



ORANGE COUNTY GRAND JURY

700 CIVIC CENTER DRIVE WEST • SANTA ANA, CALIFORNIA 92701 • 714/834-3320
www.ocgrandjury.org • FAX 714/834-5555

June 25, 2020

The Honorable Steven R. Jones
Mayor of Garden Grove
11222 Acacia Parkway
Garden Grove, CA 92840

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VIA EMAIL ONLY: stevej@ggcity.org

Dear Mayor Jones:

Enclosed is a copy of the 2019-2020 Orange County Grand Jury report, "**OC Recycling: Doing it the Right Way.**" Pursuant to *Penal Code* 933.05(f), a copy of the report is being provided to you at least two working days prior to its public release. Please note that under that subsection, "No officer, agency, department, or governing body of a public agency shall disclose any contents of the report *prior to the public release of the final report.*" (Emphasis added.) It is required that you provide a response to each of the findings and recommendations of this report directed to your office in compliance with *Penal Code* 933.05(a) and (b), copy enclosed.

Please distribute this report to your governing body.

For each Grand Jury recommendation accepted and not implemented, provide a schedule for future implementation. In addition, by the end of March of each subsequent year, please report on the progress being made on each recommendation accepted but not completed. These annual reports should continue until all recommendations are implemented.

Please mail the response to the recommendations to Kirk H. Nakamura, Presiding Judge of the Superior Court, 700 Civic Center Drive West, Santa Ana, CA 92701, with a separate copy mailed to the Orange County Grand Jury, 700 Civic Center Drive West, Santa Ana, CA 92701, no later than 90 days after the public release date, June 30, 2020, in compliance with *Penal Code* 933, copy enclosed. The **due date then is September 28, 2020.**

Should additional time for responding to this report be necessary for further analysis, *Penal Code* 933.05(b)(3) permits an extension of time up to six months from the public release date. Such extensions should be advised in writing, with the information required in *Penal Code* 933.05(b)(3), to the Presiding Judge of the Superior Court, with a separate copy of the request to the Grand Jury.

We tentatively plan to issue the public release on June 30, 2020. Upon public release, the report will be available on the Grand Jury website at www.ocgrandjury.org.

Very truly yours,

Steven G. Belasco, Foreperson
2019-2020 ORANGE COUNTY GRAND JURY

SGB:tk

Enclosures: Grand Jury Report
Penal Code 933, 933.05

California Penal Code Sections §933 and §933.05

[NOTE: to reduce grand jury requests for additional response information, the grand jury has **bolded** those words in §933.05 which should be appropriately included in a response]

- §933 (a) Each grand jury shall submit to the presiding judge of the superior court a final report of its findings and recommendations that pertain to county government matters during the fiscal or calendar year. Final reports on any appropriate subject may be submitted to the presiding judge of the superior court at any time during the term of service of a grand jury. A final report may be submitted for comment to responsible officers, agencies, or departments, including the county board of supervisors, when applicable, upon finding of the presiding judge that the report is in compliance with this title. For 45 days after the end of the term, the foreperson and his or her designees shall, upon reasonable notice, be available to clarify the recommendations of the report.
- (b) One copy of each final report, together with the responses thereto, found to be in compliance with this title shall be placed on file with the clerk of the court and remain on file in the office of the clerk. The clerk shall immediately forward a true copy of the report and the responses to the State Archivist who shall retain that report and all responses in perpetuity.
- (c) No later than 90 days after the grand jury submits a final report on the operations of any public agency subject to its reviewing authority, the governing body of the public agency shall comment to the presiding judge of the superior court on the findings and recommendations pertaining to matters under the control of the governing body, and every elected county officer or agency head for which the grand jury has responsibility pursuant to Section 914.1 shall comment within 60 days to the presiding judge of the superior court, with an information copy sent to the board of supervisors, on the findings and recommendations pertaining to matters under the control of that county officer or agency head and any agency or agencies which that officer or agency head supervises or controls. In any city and county, the mayor shall also comment on the findings and recommendations. All of these comments and reports shall forthwith be submitted to the presiding judge of the superior court who impaneled the grand jury. A copy of all responses to grand jury reports shall be placed on file with the clerk of the public agency and the office of the county clerk, or the mayor when applicable, and shall remain on file in those offices. One copy shall be placed on file with the applicable grand jury final report by, and in the control of the currently impaneled grand jury, where it shall be maintained for a minimum of five years.
- (d) As used in this section "agency" includes a department.

- §933.05 (a) For purposes of subdivision (b) of Section 933, as to each grand jury finding, the responding person or entity shall indicate one of the following:
- (1) The respondent **agrees** with the finding.
 - (2) The respondent **disagrees wholly or partially** with the finding, in which case the response shall specify the portion of the finding that is disputed and shall include an explanation of the reasons therefor.
- (b) For purposes of subdivision (b) of Section 933, as to each grand jury recommendation, the responding person or entity shall report one of the following actions:
- (1) The recommendation **has been implemented**, with a summary regarding the implemented action.
 - (2) The recommendation **has not yet been implemented, but will be implemented** in the future, with a **timeframe** for implementation.
 - (3) The recommendation **requires further analysis**, with an explanation and the scope and parameters of an analysis or study, and a **timeframe** for the matter to be prepared for discussion by the officer or head of the agency or department being investigated or reviewed, including the governing body of the public agency when applicable. This timeframe shall not exceed six months from the date of publication of the grand jury report.
 - (4) The recommendation **will not be implemented** because it is not warranted or is not reasonable, with an explanation therefor.
- (c) However, if a finding or recommendation of the grand jury addresses budgetary or personnel matters of a county agency or department headed by an elected officer, both the agency or department head and the board of supervisors shall respond if requested by the grand jury, but the response of the board of supervisors shall address only those budgetary or personnel matters over which it has some decision making authority. The response of the elected agency or department head shall address all aspects of the findings or recommendations affecting his or her agency or department.
- (d) A grand jury may request a subject person or entity to come before the grand jury for the purpose of reading and discussing the findings of the grand jury report that relates to that person or entity in order to verify the accuracy of the findings prior to their release.
- (e) During an investigation, the grand jury shall meet with the subject of that investigation regarding the investigation, unless the court, either on its own determination or upon request of the foreperson of the grand jury, determines that such a meeting would be detrimental.
- (f) A grand jury shall provide to the affected agency a copy of the portion of the grand jury report relating to that person or entity two working days prior to its public release and after the approval of the presiding judge. No officer, agency, department, or governing body of a public agency shall disclose any contents of the report prior to the public release of the final report.

