	109 Park	Morgan Field Park	Painted wood	Fountain	Control
12	86 Park	Off of E 126th St	Painted wood	Bench	S. Deering / East Side
13	95 Park	Lion Field	Painted Concrete	Building	Control
14	82 Bus Stop	Avenue O & 114th Street	Glass	Bus shelter	S. Deering / East Side
15	88 Bus Stop	103rd Street CTA Terminal	Plastic	Glass wall panel	S. Deering / East Side
16	43 Bus Stop	Ewing & 103rd St	Metal	Bus sign	S. Deering / East Side
17	87 Park	Harborside International Golf Center	Metal	Guardrail	S. Deering / East Side
18	53 Bus Stop	2801 E 106th Street	Metal	Bus stop sign	S. Deering / East Side
19	57 Park	Krause Park	Concrete	Barrier	S. Deering / East Side
20	29 Bus Stop	Yates & 102nd Street	Metal	Bus sign	S. Deering / East Side
21	32 Bus Stop	Commercial & 102nd St	Metal	Bus sign	S. Deering / East Side
22	6 Park	Veteran's Memorial Park	Painted wood	Bench	S. Deering / East Side
23	12 Bus Stop	Yates & 99th St	Metal	Bus sign	S. Deering / East Side
24	84 Park	Eggers Woods	Wood	Table	S. Deering / East Side
25	21 Park	Luella Park	Painted wood	Bench	S. Deering / East Side
26	100 Bus Stop	Commercial & 104th Street	Metal	Bus sign	S. Deering / East Side
27	46 Bus Stop	2700 E 104th Street	Metal	Bus sign	S. Deering / East Side





# Technical Review

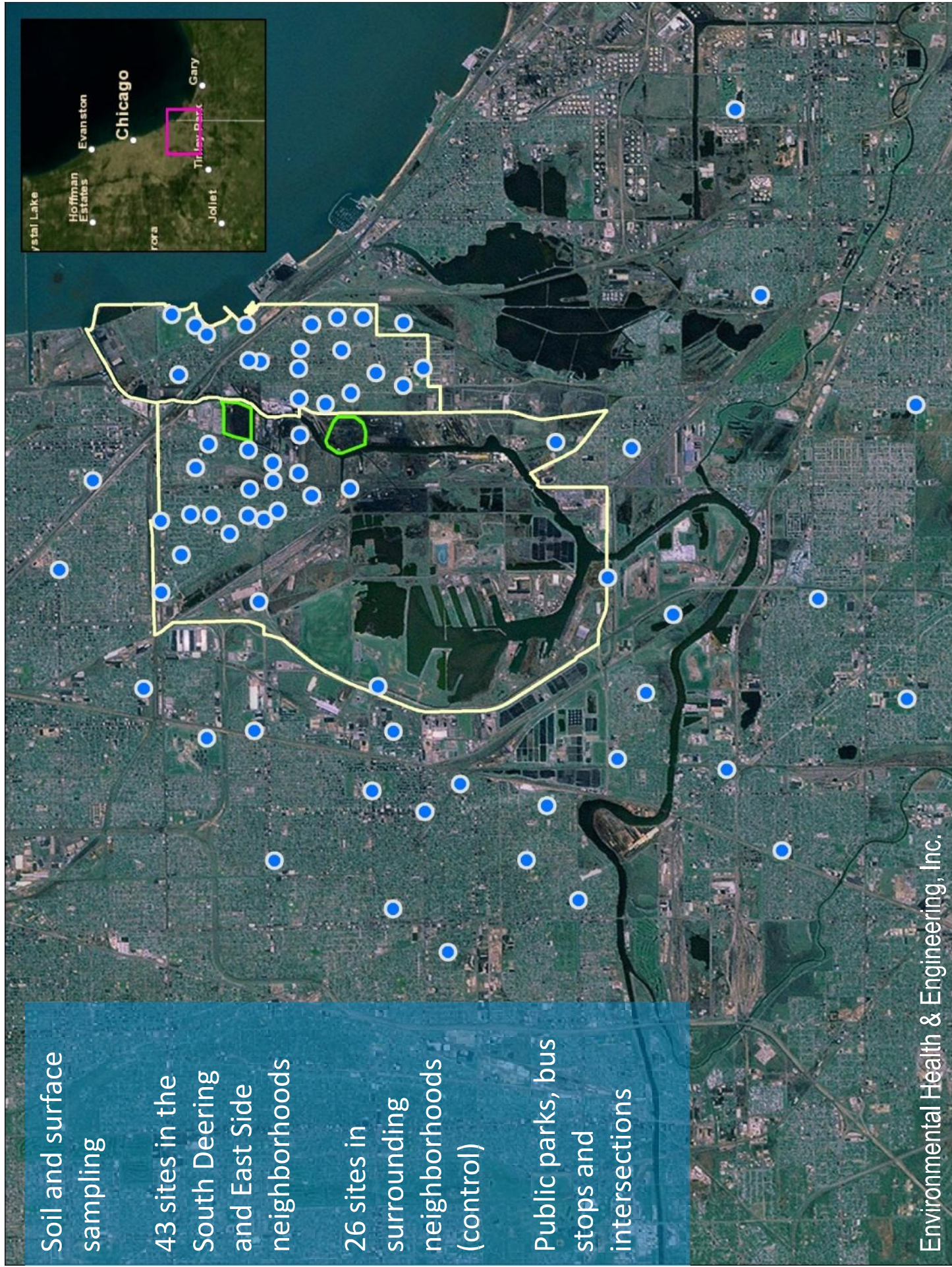
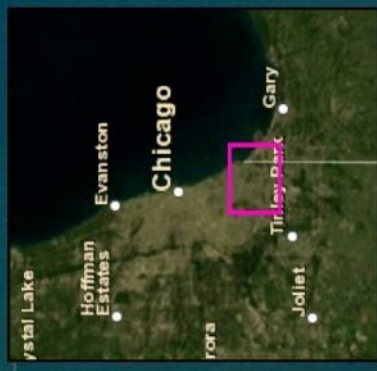
- All sampling and testing designed by David L. MacIntosh, Sc.D, C.I.H, Chief Science Officer with Environmental Health & Engineering, Inc.
  - Adjunct Associate Professor at the Harvard School of Public Health
  - Technical advisor to government agencies and the World Health Organization
  - 20 years experience as an active member of the environmental health profession
  - Author of numerous publications in the area of exposure assessment, risk analysis, and environmental management
- Test results interpreted and analyzed by Dr. MacIntosh

