

CHALLENGES AND OPPORTUNITIES IN MAPPING THE NORTH AMERICAN HAZARDOUS WASTE TRADE

Follow along at:

geography.wisc.edu/hazardouswaste/map

or

uwcart.github.io/waste/hmm

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WHERE DOES WASTE GO?



THIS IS AN OPPORTUNITY...

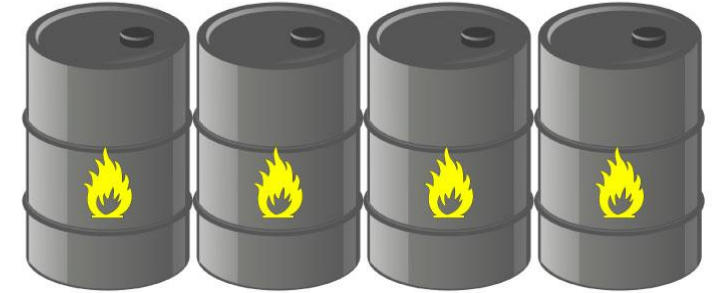
BUT ALSO A CHALLENGE....

FOIA

971 pdfs
On average, 7 manifests each
For a total of over 18,000
shipments



shipment 1



shipment 2



shipment 3



Need Agreement Form

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

DL3799026

SC PPW 3/3/2011

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator ID Number ARD069748192	2. Page 1 of 3	3. Emergency Response Phone (800)483-3718	4. Manifest Tracking Number 003896230 FLE	
5. Generator's Name and Mailing Address Clean Harbors Canada Inc 7842 Progress Way Delta, BC V4G 1A4 Generator's Phone: (604)940-0894			5. Generator's Site Address (if different than mailing address) RT: CLEAN HARBORS 309 American Circle El Dorado, AR 71730			
6. Transporter 1 Company Name Alchemist Transport Inc (USA)			2560/47/11		U.S. EPA ID Number MKA000003954 FCCANADA	
7. Transporter 2 Company Name Clean Harbors Environmental Services			U.S. EPA ID Number WV Importer EPA ID			
8. Designated Facility Name and Site Address Clean Harbors El Dorado LLC 309 American Circle El Dorado, AR 71730 Facility's Phone: (870)863-7173			U.S. EPA ID Number ARD069748192			
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers		11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
		No.	Type			
	1 UN1391, WASTE ALKALI METAL DISPERSIONS, 4.3, PG I	001	DM	00097	P	0001 0003
X	2 UN1391, WASTE ALKALI METAL DISPERSIONS, 4.3, PG I	005	DF	02088	P	0001 0003
	3.					
	4.					
14. Special Handling Instructions and Additional Information 1. EL-CH487251 ERG#138 1X55 2. EL-CE487251 ERG#138 5X85						
15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged,						

