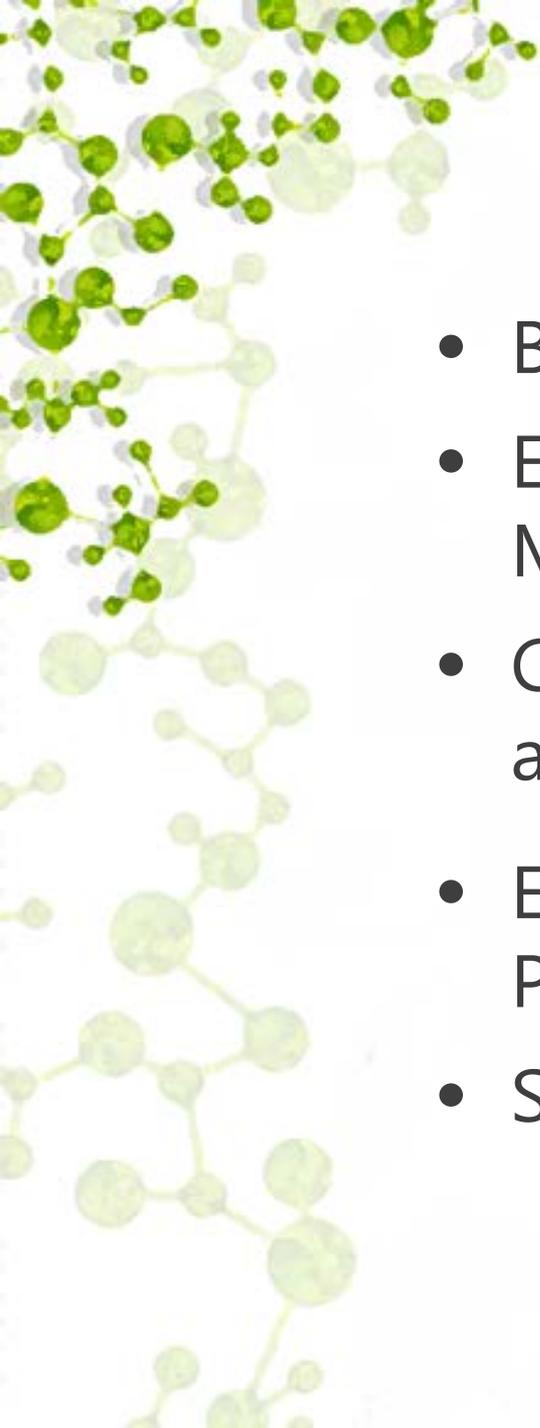


Examples: Reporting under CDR, TRI, and RCRA

Public Meeting
Afternoon Session

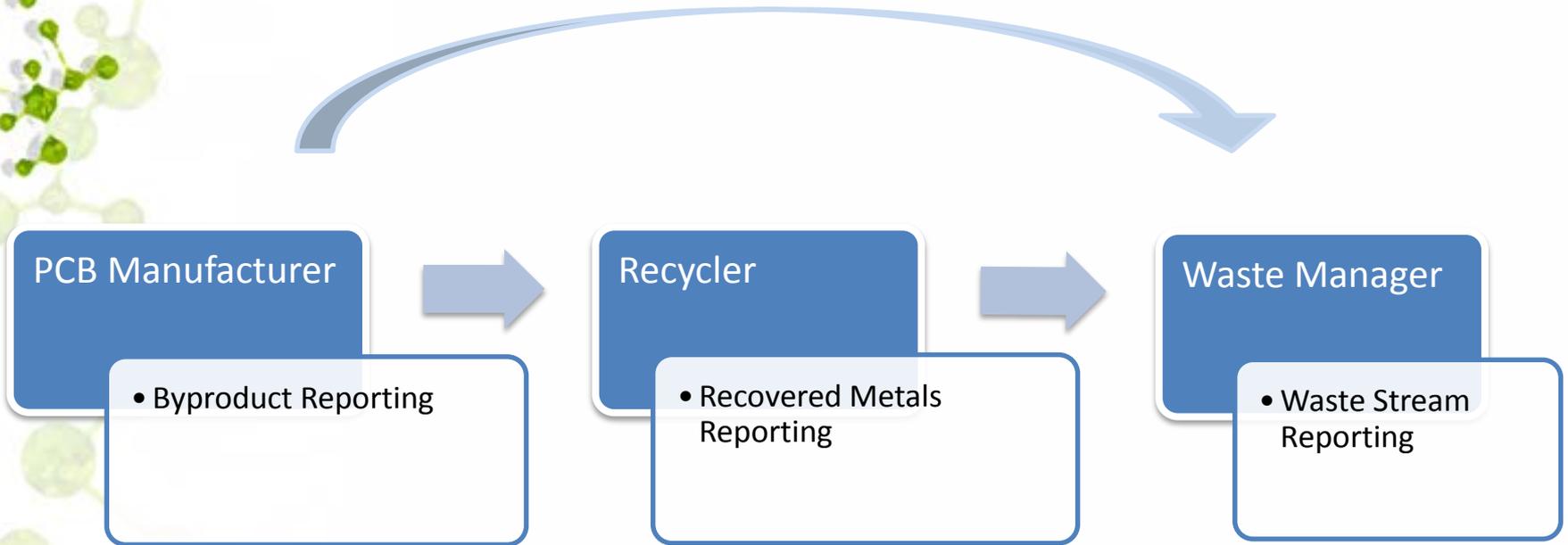
May 9, 2017



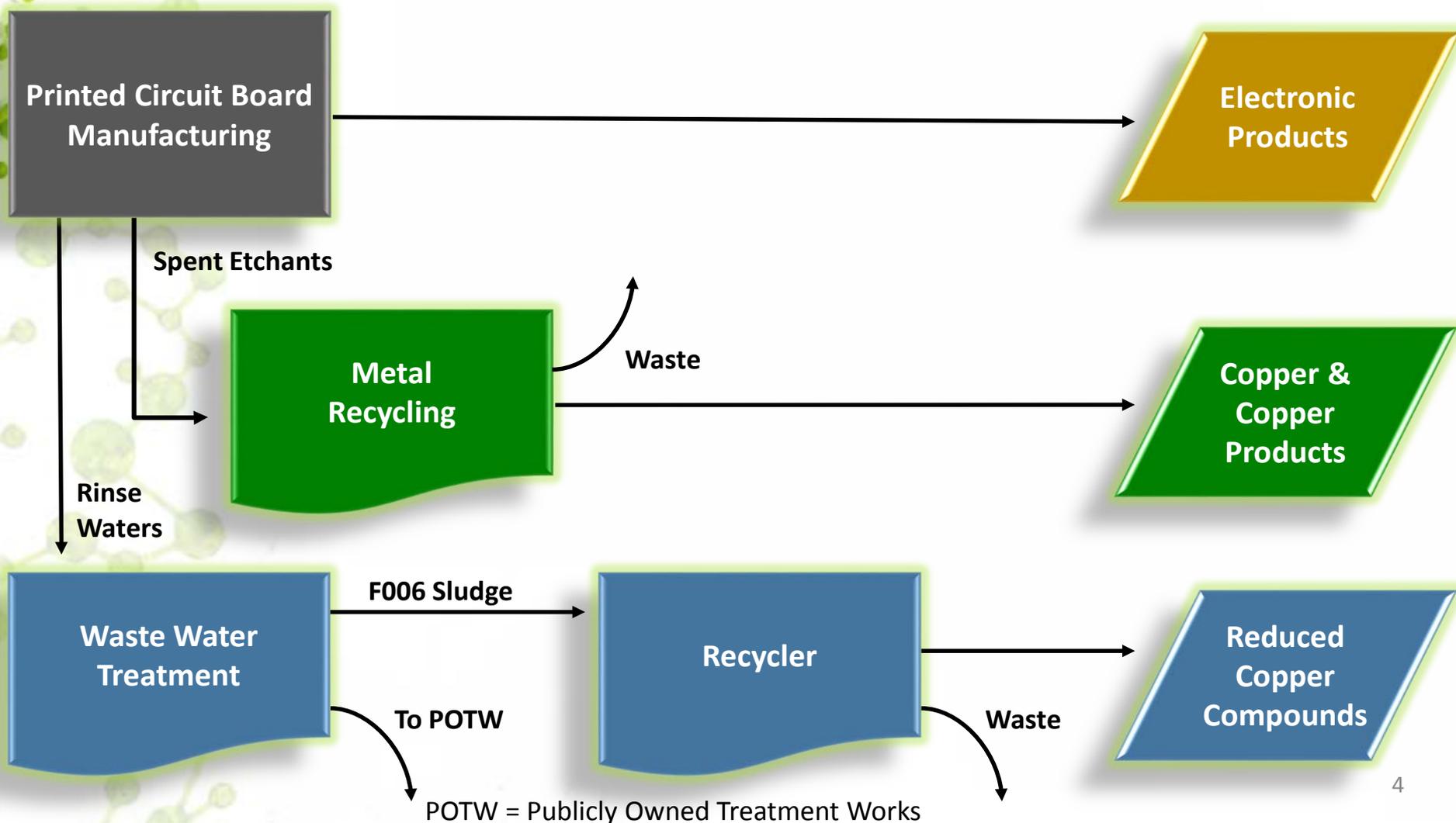
Agenda

- Background: Process Diagrams
- Example: Printed Circuit Board (PCB) Manufacturer
- CDR Comparison: PCB Manufacturer and Recycler
- Example: Recycler of Copper/Metal Processing
- Summary

Process Diagram Through Reporting Programs



Process Diagram of Byproduct Chemical Reporting



Printed Circuit Board (PCB) Manufacturer Example

- **CDR Reporting:**

2012	2016
(2010-2011 data)	(2012-2015 data)
13 Sites	14 Sites
All sites reported only Copper or its Compounds	All sites reported only Copper or its Compounds
All sites reported chemicals except for Copper hydroxide were identified as Recycled, Reprocessed, Reused	All sites reported chemicals were identified as Recycled, Reprocessed, or Reused

