

Colorado Smelter Final Meeting Summary for November 12, 2019

Please note: This summary is not a detailed transcript of the meeting, but rather is the facilitator's summation of discussions and decisions that occurred at the meeting. It is not intended to summarize government policy. The facilitator is not an EPA employee.

On November 12, 2019, the Colorado Smelter Community Advisory Group (CAG) and members of the public met at the NeighborWorks building located at 1241 East Routt Avenue. The CAG typically meets the second Tuesday of every month at this location.

The key topics covered during the meeting included:

- Alley dust update by the Environmental Protection Agency (EPA);
- Air monitoring update by Skeo (the community technical advisor); and
- Next steps and public comments.

Copies of all presentations and documents distributed at the meeting can be found at the back of this document, including:

- Attachment A: The agenda for the November 12, 2019 CAG meeting
- Attachment B: Facilitator's tracking sheet as of October 12, 2019
- Attachment C: Meeting attendance at the November 12, 2019 meeting
- Attachment D: EPA November 2019 Sampling and Cleanup Update
- Attachment E: Alley Dust Presentation by EPA
- Attachment F: Skeo's review of the EPA air monitoring report
- Attachment G: Skeo's presentation on the EPA air monitoring report.

A wide variety of documents and background about the site can be found on the Colorado Department of Public Health and Environment (CDPHE) website at <https://www.colorado.gov/pacific/cdphe/cosmelt/CAG>.

Alley Dust

The CAG has asked a variety of questions about the alley dust with a general focus on whether the alleys are recontaminating properties that have been cleaned up. Charlie Partridge, an EPA toxicologist, presented a PowerPoint on the topic. This document can be found in Attachment E at the back of this summary. In sum, Charlie has concluded that the alleys are not recontaminating homes. He noted that EPA will also be providing a final report on the topic in about a month. Following the presentation, CAG and members of the public asked several questions, including:

Q: Could EPA provide information showing the correlation between 1" and 6" sampling in the dirtiest of Grove and Eilers alleys and the nearby properties?

A: Yes.

Q: Did the model account for property size?

A: Yes.

Q: Were the alley samples taken in the middle or the side of the alleys?

A: Most were taken in the middle. The sides are often very compact and difficult to get samples. In the end, samples were gathered from a variety of locations in the alleys due to compacting and other limitations. This should not impact the results.

Q: Can something be done to reduce the dust from the alleys? Does EPA think such dust could be a health hazard?

A: EPA's contactors do suppress the dust from their trucks and work, but EPA can only use funds to address problems related to the Colorado Smelter and cleanup activities. Concerns about general dust from the alleys should probably be taken to city government. It is possible for dust to be a health hazard.

Q: The alleys are becoming unlevelled and sinking due to all the trucks from the EPA work. Will EPA fix this?

A: EPA will look into the potential damage and potential remedies.

Q: Is there a way to identify whether homes on highly contaminated alleys are causing high levels of dust contamination in homes?

A: Yes, we can look into this. If the level of dust contamination in a home is below the EPA cleanup level, then the problem would need to be addressed by local government.

Following the discussion, it was agreed that the CAG and Skeo would look at the final alley report before determining any additional next steps.

Air Monitoring

EPA has completed an air monitoring report for Operable Unit 2. (Operable Unit 2 is the former smelter area). This document can be found on the CDPHE website:

<https://www.colorado.gov/pacific/cdphe/cosmelt/pamphlets-reports>. The CAG had questions and concerns about the draft air monitoring report and asked Treat Suomi of Skeo, the community technical advisor, to review the air monitoring report. Skeo completed a report on this topic, which can be found in Attachment F at the back of this report. Skeo's PowerPoint presentation on the report can be found in Attachment G. Overall, Treat stated that he and Skeo's air experts are in general agreement with EPA: OU2 is not likely to impact air quality. Skeo identified two specific questions of potential interest for the CAG to request follow-up:

TASC Comment: Average concentrations of cobalt and manganese were above their respective Residential Air Regional Screening Level in each quarterly report. The average concentration of aluminum was above its Residential Air Regional Screening Level for three of four quarters. Additionally, maximum detections of cobalt were above its Residential Air Regional Screening Level in each quarterly report. Maximum detections of nickel were above its Residential Air Regional Screening Level in the first two quarterly reports. The laboratory detection limits for arsenic were too high to determine if any arsenic concentrations were above its Residential Air Regional Screening Level in any quarter. Average lead concentrations were below its Residential Air Regional Screening Level in each quarterly report. Exceeding a screening level means that more evaluation may be needed. It is not an indication of a health risk. EPA action levels for protecting health are often much higher than screening levels. The CAG may want to ask EPA if additional evaluation of air quality is planned.

TASC Comment: As the wind roses from EVRAZ and Pueblo Memorial Airport show, winds in Pueblo blew from every direction at different times during each quarterly reporting period. It is

unclear which direction the wind was blowing on sampling dates other than the highest five presented in the report. The CAG may want to ask EPA to summarize wind data for the dates when sampling occurred.

The CAG requested that EPA follow-up on these two questions. Regarding, the first question, Sabrina Forrest of EPA noted that OU2 is just getting started and more monitoring of various types will occur, although a detailed schedule is not yet available. To date, EPA has focused mostly on OU1 (the residences) to ensure that community members are protected from lead and arsenic in their homes. OU2 will have its own risk assessment. EPA agreed to investigate the answer to the second question and report back to the CAG.

Several CAG members noted an appreciation to Treat and Skeo for summarizing the report and identifying questions. Many noted that they felt reassured by the report. Some CAG members expressed a desire to have additional testing locations that are closer to the slag pile and which account for the different wind directions. Treat noted that he went into this research effort aware of the CAG concerns about the location of the air monitor. However, after reviewing all of the data, he was less concerned about the air monitor location. He stated that given how variable the wind in Pueblo is—this monitor would have picked up particulates in the air on at least some days if there was material blowing off of the slag pile. It didn't.

Charlie Partridge of EPA stated that the slag piles might have caused contamination in the past with material blowing off of them, but he doesn't think they are causing current air contamination. No new smelting has happened in over 100 years. The materials of concern at this site are heavy metals (lead and arsenic), which are not prone to blowing. The piles now have vegetation growing on them.

A CAG member expressed concern that these air samples will determine how the slag piles are cleaned up. Treat stated that he did not think that the cleanup approach for the slag piles would be selected based on air quality concerns.

The local health department noted that they are very concerned about kids playing in the dirt in yards and not washing afterward—but they are not concerned about the air quality issues caused by the site. They noted the American Lung Association recently identified Pueblo as one of the cleanest cities for year round air particulate pollution.

A CAG member noted that he would like to review the air assessment data and see if any contaminants can be attributed to the Smelter or other sites. If other sites are responsible, he would like to investigate funding from other sources. The group discussed the potential for the Agency for Toxic Substances and Disease Registry (ATSDR) or the state to investigate overall air quality issues. A CDPHE representative at the meeting noted that they have been watching the manganese levels from Evraz for years. However, he noted that manganese is not a regulated air contaminate so asking Evraz or anyone else to do anything is a big ask.

Following the conversation, a handful of community members in the room still had some concerns about the location of the air monitor. Others noted that there are limited resources and that they would like to focus on issues of clear concern to children. Sabrina Forrest the EPA project lead agreed her team will report back on the two questions Skeo identified above. She noted that concerned citizens can write a letter to EPA for consideration of additional air monitors, but that science will need to back up any additional requests she makes.

Next Steps, Announcements, and Public Comments

The CAG agreed to continue meeting on the second Tuesday of each month at Neighborworks, which is located at 1241 East Routt in Pueblo. Thus, 2020 meeting dates include:

- January 14
- February 11
- March 10
- April 14
- May 12
- June 9
- July 14
- August 11 (No August Meeting?)
- September 8
- October 13
- November 10
- No December Meeting

A CAG member noted that EPA contractors came on her property to mark utility lines without notifying her. Sabrina stated that EPA's consent form, which homeowners sign, does allow staff to come and mark utilities without seeking additional permission. However, staff should and do try to inform homeowners before coming onto private property even given the prior consent provided. Another CAG member noted that a porta-potty for EPA contractors had been placed in front of his house. He wishes they had asked permission first. EPA agreed.

Attachment A: The agenda for the November 12, 2019 CAG meeting

Community Advisory Group for the Colorado Smelter



FINAL AGENDA

Tuesday, November 12, 2019 5:30 p.m. to 7:30 p.m.

Location: NeighborWorks, 1241 East Routt Avenue

Please note: CAG meetings are intended to address topics that impact many people. Questions about sampling, cleanup or restoration of an individual property are best dealt with one-on-one with staff by calling or visiting the project office Monday through Friday between 8 a.m. and 5 p.m. The office is located at 200 South Santa Fe, 5th floor. The phone number is: 719-299-4468.

- 5:30 p.m. **Introductions agenda review, and logistics**
Kristi Parker Celico, Facilitator
- 5:35 p.m. **Alley dust update**
Charlie Partridge, EPA
- *Presentation (15 minutes)*
 - *Question Period (10 minutes)*
- 6:00 p.m. **Air monitoring update**
Treat Suomi, Skeo (Community Technical Advisor)
- Community Technical Review (20 minutes)
 - Question Period (15 minutes)
- 6:35 p.m. **Metrics**
- 2019 Sampling numbers, Sabrina Forrest, EPA (5 minutes)
 - 2019 Cleanup numbers, Julie Babcock, US Army Corps of Engineers (5 minutes)
 - Question Period (10 minutes)
- 6:55 p.m. **Announcements, public comments, and planning for the next meeting**
- Public comment (Concerns impacting lots of homes. Individual concerns are best addressed one-on-one.)
 - Outstanding issues on tracking sheet
 - Plans for 2020
 - NeighborWorks Again!
 - Proposed 2020 Meeting Dates (second Tuesday)
 - January 14
 - February 11
 - March 10
 - April 14
 - May12

- June 9
- July 14
- No August Meeting?
- September 8
- October 13
- November 10
- No December Meeting
- Proposed topics in 2020
 - iROD to ROD
 - 5 year review process
 - Institutional Controls
 - Others?

7:30 p.m. **Adjourn**

*Please note that times on the agenda are intended as guidelines and may be adjusted to meet the needs of the CAG and/or the community. If you would like to make a public comment and cannot stay until the end of the meeting, please hand a note to the facilitator ASAP stating your name and topic.

2019 Dates for the Colorado Smelter CAG meetings (second Tuesday of most every month from 5:30 to 7:30 pm at NeighborWorks):

- No December CAG meeting

Cleanup levels in Interim Record of Decision (i-ROD)

	Lead (PPM)	Arsenic (PPM)
Background	71	13
Indoor dust cleanup	275	61
Outdoor soil cleanup	350	61
Recreation soil cleanup	1710	273
Not To Exceed level	1918	1000

Attachment B: Facilitator's tracking sheet as of October 12, 2019

Colorado Smelter Facilitator's Tracking Document
 Outstanding items as of October 12, 2019
 (New Items are in GRAY)

Date	CAG Input/Decision	Response	Task Completed
10/8/19	Human Health Risk Assessment In the final Assessment, the CAG asks EPA to consider: <ul style="list-style-type: none"> • All concerns raised in Skeo report • Moving the blood lead level from 6.24 ug/dL to 5.0 ug/dL. 		
9/10/19	Quality Concerns: <ul style="list-style-type: none"> • Topsoil quality • Length of warranty of work? • Completing punch list work in a timely fashion • Not damaging personal property • Ensuring the office phone is manned. • Expanding office hours for those who work 9 to 5. New Issues raised at 10/8/19 meeting: <ul style="list-style-type: none"> • Is it too late in the season to be planting grass seed? • Do government contractors carry insurance? Can we sue them? 	All September items were addressed at October 2019 CAG	Done
9/10/19	Alleys: <ul style="list-style-type: none"> • Would it be possible to compare the correlation between alleys and yards for just dirtiest alleys south of the smelter? • Can EPA look at this data to ensure that hot spots are not being averaged out? • Can EPA do this correlation analysis for more than just the top inch of soil? • The presentation notes that the alleys are tightly packed. This is not true. In some alleys there are inches of loose dirt. The dust from alleys stays airborne for a long time. • Could the alleys be paved? 	This topic is on the November 2019 CAG agenda.	

	<ul style="list-style-type: none"> • Is there a dust suppression approach that could be used? 		
6/2019	<p>Definitions/Acronym Document: Can EPA develop a definitions/acronym document and make it available for the public at CAG meetings?</p>		
6/12/19	<p>Institutional controls: Topics for EPA and the City of Pueblo to consider when discussing institutional controls.</p> <ul style="list-style-type: none"> • Who does/pays for future work in contaminated areas after EPA has left, including: public utilities, sidewalks, alley ways. How will emergencies be handled? • If EPA determines that a house doesn't need a cleanup at this time, could it still have an institutional control required? • I want to keep the roses on my property. Can I dig them up and replant them into clean dirt and then put them back. EPA Response: Let us talk about this internally before you do this. Generally, we don't want to encourage community members to dig in soil that might be contaminated. • How will the interim Record of Decision be converted to the final Record of Decision? • Will the institutional control discussions be public conversations? 	In coming months/years, EPA and the City of Pueblo will develop agreements on how to address a number of issues such as this.	
8/2019	<p>Area Weighted Averaging (AWA): On behalf of the CAG, Terry/Harric/Velma are working on revising a letter to send to EPA regarding this topic.</p>	The CAG finished this letter and sent it to EPA and CDPHE on October 11.	Done.

4/2018	<p>PDPHE Follow-up</p> <ul style="list-style-type: none"> • PDPHE will provide quarterly reports to the CAG in January, April, July, and October. • PDPHE will send the CAG information on the RRP Workshop when available • CAG requests that PDPHE provide lead blood numbers by quarter and year and measured against an annual goal at the January 2020 meeting. 	<ul style="list-style-type: none"> • PDPHE received funding for the RRP Workshop. Dates will be provided when available. 	
4/2018 and 6/14/19	<p>Air Monitoring</p> <p>7/2019: Need to clarify definition and location of slag pile in future discussions.</p> <p>7/2019: Request Skeo provide a technical memorandum on the topic.</p>	Topic likely to be addressed at November CAG meeting.	
2/2015	CAG asked what information will be filed on public housing records when properties are sampled and after cleanup.	EPA and CDPHE will work with the City of Pueblo to determine whether and how this will happen.	Ongoing

Attachment C: Meeting attendance at the November 12, 2019 meeting

Attachment C
Attendance at November 12, 2019 CAG Meeting

Name	12-Nov-19
Ashenafi, Sisay	
Aviles, Jesse	
Babcock, Julie	x
Blomberg, Rachel	
Brown, Ed	x
Carrillo, Jody	
Campbell, Velma	x
Celico, Kristi	x
Cirian, Mike	
Close, Doug	
Coomes, Merrill	
Costanzi, Fran	
Dupler, Monica	x
Flores, Dennis	
Finger, John	
Fitzgerald, Doug	x
Forrest, Sabrina	x
Gallagher, Brian	
Garcia, Cathy	x
Harrison, Jennifer	x
Hart, Terry	x
Kocman, Joe	
Kocman, Pam	
Lamberg, Alan	
Marsh, Eric	
Marston, Erika	x
Martinez, Aaron	x
Meier, Steven	
Miller, Jamie	
Natterman, Jeannine	x
Nicoll, Chris	
O'Brien, Mallory	
O'Neal, Kenneth	x
Otero, Catherine	x
O'Reilly, Maureen	
Partridge, Charlie	x
Renfree, Paul	x

Romalia, Kathleen	x
Romero, Alexis	
Romero, Richard	x
Rothrock, Briana	x
Suomi, Treat	x
Tarbert, Jason	x
Taylor, Renee	x
Vander Valk, Harric	x
Von Stein, Ruth	
Wharton, Steve	

Additional Guests: Scott Gordon and
Demetri Barton

Attachment D: EPA November 2019 Sampling and Cleanup Update

Colorado Smelter Site Monthly Update



COLORADO
Hazardous Materials
& Waste Management Division
Department of Public Health & Environment



Videographer will be filming at November CAG meeting

EPA headquarters is producing an internal training video about the agency's lead model and will have a videographer at the November CAG meeting. CAG participants are advised to please sit at the back of the room if they do not wish to be in the video.

Open House November 13!

Please join us at an open house at our new project office in Pueblo, 200 S. Santa Fe, **Wednesday, November 13, 2019 from 3 p.m. to 6 p.m.** Light snacks will be provided. EPA will be available to answer questions about individual properties.

