

**WHITE PAPER**  
**ON ENHANCING REGIONAL DRY WASTE RECOVERY**

September 21, 2006

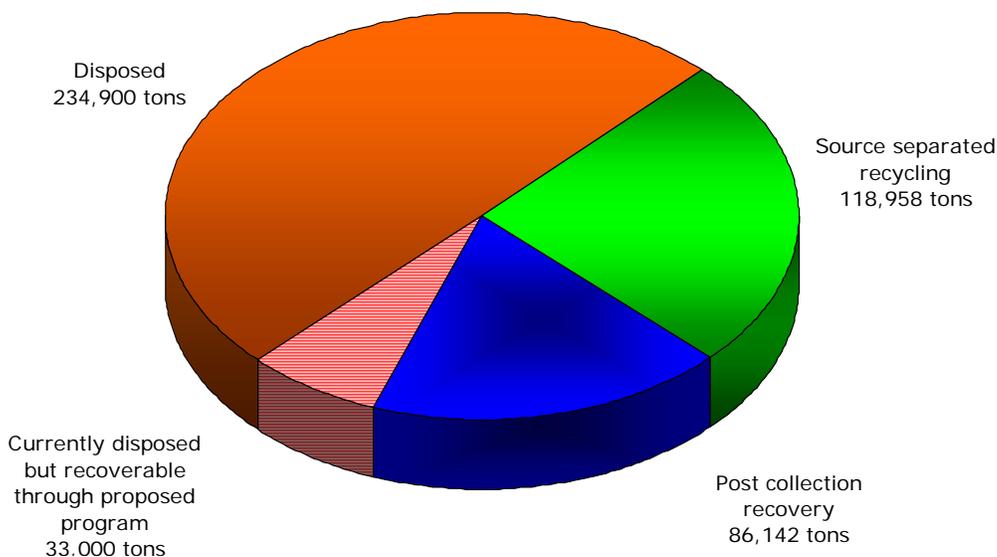
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**Summary**

This paper describes the region's current dry waste<sup>1</sup> recovery system, and details a recommended change to that system that could divert at least 33,000 tons of this material from disposal each year. Information contained in these pages should assist policymakers in understanding the problem, the proposed program, and the potential implications of that approach. This new policy and program direction is part of the comprehensive effort to meet the construction and demolition debris (C&D) recovery goals described in the 2006 Interim Waste Reduction Plan.

The program described in this paper would enhance dry waste recovery in the region by requiring mixed dry waste loads to be processed through a dry waste recovery facility prior to landfill disposal. With the implementation of this requirement, the controversial Regional System Fee Credit Program would be phased out.

**Figure 1. FY2005-06 Dry waste disposition\***



<sup>1</sup>Dry waste loads are those originating (1) from the building industry (i.e., construction and demolition projects) or (2) from the commercial sector (i.e., businesses whose waste output contains no or only minimal levels of putrescible or odor-causing wet waste material). These dry loads contain documented high levels of wood, metal, cardboard, and paper – all readily recoverable. The program detailed in this white paper primarily affects mixed dry waste loads from construction and demolition (C&D) projects. Many mixed dry waste C&D loads are not put through a dry waste recovery process, but are instead disposed at two landfill sites in Washington County: Hillsboro and Lakeside.

\*Tonnage data is based on conservative long-term trends detailed in Appendix B.

### **Problem Statement**

The region has many elements of an effective dry waste management system in place - a well-informed building industry, a variety of market outlets for source-separated dry loads, and well-distributed dry waste recovery capacity for processing mixed dry loads. Unfortunately, the low cost of disposal at two landfills in Washington County limits further significant increases in dry waste recovery in the region.

Dry waste consists primarily of seven types of material: wood, metal, corrugated cardboard, concrete, drywall and roofing. On a typical construction or demolition project, over 90% of this material is reusable or recoverable with current technology and markets. Waste composition data from Oregon's Department of Environmental Quality confirms that the biggest opportunities for increased dry waste recovery would come from material disposed at the two local landfills: Hillsboro and Lakeside.

A comparison of rates charged by the facilities that accept mixed dry waste shows landfilling has a clear attraction for those generators seeking the lowest cost option:

- Landfilling of dry waste at Lakeside is \$50/ton, or \$61/ton at Hillsboro.
- Tip fees at dry waste recovery facilities vary, but are usually \$65-70/ton.
- The Metro tip fee for dry waste is \$70/ton.