PCB Example: 2016 CDR Processing and Use

Chemical/CAS	Type	Sector	Function
Copper 7440-50-8	Processing— incorporation into article	Primary Metal Manufacturing	Other
Copper chloride 1344-67-8	Processing— incorporation into formulation, mixture, or reaction product	All Other Basic Inorganic Chemical Manufacturing	Other
		Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	
Copper chloride (CuCl ₂) 7447-39-4	Processing as a reactant	All Other Basic Inorganic Chemical Manufacturing	Agricultural chemicals (non pesticidal)
		Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	
	Processing— incorporation into formulation, mixture, or reaction product	Computer and Electronic Product Manufacturing	Functional fluids (closed systems)
		All Other Basic Inorganic Chemical Manufacturing	Other
Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing			

PCB Example: 2016 CDR Processing and Use

Chemical/CAS	Type	Sector	Function
Copper hydroxide (Cu(OH) ₂) 20427-59-2	Processing—incorporation into formulation, mixture, or reaction product	Mining (except Oil and Gas) and Support Activities	Other
	Use—non-incorporative activities	Computer and Electronic Product Manufacturing	Solids separation agents
	NKRA		
Copper sulfide (CuS) 1317-40-4	Processing as a reactant	Primary Metal Manufacturing	Other
Copper(2+), tetraammine-, chloride (1:2) 10534-87-9	Processing as a reactant	All Other Basic Inorganic Chemical Manufacturing	Intermediates
		Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing	Agricultural chemicals (non pesticidal)
	Processing—incorporation into formulation, mixture, or reaction product	All Other Basic Inorganic Chemical Manufacturing	Other
	NKRA	Computer and Electronic Product Manufacturing	NKRA