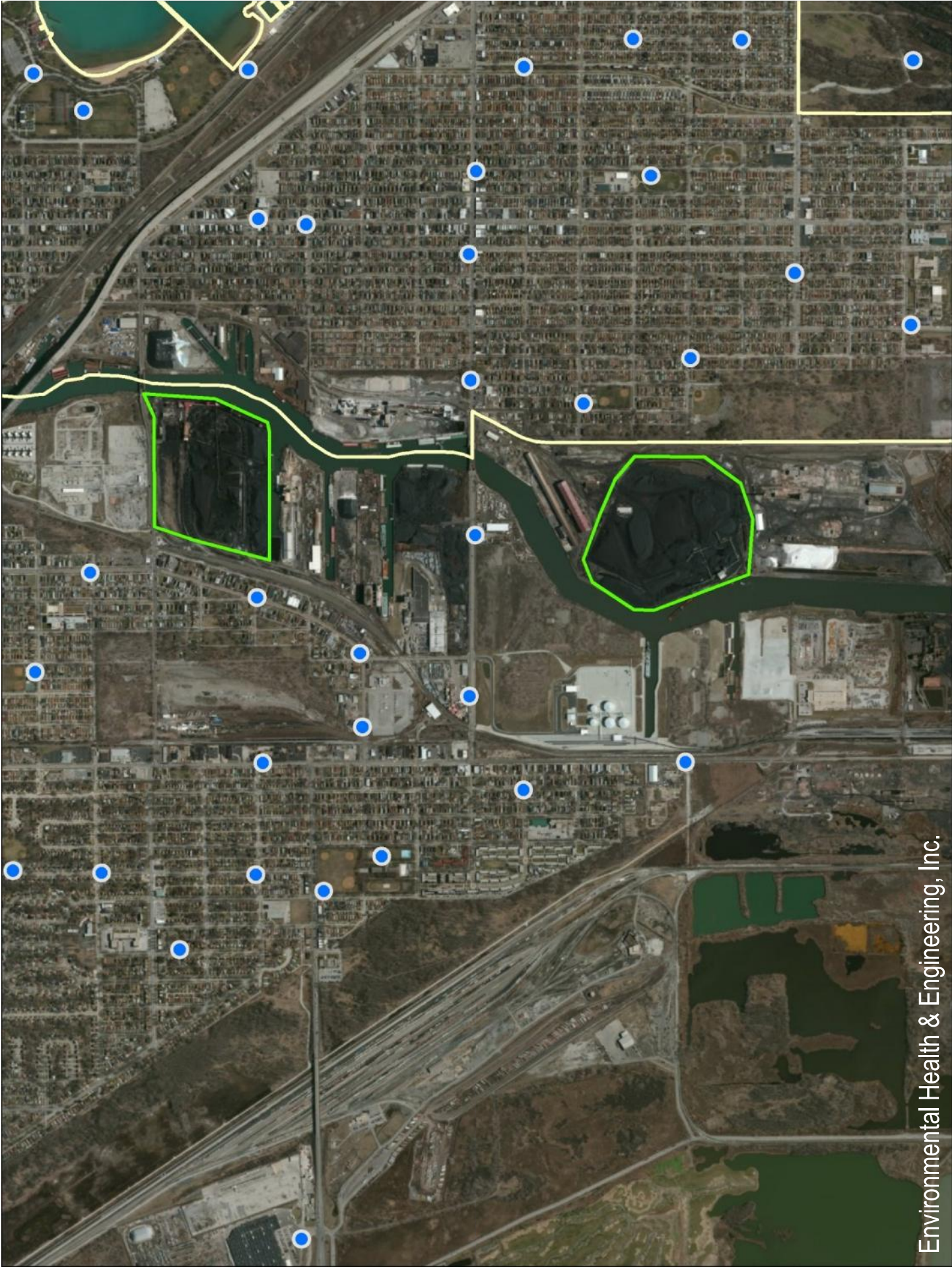
Soil and surface  
sampling

43 sites in the  
South Deering  
and East Side  
neighborhoods

26 sites in  
surrounding  
neighborhoods  
(control)

