Executive Summary

Introduction

In July 2021, Senate Bill 158 (SB 158) was approved and introduced numerous programmatic reforms to the Department of Toxic Substances Control (DTSC). One of the changes requires DTSC to develop Hazardous Waste Management Reports and Plans every three years (in accordance with Health and Safety Code § 25135). This first Report marks the starting point of an iterative process to determine the types of information and additional research needed to guide a comprehensive planning process for hazardous waste management in the state. As such, the main objectives of the first Report are the following:

- Establish a baseline understanding of the management of hazardous waste in the State of California
- Identify data gaps and items that require additional research
- Begin to develop plans to fill data gaps and complete additional research

DTSC conducted multiple outreach efforts in 2022 to encourage stakeholder input into this Report and to guide its research. DTSC established a Report webpage, e-List, introduction video, and an introductory letter that was sent to more than 15,000 interested stakeholders. In the summer of 2022, DTSC held a series of virtual workshops that highlighted research and data collection on three topics: 1) Universal Waste, 2) Manifested Hazardous Waste, and 3) Hazardous Waste Transportation. DTSC also presented to various groups, including members of the BES, representatives from the Department of Resources Recycling and Recovery (CalRecycle), Certified Unified Program Agencies (CUPAs), county representatives, and the United States Environmental Protection Agency (U.S. EPA) Region 9. Additionally, DTSC staff attended numerous meetings and workshops hosted by other groups, including BES, environmental justice organizations, and legislative hearing updates.

This Report provides information about the types and quantities of hazardous wastes generated in the state as well as the destinations and ultimate dispositions of these wastes, utilizing available data from roughly the last decade (January 2010 to May 2022).[1] Information from the Report and future iterations will be used to inform the Hazardous Waste Management Plans (Plans) that will be updated triennially. The Plans will recommend strategies to reduce hazardous waste generation, manage more waste in state, and address issues of concern such as hazardous waste impacts to disadvantaged communities. DTSC will consult with stakeholders and work in

[1] The date range was based on available computer processing capabilities at the start of the project and the data analysis software used.

coordination with the Board of Environmental Safety (BES) throughout the planning process. DTSC will prepare the first Plan by March 1, 2025, and every three years thereafter, for presentation to the Board of Environmental Safety (BES) for approval.

Hazardous Waste Management Report

DTSC's approach to hazardous waste management incorporates the concept of a "hierarchy" of waste management. The basic structure of the hierarchy has source reduction as the highest priority, followed by recycling, treatment (including stabilization), and land disposal.[2] This hierarchy helps to provide the approach that generators should consider when determining how to manage their hazardous waste. In its effort to emphasize source reduction, the state has relied on laws and policies intended to encourage less waste generation.

Hazardous waste control laws were first introduced in California in the 1970s, prior to the U.S. EPA's Resource Conservation and Recovery Act (RCRA). California developed a program of hazardous waste management that was more stringent and broader in scope than the federal program. As a result, many more wastes are identified and managed as hazardous in California than by U.S. EPA or most other states. Specifically, less than 19 percent (3.8 million tons) of hazardous wastes tracked with a manifest in California were classified as hazardous under federal criteria. These are referred to as RCRA hazardous wastes. The remaining 81 percent (more than 17 million tons) are considered hazardous in California but not by U.S EPA. These wastes are referred to as non-RCRA hazardous wastes.

Since the 1980s, California's hazardous waste management policy objective has been to responsibly manage its own hazardous waste within its own borders rather than depend on out-of-state facilities. To provide adequate capacity, the state intended to rely primarily on waste reduction and recycling, and secondarily on new facilities. This emphasis was based on three factors:[3]

1. California had grown a relatively robust waste reduction program.
2. Facility permit applications were actively being processed.
3. Legislative efforts (AB 2948 Tanner and AB 650 Tanner) were moving forward toward hazardous waste facility siting and hazardous waste management planning.

