



2022 TOXICS RELEASE INVENTORY NATIONAL ANALYSIS

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PRESENTATION OVERVIEW

- Quick intro to TRI
- Key messages from the 2022 National Analysis
- Summary of the 2022 NA findings
- Look at the National Analysis Homepage
- Questions and discussion

WHY WAS THE TOXICS RELEASE INVENTORY CREATED?



Bhopal memorial for those killed and disabled by the 1984 toxic gas release

- **Bhopal, India – December 1984**
 - Methyl isocyanate gas released at a Union Carbide chemical plant
 - Thousands died the first night
 - Thousands more have died due to long-term health effects
 - Survivors continue to suffer with permanent disabilities
- **Institute, West Virginia – August 1985**
 - Chemical release at a similar facility in the U.S.
 - Over 100 people hospitalized
- **EPCRA – 1986**
 - Concern about chemical accident preparedness and availability of information on toxic chemical releases led to the passing of the Emergency Planning and Community Right-to-Know Act (EPCRA) and the creation of TRI

WHAT IS THE TRI?

TRI-listed chemicals may pose a threat to human health and the environment.

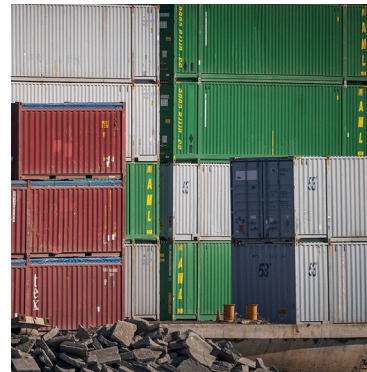
TRI tracks the management of these chemicals in waste.



**Environmental
Releases**



**Waste
Management**



**Waste
Transfers**



**Pollution
Prevention**

WHICH FACILITIES REPORT TO TRI?

1. Facility must be in a **TRI-covered industry sector or category**, including:



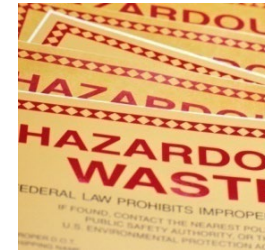
Manufacturing



Coal/oil electricity generation



Certain Mining Facilities



Hazardous Waste Management



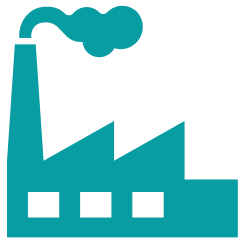
Federal Facilities

2. Facility must have the equivalent of at least **10 full-time employees**
3. Facility must manufacture, process, or otherwise use more than a **certain threshold amount of a TRI-listed chemical within a calendar year**

WHAT IS A RELEASE?

Releases are the different ways that chemicals from industrial facilities enter the

AIR



Stack
emissions



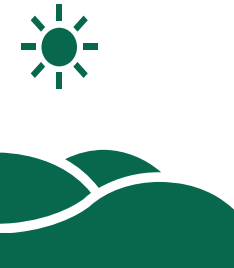
Fugitive
emissions

WATER



Surface water
discharges

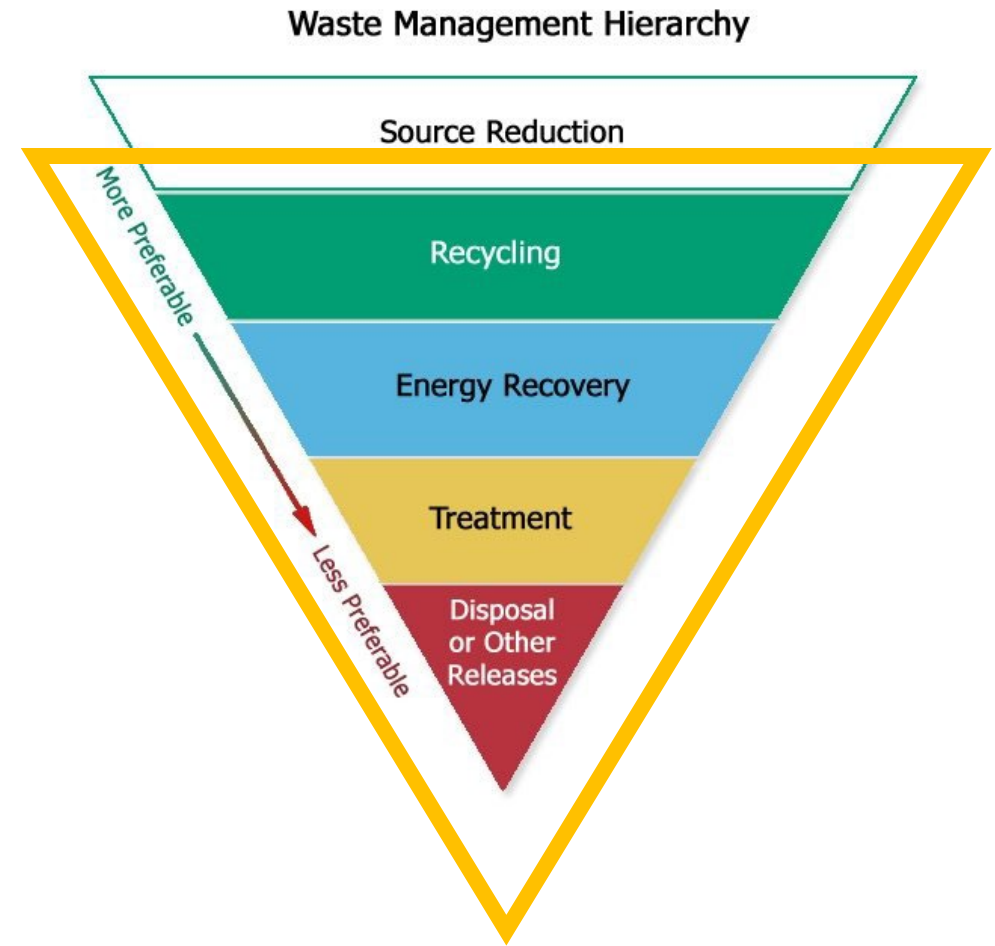
LAND



Disposal to land

WHAT IS "PRODUCTION RELATED WASTE"?

Production related waste is the chemical waste that comes from normal operations at a facility.



SECTION 8.10

SOURCE REDUCTION CODES



Select from 24 codes organized into five categories to describe the source reduction activity.

WHAT DO FACILITIES REPORT TO TRI?

- **On-site releases**
 - Air emissions
 - Surface water discharges
 - Disposal to land
- **Other on-site waste management**
 - Recycling
 - Energy recovery
 - Treatment
- **Transfers to off-site locations**
- **Pollution prevention activities**
 - Pollution prevention activities
 - Barriers to pollution prevention
 - Optional comments

CONSIDERATIONS WHEN USING TRI DATA

- TRI covers many—but not all—sectors and chemicals
- Quantities of releases from facilities are not necessarily an indicator of potential human health risks
- Most TRI releases are covered under various permitting programs
- Not all uses of a chemical are covered under TRI reporting thresholds
- TRI reporting requirements, covered chemicals, and covered industries have changed over time
- TRI data are published each July and are updated throughout the year
- TRI is one of many sources of environmental information from EPA

WHAT IS THE TRI?

800+

individual chemicals and
chemical categories

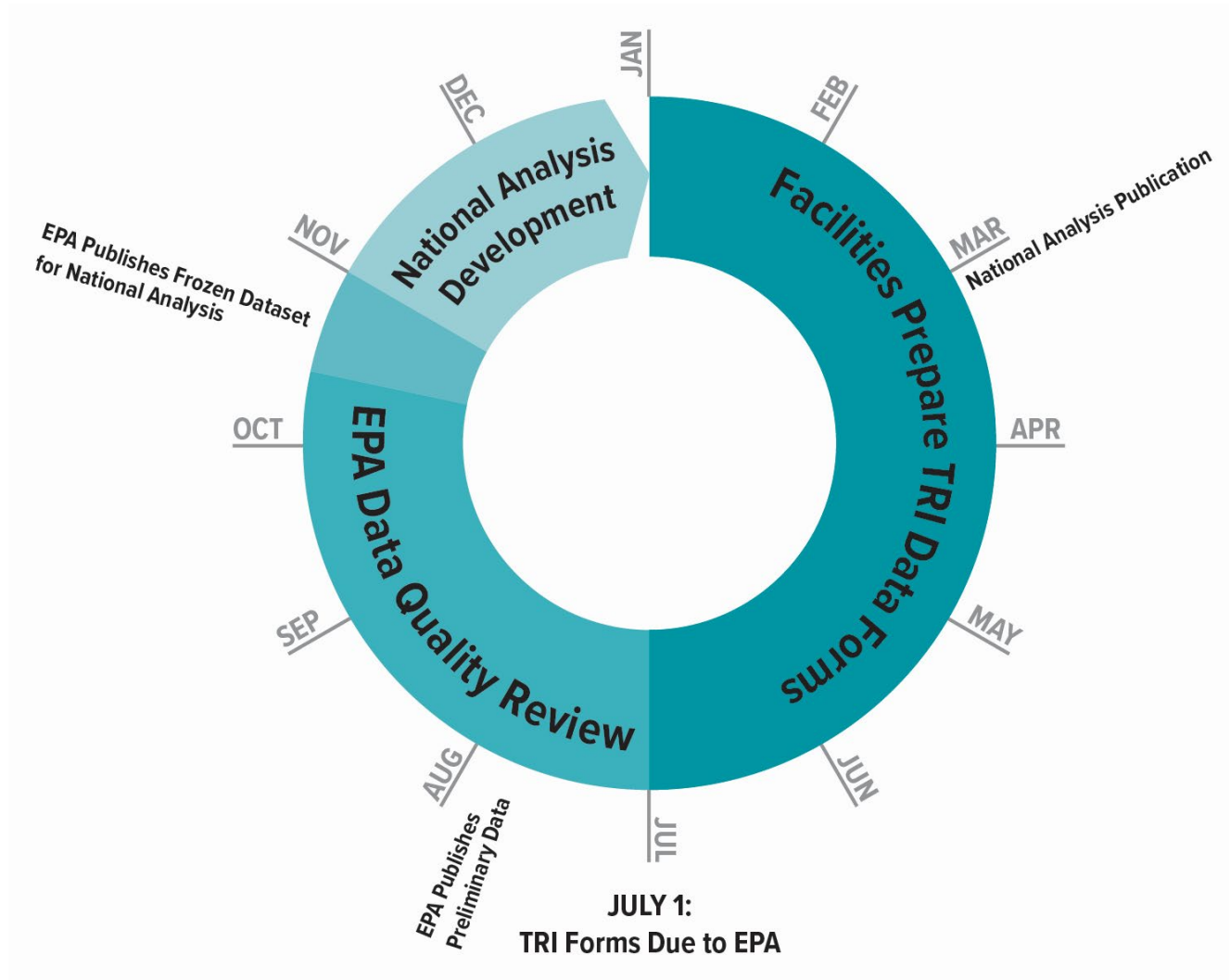
21,000+

industrial and federal
facilities

SINCE 1987

annual reporting
directly from facilities

TRI DATA CYCLE



FORMS

2022	78,847
2013-2022	-5%

FACILITIES

2022	21,752
2013-2022	-2% (551)

