



August 11, 2010

Department of Toxic Substances Control (DTSC)
P.O. Box 806
Sacramento, CO 98512-0806

Attention: Ellen L. Haertle, MS-22
ehaertle@dtsc.ca.gov

Re: Comments on Proposed Standards for Management of Waste Solar Panels

Dear Ellen Haertle and DTSC,

Attached are comments from pv recycling, llc in reference to DTSC's Proposed Standards for Management of Waste Solar Panels, Department Reference Number R-2010-01.

pv recycling, llc has concerns regarding DTSC's approach which will deregulate management of photovoltaic (PV) modules and photovoltaic manufacturing scrap, regardless if it is classified as hazardous or universal. Due to the unwillingness of those generating PV module waste to voluntarily pay for collection and recycling, the only treatment option is to hold manufacturers accountable for waste stewardship through pre-financed extended producer responsibility (EPR). EPR fits with California's Green Chemistry Initiative, and a well designed EPR can promote eco-design and green innovation. pv recycling, llc has already started developing, with input from photovoltaic module manufacturers, an infrastructure to operationalize an EPR system. Conceptually the manufacturers, and other industry representatives, want collection and recycling programs, and will finance these efforts when required by regulation. Basically, if they all have to invest in a program it "levels the playing field" for the additional cents per watt they must charge their customers. (See Attachments A and B)

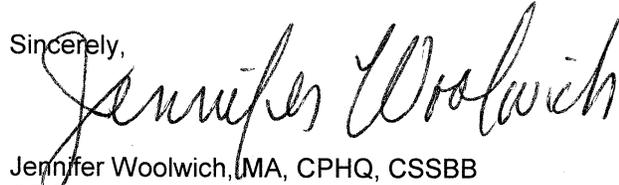
Technically reports on TCLP, TTLC, and STLC from the Non-Toxic Solar Alliance (NTSA), the Norwegian Geotechnical Institute (NGI), and a review of both studies by the Wuppertal Institute for Climate, Environment, and Energy all suggest that a number of photovoltaic (PV) modules sold and installed in California fail toxicity tests. Data demonstrates that for the current and future PV installations in California, large quantities consisting of millions of pounds of these modules will need disposal. (See Appendix C) However, current capacity to recycle all module technology types is far below, to nonexistent, than what is and will be demanded. Without a pre – financed collection and recycling systems, there will be no funding available to support the needed infrastructure to recycle PV modules, and manufacturing scrap now and in the future.

It is important to note that a recent European decision to grant a four-year exemption to the Restriction on Hazardous Substances (RoHS) and Waste Electrical and Electronic Equipment Directive (WEEE) was based on the apparent efforts of PV CYCLE and the European PV Industry Association (EPIA) to establish a national recycling and collection scheme in Germany. For two years, pv recycling, llc has worked very closely with PV CYCLE, the Solar Energy Industry Association (SEIA), and other decision makers in manufacturing, to develop a collection and recycling model that meets the needs of the industry. As a result pv recycling, llc's business plan was composed and continues development to meet the needs of the industry. (See Attachment J) As mentioned above, these entities will finance such programs both on the state and national levels, but will do so only if regulation requires it for all producers, regardless of technology type. (See Appendix B) Although, DTSC's proposed standards apply only to the State of California, it is believed that the outcome will set precedence for other states in the union.

Enclosed are several attachments. Attachment D contains overall comments to the proposal, Attachment E includes responses to "Questions for Participants," and Attachment F addresses the proposed standards.

Thank you for considering suggestions and comments from pv recycling, llc. Having an opportunity to discuss these replies would be greatly welcomed. Please feel free to contact Jennifer Woolwich if there are any further questions.

Sincerely,

A handwritten signature in black ink that reads "Jennifer Woolwich". The signature is written in a cursive style and is positioned above the typed name and title.

Jennifer Woolwich, IMA, CPHQ, CSSBB
CEO

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Attachment A

Interview tool was developed using information from the “Study on the Development of a Takeback Recovery System for Photovoltaic Products,” and tested with a module manufacturer. The interview population consisted of all module manufacturers with at least one UL certified module as of March 30, 2009. An adjusted 74% response rate was attained from the 54 companies listed, 42 which were contacted, and with 29 completing the interview.

Market Research Interview Results, June 2009
N=42, n=29
Multiple Responses Allowed

Topic	Number	Percent
Collection and Recycling System Needed	29	100%
Sell in U.S. Market	26	90%
Not Have Take Back Procedure	15	58%
Producer Responsible for Collection	16	55%
Independent Third party Responsible for Collection	13	45%
Producer Responsible for Collection Financing	15	52%
End User Responsible for Collection Financing	8	28%
Producer Responsible for Recycling	6	21%
Independent Third Party Responsible for Recycling	20	69%
Producer Responsible for Recycling Financing	13	45%
Independent Responsible for Recycling Financing	10	34%
Producer to Use Independent Third Party Recycling Facility	25	86%
Producer Inform End User of Facility	21	84%
U.S. Manufacturing Facility Current	12	41%
Put in Storage	8	67%

Note: Interview tool was developed using information from the “Study on the Development of a Takeback Recovery System for Photovoltaic Products,” and tested with a module manufacturer. The interview population consisted of all module manufacturers with at least one UL certified module as of March 30, 2009. An adjusted 74% response rate was attained from the 54 companies listed, 42 which were contacted, and with 29 completing the interview.

Attachment B

Below is a list of manufacturers in the industry who verbally stated collection and recycling programs are needed in the United States, and will finance if required by regulation. Decision maker names and titles are not included out of courtesy, but can be provided upon request. Also, the companies on this list are in the Attachment C tables that identify pv recycling, llc's primary and secondary target markets. In addition, all of these companies participated in our market research, focus groups, and informal discussions.

Abound
BP Solar
First Solar
Jetion
Kyocera
Mage
Primestar
Schott
SHARP
SolarWorld
SOLON
SoloPower
SunPower
Suntech
Trina
Yingli

Attachment C

This table demonstrates the installed base in California by integrator and brand of module.

Secondary Target Market, California Integrators as of July 2009

Integrator	Quantity of Modules Installed¹	Brand of Modules Installed²	Primary Target Market
SunPower Corporation	361,081	Sunpower(79%)	X
		Evergreen(21%)	X
Chevron Energy Solutions	283,219	SolarWorld (63%)	X
		Sharp (27%)	X
SunEdison, LLC	166,752	Evergreen (42%)	X
		Kyocera (31%)	X
Team-Solar, Inc.	143,619	Kyocera (32%)	X
		Evergreen (28%)	X
		Sanyo (20 %)	X
SPG Solar, Inc.	132,863	Suntech Power (24%)	X
		Kyocera (23%)	X
		Sharp (22%)	X
		Mitsubishi (22%)	X
SolarCity	130,015	BP Solar (26%)	X
		First Solar (26%)	X
		Evergreen (15%)	X
		Kyocera (12%)	X
REC Solar, Inc.	109,645	Mitsubishi (48%)	X
		Sanyo (18%)	X
		Evergreen (14%)	X
Conergy Projects, Inc.	63,286	Conergy (44%)	
		First Solar (25%)	
		Sanyo (16%)	X
		Suntech Power (14%)	X
BP Solar International, Inc.	55,049	BP Solar (100%)	X
Akeena Solar, Inc	54,834	Andalay Solar (42%)	X
		Sharp (25%)	X
		Kyocera (15%)	X
		Sunpower (12%)	X

Sources: ^{1,2} California Solar Initiative Database, 2009

Attachment C Continued

This table demonstrates which manufacturers have the largest installed base in California.

Primary Target Market as of July 2009

Market	Research		Manufacturers		
	Source	Frequency		CA Installed Base ⁴	US Facility Capacity
UL Certified Manufacturers	UL Certified List ¹	Monthly	1. Sunpower (US)	24 %	Future
			2. Sharp (US)	18 %	100 MW ⁵
			3. BP Solar (US)	12 %	150 MW ⁶
			4. Kyocera	9 %	NA
			5. Evergreen Solar	8 %	TBD
			6. Sanyo	7 %	NA
			7. Mitsubishi	6 %	NA
			8. SolarWorld California, Oregon	4 %	100 MW ⁷
			9. Akeena/Andaly Solar, Inc	3 %	NA
			10. Suntech Power, Inc	2 %	NA
			1. Calisolar	NA	3 MW Pilot ⁹
			2. Microlinks Devices	NA	TBD
			3. PlexTronics	NA	TBD
			4. PrimeStar Solar	NA	20 – 90 MW ⁹
			5. Enfocus	NA	TBD
			6. Solaria	NA	TBD
			7. SolFocus	NA	30 MW ¹⁰
			8. Solo Power	NA	20 MW ¹¹

Sources: ¹ <http://database.ul.com>, ² <http://www.enf.cn>, ³ <http://www1.eere.energy.gov>, ⁴ California Solar Initiative Database, 2009, ⁵ <http://solar.sharpusa.com>, ⁶ <http://www.bp.com>, ⁷ <http://solarworld.de>, ⁸ <http://www.abound.com>, ⁹ <http://www.greentechmedia.com>, ¹⁰ <http://www.solfocus.com>, ¹¹ <http://www.solopower.com>

Attachment D

Important issues missing from DTSC's regulatory framework for end-of-life PV

pv recycling, llc is concerned that DTSC does not have the regulatory authority to develop the necessary recycling programs to support the declassification of hazardous PV to universal waste.

pv recycling, llc strongly supports a recycling program that includes all types of PV modules sold in the State of California and support the State of California's resources conservation, recycling, renewable energy and green chemistry goals.

DTSC's effort to deregulate hazardous PV modules without considering the cost or extending the financial responsibility of end-of-life management to manufacturers risks instituting ineffective recycling that will cause further harm to human health and the environment. The following important issues are missing from DTSC's regulatory framework for end-of-life PV.

Provision for Extended Producer Responsibility (EPR).

Who is responsible for paying? The proposed regulations do not require manufacturers or "producers" to support the cost of recycling. There is an inaccurate assumption that hazardous waste recycling is profitable and that there will be a profit motive in the collection and processing. All hazardous waste has a cost associated with it. Estimates on the costs of recycling PV range from \$0.02/watt for crystalline silicon PV modules in large shipments in 20 ton containers (Fthenakis 2000) to \$0.04-\$0.05/watt for CdTe PV modules (Bohland et al. 1997) to \$0.08-\$0.11/watt for CIGS modules like those manufactured by six Bay Area startups. Based on total announced, planned, and installed PV capacity in California, the cost of recycling would be over \$800 million. Weakening the law without identifying who will pay the cost of recycling will promote noncompliance with DTSC's original intent for environmentally sustainable disposal and/or recycling.

Enforcement. DTSC doesn't have the capacity, or the resources, to enforce a universal waste rule for solar panels. The current electronic universal waste recycling program is ineffective. DTSC doesn't have the resources to enforce compliance for domestic recycling or the export of electronic waste. DTSC should not propose new universal waste regulations without identifying who will manage and pay for regulatory enforcement.

Labeling. The proposed regulations do not include provisions for product labeling. In order to facilitate proper and safe recycling, all solar PV should be labeled for the benefit of the customers. Without a labeling regime, customers (and other generators) who put their modules in a landfill cannot be held responsible for complying with hazardous waste laws. The label used in the DTSC workshop presentation is insufficient for an effective recycling scheme. In addition to mandatory labeling, there needs to be more discussion about the size and permanence of labels and what information is required. (See Attachment G)

Pre-Market Testing. All PV panels that enter the market should be tested for hazardous materials. Testing will allow DTSC to track panels that require special handling when they become waste. Premarket testing is also a prerequisite for product labeling, EOL handling, and will allow the state government to track PV modules that require special EOL management.

