



Bay Area Hazardous Waste Management Facility Allocation Committee

Administered by:
Association of Bay Area Governments

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To: Bay Area Hazardous Waste Management Facility Allocation Committee
From: Technical Advisory Committee
Re: Proposed Committee Project: *Sustainable Processing of Universal Waste and Electronics*
Date: January 27, 2012

The Bay Area Hazardous Waste Management Facility Allocation Committee (Committee) has monitored Bay Area hazardous waste trends since 1989. Responding to state legislation, the Committee developed a regional fair-share approach for siting treatment facilities. In 2003 the Committee requested an in-depth look at the region's hazardous waste treatment capacity. Since that time the Region's treatment capacity has continued to decline. The most recent analysis of Bay Area data indicated that in 2009, over 80 percent of hazardous waste in the Bay Area was exported for treatment elsewhere.

Following the 2006 California legislation that made it illegal to dispose of universal waste (UW) products (e.g., fluorescent lamps, alkaline batteries, and electronic product) in the trash, the volume of these wastes has drastically increased at household hazardous waste (HHW) collection facilities. The challenges to local governments of managing this burgeoning volume was highlighted in the October 29, 2010 Committee report, *Hazardous Waste Generation and Treatment Trends*.¹ Ultimately most universal waste is shipped not just out of the region, but outside the U.S. for treatment/resource recovery.

Over the years, the Committee has demonstrated an interest in managing at least some of these wastes in the region. There are a number of reasons why local processing of UW may be a more sustainable option for the Bay Area.

- The lack of recycling-based manufacturing and processing facilities means that the higher paying recycling jobs are located outside the region.² Increased local recovery capacity has the potential to stimulate investment and the creation of jobs in the de-manufacturing, recycling, and reuse industries.
- Underutilized industrial lands are at risk of conversion to other uses. Identifying productive uses for these sites contributes to a more sustainable, resilient, balanced regional economy.
- The types and volumes of wastes that are considered hazardous are on the rise; while the draft Green Chemistry rules require manufacturers of products that contain chemicals of concern to develop product stewardship plans, the rules will potentially

¹ <http://www.abag.ca.gov/hazwaste/staffmemos.html>

² CalRecycle (aka Integrated Waste Management Board), 2003. Benefits of Regional Recycling Markets: An Alameda County Study.

result in new categories of consumer products that must be handled differently from the way they are handled today.

- Shipping these items outside the region and/or outside the country increases the region's carbon footprint. In addition, because processors in other countries may not be bound by regulations as stringent as those in the U.S, their activities may expose workers and the environment to serious harm.

With the need growing, and technologies improving, it may be appropriate to initiate an effort to examine the potential to site such facilities in the Bay Area at this time.

Fiscal Year 2012-13 Work Plan: Proposed White Paper

On October 7, 2011 the Technical Advisory Committee (TAC) met to plan for the next biennial analysis (during fiscal year 2012/13) of the Bay Area's 2010/11 hazardous waste generation and treatment trends. As an alternative to performing that analysis, the TAC discussed the possibility of researching how the Bay Area might encourage businesses to site state-of-the-art U and E-waste recycling facilities here. In addition to meeting the committee's objective of treating more hazardous wastes locally, such facilities might have other significant benefits:

1. **Create jobs** – provide good "green" and "green collar" jobs in de-manufacturing and re-manufacturing,
2. **Stimulate economic development** – preserve and put underutilized industrial areas back to use,
3. **Realize savings** - reduce financial costs and environmental impacts of shipping materials out of the region,
4. **Achieve sustainability** - reclaim and reuse resources from our waste stream resulting in a reduced burden on nonrenewable natural resources, and
5. **Promote resiliency** - contribute to a more diverse and sustainable economy.

The TAC discussed producing a white paper with four sections. The *first section* would identify specific u-wastes as opportunities/challenges for siting recycling facilities for certain universal and electronic wastes that show promise for local recovery. The white paper would consider the following products to investigate further: batteries, fluorescent bulbs, cell phones, computers, rigid plastics, and leaded glass. Each product would be evaluated as to how potentially successful it would be to site a processing facility based on readily available information.