Public parks, bus  
stops and  
intersections

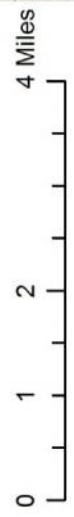
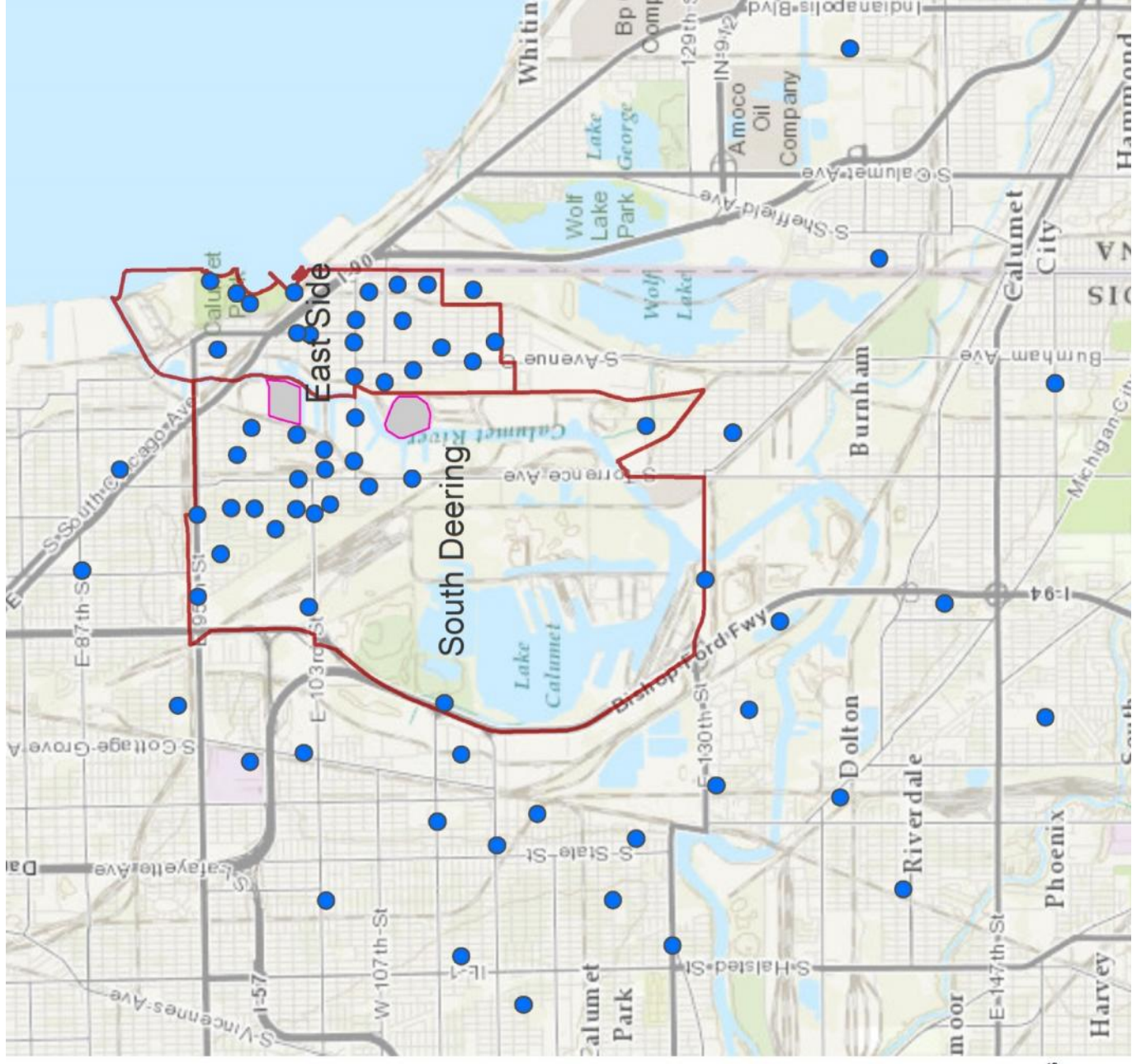