Note: 2023 preliminary dataset is currently available to the public

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2022 TRI NATIONAL ANALYSIS OVERVIEW

KEY FINDINGS

- **Releases have decreased by 21% since 2013**
 - Air releases continue to trend downward
 - 2013-2022: Decreased by 204 million pounds (26%)
 - 2021-2022: Decreased by 5 million pounds (1%)
- **TRI facilities implemented 3,589 new pollution prevention activities in 2022**
 - Increase of 6.5% compared to 2021
- **Expansions to TRI reporting support transparency and understanding on issues of importance to the public and EPA**
 - Increase in forms and facilities reporting on PFAS; TRI now tracks management of 180 PFAS with addition of four PFAS for RY2022
 - First year reporting for nat. gas processing and certain contract sterilization facilities

NEW TO THE 2022 NATIONAL ANALYSIS

FEATURED SECTOR

Primary Metal
Manufacturing

FIRST YEAR REPORTING

Natural gas
processing facilities

Certain contract
sterilization facilities
on ethylene oxide

CHEMICAL ADDITIONS

4 per- and
polyfluoroalkyl
substances (PFAS)

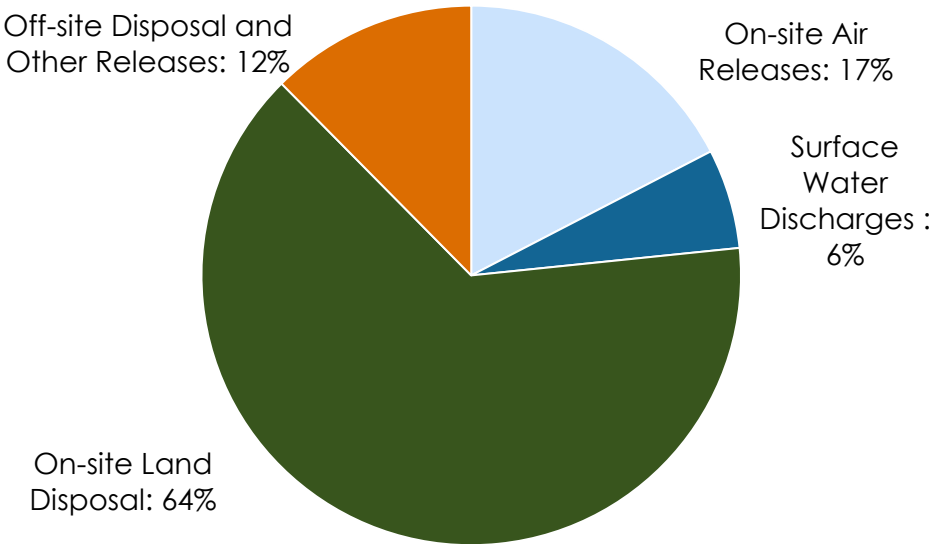
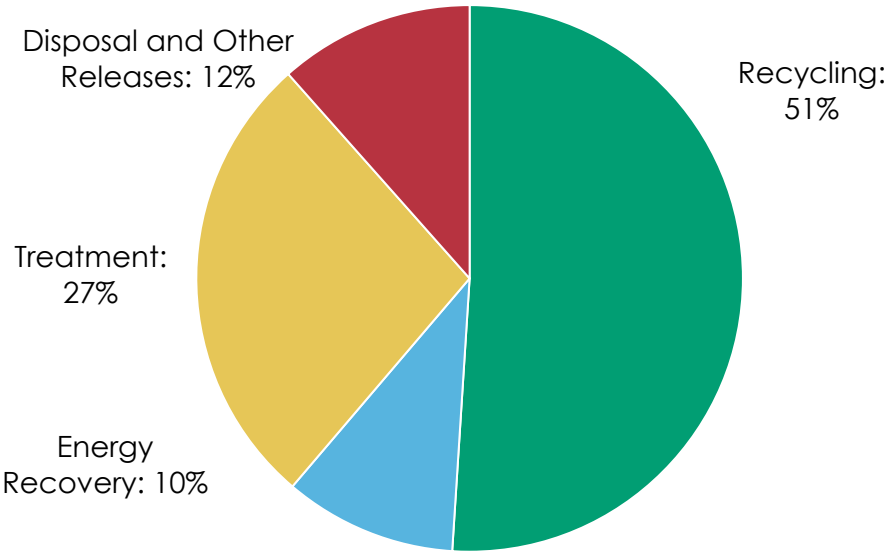
NEW IN MAPPING

Facilities that
implemented
pollution prevention
activities

2022 NATIONAL ANALYSIS OVERVIEW

Waste Managed	
2022	28.6 billion pounds
2021-2022	-2%
2013-2022	+7%

Disposal and Other Releases	
2022	3.3 billion pounds
2021-2022	+1%
2013-2022	-21%



TRI FACILITIES REPORTING POLLUTION PREVENTION

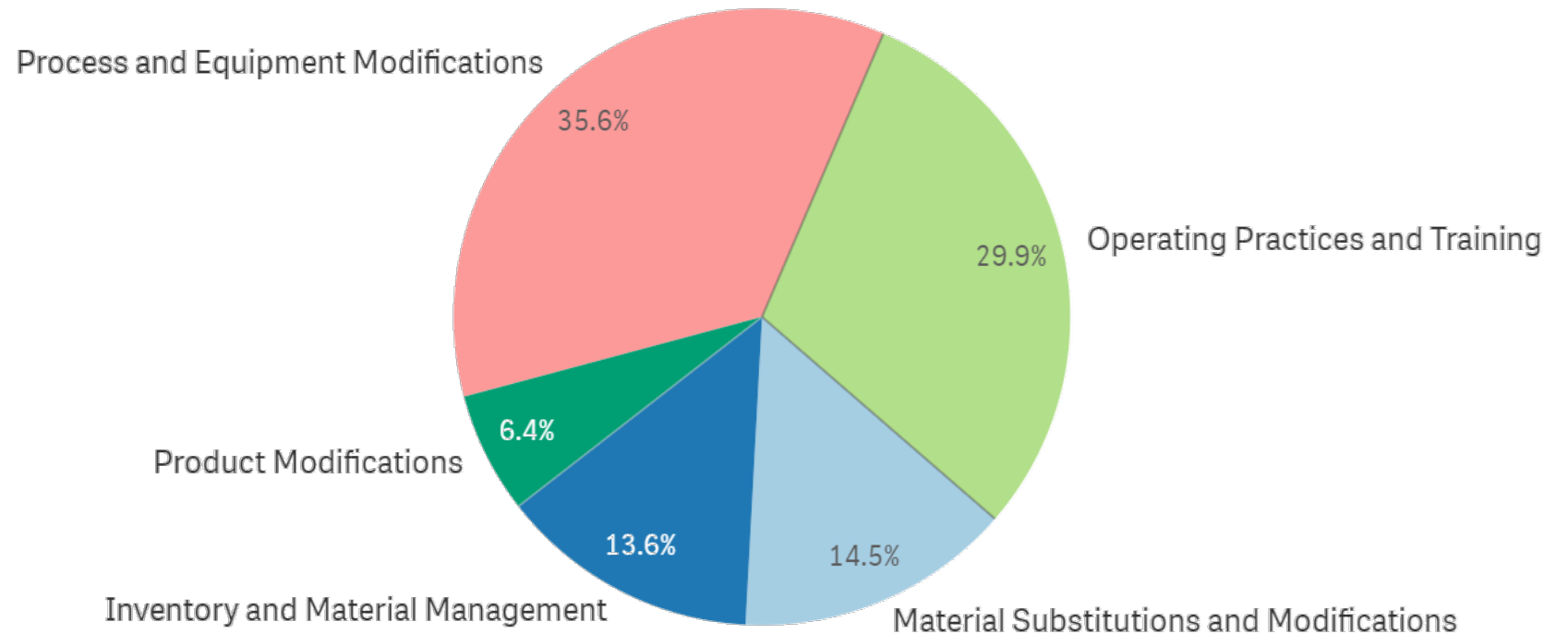
2022

1,759 facilities
8% of all facilities

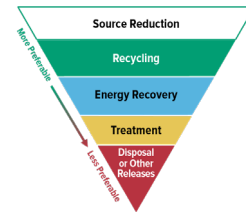
3,589 P2 activities

2021-2022

+6.5% P2 activities



TRENDS IN WASTE MANAGED



2022

28.6 billion pounds

2021-2022

-2% (727 million pounds)