Exporter name and address

Manifest number

Importer name and address

Importer EPA ID

of containers

Container type

UN waste code | Waste description | Packing group

Quantity

Quantity unit

EPA waste code

1	Foreign Exporter Name	Hazardous Waste Description	DOT/UN ID Code	DOT/UN ID Code description
6575	CLEAN HARBORS INC	WASTE CORROSIVE LIQUIDS, OXIDIZING, NOS (SULPHURIC ACID/POTASSIUM DICHLORIDE)	UN3098	Oxidizing liquid, corrosive, n.o.s.
6576	CLEAN HARBORS INC	WASTE CORROSIVE LIQUID, ACIDIC, INORGANIC, NOS (CHROMIUM TRIOXIDE/SULPHURIC ACID MIX)	UN3264	Corrosive liquid, acidic, inorganic, n.o.s.
6577	CLEAN HARBORS INC	WASTE HYPOCHLORITE SOLUTIONS (SODIUM HYPOCHLORITE)	UN1791	Hypochlorite solutions
6578	CLEAN HARBORS INC	WASTE HYPOCHLORITE SOLUTIONS (SODIUM HYPOCHLORITE)	UN1791	Hypochlorite solutions
6579	CLEAN HARBORS INC	WASTE NOT REGULATED BY TDG (WATER WITH TRACE IODINE)	UY2307	
6580	CLEAN HARBORS INC	WASTE FLAMMABLE LIQUID, TOXIC, CORROSIVE, NOS (HYDRAZINE/MORPHOLINE SOLUTION)	UN3286	Flammable liquid, toxic, corrosive, n.o.s.
6581	CLEAN HARBORS INC	WASTE FLAMMABLE SOLIDS, ORGANIC, NOS (ALUMINUM PASTE)	UN1325	Flammable solids, organic, n.o.s.
6582	CLEAN HARBORS INC	WASTE CORROSIVE LIQUIDS, NOS (AMMONIUM HYDROXIDE SOLUTION)	UN1760	Corrosive liquids, n.o.s.
6583	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (HEMOSIL)	AY2307	
6584	CLEAN HARBORS INC	WASTE ORGANOMETALLIC SUBSTANCE, LIQUID, WATER-REACTIVE, FLAMMABLE (FORMALDEHYDE)	UN3399	Organometallic substance, liquid, water-reactive, flammable, n.o.s.
6585	CLEAN HARBORS INC	WASTE CORROSIVE LIQUIDS, NOS (HYDROCHLORIC/SULPHURIC ACID MIX)	UN1760	Corrosive liquids, n.o.s.
6586	CLEAN HARBORS INC	WASTE CORROSIVE LIQUIDS, FLAMMABLE, NOS (DICYCLOLIODARANE)	UN2920	Corrosive liquids, flammable, n.o.s.
6587	CLEAN HARBORS INC	WASTE CORROSIVE LIQUIDS, TOXIC, NOS (HYDROFLUORIC/NITRIC ACID)	UN2922	Corrosive liquids, toxic, n.o.s.
6588	CLEAN HARBORS INC	WASTE PARAFORMALDEHYDE	UN2213	Paraformaldehyde
6589	CLEAN HARBORS INC	WASTE LITHIUM	UN1415	Lithium
6590	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (SALICYLIC ACID)	AY2307	
6591	CLEAN HARBORS INC	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (SODIUM BORATE)	UN3077	Environmentally hazardous substances, solid, n.o.s.
6592	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (SODIUM PHOSPHATE)	AY2307	
6593	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (SODIUM CHLORIDE)	AY2307	
6594	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (SODIUM CHLORIDE)	AY2307	
6595	CLEAN HARBORS INC	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (FLUORESCENT DYE)	UN3077	Environmentally hazardous substances, solid, n.o.s.
6596	CLEAN HARBORS INC	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (FLUORESCENT DYE)	UN3077	Environmentally hazardous substances, solid, n.o.s.
6597	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (BORIC ACID)	AY2307	
6598	CLEAN HARBORS INC	WASTE NOT REGULATED BY TDG (DISODIUM EDETATE)	UY2307	
6599	CLEAN HARBORS INC	WASTE OXIDIZING SOLID, NOS (SODIUM NITRATE/SODIUM PERBORATE)	UN1479	Oxidizing solid, n.o.s.
6600	CLEAN HARBORS INC	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (FLUORESCENT DYE)	UN3077	Environmentally hazardous substances, solid, n.o.s.
6601	CLEAN HARBORS INC	WASTE ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, NOS (FLUORESCENT DYE)	UN3077	Environmentally hazardous substances, solid, n.o.s.
6602	CLEAN HARBORS INC	WASTE NON HAZARDOUS, NON DOT REGULATED MATERIAL (BORIC ACID)	AY2307	

UNCERTAINTIES. DATA CAN BE:

- **Inconsistent**

- Example: Company names spelled differently, e.g., AIR PRODUCTS & CHEMICALS and AIR PRODUCTS & CHEMICALS, INC
- Solution: Standardize spellings in spreadsheet

- **Variable**

- Example: Sometimes lead is liquid, sometimes lead is solid. Sometimes it's measured by weight, sometimes by volume.
- Solution: In the mapping tool, allow users to disaggregate waste by type and measure.