### **Current Dry Waste Recovery System**

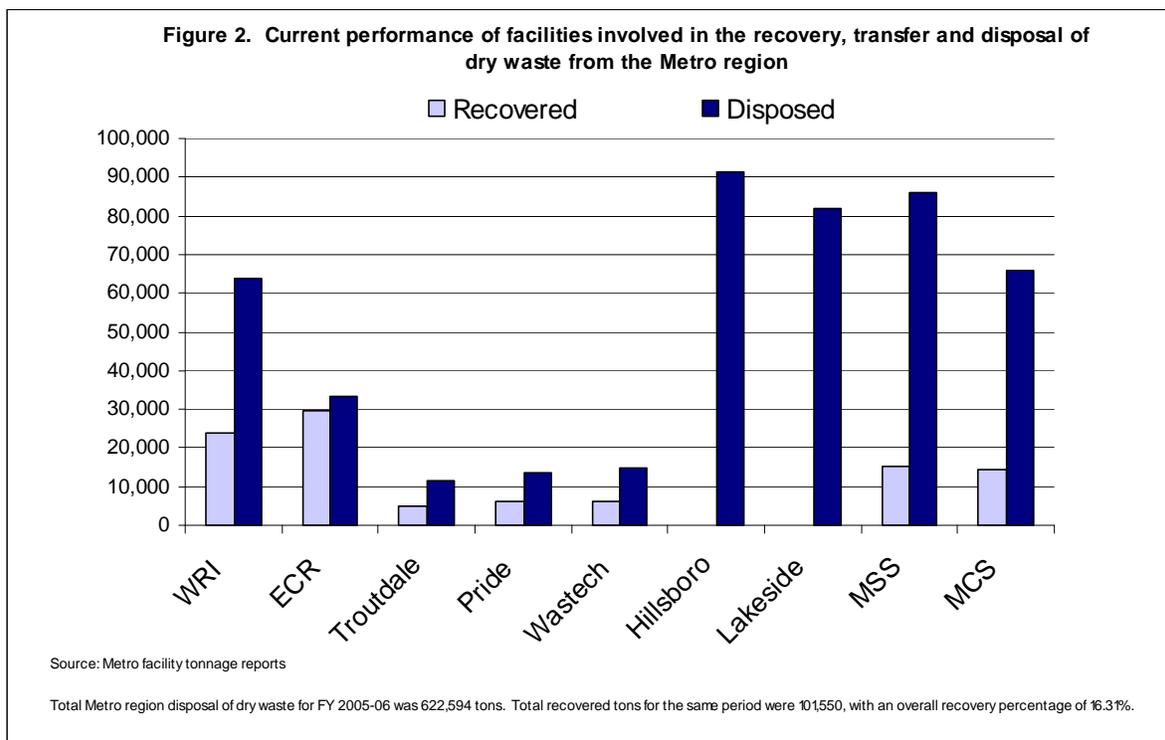
The region's building industry has a great deal of choice in how they manage debris.<sup>2</sup> This is facilitated by a well-developed system of over 90 source-separated recyclers and salvagers, as well as seven facilities that recover recyclables from mixed dry waste. (See map listing Metro region C&D recyclers and dry waste recovery facilities in appendix A.)

- **Source-separated recyclers** accept loads of already sorted materials, which are essentially 100% recyclable. These facilities pay generators for materials like cardboard and metal or charge between \$5/ton - \$25/ton for most materials that have well developed local markets (wood, land clearing debris and rubble). Fees for recycling more difficult to process materials or those that have less developed markets (asphalt roofing and drywall) are in the \$50-70/ton range.
- **Dry waste facilities** accept mixed loads of debris that are free of food waste and that meet particular standards for minimum recovery content (this varies widely, but is usually 30% wood cardboard, metal or concrete/brick as judged by inspecting the top of load before a facility agrees to accept the material). These facilities typically achieve a 25-50% recovery rate. Examples of these facilities include East County Recycling, Wastech and Pacific Land Clearing.

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<sup>2</sup> See map listing Metro region C&D recyclers and dry waste recovery facilities in Appendix A.

- **Transfer stations** that process mixed dry loads for recovery and achieve an 18–35% recovery rate. Examples of these facilities include Metro transfer stations, Pride and Troutdale Transfer Station.
- **Building material reuse facilities** accept and resell used building materials (salvage) taken out of buildings during demolition or remodeling.<sup>3</sup>



## Metro's Roles in Dry Waste Recovery

Metro's roles in and responsibilities for the management of dry waste can be divided into three types of activities: (1) waste reduction programs; (2) regulation/enforcement of Metro Code related to dry waste recovery and disposal; and (3) economic incentives. Since 2000, Metro has invested between \$900,000 and \$1.5 million yearly in these areas (combined).

### **Waste Reduction Programs**

Metro's programs related to reusing and recycling C&D debris/dry waste began in the late 1980's with pilots and demonstrations and have grown into a \$300,000 per year program that is coordinated through a regional C&D work group. Program emphasis has been on education and outreach programs to demonstrate cost savings from recycling and providing the tools to institutionalize source-separated recycling and building material salvage practices. Recent programs include partnerships with construction industry trade associations, green building

<sup>3</sup> The method of compensating the generator for the value of used building materials is generally based on one of two models: cash paid for the wholesale value of the materials or, in the case of most non-profit centers, providing a tax deductible receipt for the estimated value of the donated materials.

groups like the Cascadia Region Green Building Council and the Portland Office of Sustainable Development to demonstrate the cost savings, tools and techniques that can be used to recycle and salvage. To date, all of Metro's recycling programs have been based on the "opportunity model," i.e., giving the generator the opportunity to recycle, and information about how to recycle, but not requiring them to do so. (Further detail on the history of Metro's waste reduction programs for this sector can be found in Appendix C.)