Evaluation criteria would include:

- Innovative waste treatment technology
- Low or no threat to the environment or public health
- Largest flow of waste
- Public acceptance
- Ease of permitting
- Manufacturer's priorities
- Cost
- Local demand

The TAC has identified the following diverse group of public, private, and non-profit organizations as stakeholders that could contribute knowledge and expertise:

- Planning / Community & Economic Development departments
- CalRecycle Recycling Market Development Zones
- Community/Social Equity/Environmental Justice groups (Urban Habitat, Green for All)
- Public agencies and affiliates (Cal EPA, US EPA, Governor's Office of Economic Development, CalRecycle, Department of Toxic Substances Control, Bay Area Air Quality Management District, SF Bay Water Quality Control Board, California Product Stewardship Council)
- Environmental groups (Natural Resources Defense Council, Environmental Defense Fund, Silicon Valley Toxics Coalition)
- Brownfields reuse organizations (Center for Creative Land Recycling)
- TSDs and/or Waste Disposal Companies
- Business and labor organizations
- Product manufacturers/de-manufacturers/remanufacturers
- Academic / research community

In order to conduct the research and ground-truth the evaluation, we would contact a representative sub-set of these stakeholders for input. The perception that a U-Waste recycling facility would be undesirable in local communities ultimately could be the largest obstacle to overcome. While the extensive level of outreach needed to fully address this perception is beyond the scope of the White Paper, we plan to work with key stakeholders who can help us to frame the issues constructively.

The **second section** of the white paper would delve into lessons learned from past efforts to site recycling/processing facilities: For example, the US EPA funded a California Integrated Waste Management Board (now CalRecycle) project in Alameda County to develop regional recycling markets by assisting recycling businesses to locate in close proximity to an existing facility (Waste Management's Davis Street Transfer Station).³ The CalRecycle project capitalized on existing StopWaste.Org grants to local businesses and the Oakland/Berkeley Recycling Marketing Development Zone program. The CalRecycle project tested the hypothesis that recycled commodities would be "more marketable if collected and used as a manufacturing feedstock within the region in which they were generated". The project provided technical assistance, financing, and a consistent feedstock for recycling. Although the initial results, reported in 2003, were glowing (i.e., creation of 100 jobs, 140,000 tons of waste per year diverted, and the development of new, innovative recycling techniques), one-third of the featured businesses are now defunct. Learning why some succeeded while others failed could provide valuable input to future efforts.⁴

The white paper's **third section** would explore other potential obstacles to siting and/or operating U-Waste recycling facilities in the Bay Area. At present, electronics is a category of wastes for

³ CalRecycle (aka Integrated Waste Management Board), 2003. Benefits of Regional Recycling Markets: An Alameda County Study.

⁴Tom Padia, November 21, 2011. Source Reduction and Recycling Director, StopWaste.org, personal communication.

which information is more readily available, and thus is used here to illustrate some of the challenges. Two current initiatives, one to process polymers and the other to process batteries are also briefly noted. If the project goes forward, the opportunities and challenges to process these and other wastes would be fully explored.

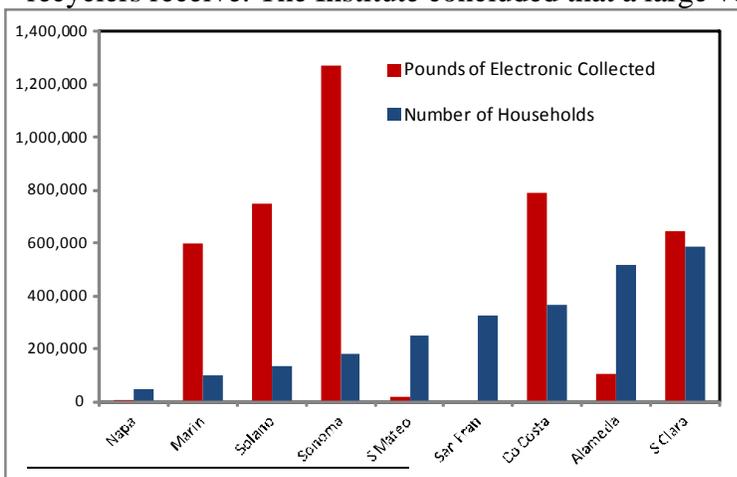
Electronics Recycling

Expanding the capacity for used electronics recycling in the Bay Area faces many obstacles, despite the passage of regulation in California that provides built-in financial incentives. The obstacles include higher costs to local governments, low recycling rates amongst households, small number of local recyclers, and concerns regarding the lack of uniformity in safe and secure recycling practices. Each of these obstacles is touched upon below, as an example of the types of issues the project would explore in greater depth.