OC Recycling: Doing it the Right Way



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SUMMARY

The California legislature has enacted waste and recycling laws increasingly aimed at diverting the total amount of waste going to local landfills. Assembly Bill (AB) 939 enacted the California Integrated Waste Management act over 30 years ago because of an increase in waste stream and a decrease in landfill capacity. With recycling laws and mandatory recycling becoming more widespread, local jurisdictions are required to comply by implementing more and more programs. In an attempt to meet legislative mandates, Orange County cities and Orange County Waste & Recycling (OCW&R) have contracts with private waste management companies to include recycling education for residents and businesses.

Despite all good legislative intentions, there remains the modern day reality of recycling costs, sustainability of current programs and the growing need for new programs to keep up with new laws. Most recently, the international economic markets for recycling have diminished significantly. Revenues once generated from recyclables no longer offset the hauler's expenses to handle waste. Waste management companies face higher costs associated with sorting and processing trash at Material Recovery Facilities (MRF) while landfill management is working on ways to extend the life of Orange County Landfills. Declining recycling revenues combined with the increased processing costs, will be passed onto consumers in the form of higher waste collection bills as these realities come to fruition. Because of the COVID 19 pandemic, we are seeing an increased use of packaging materials, disposable paper and plastic utensils, prepackaged produce and bulk items at the grocery stores, single use plastic bags, curbside service packaging and more goods shipped directly to consumers. They all exacerbate the waste disposal problems. If trends continue, by 2050 there will be 12 billion metric tons of plastic in national landfills.¹

The Grand Jury found that 90% of cities surveyed have sole sourced their waste contracts for anywhere from 39 to 72 years with the same waste hauler. Failure to test the marketplace for competitive pricing may have led to current residential rates that vary from \$12.48 to \$23.47 per month. Similar variances exist with commercial services. Further, 80% of the surveyed cities do not have a robust recycling program for multi-family units leading to increased sorting costs for the MRF facilities and more waste being sent to landfills. While educational material exists to help businesses and residents learn what to recycle, the Grand Jury found dissemination of this information to be spotty and in most cases, incomplete, particularly for single use plastic shopping bags.

¹ Science: <https://www.howstuffworks.com/>

REASON FOR THE STUDY

Residents and businesses in Orange County commonly go about their regular routines in throwing away everyday waste. Public perceptions have been that recycling simply comes down to knowing what is recyclable, what waste is, and what goes where. Many households obligingly separate their trash but are not always certain which container is the right one to dispose of an article. The confusion is understandable given the material composition and multitude of objects thrown away in our society. The Grand Jury was interested in how local jurisdictions reach out to educate the public on the significance of recycling, the availability of information on the proper sorting of waste, and how changing industry demands could affect people's everyday habits and the rates they pay.

Following AB 939, ever more stringent requirements have been mandated by AB 341 (recycling programs for businesses and multi-family complexes), AB 1826 (business organic waste recycling) and Senate Bill (SB) 1383 (residential organic waste recycling). The Grand Jury wanted to ascertain the level of compliance by municipalities and how prepared they are to meet these mandates for residents, businesses and multi-family complexes.

METHOD OF STUDY

The Grand Jury participated in tours of the three Orange County active landfills: Prima Deshecha landfill located in San Juan Capistrano, Olinda Alpha in Brea, and the Frank R. Bowerman landfill in Irvine, all owned and operated by the County of Orange and managed by OCW&R. This enabled the Grand Jury to gain a better understanding of the refuse collection and disposal process.

The Grand Jury participated in a tour of the MRF operated by the private company, Waste Management, located at 2050 North Glassell Street, Orange, CA 92865.

The Grand Jury reviewed the legislation contained in AB 341, 939, 1594, 1826 and in SB 1383 and 270 as well as Prop 67 for an understanding of the mandates the cities, county and private trash haulers operate under.

The Grand Jury searched the internet and reviewed articles from the sites of CalRecycle (the state agency created by AB 939), OCW&R, and the Environmental Protection Agency (EPA), as well as from various sources relating to the trash hauling and the overall operations of the waste and recycling industry.

The Grand Jury identified a sampling of ten cities throughout the county as well as the County of Orange (unincorporated areas) that have agreements with all of the major private trash hauling companies servicing Orange County. The cities selected ranged from Brea in the north to Dana

Point in the south with a variety of larger (Santa Ana, Irvine) and smaller (Buena Park, Mission Viejo) cities in different geographical areas of the County. The Grand Jury thereupon requested, received, and reviewed all city and county legal contracts between the government entities and private trash haulers, and conducted interviews with city and county contract administrators on the following key contract elements:

- Current residential and commercial rate schedules
- Start and end dates of the contracts
- Date the hauler(s) began servicing the government entity
- Colors of the residential carts
- Recycling educational materials to be provided by the haulers including website hosting, flyers, billing inserts, and recycle cart instructions
- Insurance coverage for liability, auto and truck and workman's compensation
- Proof of funding for performance bonds, if contractually required
- Date of last audit by the municipality of contract terms
- Indemnification by the haulers of municipalities
- Responsible party for billing residential customers

The Grand Jury conducted interviews with waste management and recycling companies (waste haulers) that service the cities investigated.

BACKGROUND AND FACTS

California legislation is pointing the county landfills toward a Resource Recovery Facility model: this means providing recycling and diversion operations in addition to landfilling. If we all bring the right things to the landfill, we will reduce the amount of waste that we have on this earth. Over the past few decades, the California state legislature's environmental concerns led to the passage of laws that established solid waste diversion rates that significantly extend the useful life of regional landfills and, in effect, established recycling requirements for local jurisdictions. The legislature in more recent years has also focused on recycling as a part of the state's efforts to address climate change at the local level. Table 1 summarizes the significant legislation affecting local recycling efforts.