The result of these efforts has been a substantial increase in builders' "recycling IQ", as demonstrated in several surveys of the C&D industry over the last eight years. While making the link between educational efforts and recycling/disposal behavior is difficult, qualitative surveys of the construction industry indicate that this group is acting on information provided by significantly increasing their reuse and recycling of dry waste.

### **Regulatory Program**

Metro has authority to regulate privately owned solid waste facilities. Facilities in the region that process dry waste are either licensed or franchised based on the magnitude and potential environmental impact of their activities. In addition to permitting, the regulatory program ensures public health and safety through regular monitoring and inspections to determine compliance with Metro Code and operating requirements, as well as audits to ensure that Metro fees and excise taxes are paid. Enforcement actions are taken against non-compliant operators and operations. (Historical detail on Metro's regulatory policy and requirements for this sector can be found in Appendix C.)

### **Economic Incentives**

The primary economic incentives for private facilities to continue performing dry waste recovery include avoided disposal costs, proceeds from the sale of recyclable materials, and Metro fee and tax credits. These incentives along with other market drivers, such as green building, have contributed to a system of alternatives to disposal for dry waste generators including facilities that perform post collection recovery, source-separated recycling and salvage for reuse.

By far the largest economic incentives for private facilities engaging in dry waste recovery are: 1) the avoided costs of disposal, and 2) sales of recovered materials. For each ton of waste recovered, a private facility avoids the costs associated with landfilling, including transportation, disposal, and government fees. In addition, a facility operator has the opportunity to sell the recyclables at market rates, and receive Metro fee and tax credits. Metro's annual investment in the post collection recovery system through the Regional System Fee Credit Program has ranged from \$600,000 to \$1.2 million in fee and tax credits to private facility operators.

These avoided costs — and revenue from material sales — translate into real profits when a private facility accepts a load of recoverable dry waste. Currently, for every ton recovered, a private operator can avoid over \$50 in costs,<sup>4</sup> plus they can sell the recovered materials for perhaps \$35 per ton and receive an additional \$10 per ton or so in Metro fee and tax credits, netting around \$100 in revenue before expenses.

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<sup>4</sup> \$50 avoided disposal costs for every ton recovered from mixed waste are based in the following numbers: \$12 per ton transport, \$20 per ton tipping fee at a landfill, \$24 per ton in government fees and taxes (Metro's Regional System Fee + Excise Tax, \$23 combined, and DEQ fees of \$1.24).

## **Proposed New Direction: Enhanced Dry Waste Recovery Program (EDWRP)**

From the generators perspective, the low cost of disposal at two landfills in Washington County often trumps other recovery options and limits further significant increases in dry waste recovery in the region. Based on analysis of current trends, significant additional dry waste recovery is unlikely to materialize without new program direction.

To explore several options for increased dry waste recovery, Metro formed the Contingency Plan Workgroup (CPWG) in 2003. This group, comprised of local governments, businesses, construction industry representatives, haulers, dry waste recovery facilities and landfill operators, reviewed several program options and determined that requiring processing of dry waste prior to landfill disposal would be the option most likely to help the region attain its recovery goal for the building industry sector.

This paper recommends that Metro implement the CPWG recommendation and pass an ordinance that would require that all Metro region dry waste undergo a recovery process before being landfilled. With that requirement in Metro Code carried out at the region's solid waste facilities, over 33,000 additional tons of dry waste recovery is likely to occur.

### **Program description**

- All non-source separated dry waste generated in the Metro region will be required to be processed for material recovery before landfill disposal.
- Materials specified for recovery would be those with steady markets: wood, yard debris, metal, plastics, corrugated cardboard and paper.
- Enforcement of the existing 25% minimum recovery standard for dry waste recovery facilities would be suspended during the phase-in to encourage dry waste recovery facilities to accept all dry waste loads delivered, regardless of their recovery potential.
- A minimum recovery standard would remain in place only as a qualifier for receiving credits towards the Regional System Fee, but the Regional System Fee Credit program would be phased out by July 2007
- Dry waste recovery facility performance monitoring would increase under EDWRP to allow Metro enforcement staff to verify reported recovery levels.
- EDWRP would be phased in during an eight month period,<sup>5</sup> to gauge the effects and results on tonnage flows, dry waste recovery facility performance and reporting.
- At the end of the program phase-in, Metro staff will evaluate the performance level for each facility that processes dry waste to determine if, as a group, they achieved at least a 25% recovery percentage. The outcome of this analysis will result in a new recommended minimum recovery percentage for all facilities that process dry waste.