Operable Unit 2 soil sampling report is now available

EPA has completed a technical memorandum regarding soil sampling for the former smelter area (OU2). This document will soon be available on EPA's and CDPHE's websites.

No December CAG meeting!

Due to the holidays, the Colorado Smelter Community Advisory Group (CAG) will not be meeting in December. The next CAG meeting will be Tuesday, January 14, 2020 at NeighborWorks, 1241 E. Routt Avenue, Pueblo.

Holiday office closures

Please note that the Pueblo project office will be closed for the Thanksgiving holiday November 27 to November 29 (reopening December 2) and for Christmas December 23 to January 2 (reopening January 3, 2020). If a resident has an urgent matter they can contact the project office at 719-299-4468.

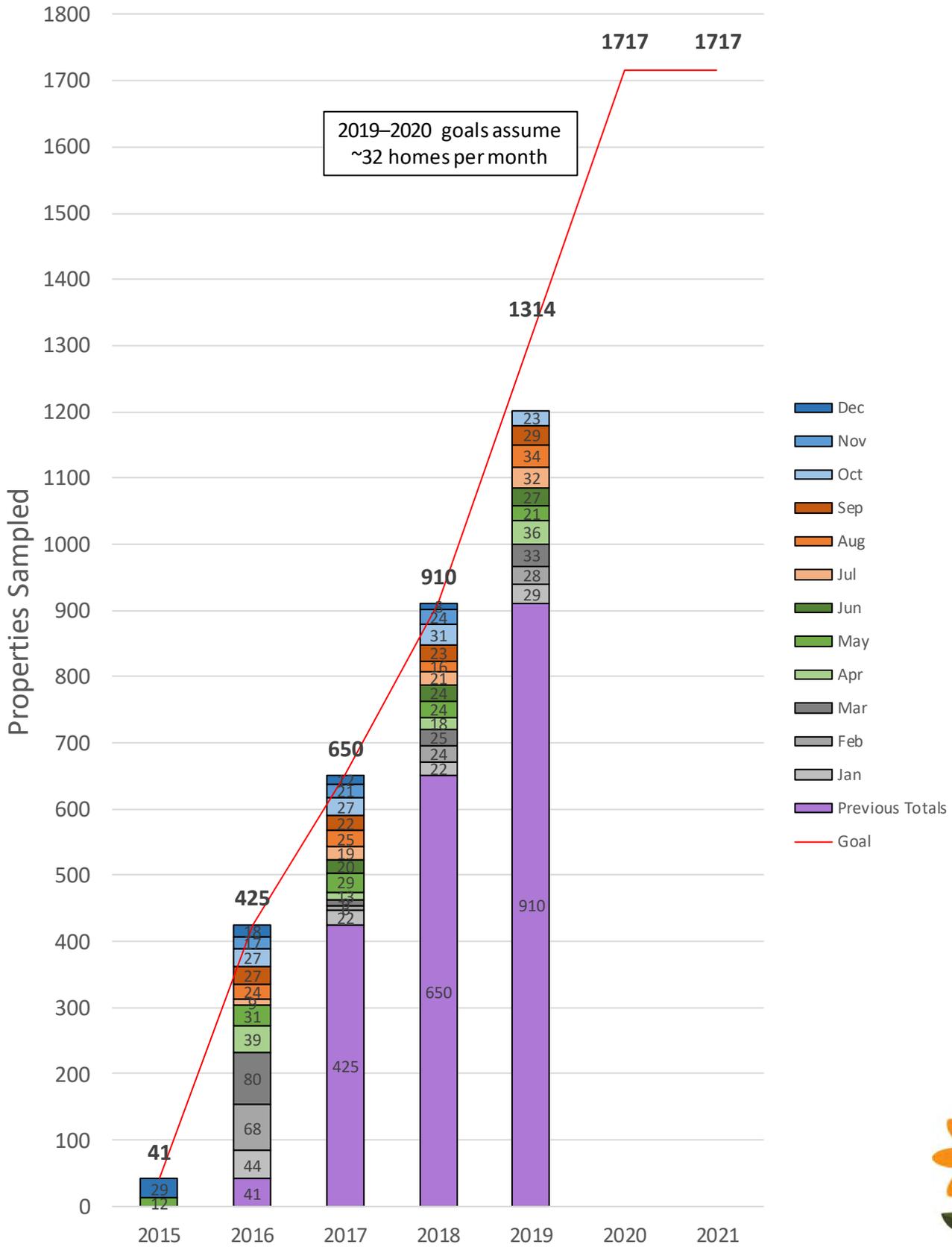
Skeo to conduct technical review

Skeo & Associates, a contractor that provides technical assistance to the CAG, is conducting a technical review of EPA's air monitoring report and will present their review at the November CAG meeting.

Sampling and cleanup progress last month

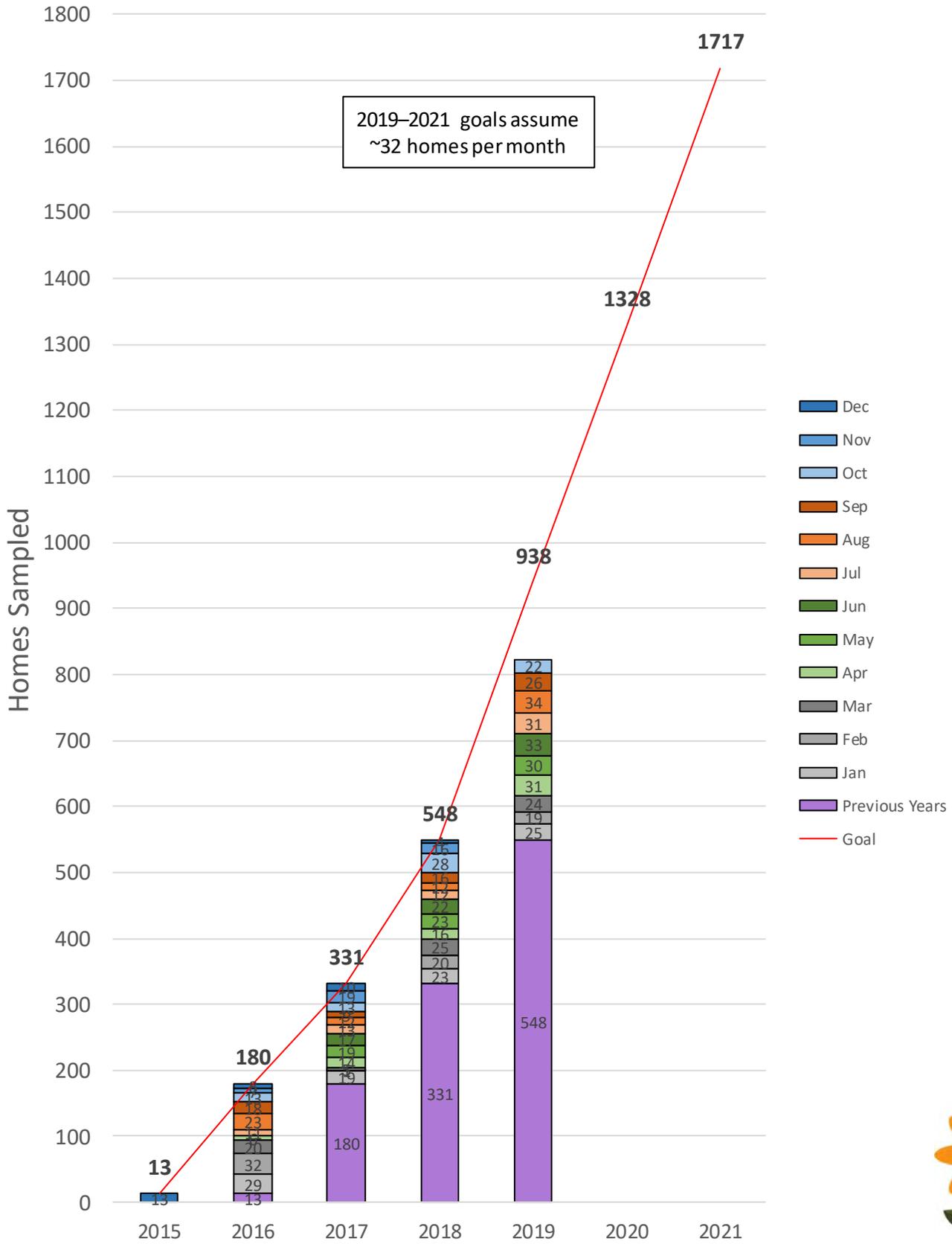
- 23 yards were sampled and 22 properties were sampled for indoor dust.
- Cleanup and restoration has been completed at 22 properties.
- Indoor dust cleanups have been completed at 14 properties.

Soil Properties Sampled By Year (and Month)



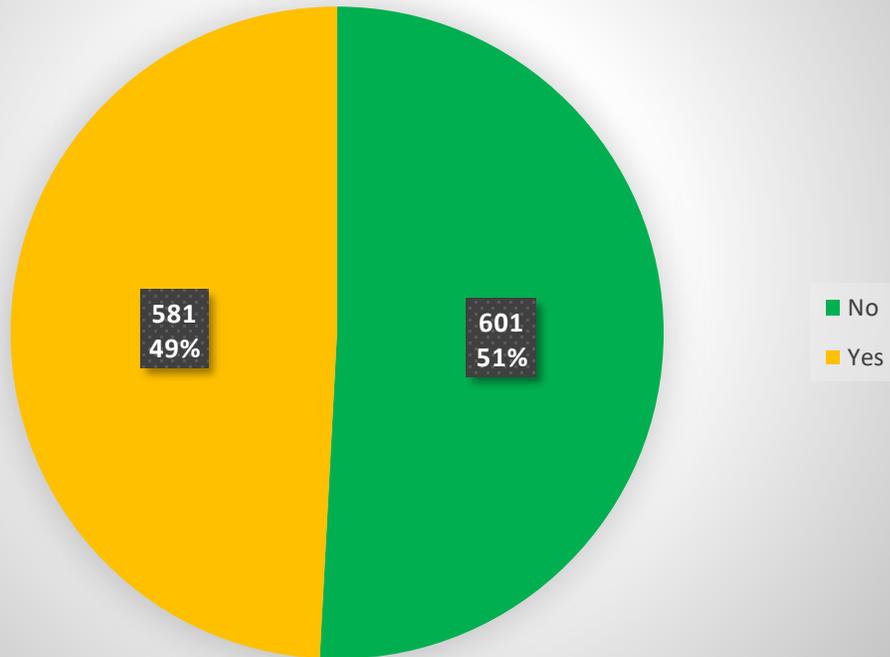
Totals	41	425	650	910	<u>1202</u>	Goal 1717
						(Will change based on sampling percentages)

Dust Homes Sampled By Year (and Month)



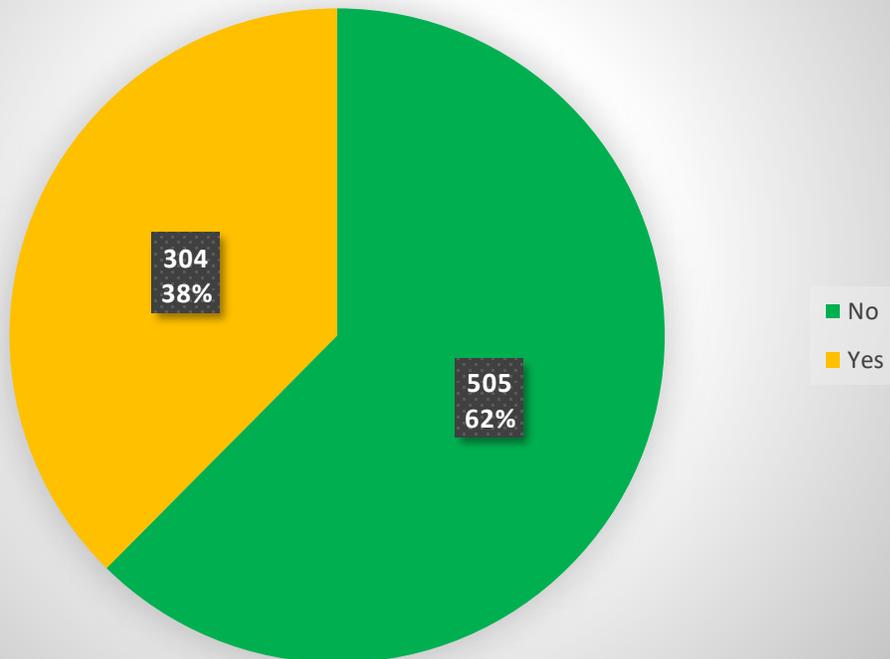
Totals	13	180	331	548	<u>823</u>	Goal 1717
						(Will change based on sampling percentages)