Table 1. Summary of regulations shaping the future of the waste and recycling industry

Legislation	Year Enacted	Effect on local Jurisdiction	Fines for failing to comply
<p>AB 939 Integrated Waste Management Act (IWMMA)</p>	<p>1989</p>	<p>Each jurisdiction in California is required to divert at least 50 percent of its waste away from landfills, whether through waste reduction, recycling or other means. Local jurisdictions are required to enact plans and implement recycling programs to divert 25% by 1995 and 50% of their solid waste from landfills by January 1, 2020.</p>	<p>\$10,000 per day for local jurisdictions that fail to submit an adequate element or plan or fails to implement a Source Reduction and Recycling Element (SRRE) or Household Hazardous Waste Element to CallRecycle.</p>
<p>AB 341 Mandatory Commercial Recycling</p>	<p>2011</p>	<p>The Mandatory Commercial Recycling Measure (MCRM) focuses on increased commercial waste diversion away from landfills to reduce Green House Gas (GHG) emissions. The MCRM is designed to achieve a reduction in GHG emissions of 5 million metric tons of carbon dioxide (CO₂) equivalents. To achieve the measure’s objective, an additional 2 to 3 million tons of materials must be recycled annually from the commercial sector by the year 2020 and beyond. AB 341 requires businesses, public entities and multi-family complexes to establish a recycling program to achieve a statewide 75 percent waste diversion goal by 2020.</p>	<p>Maximum fine set at \$10,000 per day.</p>
<p>AB 1594 Green Material used as ADC</p>	<p>2014</p>	<p>In September 2014, Governor Brown signed Assembly Bill (AB) 1594 (Williams, Chapter 719, Statutes of 2014), mandating that as of January 1, 2020, the use of green material as <u>alternative daily cover (ADC)</u> will no longer constitute diversion through recycling. ADC will instead be considered disposal in terms of measuring a jurisdiction’s annual 50 percent per capita disposal rate (Public Resources Code (PRC) Section 41781.3). Landfills no longer get diversion credit for Alternate Daily Cover (ADC).</p>	<p>Maximum fine set at \$10,000 per day.</p>

Legislation	Year Enacted	Effect on local Jurisdiction	Fines for failing to comply
<p>AB 1826 Mandatory commercial organics recycling</p>	<p>2014</p>	<p>Beginning in 2020, local governments can no longer use Processed Green Material (PGM) as ADC.</p> <p>Imposes requirements for recycling organic waste. Business that generate a specified amount of organic waste per week must send it to organic waste recycling services starting 2016. In addition, local jurisdictions are required to adopt an organic waste recycling program and report to CalRecycle on progress. First, CalRecycle must determine if the statewide disposal of organic waste has not been reduced by 50 percent of the level of disposal during 2014, pursuant to PRC Section 42649.81(a)(4): “On or after January 1, 2020, if the department determines that statewide disposal of organic waste has not been reduced to 50 percent of the level of disposal during 2014, a business that generates two cubic yards or more per week of commercial solid waste shall arrange for the organic waste recycling services specified in paragraph (3), unless the department determines that this requirement will not result in significant additional reductions of organics disposal.”</p>	<p>Maximum fine set at \$10,000 per day.</p>
<p>SB 1383 Education and Outreach Resources</p>	<p>2016</p>	<p>Organics Diversion and Edible Food Recovery This bill uses methane emissions reduction as the driving force for organic waste diversion and edible food recovery. The two-part bill seeks to reduce organic waste by 75% and recover 20% of edible food for human consumption by 2025.</p>	<p>Enforcement and penalties begin in January 1, 2022. See Bill SB 1383 for specifics</p>
<p>Prop 67</p>	<p>2016</p>	<p>California voters approved proposition 67, banning single use plastic carry out bags—state law. Ban on Single Use Carry out bags</p>	<p>A store or producer of reusable grocery bags that violates the law may be fined \$1,000 per day for the first violation, \$2,000 per day for the second violation, and \$5,000 per day</p>
<p>SB 270</p>	<p>2020</p>	<p>Until 2020, existing law required an operator, owner, or manager of a store or business, as defined, to establish an on property</p>	<p></p>

Legislation	Year Enacted	Effect on local Jurisdiction	Fines for failing to comply
		<p>courtesy recycling program that provided to customers the opportunity of returning clean plastic carryout bags to that store.</p> <p>Due to the COVID 19 pandemic and the necessary physical distancing measures, businesses are using single use plastic bags without penalty. And no longer allowing customers to use their recyclable reusable bags.</p>	<p>for the third and subsequent violations. -</p> <p>Per Executive Order N-54-20 signed April 22, 2020, Public Resources Code section 42283 is suspended for a period of 60 days, (starting April 22, 2020 and ending June 22, 2020).</p>

These legislative efforts have had a significant effect on the amount of waste diverted from landfills. In 1989 before the enactment of AB939, the state was only diverting about 10 percent of solid waste from landfills. A generation later, California diverted an estimated 63 percent of trash from landfills in 2016.²

² Source: <https://www.calrecycle.ca.gov/>

Landfill Management: OC Waste and Recycling

There are three active landfills within the County (Olinda Alpha, Frank R. Bowerman, and Prima Deshecha). The county department responsible for managing and operating these landfills is OCW&R. The three landfills are the final destination of all non-hazardous solid waste. Typically, the three landfills accept approximately 16,900 tons of trash per day.³

The biggest impact to these landfills is attributable to recycling legislation enacted in the past decade. In trying to meet the AB 341 goal of recycling 75 percent of its waste by 2020, the passage of AB 1594 presents even greater challenges in reaching such an ambitious target because it does not allow certain materials that are currently counted as “diversion,” i.e., green waste used as alternate daily cover at landfills. As indicated in the Director’s Message in the 2019 OC Waste and Recycling Annual Report, OCW&R... “spent much of 2019 developing plans and building relationships toward a regional solution for the imminent, industry-transforming legislation and to augment the lack of organics recycling infrastructure. Assembly Bill 1594 and Senate Bill 1383 are reshaping the waste and recycling industry. The shifts in our industry have never been more monumental.”⁴ The impact of the various Table 1 legislative efforts is discussed in the following sections of this report.

Organic Waste – Environmental Impact

California leads the nation in environmental legislation based on initiatives designed to protect people and preserve natural resources. Recycling is among these initiatives. However, recycling no longer means just bottles, cans and newspapers. The newest legislation expands recycling to include the diversion of organic waste –materials that come from living things, largely plants and food. Organics is a large portion of the waste stream (about a third). The decomposition of leaves, grass, food and other organic waste produces methane gas in landfills. It has been found that landfills are the third largest source of total methane throughout the country, and food waste alone accounts for about 18 percent of landfill disposal. (Source: CalRecycle). Methane gas is also known as greenhouse gas because it has an extreme heat-trapping capability that is destructive to the atmosphere.

To address the problem of greenhouse gases, California enacted AB 1826 in 2014 and targeted a 50 percent reduction in the landfill disposal of organic waste by the year 2020. Beginning in 2016, restaurants, supermarkets, large public venues and food processors were required to separate food scraps and green waste for organic recycling. This created a challenge for the trash haulers who had to collect the organic material and dispose of it in a cost effective manner, or pass on these costs as increased fees for ratepayers. In its investigations, the Grand Jury toured a

³ 2017-2018 O.C. Grand Jury Report, Talking Trash, Pg. 6.

⁴ OC Waste & Recycling 2019 Annual Report

MRF and discovered the waste hauler had developed and built a proprietary processing infrastructure to handle food waste collected from businesses.

