

# Practicability Report:

## Metal Aerosol Cans (Non-Empty)

9/17/25

### Report Summary

Oregon Administrative Rule (OAR) 340-090-0630(3) defines the list of materials that the Producer Responsibility Organization (PRO) is obligated to collect and ensure delivery to a Responsible End Market (REM). This includes aerosol cans, which Circular Action Alliance Oregon, LLC (CAA Oregon), in its capacity as the PRO, determines to be beyond the threshold of practicability when received as non-empty. In Oregon, non-empty aerosol cans are currently recommended for disposal at Household Hazardous Waste (HHW) facilities, HHW collection events, or as allowed in municipal solid waste. When all stages of collection and management for non-empty aerosol cans are evaluated, and requirements of OAR 340-090-0650(3)(b) are met, CAA Oregon concludes that the costs to manage non-empty aerosol containers exceed DEQ's societal benefit benchmarks across materials management scenarios.

The Department of Transportation's (DOT) classification of non-empty aerosol cans as dangerous goods under 40 CFR 273 contributes significantly to the impracticability conditions. This classification mandates specialized handling, transportation, and disposal of non-empty cans intact, and is aligned with the safety instructions found on many aerosol products (Table 1). Conditions beyond practicability persist for the PRO even under interpretations that consider puncturing and draining aerosol cans. This is due to disposal costs and fees from hazardous residuals end markets as well as the necessity for filtration consumables, used to collect can drainage, which themselves become an additional waste stream. The costs and impracticable conditions for this scenario arise before factoring in additional requirements such as staffing, related facility upgrades, and potentially permitting for each collection site. The costs incurred across scenarios from both transportation and disposal requirements create conditions for the category that exceed the societal benefit benchmark for the PRO. CAA Oregon believes the specific transportation requirement in compliance with 40 CFR 273, which is out of CAA Oregon's control, alone qualifies as demonstration that "an action is not practicable" and demonstrates "costs that are not justified given the resulting societal benefits," per the rule.

Additionally, no REM disposition currently exists in Oregon, Washington, Northern California, or western Idaho for processing aerosol containers with residual volumes. As a result, all units collected under 40 CFR 273 must be shipped to regional Treatment, Storage, and Disposal (TSD) facilities, where incineration or landfill is the only available disposition, preventing the end market from demonstrating an adequate REM recovery yield. Even in the landfill scenario, there is no metal recovery potential. In the findings below, CAA Oregon offers cost analysis of a technology that could be used to evacuate residual contents at an end market, but siting, building, and permitting could take more than 5 years, and the transportation requirements to get containers to that end market

would still apply, creating a total cost to manage that exceeds the societal benefit described in OAR 340-090-0670(5)(c).

CAA Oregon raised concerns of the cost to manage with DEQ during rulemaking, resulting in the PRO's management obligation being delayed until January 1, 2028 (OAR 340-090-0630(3)(a)), giving CAA Oregon time to explore all management options and related costs. The following sections of this report lay out the practicability test for non-empty aerosols.

### *Primary Practicability Considerations:*

- The cost for CAA Oregon to manage non-empty aerosol cans exceeds the societal benefit benchmark, pursuant to OAR: 340-090-0670 (5)(c).
- The classification of non-empty aerosols as dangerous goods in the DOT regulation requiring special handling and in accordance with OAR 340-090-0650 (3)(b)(A)(B) and 40 CFR 261.7, are drivers of costs beyond the societal benefit threshold.

### *In this report, the following is also prepared related to practicability:*

- CAA Oregon will evaluate the transactional costs of identified solutions against the benchmark for non-empty aerosol cans in accordance with OAR 340-090-0670 (5)(c)(A) and in accordance with requirements for the PRO established in ORS 459A.869.