### **Analysis of Potential Program Impacts**

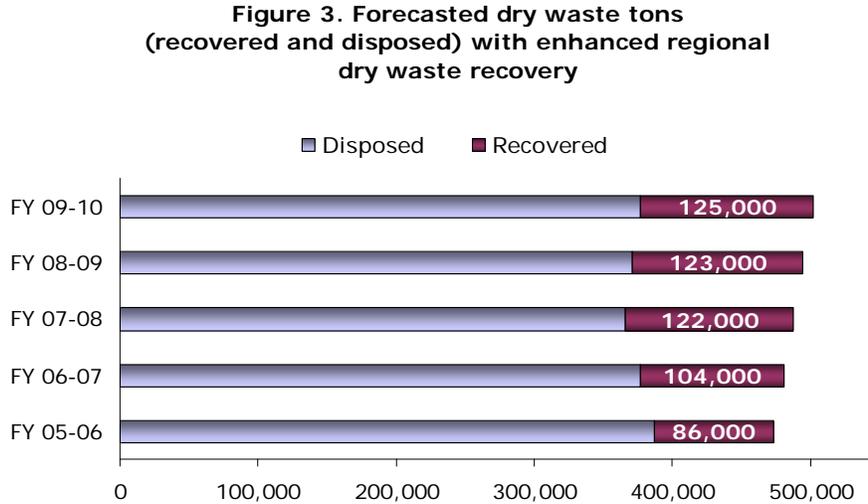
This section reviews the estimated impacts on dry waste recovery levels and pricing resulting from implementation of EDWRP, as well as the anticipated environmental benefits.

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<sup>5</sup> New MRF standards would become effective at the time the EDWRP takes effect.

*Recovery potential*

Figure 3 shows the shows a projected 1.5% growth rate for dry waste generation, with Enhanced Dry Waste Recovery diverting 33,000 tons from disposal to recovery.



\* Forecast data is based on conservative long-term trends detailed in Appendix B.

Figure 4 provides more detail on what types of materials that we can expect to be recovered under Enhanced Dry Waste Recovery (from the dry waste currently being delivered to Hillsboro Landfill and Lakeside Reclamation).

Existing market conditions have been taken into consideration in creating this estimate. For example, local markets for wood, cardboard and metal are relatively well developed, resulting in high recovery levels for these materials. Conversely, roofing and drywall, while plentiful in the waste stream and relatively easy to sort, are assumed to be recovered at a low level due to limited local markets.

While there are many different types of facilities that process dry waste, each achieving different recovery levels, the feasible recovery levels assume that these tons will go to a typical solid waste facility with relatively low-tech dump and pick sorting operation or a simple sort line. Generally, these facilities utilize hand labor over mechanical sorting equipment (i.e., screens or water baths). Local examples include WRI, Wastech and East County Recycling.

**Figure 4. Hillsboro and Lakeside Landfills' waste composition and feasible recovery levels**

Material	Incoming dry waste <sup>1</sup>		Meets sort size spec <sup>2</sup>		Potential capture rate of sized materials <sup>3</sup>	
	% total	Tons	Percent	Tons	Percent	Tons
Wood	23.4%	29,222	98.3%	28,719	61.9%	17,769
Metal	11.1%	13,862	98.3%	13,626	55.0%	7,494
Cardboard	3.0%	3,746	99.1%	3,714	55.0%	2,043
Other Recyclable Paper	1.7%	2,123	0.0%	0	0.0%	0
Rigid Plastics	4.1%	5,120	100.0%	5,120	10.0%	512
Film Plastic	2.9%	3,622	100.0%	3,622	5.0%	181
Roofing	7.0%	8,742	100.0%	8,742	10.0%	874
Wallboard	14.0%	17,483	100.0%	17,483	0.0%	0
Yard Debris	4.7%	5,869	100.0%	5,869	40.0%	2,348
Subtotal Recyclable	71.9%	89,790	96.8%	86,896	35.9%	31,221
Other dry waste material <sup>4</sup>	28.1%	35,092				
Totals	100%	124,882				

<sup>1</sup>Based on DEQ 2002 waste characterization data.

<sup>2</sup>Based on DEQ 2005 preliminary waste characterization data, June 2006.

<sup>3</sup>Assumes current markets with dump and pick operations or simple sort line to target easy materials, similar to recovery operations at other private facilities in Metro region.

<sup>4</sup>Based on 2002 actual generation, tons: 124,882.

### *Environmental Benefits*

The Enhanced Dry Waste Recovery Program will result in a minimum of 33,000 tons of new dry waste recovery each year, as described in Figure 4. This material will serve as manufacturing feedstock in some instances, alternative fuel sources in others. In each case, the material recovered reduces the need to extract raw materials, eliminating attendant energy use and pollution associated with virgin material extraction.

As shown in Figure 5, the dry waste diverted from landfill disposal and recovered in some fashion will result in a reduction in greenhouse gases, energy consumption and airborne wastes.

**Figure 5. Environmental Benefits of EDWRP\***

ACTION	QUANTITY	EQUIVALENT TO...
Reduce greenhouse gases by	25,931 MTCE (Metric tons of carbon equivalent)	keeping 19,567 cars off the road for a year
Reduce energy consumption by	733,971 Million BTU (British thermal units)	the energy used by 6,977 average households during a year
Reduce airborne wastes by	35,000 tons	21.8 million miles of heavy truck travel

\*These benefits are projected by the National Recycling Coalition Environmental Benefits Calculator.