In 2016, SB 1383 increased the landfill organic reduction target to 75 percent by 2025. By 2022, SB 1383 requires all organic waste generators, both residents and businesses, as well as non-local entities and local education agencies, to participate in organic material collection programs. In addition, local jurisdictions were required to adopt enforceable ordinances to ensure that all residential and commercial generators are compliant. Beginning in 2022, CalRecycle can assess penalties for noncompliance.

Only two of the ten cities surveyed have a residential organics collection service (i.e. food waste collection). All cities will eventually need to implement organics collection programs to meet these goals by 2022. Local jurisdictions will be required to provide collection service automatically to all generators (also known as universal service). At this time, most of the county's jurisdictions already have residential organics collection service for green waste. Since the SB 1383 residential food waste collection requirements will affect all residents, cities and the county will need to work with the waste industry to educate and inform many Orange County households and multi-dwellings on properly sorting and disposing of their food waste into new or different containers.

Rising Industry Costs and Waste Disposal Rates

In today's trash industry, the truth is waste disposal is increasingly more expensive. Items not recycled mean landfill deposition and, subsequently, shortening of the useful life of landfills plus higher charges to haulers, which eventually passes these costs on to the residents and businesses. For example, there are several multi-family complexes within Orange County that do not offer recycling services to their tenants, and it's this environment that generates the "dirty trash", that is, recyclable materials co-mingled with dirty disposable trash. While overseas markets like China, Indonesia, Vietnam, and India formerly accepted bales that included some dirty trash⁵, current domestic and foreign contamination standards require more sorting and cleaning of recyclables.

In Orange County, cities each contract exclusively with one commercial hauler who processes waste and recyclable items within their municipalities for both residential and commercial customers. OCW&R splits the unincorporated areas of Orange County into Franchise Areas (FA) and contracts with a range of commercial haulers to service those areas. Non-exclusive contracts are common to allow residents and commercial customers to contract for pickup of construction demolition waste with the hauler of their choice. The Grand Jury found that rates

⁵ Material containing unacceptable levels of contamination?

vary widely among the municipalities studied. Table 2 shows the current rates from lowest to highest for residential and selected commercial services. Several trends are evident:

- Waste Management and CR&R tend to charge lower rates with Republic charging the highest for both residential and commercial customers.
- Larger cities with a greater population of residents tend to pay more even if serviced by Waste Management (i.e. Santa Ana).
- FA benefit from OCW&R's ability to contract with a variety of commercial haulers to offer among the lowest commercial rates to businesses in those FA areas.
- A majority of cities investigated by the Grand Jury do not comply with the multi-family recycling requirements of AB 341 (i.e. separate bins for recyclables).
- Most cities offer some form of senior discounts.
- All offer roll out service for disabled residents.

Table 2. Selected rates for service as of March 16, 2020

Entity	Hauler	Residential Rate per month	Entity	Hauler	Commercial Rate per month
Irvine	Waste Mgmt.	\$12.48	Orange	CR&R	\$65.90
Mission Viejo	Waste Mgmt.	\$14.71	Mission Viejo	Waste Mgmt.	\$79.54
Dana Point	CR&R	\$16.03	Irvine	Waste Mgmt.	\$116.16
FA2 (Brea Islands)	CR&R	\$16.48	Dana Point	CR&R	\$120.15
FA5 (OPA)	Waste Mgmt.	\$17.43	FA1	CR&R	\$125.46
FA5 (El Mod.)	Waste Mgmt.	\$17.43	FA2 (Brea Islands)	CR&R	\$125.46
FA 6,7,8	Waste Mgmt.	\$17.43	FA2 (Placentia)	Republic	\$125.46
FA 9	CR&R	\$17.43	FA3 (Orange)	CR&R	\$125.46
Orange	CR&R	\$17.47	FA3 (Stanton)	CR&R	\$125.46
FA3 (Orange)	CR&R	\$17.76	FA5 (OPA)	Waste Mgmt.	\$125.46
Buena Park	Park Disposal	\$18.37	FA5 (Canyons)	Waste Mgmt.	\$125.46
FA1	CR&R	\$18.89	FA5 (El Mod.)	Waste Mgmt.	\$125.46
FA3 (Stanton)	CR&R	\$20.10	FA 6,7,8	Waste Mgmt.	\$125.46
Anaheim	Republic	\$21.62	FA 9	CR&R	\$125.46
Huntington Beach	Republic	\$21.83	Santa Ana	Waste Mgmt.	\$145.05
Santa Ana	Waste Mgmt.	\$21.90	Brea	Republic	\$153.24
Brea	Republic	\$21.97	Buena Park	Park Disposal	\$155.45
FA2 (Placentia)	Republic	\$22.52	Anaheim	Republic	\$167.57
Garden Grove	Republic	\$23.47	Huntington Beach	Republic	\$178.19
FA5 (Canyons)	Waste Mgmt.	\$25.52	Garden Grove	Republic	\$180.89

Waste Management and Environmental Service Providers – Industry Innovations

Major recycling legislation did not specify the methods or means to meet imposed recycling mandates. As such, cities in Orange County typically rely upon commercial waste haulers to develop workable solutions to pick up waste and recyclable material from residences and businesses within their respective jurisdictions, and in conjunction with the provider, to develop and implement local recycling programs. Some cities have a robust recycling plan that provides residents with bins for waste management. Separate bins for recyclables, trash and green waste. This enables recyclables to go directly to a dedicated MRF (otherwise referred to as a “clean” MRF) and the trash and green waste directly to the landfill. When separate bins are not offered, and sorting does not occur by the customer, all waste is put into one “trash” bin then collected and delivered to a “dirty” MRF (one that accepts unsorted material) where it is sorted and either recycled or sent to a landfill.

Over long periods, cities and OCW&R relied on provisions in long-standing agreements that required private trash companies to meet any emerging recycling legislative demands. The waste industry responded by developing proprietary technology to better sort and recycle solid waste, and recently developed new technology to collect commercial organic waste.

The processing and separating of solid waste required significant private sector capital investment and technological advancement with the creation of the MRF. The MRF is a facility that receives commingled materials and then uses a combination of equipment and manual labor (pickers) to separate and densify materials in preparation for shipment downstream to recyclers of the particular materials recovered. The recovered materials include ferrous metals, aluminum in all its shapes, polyethylene terephthalate (PET) and high-density polyethylene (HDPE) plastics, and mixed paper. The MRF has become a key component of residential and commercial single-stream recycling programs. The Waste Management MRF visited by the Grand Jury makes a concerted attempt to find as many outlets for recyclables as they can. In fact, the Grand Jury found MRFs are exceeding the mandates in AB 341 by at least 10% (required 75% by year 2020). One facility alone recycles 170 thousand tons from residential collections, and 12,750 tons from commercial gatherings per month.