In 2003 SB 20, the Electronic Waste Recycling Act, established an Advanced Recycling Fee (ARF) on retail sales of electronic wastes. Recyclers are reimbursed at a rate \$0.48/lb for eligible products collected and recycled, \$0.20/lb. of which must be passed on to the approved collector. The Act was subsequently amended by SB 50, and expanded by emergency DTSC regulation. Local agencies have found the ARF “difficult to implement and administer”. A considerable amount of bureaucracy has been created to establish, collect, and disperse fees and to certify recyclers.⁵

Currently, the wastes that were “covered” under the Act, as amended, are video display devices with screens greater than four inches that are presumed to be hazardous when disposed including cathode ray tube (CRT) devices, CRT televisions and computer monitors; liquid crystal display (LCD) televisions and desktop monitors; laptop computers with LCD displays; portable DVD players, and plasma televisions sold in California. HHW programs also collect a significant volume of “non-covered” video display devices.

The Institute for Electronic Recyclers conducted a national survey in 2010 and found a low recycling rate amongst consumers/households. Despite the fact that the consumer market constitutes the largest electronics volume purchased, it constitutes only 26 percent of what recyclers receive. The Institute concluded that a large volume of electronics most likely ends up



in landfills. In addition, they report that increasing the recycling volume amongst consumers/households “will inevitably spur economic growth and job creation with an expanded industry.”⁶

Covered and universal electronic wastes collected in 2008/09 by HHW programs, as reported to DTSC on 303 forms, are shown here along with the

⁵ Rob D’Arcy, 2006. Local Governments’ Looming Fiscal Crisis - Household Hazardous Products and the Need for Extended Producer Responsibility. www.calpsc.org/assets/policies/thru2008/CA_HHW_EPR_D%27Arcy_White_Paper.pdf

⁶ International Data Corporation, 2011, Survey, Inside the US Electronics Recycling Industry.

number of households by county. Sonoma County reported the highest amount (1.3 million pounds). Sonoma County has consistently collected over 1 million pounds for the past three years. Staff at the Sonoma County Waste Management Agency attribute their high volumes to their aggressive advertising program.⁷ Sonoma County HHW electronics are shipped to ECS Refining in San Joaquin County (Stockton).

The variability between counties likely reflects the additional collections done by private companies that are not reflected on the 303 forms. A search of CalRecycle’s database of recyclers approved to accept covered electronic products indicates that statewide there are over 500 collectors, but just over 50 that actually do recycling. There are 10 approved recyclers in the Bay Area. The General Accounting Office reports that, “while some exported used electronics can be handled responsibly... a substantial amount ends up in countries such as China and India, where they are often handled and disposed of unsafely.”⁸ Secure destruction of all sensitive information and materials must be guaranteed, and industry experts are finding that the “reverse logistics” or the process of ensuring safe handling and destruction of potentially sensitive information stored on computers is not standardized.⁹ Third-party certification, such as R2 and e-Steward provide mechanisms to ensure environmental, worker health and safety, and security practices are adhered to.¹⁰ Four of the ten Bay Area recyclers who are approved by DTSC to recycle covered electronics have received third party certification.

Used Electronics Collectors and Recyclers by County		
County	Collectors ¹	Recyclers ¹
Alameda	45	5
Contra Costa	21	1
Marin	5	0
Napa	4	0
San Mateo	10	0
San Francisco	2	0
Santa Clara	38	4
Solano	6	0
Sonoma	8	0
Total	139	10

¹ CalRecycle database, 2011. Approved to accept SB50/SB20 covered wastes.
www.calrecycle.ca.gov/Electronics/Reports/Search.aspx

Promising Recycling Prospects

TAC members have suggested following up with two recyclers--MBA Polymers and Akkuser—that might be good prospects for a Bay Area facility. We understand that both companies have sought to locate/expand in the Bay Area. MBA Polymers is an international company headquartered in Richmond, CA. They are equipped to receive complex waste streams, separate out the polymers, and purify them for reuse. MBA Polymers recycles plastics from goods including appliances, autos, computers, and electronics. Their primary recycling operations take place in China, Austria, and the UK. The Richmond headquarters is a research-only facility.