Percent of Sampled Residential Properties Needing Soil Cleanup

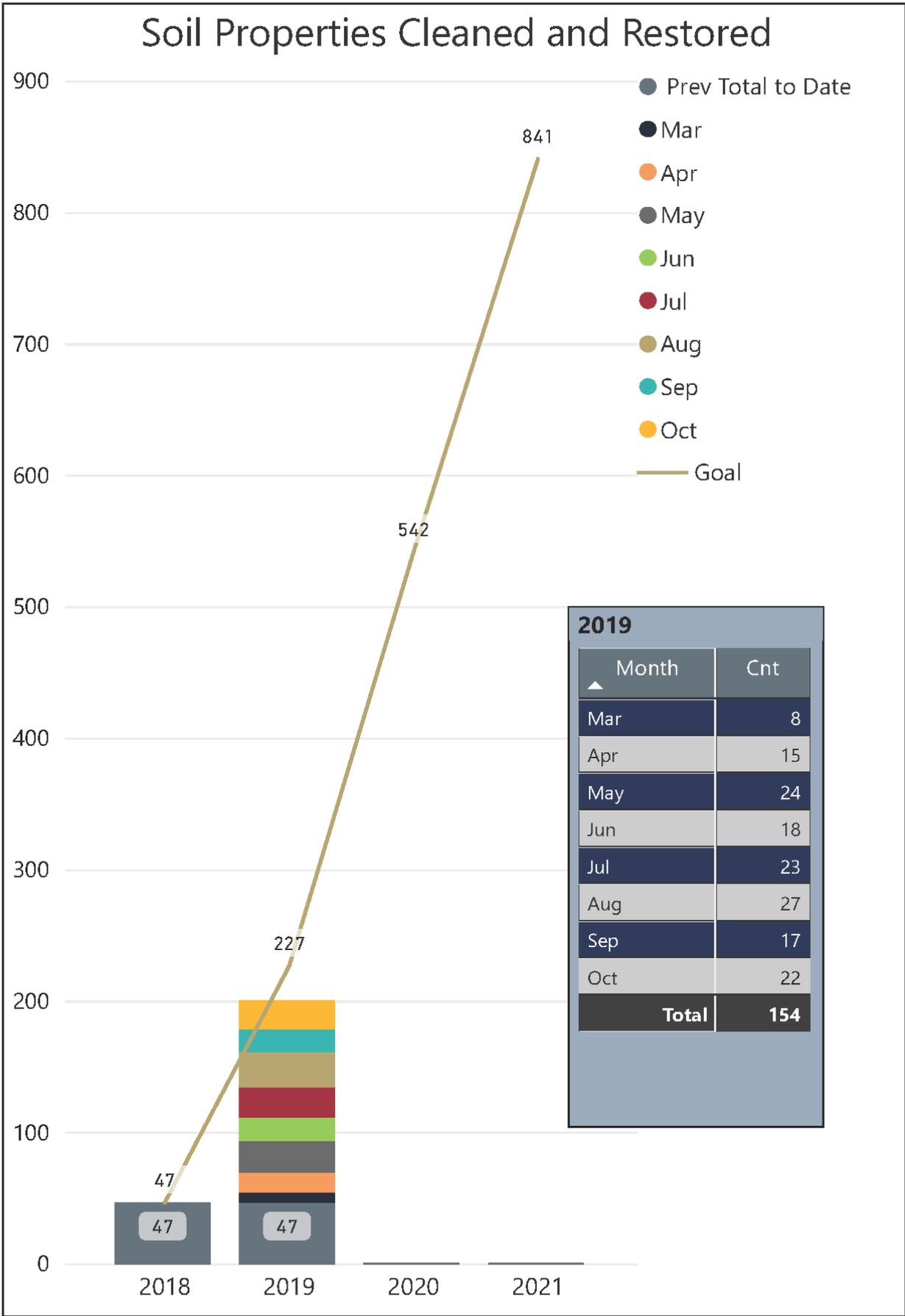


Soil sampling as of 10/25/2019 and dust sampling as of 10/25/2019

Percent of Sampled Residential Properties Needing Dust Cleanup



**Pie chart totals are based on validated data and may be different than the sampling totals.*



Totals

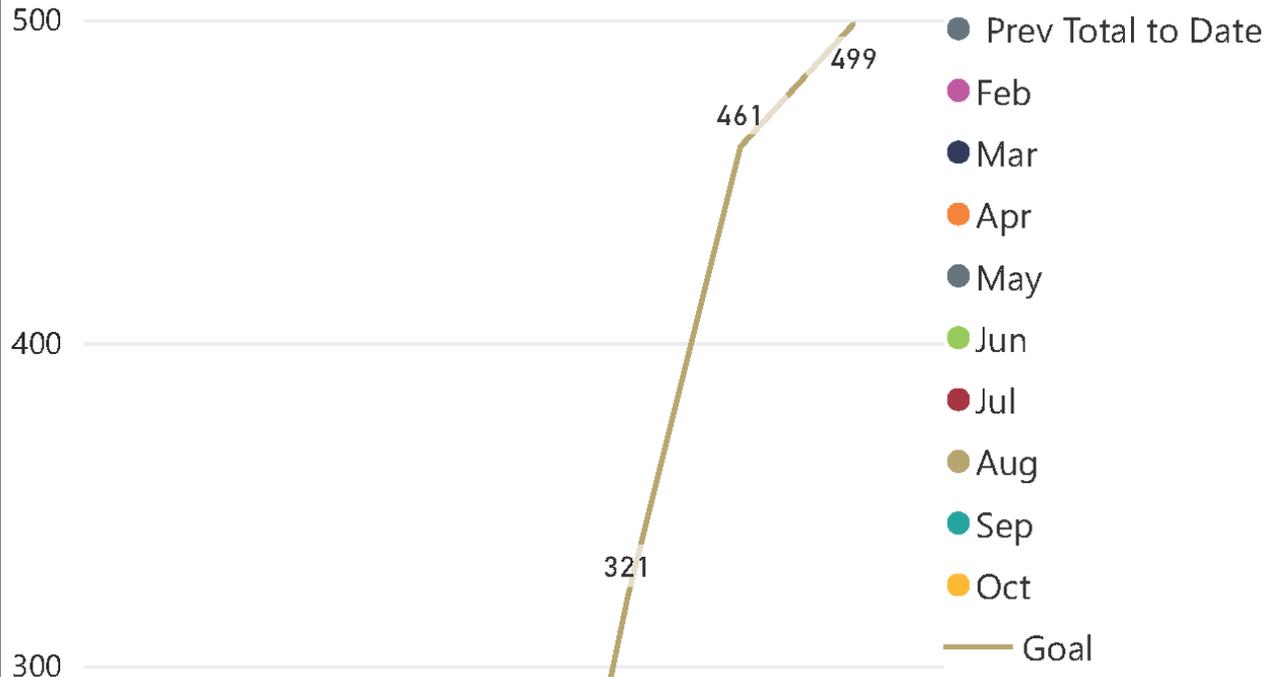
47

201

Goal 858

(Subject to change based on sampling consent and completions)

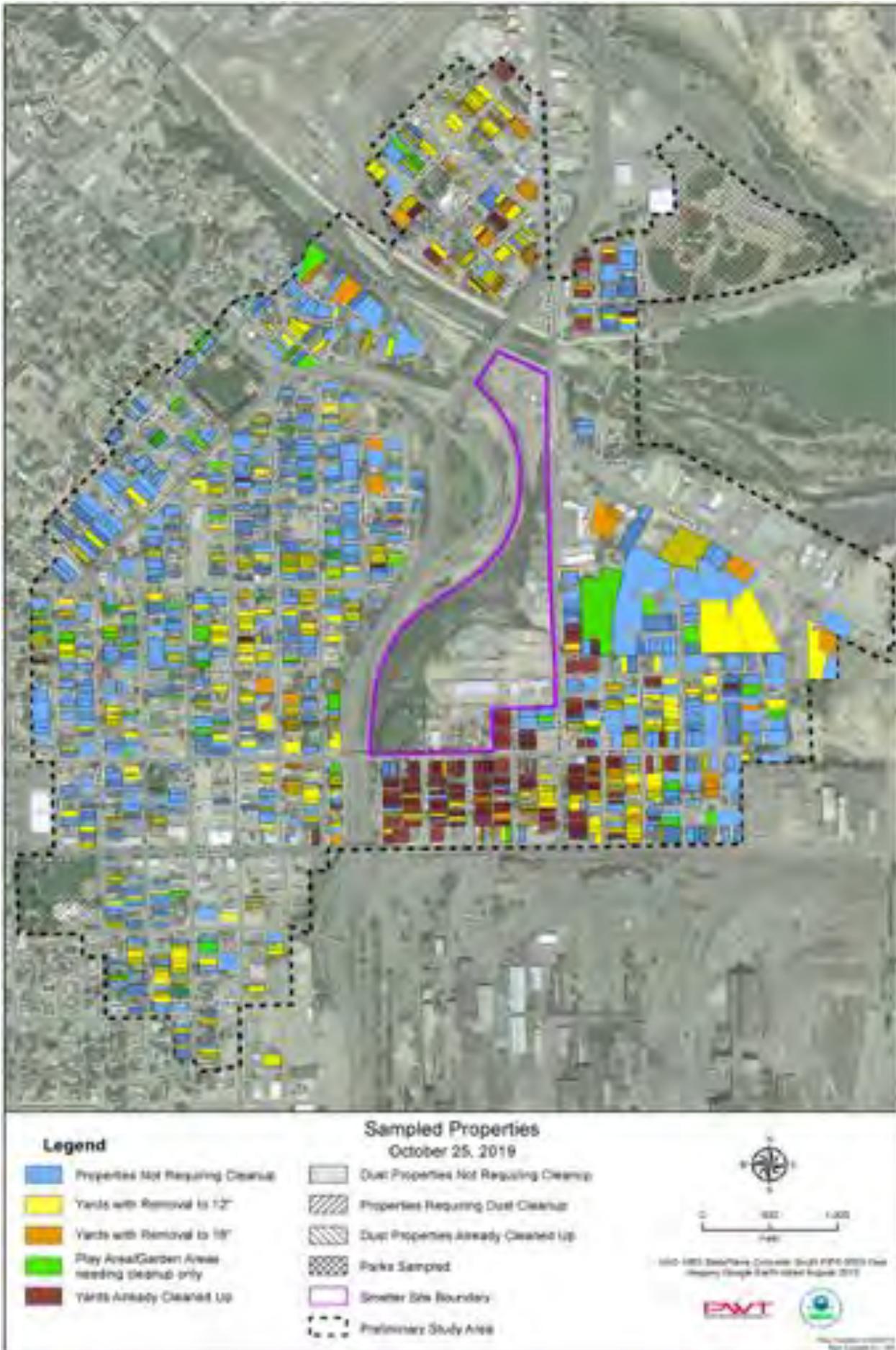
Dust Properties Cleaned



2019	
Month	Cnt
Feb	8
Mar	13
Apr	1
May	11
Jun	10
Jul	11
Aug	6
Sep	10
Oct	14
Total	84

Totals	20	34	43	<u>127</u>				Goal 522
	(Subject to change based on sampling consent and completions)							





Colorado Smelter Site Activities

2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Community Advisory Group meetings (monthly)		x	x	x	x	x	x	x	x	x	x	
Sampling—Residential (OU1)	x	x	x	x	x	x	x	x	x	x	x	
Cleanups (OU1)	x	x	x	x	x	x	x	x	x	x	x	
Begin discussing Institutional Controls with City									x	x	x	
Draft Human Health Risk Assessment available for review								x	x	x	x	
Report on soil sampling pilot expected (OU2)											x	
Quarterly surface water sampling (OU2)			x			x						
Air sampling report completed (OU2)										x		
Community Involvement Plan Update completed								x				
Revitalization report completed								x				

x = completed

2020	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Community Advisory Group meetings (monthly)												
Sampling—Residential (OU1)												
Cleanups (OU1) (ongoing)												
Sampling—Phase I (OU2)												
Sampling—Phase I report (OU2)												

Operable Unit 1 (OU1) includes about 1,900 residential and commercial properties that are located within about half a mile of the former smelter area.

Operable Unit 2 (OU2) includes a former silver and lead smelter and stack that operated in the Eilers and Bessemer neighborhoods from 1883 to 1908.

Join Us for an Open House at the New Project Office!



3 p.m. to 6 p.m.

Wednesday, November 13, 2019

200 S. Santa Fe, 5th Floor, Pueblo

QUESTIONS?

For general questions, contact the Community Involvement Coordinators:

- **U.S. Environmental Protection Agency (EPA)**

Jennifer Harrison

800-227-8917 ext. 312-6813

harrison.jennifer@epa.gov

- **Colorado Department of Public Health & Environment (CDPHE)**

Jeannine Natterman

888-569-1831 ext. 3303

jeannine.natterman@state.co.us

For questions about cleanup at your property, call or visit our Pueblo project office, 200 S. Santa Fe, 5th Floor, 719-299-4468. Open daily from 8 a.m. to 5 p.m.

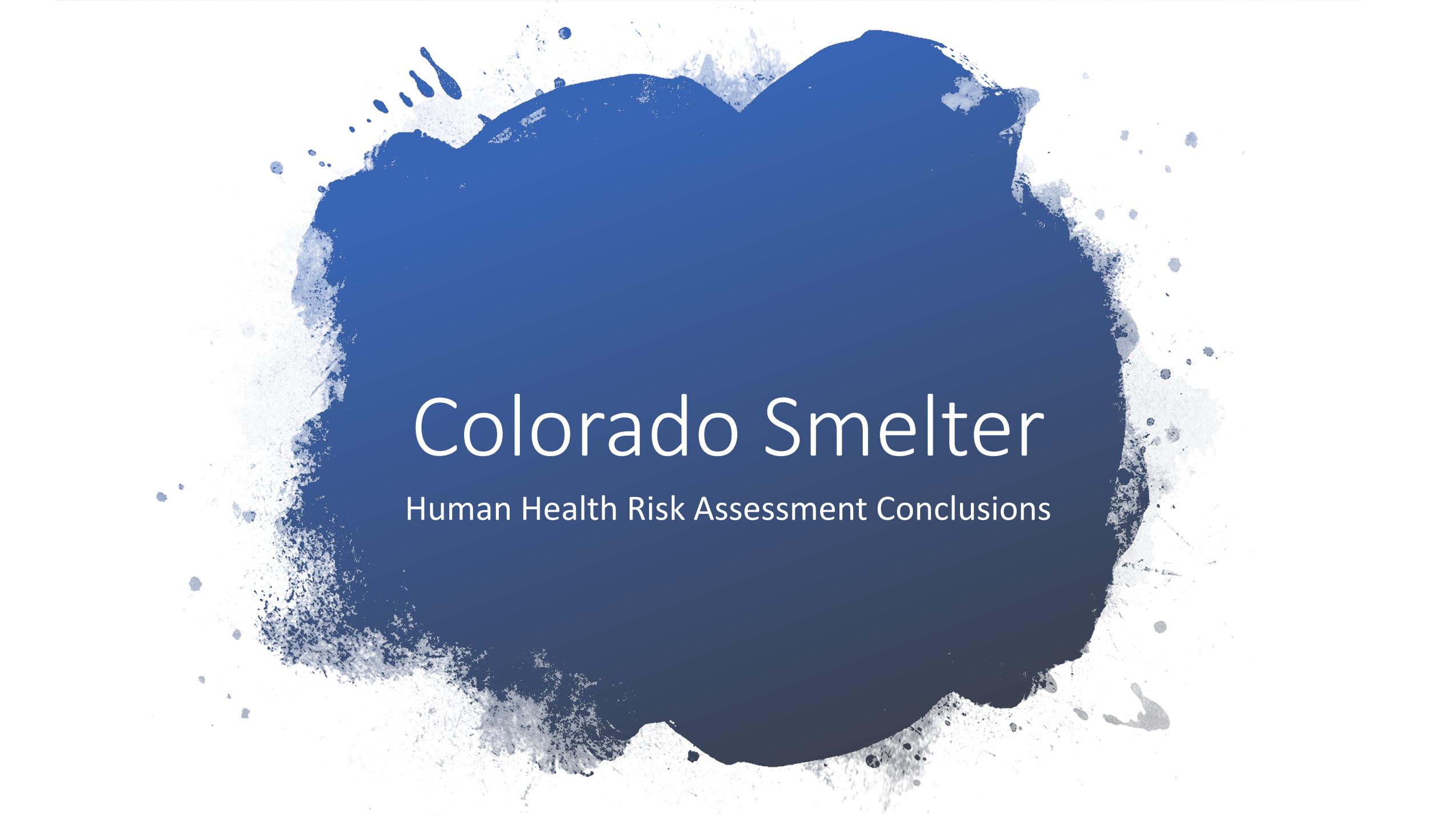
Call Pueblo Department of Public Health and Environment at 719-583-4307 for lead program information, free blood lead testing or healthy home screening.

¿Habla español? Puede llamar a Jesse Aviles 303-312-6287.

For ongoing updates, like EPA Region 8's Facebook page:

<https://www.facebook.com/eparegion8/>

Attachment E: Alley Dust Presentation by EPA



Colorado Smelter

Human Health Risk Assessment Conclusions

Human Health Risk Assessment

- Does the Risk Assessment support the listing of Colorado Smelter? Yes
- Does the Risk Assessment identify the contaminants? Yes
- Does the Risk Assessment identify the toxicity of the contaminants? Yes
- Does the Risk Assessment identify an affected population? Yes
- Does the Risk Assessment provide information to determine a cleanup level? Yes

Dirt Alleyway Analysis



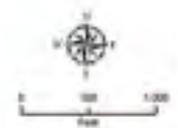
Alley Analysis Background

- Unpaved alleys
 - Sampled February-March 2017
 - 442 samples from 93 alleys and 4 depths
- Concerns were raised about alleys in July 2019 CAG meeting
 - Heavy traffic in alleys
 - Could this lead to recontamination of properties?
- Results presented at September 2019 CAG meeting
 - No correlations observed
 - Concern from residents about specific neighborhood effects



- Legend**
- █ Lead concentration < 300
 - █ Lead concentration = 300
 - █ Lead concentration > 700
 - Smelter Site Boundary
 - Revised Study Area

Alley Soil Results
0-1 inch
September 26, 2019

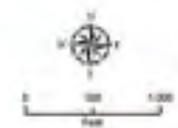


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- Legend**
- █ Lead concentration < 300
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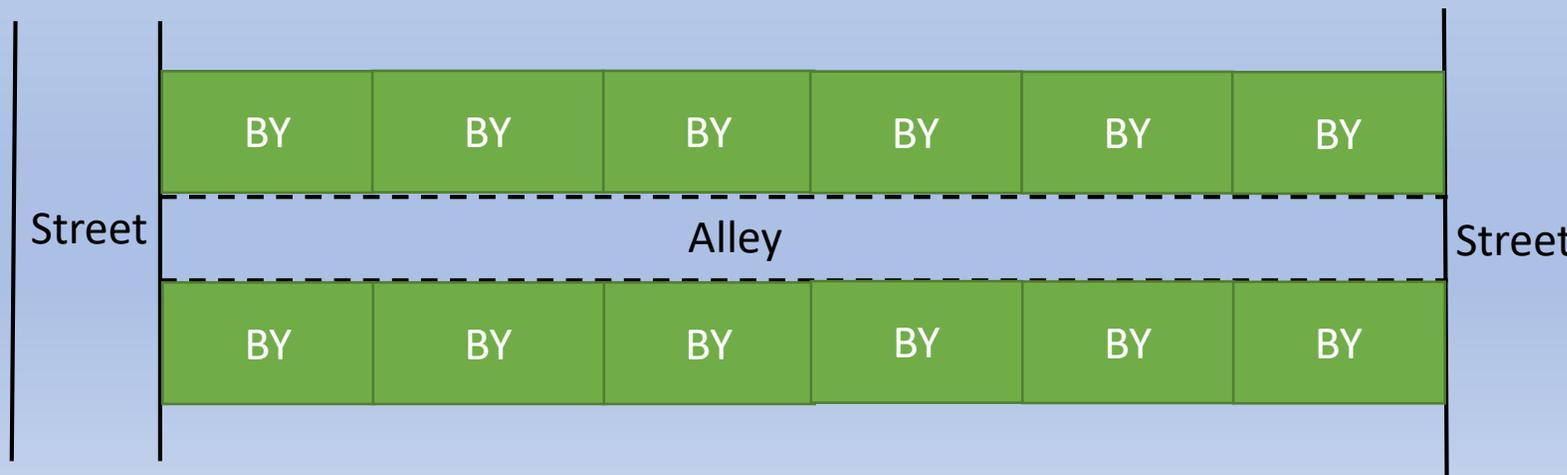
Alley Soil Results
September 26, 2019