During the visit to a local MRF, the Grand Jury witnessed how its operations struggled with a variety of unwanted materials such as plastic bags, large objects and waste, all of which increased the need for manual sorting, and which increases inefficiencies for MRF operators. As explained by MRF operations personnel, proper and better sorting by customers significantly increases efficiency and ultimately saves time and money. The dirtier the customer’s waste, the

more it costs to process it. Costs associated with hiring more workers to sort unwanted and nuisance articles is a major bottom-line factor, especially for many haulers⁶.

Recycled materials recovered from MRF's are eventually sold to domestic or foreign manufacturers. Most of the cities' contracts allow the haulers to retain recycling commodity profits to help offset their operating costs and, in turn, help keep waste rates down. Per CalRecycle, "California collected 44 percent of its solid waste for recycling and exported about two-thirds of that material to foreign countries for recycling and remanufacturing. This reliance has made California (and many other states and nations) vulnerable to fluctuating global commodity markets. In 2016, we exported 15 million tons of recyclable materials and 62 percent of that material was shipped to China. In 2017, China announced National Sword, which banned 24 recyclable materials from entering the country (including unsorted mixed paper and plastic), limited contamination to 0.5 percent, and increased enforcement inspections. Other Southeastern Asian countries have introduced similar import bans to aim for cleaner materials. As a result, solid waste facilities and transfer stations in California are having a hard time moving once easily exported materials. The need for a robust domestic recycling infrastructure has never been more relevant."

In the face of declining markets and lower prices for the materials they sell, such as has been experienced in recent years due to tightening import restrictions by China, waste haulers are pursuing alternate foreign and domestic markets. Should such markets not emerge, then the financial impact could negatively affect city and county contract costs that ultimately lead to higher waste rates and increased landfill rates.

State Reporting and Local Contract Auditing

In 1989, the California Integrated Waste Management Act (AB 939) established a state agency, now known as CalRecycle, to direct public attention to an increasing waste stream and decreasing landfill capacity and to administer mandates to reduce waste being disposed. As part of the requirements of AB 939, jurisdictions were to report to CalRecycle on an annual basis about local recycling, reuse, and the reduction of waste within their boundaries.

Those cities interviewed by the Grand jury indicated they use the landfill data provided by their contracted haulers, confirmed by the county landfill operator reports from OC Waste and Recycling, and other recycling information provided by the waste service provider to produce the mandatory reports sent to CalRecycle. City and county contract language allow local jurisdictions to audit contracts and conduct route inspections to verify the accuracy and legitimacy of the data and information provided by the hauler.

⁶ Laguna Beach Independent: August 6, 2018. Gabrielle Mix.

Since cities and the county have consistently complied with CalRecycle reporting requirements, the Grand Jury found that local jurisdictions were content with their contractors' overall performances based upon a review of reports submitted by the contractor. Consequently, no contract reviews or operational inspections are completed nor was documentation available for this Grand Jury to review. The Grand Jury believes best business practices dictate local jurisdictions should:

- Go out for competitive bids and negotiate shorter contract lengths as well
- Conduct periodic reviews or audits of their waste contracts
- Conduct random route inspections of their contracted waste hauler's residential and commercial pick-up services
- Periodically visit contractor MRFs to meet with operational management to review documentation and verify the disposition of recycling materials.

Waste Management Providers Current Recycling Programs

Republic Services

Of the various programs reviewed by the Grand Jury for this report, the recently launched program (2019) by Republic Services stands out for its simplicity and ability to galvanize improvements to the recycling efforts. Entitled "Empty, Clean & Dry" this consumer education program emphasizes three components⁷:

- **EMPTY:** Remove any remaining food or liquid contents from the recyclable item before placing it in a recycling container;
- **CLEAN:** Lightly rinse the recyclable item with only a small amount of water to remove any remaining residue; and
- **DRY:** Gently shake out any excess water or let the recyclable item air-dry before placing it in a recycling container.

Although almost anything can potentially be recycled, the Republic Services lists the most common contaminating items as follows:

- Ropes and cordage
- Chains
- Batteries
- Diapers
- Latex gloves
- Food
- Clothing

⁷ America Recycles, <https://www.pnnewswire.com/>

- Cell phones
- Styrofoam
- Hard cover books
- Toys

Missing from this list are single use plastic bags, which are hard to recycle and damaging to sorting equipment.

Waste Management

The programs offered by Waste Management include various flyers and newsletters explaining what is recyclable and what is not. Plastic shopping bags are not even addressed in the material the Grand Jury reviewed, leaving the resident with unanswered questions.

CR&R

Similar to the offerings of Waste Management, CR&R also produces flyers and billing inserts containing recycling information. Similar to the Waste Management material, the subject of recycling single use plastic bags is not addressed.

Public Education – Changing Behavioral Habits

Since 1989, cities and the County have contractually required private waste service providers to implement a variety of programs to address waste disposal including curbside recycling, commercial recycling programs, and organics collection. In the years since the passage of major recycling laws, the changes in the behavioral habits of citizens on properly sorting household waste may best be attributable to increased education. For comprehensive information on what can be recycled as well as how recyclable various plastics are, please see the Appendix.

The legislative mandates put upon local jurisdictions were meant to develop and provide an educational process to inform the public on the proper and best ways of sorting waste. In reviewing cities and county contracts, and as confirmed from interviews conducted, the Grand Jury generally found existing agreements delegated the bulk of such obligations to their respective waste service providers. A review of recycling education material produced and provided by waste companies showed they regularly send out notices on services and informational materials, particularly waste sorting, to its customers. The waste companies have websites that highlight recycling. They are also actively engaged in community relations, including: attending and supporting community events to promote recycling, performing as guest speaker to events (i.e., schools), offering and conducting tours of their recycling facilities, and providing regular quarterly newsletters to customers. The Grand Jury noted that recycling instructions were virtually non-existent on the recycle bins themselves. Cities and the County generally inform citizens about recycling via their respective websites, but they rely mainly on their contracted waste haulers to educate residential and commercial customers about recycling requirement updates, and to promote recycling through community relations efforts.

CalRecycle Educational Programs

The Education and the Environment Initiative (EEI), was signed into law in 2003 and required the creation of a standards-based curriculum to bring environmental literacy into California's K-12 schools. The EEI curriculum consists of 85 K-12 units that teach science and history-social science standards. By addressing 15 environmental topics, the Grand Jury sees this program as more of a general awareness of the environment since recycling tends to get lost in the plethora of global climate change, water, environmental sustainability and similar topics.