UNCERTAINTIES. DATA CAN BE:

- **Ambiguous**

- Example: Some waste described differently and listed under different categories, but appearing to be the exact thing:
 - WASTE CORROSIVE LIQUIDS, N.O.S. (SODIUM HYDROXIDE) - UN1760
 - WASTE CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S. (SODIUM HYDROXIDE) - UN3266
 - WASTE CAUSTIC ALKALI LIQUIDS, N.O.S. (SODIUM HYDROXIDE) - UN1719
- Solution (in development): Use small multiples to indicate differences when waste types are differently classified

- **Missing**

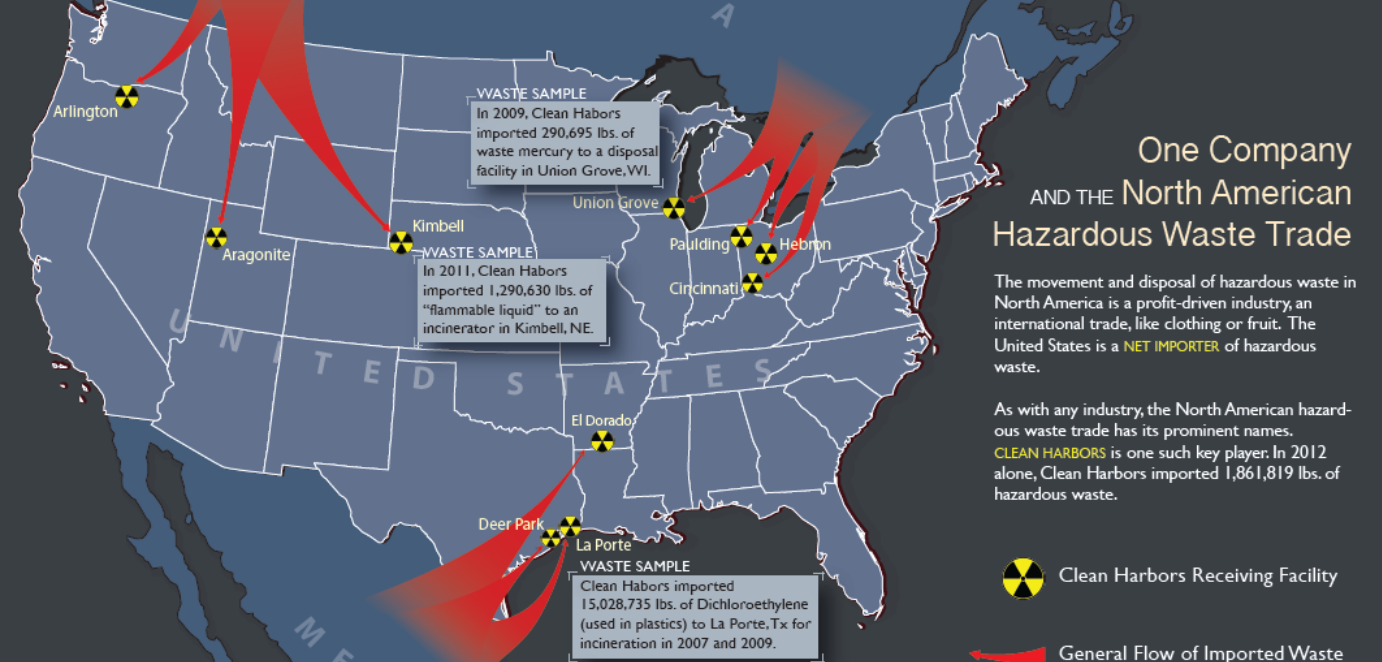
- Example: Some manifests lack information on the expected management method.

UNCERTAINTIES. DATA CAN BE:

- **Imprecise**
 - Example: "UN3077 – Environmentally hazardous substance, N.O.S. (not otherwise specified)" as a waste type or "Other reclamation" as a management method
 - Example: Geocoding exporters
 - Solution: Manually correct geocoding in Google Maps

OPPORTUNITY...

- Design Challenge
 - Take an "ecosystem" or atlas-based approach:
 - Generate a multiplicity of views of the data
- Design an interactive tool to help us better grasp the dataset and its uncertainties



How one line on a map explains 9% of the U.S.-Mexico hazardous waste trade

By Evan Applegate & Eric Nost

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Let's talk about **Clean Harbors ENVIRONMENTAL SERVICES**

a company that appears in 1/3 of the rows in the "waste importer" dataset. Its ubiquity isn't so surprising: they had **\$1 billion** in waste disposal revenues last year, and according to them most of the hazardous waste incinerated in North America goes through one of their facilities.

Most of the waste they import is leftovers from the manufacture of **vinyl chloride**, the stuff you need to make PVC pipes.

Further digging revealed that Clean Harbors imports a lot of this vinyl chloride waste: 11,089 tons from 2007-2012, which adds up to **9% of all hazardous waste imported into the U.S.** that's measured in pounds or kilograms. Where does it all come from?