DTSC testing protocols and regulatory thresholds. DTSC doesn't have testing methods for emerging materials such as nanoparticles. DTSC also has no regulatory threshold for tellurium.

Domestic recycling (treatment). Although the proposed regulations only exempt products that are recycled (i.e., treated) domestically, there is very little incentive for recyclers to invest in hazardous waste recycling/treatment facilities based on a voluntary recycling program. The materials risk being illegally dumped, mishandled by recycler, or land filled without adequate treatment facilities.

Household hazardous waste. If households and small quantity generators are not included in the universal waste rule then local governments will be responsible for the cost of hazardous waste handling of end-of-life panels. Local governments can't afford this additional waste stream.

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Attachment E

Responses to questions for participants

Include examples and supporting documentation, especially in your response to Questions to Participants

1. Should treatment of solar panels be allowed? For example, should some level of simple disassembly of the solar panels (e.g., removal of metal frames, wires) be allowed? Will that facilitate reclamation? Who should conduct such treatment?

If disassembly facilitates recycling than it should be allowed. Aluminum and copper are low hanging fruit in terms of recycling, and they could be of value. However, recycling the materials should not come at the expense of disposing of the remaining materials. Also, the removal of frames could make it more likely that the panel is broken, possibly releasing cadmium or lead into the environment. pv recycling, llc has received inquiries from other recyclers who have reclaimed the aluminum frames and copper wires from modules, and wanted guidance on what to do with, or wanting to sell, the remaining laminate (unframed module). An email and photographs of such an inquiry is in Attachment H.

2. Do we integrate the proposed chapter 23, article 8 standards into existing chapter 23 standards?

The universal waste option for PV is not a sufficient response to ensuring collection and recycling. Other articles regulated as universal waste—lamps, thermostats, and batteries—have very low rates of recycling. To meet the specific needs of the industry and ensure compliance, a legislative ruling needs to be acquired to develop a separate chapter of regulation; Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

3. Under the proposed exemption in 66261.6, will transport directly to a reclamation facility allow for current solar panel recycling activities that are already in-place by some solar panel manufacturers? Will this allow for 3rd party entities to receive solar panels with ultimate disposition to a reclamation facility?

See comments in Attachment F.

4. Are solar panel transporter requirements enough? Is reference to chapter 23 universal waste transporter requirements enough? Should there be specific shipping paper requirements and tracking of shipment?

If PV modules are known to be hazardous, then their transport should be tracked to monitor recycling rates and to ensure that it is disposed of properly.

5. Proposed inclusion of solar panels into universal waste management scheme does not include existing household or conditionally exempt small quantity universal waste generator universal waste exemptions. Is this necessary to ensure that only universal waste solar panel handlers manage solar panels (e.g., trained solar panel installers)? Does this support current solar panel manufacturer take-back models and provide a more pro-active approach to mitigate the impact on local solid waste collection facilities/resources?

The only take back model currently in the industry is administered by a company that almost exclusively sells to large customers. There is currently no take back model for homeowners. Because of the nature

of PV installation, it is likely that trained installers will be onsite for decommissioning. However, the decommissioning will have to be paid for by customers as currently proposed, making it less likely that PV will be effectively recycled.

6. Is there a need for annual reports? If so, what kind of information should be provided to DTSC, and who should provide this information?

An annual report should monitor recycling rates and overall policy effectiveness. This will provide data to demonstrate compliance.

7. Are the regulations clear on the definition of a solar panel? Are visual standards enough? How broken is broken? Is a definition for solar cell needed as well?

The definition of solar panel is currently too subjective.

8. Does DTSC need information (i.e., notification) to identify "solar panel vendors"? If so, what kind of information is needed, and how frequently would that initial information be updated (e.g., annually, owner name/address changes, etc.)?

NA

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Attachment F

Comments on DTSC Proposed Standards for Management of Waste Solar Panels

1. Cover Page Regulation Description

Comment:

The Cover Page proposes “three management options,” which is complicated and may confuse those developing, implementing, enforcing and complying with the regulation. Solar panels and solar panel manufacturing scrap comprise of various semiconductor thin film and silicon technologies. These various technologies consist of materials, that when they become waste, may or may not be classified as hazardous or universal. From a business perspective, manufacturers will be reluctant to inform customers, integrators, and the public about their product’s classification. Such information could be misinterpreted, misused, and damaging to the industry in general. Also, none of the three options address managing photovoltaic manufacturing scrap generated at solar panel manufacturing facilities, including solar panels that are rejected during final quality inspection.

Suggested Changes/Rationale:

Instead of proposing the three options, “1. Full hazardous waste regulations, 2. Conditional hazardous waste exemption, and 3. Universal waste management,” DTSC should propose “Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.”

An example of Alternative Management Standards development and use include “Chapter 34: Alternative Management Standards for Treated Wood Wastes.” (See Attachment I)

Having the standards composed in a separate chapter will allow for an all encompassing regulation that addresses the specific waste management needs of this new and rapidly evolving industry, regardless of technology type, without causing misinterpretation of the regulation’s original intent, and a potential negative impact on the deployment of solar technology. In addition, it will eliminate the need to publicly classify waste solar panels and solar manufacturing scrap while still ensuring that the materials will be processed in a socially and environmentally sustainable manner.

However, the concepts present in the existing Requirements and Standards will be included in the new Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap, with potential development of regulation to meet the specific needs of the industry.

Edits:

This document proposes an amendment that provides for the appropriate regulation of waste solar panels and photovoltaic manufacturing scrap. It proposes the composition of a separate chapter to effectively and efficiently address the unique needs of the industry. This regulation

is CCR, Title 22, Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

~~presents two, proposed (new) options for the management of hazardous waste solar panels at end-of-life. Both options are not mutually exclusive, but are presented together so that a regulatory entity has a choice of management schemes. Absent these two regulatory conditional exemptions, hazardous waste solar panels must be managed under full hazardous waste regulations, which are California's current standards. Thus, as drafted, there would be three (3) options for management of hazardous waste solar panels:~~

- ~~1. Full hazardous waste regulations (current standard)~~
- ~~2. Conditional hazardous waste exemption (proposed)~~
- ~~3. Universal waste management (proposed)~~

~~It is also important to note that once a regulatory scheme is chosen for the management of a particular hazardous waste solar panel, that scheme must be followed or that waste may no longer be subject to that particular exemption.~~

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2. **CCR, title 22, division 4.5, chapter 10, 66260.10**
Definitions

Comment:

The current definition of a solar panel also includes descriptions of solar panel waste and components there of. To improve the differentiation of solar panels from solar panel waste and solar panel manufacturing scrap additional definitions are needed.

The current definition of a “Solar Panel Vendor” does not include the contracting of Third Party entities by manufacturers, producers, marketers, or distributors to collect, transport, and reclaim material from solar panel waste. It also does not include contracting with Third Parties to collect, transport, and reclaim material from solar panel manufacturing scrap.

Suggested Changes/Rationale:

Limit the definition of “Solar Panel” to what it is and what it does.

Add definition for “Solar Panel Waste.”

Add definition for “Solar Panel Manufacturing Scrap.”

Amend definition for “Solar Panel Vendor” to include contracting with Third Parties.

This will clarify what are Solar Panel Waste and Solar Panel Manufacturing Scrap.

Edits:

66260.10 Definitions

"Solar panel" means any photovoltaic module, photovoltaic panel, or other photovoltaic device that collects energy from the sun for the purpose of converting light into electricity for general electricity grid use. ~~“Solar panels” does not include physically damaged, deteriorated, or altered solar panels (or components thereof), that are no longer recognizable as intact or broken solar panels, nor does it include solar powered electronic devices that have solar cells incorporated into their structures.~~

“Solar Panel Waste” means any used or unused solar panel that is discarded by the owner without the intent to install it, re-install, it or refurbish it for resale or other means of exchange.

“Solar Panel Manufacturing Scrap” means any rejected material generated during the solar panel manufacturing process including inputs and completed solar panel product.

"Solar Panel Vendor" means the manufacturer, producer, marketer or distributor of solar panels located within the United States and its territories, or a third-party entity under contract with a manufacturer, producer, marketer or distributor of solar panels to perform duties specified in Chapter 35, who administers a solar panel reclamation program and who accepts (for reclamation) one or more solar panels that are subject to the conditions for the exemption in section 66261.6 of chapter 11 of this division.

3. **CCR, title 22, division 4.5, chapter 11, section 66261.6
Requirements for Recyclable Materials**

Comment:

Currently the proposed section 66261.6(a)(3)(D) is not subject to regulation under Division 4.5 provided conditions are met for subsection (a)(8) and (a)(8)(H). Having to direct those developing, implementing, and maintaining a solar panel reclamation program to other regulatory citations, that then refer to subsequent citations, is cumbersome. Directing the reader to a separate chapter that addresses the specific needs of this industry will facilitate cooperation and compliance.

Suggested Changes/Rationale:

Instead of proposing that conditions in subsection (a)(8) and (a)(8)(H) are met, the conditions are to be met are in Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

Having the standards composed in a separate chapter will allow for addressing specific management needs of this new and rapidly evolving industry.

However, most concepts related to waste solar panels and solar panel manufacturing scrap in the existing 66261.6 Requirements for Recyclable Materials will be included in the new Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

Remove 66261.6 (a)(8)A through (a)(8)(H) and incorporate content/concepts into Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

Edits:

~~66261.6(a)(3)(D) solar panels destined for reclamation within the United States and its territories in a program administered by a Solar Panel Vendor provided that the conditions in Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap are met. subsection (a)(8) of this section are met. However, such solar panels are subject to regulation as described in subsection (a)(8)(H) of this section upon arrival at a designated facility located in California.~~

66261.6 (a)(8)A through (a)(8)(H)

~~(8)(A) Solar panels shall be managed in a manner that prevents releases of any solar panels or any hazardous component of a solar panel to the environment under reasonably foreseeable conditions pursuant to the requirements of this section.~~

~~(B) Only intact solar panels shall be managed. Any solar panel or container of solar panels that shows evidence of leakage or damage that could cause a release of hazardous constituents to the environment shall be managed in accordance with article 8 of chapter 23 of this division.~~

~~(C) A solar panel or container of solar panels shall be labeled with one of the following phrases: "Solar Panels Not Scrap Metal", or "Solar Panels Not CRT Glass".~~

~~(D) Any spills or releases of a solar panel or components thereof shall be cleaned up immediately.~~

~~(E) A transporter of solar panels shall manage solar panels in compliance with the requirements of article 5 of chapter 23 of this division.~~

~~(F) A transporter of solar panels shall not deliver solar panels to a place other than to a reclamation facility within the United States and its territories designated by the Solar Panel Vendor who is administering the solar panel reclamation program.~~

~~(G) A person is prohibited from exporting solar panels unless export is conducted in accordance with applicable export requirements for hazardous waste as described in chapter 12 of this division.~~

~~(H) The solar panels shall be recycled by being reclaimed at the designated facility, including recovery of the hazardous constituents.~~

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**4. CCR, title 22, division 4.5, chapter 11, section 66261.9
Requirements for Universal Waste**

Comment:

Currently the proposed regulation includes solar panels in Chapter 11: Section 66261.9 Requirements for Universal Waste. Having to direct those developing, implementing, and maintaining a solar panel reclamation program to this chapter, that then refer to subsequent citations, is cumbersome. Composing a separate chapter that addresses the specific needs of this industry will facilitate cooperation and compliance.