Rather than the EEI curriculum, a more directed approach to recycling for children are three newsletters that were originally published in 2009 and republished on the CalRecycle website on July 19, 2018:

- 3 Rs Edition: RecyCool Planet Newsletter
- Glass Edition: RecyCool Planet Newsletter
- Plastic Edition: RecyCool Planet Newsletter

Each edition has useful recycling information presented in an interactive way that should engage children in the recycling process. The Grand Jury encourages municipalities to utilize these materials in their local school districts.

Plastic Shopping Bags—the Achilles Heel of Recycling

The convenience of plastic shopping bags makes them a favorite mode of carrying not only grocery items but also takeout food, clothes, home repair goods, and many other items needed to be carried without fear of the bags tearing, unlike traditional heavy paper grocery bags.

The passage of Proposition 67 in 2016 led to the banning of single use carry out bags in California. Grocery stores offered incentives (sometimes called “bag points”) to encourage customers to bring their own reusable bags when shopping. Although subject to possible fines, single use carry out bags were still offered by most grocery stores and merchants on a requested basis until very recently.

With the advent of the COVID-19 pandemic and the attendant behavior changes mandated by government officials, Governor Newsom issued Executive Order N-54-20 that reinstated the use of single use plastic bags for 60 days and prohibited the bagging of groceries in bags brought in by the customer (although the customer could bag their own groceries in their reusable bags). The upshot of this change is that more plastic bags will be used in the near future.

Although according to industry sources, plastic bags can be recycled, they require more effort to do so. Specifically, the Grand Jury found that the MRF we toured had to halt their sorting line every hour or so to remove the plastic bags that became entangled in the machinery (specifically referred to as “star screens” in the industry). The excellent recycling guide offered by OCW&R

(<https://ocrecycleguide.com/RecycleGuide/AZGuide>) recommends taking plastic bags to grocery or other retailers that offer recycling services.

Given the difficulty of recycling plastic bags through the MRFs, it is the Grand Jury's recommendation that municipalities devote more effort to educating their residents about how to dispose of these single use plastic bags so that recycling efforts can be devoted to sorting items, rather than cleaning sorting equipment.

FINDINGS

In accordance with California Penal Code Sections §933 and §933.05, the 2019-2020 Grand Jury requires responses from each agency affected by the findings presented in this section. The responses are to be submitted to the Presiding Judge of the Superior Court.

Based on its investigation described here, the 2019-2020 Orange County Grand Jury has arrived at the following principal findings:

- F1. In nine of the ten cities investigated, the waste hauler has been the sole source provider to their respective city(s) anywhere from 39 to 72 years. Where there is an opportunity for service providers to compete, there is an opportunity for competitive bidding, which may result in improvements in cost and performance.
- F2. The labeling on residential bins are not always legible or have *comprehensive enough* instructions laminated or otherwise made a part of the lid, especially with regards to single use plastic shopping bags. Education and outreach efforts need to be reinforced as often as possible and a visual reminder on the recycle container will help alleviate confusion.
- F3. Orange County Waste and Recycling as well as the waste haulers provide helpful recycling education to the public where contractually required to do so. It is the Grand Jury's view that most cities delegate much of the customers/public education efforts to the waste haulers. Contracts indicate both parties are responsible for educating the public.
- F4. Cities are not in compliance with AB 341 mandates with respect to providing recycling containers for multi-family units.

RECOMMENDATIONS

In accordance with California Penal Code Sections §933 and §933.05, the 2019-2020 Grand Jury requires responses from each agency affected by the recommendations presented in this section. The responses are to be submitted to the Presiding Judge of the Superior Court.

Based on its investigation described here, the 2019-2020 Orange County Grand Jury makes the following recommendations:

- R1. All cities and county entities that do not have a contract review process in place should establish one to ensure regular reviews of service contracts are performed and that contract terms are still relevant as legislative changes are enacted. Serious consideration should be given to shortening the length of contracts to facilitate opportunities for competitive bidding where feasible. (F1)
- R2. Municipalities should ensure that recycle bins be labeled with comprehensive recycling instructions to facilitate proper sorting of waste (F2 and (F3).
- R3. Cities, that have not already do so, should implement the requirements of AB 341 as they pertain to multi-family recycling programs. Additionally, such programs need to be closely monitored by city contract administrators rather than relying solely on waste haulers to fulfill the mandates (F4).

COMMENDATIONS

In addition to having among the lowest rates for both residential and commercial trash service, the city of Irvine is one of only two interviewed cities with an aggressive multi-family recycle program. Further, they are the only interviewed city that does not charge commercial customers for servicing their recycling bins. The Grand Jury commends the city of Irvine for their commitment to recycling.

For having a comprehensive and well-publicized organics residential recycling program in place full two years before required to do so by SB 1383, the Grand Jury commends the city of Orange.

RESPONSES

The following excerpts from the California Penal Code provide the requirements for public agencies to respond to the findings and recommendations of this Grand Jury report:

§933

“(c) No later than 90 days after the grand jury submits a final report on the operations of any public agency subject to its reviewing authority, the governing body of the public agency shall comment to the presiding judge of the superior court on the findings and recommendations pertaining to matters under the control of the governing body and every elected county officer or agency head for which the grand jury has responsibility pursuant to Section 914.1 shall comment within 60 days to the presiding judge of the superior court, with an information copy sent to the board of supervisors, on the findings and recommendations pertaining to matters under the control of that county officer or agency head or any agency or agencies which that officer or agency head supervises or controls. In any city and county, the mayor shall also comment on the findings and recommendations. All of these comments and reports shall forthwith be submitted to the presiding judge of the superior court who impaneled the grand jury. A copy of all responses to grand jury reports shall be placed on file with the clerk of the public agency and the office of the county clerk, or the mayor when applicable, and shall remain on file in those offices....”

§933.05.

(a) For purposes of subdivision (b) of Section 933, as to each grand jury finding, the responding person or entity shall indicate one of the following:

(1) The respondent agrees with the finding.

(2) The respondent disagrees wholly or partially with the finding, in which case the response shall specify the portion of the finding that is disputed and shall include an explanation of the reasons therefor.

(b) For purposes of subdivision (b) of Section 933, as to each grand jury recommendation, the responding person or entity shall report one of the following actions:

(1) The recommendation has been implemented, with a summary regarding the implemented action.

(2) The recommendation has not yet been implemented, but will be implemented in the future, with a timeframe for implementation.