## **Practicability Study for Non-Empty Aerosol Cans**

### *Background Information*

CAA Oregon's approved program plan notes that Phase II rules delay the addition of aerosol containers and pressurized cylinders to the PRO's accepted list of materials until 2028. CAA Oregon is not pursuing collection of aerosols at the PRO material collection points during the course of the first program plan. This report is aimed solely at addressing the practicability of managing non-empty aerosols with residual contents. Within the program period, CAA Oregon will submit a program plan amendment proposing the addition of empty metal aerosol cans to the Uniform Statewide Collection List (USCL). That proposal will address only empty containers, which are non-hazardous and more readily recyclable. CAA Oregon believes that collecting and processing empty aerosols can be done safely and efficiently, distinguishing it from the challenges posed by non-empty containers that still hold residual contents.

Metal aerosol cans carry the designation of a DEQ Specifically Identified Material (SIM) and CAA Oregon will implement a phased education strategy to Oregon communities based on existing curbside collection practices. Research is underway, in collaboration with the U.S. Aerosol Recycling Initiative and local governments, to determine how to optimize education to ensure proper preparation and safe inclusion in the statewide program. CAA Oregon will also reinforce education for residents and small generators to direct the use of HHW programs or municipal solid waste options for their non-empty cans.

Oregon currently has HHW programs that operate throughout the state collecting this material. HHW operations currently span a combination of dedicated facilities and collection events in numerous counties, including Baker, Benton, Clackamas, Clatsop, Columbia, Coos, Crook, Curry, Deschutes, Douglas, Gilliam, Hood River, Jackson, Josephine, Lane, Lincoln, Linn, Marion, Morrow, Multnomah, Polk, Sherman, Tillamook, Union, Wallowa, Wasco, Washington and Yamhill counties.

### *Definition*

The Code of Federal Regulations (CFR) states the following definition for aerosol containers in 40 CFR 273.9: Aerosol can mean a non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

### *Special Handling*

For compliant handling, non-empty aerosol containers must be packed in single-use, DOT-certified containers, labeled to indicate hazardous contents, and accompanied by a proper manifest documenting the waste and its movement. These requirements are intended to ensure safe storage, transportation, and delivery to permitted end-market facilities.

PRO sites or collection events handling non-empty aerosols must comply with collection, transportation, and end-market management requirements under multiple regulatory frameworks, including federal regulations (CFR: 40 CFR 273 and 40 CFR 261) and Oregon Administrative Rules (OAR 340-109-0020). 40 CFR 261 defines what constitutes hazardous waste, requiring generators and collectors to properly identify and categorize aerosol containers with residual contents. 40 CFR 273 specifies standards for the management of universal waste, including proper packaging, labeling, and recordkeeping to ensure safe handling and transport of hazardous materials. Under OAR 340-109-0020, Oregon mandates that collectors implement controls consistent with federal standards, including employee training, site preparedness, and compliance with state-specific reporting and inspection requirements.

### *Material Performance Standards*

Non-empty aerosol cans and any managed residuals are inherently hazardous and highly flammable, particularly when exposed to temperatures above 120°F. PRO collection point storage during summer months, especially in enclosed containers, could exceed this threshold, creating significant risks. Compliance with Consumer Product Safety Commission (CPSC) and Department of Transportation (DOT) labeling is legally enforceable; therefore, a 120°F limitation is a binding storage requirement found on aerosol cans. Proper ventilation, temperature control, and monitoring are essential to meet this safety standard.

To comply with Oregon materials performance standards under OAR 340-102 (Standards Applicable to Generators of Hazardous Waste) and OAR 340-105 (Management Facility Permits), collection sites for non-empty aerosol containers and pressurized cylinders must undergo preparation and inspection for hazardous contents. This necessitates specialized handling and storage protocols for non-empty cans, elevating operational complexity and costs associated with safely managing these items.