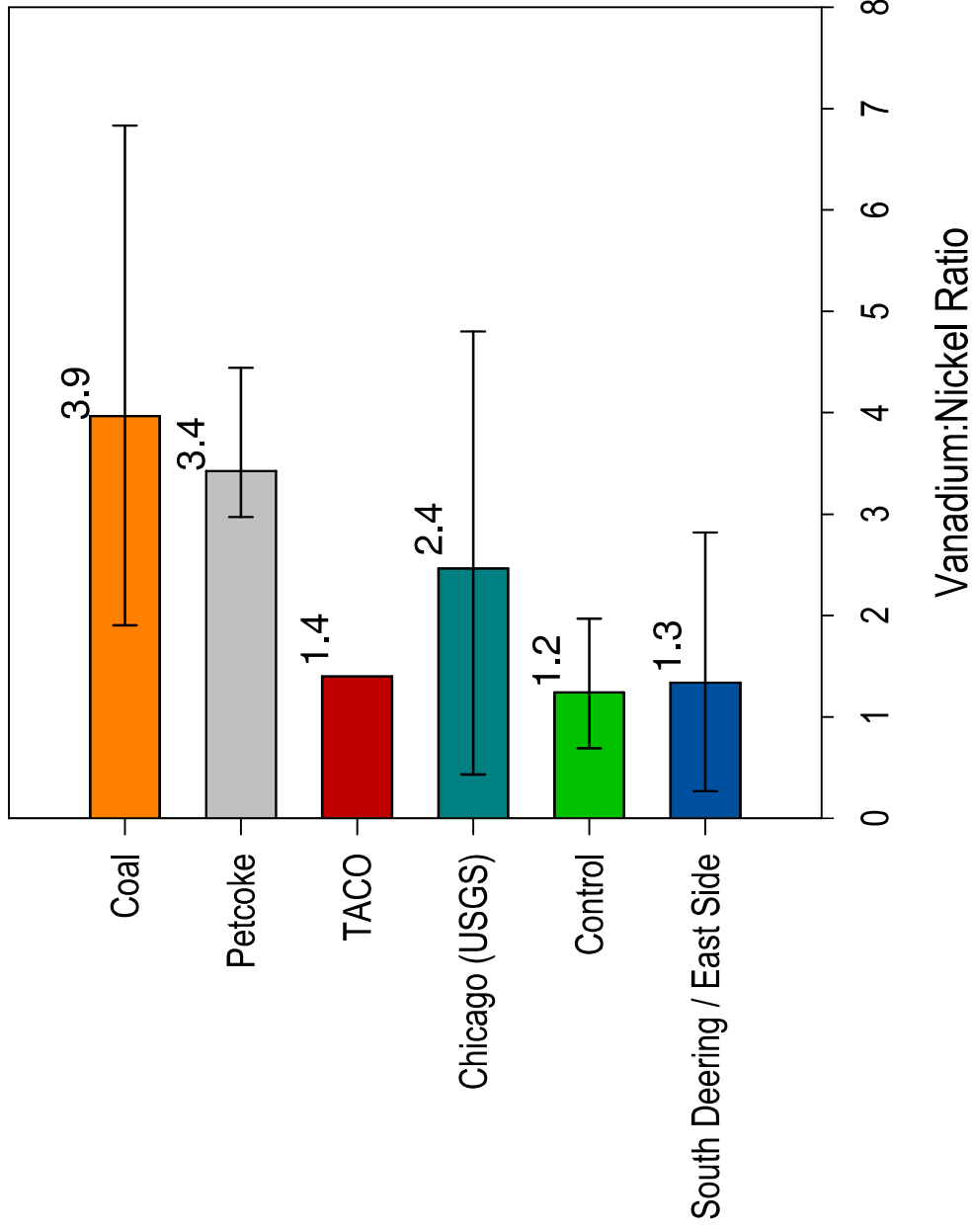
### Sampling Locations

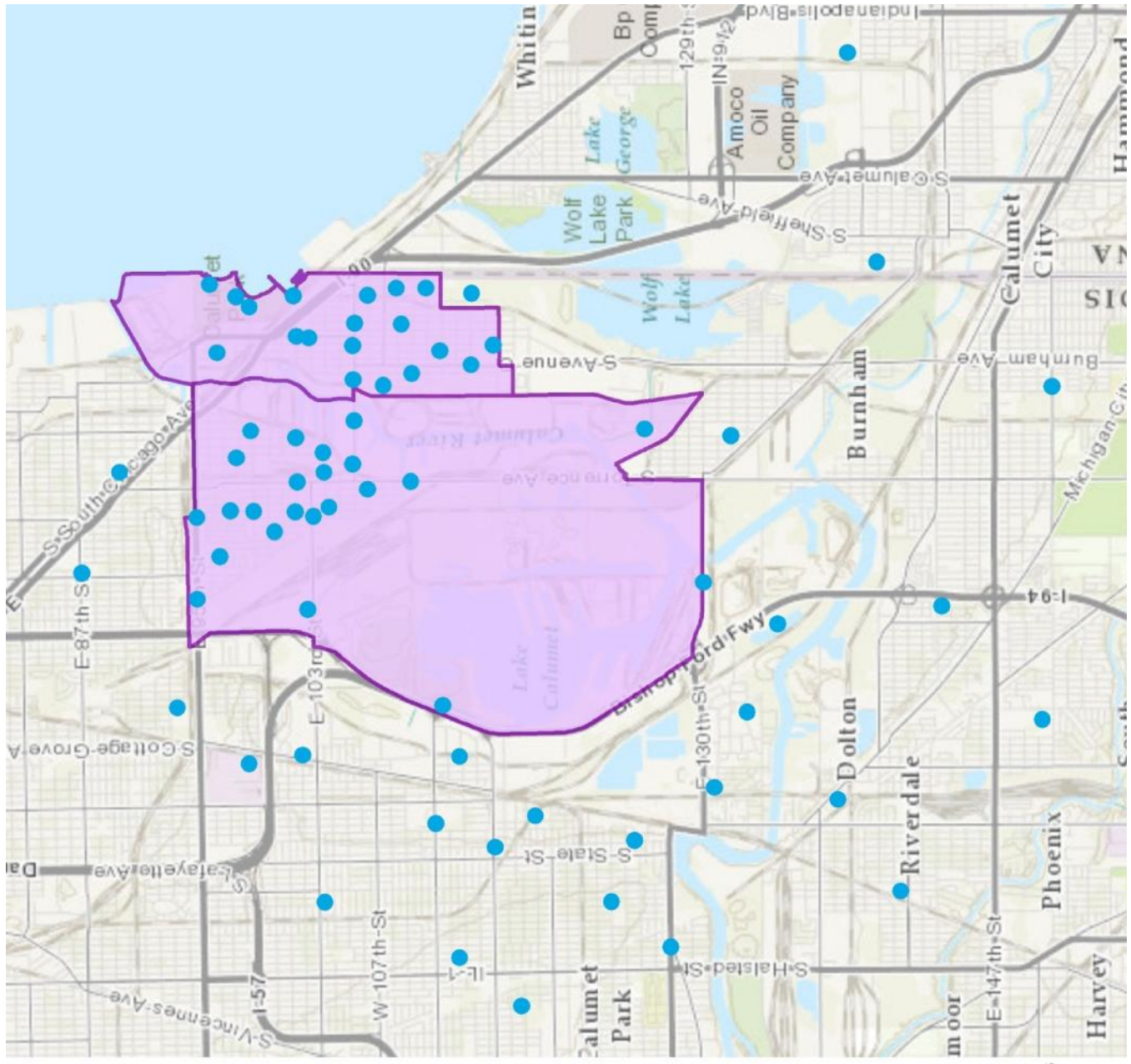
- Sampling Locations
- Site Locations
- Neighborhood Boundaries

Soil and surface sampling  
69 total sites, 26 sites in control area  
Public parks, bus stops and intersections



# Signature Metal Ratios



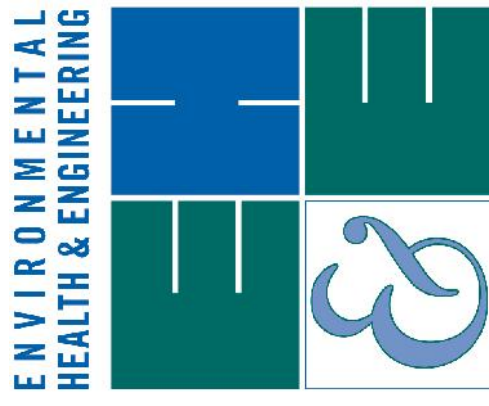


- Sampling Locations
- S. Deering / East Side

	Mean V:Ni Ratio
S. Deering/East Side	1.3
Control	1.2
Chicago (USGS)	2.4
TACO	1.4
Petcoke	3.4
Coal	3.9



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[www.eheinc.com](http://www.eheinc.com)  
800-825-5343



# Petcoke-Coal Test Results

David L. MacIntosh, Sc.D., C.I.H.,  
Chief Science Officer  
April 21, 2014



ENVIRONMENTAL HEALTH  
& ENGINEERING, INC.



# David L. MacIntosh

- All sampling and testing designed by David L. MacIntosh, Sc.D, C.I.H, Chief Science Officer with Environmental Health & Engineering, Inc.
  - Adjunct Associate Professor at the Harvard School of Public Health
  - Technical advisor to government agencies and the World Health Organization
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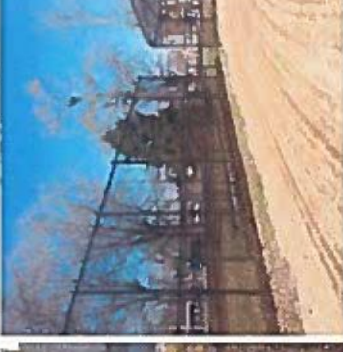
# Findings

- No evidence of petcoke or coal on surfaces or in soil of East Side and South Deering neighborhoods based on indicators identified by testing petcoke and coal and by geography\*
- Supporting Information
  - Composition of soil in East Side and South Deering neighborhoods similar to control neighborhoods and was not different in any statistically significant way from levels in soil in the City of Chicago as reported by the U.S. Geological Survey or from background levels reported by the State of Illinois Environmental Protection Agency Tiered Approach for Corrective Action (TACO) program
  - Signature trace metals and PAHs for petcoke and coal not found on surfaces sampled