(3) The recommendation requires further analysis, with an explanation and the scope and parameters of an analysis or study, and a timeframe for the matter to be prepared for discussion

by the officer or head of the agency or department being investigated or reviewed, including the governing body of the public agency when applicable. This timeframe shall not exceed six months from the date of publication of the grand jury report.

(4) The recommendation will not be implemented because it is not warranted or is not reasonable, with an explanation therefor.

(c) However, if a finding or recommendation of the Grand Jury addresses budgetary or personnel matters of a county agency or department headed by an elected officer, both the agency or department head and the board of supervisors shall respond if requested by the grand jury, but the response of the board of supervisors shall address only those budgetary or personnel matters over which it has some decision-making authority. The response of the elected agency or department head shall address all aspects of the findings or recommendations affecting his or her agency or department.

(d) A grand jury may request a subject person or entity to come before the grand jury for the purpose of reading and discussing the findings of the grand jury report that relates to that person or entity in order to verify the accuracy of the findings prior to their release.

(e) During an investigation, the grand jury shall meet with the subject of that investigation regarding the investigation, unless the court, either on its own determination or upon request of the foreperson of the grand jury, determines that such a meeting would be detrimental.

(f) A grand jury shall provide to the affected agency a copy of the portion of the grand jury report relating to that person or entity two working days prior to its public release and after the approval of the presiding judge. No officer, agency, department, or governing body of a public agency shall disclose any contents of the report prior to the public release of the final report.

(Amended by Stats. 1997, Ch. 443, Sec. 5. Effective January 1, 1998.)

Responses Required

Comments to the Presiding Judge of the Superior Court in compliance with *California Penal Code Section 933.5* are required from:

Findings

County of Orange Board of Supervisors	F2,4
City councils of the following cities:	
City of Anaheim	F1,2,3,4
City of Brea	F1,2,3,4
City of Buena Park	F1,2,3,4
City of Dana Point	F1,2,3
City of Garden Grove	F1,2,3,4
City of Huntington Beach	F1,2,3,4
City of Irvine	F1,2,3
City of Mission Viejo	F1,2,3,4
City of Orange	F2,3,4,
City of Santa Ana	F1,2,3,4

Recommendations

County of Orange Board of Supervisors	R1,2,3
City councils of the following cities:	
City of Anaheim	R1,2,3
City of Brea	R1,2,3
City of Buena Park	R1,2,3
City of Dana Point	R1,2
City of Garden Grove	R1,2,3
City of Huntington Beach	R1,2,3
City of Irvine	R1,2
City of Mission Viejo	R1,2,3
City of Orange	R1,2,3
City of Santa Ana	R1,2,3

GLOSSARY

Hazardous Waste - Speaking in general terms, hazardous wastes are solid wastes that are toxic, ignitable, reactive, or corrosive according to Chapter 11 of Division 4.5 of Title 22 of the California Code of Regulations.

Household Hazardous - Waste includes paint, antifreeze, used motor oil, batteries, pesticides, caustic cleaners, needles, fluorescent light bulbs, medications, and other items that may present handling problems or other hazards if they are left in the solid waste stream.

Integrated Waste Management - Managing waste by multiple techniques to achieve solid waste and resource conservation goals. The techniques may include waste reduction, reuse, recycling, composting, transformation, disposal to landfills, and other means.

Municipal solid waste or MSW - "Municipal solid waste" or "MSW" means all solid wastes generated by residential, commercial, and industrial sources, and all solid waste generated at construction and demolition sites, food-processing facilities, and treatment works for water and waste water, which are collected and transported under the authorization of a jurisdiction or are self-hauled. Municipal solid waste does not include agricultural crop residues (SIC Codes 071 through 0724, 0751), animal manures (SIC Code 0751), mining waste and fuel extraction waste (SIC Codes 101 through 1499), forestry wastes (SIC Codes 081 through 0851, 2411 and 2421), and ash from industrial boilers, furnaces, and incinerators.

Organic waste - "Organic waste" means solid wastes originated from living organisms and their metabolic waste products, and from petroleum, which contain naturally produced organic compounds, and which are biologically decomposable by microbial and fungal action into the constituent compounds of water, carbon dioxide, and other simpler organic compounds. Sometimes called **biodegradable waste**.

Processed Green Material or PGM – consists of yard wood wastes that are dried, crushed, shredded, and sorted. These yard wastes should not contain grass clippings or leaves, which compost quickly and can cause odor violations.

Recycling - Using waste as material to manufacture a new product. Recycling involves altering the physical form of an object or material and making a new object from the altered material.

Solid wastes - Discarded or abandoned materials. Solid wastes can be solid, liquid, semi-solid or containerized gaseous material. For regulatory purposes, **hazardous waste** is a subset of solid waste.

Waste - Objects or materials for which no use or reuse is intended.

Source: CalRecycle

ACRONYMS

A list of definitions for uncommon terms and acronyms is included here

AB	Assembly Bill
ADC	Alternative Daily Cover
CalRecycle	California Department of Resources Recycling and Recovery
COVID-19	Corona Virus Disease, 2019-2020
EEI	Education and the Environment Initiative
EPA	Environmental Protection Agency
FA	Franchise Areas
GHG	Green House Gas
HDPE	High-Density Polyethylene
IWMA	Integrated Waste Management Act
MCRM	Mandatory Commercial Recycling Measure
MRF	Material Recovery Facility
OCW&R	Orange County Waste & Recycling
PET	Polyethylene Terephthalate
PGM	Processed Green Material
PRC	Public Resources Code
SB	Senate Bill
SRRE	Source Reduction & Recycling Element

APPENDIX





In compiling this report from various credible sources, one of the Grand Jury's goals was to be able to provide a comprehensive recycling guide to the readers of this report. The website below containing a list of recycling options from OCW&R is very complete and can be accessed directly at <https://ocrecycleguide.com/RecycleGuide/AZGuide>.

The Grand Jury acknowledges all efforts to inform and educate the public on matters of what is trash and what is reusable are necessary and important, though evolving conditions are changing with every passing day. From the grammar schools to the universities, to community recycling or retail programs, and through general education spots on television and in print – the more everyone knows and appreciates our concern for the future, the better our society will benefit.

1. Recyclable plastic types by recycling symbol number



Plastic products are typically labeled with a number surrounded by the recycling symbol. These numbers and labels identify both the type of resin used to make the plastic and the products' recyclability. Associated with the different types of resin are potential health risks. The following table summarizes seven different types of commonly used plastics, product examples, recyclability, and potential health risks.