This policy goal has not been realized, and the factors that were identified in the 1980s as being favorable to increasing capacity no longer exist. Only about half (53 percent) of the hazardous waste generated in California since 2010 has been managed in state, with the rest shipped to other states or countries. Further, California no longer has an

[2] Hazardous waste Management Planning Needs and Practices: A Review of Several State Agency Approaches, US EPA, January 1, 2016
[3] State of California, Capacity Assurance Plan for Hazardous Waste Management, October 1989.

active waste reduction program, there are currently no permit applications for new hazardous waste management facilities, and additional protections for communities near permitted facilities are underway, which may further disincentivize development of additional capacity.

Over the past 40 years, California has experienced a decline in the number of operating hazardous waste facilities that have a full RCRA Equivalent Permit or Standardized Permit – a decrease from more than 400 in 1983 to fewer than 100 in 2021. Conversely, the number of generators appears to have almost doubled since 2010 to nearly 100,000 in 2021. Given the decline in hazardous waste management facilities over time and more stringent requirements for operating permitted facilities, it is anticipated that California's hazardous waste management capacity will be further reduced and that more California-generated hazardous waste will be shipped to other states.

In this first Report, DTSC presents available information regarding hazardous waste generation, disposal, and transportation, and other hazardous waste related topics as required by HSC § 25135. The data are summarized and interpreted for trends in hazardous waste management. Key findings regarding hazardous waste generation, disposal, and other notable findings are included below:

Generation

- Since 2010, the number of hazardous waste generators in California appears to have increased from approximately 55,000 to 94,500 in 2021.[4]
- The annual quantity of all types of hazardous waste tracked with a manifest has ranged from 1.4 million tons to 2.0 million tons since 2010.
- Since 2010, the quantity of manifested RCRA hazardous waste has ranged from 224,600 tons per year to 398,600 tons per year.
- The quantity of manifested non-RCRA hazardous waste fluctuated between 1,091,240 tons per year and 1,680,348 tons per year.
- Preliminary evaluation of RCRA and non-RCRA hazardous waste indicates a decline in generation from 2000 to 2021, which is consistent with prior evaluation that have concluded that the amount of all types of hazardous waste generated in California has decreased over time.[5]
- Three waste streams – contaminated soil, used oil, and other inorganic debris – make up approximately 65 percent of all hazardous waste generated since 2010.

Disposal

[4] The generator count may fluctuate depending on the database being referenced (HWTS or CERS). This Report utilizes distinct EPA IDs located on manifests that were included in HWTS. Additionally, because California issues identification numbers to both a location and an owner, this may result in an over-estimation of the number of generators.

[5] DTSC, Community Protection and Hazardous Waste Reduction Initiative, November 2017. Weblink

- The top three types of destination facilities that wastes are shipped to, either in state or out of state, are land disposal facilities, reclamation or recycling facilities, and incinerators.
- Since 2010, approximately 12.5 million tons (59.2%) of manifested hazardous waste was disposed of in land disposal units, 5.09 million tons (24.2%) was shipped for recycling, and approximately 620,000 tons (2.31%) was incinerated.
- Since 2010, 3.13 million tons (43.9%) of contaminated soil has been managed in California, while 4.00 million tons (56.1%) has been shipped out of state.
- Since 2010, the top three destination states California's generators have shipped hazardous waste to have been Utah (3,158,000 tons (15.2%)), Arizona (2,839,400 (13.4%)), and Nevada (2,169,400 (10.4%)).
- California has two permitted hazardous waste landfills. At the current rate of land disposal in state and out of state, they have an estimated 20 years of permitted capacity remaining. If all RCRA and non-RCRA waste that is destined for land disposal were to remain in California, these two hazardous waste landfills would reach their permitted capacity in 9.5 years.

Other Notable Findings

- The distance between generators and destination facilities ranged from approximately one mile to nearly 2,500 miles, with an average distance of about 500 miles. Further analysis would be needed to estimate related subjects like the annual greenhouse gas emissions from hazardous waste transportation.
- Some hazardous waste generators treat or recycle a significant quantity of waste on site. This reduces the amount of hazardous waste that must be sent off site for treatment or disposal. The degree to which these practices could be expanded requires further research.
- Pollution prevention programs have been successful in reducing specific types of hazardous waste but have not historically resulted in large percentage reductions in overall waste generation.
- Hazardous waste generators, which also frequently store and use hazardous materials, may contribute significant impacts to vulnerable and disadvantaged communities due to their proximity to these communities. Additional research is needed to determine the number of hazardous waste generators located within disadvantaged communities.
- Fifty-five percent of California's permitted hazardous waste management facilities (41 of 74) are located within disadvantaged communities.
- California's criteria for identification of hazardous waste were developed in the 1970s and early 1980s and rely on assumptions and justifications that must be reviewed to ensure they are consistent with current science and technology.