\* Indicators include vanadium, V:Ni ratio, distribution of trace element and PAH concentrations, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, 1-chloronaphthalene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(a,h)anthracene; dibenz(a,h)anthracene; proximity to petcoke/coal terminals; and surrogates of transportation-related impacts (lead, proximity to roads and asphalt)

# Study Outline

- Conducted an investigation with the objective of examining surfaces and soil in the East Side and South Deering neighborhoods for the presence of petcoke and coal.
- Examined the soil and surfaces for chemical indicators (signatures) of petcoke and coal, including certain metal (vanadium to nickel) and polynuclear aromatic hydrocarbon (PAHs) ratios.
- Samples were collected and tested in accordance with ASTM and EPA methods by independent environmental professionals and laboratories.
- Collected samples of soil and surface dust in late November-early December 2013 and April 2014 from the East Side and South Deering neighborhoods and control areas.
  - 69 locations in November-December 2013
  - 39 locations in April 2014, collected after an extended period of windy and dry conditions
  - Publicly accessible locations: parks and rights of way
  - Many locations near the petcoke/coal terminals
  - Benches, bleachers, bus stop shelters, sides of storage buildings, and green space
  - Selected to be representative of buildings and yards on private property

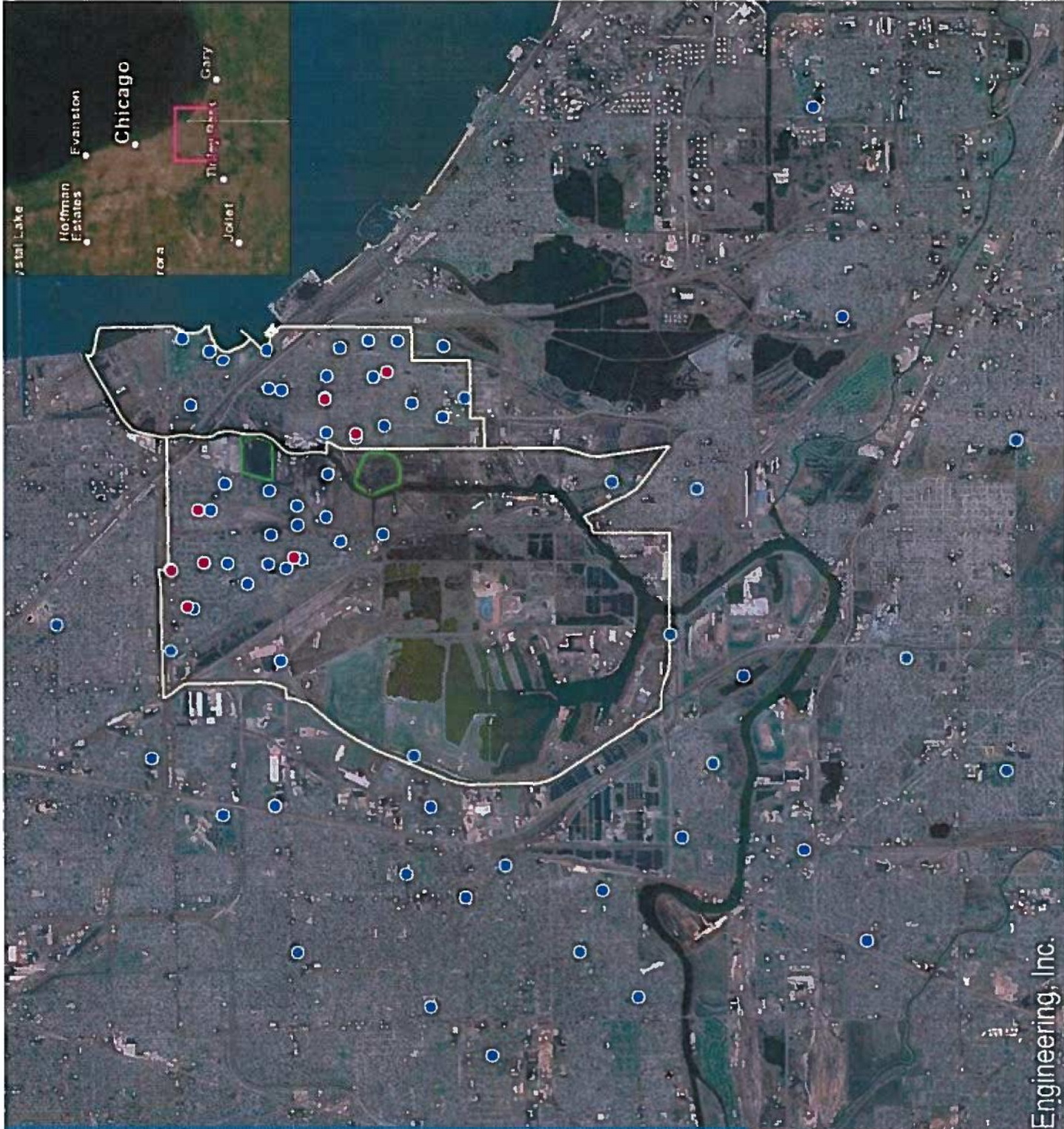


Soil and surface  
sampling

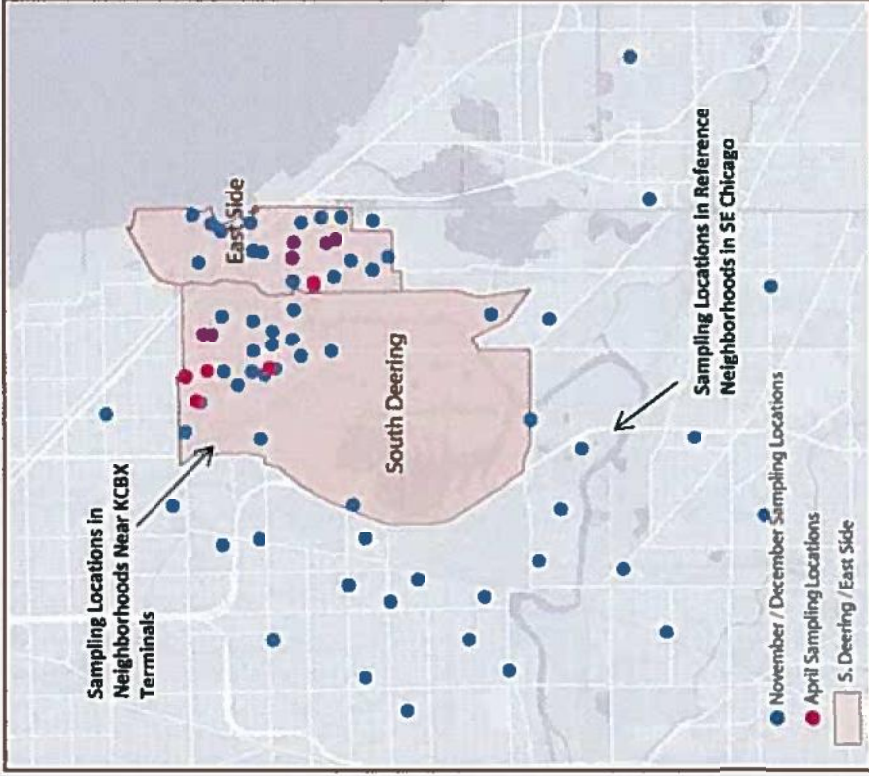
82 sites in the  
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# Polynuclear Aromatic Hydrocarbon Profiles