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EWT Environmental Services, Inc. 2013

General Approach

- Use linear regression correlation to compare concentrations in alleys to adjacent backyards
 - Alley samples are collected over full length of a block
 - Assign each unpaved alley a group of DUs consisting of backyard DUs adjacent to that alley
 - Calculate an average for that group of DUs

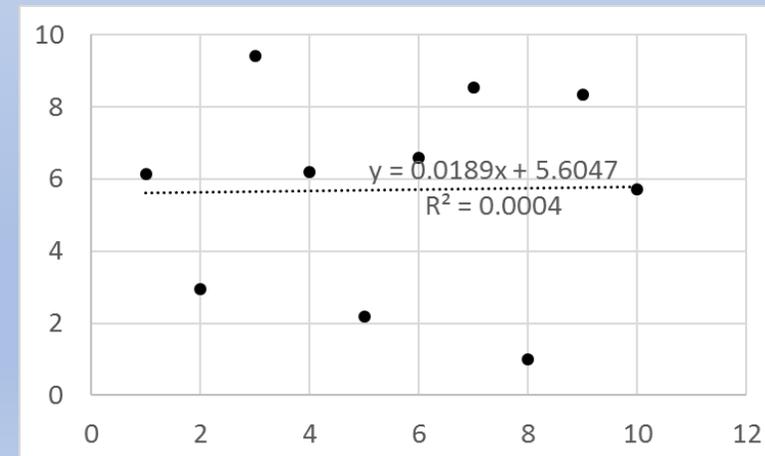
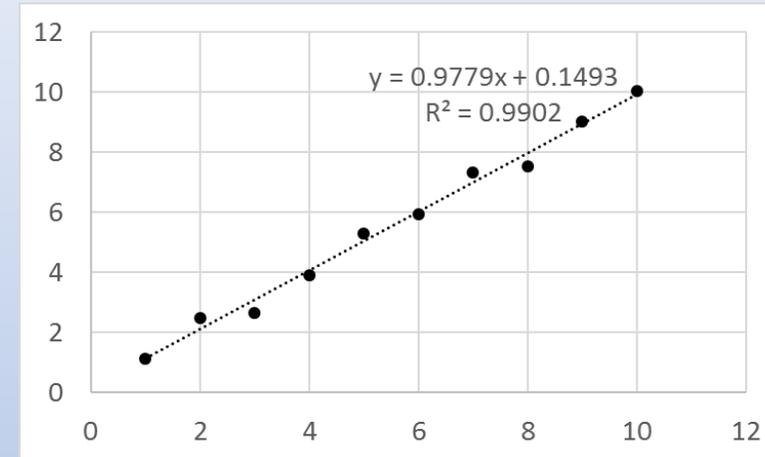


Linear Regression

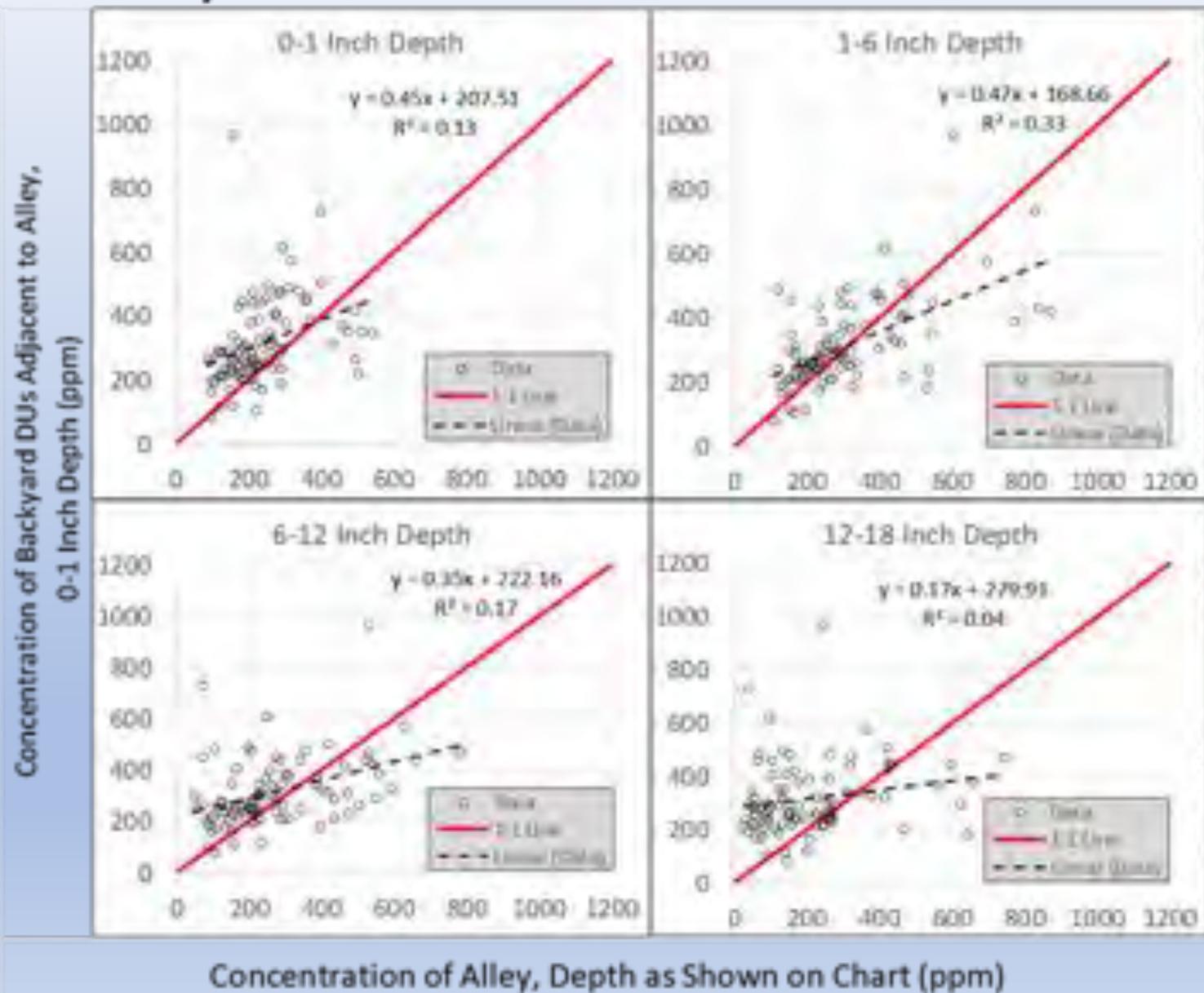
- Statistical Method
 - Test to see whether variables may be related
 - Measure of how related is called R, “correlation coefficient”
 - R ranges from 0 to 1
 - The higher R is, the better the correlation, and the more likely the variables are to be related
 - Some amount of correlation can be present just by random chance
 - R^2 is usually used instead of R, but this also varies from 0 to 1

Examples

- Strong Correlation
 - R^2 is very close to 1
 - Variables are likely related
 - Example – length of vehicle versus weight of vehicle
- Weak Correlation
 - R^2 is very close to 0
 - Variables are likely not related at all
 - Example – shoe size and first number of street address



All Alleys - Lead



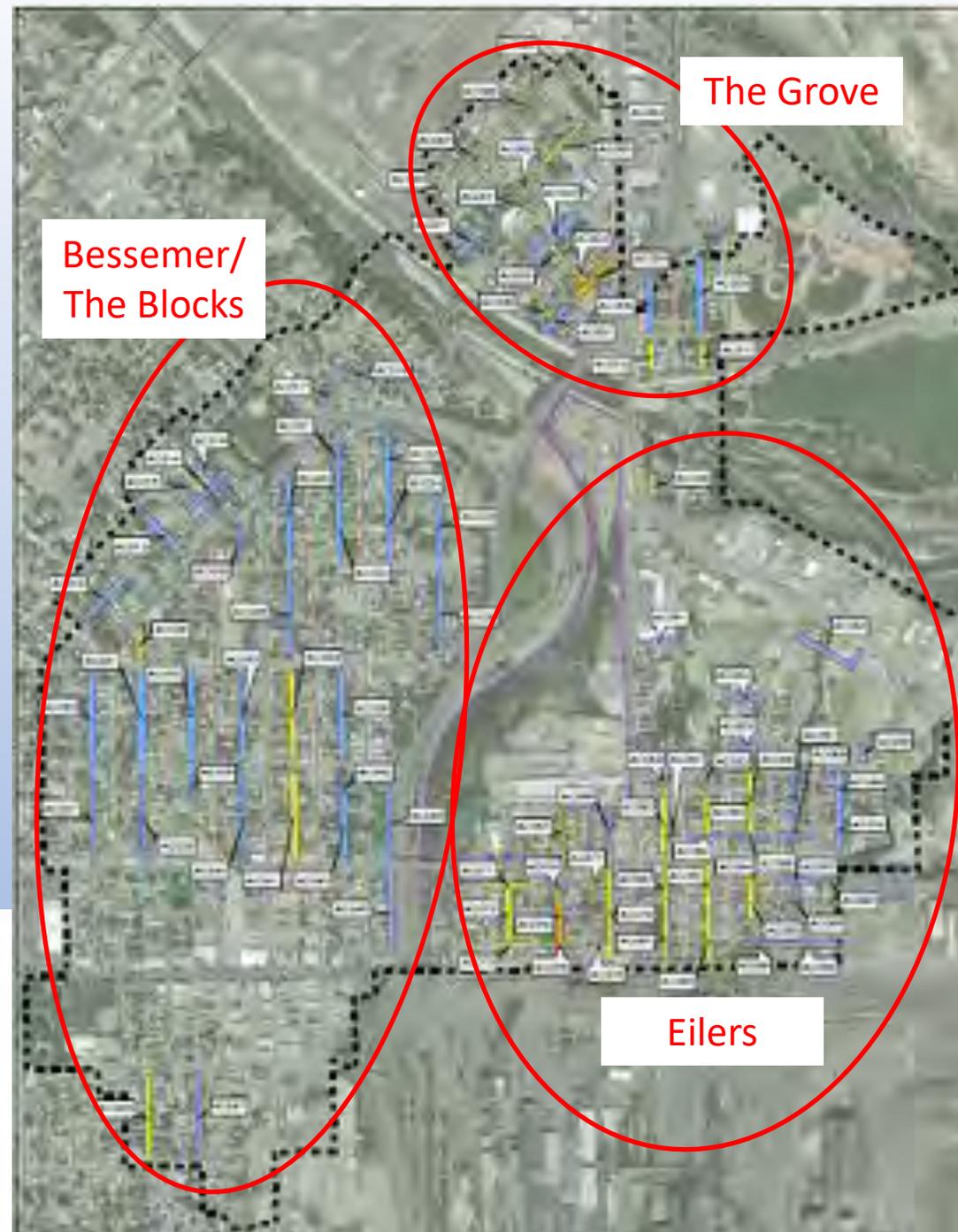
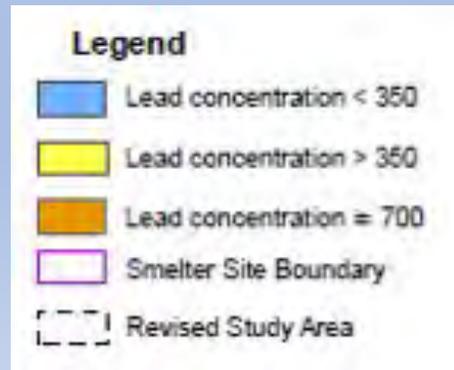
Neighborhood Analysis

Address concern about local effects that might be masked by using all alley data

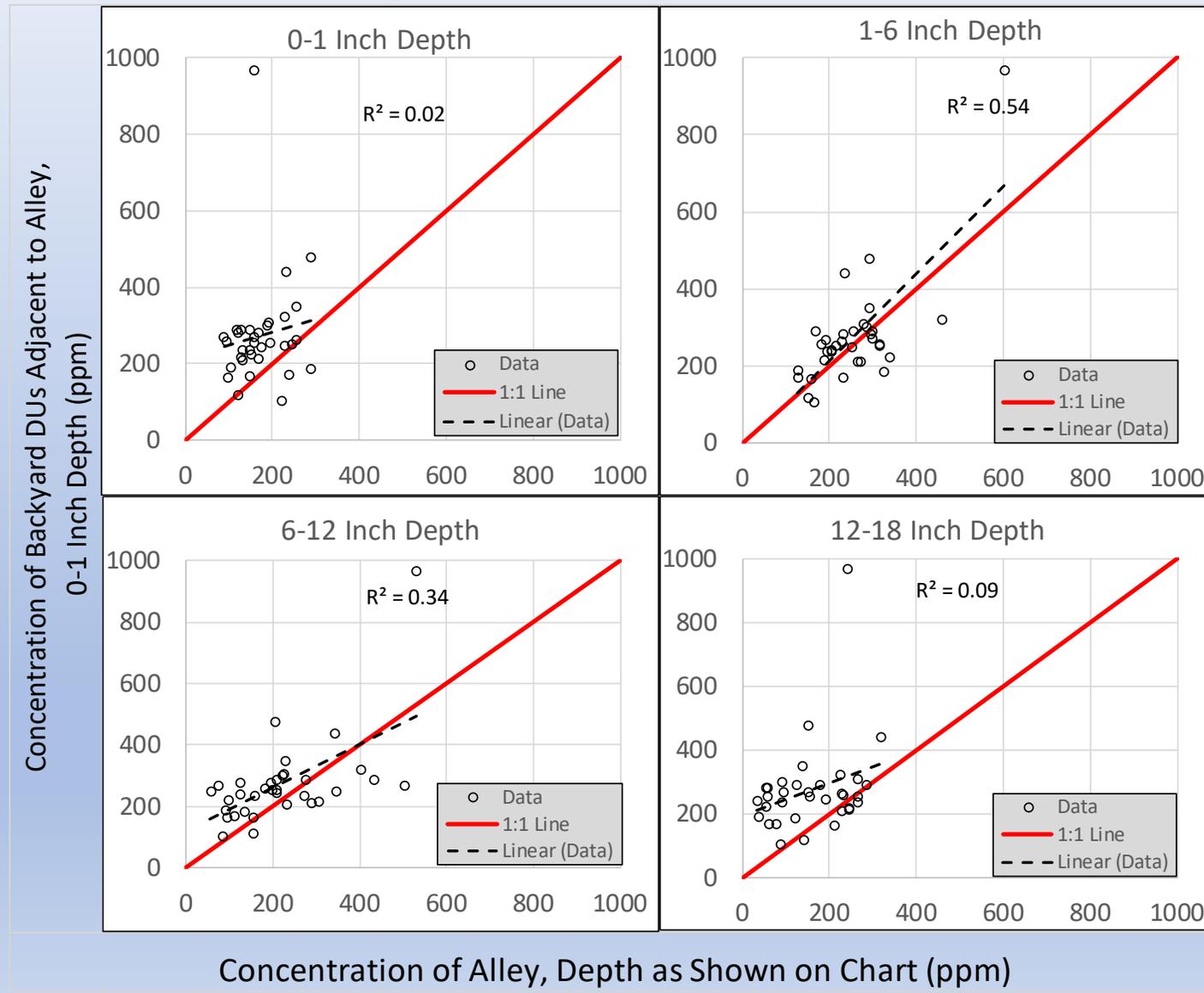
Three neighborhoods:

- Bessemer/The Blocks, 40 alleys
- Eilers, 34 alleys
- The Grove, 19 alleys

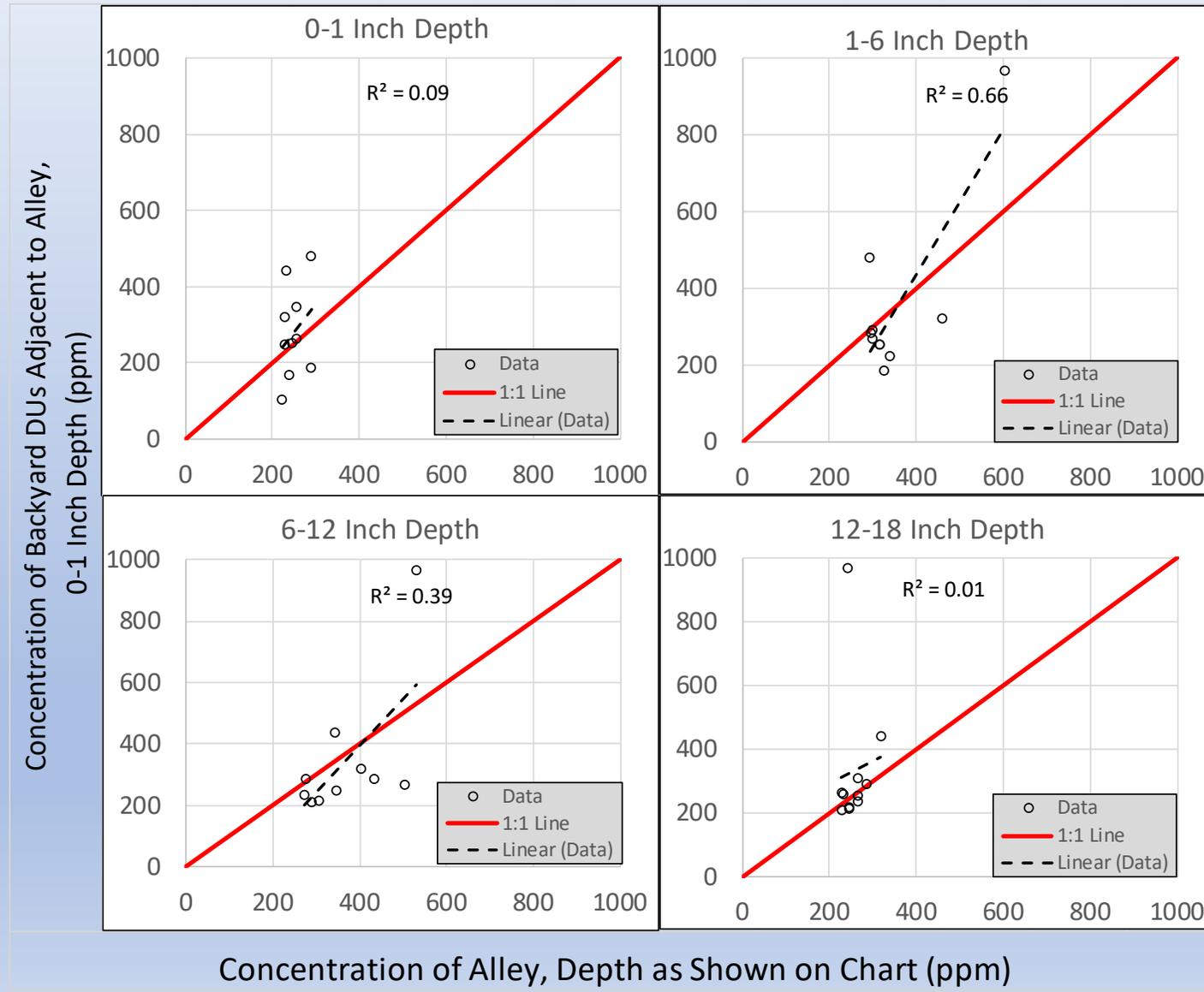
Create a correlation for the top 10 concentrations from each neighborhood, for each depth and analyte



All Bessemer Alleys - Lead



Top 10 Bessemer Alleys - Lead



Summary

- No obvious correlations visible between alleys and residential backyards
- Recontamination is unlikely for several reasons
 - City only grades alleys on an as-needed basis based on resident requests
 - Highest concentrations in the surface soil within alleys are less than twice the lead PRG
 - Backyards overall have larger area than alleys
 - A large amount of soil would have to move from the alley into a specific backyard, but wind directions change frequently, making that unlikely

Attachment F: Skeo's review of the EPA air monitoring report

Technical Assistance Services for Communities

TASC Review of the Colorado Smelter Operable Unit 2 TSP and Metals Air Concentration Summary



Contract No.: EP-W-13-015

Task Order No.: 68HE0S18F0209: OSRTI – Multi Regions & Headquarters
Support

Technical Directive No.: R8 1.4.3 Colorado Smelter

Summary and Review of the TSP and Metals Air Concentration Summary for March 9, 2018, to March 8, 2019, at the Dance Studio Monitoring Station for the Colorado Smelter Operable Unit 2 (OU2) Site, September 2019

The Colorado Smelter Community Advisory Group (CAG) requested assistance from EPA's Technical Assistance Services for Communities (TASC) program to help the community understand the technical aspects of the September 2019 TSP (Total Suspended Particulate) and Metals Air Concentration Summary for March 9, 2018, to March 8, 2019, at the Dance Studio Monitoring Station (Report). The air sampling was part of a remedial investigation by EPA for operable unit 2 (OU2) at the Colorado Smelter Superfund site. EPA divided the site into two OUs for cleanup planning. OU2 is the former Colorado Smelting Company facility. OU1 consists of community properties surrounding the former Colorado Smelter.

The Colorado Smelting Company was active from 1883 to 1908 and operated eight blast furnaces, two calcining furnaces, one fusing furnace and 20 kilns. This past smelting activity led to high levels of lead and arsenic on site and in nearby residential soils. Approximately 700,000-square-feet of slag piles remain in OU2. The report states that air sampling was designed to document air quality impacts expected to occur during the OU2 remedial investigation. However, EPA has further explained that the main purpose of the investigation was to determine whether windblown contaminants were currently posing a possible health risk to nearby residents or to the clean soils of remediated OU1 properties. EPA has also explained that air will be monitored during any excavation and construction activities at OU2.

TASC's review provides a brief summary of the Report, along with TASC's comments for the community. The review is divided into the following sections:

- Acronyms and Definitions
- Introduction (Report Section 1)
- Sampling Description (Report Section 2)
- TSP and Metals Sampling Results (Report Section 3)
- Maximum TSP Concentration Sampling Day Analysis (Report Section 4)
- Summary (Report Section 5)

This document is funded by EPA's TASC program. Its contents do not necessarily reflect the policies, actions or positions of EPA.

Summary of TSP and Metals Air Concentration Summary

- EPA collected 59 24-hour air samples from a sampler on the roof of Jeannie's Academy of Dance at 1143 S Santa Fe Avenue, Pueblo, Colorado, from March 9, 2018, to March 8, 2019.
- The air samples were tested for TSP and 22 metals, including arsenic and lead.
- The mass of the 22 metals made up only about 15% of the total mass of suspended particles in the samples collected.
- Arsenic was never detected, and lead was detected at low concentrations.
- The field-blank checks and other laboratory quality control checks did not indicate any problems for the sampling program. A field blank is an unused filter that is sent with the batch of samples to detect whether samples are possibly being contaminated during the handling process.
- Results for three of the five days with the highest TSP concentrations (March 15, June 7 and October 5, 2018) indicated that OU2 may have contributed to the higher TSP results. Likewise, for three of the five days with the highest TSP concentrations (March 15, April 20, and June 13, 2018), results indicated that excavations in OU1 (community properties) may have contributed to the higher TSP results. However, EPA has explained that air monitoring and dust suppression were conducted for all OU1 excavations during those time periods, and there were no exceedances for dust on the properties. All five days had higher-than-normal wind speeds.
- The Report concludes that the relatively low TSP and metal concentrations measured indicate that wind erosion from OU2 is not generating large impacts in the surrounding region.

TASC Overarching Comments on the TSP and Metals Air Concentration Summary

TASC found the air sampling followed EPA's regulations for sampling particulate matter in air. TASC agrees with the report's finding that OU2 likely does not have a significant impact on the surrounding region as a source of windblown site-related contaminants. However, community members may want to ask for additional information from EPA, as noted in the TASC comments below.

- Jeannie's Academy of Dance location for the sampler is acceptable for screening for possible air quality issues caused by OU2. Predominant winds often blow from the direction of OU2 toward the sampler. Higher levels of arsenic and lead have been found in the soils southeast of the former smelter, possibly indicating more windblown deposition from OU2 toward the sampler location. This site is secure and has been used for previous air monitoring. The rooftop location is above street-level dust that could skew results. On the other hand, the rooftop location may not capture the same contaminant levels that are in the breathing zone of nearby residents. This location was previously used to monitor for emissions from EVRAZ Rocky Mountain Steel (EVRAZ), and contaminants at this location may be from other sources besides OU2. Monitoring air at only one location may limit EPA's ability to determine if windblown dust from OU2 is an important source of ongoing off-site contamination.

- Average concentrations of cobalt and manganese were above their respective Residential Air Regional Screening Level in each quarterly report. The average concentration of aluminum was above its Residential Air Regional Screening Level in three of four quarters. Additionally, maximum detections of cobalt were above its Residential Air Regional Screening Level in each quarterly report. Maximum detections of nickel were above its Residential Air Regional Screening Level in the first two quarterly reports. The detection limits for arsenic were too high to determine if any arsenic concentrations were above its Residential Air Regional Screening Level in any quarter. EPA has explained that no commercial laboratory in the U.S. was able to analyze for arsenic at or below its Residential Air Regional Screening Level. Average lead concentrations were below its Residential Air Regional Screening Level in each quarterly report. Exceeding a screening level means that more evaluation may be needed. It is not an indication of a health risk. EPA action levels for protecting human health are often 10 to 100 times higher than screening levels. **The CAG may want to ask EPA if additional evaluation of air quality is planned.**
- Predominant wind directions reported by Pueblo Memorial Airport and EVRAZ were generally either from the southeast or northwest. Pueblo Memorial Airport reported average wind speeds between 7.9 miles per hour and 10.8 miles per hour. In its 2017 Air Quality Data Report (December 26, 2018), the Colorado Air Pollution Control Division's Department of Public Health and Environment Technical Services Program reports that wind generally blows up valley from the southeast during the day and down valley from the west at night. It also reports that Pueblo experiences average wind speed ranges from 7 miles per hour in the fall and early winter to 11 miles per hour in the spring. The wind roses presented in the four monitoring quarters confirm these generalizations.
- For three of the five days with the highest TSP concentrations, winds measured at EVRAZ were from the direction of OU2 or portions of OU2 toward the air sampler. These days were March 15, June 7 and October 5, 2018. As the wind roses from EVRAZ and Pueblo Memorial Airport show, winds in Pueblo blew from every direction at different times during each quarterly reporting period. It is unclear from which direction the wind was blowing on sampling dates other than the highest five presented in the report. **The CAG may want to ask EPA to summarize wind data for the dates when sampling occurred.**

Acronyms and Definitions

Cubic meter (m^3) – A measure of volume.

Meters per second (m/s) – A measure of speed.

Micrograms (μg) – A measure of mass.

Micron or micrometer (μm) – A measure of length.

Miles per hour (mph) – A measure of speed.

Total Suspended Particulates (TSP) – Small particles suspended in ambient air. TSP samplers typically collect particles up to 25 to 50 microns in diameter. For comparison, the diameter of a human hair is 80 to 100 microns in size.

TSP high volume air sampler – A piece of equipment that draws a large known volume of air through a pre-weighed filter for 24 hours. The filter traps the particles suspended in ambient air as the air passes through the instrument. The filter is removed and sent to a laboratory where the trapped particles are weighed and analyzed. Dividing the mass of particles by the volume of air sampled gives the concentration of TSP.

Wind rose – A graphical way to depict wind direction and speed over time.

Figure 1. EVRAZ Daily Wind Rose for March 15, 2018

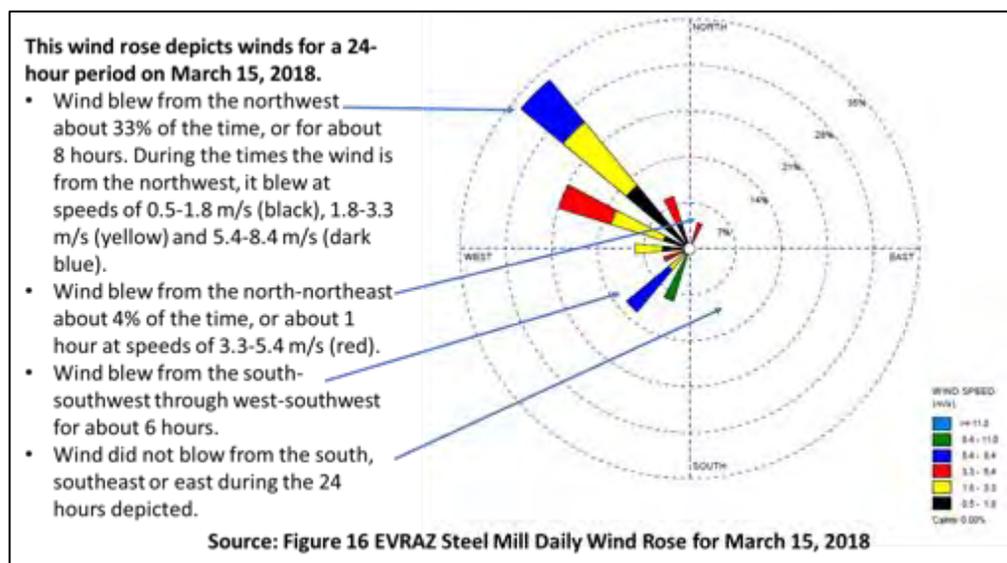
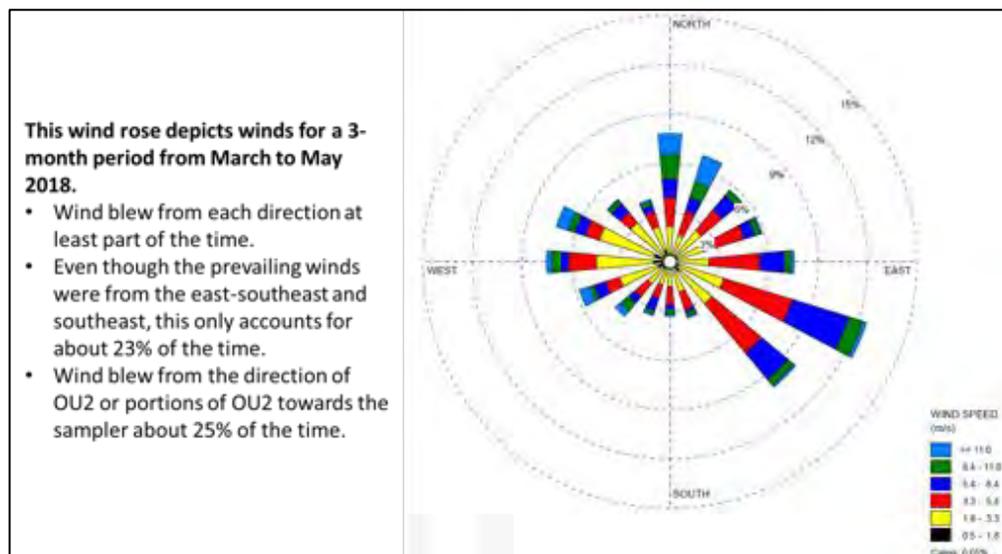


Figure 2. Pueblo Memorial Airport Wind Rose for Three-Month Period



Introduction (Report Section 1)

EPA's contractor conducted a TSP and metals air quality sampling program as part of the remedial investigation for OU2 at the site. The report states that the sampling was designed to document air quality impacts expected to occur during the investigation. However, EPA has further explained that the main purpose of the investigation was to determine whether windblown contaminants were currently posing a possible health risk to nearby residents or to the clean soils of remediated OU1 properties. EPA has also explained that air will be monitored during any excavation and construction activities at OU2.

The Report describes the operations conducted during the monitoring year from March 9, 2018, to March 8, 2019, as well as the sampling results.