### *Ratepayer Impact*

An estimate of potential ratepayer impact associated with the implementation of an Enhanced Dry Waste Recovery Program is based on two potential market responses:

#### **Scenario 1, No new capital investment (i.e., no new dry waste recovery facility is constructed) in response to new program;**

In this first scenario, existing capacity among the region's existing dry waste recovery facilities accommodates processing of the additional 125,000 tons from Hillsboro and Lakeside landfills. No new dry waste recovery facilities are constructed as a result of implementing EDWRP.

#### **Scenario 2: One new dry waste recovery facility is constructed in response to the new program;**

In this scenario, one dry waste recovery facility would be constructed to sort dry waste, presumably at Hillsboro Landfill. (Hillsboro Landfill is out of the Metro region and therefore unaffected by the current regional moratoriums on transfer stations and dry waste recovery facilities.) The 55,000 tons of mixed dry waste that currently go to Lakeside would shift mostly to Hillsboro, WRI and Pride with minimal new tons to Metro Central and Metro South.

Minimal changes in dry waste flow are anticipated on the east side of the region. There are several large demolition contractors on the east side that, as a rule, haul all mixed dry waste to Lakeside Landfill. These tons will be distributed among the east side dry waste recovery facilities and Metro facilities. It is likely that the operator at Lakeside will choose to seek out dry waste recovery facility residual tons to partially or completely replace the lost dry waste tons.

Under either scenario, all mixed dry waste would be processed through a dry waste recovery facility before being disposed. What differs from one scenario to the next are the likely effect on future pricing of dry waste recovery and disposal and, to a lesser extent, the resulting flows of dry waste tons to and from different solid waste facilities. Implications of this program, including an analysis of two market response scenarios, are identified below and described in the attached Pro Forma Analyses in Appendix B.

#### **Assumptions Common to Both Scenarios**

- Base tonnage: long-run trend
- Tonnage diversion: 125,000 tons from landfills to facilities that perform dry waste recovery
- Recovery rate on diverted tons: 25%, i.e., 33,000 tons of new recovery (See Figure 4).
- Enforcement: One additional FTE for inspections, monitoring
- RSF Credits: zero in FY 07-08

#### **Key distinction between scenarios**

- Capital investment for new dry waste recovery facility

**Figure 6. Key Outcomes from Scenarios**

<b>Anticipated Outcome</b>	<b>Scenario A: Utilization of Existing Capacity</b>	<b>Scenario B: Industry chooses to build one new dry waste recovery facility</b>
New Recovery	33,000 tons	33,000 tons
Dry waste recovery facility pricing <sup>6</sup>	Increase \$4.38 per ton	Increase \$5.05 per ton
Metro's Regional System Fee	Increase ~\$0.30 per ton	Increase ~\$0.30 per ton
Source Separation	1.2% (1,500) – 4.5% (5,625) tons of currently landfilled tons will become source separated	1.2% (1,500) – 4.5% (5,625) tons of currently landfilled tons will become source separated
Generator transportation costs	No increase	No increase
Net change in fiscal position for Metro (Phase out of fee and tax credit program, additional new enforcement staff and loss of revenue from avoided Metro fees for new recovered tons)	(\$375,000/year)	(\$375,000/year)

### **Pricing for Capital Recovery**

Building new capacity induces new costs on the system, principally the costs of the capital invested in that new capacity and any associated operating costs. For example, in Scenario B, a new \$4 million dry waste recovery facility is built and results in about \$10 per ton capital cost and \$5 per ton operating cost for the owner of the new dry waste recovery facility.

If that capital investment were recovered in accordance with financing terms (e.g., 12% cost of capital, 20-year term), then the customers of that new dry waste recovery facility would see prices rise more than \$15 per ton, about triple the increase expected at existing dry waste recovery facilities. Customer sensitivity to price increases is probably sufficient for a threefold

<sup>6</sup> Under Scenario B the owner of the newly built dry waste recovery facility is unlikely to be able to fully recover his capital investment in today's market. If it did, requiring an increase of \$10 per ton or more to the dry waste recovery facility price, it, would likely price itself out of business. Accordingly, dry waste recovery facility pricing under Scenario B recovers only a fraction of the invested capital. See discussion on pricing for capital recovery in the following section.

differential to drive customers away; therefore, the owner of the new dry waste recovery facility would likely choose to set prices lower to retain his customer base, thus absorbing a large portion of their invested capital costs.

On the other hand, competitors may choose to price follow the higher pricing at the new dry waste recovery facility, thus enjoying a windfall.

Projected pricing as summarized in the figure above and in Appendix B reflect a “compromise” price point that assumes both pricing reactions: some capital recovery by the owner of the new dry waste recovery facility and some windfall profit taking by its competitors.

### **Issues for Further Review**

1. On what basis should the RSF credit program be phased out: EDWRP performance or a certain date?
2. What types of performance metrics should be monitored and measured during the pilot and once EDWRP has been fully implemented?
3. What elements of this program might be subject to legal challenges and on what basis?
4. What undesired generator behaviors could this regulatory approach lead to?
5. How should the program be phased in (to allow one or both of the two dry waste landfills to build dry waste recovery facilities or make alternate arrangements with existing dry waste recovery facilities)?