Recycling +7%

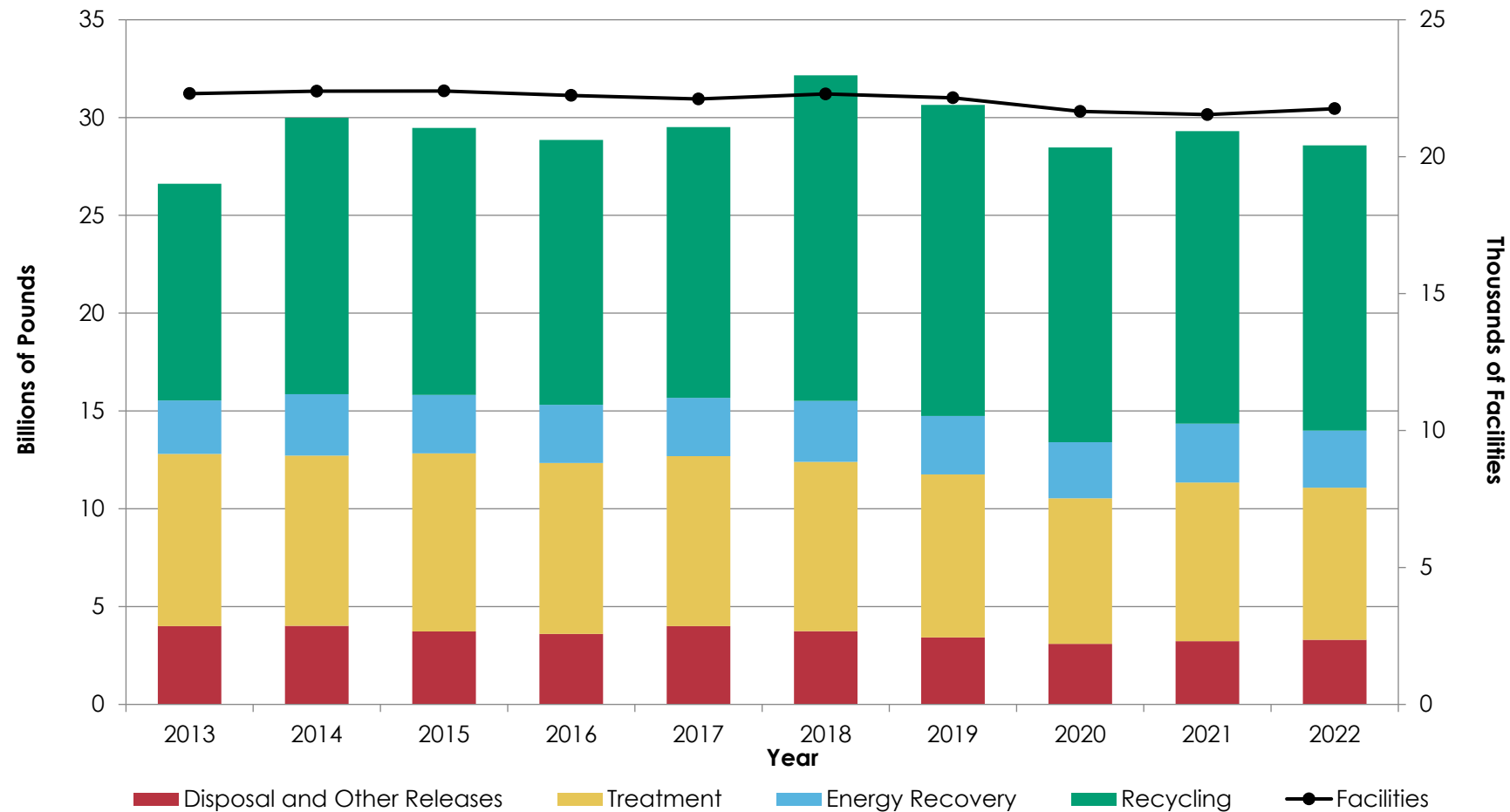
Energy recovery -3%

Treatment -4%

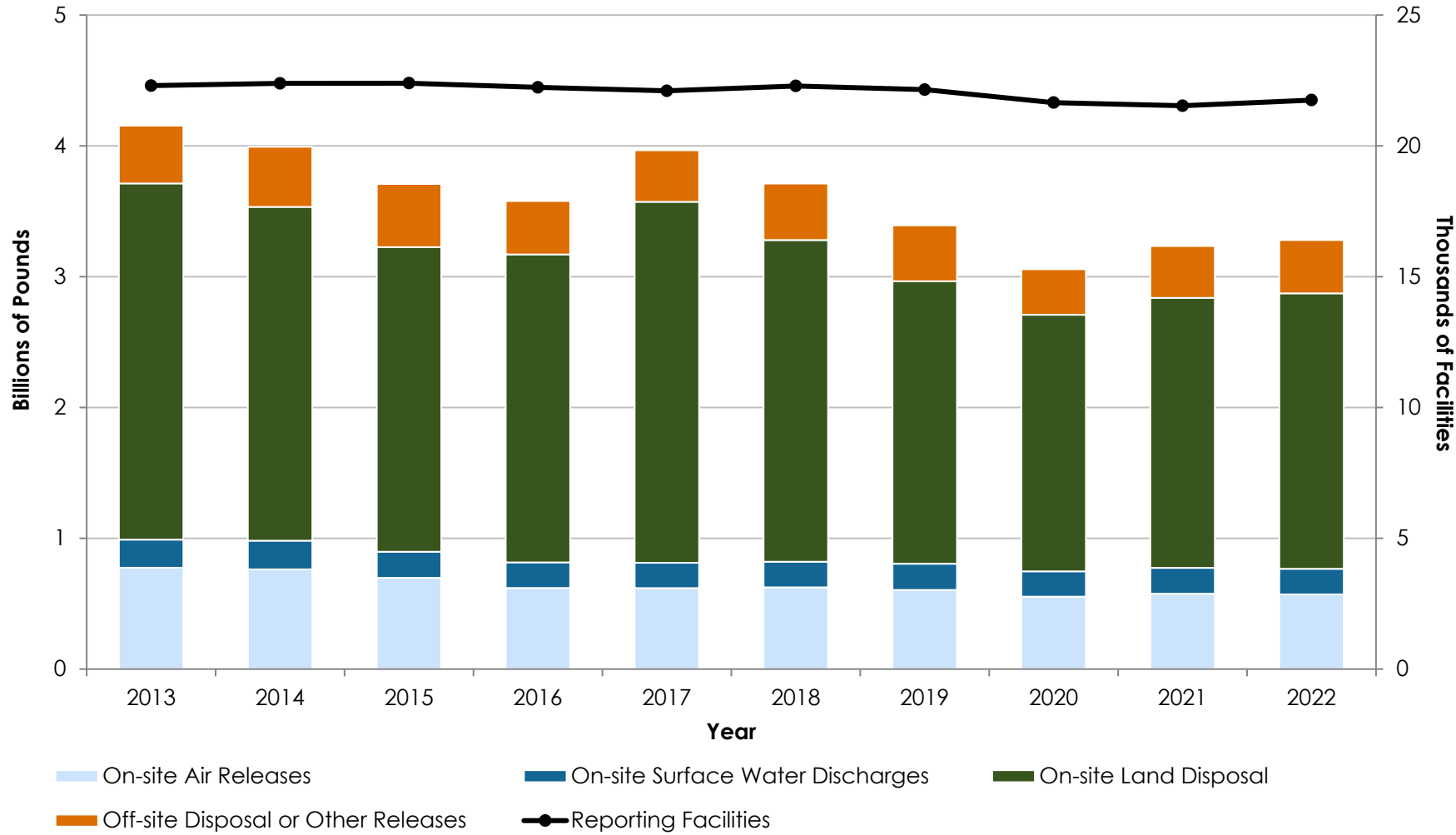
Releases +<1%

2013-2022

+7% (2.0 billion pounds)



TRENDS IN RELEASES



2022

3.3 billion pounds

2021-2022

+1%

Air emissions -1%

Water discharges -1%

On-site land disposal +2%

Off-site disposal +2%

2013-2022

-21%

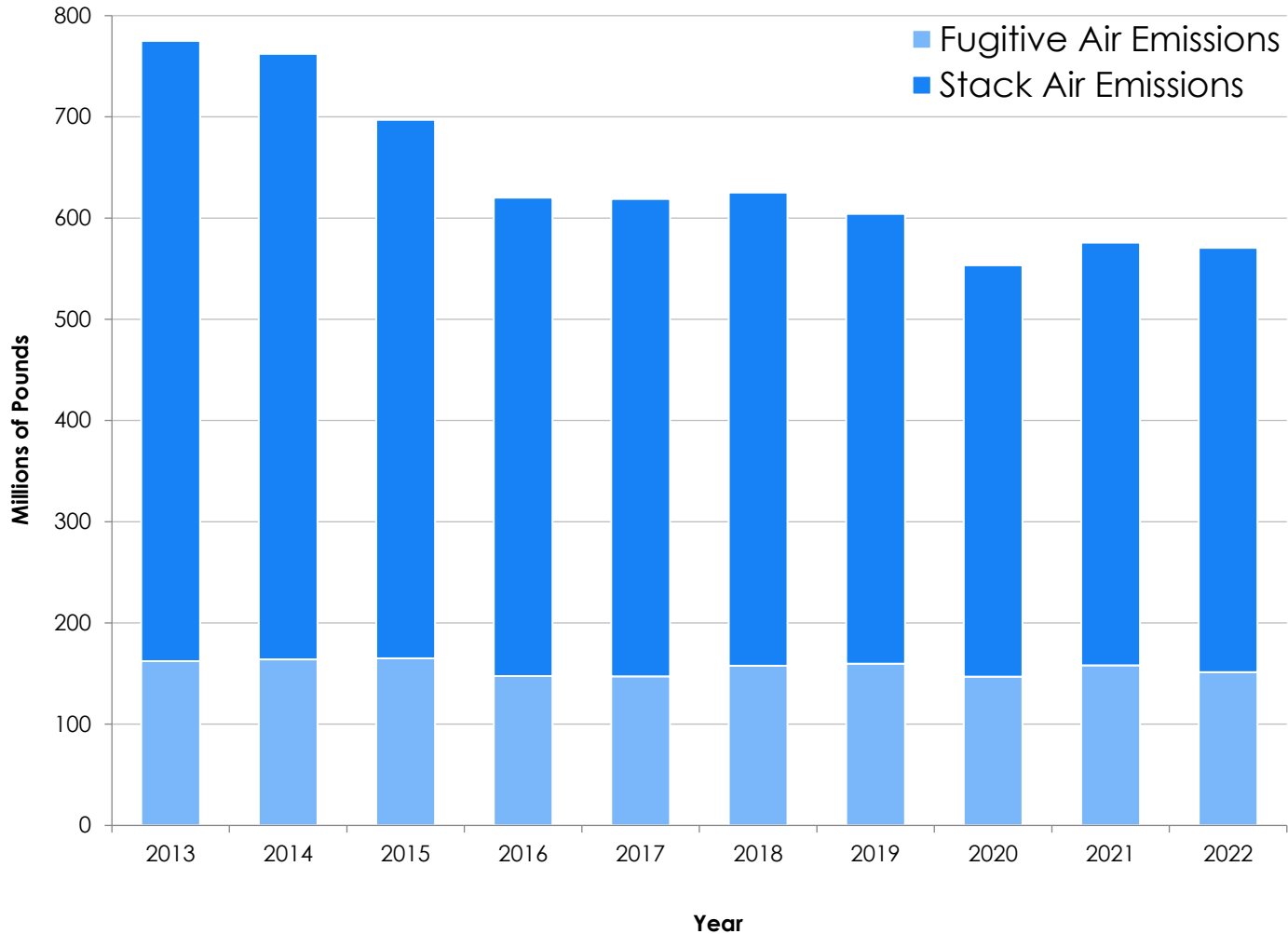
Air emissions -26%

Water discharges -9%

On-site land disposal -23%

Off-site disposal -8%

TRENDS IN RELEASES TO AIR



2022

571 million pounds

2021-2022

-1% (5 million pounds)