PCB Example: 2016 CDR Consumer/Commercial Use

Chemical/CAS	Consumer/Commercial Use (one or more reports)
Copper chloride (CuCl ₂) 7447-39-4	Agricultural products (non pesticidal) - Commercial
Copper(2+), tetraammine-, chloride (1:2) 10534-87-9	Agricultural products (non pesticidal) - Commercial

PCB Manufacturer Example: CDR and TRI Reporting

Reporting Element	CDR	TRI
Facilities/Sites	14	14 CDR Facilities + 2 Others
Chemicals/Chemical Compounds	6	18
- Inorganic (non-metal)	0	4
- Metals	6 (Cu & 5 Individual Cu Compounds)	4 (Cu and Cu Compounds)
Metals Recycled, Reprocessed, or Reused	6	4 Offsite
Byproduct	No data element	Approximately half of all forms for these Metal Compounds contained Byproducts

NOTE: As reported most recently to EPA

PCB Manufacturer Example: TRI and RCRA Reporting

Reporting Element	TRI	RCRA
Facility/Site	16	11
Chemicals/Chemical Compounds	18	17 Unique Waste Codes
- Inorganic (non-metal)	4	
- Metals	4 (Cu and Cu Compounds)	2 (F006 specifically)
Waste Generated & Metal Recycling, Reprocessing, or Reuse	<u>All Metals Recycled <i>Offsite</i></u> Production Waste Recycled – 99% Environmental Release – 1%	<u>All Managed <i>Offsite</i></u> Metals Recovery – 82% Other Treatment – 18%

NOTE: As reported most recently to EPA

Printed Circuit Board Manufacturer Sites

Facility / Site		CDR	TRI	RCRA*
Santa Ana	CA	3 [Cu]	Cu	F006
Santa Clara	CA	3 [Cu]	[Cu]	
San Diego	CA		[Cu]	F006
Anaheim	CA	2 [Cu]	[Cu]	F006
Milpitas	CA	2 [Cu]	[Cu]	F006
San Jose	CA	2 [Cu]	[Cu]	F006
Littleton	CO	2 [Cu]	[Cu]	
Stafford	CT	2 [Cu]	[Cu]	
Staffordville	CT	2 [Cu]	[Cu]	
Stafford Springs	CT			
North Jackson	OH	1 [Cu]	[Cu]	F006
Cuyahoga Falls	OH	2 [Cu]	[Cu]	F006
Forest Grove	OR	3 [Cu]	[Cu]	F006
Logan	UT	4 [Cu]	[Cu]	F006
Dulles	VA	3 [Cu]	[Cu]	F006
Chippewa Falls	WI	Cu, 3 [Cu]	[Cu]	F006