## Non-Empty Aerosol Can Practicability Assessment

### *Environmental and Safety Impact*

Under current practices, the benefit of recycling the metal's value is lost, and the benchmark for environmental benefit from specialized facilities is limited to safe destruction of hazardous constituents. Hazardous waste collection programs around the state that collect non-empty aerosols involve the following considerations:

- *Collection:* Material must be collected at a staffed hazardous waste collection facility that has an emergency contact available at all times, and it must be stored in an environment that will pass inspection for ventilation and temperature control per CPSC/OSHA.
- *Transportation:* Shipments from HHW collection events or sites in Oregon move with a hazardous waste manifest to a permitted Treatment, Storage, and Disposal (TSD) facility. Aerosol containers are managed as hazardous waste if non-empty and pressurized. For shipment, they must be placed in DOT-approved containers such as steel 55-gallon drums or pails. These are marked under Aerosols, Class 2.1 (flammable gas), and transported according to 49 CFR hazardous materials regulations.
- *End-of-life management:* At present, aerosol containers collected through Oregon HHW programs are shipped to a permitted TSD facility. Once received, containers are incinerated or landfilled as hazardous waste with no recovery of the container or residual product. This means that, under current practice, metal is not recovered for recycling, and the environmental benefit is limited to safe destruction of hazardous constituents.

Improper handling or disposal of non-empty aerosol containers can lead to environmental contamination and worker safety concerns. The accumulated residual hazardous waste, including solvents and propellants, presents the risk of soil and groundwater contamination if containers are disposed of improperly.

### *Research Methodology*




The inputs for the practicability assessment are obtained from service providers supplemented by related estimates, to reflect the range of management options under consideration. Cost calculations for CAA Oregon are based on standardized collection containers, primarily 55-gallon drums, and

other DOT-approved containers suited to the volumes generated. Using Cascadia Consulting Group's projection of 325 tons per year, this corresponds to approximately 0.45 cubic yards per depot per week, or an average of 1.6 55-gallon drums per week of material. Each pathway incorporates associated costs, in accordance with federal and state regulatory requirements. Detailed cost tables and supporting information are provided in Appendix A and Appendix B.

## Costs

The following costs are for the special handling of non-empty aerosol cans. These costs would be incurred post collection based on quotes provided by licensed service providers to meet the strict requirements of the statute and regulations. Three options are presented, and they include the transfer of intact aerosol cans to permitted Treatment, Storage, and Disposal (TSD) facilities, the investment in DeSpray® processing capacity, as well as the use of Aerosolv® systems in the case of puncturing and draining at PRO depots. Even in the case where residuals are drained into a consolidated drum at the collection site (via the Aerosolv® unit), the fill threshold is met within 30 days, and additional costs still exceed practicability on the per-ton basis. These figures are provided to demonstrate costs to the practicability standard across a range of implementation scenarios below. PRO Depot capital equipment costs and operational costs including staffing of the recycling centers have not been included in the post-collection cost calculations.

Table 1: All handling disposition scenarios

<u>TSD</u> Cans Intact to end site. (Incineration/Landfill)	<u>Despray (investment)</u> Cans Intact to end site. Scrap Metal, residual recovery	<u>Aerosolv®</u> Puncture/Drain at PRO Depot (Scrap Metal, TSD)
Regulated site that manages hazardous waste by safely receiving, storing, treating, and ultimately disposing of materials in compliance with federal and state standards.	Investment in facility for state/region that empties, depressurizes, and separates aerosol cans into recyclable metal, liquid, and propellant streams.	Device that punctures and depressurizes aerosol cans, capturing liquid residues and filtering propellants so the empty cans can be safely recovered as scrap metal.
		
Reference Photo: NRC	Reference Photo: DeSpray	Reference Photo: Aerosolve
<u>PRO Collection Containers:</u> 5 Gallon Pail 30 Gallon Drum 55 Gallon Drum	<u>PRO Collection Containers:</u> 5 Gallon Pail 30 Gallon Drum 55 Gallon Drum	<u>PRO Collection Containers:</u> 30 Gallon Drum 55 Gallon Drum

For CAA Oregon to establish a program for non-empty aerosol containers that would comply with all state and federal hazardous waste management, transportation and REM requirements, the cost to manage on a per-ton basis exceeds a societal benefit threshold (Table 3) by a factor of at least two and sharply increases to beyond a factor of five with handling pursuant to 40 CFR 273 which requires cans to be intact. Use of the Aerosolv® system would require puncturing onsite, which constitutes hazardous waste treatment, requiring permitting and facility upgrades specific to handling the hazardous contents. This creates further costs and could take years to put into place.