Sectors w. large Δ

↓ Paper

↓ Chemicals

↑ Nat. gas processing

Chemicals w. large Δ

↑ n-Hexane

↓ Methanol

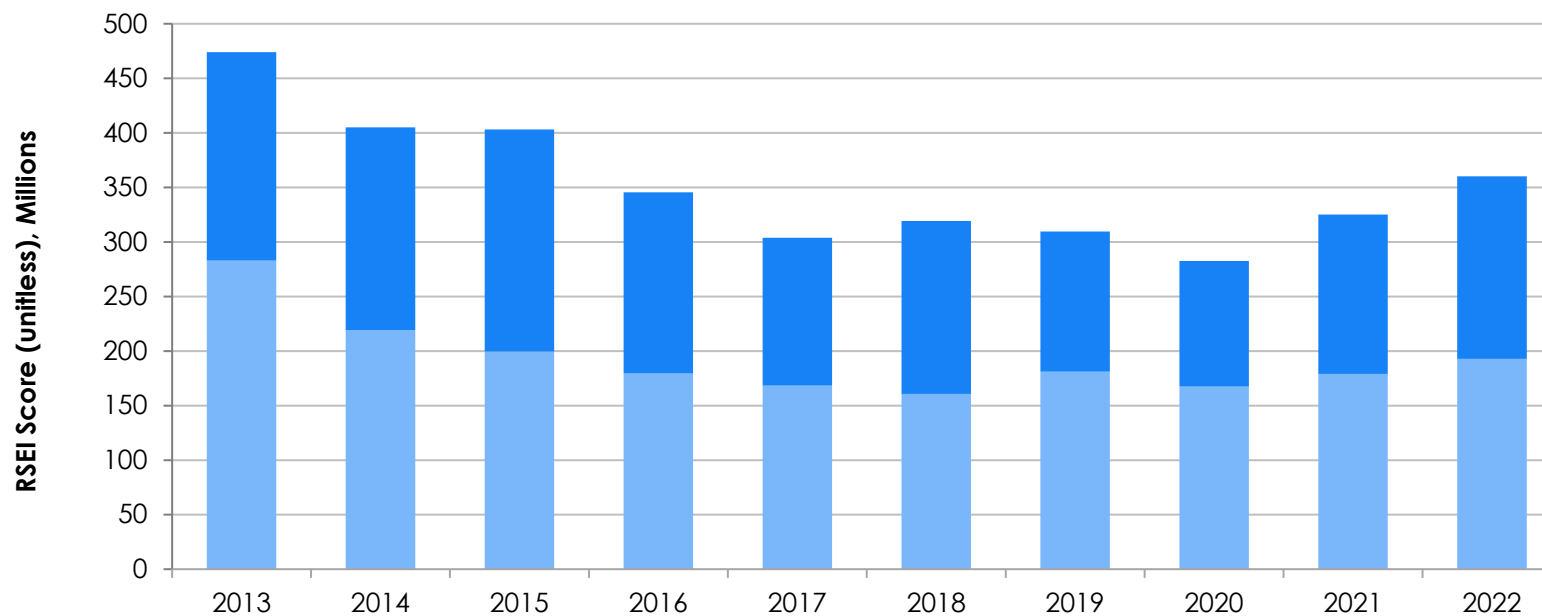
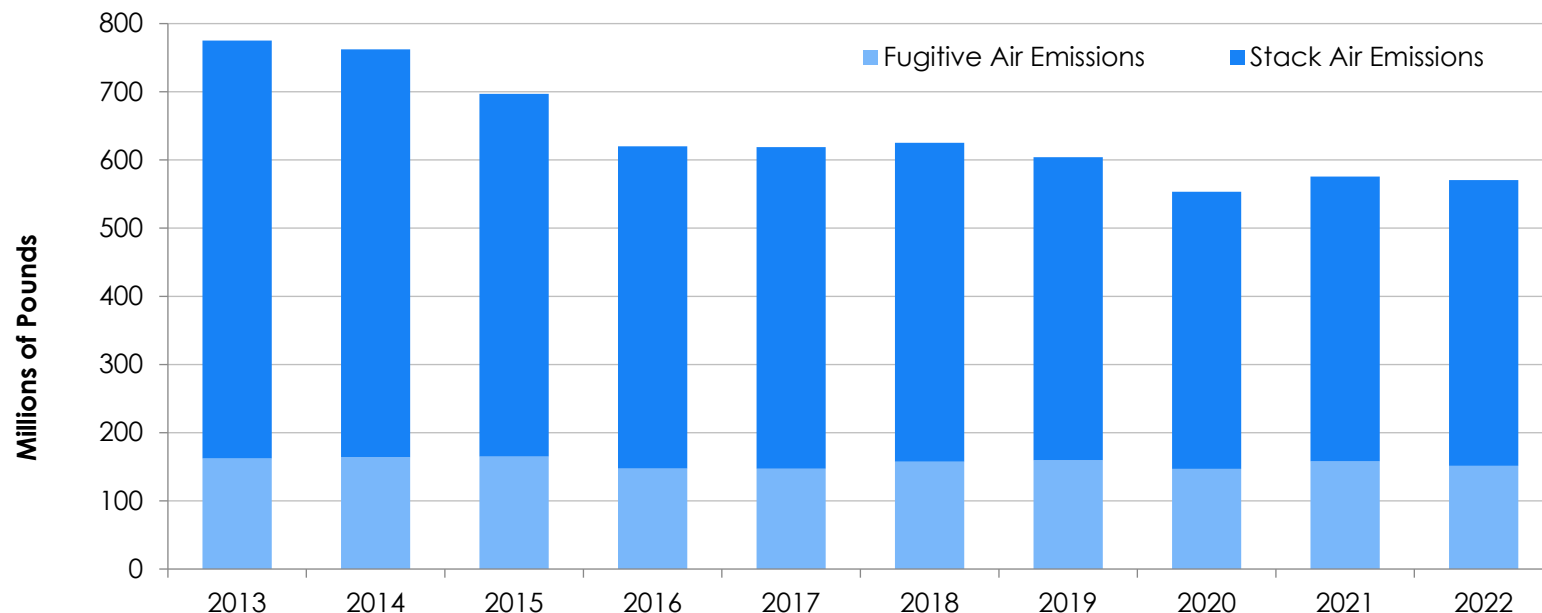
↓ Chlorine

2013-2022

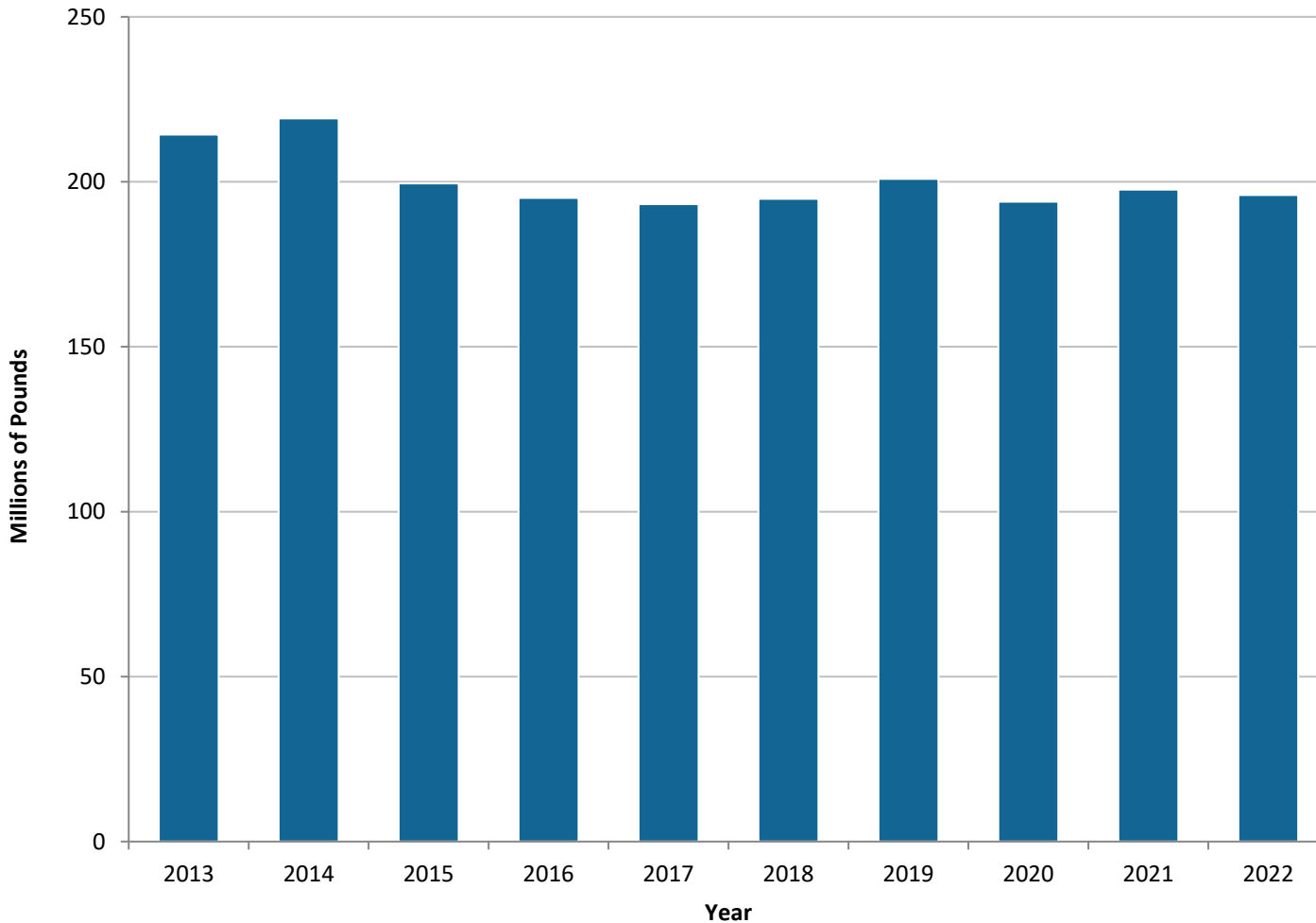
-26% (204 million pounds)