[] = Compounds

* Potential Metal-Containing Waste Stream

PCB Example: TRI Recycling On & Offsite

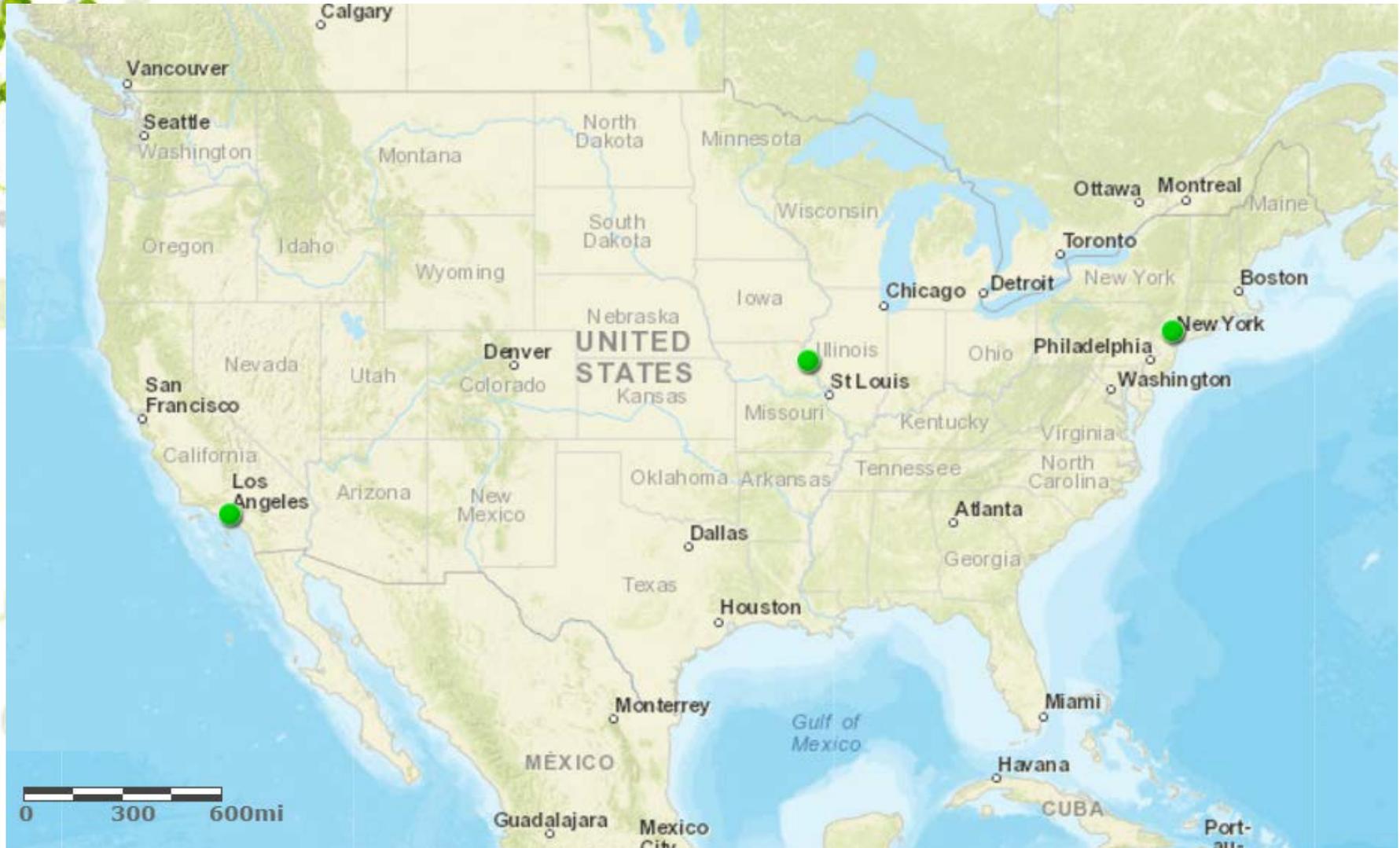
			----- Recycling -----			Sub-Categories of Manufacturing			
Facility Code	Chemical Name	Total PR* Waste (lbs)	Offsite (lbs)	Onsite (lbs)	% Total of PR* Waste	Byproduct	Manufacture Impurity	Sale/ Distribution	Used/ Processed
						----- % that Selected this Sub-Category -----			
All Facilities	Copper	151,854	150,516	0	99	0	0	0	0
	Copper Compounds	1.637 M	1.618 M	0	99	57	0	57	36