Suggested Changes/Rationale:

Instead of establishing requirements for managing solar panels within Chapter 11: Section 66261.9 Requirements for Universal Waste, include the requirements in Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

If the solar panel vendor is in compliance with 66261.6 Requirements for Recyclable Materials and the proposed Chapter 35: Alternative Management Standards for Waste Solar Panels and Photovoltaic Manufacturing there is no need for “Solar Panel Waste” or “Solar Panel Manufacturing Scrap” to be included in 66261.9 Requirements for Universal Waste.

Edits:

Requirements for Universal Waste. 66261.9(a) ~~(8) Solar panels, as described in section 66273.7.1, subsection (a).~~

**5. CCR, title 22, division 4.5, chapter 23
Standards for Universal Waste Management**

General Comment:

Currently the proposed regulation includes solar panels in Chapter 23: Standards for Universal Waste Management. Having to direct those developing, implementing, and maintaining a solar panel reclamation program to this chapter, that then refer to subsequent citations, is cumbersome. Composing a separate chapter that addresses the specific needs of this industry will facilitate cooperation and compliance.

Below are more detailed Comments, Suggested Changes/Rationale, and Edits for specific sections, with the intent of relocating the text to Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

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**6. CCR, title 22, division 4.5, chapter 23, section 66273.1
Scope**

Comment:

In the Scope 66273.1 (a)(8) remove the text “section 66273.7.1, subsection (a)” and replace with Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

Suggested Changes/Rationale

In the Scope 66273.1 (a)(8) remove the text “section 66273.7.1, subsection (a)” and replace with Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

Edits:

66273.1. Scope.

(a) This chapter establishes requirements for managing universal wastes, as defined in section 66273.9. The following universal wastes are subject to regulation pursuant to this chapter:

- (1) Batteries, as described in section 66273.2, subsection (a);
 - (2) Electronic devices, as described in section 66273.3, subsection (a);
 - (3) Mercury-containing equipment, as described in section 66273.4, subsection (a);
 - (4) Lamps, as described in section 66273.5, subsection (a) (including, but not limited to, M003 wastes);
 - (5) Cathode ray tubes, as described in section 66273.6, subsection (a);
 - (6) Cathode ray tube glass, as described in section 66273.7, subsection (a); and
 - (7) Aerosol cans, as specified in Health and Safety Code section 25201.16.and
 - (8) Solar panels, as described in ~~section 66273.7.1, subsection (a).~~ Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.
- (b) This chapter provides an alternative set of management standards in lieu of regulation as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division. The alternative management standards of articles 1 through 3 of this chapter do not apply to destination facilities, as defined in section 66273.9, except as otherwise specified in section 66273.60, subsections (b) or (c).

**7. CCR, title 22, division 4.5, chapter 23, section 66273.7.1
Applicability – Solar Panels**

Comment:

The current section heading for 66273.7.1 applies only to Solar Panels. It needs to address Solar Panel Waste and Solar Panel Manufacturing Scrap as this is the intent of the regulation.

66273.7.1 (b)(1) through (b)(5) are not needed if only addressing Solar Panel Waste and Solar Panel Manufacturing Scrap. Having definitions for Waste Solar Panels and Solar Panel Manufacturing Scrap clarifies what is applicable.

66273.7.1 (c)(B) states that solar panels become waste when they are cracked, whether or not they are still functional and remain in service. The breakage provision is too restrictive. Solar panels that are cracked, fractured, or shattered are designed to retain functionality and be left in place by the owner. By designating “cracked, broken or shattered” panels as waste, DTSC requires potentially functioning solar panels to be removed, and trigger accumulation time limits and other criteria.

66273.7.1 (c)(1) through (c)(2)(B) separates used and unused solar panels, and differentiates between retrograde and non-retrograde unused panels. Regardless of the status of a waste solar panel, all of them are classified as waste when the owner discards the solar panel without the intent to install it, re-install it, or refurbish it for resale or other means of exchange.

66273.7.1 does not include requirements for Solar Panel Manufacturing Scrap. Since the majority of waste generated by this industry, now and in the future, is from manufacturing processes, it is imperative that solar panel manufacturing scrap be included in a reclamation program. With its inclusion large quantities of scrap solar cells, scrap metal, unframed laminates, and rejected solar panels will not be disposed of at a landfill. This is imperative as some inputs used to manufacture solar panels are considered hazardous in certain quantities and certain forms. Examples include silver, copper, lead, arsenic, cadmium, selenium. In addition, toxins are released when certain inputs are ignited, such as hydro fluoronic acids (HF) from back sheets.

Suggested Changes/Rationale:

Instead of establishing requirements for managing solar panels within Chapter 23: Standards for Universal Waste Management, include the requirements in Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap.

66273.7.1 change title to reflect applicability to Solar Panel Waste and Solar Panel Manufacturing Scrap.

Delete 66273.7.1 (b) through (b)(5), the language is not needed, and is clarified using the improved definitions

Reword 66273.7.1(c) through (c)(2)(B), there is no need to differentiate between used, unused, retrograde, and non-retrograde solar panels when determining when it becomes a waste.

Add subsection (d) Generation of solar panel manufacturing scrap to address when such scrap becomes a waste

Edits:

66273.7.1. ~~[Reserved.] Applicability—Solar Panels.~~ Solar Panel Waste and Solar Panel Manufacturing Scrap

(a) Solar panels covered pursuant to chapter 23. The requirements of this article apply to ~~solar panels~~ solar panel waste and solar panel manufacturing scrap, as defined in subsection (b) of this section., except those listed in subsection (b) of this section., and on what date these become waste, as defined in subsections (c) and (d).

(b) “Solar Panel Waste” means any used or unused solar panel that is discarded by the owner without the intent to install it, re-install it, or refurbish it for resale or other means of exchange.

“Solar Panel Manufacturing Scrap” means any rejected material generated during the solar panel manufacturing process including inputs and completed solar panel product.

~~(b) Solar panels not covered pursuant to this chapter. The requirements of this chapter do not apply to the following solar panels:~~

~~(1) Solar panels that are not yet wastes pursuant to chapter 11 as provided in subsection (c) of this section;~~

~~(2) Solar panels that do not exhibit a characteristic of a hazardous waste as set forth in article 3 of chapter 11 of this division;~~

~~(3) Solar panels that are destined for recycling (or are recycled) by being “used in a manner constituting disposal,” as described in section 66266.20, or that are destined for disposal (or are disposed) to a class I landfill. Such solar panels shall be managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division;~~

~~(4) Solar panels that are managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division;~~

~~(5) Solar panels managed pursuant to section 66261.6(a)(3)(D).~~

(c) Generation of waste solar panels.

(1) A used or unused solar panel becomes a waste on the date when ~~the earlier of the following~~ occurs:

~~(A) The the owner discards the solar panel; or~~

~~(B) The solar panel is physically cracked, broken, or shattered, or otherwise removed from service without intent to re-install it~~ install it, re-install it, or refurbish it for resale or other means of exchange.

~~(2) Unused solar panels.~~

~~(A) An unused solar panel that is not a retrograde material becomes a waste on the date it is discarded (e.g., when stored prior to being sent for reclamation).~~

~~(B) An unused solar panel that is a retrograde material becomes a waste on the date that it becomes a recyclable material pursuant to subsection (c) of the definition of “recyclable materials” in section 66260.10.~~

(d) Generation of solar panel manufacturing scrap

Solar panel manufacturing scrap becomes a waste on the date when the owner discards the material without intent to rework, reuse, or reintroduce it into the production process or refurbish rejected solar panels for resale or other means of exchange.

8. CCR, title 22, division 4.5, chapter 23, section 66273.8 Exemptions

Comment:

It has been proposed to eliminate the exemption for Household Universal Waste and Conditionally Exempt Small Quantity Generators of Universal Waste from 66273.8 for generators of solar panels. The stated intent for this elimination of those general universal waste provisions is to encourage small quantity generators to use trained installers to disassemble solar arrays.

With the composition on Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap, there is no need to apply or exempt Household Universal Waste regulations to household and small quantity generators. Having reclamation programs administered by Solar Panel Vendors will promote appropriate decommissioning, collection, transport, and material reclamation from waste solar panels and solar panel manufacturing scrap.

Additionally, by removing the exemption, household owners and small quantity generators of universal waste solar panels will have to adhere to accumulation time-limit, personnel training, and many other requirements that will not advance the goal of ensuring that waste solar panels are collected and recycled appropriately. Overall, the intent of waste regulation is to transfer the regulatory burden from unsophisticated entities, such as households, to sophisticated entities, such as those informed by the module manufacturer, including integrators/installers and collection centers.

Suggested Changes/Rationale:

Delete 66273.8(c)

Edits:

~~(c) The exemptions provided for in subsections (a) and (b) of this section shall not be applicable to the management of universal waste solar panels.~~

**9. CCR, title 22, division 4.5, chapter 23, section 66273.9
Definitions**

Comment:

The definitions in this section include those that are not related to management of Waste Solar Panels and Solar Panel Manufacturing Scrap.

The definition of solar panel needs to be updated to match the definition in 66260.10.

The definitions for Solar Panel Waste and Solar Panel Manufacturing Scrap are absent.

Suggested Changes/Rationale:

Instead of establishing requirements for managing solar panels within Chapter 23: Standards for Universal Waste Management, include the requirements in Chapter 35: Alternative Management Standards for Waste Solar Panels and Photovoltaic Manufacturing.

Delete definitions that do not apply to the management of Waste Solar Panels and Solar Panel manufacturing Scrap.

Update the solar panel definition to match the definition in 66260.10.

Add definitions for Panel Waste and Solar Panel Manufacturing Scrap as defined above.

Edits:

66273.9. Definitions.

When used in this chapter, the terms listed in this section have the meanings given below. Unless otherwise specified, listed terms that cross-reference the definitions of other listed terms refer to the definitions set forth in this section for those other terms. ~~Terms that are also defined in chapter 10 of this division are duplicated here solely for convenience of the regulated community. Terms used in this chapter that are not defined in this section but are defined in chapter 10 of this division and/or chapter 6.5 of division 20 of the Health and Safety Code have the meanings given in those sources.~~

~~“Ampule” means an airtight vial made of glass, plastic, metal, or any combination of these materials.~~

~~“Battery” means a device consisting of one or more electrically connected electrochemical cells that is designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, a cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.~~

~~“Cathode ray tube” means a vacuum tube or picture tube used to convert an electrical signal into a visual image.~~

~~“CESQUWG” see “Conditionally exempt small quantity universal waste generator.”~~

~~“Closure” means the act of closing a universal waste handler’s facility pursuant to the requirements of article 7 of this chapter.~~

~~“Conditionally exempt small quantity universal waste generator” means a generator of universal waste who:~~

(a) generates no more than 100 kilograms (220 pounds) of RCRA hazardous wastes, including universal wastes that are RCRA hazardous wastes, and no more than 1 kilogram (2.2 pounds) of acutely hazardous waste in any calendar month; and

(b) remains in compliance with 40 CFR section 261.5.