TRENDS IN RELEASES TO AIR RSEI SCORE

A Risk-Screening Environmental Indicators **(RSEI) Score** is an estimate of relative potential human health risk. It is a unitless value that accounts for the quantity of a chemical release, the fate and transport of the chemical through the environment, the size and locations of potential exposed populations, and the chemical's toxicity.



TRENDS IN RELEASES TO WATER



2022

196 million pounds

2021-2022

-1% (2 million pounds)

Sectors w. large Δ

↓ Food

↓ "Other"

↑ Petroleum products

Chemicals w. large Δ

↓ Nitrate compounds

↓ Methanol

↑ n-Hexane

2013-2022

-9% (18 million pounds)

Driven by

↓ Primary metals

↓ Chemical manufacturing

TRENDS IN RELEASES TO WATER

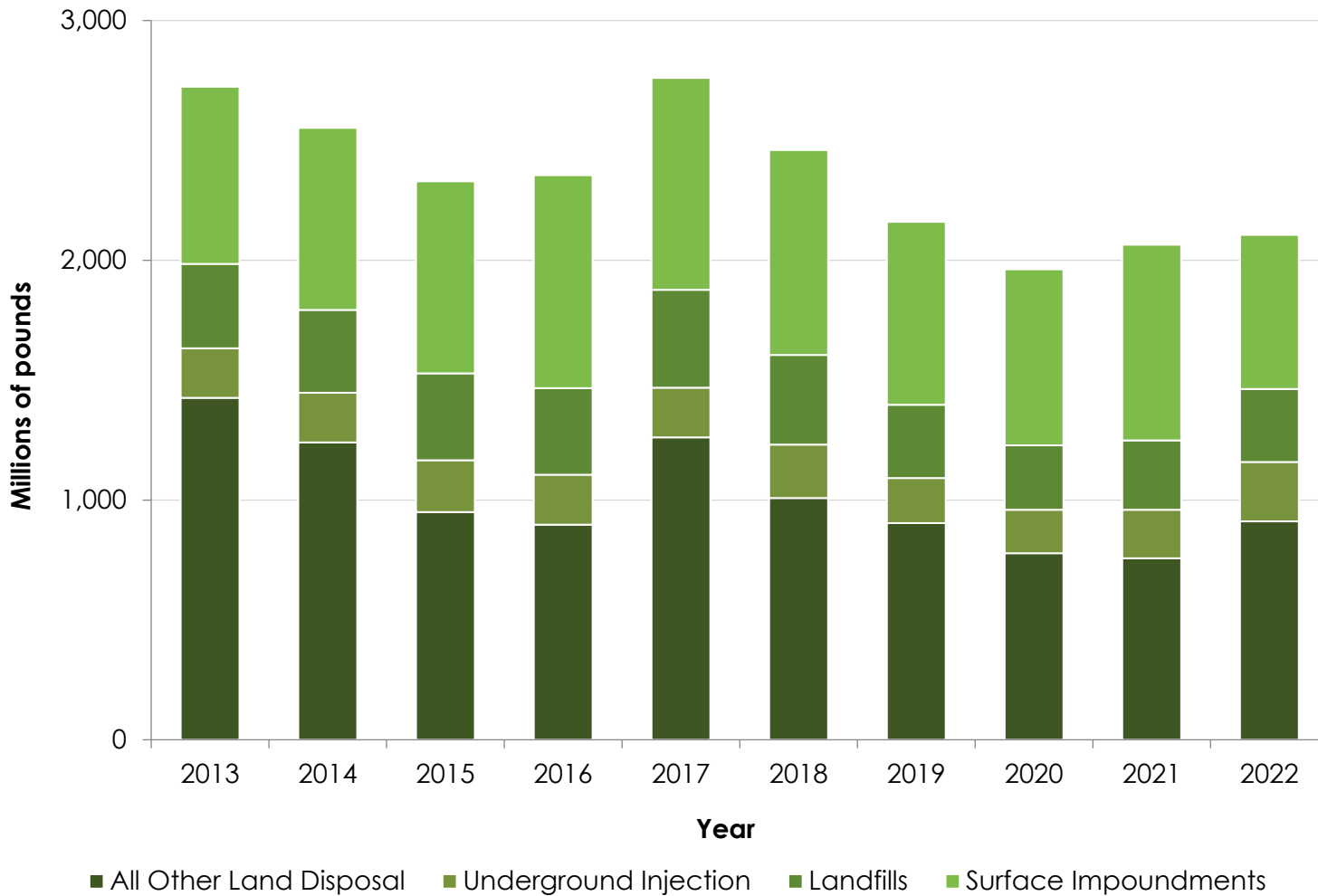
RSEI SCORE

A **RSEI Score** is an estimate of relative potential human health risk. It is a unitless value that accounts for the quantity of a chemical release, the fate and transport of the chemical through the environment, the size and locations of potential exposed populations, and the chemical's toxicity.



TRENDS IN LAND DISPOSAL

ALL SECTORS



2022

2.1 billion pounds

631 million pounds (30%) reported from waste rock

2021-2022

+2% (41 million pounds)

Driven by ↑ Hazardous waste management
↑ Natural gas processing

Offset by ↓ Chemical manufacturing
↓ Metal mining

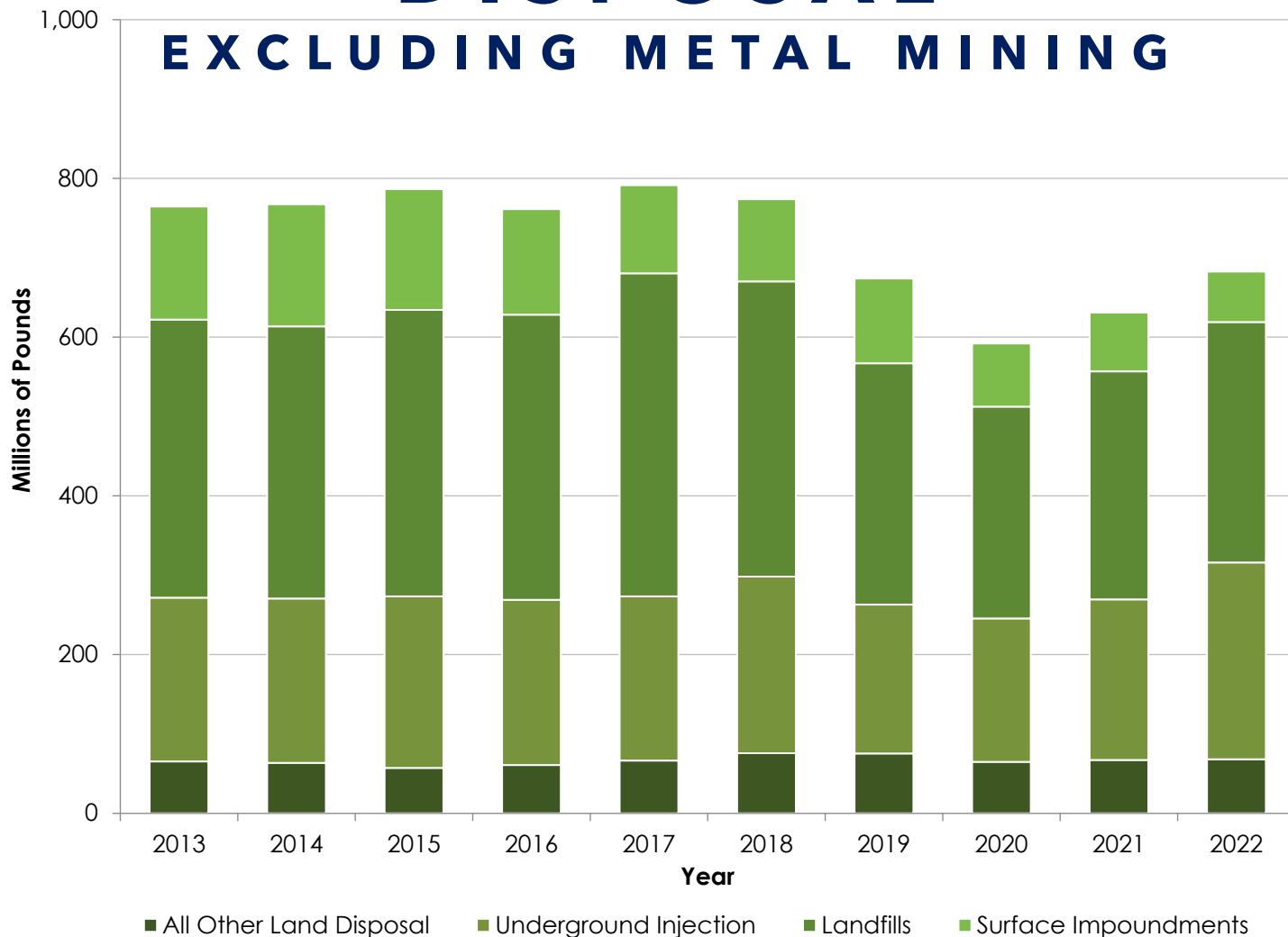
2013-2022

-23% (618 million pounds)