### **Conclusion**

The region has many elements of an effective dry waste reuse and recovery system in place: A construction industry with a high “recycling IQ”, several material salvage enterprises, diverse source-separated recycling options, dry waste recovery capacity for mixed dry waste, and stable material markets.

The low-cost economic draw of two dry waste landfills in Washington County, however, limits the potential for increasing dry waste recovery beyond current levels. The enactment of an Enhanced Dry Waste Recovery program would directly address this problem by requiring a processing step before disposal. This “sustainability safety net” for post collection recovery of dry waste loads can be performed by any one of a network of public and private facilities. The result could be a minimum of 33,000 new tons of dry waste recovery.

### **Timeline/Next steps**

Workgroup to guide EDWRP development	August 2006
SWAC reviews program proposal	September 2006
Metro Council consideration of EDWRP	October 2006
Develop EDWRP rules	November-December 2006
Phase-in of EDWRP	January 2007-January 2008
Full implementation of EDWRP	February 2008

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## Appendix B. Detailed Pro Forma Assumptions and Outputs

### Dry Waste Post Collection Recovery Pro Forma Analysis Scenario 1: Utilization of Existing Capacity

Summary of Market					
Base Flows (tons/year)	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10
Unprocessed dry waste, of which delivered to:	473,000	480,100	487,300	494,600	502,100
Material recovery facilities	166,000	168,500	171,000	173,600	176,200
Transfer stations	182,000	184,700	187,500	190,300	193,200
Landfills	125,000	126,900	128,800	130,700	132,700
Recovered materials	86,142	87,433	88,740	90,081	91,438
Solid waste landfilled	386,858	392,667	398,560	404,519	410,662
Process residual	167,218	169,723	172,260	174,863	177,498
Unprocessed waste	219,640	222,944	226,300	229,656	233,164
<u>Diverted Flows (tons/year)</u>					
Unprocessed dry waste, of which delivered to:	473,000	480,100	487,300	494,600	502,100
Material recovery facilities	166,000	231,950	299,800	304,300	308,900
Transfer stations	182,000	184,700	187,500	190,300	193,200
Landfills	125,000	63,450	0	0	0
Recovered materials	86,142	103,613	121,584	123,409	125,277
Solid waste landfilled	386,858	376,487	365,716	371,191	376,823
Process residual	167,218	216,993	268,216	272,235	276,359
Unprocessed waste	219,640	159,494	97,500	98,956	100,464
<u>New Recovery (tons/year)</u>	0	16,180	32,844	33,329	33,839
System Facility Costs (Per Ton)					
<u>At Base Flows</u>					
Material recovery facilities	\$66.54	\$67.03	\$67.56	\$68.12	\$68.70
Average MRF tip fee	\$61.94	\$62.44	\$62.97	\$63.52	\$64.10
Transfer stations	\$73.91	\$70.86	\$72.99	\$75.18	\$77.43
Landfills	\$52.80	\$54.38	\$56.01	\$57.69	\$59.42
<u>At Diverted Flows</u>					
Material recovery facilities	\$66.54	\$65.95	\$67.05	\$67.75	\$68.49
Average MRF tip fee	\$61.94	\$64.19	\$67.05	\$67.75	\$68.49
Transfer stations	\$73.91	\$70.86	\$72.99	\$75.18	\$77.43
Landfills	\$52.80	\$54.38	\$56.01	\$57.69	\$59.42
Generator Cost Analysis - Increase / (Decrease) per Ton					
Internal management/compliance	0.00	0.00	0.00	0.00	0.00
Collection	0.00	0.00	0.00	0.00	0.00
Disposal Cost (for users of:)					
Material recovery facilities	\$0.00	\$1.76	\$4.08	\$4.23	\$4.38
Transfer stations	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Landfills	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Net Cost / (Savings) for Users of					
Material recovery facilities	\$0.00	\$1.76	\$4.08	\$4.23	\$4.38
Transfer stations	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Landfills	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Increases / (Decreases) in Public Costs					
<u>Increases / (Decreases) in Program Costs</u>					
Personal Services					
Inspector		\$46,000	\$92,000	\$96,600	\$101,430
Technicians		\$69,000	\$46,000	\$48,300	\$50,715
Materials & Services					
Performance monitoring	\$0	\$56,690	\$66,130	\$68,114	\$70,157
Fee and tax credits	\$0	(\$300,000)	(\$600,000)	(\$600,000)	(\$600,000)
Capital Grants	\$0	\$0	\$0	\$0	\$0
Total (net change in program costs)	\$0	(\$128,310)	(\$395,870)	(\$386,986)	(\$377,698)
<u>Revenue Increases / (Decreases):</u>					
Due to Diversion	\$0	\$0	\$0	\$0	\$0
Due to Recovery	\$0	(\$370,031)	(\$751,142)	(\$762,223)	(\$773,886)
<u>Net Change in Fiscal Position</u>	\$0	(\$241,721)	(\$355,272)	(\$375,237)	(\$396,189)

Dry Waste Post Collection Recovery Pro Forma Analysis (cont.)