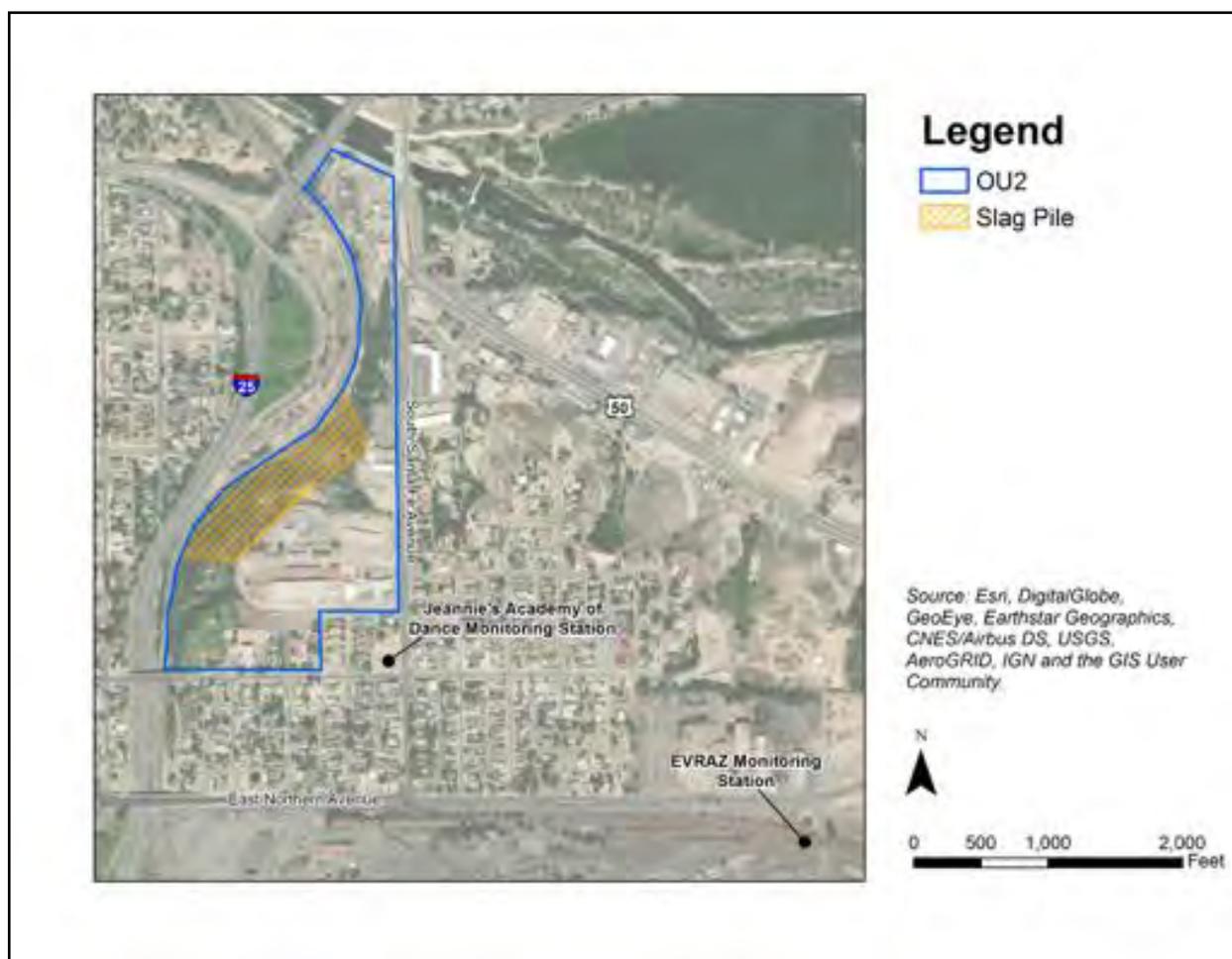
Sampling Description (Report Section 2)

Section 2 describes the sampling location, monitoring method, equipment calibration and audits, data processing and meteorological data.

Location. The TSP high-volume air sampler is located on the roof of Jeannie's Academy of Dance at 1143 S Santa Fe Avenue, Pueblo, Colorado. This is roughly downwind of the Colorado Smelter. Figure 3 is an aerial photo showing the locations of the dance studio station, the former Colorado Smelter and the EVRAZ meteorological monitoring station. There is a slag pile on the western side of the Colorado Smelter property.

TASC Comment: This location for the sampler is acceptable for screening for possible air quality issues caused by OU2. Predominant winds often blow from the direction of OU2 toward the sampler. Higher levels of arsenic and lead have been found in the soils southeast of the former smelter, possibly indicating more windblown deposition from OU2 toward the sampler location. This site is secure and has been used for previous air monitoring. The rooftop location is above street-level dust that could skew results. On the other hand, the rooftop location may not capture the same contaminant levels that are in the breathing zone of nearby residents. This location was previously used to monitor for emissions from EVRAZ, and contaminants at this location may be from other sources besides OU2. Monitoring air at only one location may limit EPA’s ability to determine if windblown dust from OU2 is an important source of ongoing off-site contamination.

Figure 3. OU2 area, Jeannie’s Academy of Dance Monitoring Station, and EVRAZ Monitoring Station



Monitoring Method. EPA’s contractor used a TE-2670DV TSP high-volume air sampler to collect one 24-hour sample every six days. Fifty-nine (59) samples out of a possible 61 samples were successfully collected from March 9, 2018, to March 8, 2019. On every sampling day, EPA’s contractor collected filters from the sampler. These filters were sent in batches to a laboratory for analysis. The laboratory analyzed the filters for 22 metals – aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium,

manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc. For quality control, six field blanks were collected, shipped in the same box as the samples and analyzed in the same batch. A field blank is an unused filter that is sent with the batch of samples to detect whether samples are possibly being contaminated during the handling process.

Equipment Calibrations and Audits. Equipment calibrations and audits were performed quarterly during the sampling period. The technicians conducting the calibrations and audits found no issues. Appendix A of the Report provides calibration and audit sheets.

Data Processing. The TSP and metal mass weights from the laboratory were divided by the respective sample air volumes to obtain concentrations in ambient air. Actual sampler air volumes were calculated using measured atmospheric pressure, sampler pressure differential, measured ambient temperature and most recent equipment calibration values. Standard air volumes were calculated for a standard atmospheric pressure (760 millimeters mercury) and standard temperature (298.15 Kelvin [25° Celsius]). TSP is reported in standard and actual concentrations and metals are reported in actual concentrations. Results are presented in Section 3.0 of the Report.

Meteorological Data. The meteorological data included data from Pueblo Memorial Airport for the period January 1, 2018, to March 31, 2019, and quarterly reports from EVRAZ's air monitoring station for the 2018 calendar year as well as five years of hourly data from 2013 to 2017.

TSP and Metals Sampling Results (Report Section 3)

This section presents the TSP and metals sampling results for the monitoring year on a quarterly basis along with corresponding meteorological data from both EVRAZ and the Pueblo Memorial Airport. Wind speeds and directions during the monitoring periods are presented in the form of wind roses. The Acronyms and Definitions Section of the Report provides a wind rose definition and diagrams.

First Monitoring Quarter – March to May 2018

The first monitoring quarter ran from March 9 to May 31, 2018. Fourteen out of a possible 14 samples were collected. One field blank was collected with the April 20 sample. Metals made up about 15% of the total suspended particles collected on the sample filters. Ninety-five percent of the total mass of metals comprised five metals. Calcium and iron represent the largest portions of the metals, followed by magnesium, aluminum and sodium. The metals arsenic, selenium and thallium were not detected. Silver was detected in only one sample. Lead was detected in all 14 samples, with concentrations ranging between 0.003 and 0.05 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). The Residential Air Regional Screening Level for lead is $0.15 \mu\text{g}/\text{m}^3$.

Two wind roses are presented – one for EVRAZ and one for Pueblo Memorial Airport. The EVRAZ wind rose (Figure 4 of the Report) is for the time period January to March 2018, while the Pueblo Memorial Airport rose (Figure 5 of the Report) is for March to May 2018. For EVRAZ, the predominant winds are from the west-northwest about 15% of the time. For the other 85% of the time during the three months of monitoring, winds were variable and from

other directions. For Pueblo Memorial Airport the predominant winds are from the east-southeast just over 12% of the time. The Pueblo Memorial Airport rose indicates that average wind speed during the monitoring quarter was 4.83 meters per second (10.8 miles per hour). The Pueblo Memorial Airport wind rose indicates that winds exceeded 11 meters per second (24.6 miles per hour) part of the time during March to May. The EVRAZ wind rose indicates that winds did not exceed 10 meters per second (22.3 miles per hour) during January to March.

Second Monitoring Quarter – June to August 2018

The second monitoring quarter ran from June 1 to August 31. Fourteen out of a possible 16 samples were collected. Two field blanks were collected during the June 13 and August 12 sampling events. Metals made up about 15% of the total suspended particles collected on the sample filters. More than 90% of the total mass of metals was comprised of five metals. Calcium and iron represent the largest portions of the metals, followed by aluminum, magnesium and sodium. The metals arsenic and thallium were not detected. Silver was detected in only one sample. Lead was detected in all 14 samples, with concentrations ranging between 0.003 and 0.03 $\mu\text{g}/\text{m}^3$.

Two wind roses are presented – one for EVRAZ and one for the Pueblo Memorial Airport. The EVRAZ wind rose (Figure 7 of the Report) is for the time period April to June 2018, while the Pueblo Memorial Airport rose (Figure 8 of the Report) is for June to August 2018. For EVRAZ, the predominant winds are from the east-southeast and east at just over 10% of the time each. For Pueblo Memorial Airport, the predominant winds are from the east-southeast and east at 15% and 13% of the time, respectively. The Pueblo Memorial Airport rose indicates that average wind speed during the monitoring quarter was 4.40 meter per second (9.8 miles per hour). The Pueblo Memorial Airport wind rose indicates that winds rarely exceeded 11 meters per second (24.6 miles per hour) from June to August. The EVRAZ wind rose indicates that winds did not exceed 13 meters per second (29.1 miles per hour) from April to June.

Third Monitoring Quarter – September to November 2018

The third monitoring quarter ran from September 1 to November 30, 2018. Fifteen out of a possible 15 samples were collected. One field blank was collected with the October 17 sample. Metals made up about 15% of the total suspended particles collected on the sample filters. More than 90% of the total mass of metals comprised five metals. Calcium and iron represent the largest portions of the metals, followed by aluminum, magnesium and sodium. The metals arsenic, silver and thallium were not detected. Selenium was detected in only one sample. Lead was detected in all 14 samples, with concentrations ranging between 0.003 $\mu\text{g}/\text{m}^3$ and 0.02 $\mu\text{g}/\text{m}^3$.

Two wind roses are presented – one for EVRAZ and one for Pueblo Memorial Airport. The EVRAZ wind rose (Figure 10 of the Report) is for the time period July to September 2018. The Pueblo Memorial Airport rose (Figure 11 of the Report) is for September to November 2018. For EVRAZ, the predominant winds are from the east-southeast and east at just over 12% of the time each. For Pueblo Memorial Airport, the predominant winds are from the west, east-southeast and east at about 12%, 11.5% and 11.5% of the time, respectively. The Pueblo Memorial Airport rose indicates that average wind speed during the monitoring quarter was 3.52 meters per second (7.9 miles per hour). The Pueblo Memorial Airport wind rose indicates that winds exceeded 11

meters per second (24.6 miles per hour) part of the time during September to November. The EVRAZ wind rose indicates that winds did not exceed 10 meters per second (22.3 miles per hour) from July to September.

Fourth Monitoring Quarter – December 2018 to March 8, 2019

The third monitoring quarter ran from December 1 to March 8. Sixteen out of a possible 16 samples were collected. One field blank was collected with the October 17 sample. Metals made up about 15% of the total suspended particles collected on the sample filters. More than 90% of the total mass of metals comprised five metals. Calcium and iron represent the largest portions of the metals, followed by sodium, aluminum and magnesium. The metals arsenic, selenium and thallium were not detected. Silver was detected in only one sample. Lead was detected in all 14 samples, with concentrations ranging between 0.002 $\mu\text{g}/\text{m}^3$ and 0.015 $\mu\text{g}/\text{m}^3$.

Two wind roses are presented – one for EVRAZ and one for Pueblo Memorial Airport. The EVRAZ wind rose (Figure 10 of the Report) is for the time period October to December 2018. The Pueblo Memorial Airport rose (Figure 11 of the Report) is for December 2018 to March 4, 2019. March 4 is the last sampling date. For EVRAZ, the predominant winds are from the west-northwest about 17% of the time and northwest about 11% of the time. For Pueblo Memorial Airport, the predominant winds are from the west at just above 12%, from the west-northwest at about 11% and from the east-southeast at about 11%. The Pueblo Memorial Airport rose indicates that average wind speed during the monitoring quarter was 3.95 meters per second (8.8 miles per hour). The Pueblo Memorial Airport wind rose indicates that winds exceeded 11 meters per second (24.6 miles per hour) part of the time from December 2018 to March 4, 2019. The EVRAZ wind rose indicates that winds did not exceed 10 meters per second (22.3 miles per hour) from October to December 2018.

TASC Comment: Average concentrations of cobalt and manganese were above their respective Residential Air Regional Screening Level in each quarterly report. The average concentration of aluminum was above its Residential Air Regional Screening Level for three of four quarters. Additionally, maximum detections of cobalt were above its Residential Air Regional Screening Level in each quarterly report. Maximum detections of nickel were above its Residential Air Regional Screening Level in the first two quarterly reports. The laboratory detection limits for arsenic were too high to determine if any arsenic concentrations were above its Residential Air Regional Screening Level in any quarter. Average lead concentrations were below its Residential Air Regional Screening Level in each quarterly report. Exceeding a screening level means that more evaluation may be needed. It is not an indication of a health risk. EPA action levels for protecting health are often much higher than screening levels. **The CAG may want to ask EPA if additional evaluation of air quality is planned.**

TASC Comment: Predominant wind directions reported by Pueblo Memorial Airport and EVRAZ were generally either from the southeast or northwest. Pueblo Memorial Airport reported average wind speeds between 7.9 miles per hour and 10.8 miles per hour. In their 2017 Air Quality Data Report (December 26, 2018), the Colorado Air Pollution Control Division's Department of Public Health and Environment Technical Services Program reports that wind generally blows up valley from the southeast during the day and down valley from the west at night. It also reports that Pueblo experiences average wind speed ranges from 7 miles per hour in the fall and early winter to 11 miles per hour in the spring. The wind roses presented in the four monitoring quarters seem to confirm these generalizations.

Maximum TSP Concentration Sampling Day Analysis (Report Section 4)

Section 4 of the Report provides a detailed analysis for the top five TSP concentration days over the monitoring year, looking at both the meteorology on the sampling day and any excavation activities. Over the monitoring year, five days measured TSP concentrations greater than 100 micrograms at standard temperature and pressure (std) per cubic meter of air ($\mu\text{g-std}/\text{m}^3$). The dates are March 15, April 20, June 7, June 13 and October 5, 2018. One or two excavations were ongoing in the Eiler Heights neighborhood on March 15, April 20 and June 13. No excavation took place on June 7. No information is available for activities on October 5.

March 15 Sampling Day

The TSP concentration measured on March 15, 2018, was $112 \mu\text{g-std}/\text{m}^3$. This is the fifth-highest concentration measured for the monitoring year. Predominant winds on that day were from the northwest and west-northwest. The mean wind speed for the day was 3.8 meters per second (8.5 miles per hour), which is higher than the five-year mean wind speed of 2.7 meters per second (6.0 miles per hour) reported by EVRAZ. The maximum hourly wind speed was 9.5 meters per second (21.2 miles per hour) from the south-southwest, with several hours having mean wind speeds above 4.5 meters per second (10 miles per hour). No precipitation fell during the sampling day, and the day with the most recent precipitation was February 24. The site technician reported high winds had occurred during the week. Two excavation areas in Eiler Heights were active during the sampling day.

Most of the day, winds were blowing from the direction of the site toward the sampler. However, the winds were blowing from the direction of excavation activities toward the sampler for about six hours. The high TSP concentration for this sampling day is likely due to the higher-than-normal wind speeds. The excavation activities, the site and other sources in the area, including Interstate 25 and nearby manufacturing facilities such as EVRAZ, may have contributed to the high TSP concentration. The Acronyms and Definitions section of the Report provides the March 15, 2018 wind rose and diagram.

April 20 Sampling Day

The TSP concentration measured on April 20, 2018, was $161 \mu\text{g-std}/\text{m}^3$. This is the second-highest concentration measured for the monitoring year. Predominant winds on that day were from the east through south-southeast for most of the day. The mean wind speed was 7.5 meters

per second (16.7 miles per hour), which is much higher than the five-year mean wind speed of 2.7 meters per second (6.0 miles per hour). The maximum hourly wind speed was 10.8 meters per second (24.1 miles per hour) from the south-southeast, and most of the hours experienced mean wind speeds above 4.5 meters per second (10 miles per hour). No precipitation fell during the sampling day. The day with the most recent precipitation was April 9. The site technician reported extremely high winds had occurred on April 17. Two excavation areas were active during the sampling day; one in Eiler Heights to the southeast of the sampler and one on East Evans Avenue, west of Interstate 25 to the west-northwest of the sampler.

For most of the day, the winds blew from the direction of EVRAZ and the excavation activity area in Eiler Heights toward the sampler. The sampler was never downwind of the excavation area to the west-northwest. The high TSP concentration for this sampling day is likely due to the higher-than-normal wind speeds. EVRAZ, the excavation area to the southeast and other sources in the area, including Interstate 25 and nearby manufacturing facilities such as EVRAZ, may have contributed to the high TSP concentration.