* PR = Production Related

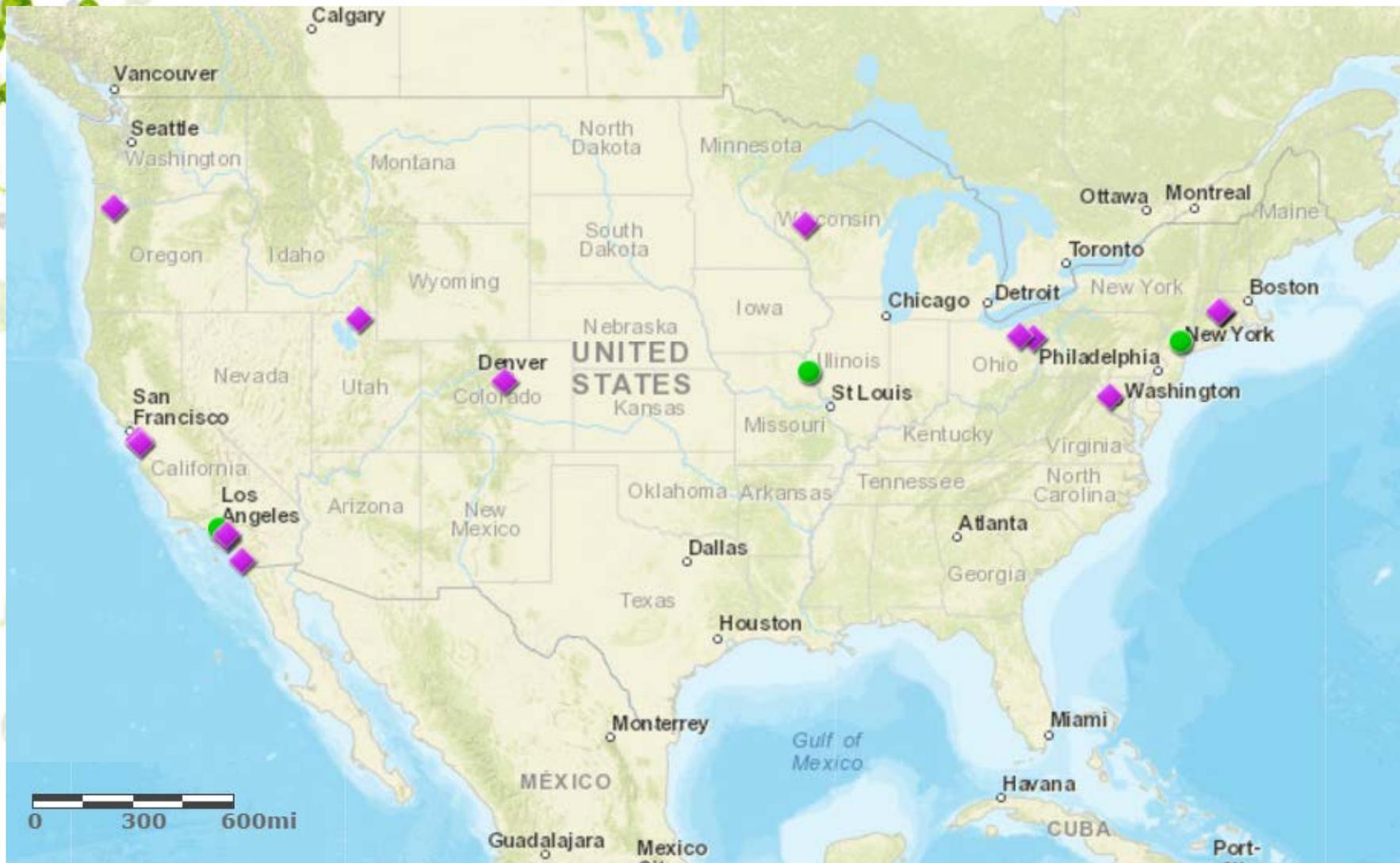
PCB Byproducts to Recycler

Reporting Elements	PCB CDR	Metals Recycler CDR
Facilities/Sites	14	3 (1 Headquarters)
Chemicals/Chemical Compounds	6	41
- Inorganic (non-metal)	0	21
- Metals	6 (Copper & 5 Specific Copper Compounds)	11 (All Compounds – Copper, Iron, Tin, Zinc, & Chromium)
Metals Recycled, Reprocessed, or Reused	All	None

Locations of Metal Recycler Facilities



Locations of both PCB Manufacturing Facilities and Metal Recycler



Recycler Example: TRI & RCRA

Reporting Element	TRI	RCRA
Facility/Site	Site X (CA)	Site X (CA)
Chemicals/ Waste Stream	6 Total	14 Unique Waste Codes
- Inorganic (non-metal)	3	
- Metals	3 (All Metal Compounds – including Copper)	2 (F006 – Electroplating Wastewater Sludge)
Waste (Management Method) & Recycling, Reprocessing, or Reuse	87% of metals (lbs) recycled; 93% of which occurred Onsite	<u>All Managed Onsite; Managed Tons:</u> 67.1% – identified as Metal Recovery 29.7% – identified as Other recovery or reclamation for reuse 2.7% – Neutralization only (no other treatment) 0.5% – Transfer Off-site
Byproduct	Each metal compound was reported as a Byproduct	Not a data element