~~“CRT” see “Cathode ray tube.”~~

~~“CRT glass” means any glass released or derived from the treatment or breakage of one or more CRTs or CRT devices and subsequently reclaimed at a CRT glass manufacturer, or a primary or secondary lead smelter.~~

~~“Current closure cost estimate” means the most recent of the estimates prepared in accordance with article 7 of this chapter.~~

~~“Dental amalgam” means dental amalgam chunks, dental amalgam fines, mixtures containing dental amalgam fines, single-use dental amalgam traps that contain dental amalgam, dental amalgam sludge, vacuum pump filters that contain dental amalgam, and extracted teeth with amalgam restorations.~~

~~“Destination facility” means a facility that treats, disposes of, or recycles a particular category of universal waste pursuant to section 66273.60. A facility at which a particular category of universal waste is only accumulated is not a destination facility for purposes of managing that category of universal waste.~~

~~used in medical procedures.~~

~~“Dilators and weighted tubing” include, but are not limited to, bougie tubes, Canter tubes, and Miller-Abbot tubes.~~

~~“Electronic device” means any electronic device that is identified as hazardous waste because it either exhibits the characteristic of toxicity as specified in article 3 of chapter 11 of this division, and/or is a listed hazardous waste as specified in article 4.1 of chapter 11 of this division. Examples of electronic devices include: computer monitors, televisions, cash registers and oscilloscopes (CRT devices), computers, computer peripherals, telephones, answering machines, radios, stereo equipment, tape players/recorders, phonographs, video cassette players/recorders, compact disc players/recorders, calculators, and some appliances. Electronic device does not mean a major appliance, as defined in Public Resources Code section 42166, or other devices which are comprised largely of metals, qualify as “scrap metal” as defined in section 66260.10, and are recycled.~~

~~“Flame sensor” means a device, usually found in a gas-fired appliance, that uses the expansion and contraction of liquid mercury contained in a probe to open and shut a valve.~~

~~“Foreign Destination” means the ultimate recycling, treatment or disposal facility in a receiving country to which universal waste will be sent.~~

~~“Gas flow regulator” means a piece of mercury-containing equipment used to regulate the flow of gas through a gas meter.~~

~~“Gauge” see “Pressure or vacuum gauge.”~~

~~“Generator” means:~~

~~(a) Any person, by site, whose act or process produces hazardous waste identified or listed in chapter 11 of this division or whose act first causes a hazardous waste to become subject to regulation.~~

~~(b) Any person, by site, whose act or process produces universal waste or whose act first causes a universal waste to become subject to regulation.~~

~~“Handler of universal waste” see “Universal waste handler.”~~

~~“Household” means a single detached residence or a single unit of a multiple residence unit and all appurtenant structures. For the purposes of this section, household does not mean a hotel, motel, bunkhouse, ranger station, crew quarters, campground, picnic ground, or day-use recreation facility.~~

~~“Lamp” means the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the~~

electromagnetic spectrum. Examples of common lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

"Management" means the handling, storage, transportation, processing, treatment, recovery, recycling, transfer and disposal of hazardous waste (including universal waste).

"Mercury-added lamp" means a lamp to which elemental mercury has been added as an essential part of the manufacturing process used to create that lamp. Examples of common mercury-added lamps include, but are not limited to, fluorescent lamps and mercury vapor lamps.

"Mercury-added novelty" means a mercury-added product intended mainly for personal or household enjoyment or adornment. A "mercury-added novelty" includes, but is not limited to, any item intended for use as a practical joke, figurine, adornment, toy, game, card, ornament, yard statue or figure, candle, jewelry, holiday decoration, and item of apparel, including footwear.

"Mercury-containing equipment" means a thermostat, mercury switch, thermometer, dental amalgam, pressure or vacuum gauge, mercury-added novelty, mercury counterweight and damper, dilator and weighted tubing, mercury-containing rubber flooring, and gas flow regulator.

"Mercury-containing motor vehicle light switch" means any light switch found in the hood or in the trunk lid of a motor vehicle, if the light switch contains mercury.

"Mercury-containing motor vehicle switch" means any motor vehicle switch that contains mercury including, but not limited to, a mercury-containing motor vehicle light switch.

"Mercury-containing rubber flooring" means any rubber flooring material formulated with intentionally added mercury.

"Mercury counterweights and dampers" means enclosed devices that use liquid mercury for weight or dampening; "mercury counterweights and dampers" includes, but is not limited to, a mercury bow stabilizer used in archery, a mercury recoil suppressor used in shooting, and a mercury counterweight used in a clock.

"Mercury gas flow regulator" see "Gas flow regulator."

"Mercury switch" means an electrical switch that employs mercury to make an electrical contact.

"Mercury switch" includes, but is not limited to, the following mercury-containing switches: mercury-containing motor vehicle switches, tilt switches, vibration-sensing switches, off-balance switches, float switches, silent light switches, and relays.

"Mercury thermometer" see "Thermometer."

"Non-automotive mercury switch" means any mercury switch other than a mercury-containing motor vehicle switch.

"Onsite" means the same or geographically contiguous property which may be divided by public or private right-of-way, provided that the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which the person controls and to which the public does not have access, are also considered onsite property.

"Pressure or vacuum gauge" means any device in which pressure or vacuum is measured using the height of a column of liquid mercury. "Pressure or vacuum gauge" includes, but is not limited to, barometers, manometers, and sphygmomanometers.

"Producer" see "Generator."

"Scrap metal" means (a) any one or more of the following, except as provided in subsection (b) of this section:

- (1) manufactured, solid metal objects and products;
- (2) metal workings, including cuttings, trimmings, stampings, grindings, shavings and sandings;
- (3) solid metal residues of metal production; or
- (4) printed circuit boards that are recycled [except for printed circuit boards referenced in subsection (b)(7) of this section].

(b) "Scrap metal" excludes all of the following:

- (1) lead-acid storage batteries, waste elemental mercury, and water-reactive metals such as sodium, potassium and lithium;

~~(2) magnesium borings, trimmings, grindings, shavings and sandings and any other forms capable of producing independent combustion;~~
~~(3) beryllium borings, trimmings, grindings, shavings, sandings and any other forms capable of producing adverse health effects or environmental harm in the opinion of the Department;~~
~~(4) any metal contaminated with a hazardous waste, such that the contaminated metal exhibits any characteristic of a hazardous waste under article 3 of chapter 11 of this division;~~
~~(5) any metal contaminated with an oil that is a hazardous waste and that is free-flowing;~~
~~(6) sludges, fine powders, semi-solids and liquid solutions that are hazardous wastes; and~~
~~(7) any printed circuit board that has been removed from a universal waste electronic device by a universal waste handler as a result of the handler's conduct of activities authorized by sections 66273.71, 66273.72, and/or 66273.73 of chapter 23 of this division and is subject to management as a hazardous waste pursuant to sections 66273.71, 66273.72 and/or 66273.73.~~

"Solar panel" means any photovoltaic module, photovoltaic panel, or other photovoltaic device that collects energy from the sun for the purpose of converting light into electricity for general electricity grid use. ~~"Solar panels" does not include physically damaged, deteriorated, or altered solar panels (or components thereof), that are no longer recognizable as intact or broken solar panels, nor does it include solar powered electronic devices that have solar cells incorporated into their structures.~~

~~"Solar Panel Waste" means any used or unused solar panel that is discarded by the owner without the intent to install it, re-install, it or refurbish it for resale or other means of exchange.~~

~~"Solar Panel Manufacturing Scrap" means any rejected material generated during the solar panel manufacturing process including inputs and completed solar panel product.~~

"Solar Panel Vendor" means the manufacturer, producer, marketer or distributor of solar panels located within the United States and its territories, or a third-party entity under contract with a manufacturer, producer, marketer or distributor of solar panels to perform duties specified in Chapter 35, who administers a solar panel reclamation program and who accepts (for reclamation) one or more solar panels that are subject to the conditions for the exemption in section 66261.6 of chapter 11 of this division.

~~"Thermometer" means any thermometer that uses the expansion and contraction of a column of mercury to measure temperature.~~

~~"Thermostat" means a temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of section 66273.33(c)(5).~~

"Treatment" or "treat" or "treating" means any method, technique, or process which changes or is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose including, but not limited to, energy recovery, material recovery or reduction in volume.

~~"Universal waste" means any of the wastes that are listed in section 66261.9.~~

~~"Universal waste dental amalgam" see "Dental amalgam."~~

~~"Universal waste dilators and weighted tubing" see "Dilators and weighted tubing."~~

~~"Universal waste gas flow regulator" see "Gas flow regulator."~~

~~"Universal waste gauge" see "Pressure or vacuum gauge."~~

~~"Universal waste handler":~~

~~(a) Means:~~

~~(1) A generator (as defined in section 66260.10 and this section) of universal waste; or~~

~~(2) The owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination facility, or to a foreign destination; or~~
~~(3) The owner or operator of a facility who is authorized to treat universal waste pursuant to article 7 of this chapter.~~

~~(b) Does not mean:~~

~~(1) A person who treats or recycles (except as allowed/authorized in this chapter), or disposes of, universal waste; or~~
~~(2) A person engaged in the offsite transportation of universal waste by air, rail, highway, or water, including a universal waste transfer facility; or~~
~~(3) The owner or operator of a destination facility.~~

~~“Universal waste lamp” see “Lamp.”~~

~~“Universal waste mercury counterweights and dampers” see “Mercury counterweights and dampers.”~~

~~“Universal waste mercury switch” see “Mercury switch.”~~

~~“Universal waste rubber flooring” see “Mercury-containing rubber flooring.”~~

~~“Universal waste thermometer” see “Thermometer.”~~

~~“Universal waste transfer facility” means any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of universal waste are held during the normal course of transportation for ten days or less.~~

~~“Universal waste transporter” means a person engaged in the offsite transportation of universal waste by air, rail, highway, or water.~~

~~“Universal waste treatment unit” means a contiguous area of a universal waste handler’s facility on or in which universal waste is managed pursuant to section 66273.73, subsection (a)(2) or section 66273.73, subsection (b). Examples of universal waste treatment units include a disassembly or removal area, a shredder and associated equipment, a glass crusher, an accumulation area, or a container staging or storage area. A container alone does not constitute a universal waste treatment unit. A universal waste treatment unit includes containers and the land or pad upon which they are placed.~~

~~NOTE: Authority cited: Sections 25141, 25150, 25214.6, 25150.6, 25201, 25214.9, 25219.1 and 58012, Health and Safety Code; and Section 42475, Public Resources Code. Reference: Sections 25141, 25150, 25159.5, 25201, 25212, 25214.6, 25214.9, 25219, 25219.1 and 25219.2, Health and Safety Code; 40 CFR Sections 261.4, 261.5 and 273.9.~~

10. CCR, title 22, division 4.5, chapter 23
Article 8: Standards for the Management of Universal Waste Solar Panels

Comments:

Currently the proposed regulation includes standards for specifically handling waste solar panels as universal waste. With the implementation of Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap there is no need for having Article 8. Rather the contents of this article will be included in Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap. As mentioned above, this meet the needs of the industry while also ensuring processes that are socially and environmentally sustainable.

There is no regulation regarding Solar Panel Manufacturing Scrap.

Additional details are provided in subsequent sections.

Suggested Changes/Rationale:

Change language in all sections to reflect Alternative Management Standards rather than Universal Waste Standards.

Include language regarding Solar Panel Manufacturing Scrap

Since the majority of waste generated by this industry, now and in the future, is from manufacturing processes, it is imperative that solar panel manufacturing scrap be included in a reclamation program. With its inclusion large quantities of scrap solar cells, scrap metal, unframed laminates, and rejected solar panel will not be disposed of at a landfill. This is imperative as some inputs used to manufacture solar panels are considered hazardous in certain quantities and certain forms. Examples include silver, copper, lead, arsenic, cadmium, selenium. In addition, toxins are released when certain inputs are ignited, such as hydro fluoric acids (HF) from back sheets.

Additional details are provided in subsequent sections.

Edits:

Details are provided in subsequent sections.

11. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.80
Applicability

Comments:

When Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap is implemented there is no need for waste solar panels and manufacturing scrap to be handled by universal waste handlers. Rather, handlers need to comply with the Alternative Management Standards.

Suggestions/Rationale:

Remove the word “universal” and replace with “solar panel manufacturing scrap.”

Edits:

66273.80. Applicability.

This article applies to handlers of ~~universal~~ waste solar panels and solar panel manufacturing scrap(as defined in section 66273.9).

DRAFT

12. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.81
Prohibition

Comment:

Currently the Prohibition allows for export of waste solar panels if conducted in accordance with article 4 of chapter 23 or with applicable export requirements for hazardous waste exports as described in chapter 12 of division 4.5. To allow for export of such material is of concern. Socially and environmentally there have been negative impacts from the export of electronic and other waste products. Similarly, solar panel waste and solar panel manufacturing scrap contain material considered hazardous in certain quantities and in certain forms. Examples include silver, copper, lead, arsenic, cadmium, selenium. In addition, toxins are released when certain inputs are ignited, such as hydro fluoric acids (HF) from back sheets. Since there is knowledge, resources, and facilities in the United States to collect and recycle solar panel waste and solar panel manufacturing scrap in a manner that is safe for people and the planet, there is no need for this waste to be exported. It is understood that companies will want to export small quantities of waste and scrap to conduct research regarding failure and rejection modes. As needed, arrangements can be made to meet such export in compliance with article 4 of chapter 23 or chapter 12 of division 4.5.

As written this section does not include solar panel manufacturing scrap. Since the majority of waste generated by this industry, now and in the future, is from manufacturing processes, it is imperative that prohibition regulations be applied to solar panel manufacturing scrap. With its inclusion large quantities of scrap solar cells, scrap metal, unframed laminates, and rejected solar panels will not be disposed domestically or exported to countries not equipped with appropriate knowledge, resources, and facilities. This is imperative as some inputs used to manufacture solar panels are considered hazardous in certain quantities and certain forms, and can cause harm to people and the environment. Examples include silver, copper, lead, arsenic, cadmium, selenium. In addition, toxins are released when certain inputs are ignited, such as hydro fluoric acids (HF) from back sheets.

Suggested Changes/Rationale:

Change language in 66273.81 (c) to prohibit export of waste solar panels and solar panel manufacturing scrap; and to explain exportation of waste solar panels and solar panel manufacturing scrap for the purpose to research failure and reject modes.

Edits:

66273.81. Prohibition.

A handler of ~~universal~~ waste solar panels or solar panel manufacturing scrap is:

(a) Prohibited from disposing of the solar panels or solar panel manufacturing scrap; and (b) Prohibited from diluting or treating the solar panels or solar panel manufacturing scrap, unless the handler is responding to a release as provided in 66273.83.

(c) Prohibited from exporting solar panels or solar panel manufacturing scrap unless export is destined for a facility where the sole intent is to examine solar panels or solar panel manufacturing scrap for reasons of failure and the export process is conducted in accordance with article 4 of this

chapter 23, or with applicable export requirements for hazardous waste exports as described in chapter 12 of this division.

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13. CCR, title 22, division 4.5, chapter 23
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.82
Notification Requirements for Handlers of Universal Waste Solar Panels

Comment:

There language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Section 66273.82 contains actions that are burdensome to the industry and will delay collection and recycling of waste solar panels and solar panel manufacturing scrap, and will contribute to noncompliance of 66273.86 Accumulation Time Limits.

66273.9 defines handlers of universal waste as generators of waste solar panels, owners of facilities that receive/accumulate waste solar panels, and those who treat such waste. Since generators include module manufacturers, integrators, and system owners, these entities would have to provide notification and obtain an ID for accumulating small quantities (5,000kg, the equivalent of only 250 modules/scrap) without the intent of treating the waste or scrap. Since these generators already have policies and procedures in place to manage the waste and scrap, and most module manufacturers will use a third party to recycle their waste, there is no need for additional government regulation. Rather, resources should be focused on the third party facilities accumulating and treating such waste. These entities will be continuously processing large quantities and exposing people to reclaimed material. The likelihood of hazardous conditions and material exposure to workers and the environment is greater at such facilities when compared to generator locations. Providing notification and requiring an ID for those facilities accumulating or treating waste solar panels and solar panel manufacturing scrap would not only enable generators to identify the companies that receive and treat such waste, it will also allow for government oversight of these facilities as related to environmental, health, and safety issues.

Suggestions/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Change universal waste language to reflect alternative management standards.

Do not require generators to provide notification nor acquire ID. They will have small quantities and will not be treating the waste solar panels or solar panel manufacturing scrap. Generators already have policies and procedures in place regarding internal waste management.

Remove the word “handler” from 66273.82(a)(1), and replace with “facilities receiving, accumulating, or treating.” This will exclude generators from providing notification and acquiring an ID.

Remove 5,000kg as a trigger for providing notification and acquiring an ID. The quantity of waste solar panels or solar panel manufacturing scrap is not an issue. The concern is how the facilities accumulating and treating continuous quantities will be managing environmental, health, and safety requirements, and that thee facilities provide notification and acquire an ID.

Edits:

66273.82. Notification Requirements for Handlers of ~~Universal Waste Solar Panels~~ and Solar Panel manufacturing Scrap.

(a) USEPA notification requirements.

(1) Except as provided in subsections (a)(2) and (b) of this section, ~~a handler facilities receiving, accumulating, or treating of universal waste solar panels and solar panel manufacturing scrap,~~ shall have sent written notification of universal waste solar panel such management to the Regional Administrator, and received a federal ID Number, before commencing such business ~~accumulating 5,000 kilograms of universal waste solar panels.~~

(2) A ~~universal waste handler, excluding generators,~~ who has already notified the USEPA of the universal waste solar panel handler's hazardous waste management activities and has received an EPA Identification Number is not required to renotify pursuant to this section.

(b) A handler, excluding generators, of universal waste solar panels and solar panel manufacturing scrap who commences such business, ~~accumulates 5,000 kilograms of universal waste solar panels,~~ but who would not be required to notify the Regional Administrator pursuant to 40 Code of Federal Regulations section 273.32(a)(1) because the universal waste solar panels handled are non-RCRA hazardous waste shall send written notification to the Department, and shall obtain an ID Number, as defined in section 66260.10, from the Department.

(c) The notifications made pursuant to sections (a) and (b) of this section shall include:

(1) The universal waste solar panel handler's (excluding generators) name and mailing address;

(2) The name and business telephone number of the person at the ~~universal waste solar panels and solar panel manufacturing scrap~~ handler's (excluding generators) site who should be contacted regarding universal waste solar panel management activities;

(3) The address or physical location of the ~~universal waste solar panels and solar panel manufacturing scrap~~ management activities;

(4) A list of all of the types of ~~universal waste solar panels and solar panel manufacturing scrap~~ managed by the handler (excluding generators) (e.g., thin-film, crystalline silicon);

(5) A statement indicating that the handler (excluding generators) of ~~universal waste solar panels and solar panel manufacturing scrap~~ is commencing business ~~accumulating more than 5,000 kilograms of universal waste solar panels at one time~~ and the types of universal waste solar panels (e.g., thin-film, crystalline silicon) the handler (excluding generators) of ~~universal waste solar panels and solar panel manufacturing scrap~~ is receiving, accumulating, and/or treating ~~above this quantity.~~

14. CCR, title 22, division 4.5, chapter 23
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.83
Waste Management and Response to Releases

Comment:

There language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

There language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Subpart (a) of Section 66273.83 specifies how solar panel universal wastes are to be managed and releases contained uses language from sections of Chapter 23 applicable to other classes of universal waste, including provisions of section 66273.33 governing lamps, and provisions of section 66273.33.5 governing CRTs and electronic devices. A number of the provisions applied to solar panels, particularly those governing lamps and CRTs, are designed to prevent the breakage of universal wastes that are far more fragile and prone to releasing hazardous constituents than are waste solar panels and solar panel manufacturing scrap.

CRTs, which are easily broken and, when broken, are extremely likely to release lead into the environment are distinctly different than solar panels and, for that matter, electronic devices. Similarly waste lamps are significantly more fragile and likely to release hazardous constituents into the environment than are solar panels. Solar panels, by comparison, are designed to operate in and withstand extreme weather conditions for over two decades. They are necessarily much more robust than lamps or CRTs, and as a result are much less prone to breaking. Further, the hazardous constituents contained in waste solar panels and solar panel manufacturing scrap are highly stable, encapsulated, and are unlikely to escape even if the panels are broken. The fact that the panels are far less likely to break than CRTs or lamps, combined with the fact that broken panels are much less likely than broken CRTs or lamps to release hazardous constituents, indicates that the panels should *not* be subject to the same management standards as those governing CRTS or lamps.

In addition, there are low recycling rates for the above devices, and other waste classified as universal. However, with development of Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap and proper oversight requirements in 66273.5(a)(1)(B) will suffice for waste solar panels and solar panel manufacturing scrap.

Another concern is with 66273.83(b)(1). Since photovoltaic materials are not labeled based on semiconductor type, it is not clear that the solar panel generator will even know what constituent materials the panel might have. To put the onus on the generator to determine is the release is a hazardous waste is not the best way to do this. If panels were labeled, it would be easier. With an EPR collection and recycling program, solar panels can be labeled at time of manufacture. The label does not necessarily have to list the modules' materials, rather it will direct the generator to a company that is knowledgeable on how to manage that specific waste. This label can also have symbols representing how the waste is to be handled, similar to the symbols used for plastics recycling. (See Attachment G)

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Solar Panels and solar panel manufacturing scrap should be subject to management standards equivalent to those regulating electronic devices. Section 66273.83 should therefore be revised to include language similar to that utilized by the management standards for electronic devices at section 66273.33.5(a)(1)(B).

Add language to 66273.83(b)(1) to include manufacturers adhering labels to solar panels which inform generators on how to contact a collector and recycler, and have symbols indicating handling and treatment needs.

Change universal waste language to reflect alternative management standards.

Edits:

66273.83. Waste Management and Response to Releases.

(a) A handler of ~~universal waste solar panels~~ and solar panel manufacturing scrap shall manage the solar panels and scrap in a manner that prevents releases of any ~~solar panels hazardous constituents~~ or any hazardous component of a solar panel to the environment under reasonably foreseeable conditions, as follows:

(1) A handler of ~~universal waste solar panels~~ and solar panel manufacturing scrap shall contain any solar panel in a ~~container or package that is structurally sound, adequate to prevent breakage~~ manner that prevents release of hazardous constituents to the environment, the solar panel, and compatible with the contents of the solar panel. ~~Such a container or package~~ If a container is used, such a container shall lack evidence of prevent leakage, spillage or damage that could cause the release of hazardous constituents under reasonable foreseeable conditions.

(2) Intact solar panels and scrap that are managed in a manner that prevents ~~breakage of the solar panels and release of hazardous constituents~~ components of the solar panels to the environment under reasonably foreseeable conditions (e.g., stretch-film on a pallet) shall be deemed to comply with subsection (a)(1) of this section.

(3) A handler of ~~universal waste solar panels~~ and solar panel manufacturing scrap shall immediately clean up and place in a container any solar panel or scrap ~~that is broken and shall place in a container any solar panel that shows evidence of breakage, leakage, or damage that could cause the release of solar panel glass or other~~ may be expected to cause a release of hazardous constituents to the environment under reasonably foreseeable conditions. The containers shall be structurally sound, compatible with the contents of the solar panels or scrap and shall ~~lack evidence of leakage, spillage or damage that could cause leakage or releases of solar panel glass or other hazardous constituents~~ prevent releases of hazardous constituents to the environment under reasonably foreseeable conditions.