**Scenario 2: New MRF Built**

Summary of Market					
<u>Base Flows (tons/year)</u>	FY 05-06	FY 06-07	FY 07-08	FY 08-09	FY 09-10
Unprocessed dry waste, of which delivered to:	473,000	480,100	487,300	494,600	502,100
Material recovery facilities	166,000	168,500	171,000	173,600	176,200
Transfer stations	182,000	184,700	187,500	190,300	193,200
Landfills	125,000	126,900	128,800	130,700	132,700
Recovered materials	86,142	87,433	88,740	90,081	91,438
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<u>Diverted Flows (tons/year)</u>					
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Landfills	125,000	63,450	0	0	0
Recovered materials	86,142	103,613	121,584	123,409	125,277
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Process residual	167,218	216,993	268,216	272,235	276,359
Unprocessed waste	219,640	159,494	97,500	98,956	100,464
<u>New Recovery (tons/year)</u>	0	16,180	32,844	33,329	33,839
System Facility Costs (Per Ton)					
<u>At Base Flows</u>					
Material recovery facilities	\$66.54	\$67.03	\$67.56	\$68.12	\$68.70
Average MRF tip fee	\$61.94	\$62.44	\$62.97	\$63.52	\$64.10
Transfer stations	\$73.91	\$70.86	\$72.99	\$75.18	\$77.43
Landfills	\$52.80	\$54.38	\$56.01	\$57.69	\$59.42
<u>At Diverted Flows</u>					
Material recovery facilities	\$66.54	\$68.05	\$67.87	\$68.50	\$69.16
Average MRF tip fee	\$61.94	\$65.24	\$67.87	\$68.50	\$69.16
Transfer stations	\$73.91	\$70.86	\$72.99	\$75.18	\$77.43
Landfills	\$52.80	\$54.38	\$56.01	\$57.69	\$59.42
Generator Cost Analysis - Increase / (Decrease) per Ton					
Internal management/compliance	0.00	0.00	0.00	0.00	0.00
Collection	0.00	0.00	0.00	0.00	0.00
Disposal Cost (for users of:)					
Material recovery facilities	\$0.00	\$2.81	\$4.91	\$4.98	\$5.05
Transfer stations	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Landfills	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Net Cost / (Savings) for Users of					
Material recovery facilities	\$0.00	\$2.81	\$4.91	\$4.98	\$5.05
Transfer stations	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Landfills	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Increases / (Decreases) in Public Costs					
<u>Increases / (Decreases) in Program Costs</u>					
Personal Services					
Inspector		\$46,000	\$92,000	\$96,600	\$101,430
Technicians		\$69,000	\$46,000	\$48,300	\$50,715
Materials & Services					
Performance monitoring	\$0	\$56,690	\$66,130	\$68,114	\$70,157
Fee and tax credits	\$0	(\$300,000)	(\$600,000)	(\$600,000)	(\$600,000)
Capital Grants	\$0	\$0	\$0	\$0	\$0
Total (net change in program costs)	\$0	(\$128,310)	(\$395,870)	(\$386,986)	(\$377,698)
<u>Revenue Increases / (Decreases):</u>					
Due to Diversion	\$0	\$0	\$0	\$0	\$0
Due to Recovery	\$0	(\$370,031)	(\$751,142)	(\$762,223)	(\$773,886)
<u>Net Change in Fiscal Position</u>	\$0	(\$241,721)	(\$355,272)	(\$375,237)	(\$396,189)

## **Appendix C. History of Dry Waste Recovery System in the Region**

### **I. Disposal diversion programs**

Regional programs to minimize disposal of dry waste from the building industry sector began in the late 1980's and have evolved over time to continually meet the needs of generators.

Initial programs were focused on:

- Creating data to help inform and educate. This included case studies to identify recycling and salvage options, as well as opportunities and cost savings for different types of construction projects.
- Working with the construction and hauling industries to institutionalize source-separated recycling and building material salvage practices.
- Funding demonstration projects to show the economics of source-separated recycling and create connections with green building/energy efficient building projects

Middle stage programs included:

- Increasing education and outreach to generators about where to recycle, and necessary steps involved to implement recycling and/or salvage on the job.

More recent programs have emphasized:

- Continued voluntary approach to recycling, incentives, and access to information about options for dry waste recovery.
- Increased distribution of the Construction Recycling Toolkit and interactive on-line Toolkit.
- Partnerships with green building groups like the Cascadia Region Green Building Council and the Portland Office of Sustainable Development to demonstrate the tools and techniques that can be used to recycle and salvage.

The result of all these program efforts has been a substantial increase in the average builders "recycling I.Q.," borne out through several surveys of the building industry in the last eight years. This increased awareness has resulted in significant increases in building material reuse and recycling.