Costs are detailed below by effective collection options across management scenarios. Additional detail is included in subsections "1," "2," and "3" below by multiple container sizes, with further detail in Appendix A.

**Table 2: All handling disposition cost scenarios with range of container sizes.**

Disposition	Container	Quantity	Unit of Measure	1: Post Collection (\$/container)	2: Transportation (\$/container)	3: Processing/disposal (\$/container)	\$/can	Total/ Container	Drum, Container - per ton basis (rounded)	Total calculated \$/ton
TSD	5 Gallon Pail	27 cans	Aerosol Containers	\$19.99	\$101	\$192.05	\$11.59	\$313.04	296.3	<b>\$92,751.24</b>
Despray	5 Gallon Pail	27 cans	Aerosol Containers	\$19.99	\$101	\$37.99	\$5.89	\$158.98	296.3	<b>\$47,103.95</b>
TSD	30 Gallon Drum	180 cans	Aerosol Containers	\$84.30	\$177	\$451.11	\$3.96	\$712.41	44.5	<b>\$31,662.76</b>
Despray	30 Gallon Drum	180 cans	Aerosol Containers	\$84.30	\$177	\$79.31	\$1.89	\$340.61	44.5	<b>\$15,138.40</b>
Aerosolv® (including Scrap Metal Rebate)	30 Gallon Drum	944 cans' residuals	Aerosol Residuals	\$300.16	\$177	\$409.75	\$.94	\$886.91	11.4	<b>\$7,516.16</b>
TSD	55 Gallon Drum	280 cans	Aerosol Containers	\$96.3	\$177	\$584.15	\$3.06	\$857.45	28.6	<b>\$24,498.70</b>
Despray	55 Gallon Drum	280 cans	Aerosol Containers	\$96.3	\$177	\$93.18	\$1.31	\$366.48	28.6	<b>\$10,470.77</b>
Aerosolv® (including Scrap Metal Rebate)	55 Gallon Drum	1889 cans' residuals	Aerosol Residuals	\$528.25	\$177	\$501.38	\$.64	\$1,206.63	5.7	<b>\$5,110.13</b>

## Societal Benefit

CAA Oregon has prepared the per-ton transactional costs in this section to demonstrate that the management of non-empty aerosol containers exceeds the calculated societal benefit. With adjustment to the consumer price index, adjusted 1x/year with Bureau of Labor and Statistics, Consumer Price Index for All Urban Consumers (CPI-U), the Average Societal Benefit benchmark is calculated at \$2,317.38. According to OAR 340-090-0670(5)(c), a per-ton cost that exceeds the per-ton societal benefit benchmark may be considered impracticable.

Table 3: Annual Societal Benefit Calculation using CPI-U Data (Per OAR 340-090-0670(5)(c))

Year	Starting Cost	CPI-U Increase	Adjusted Cost
2021 – Baseline	\$2,017.00	Baseline	\$2,017.00
2022	\$2,017.00	5.4% [July '21-July '22]	\$2,124.92
2023	\$2,124.92	3.2%: [July '22- July '23]	\$2,191.98
2024	\$2,191.98	2.9% [July '23 – July '24]	\$2,256.05
2025	\$2,256.05	2.7% [July '24 – July '25]	<b>\$2,317.38</b>

Below, Table 4 summarizes the findings that have been presented in Table 2, which factors costs across post-collection needs, transportation, and through to end disposition. All of these costs create conditions that are fully above the societal benefit threshold by each category as a management scenario. This is outlined to summarize the societal benefit and societal cost of each approach to handling the material.