Yearly fluctuations driven by metal mines

TRENDS IN LAND DISPOSAL

EXCLUDING METAL MINING



2022

683 million pounds

Top Chemicals

Barium
Manganese
Hydrogen sulfide
Zinc

Top Sectors

Chemicals
Hazardous waste
Electric utilities
Primary metals

2021-2022

+8% (52 million pounds)

Driven by ↑ Natural gas processing

2013-2022

-11% (82 million pounds)

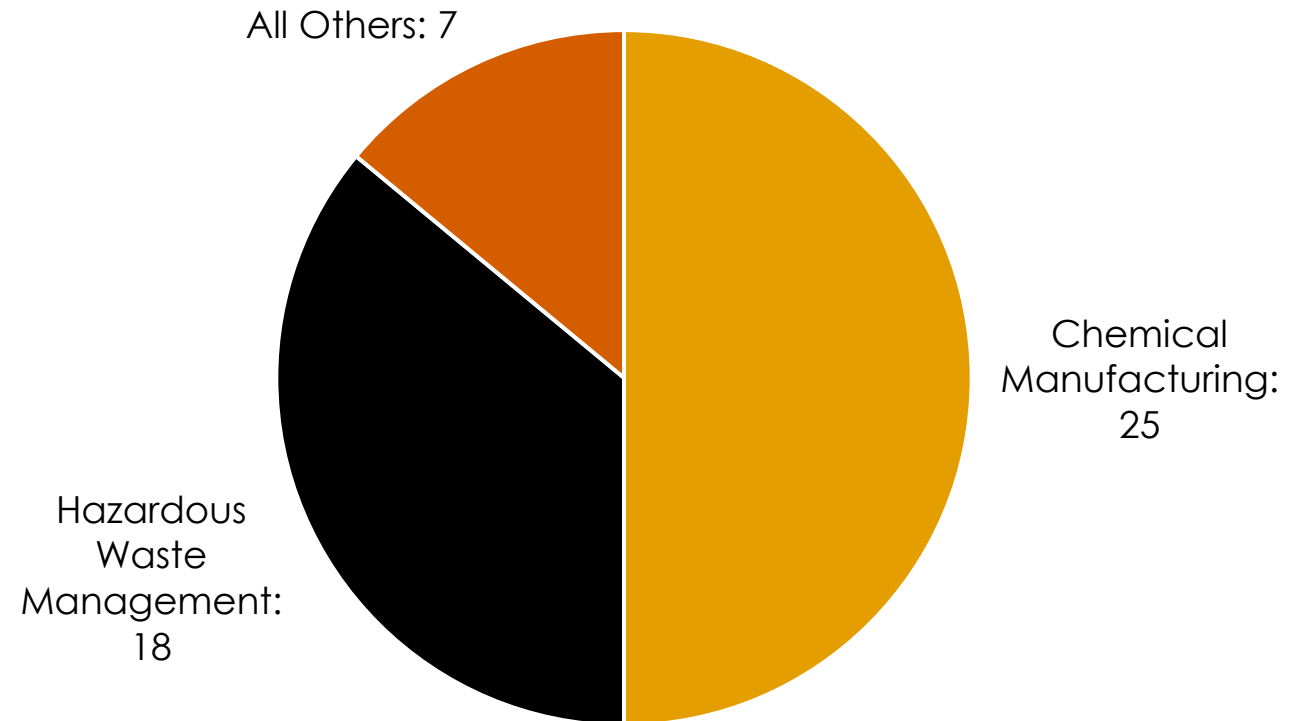
Driven by ↓ Primary metal manufacturing
↓ Chemical manufacturing

PFAS PROFILE

	2020	2021	2022
Forms	96	86	132
Facilities	42	41	50
Chemicals <i>reported</i>	46	42	44
Chemicals <i>listed</i>	172	176	180

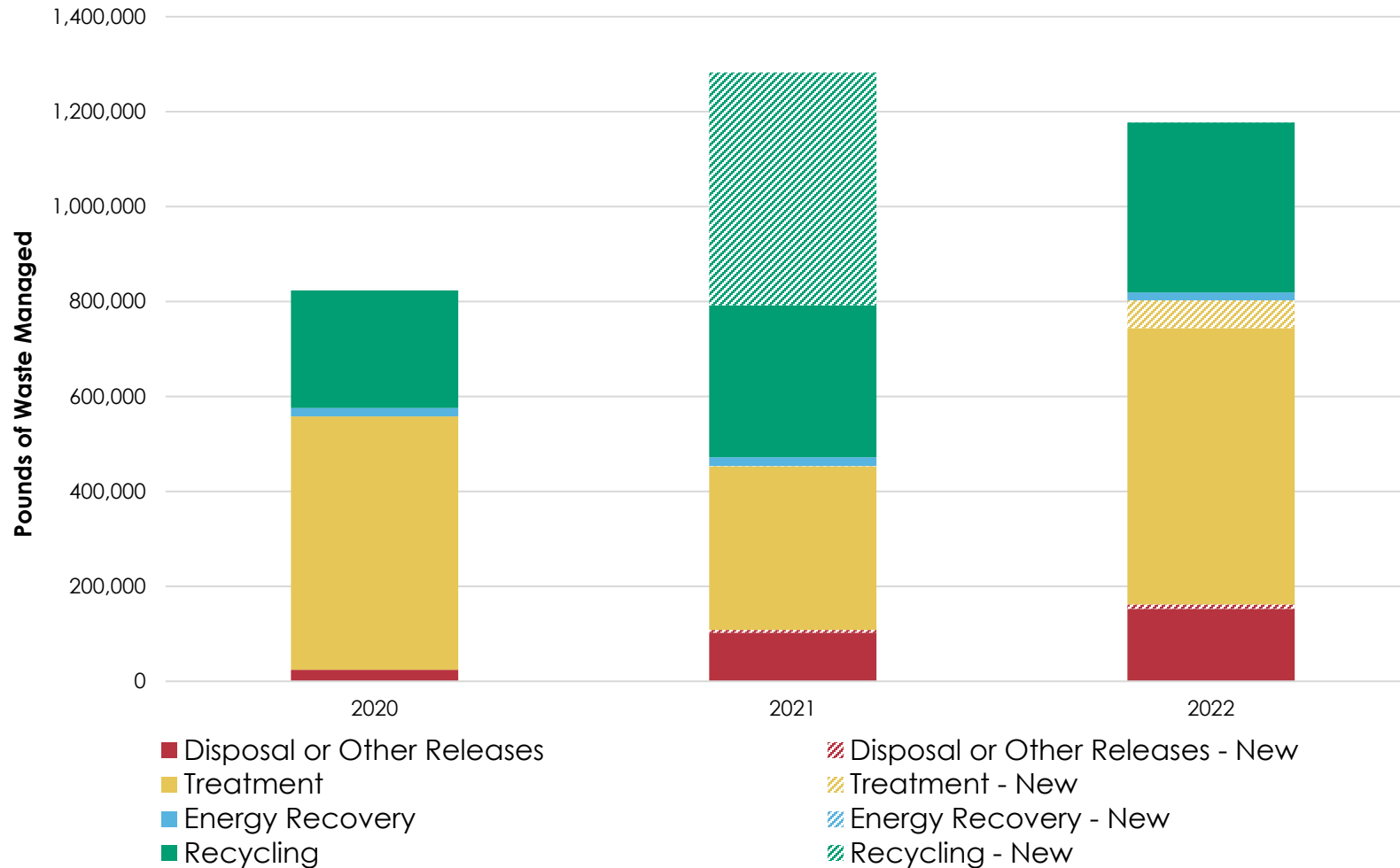
Newly-Listed PFAS in 2022
4 PFAS were added for 2022 7 forms for 2 chemicals