### **II. Facility regulation**

Regulating dry waste recovery operations began in the early 1980's; the establishment of minimum recovery thresholds began in the early 1990's

Initial facility regulation of dry waste recovery facilities:

- The first Metro dry waste recovery facility franchise that specified a minimum recovery level was granted in 1993 to ERI. As a condition of that franchise, the facility was required to meet a minimum recovery rate of 45%. The next year a franchise was granted to WRI with a phased-in minimum recovery rate that also was set at 45%.

Later regulatory developments included:

- Portland's enactment of a mandatory recycling ordinance in 1996 for construction and demolition (dry) waste,\* which required the recycling of the five primary recyclable materials found on C&D sites.
- In 1999, Metro began a formal inspection program and issuing licenses to various recovery and recycling operations

### **III. Economic incentives for dry waste recovery**

Initial operating subsidy program intended as temporary fix:

- In the late 90's significant reductions were approved in the Metro tip fee. This action negatively affected the operating economics for dry waste recovery facility operators, who had made significant investments in their facilities.
- Metro was lobbied to create a program that would make the dry waste recovery facilities "financially whole." Metro established the Regional System Fee Credit Program (RSFCP), setting a minimum recovery rate of 30% for any dry waste recovery facility to qualify for credits.
- The RSFCP has continued since 1998, at a cost of approximately \$400,000 to \$1 million annually.

Later incentive programs included:

- Grants to develop local markets. Most grants were awarded to processors of materials (carpet pad, wood and drywall) that are plentiful in the dry waste stream.
- Grants to establish permanent buildings for material salvage (reuse) operations.

### **IV. Future program direction**

- Implement region-wide system to increase dry waste salvage and recovery ensure by requiring dry loads to be processed for recovery of certain materials before disposal.
- Continue to provide education and outreach about where to recycle, and how to implement recycling and/or salvage on the job.

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\*With the exception of this City of Portland ordinance and Metro's minimum recovery requirements for dry waste recovery facilities, dry waste-related programs have been based on "the opportunity model," which gives the generator the opportunity to recycle, but does not require them to do so.

## **Metro says construction debris must be recycled**

**Scrap - The policy jibes with Metro's goal to increase recycling to 64 percent by the end of 2009**

Tuesday, August 21, 2007

SCOTT LEARN

### **The Oregonian Staff**

Beginning in 2009, builders no longer will be able to back into two Washington County landfills and scrap thousands of tons of construction debris that includes recyclable wood, metal and cardboard.

The new policy by Metro, the regional government, to mandate recycling of construction and demolition debris will take effect six years after it was first proposed. The delays came in part because of concerns by builders and by the Lakeside and Hillsboro landfills.

The policy requires mixed loads of construction debris to be sorted for recyclables before they're dumped, leaving no more than 15 percent recyclables in the leftovers. The rules, approved last week by Metro's council, are part of the agency's push to increase recycling rates in the metro area to 64 percent by the end of 2009.

Metro officials predict the policy will keep at least 33,000 tons of construction debris out of landfills. That's enough to boost overall recycling rates by 1.25 percent, Metro officials said -- a huge jump for a change to one category of recyclables.

If Metro predictions pan out, Lakeside Reclamation Landfill could see incoming loads plunge. That would be welcome news for neighboring Ponzi Vineyards and other critics of the unlined landfill.

But a Lakeside spokesman said that Metro's estimates of recoverable materials in mixed loads are overblown and that the landfill's business won't be hurt. Lakeside already recycles tons of wood each year, said Larry Harvey of PacWest Communications.

In 2003, a Metro committee looking at ways to increase recycling recommended putting the policy into effect by July 1, 2004. But the changes proved controversial with some local governments and builders, who worry about tipping fees rising.

Seven recycling stations in the region accept mixed loads. But tipping fees at the two Washington County landfills are lower, Metro officials said, an incentive for contractors on the fast-growing west side to dump the loads.

Metro analysts predict \$4 to \$5 increases in per ton tipping rates. Disposal cost increases as a percent of project costs will be less than 1 percent for most projects. But demolition of single-family homes could see project costs rise up to 5 percent.

The 400-acre Hillsboro Landfill, owned by Waste Management, is expected to build a recycling facility on-site so it can continue accepting mixed loads.

Lakeside, at 43 acres, isn't interested in building a recycling facility with as few as five years left before the landfill is full, Harvey said. A consulting firm's analysis of the landfill's waste stream concluded that its incoming waste doesn't have enough recyclables -- more than 15 percent -- to run afoul of the new law, he said.

But construction debris is one of the most promising places to get more recyclables, said David Bragdon, the Metro Council's president. "I don't find his figure to be very reliable," he said of Harvey's assertion.

Lakeside sits outside Metro's urban growth boundary but gets 95 percent of its waste from builders inside the boundary, under a Metro contract.

Neighbors have complained for years about noise, dust and contamination from Lakeside.

John Frederick, one of the neighbors fighting the landfill, said he was glad Metro stood up to Lakeside owner Howard Grabhorn. Neighbors are also pressuring the regional agency to terminate its dumping contract with the landfill.