June 7 Sampling Day

The TSP concentration measured on June 7, 2018, was 132 $\mu\text{g-std}/\text{m}^3$. This is the third-highest concentration documented during the monitoring year. Predominant winds on that day were from the north and east-southeast. The mean wind speed was 3.7 meters per second (8.2 miles per hour), which is higher than the five-year mean wind speed of 2.8 meters per second (6.3 miles per hour). The maximum hourly wind speed was 7.4 meters per second (16.5 miles per hour) from the east-southeast, with several hours having a mean wind speed above 4.5 meters per second (10 miles per hour). No precipitation fell during the sampling day, and the day with the most recent precipitation was June 3. For part of the day, the winds blew from the direction of EVRAZ and portions of the Colorado Smelter toward the sampler. The high TSP concentration for this sampling day is likely due to the higher-than-normal wind speeds. The EVRAZ and portions of the Colorado Smelter as well as other sources in the area, including Interstate 25 and nearby manufacturing facilities, may have contributed to the high TSP concentration.

June 13 Sampling Day

The TSP concentration measured on June 13, 2018, was 190 $\mu\text{g-std}/\text{m}^3$. This is the highest concentration measured for the monitoring year. Predominant winds on that day were from the south and south-southeast. The mean wind speed for the day was 4.5 meters per second (10.0 miles per hour), which is higher than the five-year mean wind speed of 2.7 meters per second (6.0 miles per hour). The maximum hourly wind speed was 11.2 meters per second (25.0 miles per hour) from the south, with several hours having mean wind speeds above 4.5 meters per second (10 miles per hour). No precipitation fell during the sampling day. The day with the most recent precipitation was June 3. The site technician did not note any unusual conditions. Three areas in Eiler Heights and within 0.1 mile of the dance studio were being excavated.

For most of the day, the winds blew from the direction of EVRAZ toward the sampler. For a small part of the day, the wind blew from the direction of the excavation areas toward the sampler. The high TSP concentration for this sampling day is likely due to the higher-than-normal wind speeds. EVRAZ and the excavation areas to the west-southwest of the sampler as

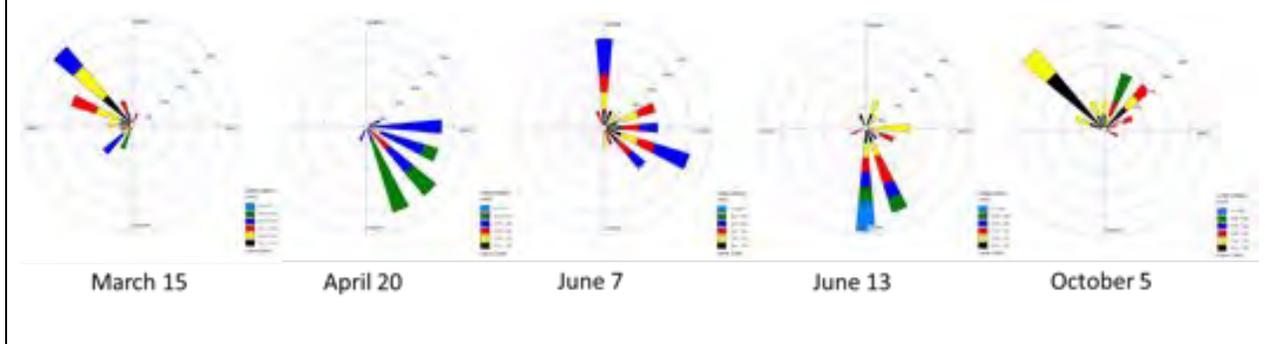
well as other sources in the area, including Interstate 25 and nearby manufacturing facilities, may have contributed to the high TSP concentration.

October 5 Sampling Day

The TSP concentration measured on October 5, 2018, was 117 $\mu\text{g-std}/\text{m}^3$. This is the fourth-highest concentration measured for the monitoring year. Predominant winds on that day were from the northwest, north-northeast and northeast. The mean wind speed was 2.8 meters per second (6.3 miles per hour), which is close to the five-year mean. The maximum hourly wind speed was 9.1 meters per second (16.5 miles per hour) from the north-northeast. The winds during the day were mostly less than 2.5 meters per second (5.6 miles per hour), until after 4 p.m. when the wind speed increased to above 4.5 miles per second (10 miles per hour). These winds were from the north-northeast to east-southeast sectors. No precipitation fell during the sampling day. The day with the most recent precipitation was September 20. No data are available on excavation activities for this sampling day.

For part of the day, the winds blew from the direction of the Colorado Smelter toward the sampler. The high TSP concentration for this sampling day is likely due to the higher-than-normal wind speeds for parts of the day. The Colorado Smelter as well as other sources in the area, including Interstate 25 and nearby manufacturing facilities such as EVRAZ, may have contributed to the high TSP concentration.

TASC Comment: For three of the five days with the highest TSP concentrations, winds measured at EVRAZ were from the direction of OU2 or portions of OU2 toward the air sampler. These days were March 15, June 7 and October 5, 2018.



Summary (Report Section 5)

EPA monitored for TSP and 22 metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, thallium, vanadium and zinc) from March 9, 2018, to March 8, 2019, on the roof of Jeannie’s Academy of Dance in Pueblo, Colorado. The dance studio is downwind of the site. A total of 59 out of 61 possible samples were collected.

TASC Comment: As the wind roses from EVRAZ and Pueblo Memorial Airport show, winds in Pueblo blew from every direction at different times during each quarterly reporting period. It is unclear which direction the wind was blowing on sampling dates other than the highest five presented in the report. **The CAG may want to ask EPA to summarize wind data for the dates when sampling occurred.**

The measured TSP average concentrations were higher for the first and second monitoring quarters than for the third and fourth monitoring quarters. It was very windy (wind speeds greater than 10 miles per hour) for several hours on each of the five days with the highest measured TSP concentrations. Wind was blowing from the general direction of the Colorado Smelter toward the sampler on three of the five days. Excavations in residential areas took place on three of the five days.

The combined total concentration of the 22 analyzed metals represented a small portion (about 15%) of the total TSP concentration. Calcium, iron, sodium, aluminum and magnesium collectively made up over 90% of the total metals mass. Thallium and arsenic were never detected. The metals silver and selenium were detected less than 10 times each during the monitoring year. The field-blank checks and other laboratory quality control checks did not indicate any problems for the sampling program.

The Report concludes that the relatively low TSP and metal concentrations measured indicate that the remedial investigation is not generating large impacts on the surrounding region.

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Attachment G: Skeo's presentation on the EPA air monitoring report

REVIEW OF THE COLORADO SMELTER OPERABLE UNIT 2 TOTAL SUSPENDED PARTICULATE AND METALS AIR CONCENTRATION SUMMARY

NOVEMBER 12, 2019



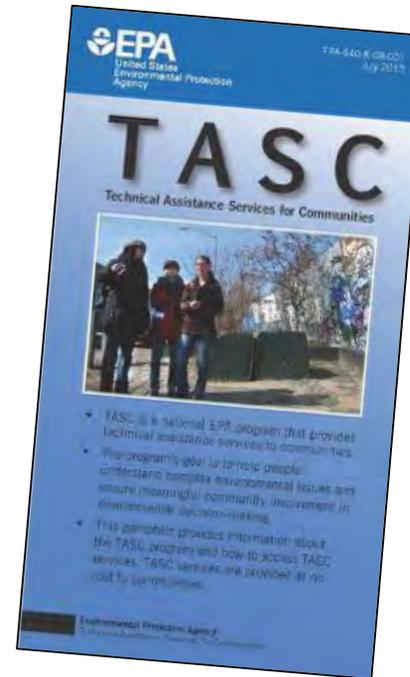
AGENDA

- TASC Program and Overall Results of TASC's Review
- Air Monitoring Basics
- OU2 Site Conditions
- Results and TASC Comments

This presentation is funded by the U.S. Environmental Protection Agency's (EPA's) Technical Assistance Services for Communities (TASC) program. Its contents do not necessarily reflect the policies, actions or positions of EPA.

TECHNICAL ASSISTANCE SERVICES FOR COMMUNITIES (TASC)

- One of several EPA-sponsored technical assistance programs
- Independent services provided under contract with 



OVERALL RESULTS OF THE REVIEW

- The air sampling followed EPA's guidelines for sampling particulate matter in air.
- TASC agrees with the report's finding that OU2 likely does not have a significant impact on the surrounding region as a source of windblown site-related contaminants.
- Community members may want to ask for additional information from EPA about EPA's air sampling approach and write-up of the results



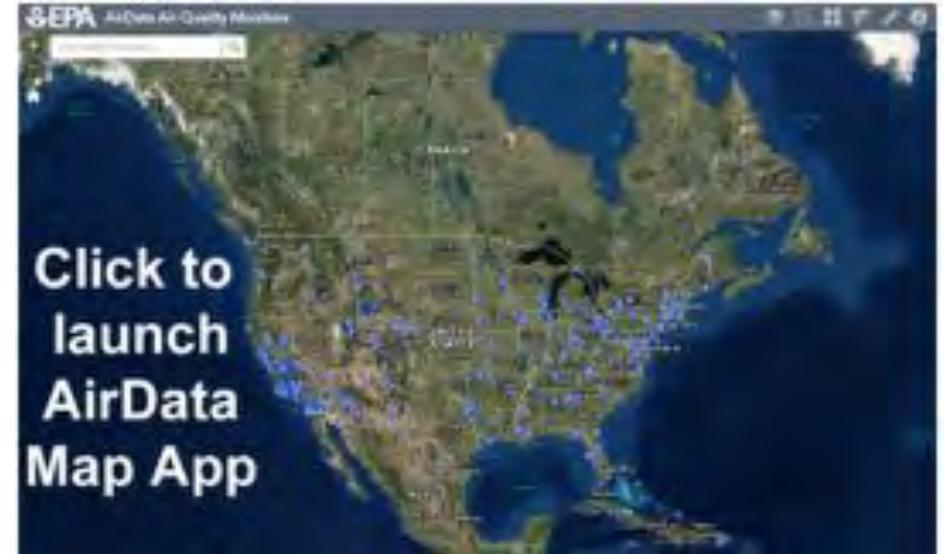
AIR MONITORING BASICS

WHY MONITOR AIR?

- Air quality regulations
- Health concerns
- Potential site-related releases

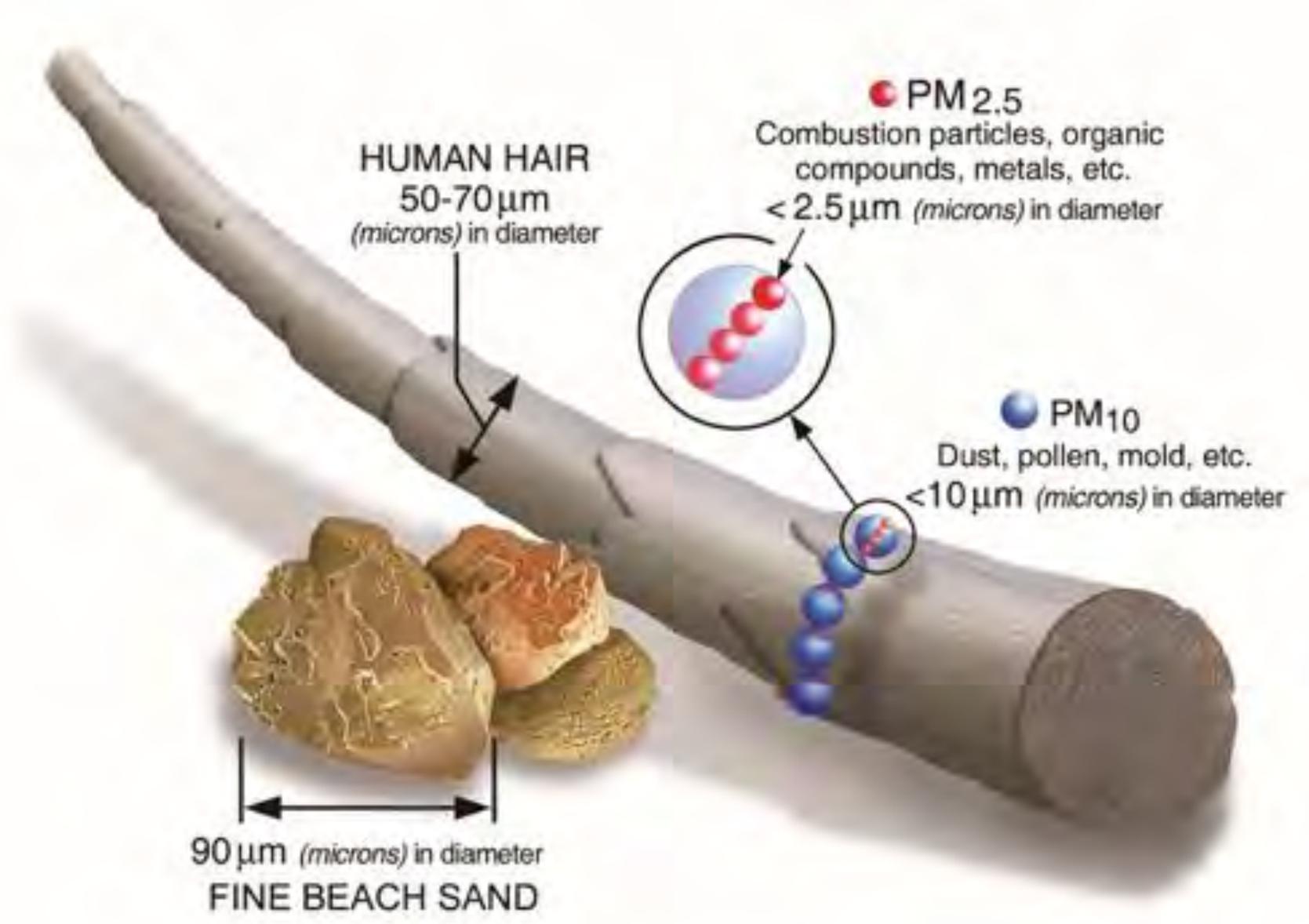
NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

- EPA requires states to monitor for all criteria pollutants
 - Carbon monoxide
 - Lead
 - Nitrogen dioxide
 - Ozone
 - Particulate matter less than 10 microns (millimeters)
 - Particulate matter less than 2.5 microns
 - Sulfur dioxide



<https://www.epa.gov/outdoor-air-quality-data/interactive-map-air-quality-monitors>

The Clean Air Act requires every state to establish a network of air monitoring stations for criteria pollutants



Source: <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#PM>

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

- Colorado has a plan
- Particulate matter 10 (PM10) and PM2.5 are monitored at Fountain School in Pueblo
- PM10 exceeded the 24-Hr maximum standard (155 micrograms per cubic meter ($\mu\text{g m}^{-3}$)) once in 2018 at Fountain School
 - On April 17 due to a high wind dust event
- PM2.5 did not exceed 24-Hr maximum standard in 2018 at Fountain School
- PM2.5 annual average in 2018 at Fountain School was $6.2 \mu\text{g m}^{-3}$
 - EPA's annual average PM2.5 standard is $12 \mu\text{g m}^{-3}$



https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2019AnnualNetworkPlan.pdf