NOTE: As reported most recently to EPA

Recycler Example: CDR & TRI

Reporting Element	CDR	TRI
Facility/Site	Sites X (CA), Y (IL), & Z (NJ)	Site X (CA)
Chemicals	41	6
- Inorganic (non-metal)	21	3
- Metals	11 (All Compounds – Copper, Iron, Tin, Zinc, & Chromium)	3 (All Compounds – Copper, Lead, & Nickel)
Metals Recycled, Reprocessed, or Reused	None	87% of metals (lbs) recycled; 93% of which occurred Onsite
Byproduct	Not a data element	Each metal compound was reported as a Byproduct

NOTE: As reported most recently to EPA

Recycler Example: TRI Recycling Onsite and Offsite

			----- Recycling -----					Sub-Categories of Manufacturing			
Condensed Facility Code	Chemical Name	Total PRW* (lbs)	Offsite (lbs)	Onsite (lbs)	Total (lbs)	% Onsite	% Total PRW	Byproduct	Manu- facture Impurity	Sale/ Distrib- ution	Used/ Proc- essed
								----- Selected this Sub-Category -----			
Site X (CA)	Ammonia	739,733	0	718,191	718,191	100	97	No	No	No	No
	Copper Compounds	1.540 M	79,207	1.422 M	1.501 M	95	97	Yes	No	Yes	Yes
	Lead Compounds	3,467	0	2,371	2,371	100	68	Yes	No	No	No
	Nickel Compounds	173,673	25,371	140,959	166,330	85	96	Yes	No	Yes	No
	Nitrate Compounds	349,160	0	0	0	0	0	No	No	No	No
	Nitric Acid	313,343	0	0	0	0	0	No	No	No	No

*PRW = Production Related Waste

Recycler Example: CDR, TRI, RCRA

CDR – Facilities by Metal/Compound

Chemical/Metal	Facilities reporting
Chromium oxide (CrO3)	Site Z (NJ)
Copper chloride (CuCl2)	Site Z (NJ)
Copper cyanide (Cu(CN))	Site Z (NJ)
Copper oxide (CuO)	Site X (CA) & Site Y (IL)
Copper, dihydroxydi- Cuprate(3-), potassium (1:3)	Site X (CA) & Site Z (NJ)
Iron chloride (FeCl2)	Site Z (NJ)
Iron chloride (FeCl3)	Site X (CA)
Iron oxide (Fe2O3)	Site X (CA)
Iron oxide (Fe2O3)	Site Y (IL)
Tin fluoride (SnF2)	Site Y (IL)
Zinc oxide (ZnO)	Site Z (NJ)
Zinc oxide (ZnO)	Site Y (IL)

TRI – Facilities by Chemical/Metal

Chemical/Metal	Facilities reporting
Ammonia	Site X (CA)
Copper Compounds	
Lead Compounds	
Nickel Compounds	
Nitrate Compounds	
Nitric Acid	

RCRA – Facilities by Waste Stream

Waste Stream/Mgmt. Method	Facilities reporting
<u>73.5% of Reports</u> Metal Recovery	Site X (CA)
<u>20.5% of Reports</u> Other recovery or reclamation for reuse	
<u>5.8% of Reports</u> Neutralization only (no other treatment)	
<u>0.3% of Reports</u> Other recovery or reclamation for reuse	

Summary: Differing Scopes

CDR	TRI	RCRA
<p>Focus is on manufacture, processing, and use data to inform EPA about potential exposures.</p>	<p>Program goal is to provide stakeholders with information about toxic chemical releases and other waste management.</p>	<p>Focus is on waste generation, transportation, treatment, storage, and disposal.</p>