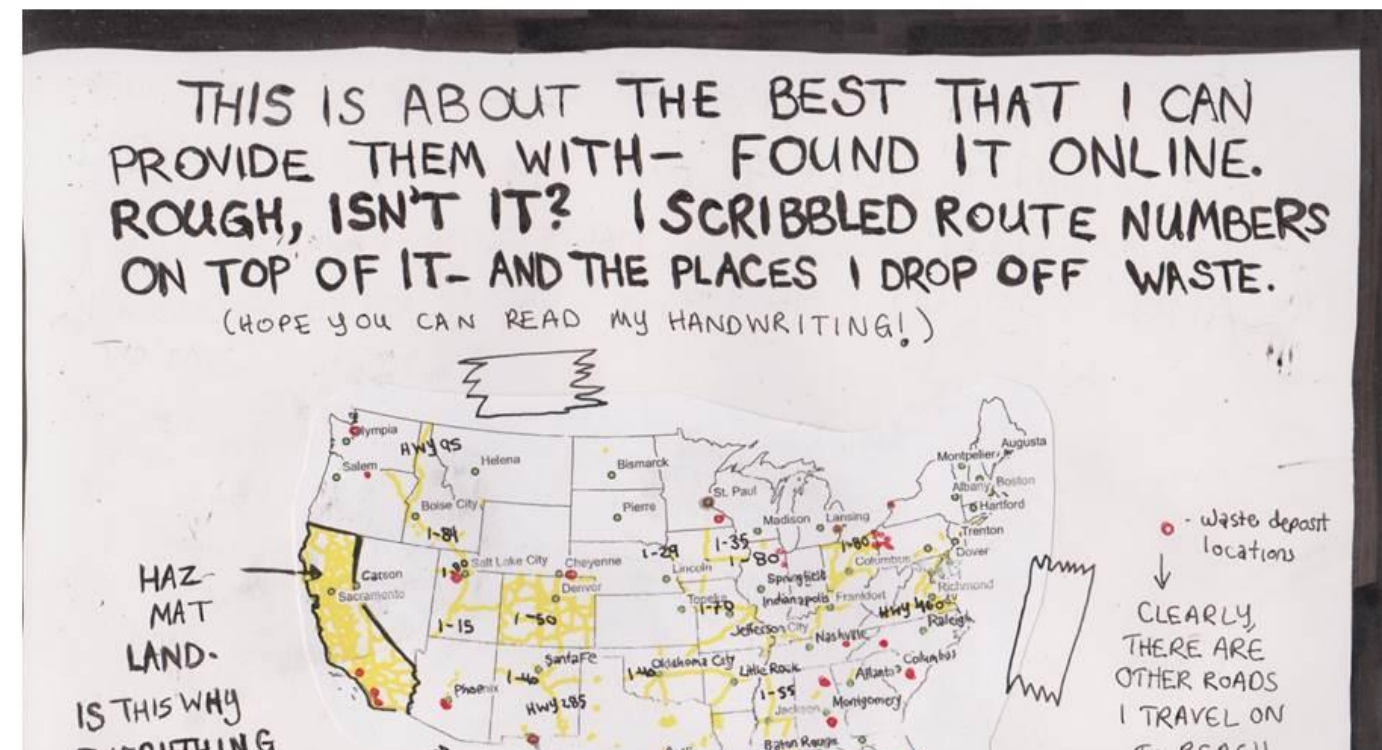
That one plant is the Deer Park facility in La Porte, Texas. But why's the waste coming 800 miles just to burn it?

4

The map holds the answer: **Pajaritos and the Deer Park facility are adjacent to ports on the Gulf of Mexico. It's a straight shot between them.** We don't have manifests but public shipping data from IHS maritime confirms that chemical tankers make regular runs between the two ports, taking on cargo in Mexico and unloading it in Texas.

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It's a simple route, and moving cargo by ship is faster than moving it by rail or truck. There's an agreement that speeds up the waste transit and that's clear: **low transportation costs equals a booming trade in waste between Mexico and the U.S.**



Clockwise from above: Evan Applegate and Eric Nost; Chelsea Nestel; Osama Abdl-Haleem

TOOL

<http://geography.wisc.edu/hazardouswaste/map>