**GREATER CHICAGO AREA**

**SAMPLED NEIGHBORHOODS  
ABUTTING COAL SITES AND CONTROLS**

## WHAT ARE POLYNUCLEAR AROMATIC HYDROCARBONS?

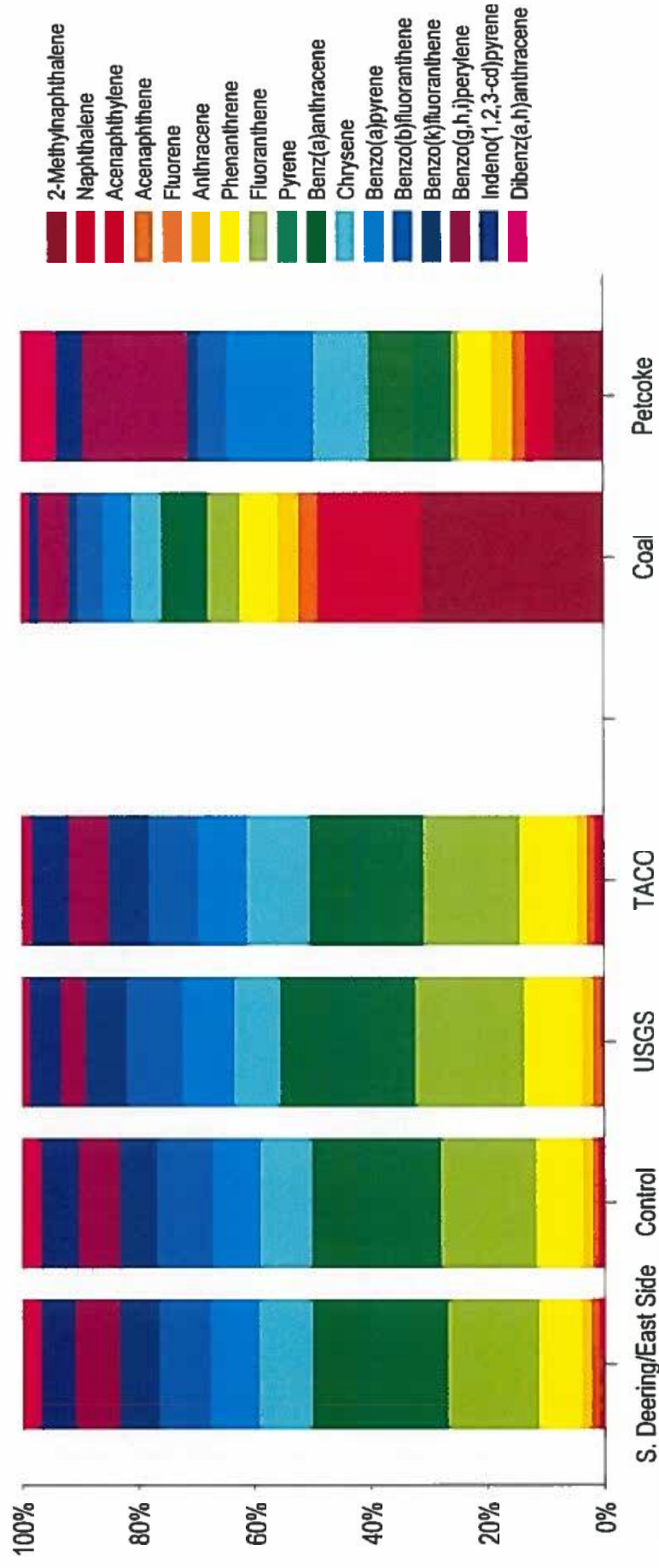
Polynuclear aromatic hydrocarbons (PAHs) are a group of chemicals that occur naturally in coal and crude oil. Forest fires and volcanoes produce PAHs naturally as well. PAHs also are present in products made from fossil fuels, such as home heating oil, kerosene, gasoline, diesel fuel, and asphalt. PAHs are released into the air whenever fossil fuels, petroleum products, wood, garbage, and other carbon-based substances are burned. PAHs are widespread in soil, air, and water throughout the United States and the world.

The amounts and mixture of PAHs in soil are generally consistent over an area, such as within a neighborhood. As a result, we usually expect to find similar levels for each PAH at locations throughout that area. Levels can differ within an area when natural or human-related processes add or remove PAHs from soil. Ratios between specific PAHs can often be used to identify sources of these differences. For example, petcoke and coal contain a different mixture of PAHs than is typically found in dities.

We measured PAHs in soil and on surfaces of the South Deering and East Side neighborhoods and compared those levels to PAHs measured in other locations in Chicago as well as to PAHs in petcoke and coal from the KCBX terminals in Chicago. The PAHs amounts and mixture in the neighborhoods were similar to other locations in the City and different from the PAH levels in petcoke and coal. There is no evidence of contamination from petcoke and coal in the neighborhoods based on these data.

The soil of South Deering and East Side neighborhoods is similar to the rest of Chicago, and different from coal and petcoke.