Table 4: Societal Benefits Considerations

Location / Scenario	Societal Benefit	Societal Cost / Tradeoff	Practicability Barriers
<b>TSD:</b> Cans intact to TSD Facility	Ensures aerosols are handled per 49 CFR 171-180 and 40 CFR 273	Current costs exceed practicability threshold . Emissions and fuel use. No material recovered.	Available TSD options do not qualify as a Recycling End Market (REM) and fail to meet yield requirements. This option does not fall within the standard of practicability for CAA to manage at PRO collection sites.
<b>Despray:</b> Cans intact to DeSpray facility	Recovery of metal and residuals.	Current costs exceed practicability threshold. Emissions and fuel use.	Costs exceed the societal benefit benchmark for CAA at PRO collection sites under DEQ's practicability test.
<b>Aerosolv®:</b> Cans punctured and drained at PRO sites with Aerosolv® unit.	Metal recovery.	Current costs exceed practicability threshold. Further Environmental Health and Safety risk and operational hazard to PRO compared to the other scenarios.	PRO collection points prepared as hazardous waste sites impracticable under both regulatory and cost considerations.



## Summary of Costs vs. Societal Benefit Benchmark

In Table 2 and Table 5, the cost-per-ton analysis compared to the societal benefit threshold shows potential end-market and disposal pathways for non-empty aerosol containers collected at PRO collection sites. The findings demonstrate that management of non-empty aerosols exceeds DEQ's societal benefit benchmark under the practicability test. The factor beyond practicability for scenarios ranges from roughly twice the threshold amount up to a factor of 40.

Table 5: Per ton costs to Societal Benefit.

Disposition	Container	Total calculated \$/ton	Societal Benefit (CPI-U adjusted)	Practicable to threshold?	Factor Beyond Practicability (rounded)
TSD	5 Gallon Pail	\$92,751.24	\$2,317.38	No	40.0
Despray	5 Gallon Pail	\$47,103.95	\$2,317.38	No	20.3
TSD	30 Gallon Drum	\$31,662.76	\$2,317.38	No	13.7
Despray	30 Gallon Drum	\$15,138.40	\$2,317.38	No	6.5
Aerosolv® (including Scrap Metal Rebate)	30 Gallon Drum	\$7,516.16	\$2,317.38	No	3.2
TSD	55 Gallon Drum	\$24,498.70	\$2,317.38	No	10.6
Despray	55 Gallon Drum	\$10,470.77	\$2,317.38	No	4.5
Aerosolv® (including Scrap Metal Rebate)	55 Gallon Drum	\$5,110.13	\$2,317.38	No	2.2

## Results and Recommendations

This practicability report demonstrates that managing non-empty aerosols incurs costs far exceeding the societal benefit benchmark of \$2,317.38/ton, primarily due to their classification as dangerous goods under DOT regulations and the requirements of OAR 340-090-0650 (3)(b)(A)(B). If costs are factored on a per-can basis, the direct costs to manage are translated to a minimum of \$.64/can (at \$5,110.13/ton) and as high as \$11.59/can (at \$92,751.24), dependent on implementable collection scenarios and interpretation of 40 CFR 273 requiring cans to remain intact. CAA Oregon will not puncture cans and will not manage hazardous waste due to the practicability of such actions, including regulatory risks and the category's performance to the practicability standard per rule. The result even at the minimum cost threshold within a contrary interpretation of 40 CFR 273 presents cost and conditions beyond practicability.

CAA Oregon recognizes the value of the steel and aluminum containers that can be collected when empty, and acknowledges that empty, non-hazardous containers can be collected without the same challenges. However, if CAA Oregon were to collect all aerosol containers, empty and non-empty,



hazardous and non-hazardous through the PRO collection network, all aerosol containers collected would need to be treated as hazardous. In an effort to maximize recovery of aerosol cans, CAA Oregon proposes to on-ramp empty aerosol containers, deemed non-hazardous in accordance to 40 CFR 273.6, to be collected as part of the USCL via a program plan amendment within the first program plan period in alignment with the following results and recommendations.

### *Practicability Results*

- The cost for CAA Oregon to manage non-empty aerosol containers exceeds the societal benefit benchmark pursuant to OAR 340-090-0670 (5)(c). The primary costs that far exceed the practicability threshold of \$2,317.38/ton are demonstrated in this report and range from \$5,110.13– \$92,751.24/ton.
- Conditions beyond practicability are driven by the classification of non-empty aerosols and their residuals as dangerous goods in the DOT regulation requiring special handling in compliance with OAR 340-090-0650 (3)(b)(A)(B).