Future Work

Future planning efforts will provide the opportunity to identify hazardous waste management strategies that maximize the potential for waste reduction and recycling while ensuring protection of public health and the environment. To accomplish this, DTSC has identified four primary areas for future work, based on consideration of public input and statutory requirements:

- Hazardous Waste Criteria
- Waste Reduction
- Capacity Assurance
- Environmental Justice

Hazardous Waste Criteria

DTSC will evaluate California's current hazardous waste criteria to determine whether they are consistent with current science and technology. This review is a significant effort that will require additional research and collaboration with other internal programs and external agencies like the Office of Environmental Health Hazard Assessment. Evaluation of the criteria has begun and will include an assessment of the differences between California's criteria and U.S. EPA's criteria.

DTSC will provide recommendations for future research and various hazardous waste criteria in the Plan.

Waste Reduction

Waste generation data indicate that overall hazardous waste generation has decreased since at least 2000. DTSC will conduct research to understand the causes of this decrease. Once the causes are understood, a targeted and intentional approach to waste reduction could be developed that is focused on specific industry sectors or waste streams rather than establish a general reduction goal based on an overall percentage. This targeted approach may result in more direct positive impacts on environmental justice communities. It will be important to consider more efficient and sustainable strategies for managing waste, such as on-site treatment, on- and off-site recycling, pollution prevention, safer alternative products, and encouraging a circular economy in California.

While DTSC is not currently resourced to implement a waste reduction program, the Department will provide recommendations in the Plan regarding development of a program and strategies.

Capacity Assurance

Since the 1980s, California's stated intention has been to manage its hazardous waste within its own borders rather than depending on out-of-state facilities. To accomplish this, the state must ensure adequate capacity exists in California.

DTSC will make recommendations in the Plan to identify opportunities to realize this goal.

Environmental Justice

Since the inception of DTSC, the Department has heard multiple concerns from environmental justice communities about the management of hazardous waste and site cleanups. Concerns have included, but not been limited to, the operation and zoning of hazardous waste facilities, cumulative impacts, the transportation of hazardous waste, and the consideration of community input.

DTSC will seek community input from environmental justice communities regarding their concerns relating to the management of hazardous waste, including how it relates to site cleanups. DTSC's Hazardous Waste Plan Unit and Office of Environmental Equity will leverage ongoing outreach efforts across the department to collect information about concerns regarding hazardous waste management. DTSC will use information gathered from these discussions to inform and develop recommendations in the Plan.

Data Gaps and Additional Questions

There are several data gaps that may not be able to be resolved but should be researched. These include but are not limited to:

- The impacts of hazardous waste generators on communities
- The total disposal capacity and throughput capacity of TSDFs
- Quantification of on-site treatment and recycling of hazardous waste
- Complete analysis of data in the Hazardous Waste Tracking System (HWTS) prior to 2010

There are also several additional questions that should be considered in preparation for the Hazardous Waste Management Plan. These include:

- Can non-RCRA contaminated soil safely be disposed of in non-hazardous waste landfills in California?
- How has the limited capacity of incinerators in the United States affected California generators?
- What incentives should be provided to encourage the construction of hazardous waste facilities to treat/recycle emerging waste streams?
- Which waste streams should be targeted for treatment or reduction?

This Report is the first step in the process of creating a comprehensive plan to guide the future of hazardous waste management in the state. California was the first in the nation to implement hazardous waste control laws and now, has a novel opportunity to reexamine how hazardous waste is defined and managed in a way that is both health protective and supportive of an in-state circular economy. To further inform this report and the development of the Hazardous Waste Management Plan, DTSC will collaborate with community stakeholders, regulated businesses, tribes and other government agencies.