Number of Facilities Reporting PFAS by Sector, 2022



PFAS PROFILE

WASTE MANAGED

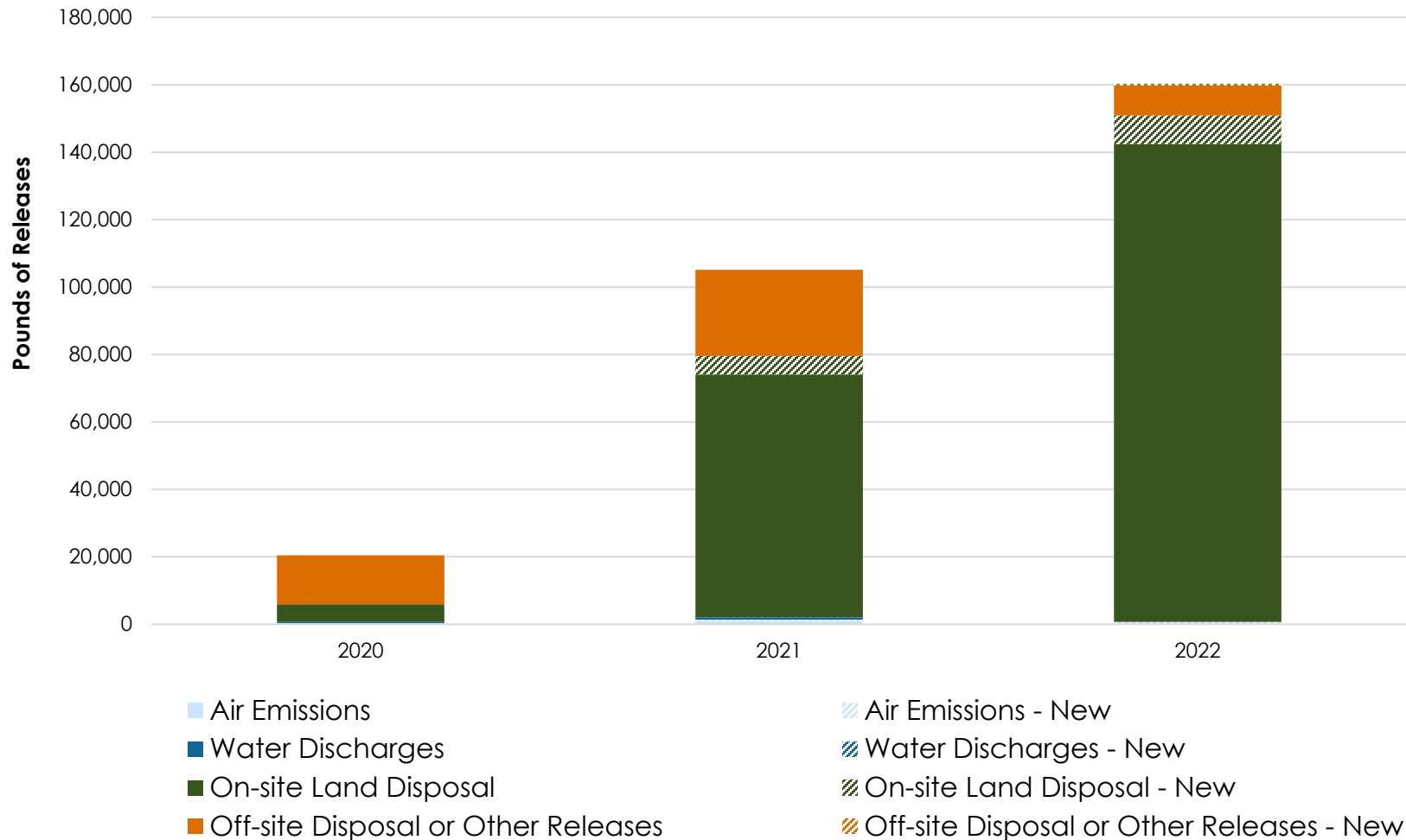


2022	
1.2 million pounds	
Newly-listed PFAS	56,000 pounds
Top Sectors	Chemicals
	Hazardous waste

2021-2022	
-8%	
Sectors w. large Δ	
↓ Chemical manufacturing	
↑ Hazardous waste management	

PFAS PROFILE

RELEASES



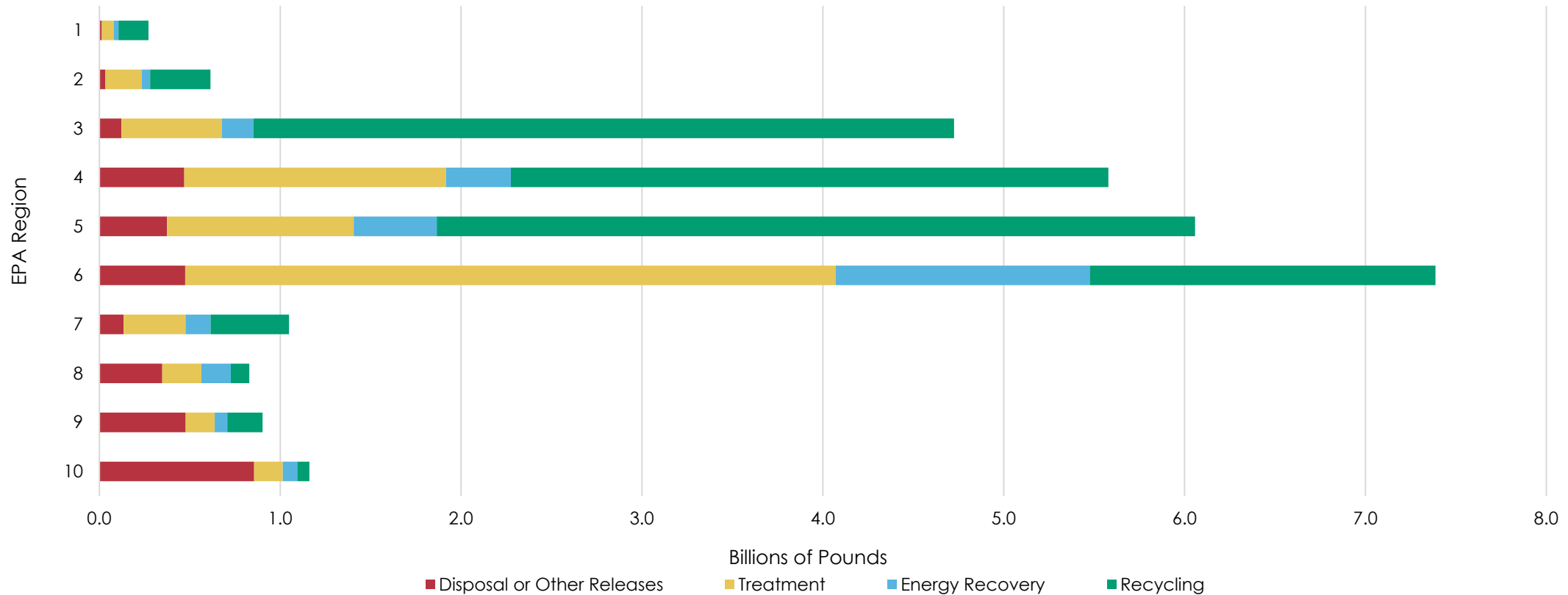
2022	
160,000 pounds	
Newly-listed PFAS	327 pounds
Top Sectors	Hazardous waste (98% of releases)

2021-2022	
+50%	
Sectors w. large Δ	
↑ Hazardous waste management	

REGIONAL ANALYSIS

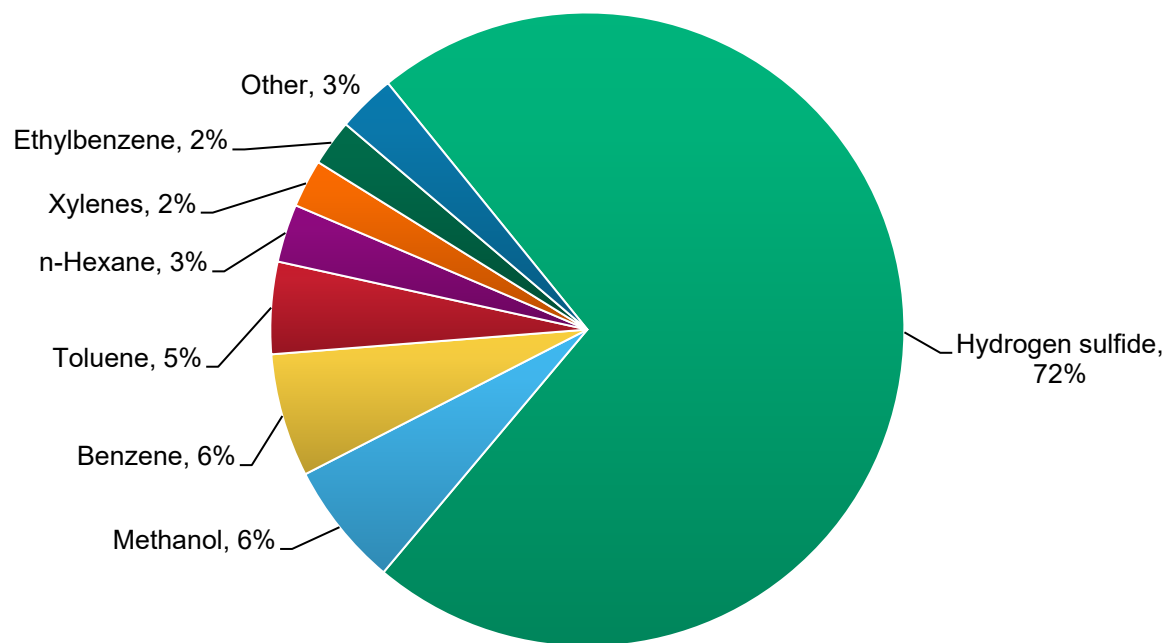
EPA regions vary in size, population, and types of facilities. Additionally, states across EPA regions have different regulations. This results in significant differences in TRI chemical releases and waste management practices.

Waste Managed by Region, 2022



NATURAL GAS PROCESSING

Natural Gas Processing Releases by Chemical, 2022



2022 Releases

89 million pounds

By medium	Land	81%
	Off-site	15%
	Air	4%
	Water	<1%

2022 Waste Managed

115 million pounds

By technique	Disposal	77%
	Treatment	20%
	Recycling	2%
	Energy recovery	1%

CONTRACT STERILIZATION FACILITIES

Starting in 2022, 29 contract sterilization facilities were required to report on ethylene oxide (EtO)

- Some also required to report for ethylene glycol
- 26 of 29 have reported to TRI for 2022

2022 Waste Managed	
14 million pounds	
Ethylene oxide	6.3 million pounds managed <i>Mostly treated</i>
	9,000 pounds released <i>All releases to air</i>
Ethylene glycol	7.4 million pounds managed <i>Nearly all recycled</i>

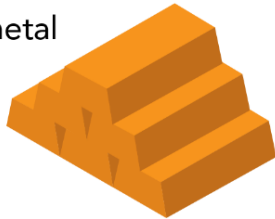
2022 FEATURE SECTOR

PRIMARY METAL MANUFACTURING

PRIMARY METALS

What the Sector Does

Facilities in the primary metal manufacturing sector process metals, such as iron, aluminum, and copper, to produce foundational metal products used throughout the economy. The sector outputs include basic metal products such as steel ingots, metal castings, sheets, bars, and wire.