### *Recommendations*

- A requirement for the PRO to collect and manage aerosols with residual contents changes the scope of the RMA to be a *product* management EPR program and not a *packaging* EPR program. CAA Oregon requests the removal of these items from the PRO Acceptance List in Rulemaking 3.
- The intent of the RMA is to manage packaging and not its contents. CAA Oregon proposes that empty aerosol containers can be managed within the societal benefit benchmark.
- CAA Oregon has presented that the management of aerosol containers greatly exceeds the specified societal benefit benchmark because of the added requirement to manage them under the assumption that they are not empty.
- CAA Oregon proposes splitting evaluation of Aerosol in ORS 459A.913 into two categories:
  - Metal Aerosol Cans – Empty/at atmospheric pressure.
  - Metal Aerosol Cans – With contents

## Appendix A:

### Cost Detail Per Drum

#### TSD End Site – Containers Intact

##### 5 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	5 gallon pail	\$ 18.19	\$ 18.19
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	5 gallon pail	\$ 24.00	\$ 24.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Disposal	1	5 gallon pail	\$ 135.00	\$ 135.00
Recovery Fee (16.5%)	1	Per job	\$ 46.20	\$ 46.20
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total/Drum</b>			<b>\$ 313.04</b>	

##### 30 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	30 gallon drum	\$ 82.50	\$ 82.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	30 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Disposal	1	30 gallon drum	\$ 337.50	\$ 337.50
Recovery Fee (16.5%)	1	Per job	\$ 98.80	\$ 98.80
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total/Drum</b>			<b>\$ 712.41</b>	

##### 55 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	55 gallon drum	\$ 94.50	\$ 94.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	55 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Disposal	1	55 gallon drum	\$ 450.00	\$ 450.00
Recovery Fee (16.5%)	1	Per job	\$ 119.34	\$ 119.34
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total/Drum</b>			<b>\$ 857.45</b>	

##### Summary -TSD

Container	Quantity	UOM	Price	\$/unit
5 Gallon Container	27	Aerosol Can	\$ 341.00	\$ 12.63
30 Gallon Container	180	Aerosol Can	\$ 712.41	\$ 3.96
55 Gallon Container	280	Aerosol Can	\$ 857.45	\$ 3.06

## Appendix A: (Cont)

### Cost Detail Per Drum

#### Aerosol Recycle/Gas Capture – Despray

##### 5 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	5 gallon pail	\$ 18.19	\$ 18.19
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	5 gallon pail	\$ 24.00	\$ 24.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Despray (Gas Capture + Recycle)	1	5 gallon pail	\$ 2.76	\$ 2.76
Recovery Fee (16.5%)	1	Per job	\$ 20.42	\$ 20.42
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total</b>				<b>\$ 158.98</b>

##### 30 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	30 gallon drum	\$ 82.50	\$ 82.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	30 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Despray (Gas Capture + Recycle)	1	30 gallon drum	\$ 18.36	\$ 18.36
Recovery Fee (16.5%)	1	Per job	\$ 46.14	\$ 46.14
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total</b>				<b>\$ 340.61</b>

##### 55 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	55 gallon drum	\$ 94.50	\$ 94.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Transportation				
Labor and Equipment	1	55 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Despray (Gas Capture + Recycle)	1	55 gallon drum	\$ 28.56	\$ 28.56
Recovery Fee (16.5%)	1	Per job	\$ 49.81	\$ 49.81
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total</b>				<b>\$ 366.48</b>

##### Summary - Despray

Container	Quantity	UOM	Price	\$/unit	\$/tonne
5 Gallon Container	27	Aerosol Can	\$ 158.98	\$ 5.89	\$ 47,103.95
30 Gallon Container	180	Aerosol Can	\$ 340.61	\$ 1.89	\$ 15,138.40
55 Gallon Container	280	Aerosol Can	\$ 366.48	\$ 1.31	\$ 10,470.77