~~(4) A handler of universal waste solar panels shall place solar panels in a container with packing materials, if such material is necessary to prevent breakage during handling, storage and transportation.~~

(b) A handler of ~~universal waste solar panels~~ and solar panel manufacturing scrap shall immediately contain all releases of solar panels or scrap and of residues from solar panels or scrap to the environment.

(1) ~~A solar panel generator~~ The handler shall determine whether any material resulting from such a release is a hazardous waste, using information from a label that manufacturer has

adhered to the panel and if so, shall manage the hazardous waste in compliance with all applicable requirements of this division. The handler of ~~universal waste solar panels~~ and solar panel manufacturing scrap is the generator of the hazardous waste resulting from the release, and is subject to the requirements of chapter 12.

(c) Hazardous waste consisting only of broken, or otherwise damaged solar panels, but that still satisfy the definition of solar panel in section 66273.9 may be managed as ~~universal waste solar panels~~ and solar panel manufacturing scrap provided that the broken, or otherwise damaged solar panel and solar panel manufacturing scrap is repackaged according to the standards of this section.

DRAFT

15. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.84
Labeling/Marking

Comment:

Appropriately labeling of waste solar panels and solar panel manufacturing scrap will promote collection, transport, receiving, accumulation, and treatment requirements that comply with environmental, health, and safety regulations.

Another concern is that photovoltaic materials are not labeled based on semiconductor type, it is not clear that the solar panel generator will even know what constituent materials the panel might have. To put the onus on the generator to determine what to do with a waste solar panel will not be effective. With an EPR collection and recycling program, solar panels can be labeled at time of manufacture. The label does not necessarily have to list the modules' materials, rather it will direct the generator to a company that is knowledgeable on how to manage that specific waste. This label can also have symbols representing how the waste is to be handled, similar to the symbols used for plastics recycling. (See Attachment G)

The language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Add language 66273.84(e) to include manufacturers adhering labels to solar panels which inform generators on how to contact a collector and recycler, and have symbols indicating handling and treatment needs.

Add language to include labeling/marketing of solar panel manufacturing scrap.

Edits:

66273.84. Labeling/ Marking.

(a) A handler of ~~universal~~ waste solar panels shall clearly label or mark solar panels (i.e., each solar panel), or a container or pallet in which solar panels are contained with the following phrase: "~~Universal-Waste—Solar Panel(s)~~".

(b) In lieu of labeling individual solar panels and/or containers or pallets of solar panels pursuant to subsection (a) of this section, a handler of ~~universal~~ waste solar panels may accumulate ~~universal~~ waste solar panels within a designated area demarcated by boundaries that are clearly labeled with the following phrase: "~~Universal-Waste—Solar Panel(s)~~".

(c) A handler of solar panel manufacturing scrap shall clearly label or mark (i.e., each rejected panel), or a container or pallet in which solar panel manufacturing scrap is contained with the following phrase: "Waste—Solar Panel Manufacturing Scrap".

(d) In lieu of labeling individual rejected panels and/or containers or pallets of solar panel manufacturing scrap pursuant to subsection (a) of this section, a handler of waste solar panel manufacturing scrap may accumulate waste solar panel manufacturing scrap within a designated

area demarcated by boundaries that are clearly labeled with the following phrase: "Waste—Solar Panel Manufacturing Scrap".

(e) Solar panel manufacturers adhere label to product informing end users, generators, and handlers on who to contact for collection and recycling, and have symbols on the label indicating handling and treatment needs.

DRAFT

16. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.85
Personnel Training

Comments:

Personnel Training is crucial to implementing a successful collection and material reclamation system that meets environmental, health, and safety regulations.

The language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Edits:

66273.85. Personnel Training.

(a) A handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap ensure that all personnel who manage solar panels at the handler's facility are thoroughly familiar with proper waste solar panel and solar panel manufacturing scrap management and emergency response procedures relative to those persons' responsibilities, as specified in subsections (b) and (c) of this section.

(b) A handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap shall initially train and provide annually, thereafter, training to all personnel who manage or who supervise those who manage solar panels and solar panel manufacturing scrap. Training materials shall be in the form of any written media (e.g., brochures, electronic mail, company letters, pamphlets, posters, etc.) and shall include the date of that material. This training shall include, at a minimum:

(1) The types and hazards associated with the solar panels and solar panel manufacturing scrap that personnel may manage at the facility (e.g., hazards due to broken glass and cadmium in solar panels);

(2) The proper disposition of solar panels and solar panel manufacturing scrap managed at the facility (e.g., the locations of solar panel containers, or the location of a centralized solar panel and solar panel manufacturing scrap accumulation area);

(3) The proper procedures for responding to releases of solar panels and solar panel manufacturing scrap (e.g., spilled solar panel glass) including the position titles and the means of contacting those personnel at the facility who are designated to respond to reports of releases (e.g., spilled solar panel glass) and/or to respond to questions received from other personnel at the facility; and

(4) The applicable requirements contained in this article regarding labeling, collecting, handling, consolidating, and shipping solar panels at the facility, including, but not limited to, the prohibition on the disposal of solar panels and solar panel manufacturing scrap, and for personnel involved in shipping solar panels and solar panel manufacturing scrap who are "hazmat employees", as defined in 49 Code of Federal Regulations section 171.8, the applicable requirements prescribed in 49 Code of Federal Regulations section 172.704.

(c) The handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap shall maintain a written record by date (e.g., a list of personnel who have received either initial or annual training information) indicating the names of personnel who received the information specified in subsection (b) of this section.

(d) The handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap shall maintain the record specified in subsection (c) of this section for at least three years from the date the person last managed any solar panels at the facility. The record of training for a “hazmat employee”, as defined in 49 Code of Federal Regulations section 171.8, shall meet the applicable requirements of 49 Code of Federal Regulations section 172.704(d). The training record may accompany a person who is transferred within the same company.

DRAFT

17. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.86
Accumulation Time Limits

Comments:

Limiting accumulation time is reasonable to decrease the potential for adverse events.

The language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Edits:

66273.86. Accumulation Time Limits.

(a) A handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap shall accumulate waste solar panels and solar panel manufacturing scrap for no longer than one year from the date the solar panel waste or solar panel manufacturing scrap was generated, or was received from another handler of universal waste solar panels.

(b) A handler of ~~universal waste~~ solar panels and solar panel manufacturing scrap shall be able to demonstrate the length of time that the waste solar panels and solar panel manufacturing scrap has been accumulated from the date it became a waste or was received. The handler of universal waste solar panels may make this demonstration by:

(1) Placing the waste solar panel or solar panel manufacturing scrap in a container and marking or labeling the container with the earliest date that any waste solar panel or solar panel manufacturing scrap in the container became a waste or was received;

(2) Marking or labeling the individual waste solar panel or solar panel manufacturing scrap with the date it became a waste or was received;

(3) Maintaining an inventory system onsite that identifies the date the waste solar panel or solar panel manufacturing scrap became a waste or was received;

(4) Maintaining an inventory system onsite that identifies the earliest date that any waste solar panel or solar panel manufacturing scrap in a group of items of waste solar panels or solar panel manufacturing scrap or a group of containers of waste solar panels or solar panel manufacturing scrap became a waste or was received;

(5) Placing the waste solar panel or solar panel manufacturing scrap in a specific accumulation area and marking or labeling the area to identify the earliest date that any waste solar panel or solar panel manufacturing scrap in the area became a waste or was received; or

(6) Any other method which clearly demonstrates the length of time that the waste solar panel or solar panel manufacturing scrap has been accumulated from the date it became a waste or was received.

18. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.87
Offsite Shipments

Comments:

Providing standard for shipping waste solar panels and solar panel manufacturing scrap decreases the opportunity for an adverse event during transfer, receiving, and accumulation.

The language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Edits:

66273.87. Offsite Shipments.

(a) A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap is prohibited from sending or taking waste solar panels and solar panel manufacturing scrap to a place other than another handler of ~~universal~~ waste solar panels, a destination facility, ~~or a foreign destination.~~

(b) If a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap self-transport waste solar panels or solar panel manufacturing scrap offsite, the handler becomes a ~~universal~~ waste transporter for those self-transportation activities and shall comply with the ~~universal~~ waste transporter requirements of ~~article 5 of this chapter~~ 35 while transporting the waste solar panels and solar panel manufacturing scrap.

(c) If a solar panel being offered for offsite transportation meets the definition of hazardous material pursuant to 49 CFR parts 171 through 180, a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall package, label, mark and placard the shipment, and prepare the proper shipping papers in accordance with the applicable Department of Transportation regulations pursuant to 49 CFR parts 172 through 180;

(d) Prior to sending a shipment of waste solar panels and solar panel manufacturing scrap to another handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap or to a destination facility, the originating handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall ensure that the receiving handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap or destination facility agrees (e.g., verbal or written communication) to receive the shipment.

(e) If a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap sends a shipment of solar panels to another handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap or to a destination facility and the shipment is rejected by the receiving handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap or destination facility, the originating handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall either:

(1) Receive the ~~solar panel(s)~~ waste solar panels and solar panel manufacturing scrap back when notified that the shipment has been rejected; or

(2) Agree with the receiving handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap on a destination facility to which the shipment will be sent.

(f) A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap may reject a shipment containing waste solar panels and solar panel manufacturing scrap ~~solar panels~~, or a portion of a shipment containing ~~solar panels~~ waste solar panels and solar panel manufacturing scrap that the handler has received from another handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap. If a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap rejects a shipment or a portion of a shipment, the handler shall contact and notify the originating handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap of the rejection and to discuss reshipment of the load. The handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall:

(1) Send the shipment back to the originating handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap; or

(2) If agreed to by both the originating and receiving handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap, send the shipment to a destination facility.

(g) If a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap receives as waste solar panels and solar panel manufacturing scrap ~~solar panels~~, a shipment containing hazardous waste that is not a waste solar panels and solar panel manufacturing scrap ~~solar panel~~, the handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall immediately notify the Department of the illegal shipment, and provide the name, address, and telephone number of the originating shipper. The Department will provide instructions for managing the hazardous waste.

(h) If a handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap receives as waste solar panels and solar panel manufacturing scrap ~~solar panels~~, a shipment of nonhazardous waste, the handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall manage the nonhazardous waste in any way that is in compliance with applicable federal, state and local solid waste regulations.

19. **CCR, title 22, division 4.5, chapter 23**
Article 8: Standards for the Management of Universal Waste Solar Panels
Section 66273.88
Tracking Solar Panel Shipments

Comments:

Tracking of solar panel shipments will enable the industry to demonstrate compliance with offsite shipment, accumulation time limits, and other standards.

The language needs to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Suggested Changes/Rationale:

Change language to reflect alternative management standards for waste solar panels and solar panel manufacturing scrap.

Edits:

66273.88. Tracking Solar Panel Shipments.

(a) Receipt of shipments. A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall keep a record of each shipment of waste solar panels and solar panel manufacturing scrap received at the handler's facility. The record may take the form of a log, invoice, manifest, bill of lading, or other shipping document. The record for each shipment of waste solar panels and solar panel manufacturing scrap received shall include the following information:

(1) The name and address of the originating handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap from which the waste solar panels and Solar Panel Manufacturing Scrap were sent;

(2) The quantity [count or weight] of waste solar panels and solar panel manufacturing scrap received; and

(3) The date of receipt of the shipment of waste solar panels and solar panel manufacturing scrap

(b) Shipments offsite. A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall keep a record of each shipment of waste solar panels and solar panel manufacturing scrap sent from the handler's facility to another facility. The record may take the form of a log, invoice, manifest, bill of lading or other shipping document. The record for each shipment of waste solar panels and solar panel manufacturing scrap sent shall include the following information:

(1) The name and address of the handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap or destination facility to which the waste solar panels and solar panel manufacturing scrap were sent;

(2) The quantity [count or weight] of waste solar panels and solar panel manufacturing scrap sent;

(3) The date of departure of the shipment of waste solar panels and solar panel manufacturing scrap.