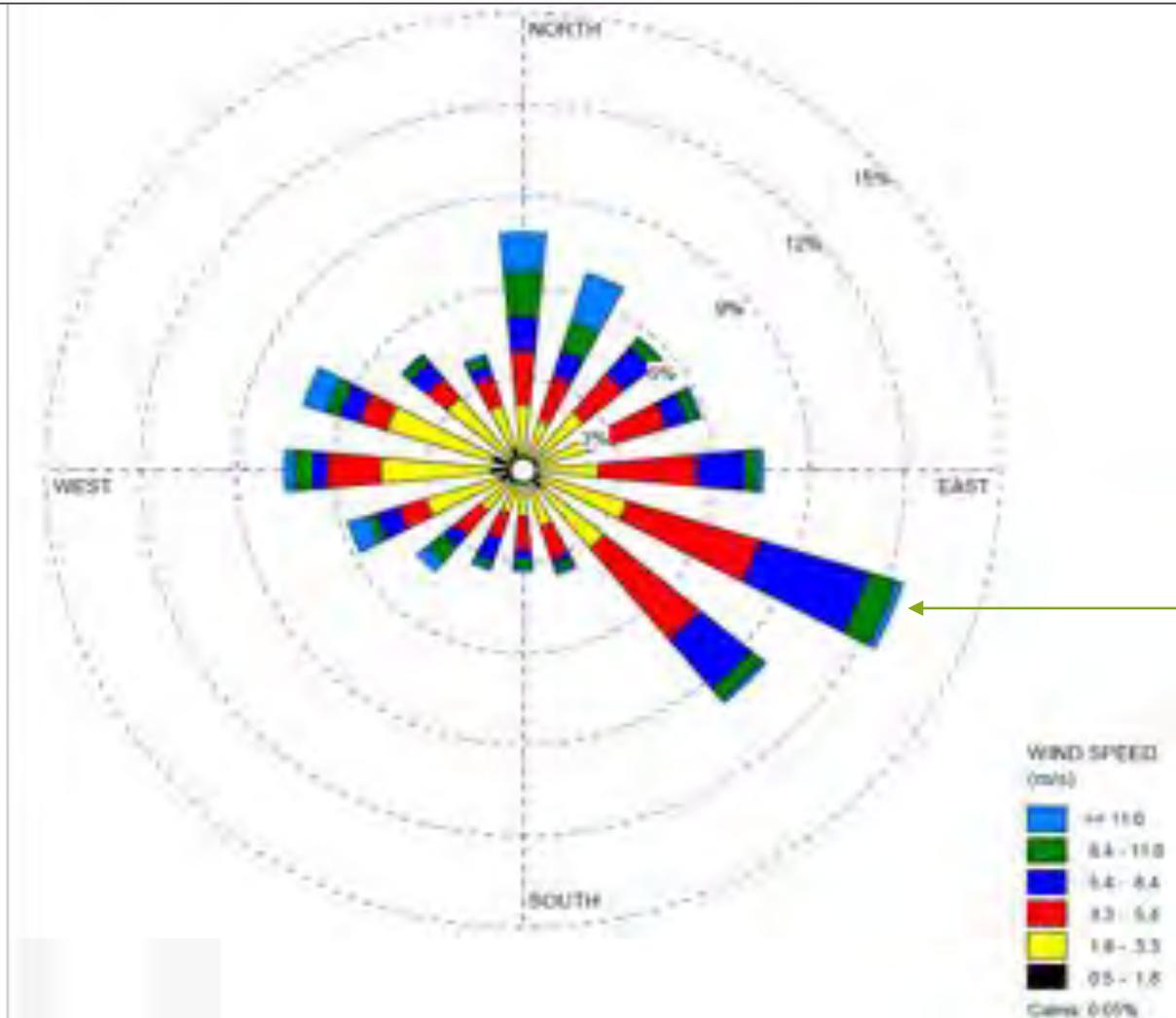
HEALTH CONCERNS

- Long term exposure to high levels of PM 2.5 and PM10
 - Coughing and wheezing, asthma attacks, bronchitis, high blood pressure, heart attack, strokes, premature death
 - Possible Sources - wood-burning stoves, forest fires, diesel engines, non-road vehicles, agricultural burning, wind-blown dust and other natural sources
- Exposure to site-related contaminants – particulate matter comprised of arsenic, lead or other metals
 - Health concerns are specific to each contaminant
 - Lead - high levels may cause anemia, weakness, kidney and brain damage, damage to a developing child's nervous system
 - Arsenic – high levels may cause cancer in the skin, lungs, bladder and kidney

PUEBLO MEMORIAL AIRPORT WIND ROSE FOR THREE-MONTH PERIOD

This wind rose depicts winds for a 3-month period from March to May 2018.

- Wind blew from each direction at least part of the time.
- Even though the prevailing winds were from the east-southeast and southeast, this only accounts for about 23% of the time.
- Wind blew from the direction of OU2 or portions of OU2 towards the sampler about 25% of the time.



Prevailing
wind from E/SE



OU2 SITE CONDITIONS



Legend

 OU2

 Slag Pile

Source: Esri, DigitalGlobe,
GeoEye, Earthstar Geographics,
CNES/Airbus DS, USGS,
AeroGRID, IGN and the GIS User
Community



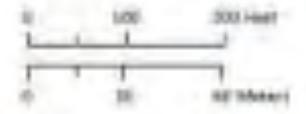
0 500 1,000 2,000
Feet



Colorado Smelter Slag Pile Investigation DRAFT

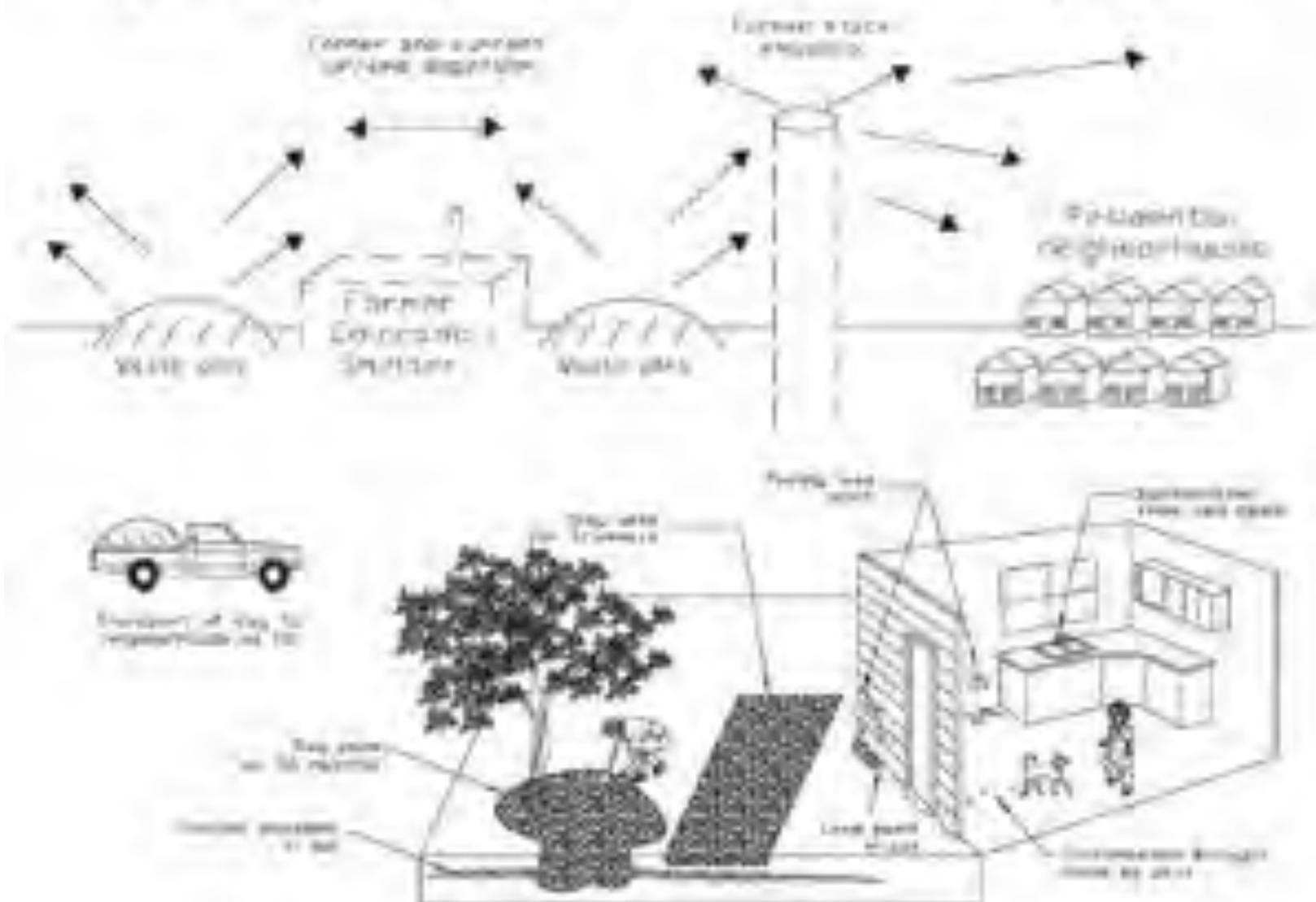
- Serial Path
- Approximate Areas of Slag Piles
(Area represented in Square Feet)
- Colorado Smelter Site Boundary

Date: August 25, 2020
Map Projection: UTM Zone 12 N, NAD 83 Spheroid
Data Sources:
Serial Path - U.S. EPA Region 8 (2014)
Slag Piles - U.S. EPA Region 8 (2014)
Site Boundary - U.S. EPA Region 8 (2014)



Jeannie's Academy of
Dance Monitoring
Station

Figure 3. Conceptual Site Model Operable Unit 1. Pacific Western Technologies, June 2017



A PILE OF OU2 SLAG



SLAG IN OU2 COVERED BY VEGETATION



BUILDINGS THAT ARE THOUGHT TO BE ON TOP OF OU2 SLAG



THE MATERIAL IN THE BACKGROUND IS NOT WITHIN THE BOUNDARIES OF OU2



HEALTH CONCERNS

- Are site-related contaminants being emitted to air in concentrations that cause a potential public health concern?
 - Residential air Regional Screening Levels (RSLs)
 - Risk-based concentrations
 - Not necessarily cleanup standards
 - Exceedance may indicate need for additional evaluation
 - Health-based risk assessment
 - Potential exposure to site-related airborne contaminants is considered in EPA's risk assessment process
 - Risk assessment results are used to make remedial decisions at Superfund sites

Metal	RSL ($\mu\text{g m}^{-3}$)
Aluminum	0.52
Arsenic	0.00065
Beryllium	0.0012
Cadmium	0.001
Cobalt	0.00031
Lead	0.15
Manganese	0.0052
Nickel	0.0094
Vanadium	0.01

$\mu\text{g m}^{-3}$ = micrograms per cubic meter of air

POTENTIAL SITE-RELATED RELEASES

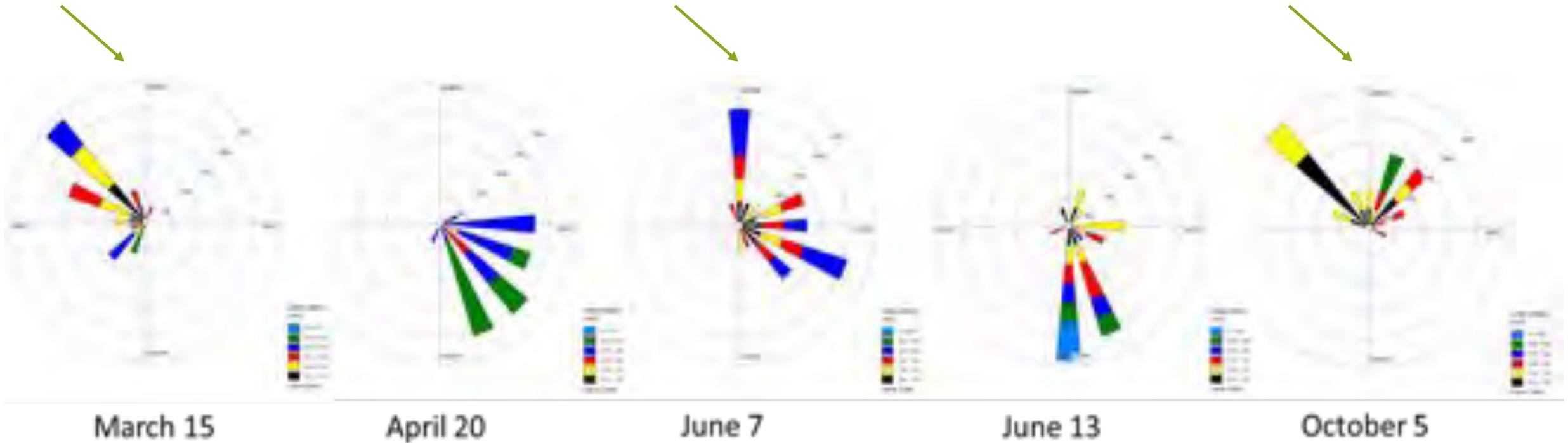
- Are unacceptable concentrations of contaminants leaving the site?
- Is work at the site causing unacceptable contaminant releases to air?
- Monitoring for site-related airborne contaminants can help answer these questions
- Key aspects of air monitoring
 - Generally downwind of site or a specific work area
 - Sometimes at a site or work zone boundary
 - Includes monitoring wind direction, speed, temperature, humidity
 - A wind rose depicts wind direction and speed for a specified time period





RESULTS AND TASC COMMENTS

EVRAZ WIND ROSES FOR 24-HOUR TIME PERIODS



RESULTS HIGHLIGHTS

- EPA collected 59 24-hour air samples from air sampler on Dance Studio roof
- Tested for total suspended particulates (TSP) and 22 metals



Legend

 OU2

 Slag Pile

Source: Esri, DigitalGlobe,
GeoEye, Earthstar Geographics,
CNES/Airbus DS, USGS,
AeroGRID, IGN and the GIS User
Community



0 500 1,000 2,000
Feet

RESULTS HIGHLIGHTS (CONTINUED)

- Arsenic was never detected
 - Laboratory detection limit was above the residential air Regional Screening Level (RSL)
- Lead was not detected above its residential air RSL
- Manganese average quarterly concentrations were 15 to 27 times higher than its residential air RSL, possibly related to EVRAZ Steel Mill
- Wind speeds were higher than normal for the 5 days with highest TSP concentrations
- Report concludes that the relatively low TSP and metal concentrations indicate that remedial investigation is NOT largely impacting air in the surrounding region

AVERAGE RESULTS COMPARED TO RESIDENTIAL AIR REGIONAL SCREENING LEVELS (RSL)

Metal	Q1 ($\mu\text{g m}^{-3}$)	Q2 ($\mu\text{g m}^{-3}$)	Q3 ($\mu\text{g m}^{-3}$)	Q4 ($\mu\text{g m}^{-3}$)	RSL ($\mu\text{g m}^{-3}$)	Avg Qs/RSL
Aluminum	0.652	0.756	0.515	0.494	0.52	1.2
Arsenic *	<0.000996	<0.000726	<DL	<DL	0.00065	
Beryllium	0.0000578	0.0000593	0.0000428	0.0000405	0.0012	0.0
Cadmium	0.000399	0.000331	0.000323	0.000222	0.001	0.3
Cobalt	0.000626	0.000628	0.000427	0.000364	0.00031	1.6
Lead	0.0127	0.0116	0.00868	0.00771	0.15	0.1
Manganese	0.142	0.122	0.0809	0.0834	0.0052	20.6
Nickel	0.00277	0.00379	0.00215	0.00211	0.0094	0.3
Vanadium	0.0028	0.00312	0.0019	0.00212	0.01	0.2
* Laboratory detection limits for arsenic were above its RSL						
DL= laboratory detection limit						

MAXIMUM RESULTS COMPARED TO RESIDENTIAL AIR REGIONAL SCREENING LEVELS (RSL)

Metal	Q1 ($\mu\text{g m}^{-3}$)	Q2 ($\mu\text{g m}^{-3}$)	Q3 ($\mu\text{g m}^{-3}$)	Q4 ($\mu\text{g m}^{-3}$)	RSL	Avg Qs/RSL
Aluminum	1.77	2.27	0.515	0.494	0.52	2.4
Arsenic *	<0.000726	<0.00100	<DL	<DL	0.00065	
Beryllium	0.000102	0.000116	0.0000428	0.0000405	0.0012	0.1
Cadmium	0.00114	0.00124	0.000323	0.000222	0.001	0.7
Cobalt	0.00157	0.00144	0.000427	0.000364	0.00031	3.1
Lead	0.0462	0.029	0.00868	0.00771	0.15	0.2
Manganese	0.449	0.469	0.0809	0.0834	0.0052	52.0
Nickel	0.00946	0.019	0.00215	0.00211	0.0094	0.9
Vanadium	0.00815	0.0101	0.0019	0.00212	0.01	0.6
* Laboratory detection limits for arsenic were above its RSL						
DL= laboratory detection limit						

TASC REVIEW

- The air sampling followed EPA's guidelines for sampling particulate matter in air.
- TASC agrees with the report's finding that OU2 likely does not have a significant impact on the surrounding region as a source of windblown site-related contaminants.
- Community members may want to ask for additional information from EPA
 - On which of the 59 sampling dates was the wind blowing from the direction of OU2 towards the air sampler?
 - Is more evaluation of air quality planned because some results were above air Regional Screening Levels (RSLs)?

IS THE DANCE STUDIO A GOOD LOCATION?

PROS

- Location likely to be worst-case dust scenario
 - Prevailing winds
 - Location of temporary stockpile
 - Higher levels of lead and arsenic soils southeast of the former smelter
- Metals data available for this location
- Rooftop location is above street-level dust from traffic
- Rooftop location provides safety from tampering or theft

CONS

- Only one monitoring location
- May detect emissions from other sources
 - For example, EVRAZ Steel Mill, OU1 excavations, highway, other industry
- Rooftop location may not capture same contaminant levels as in breathing zone



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