THE SECTOR
EMPLOYS
318,000
PEOPLE



U.S. Census Annual Survey of Manufacturers
2021 data

THE SECTOR
CONTRIBUTES
\$92 BILLION
TO U.S. GDP

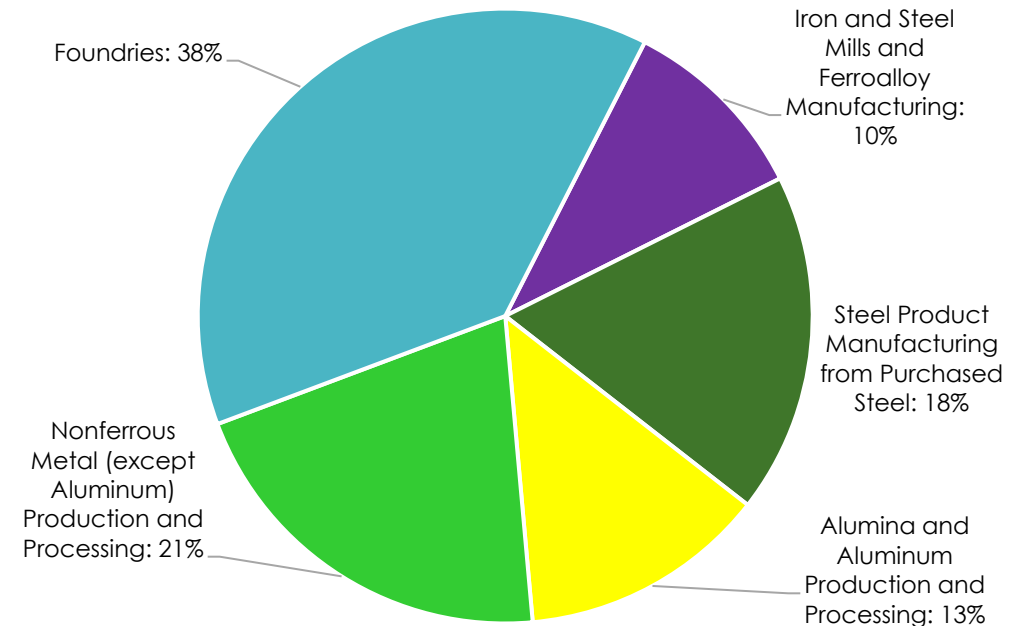


In value-added. Bureau of Economic Analysis, Year 2022 data

1,434 facilities in the sector report to TRI

U.S. EPA TRI, Reporting Year 2022

Primary Metal Manufacturing
Facilities by Subsector in 2022



PRIMARY METALS - WASTE MANAGED

2022

2.3 billion pounds

Recycled 1.6 billion pounds of metals
(more than any other sector)

Top chemicals

Zinc

Copper

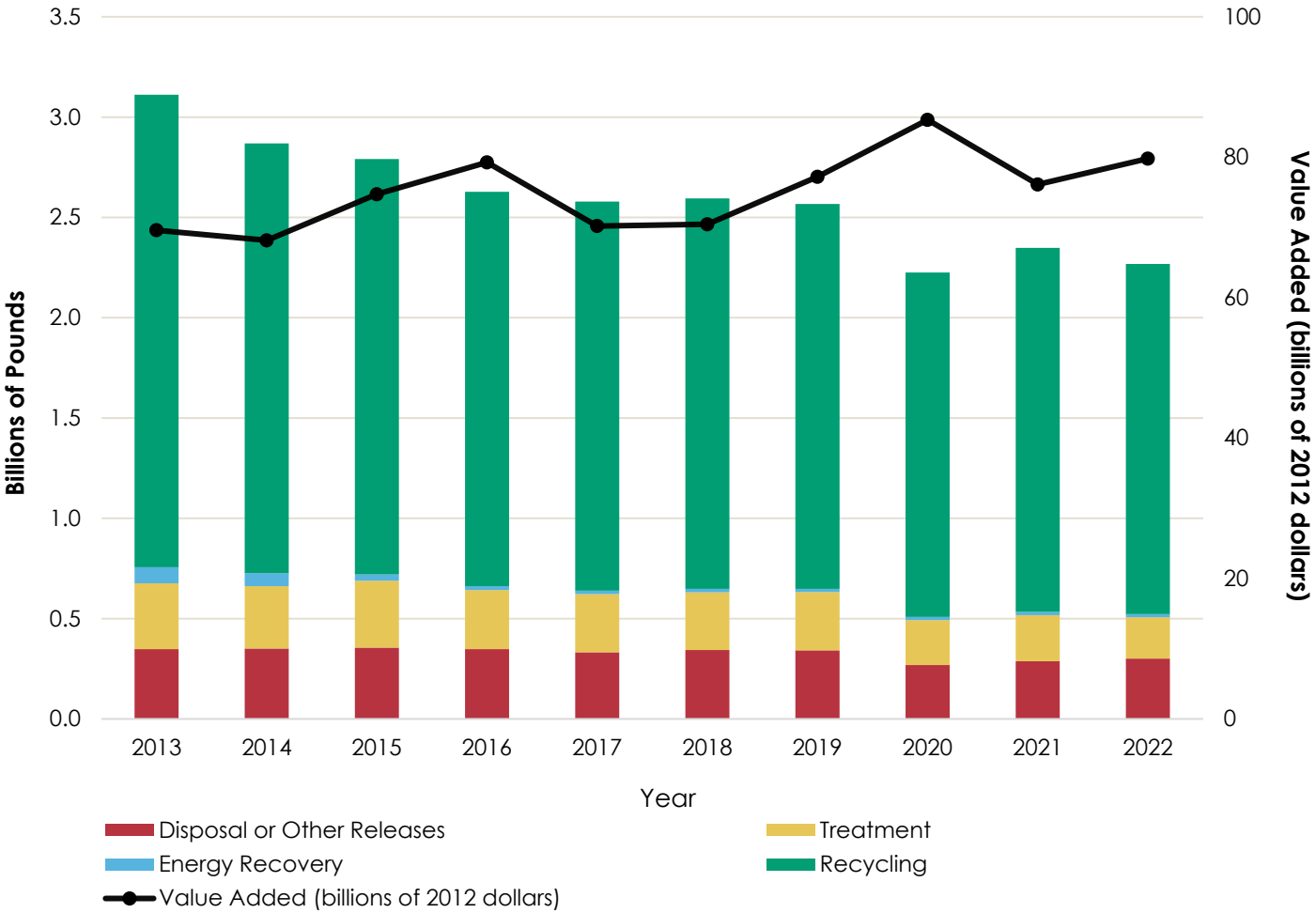
Lead

2013-2022

-27% (843 million pounds)

2021-2022

-3% (80 million pounds)

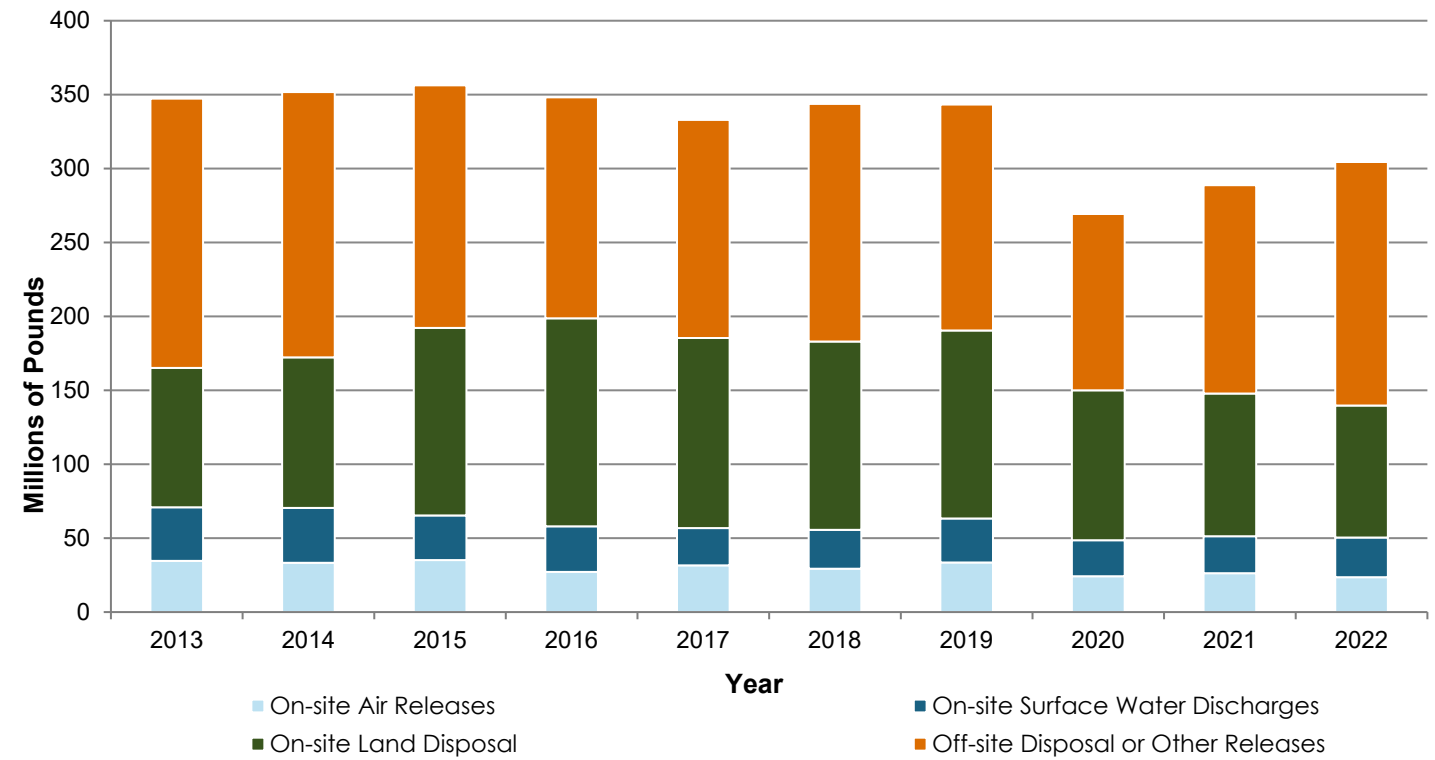


PRIMARY METALS - RELEASES

2022	
304 million pounds	
Off-site disposal accounts for more than half	
Top chemicals	Zinc
	Manganese
	Copper
Top chemicals released to air	Ammonia
	Carbonyl sulfide
	Hydrochloric acid aerosols
More lead and mercury air emissions than any other sector	

2013-2022
-12% (43 million pounds)

2021-2022
+5% (16 million pounds)



National Analysis Homepage

www.epa.gov/trinationalanalysis

QUESTIONS?

TRI National Analysis

www.epa.gov/trinationalanalysis

Additional questions and follow-up

"Contact Us" link on the National Analysis website

TRI.Help@epa.gov

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