# PAH Profiles in Soil Samples

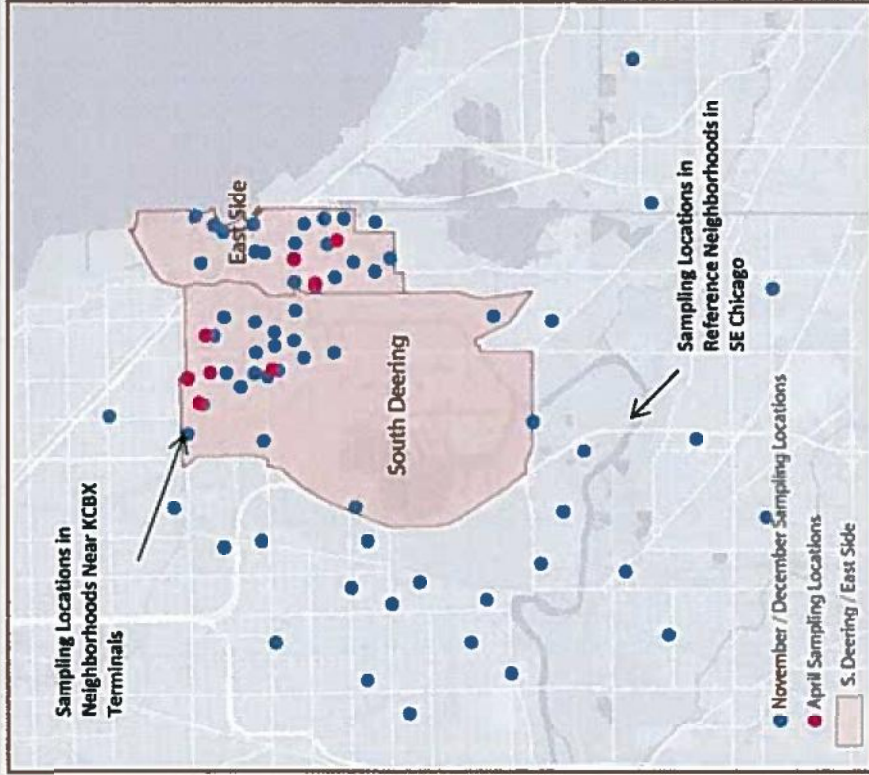


The soil of South Deering and East Side neighborhoods is similar to the rest of Chicago and different from petcoke and coal.

# Trace Metals in Soils



**GREATER CHICAGO AREA**



**SAMPLED NEIGHBORHOODS  
ABUTTING COAL SITES AND CONTROLS**

## WHAT ARE TRACE METALS?

Trace metals, such as nickel, zinc, and copper, are metals that are normally found at low levels in the Earth's crust. All soils naturally contain trace metals. Many trace metals are vital nutrients for plants, animals, and humans. Aluminum, iron, calcium, and potassium (not represented in the figures below) make up about 99% of the metals in soil. Trace metals usually make up the other 1%.

Amounts of trace metals in soils vary from location to location as soil types vary. If soil type is fairly consistent over an area, such as within a neighborhood, we usually expect to find similar levels for each trace metal at locations throughout that area. Levels can differ within an area when natural or human-related processes add or remove trace metals from soil. Ratios between specific trace metals can often be used to identify sources of these differences.

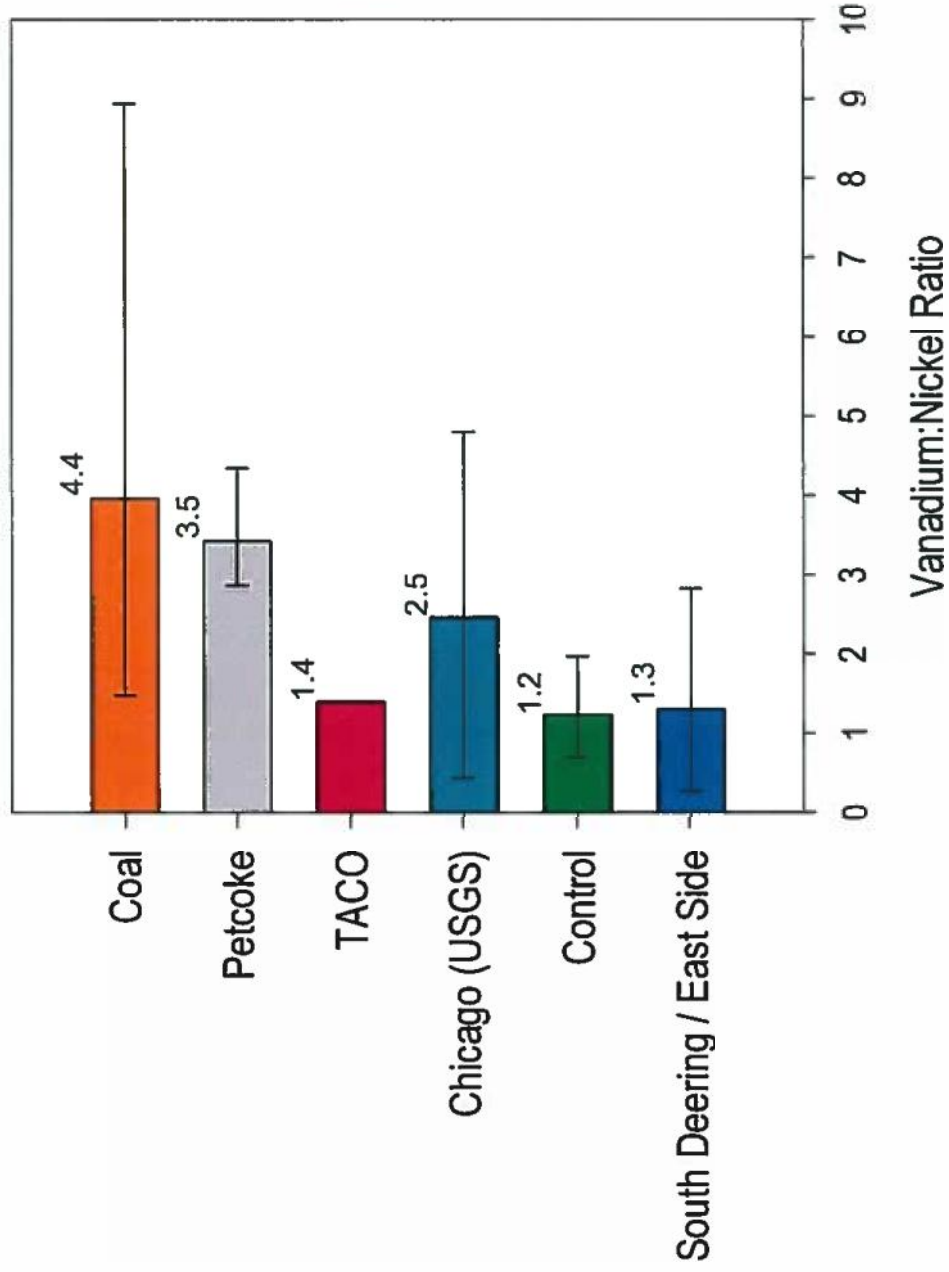
Substances such as petcoke and coal are not formed by the same processes that create soil. As a result, trace metal levels and ratios in these substances are generally different from those in soil. For example, the ratio between vanadium and nickel in petcoke and coal is quite different from the ratio of vanadium and nickel in natural soil. Finding soil with vanadium to nickel ratios that differ from natural soil and are similar to those of coal and petcoke may indicate the presence of these substances in that soil.