(c) Record retention.

(1) A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall retain each record described in subsection (a) of this section for at least three years from the date of receipt of the corresponding shipment of waste solar panels and solar panel manufacturing scrap

(2) A handler of ~~universal~~ waste solar panels and solar panel manufacturing scrap shall retain each record described in subsection (b) of this section for at least three years from the date of departure of the corresponding shipment of ~~universal~~ waste solar panels and solar panel manufacturing scrap

Attachment G

Example of label to be adhered to solar panel.



Collection and environmentally responsible recycling
of this module is available.

Please contact pv recycling, llc for additional information.

Toll free (North America): **1.888.787.2010**
International: **+ 1.520.414.8148**

or

www.pvrecycling.com

Se encuentra a disposición la recolección y el reciclado para proteger al medio ambiente de este panel. Para obtener más información, comuníquese con pv recycling, llc.

Bei diesem Modul besteht die Möglichkeit zur Abholung und zum umweltfreundlichen Recycling. Weitere Informationen erhalten Sie von pv recycling, llc.

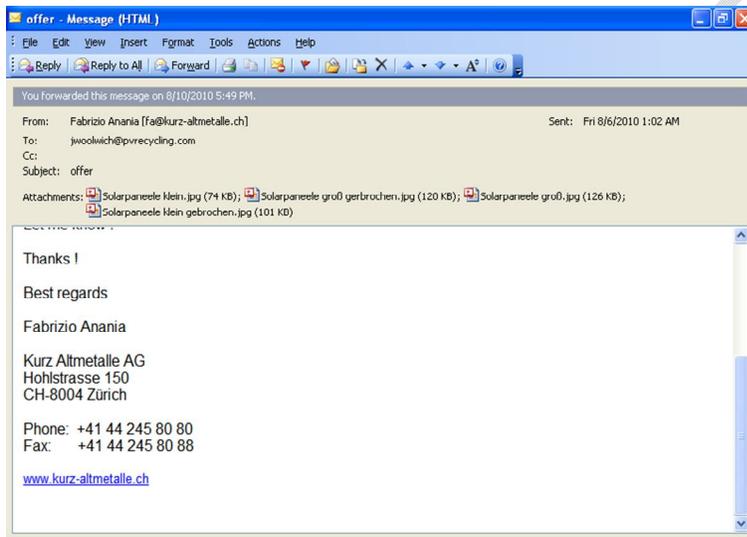
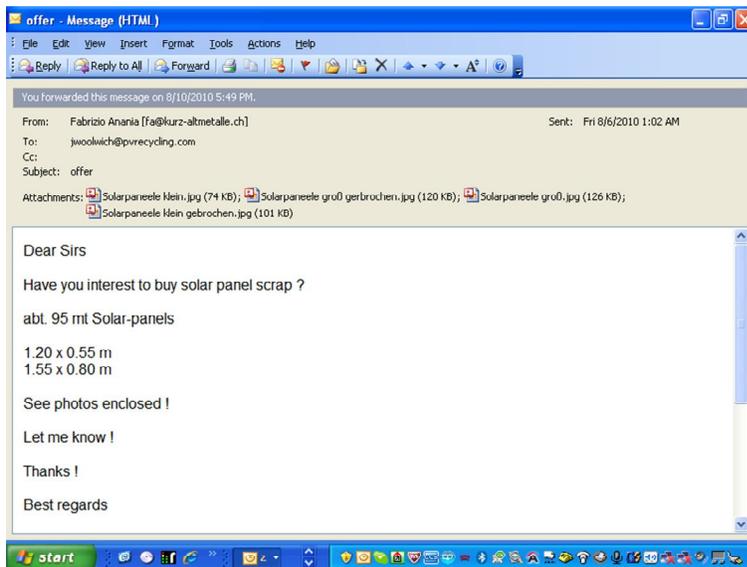
收集和以對環境負責的方式回收太陽能模組已經可行。請聯絡 pv recycling, llc 公司以獲得更多資訊。

Insert SYMBOL to identify handling/treatment method



Attachment H

Although pv recycling, Ilc has received inquiries from recyclers in the United States, due to the sensitivity of this topic an email from a company based in Switzerland is sourced.



Attachment I

This is a conceptual example for development of Chapter 35: Alternative Management Standards for Waste Solar Panels and Solar Panel Manufacturing Scrap. It is not the intent to use the language/words below for the new chapter.

Chapter 34. Alternative Management Standards for Treated Wood Waste

§ 67386.1. Scope

(a) This chapter provides an alternative set of management standards in lieu of the requirements for hazardous waste pursuant to articles 6, 6.5, and 9, chapter 6.5, division 20, Health and Safety Code, and chapters 12, 13, 14, 15, 16, 18, and 20 of this division for a person managing treated wood waste (TWW). All other chapters of this division, and section 66264.101, chapter 14, division 4.5, title 22, apply to persons managing TWW.

(b) Nothing in this chapter is a limitation on the power of this or any other governmental agency to adopt or enforce additional requirements related to the management of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.2. Applicability

(a) The alternative management standards of this chapter apply only to wood waste that meets all of the following:

(1) is a hazardous waste pursuant to chapter 11 of this division;

(2) is a hazardous waste solely due to the presence of a preservative in or on the wood that is registered in accordance with the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for use as a wood preservative; and

(3) is not subject to regulation as a hazardous waste under the federal Resource Conservation and Recovery Act (RCRA).

(b) The alternative management standards of this chapter do not apply to wood waste exempted from hazardous waste management standards pursuant to Health and Safety Code section 25143.1.5.

(c) The following wood wastes are not eligible for the alternative management standards of this chapter:

(1) wood waste that is hazardous due to the presence of coatings, paint, or other treatments that are not registered in accordance with FIFRA for use as a wood preservative; or

(2) wood waste when designated to be burned.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25143.1.5, 25150.7 and 25150.8, Health and Safety Code.

§ 67386.3. Prohibited Activities

(a) TWW managed in accordance with the alternative management standards of this chapter shall not be:

(1) burned;

(2) scavenged;

(3) commingled with other waste prior to disposal, if previously segregated;

(4) stored in contact with the ground;

(5) recycled, with or without treatment, except as provided for in subsection (c)

(6) treated except in compliance with section 67386.10; and

(7) disposed to land except in compliance with section 67386.11.

(b) Any label or mark that identifies the wood waste as TWW shall not be intentionally removed, obliterated, defaced, or destroyed prior to disposal in a landfill.

(c) TWW may be recycled only by reuse pursuant to conditions specified in (1) – (3) of this subsection. During reuse, the TWW is not subject to sections 67386.5 through 67386.11. TWW may only be reused when all of the following apply:

(1) reuse is onsite;

(2) at the time of reuse, reuse is consistent with a FIFRA approved use of the preservative with which the TWW has been treated; and

(3) prior to reuse, the TWW is handled in compliance with all applicable management standards of this chapter.

§ 67386.4. Definitions

The definitions set forth in section 66260.10 of this division shall apply unless otherwise defined. The following definitions shall apply to the terms used in this chapter:

"Agent" means a person hired by a generator for the removal, collection, or transportation of TWW.

"Class 1 hazardous waste landfill" means a landfill as defined in section 66260.10, which is also authorized as part of a permitted facility as defined in section 66260.10.

"Composting Facility" means a facility that produces compost as defined in Public Resources Code, section 40116 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Gasification Facility" means a facility that utilizes a gasification process as defined in Public Resources Code, section 40117 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Limited Volume Transfer Operation" means an operation that receives less than 60 cubic yards, or 15 tons of solid waste per operating day for the purpose of storing the waste prior to transferring the waste to another solid waste operation or facility and which does not conduct processing activities, but may conduct limited salvaging activities and volume reduction by the operator and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Resizing" means the minimal cutting, breaking, or sawing, but does not include planing, grinding, chipping, sanding, shredding, mulching, or other mechanical handling or any other treatment.

"Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation" means a site that receives less than 25 tons of any combination of construction and demolition debris and Type A inert debris per operating day for the purposes of storage, handling, transfer, or processing that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Solid Waste Landfill" means a facility as defined in Public Resources Code, section 40195.1 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transfer or Processing Station" means a facility as defined in Public Resources Code, section 40200 that is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Transformation Facility" means a facility that utilizes a transformation process as defined in Public Resources Code, section 40201 and is authorized to operate pursuant to division 30 of Public Resources Code (commencing with § 40000).

"Treated wood" means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. § 136 and following).

"Treated Wood Waste" means a waste that meets the requirements of section 67386.2(a).

“TWW” means “Treated Wood Waste.”

“TWW approved landfill” means either a class 1 hazardous waste landfill, or a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or treated wood waste and that is in compliance with this chapter.

“TWW facility” means either:

- (a) a solid waste landfill, as defined in this section, that is in compliance with this chapter; or
- (b) a transfer or processing station, as defined in this section, that is in compliance with this chapter; or
- (c) a gasification facility, as defined in this section, that is in compliance with this chapter; or
- (d) a TWW approved landfill, as defined in this section, that is in compliance with this chapter; or
- (e) a class 1 hazardous waste landfill; or
- (f) Small Volume Construction and Demolition/Inert (CDI) Debris Processing Operation, as defined in this section, that is in compliance with this chapter; or
- (g) Limited Volume Transfer Operation, as defined in this section, that is in compliance with this chapter.

TWW Facility shall not include composting facilities, or transformation facilities.

“TWW handler” means a person who generates, handles, collects, processes, accumulates, stores, transfers, transports, treats, recycles, or disposes of TWW.

“Unit” means a pile, stack, container, bundle, or other discernable aggregation of TWW for purposes of this chapter.

“Wood waste” means all waste timber products and failed timber products including solid sawn lumber and engineered wood products, offcuts, shavings and sawdust that meet the definition of “waste” pursuant to Health and Safety Code section 25124. “Wood Waste” does not mean forest residues, green waste, or garden waste materials such as branches, bushes and tree stumps.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code; Sections 40116, 40117, 40195.1, 40200, and 40201, Public Resources Code; and Section 13173 Water Code.

§ 67386.5. Labeling

(a) TWW generated, accumulated, stored, or transported within California shall be clearly marked and visible for inspection. The person managing the TWW shall ensure that each unit and/or area designated for accumulation of TWW is labeled. The area designated for accumulation of TWW shall be clearly identified and used solely for the accumulation of TWW.

(b) In order to clearly identify the nature of the waste to the receiving party and/or any observer, the TWW shall be labeled or marked with the following:

“TREATED WOOD WASTE – Do not burn or scavenge.

TWW Handler Name and Address: _____
Accumulation Date”. _____.”

(c) The TWW handler shall ensure that labels are maintained in compliance with the requirements of subsections (a) and (b) during transport.

(d) TWW accumulated for a period not to exceed thirty (30) days by a household at the site of generation in compliance with the requirements of section 67386.6 is exempt from the labeling requirements of this section.