## Appendix A: (Cont)

### Cost Detail Per Drum

#### Aerosol Recycle/Gas Capture – Aerosolv®

##### 5 Gallon Container

Service	Quantity	UOM	Price	Total
Not collectable in 5 gallon container				

##### 30 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	30 gallon drum	\$ 82.50	\$ 82.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Allocated consumables (filter/cartridge)	1	30 gallon drum	\$ 215.86	\$ 215.86
Transportation				
Labor and Equipment	1	30 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Disposal	1	30 gallon drum	\$ 271.42	\$ 271.42
Recovery Fee (16.5%)	1	Per job	\$ 123.52	\$ 123.52
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total</b>			<b>\$ 886.91</b>	

##### 55 Gallon Container

Service	Quantity	UOM	Price	Total
Post Collection				
Materials	1	55 gallon drum	\$ 94.50	\$ 94.50
Labor and Equipment	1	Label-DOT Diamond	\$ 1.80	\$ 1.80
Allocated consumables (filter/cartridge)	1	55 gallon drum	\$ 431.95	\$ 431.95
Transportation				
Labor and Equipment	1	55 gallon drum	\$ 100.00	\$ 100.00
Transportation	1	Container	\$ 50.00	\$ 50.00
Demurrage	0	hour	\$ 115.00	\$ -
Manifest	1	Emanifest	\$ 27.00	\$ 27.00
Processing/Disposal				
Disposal & (Recycle)	1	55 gallon drum	\$ 317.77	\$ 317.77
Recovery Fee (16.5%)	1	Per job	\$ 168.80	\$ 168.80
Waste Fee	1	Per job	\$ 14.81	\$ 14.81
<b>Total</b>			<b>\$ 1,206.63</b>	

##### Summary - Despray

Container	Quantity	UOM	Price	\$/unit	\$/tonne
5 Gallon Container	-	Aerosol Can	-	-	-
30 Gallon Container	944	Aerosol Can	\$ 886.91	\$ 0.94	7,516.16
55 Gallon Container	1889	Aerosol Can	\$ 1,206.63	\$ 0.64	5,110.13

## Appendix B: Cost and Calculation Detail

### Non-Empty Aerosol Processing

#### Processing Cost –TSD

Pro Depot Capital Equipment costs and staffing have not been included in the calculations. The costs in Table 2 outline the per-drum cost anticipated as well as the impact that can be determined on a per-ton basis.

#### Processing Cost –DeSpray

The costs outlined in Table 2 and detailed in Appendix A assume the use and installation of an aerosol recycling and recovery facility such as the DeSpray unit noted below. It includes the financing of the necessary building and equipment on an interest-free 15-year schedule (utilities, tax, maintenance costs not included in calculation) with further detail available in the cost detail section below and Appendix A. This scenario retains the requirement for DOT-compliant handling and transportation of hazardous waste which exceeds practicability.

Facility Investment calculation: \$ 3,971,172.00  
Costs are inclusive of aerosol recycling and recovery technology, building costs, land, and permitting. If amortized over the course of 15 years interest-free. The resulting cost to operate and amortize the investment is \$.1020/can from Oregon's projected volumes, in the case where the metal volume being recovered has the highest value as aluminum.



#### Processing Cost –Aerosolv

In interpretations beyond 40 CFR 273 where the PRO is required to demonstrate puncturing and drainage of the non-empty aerosol cans, impact that represents a per-ton basis of the related consumables is included. In this case, the per-ton cost per collection container (drum) is calculated from .185 pounds of residual hazardous contents collected per can. This does not include the upfront investment in the EPA-compliant Aerosolv® Standard System, related staffing, permitting, or facility improvements necessary to handle and treat residual aerosol volumes at PRO collection points. Each unit is about \$1k (not included in calculations) and requires filters and cartridges that need to be frequently replaced (included in calculations), contributing to total costs that ultimately exceed the practicability thresholds. With collection in 55-gallon drums as the leading example, the costs account for the allocation of consumables by each drum, with the contents of 5.714 drums calculated to reach a per-ton basis (2.52 carbon cartridges and .84 combination filter/drum).