⁷ Lisa Steinman, November 21, 2011. Waste Management Specialist, Sonoma County Waste Management Agency. Personal Communication.

⁸ General Accounting Office, August 2008, Electronic Waste: EPA Needs to Better Control Harmful U.S. Exports through Stronger Enforcement and More Comprehensive Regulation, GAO 08-1044. <http://www.gao.gov/new.items/d081044.pdf>

⁹ Haber, Terry, 2011. Bringing Standardization to Asset Recovery Logistics, Reverse Logistics Magazine, Edition 31, 2011. <http://viewer.zmags.com/publication/d9a28d6b#/d9a28d6b/4>

¹⁰ R2 Solutions www.R2solutions.org. e-Stewards www.e-stewards.org

Akkuser is a Finland- based ISO 14001 and ISO 9001 certified battery recycling company that has sought to expand operations in Santa Clara and Alameda County. Akkuser has patented Dry-Technology® to separate and process metals back into their elemental form for reuse in foundries. For the past five years, Akkuser has successfully recycled rechargeable batteries throughout Scandinavia. New technology has been developed to efficiently recycle alkaline batteries at an estimated cost of about 25 cents per pound. In a prospectus provided to Santa Clara County, Akkuser estimates that seven crushing and fourteen leaching plants would be needed to recycle all the alkaline batteries generated within California. In order to recycle rechargeable batteries not currently collected (4,536 tons), Akkuser estimates the need for three crushing plants in California. This table summarizes the number of jobs created by both a baseline scenario (one alkaline battery crushing plant, two alkaline leaching plants, and one rechargeable plant) and a full-scale scenario to meet statewide recycling demand, as determined by Akkuser.

Potential Jobs Created by CA Battery Recycling				
	Alkaline		Rechargeable	
Job Type	Baseline	Full-scale	Baseline	Full-Scale
Operations	34	378	14	42
Sorting	48	310	8	24
Office	4	40	3	9
<i>Sub-total</i>	86	728	25	75
Construction	65	455	19	57
<i>Total</i>	151	1,183	44	132
Other Permanent Jobs		Full-Scale Statewide Implementation		
Collection Logistics		3,700		
Retail Collections		8,880		
Data supplied by Akkuser, Hørsholm, Denmark				
Alkaline: Baseline=1 crushing, 2 leaching plants; Full-scale= 7 crushing,15 leaching plants				
Rechargeable: Baseline=1 plant; Full-scale=3 plants				
Plant jobs are full-time permanent; construction jobs are temporary, 9 months				

While we haven't yet researched this extensively, a recent article in the New York Times¹¹ describes how household batteries are being shipped to Mexico for processing where the rules are less stringent and enforcement virtually nonexistent. Just south of our border, workers, residents, and the environment are being exposed to dangerous levels of lead. According to the article, about 20 million batteries will cross from the U.S. into Mexico this year.

The *final section* of the white paper would recommend future actions such as developing a pilot project locally, applying for a grant for additional research, etc.

Recommendation

The TAC recommends that the Hazardous Waste committee postpone the scheduled analysis of Bay Area Hazardous Waste Trends (covering the 2010/2011 data) currently scheduled for FY 2012/13. Instead of conducting that analysis, the TAC recommends that staff, the TAC, and a consultant collaborate on developing the white paper outlined above. A key piece of the effort would be to work with stakeholders who could inform and advise the work as it proceeds. The TAC would present the Draft White Paper summarizing the results of our research, findings, and recommendations for future action at a Committee meeting in FY 2012/2013.

¹¹ Rosenthal, Elisabeth, December 8, 2011. Lead from Old U.S. Batteries Sent to Mexico Raises Risks. New York Times.