(e) TWW, generated by a household, while being self-transported to an approved TWW facility is exempt from the labeling requirements of this section if the TWW is identified to the TWW facility as TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.
Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

HISTORY

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to GovernmentCode section 11343.4 (Register 2007, No. 25).
2. Amendment of subsection (e) filed 10-3-2007; operative 11-2-2007 (Register 2007, No. 40).

§ 67386.6. Accumulation

(a) TWW shall be maintained in a manner that prevents unauthorized access and minimizes release to the environment.

(1) Unauthorized access shall be prevented by means of visual control or physical barrier when not under the direct control of the person responsible for the TWW.

(2) The TWW shall be accumulated in a manner that is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water, which may be accomplished by one of the following:

(A) Block and Tarp:

The TWW may be accumulated when all the following requirements are met;

1. TWW is elevated to prevent contact with the soil and to protect from reasonably foreseeable run-on;
2. TWW is covered to protect from precipitation; and
3. TWW is accumulated no longer than 90 days from the date the TWW is generated or received from another handler.

(B) Containerize:

The TWW may be accumulated in containers no longer than one year from the date the TWW is generated or received from another handler. The containers shall be;

1. designed, constructed, maintained, filled, its contents so limited, and closed, so that under conditions normally incidental to handling, there will be no identifiable release of TWW materials or its constituents to the environment; and
2. water-resistant if exposed to precipitation, run-on or run-off under reasonably foreseeable conditions.
3. transported to a TWW facility within 90 days of being filled to capacity.

(C) Storage Building:

The TWW shall be accumulated no longer than one year from the date the TWW is generated or received from another handler in a structurally sound building with a water-resistant floor designed to prevent the movement of water into or out of the building.

(D) Containment Pad:

The TWW may be accumulated no longer than 180 days from the date the TWW is generated or received from another handler on a containment surface and all the following requirements are met;

1. TWW does not contact soil;
2. TWW is protected from reasonably foreseeable run-on;
3. TWW is covered to protect from precipitation; and
4. TWW managed in accordance with this subsection may be accumulated uncovered if the containment surface is designed and operated to contain all precipitation and the resulting water is managed in accordance with all applicable laws and regulations.

(E) Other:

The TWW may be accumulated no longer than 90 days from the date the TWW is generated or received from another handler in any other manner in which the TWW handler can clearly demonstrate that the TWW is protected from run-on and run-off, and placed on a surface sufficiently impervious to prevent, to the extent practical, contact with and leaching to soil or water.

(b) Except as provided in subsection (c), in no case shall TWW be accumulated for more than one year from the date of generation or the date received from another handler.

(c) A handler may accumulate TWW for longer than one year from the date the TWW is generated or received from another handler, if the accumulation is solely for the purpose of accumulation of quantities of TWW necessary to facilitate disposal pursuant to section 67386.11. However, the handler bears the burden of proving that the accumulation was solely for the purpose of accumulation of quantities of TWW necessary to facilitate proper disposal.

(d) A person who accumulates TWW shall be able to demonstrate the length of time the TWW has been accumulated from the date it becomes a waste or is received.

(e) TWW generated incidental to the maintenance of a household and accumulated by the resident of the household at the site of generation is exempt from the accumulation requirements of this section if all of the following requirements are met;

(1) TWW is not physically altered except as provided in section 67386.10; and

(2) TWW is accumulated no longer than thirty (30) days.

(f) TWW generated incidental to the operation of a business accumulated at the site of generation for a period not to exceed thirty (30) days is exempt from the accumulation requirements of this section if:

(1) TWW is not physically altered except as provided in section 67386.10; and

(2) the business accumulates no more than 1,000 pounds of TWW.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

History

1. New section filed 6-18-2007; operative 7-1-2007 pursuant to Government Code section 11343.4 (Register 2007, No. 25).

2. Amendment of subsections (a)(2)(B)1.-2. and new subsection (a)(2)(B)3. filed 10-3-2007; operative 11-2-2007 (Register 2007, No. 40).

§ 67386.7. Offsite Shipments

(a) Except as provided in subsection (c), a TWW handler is prohibited from sending or taking TWW to a place other than a TWW facility, or a TWW approved landfill.

(b) Prior to sending a shipment of TWW to another TWW handler, the originating handler shall ensure that the receiving handler agrees to receive the shipment.

(c) A TWW handler who initially collects TWW at a remote site may transport that TWW to a consolidation site operated by the generator if all the following conditions are met;

(1) the TWW is transported by the generator, employees of the generator or by the generator's agent;

(2) a shipping document containing all of the following information accompanies the TWW while in transport;

(A) the quantity, by weight or volume, of TWW being transported;

(B) the location of the remote site where the TWW was initially collected;

(C) the date that the generator first began to accumulate the TWW at the remote site, the date that the shipment leaves the remote site, and the date that the shipment arrives at the consolidation site;

(D) the name, address, and telephone number of the generator, and, if different, the address and telephone number of the consolidation site to which the TWW is being transported; and

(E) the name of the individual or individuals who transport the TWW from the remote site to the consolidation site; and

(3) the TWW handler shall retain the shipping document described in subsection (c)(2) of this section for at least three years from the date the TWW leaves the TWW consolidation site.

(d) TWW shall be shipped and/or transported in a manner that prevents unauthorized access; protects the TWW from precipitation; and prevents loss, dispersion, and leaching of TWW constituents.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.8. Tracking Shipments

(a) Shipments off-site. A TWW handler shall keep a record of each shipment of TWW sent from the handler to TWW facilities. The record may take the form of a log, invoice, manifest, bill of lading, shipping document, or receipt from a TWW facility. The record for each shipment of TWW shall include the following information:

- (1) name and address of the TWW facility to which the TWW was sent;
- (2) weight of TWW, the estimated weight of TWW, or the weight of the TWW as measured by the receiving TWW facility. (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and
- (3) date the shipment of TWW left the handler.

(b) Receipt of shipments. A TWW handler shall keep a record of each shipment of TWW received at the facility. The record may take the form of a log, invoice, manifest, bill of lading, or other shipping document. The record for each shipment of TWW received shall include the following information:

- (1) name and address of the originating TWW generator from whom the TWW was sent;
- (2) weight of TWW or the estimated weight of TWW. (An estimated weight may be used when a scale is unavailable or weighing is impractical. Assumptions required for weight estimates shall be recorded in the shipment records.); and
- (3) date of receipt of the shipment of TWW.

(c) Reporting receipt of shipments. A TWW facility or a TWW approved landfill that receives TWW shall submit, to the department, semi annual reports for the periods ending June 30 and December 31 of each year. Reports shall be required beginning December 31, 2007 and shall be submitted in an electronic format provided by the department within 30 days of the end of each reporting period. Each semi annual report shall include the following information:

- (1) reporting facility information;
 1. Facility name, location address, contact person's name, and telephone number; and
 2. Identification Number.
- (2) for all TWW shipments received, other than those reported under subsections (3), (4), and (5) the TWW facility shall report the following information;
 1. generator's Identification Number, or, if the generator does not have an Identification Number, the name, address, contact person's name, mailing address, and telephone number of the generator;
 2. dates of shipments; and
 3. weight of TWW per shipment.
- (3) TWW household information;
 1. weight summary of all TWW quantities received that were generated by households.
- (4) TWW load check information;
 1. Weight summary of all TWW quantities discovered and separated from solid waste as part of an on-site load checking program.
- (5) for shipments received from another TWW facility the following information shall be reported by the receiving TWW facility;
 1. TWW facility's Identification Number or the name, address, contact person's name, mailing address, and telephone number of the TWW facility;
 2. dates of shipments; and
 3. weight of TWW per shipment.

(d) The department shall make all of the information in the semi annual reports submitted pursuant to this subdivision available to the public, through its usual means of disclosure, except the department shall not disclose the association between any specific TWW handlers and specific facilities. The list of TWW handlers served by a facility shall be deemed to be a trade secret and confidential business information for purposes of Health and Safety Code section 25173 and section 66260.2 of title 22 of the California Code of Regulations.

(e) Record retention.

- (1) a TWW handler shall retain the records described in subsection (a) of this section for at least three years from the date the shipment left the handler; and
- (2) a TWW facility shall retain the records described in subsection (b) of this section for at least three years from the date of receipt of a shipment.

(f) Households are exempt from the recordkeeping requirements of this section when the TWW is generated incidental to that household.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7, 25150.8 and 25173, Health and Safety Code.

§ 67386.9. Notification

(a) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW, the TWW handler shall obtain or maintain an Identification Number within 30 days of exceeding the weight threshold.

(b) In any calendar year that a TWW handler generates more than 10,000 pounds of TWW the handler shall send written notification to the Department within 30 days of exceeding the 10,000 pound limit.

(c) The notification shall include;

(1) TWW handler's name and mailing address;

(2) generator's Identification Number;

(3) name and business telephone number of the person at the TWW handler's site who should be contacted regarding TWW management activities;

(4) address or physical location of the TWW management activities;

(5) date the TWW handler exceeded the 10,000 pound limit; and

(6) a statement indicating that the handler is generating more than 10,000 pounds of TWW per calendar year.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.10. Treatment

(a) Treatment, as defined in Health and Safety Code section 25123.5, of treated wood waste managed in accordance with the alternative management standards of this chapter is prohibited except as provided in subsections (b) and (c).

(b) Resizing is exempt from the permitting requirements of this division when resized to facilitate transport or reuse and the following requirements are met;

(1) TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment; and

(2) if size reduction of the TWW results in sawdust, particles, or other material smaller than one cubic inch, the material shall be captured and managed as TWW.

(c) Sorting and segregating are both exempt from the permitting requirements of this division. The TWW shall be handled in a manner that prevents the uncontrolled release of hazardous constituents to the environment.

(d) An employer resizing, sorting, or segregating TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;

(2) procedures for identifying and segregating TWW;

(3) safe handling practices;

(4) requirements of the alternative management standards; and

(5) proper disposal methods.

Note: Authority cited: Sections 25150, 25150.7, and 58012, Health and Safety Code.

Reference: Sections 25150.7 and 25150.8, Health and Safety Code.

§ 67386.11. Disposal

(a) When disposed to land, TWW shall be disposed in either a Class I hazardous waste landfill, or in a composite-lined portion of a solid waste landfill unit that meets all requirements applicable to disposal of municipal solid waste in California after October 9, 1993, and that is regulated by waste discharge requirements issued pursuant to division 7 (commencing with § 13000) of the Water Code for discharges of designated waste, as defined in section 13173 of the Water Code, or TWW.

(b) A solid waste landfill that accepts TWW shall:

(1) comply with the prohibitions in section 67386.3 for handling TWW;

(2) ensure that any management of the TWW at the solid waste landfill prior to disposal complies with the applicable requirements of this chapter;

(3) monitor the composite-lined portion of a landfill unit at which TWW has been disposed. When a release is verified, cease discharge of TWW to that landfill unit until corrective action results in cessation of the release. The landfill shall notify the department that TWW is no longer being discharged to that landfill unit and when corrective action results in cessation of the release; and

(4) handle TWW in a manner consistent with all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste.

§ 67386.12. Training

(a) An employer managing TWW shall provide training for all employees handling TWW and all employees that may reasonably be expected to contact TWW. A record of the training shall be maintained for a period of three years and available for review. The training shall include:

(1) all applicable requirements of the California Occupational Safety and Health Act of 1973 (ch. 1, part 1, div. 5 (commencing with § 6300) of the Labor Code), including all rules, regulations, and orders relating to hazardous waste;

(2) procedures for identifying and segregating TWW;

(3) safe handling practices;

(4) requirements of the alternative management standards; and

(5) proper disposal methods.