We measured vanadium, nickel, and other trace metals in soil and on surfaces of the South Deering and East Side neighborhoods and compared those levels to trace metals measured in other locations in Chicago as well as to levels in petcoke and coal from the KCBX terminals in Chicago. The trace metal amounts and ratios in the neighborhoods were similar to other locations in the City and different from the levels in petcoke and coal. There is no evidence of contamination from petcoke and coal in the neighborhoods based on these data.

Trace metals in soil of South Deering and East Side neighborhoods are similar to those in soil from control neighborhoods and different from petcoke and coal.

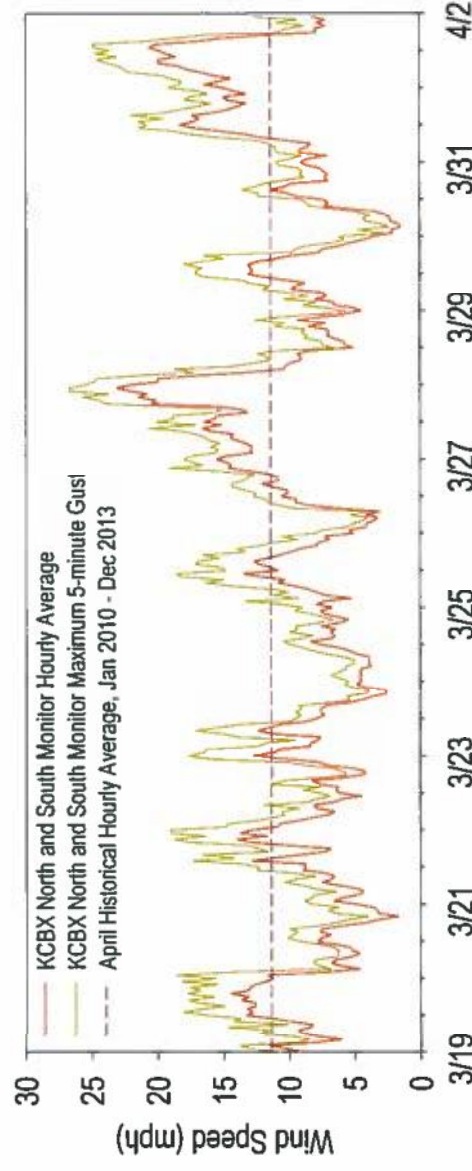


# Signature Metal Ratios



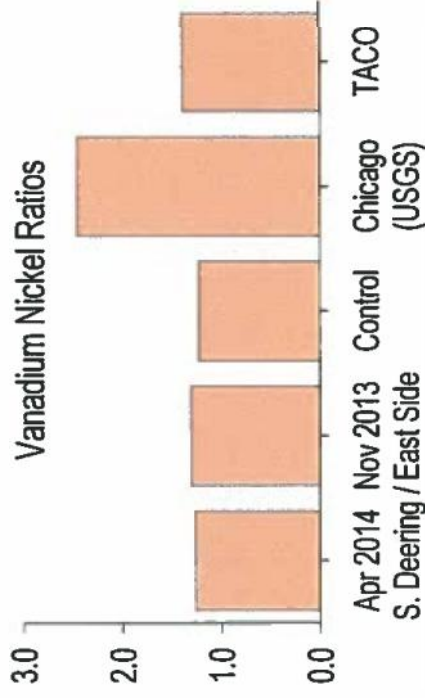
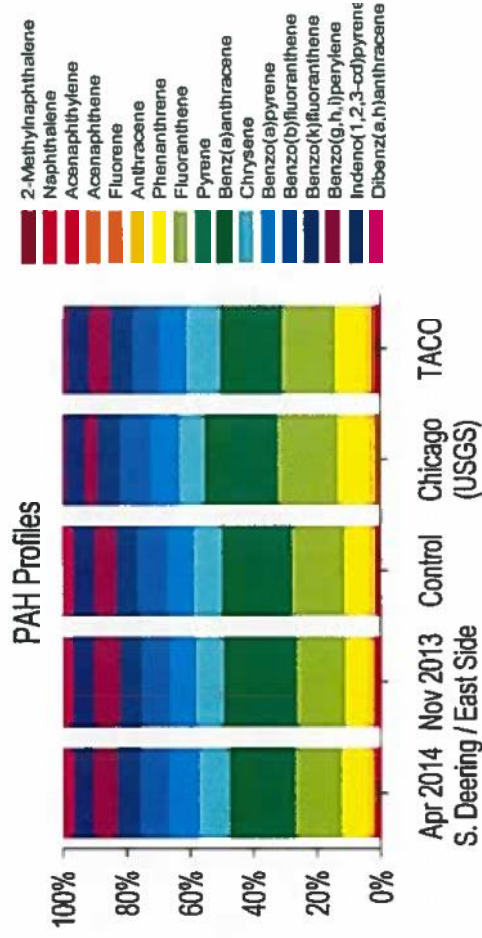
## April 2, 2014 Sampling

- Samples collected from 39 locations in parks within the abutting neighborhoods after extended period of windy and dry conditions
  - 39 surface dust samples
  - 8 soil samples
- Parks selected ranged from within 0.25 miles to greater than 1.5 miles of the KCBX terminals



# April 2, 2014 Sampling

- April sample results consistent with findings for samples in South Deering and East Side neighborhoods collected in late November-early December 2013
- PAHs and petcoke/coal signature components and ratios not detected



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