USED FOR	RECYCLABILITY	HEALTH	NOTES
PLASTIC #1 - POLYETHYLENE TEREPHTHALATE (PET)			
 <ul style="list-style-type: none"> soft drink, water, and other beverage bottles detergent and cleaning containers peanut butter and other food containers and bottles 	PET is recycled into: new bottles, polyester for fabrics and carpet, fill for bumper cars and fiberfill for sleeping bags and jackets.	No known health issues.	PET is one of the most easily recycled plastic.
PLASTIC #2 - HIGH DENSITY POLYETHYLENE (HDPE)			
 <ul style="list-style-type: none"> milk and water jugs laundry detergents, shampoo, and motor oil containers shampoo bottles some plastic bags 	Clear HDPE containers are easily recycled back into new containers. Colored HDPE are converted into plastic lumber, lawn and garden edging, pipes, rope, and toys.	No known health issues.	HDPE is easily recycled.
PLASTIC #3 - POLYVINYL CHLORIDE (PVC OR V)			
 <ul style="list-style-type: none"> clear food packaging, cling wrap detergents and window cleaner bottles some plastic squeeze bottles, cooking oil and peanut butter jars vinyl pipes shower curtains flooring, home siding, and window and door frames 	PVC is one of the least recyclable plastic due to additives. Potentially harmful substances are also created by its disposal.	Many harmful chemicals are produced in the manufacturing, disposal, or destruction of PVC including: <ul style="list-style-type: none"> Lead DEHA (di(2ethylhexyl)adipate) Dioxins Ethylene dichloride Vinyl chloride Effects of exposure to these chemicals may include: decreased birth weight, learning and behavioral problems in children, suppressed immune function and disruption of hormones in the body, cancer and birth defects, genetic changes.	Harmful chemicals created as a byproduct of PVC can also settle on grassland, where they can be consumed by livestock, and accumulate in meat and dairy products that are directly ingested by us.
PLASTIC #4 - LOW DENSITY POLYETHYLENE (LDPE)			
 <ul style="list-style-type: none"> bread, frozen food, and grocery bags most plastic wraps some bottles 	LDPE is not usually recycled.	No known health issues.	While no known health effects associated with the use of this plastic are known, organic pollutants are formed during manufacturing.

Just because the recycling number on a plastic object indicates that it is potentially recyclable doesn't necessarily mean that it is. Normally, only #1 and #2 plastic bottles with narrow necks are recycled. Check to see what plastics your local waste management organization recycles. The Earth911 Web site is a good place to start your search: www.earth911.org


**Smart
Plastics
Guide**

NATIONAL GEOGRAPHIC'S
STRANGEDAYS
ON PLANET EARTH

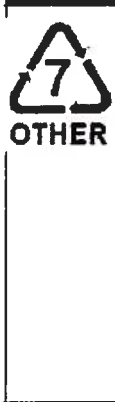
PLASTIC #5 - POLYPROPYLENE (PP)

	<ul style="list-style-type: none"> • deli soups, syrup, yogurt and margarine containers • disposable diapers • outdoor carpet • house wrap • clouded plastic containers, e.g. baby bottles, straws 	<p>PP is not easily recycled. Differences in the varieties of type and grade, mean achieving consistent quality during recycling is difficult.</p>	<p>No known health issues.</p>
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PLASTIC #6 - POLYSTYRENE (PS)

	<p>Rigid Polystyrene</p> <ul style="list-style-type: none"> • CD cases • disposable cutlery <p>Formed Polystyrene (Styrofoam)</p> <ul style="list-style-type: none"> • food containers • packaging • insulation • egg cartons • building insulation 	<p>Recycling PS is possible, but not normally economically viable.</p>	<p>Styrene can leach from polystyrene. Over the long term, this can act as a neurotoxin. Studies on animals report harmful effects of styrene on red-blood cells, the liver, kidney, and stomach organs¹.</p> <p><small>¹ US Environmental Protection Agency (1992) "Styrene". Air Toxics Website. Retrieved on 3/1/2008 from http://www.epa.gov/ttn/atah/t/01/styrene.html</small></p> <p>Styrene can be absorbed by food, and once ingested can be stored in body fat. It is thought that repeated exposure could lead to bioaccumulation².</p> <p><small>² WHO International Programme On Chemical Safety "Styrene". Environmental Health Criteria 26. Retrieved on 3/1/2008 http://www.inchem.org/documents/ehc/ehc/ehc26.htm</small></p>	<p>Try reusing styrofoam packing peanuts, and polystyrene cutlery where practical.</p>
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PLASTIC #7 - MIXED (OTHER)

	<ul style="list-style-type: none"> • lids • medical storage containers • electronics • most plastic baby bottles • 5-gallon water bottles • "sport" water bottles • metal food can liners • clear plastic "sippy" cups • some clear plastic cutlery 	<p>Mixed resin plastics like #7 are difficult, if not impossible, to recycle.</p>	<p>Health effects vary depending on the resin and plasticizers in this plastic that often includes polycarbonates. Polycarbonate plastic leaches bisphenol A (BPA) a known endocrine disruptor. By mimicking the action of the hormone, estrogen, bisphenol A has been found to: effect the development of young animals; play a role in certain types of cancer; create genetic damage and behavioral changes in a variety of species.</p> <p>bisphenol A is widespread—one study found BPA in 95% of American adults sampled¹.</p> <p><small>¹ Calafat, A.M., Kuktenyik, Z., Reidy, J.A., Caudill, S.P., Soto, A. & Needham, L.L. (2005) "Urinary Concentrations of Bisphenol A and 4-Nonylphenol in a Human Reference Population". Environmental Health Perspectives 113: 391-395. Retrieved 3/1/2008 from http://www.ehponline.org/viewfulltext.php?id=ehp.113.3.391</small></p>	<p>The number of studies documenting the detrimental effects between BPA and health are increasing.</p>
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TIPS FOR USE OF PLASTIC CONTAINERS WITH FOOD

- Avoid heating food in plastic containers. Heat can release chemicals so avoid heating food in plastic containers. For the same reason, only drink cold liquids from plastic containers.
- Wash plastic containers in mild detergents. Harsh detergents help liberate chemical from plastics making the container much more likely to leach chemicals into food.
- Avoid using plastic packaging where you can. For example, bring reusable bags when grocery shopping, and your own "to-go" containers when dining out.
- Select safe plastics for food storage. Only use plastic containers with the recycling #1, #2, #4 and #5 for food storage. Consider switching to glass storage containers since plastic containers can leach chemicals into the environment and your food as they age and become used.



Compiled by Sea Studies Foundation www.seastudies.org
Sources: Earth911.org, Institute of Agriculture and Trade Policy, WHO International Programme on Chemical Safety, U.S. EPA