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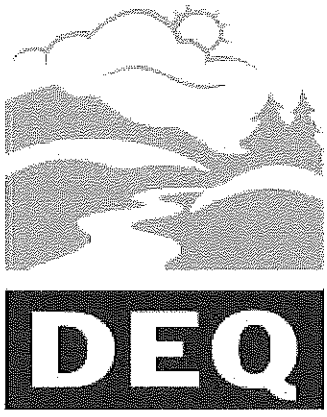
OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS 01/20/1995



State of Oregon
Department of Environmental Quality

REVISED AGENDA

ENVIRONMENTAL QUALITY COMMISSION MEETING

January 20, 1995
DEQ Conference Room 3a
811 S. W. Sixth Avenue
Portland, Oregon

FRIDAY, JANUARY 20, 1995: Work Session beginning at 8:30a.m.

1. ‡**Informational Item:** Legislative and Informational Update on Rigid Plastics Container Law and Related Issues:

(a) - Implementation of Rigid Plastic Container Law
(b) - Pyrolisis Report
(c) - Recovery Technologies Report
(d) - Rigid Plastic Container Recycling Rate for Compliance Purposes Study

2. ‡**Informational Item:** Overview on Criteria to Determine Conformity to State or Federal Implementation Plans on Transportation

3. ‡**Informational Item:** Sixth Annual Environmental Cleanup Report and Four Year Plan Projection

FRIDAY, JANUARY 20, 1995: Regular Meeting beginning at 10:30a.m

Notes:

Because of the uncertain length of time needed for each agenda item, the Commission may deal with any item at any time in the meeting. If a specific time is indicated for an agenda item, an effort will be made to consider that item as close to that time as possible. However, scheduled times may be modified if agreeable with participants. Anyone wishing to be heard or listen to the discussion on any item should arrive at the beginning of the meeting to avoid missing the item of interest.

Public Forum: *The Commission will break the meeting at approximately* ***11:30 a.m.*** *for the Public Forum if there are people signed up to speak. The Public Forum is an opportunity for citizens to speak to the Commission on environmental issues and concerns not a part of the agenda for this meeting. Individual presentations will be limited to 5 minutes. The Commission may discontinue this forum after a reasonable time if an exceptionally large number of speakers wish to appear.*

A. Approval of Minutes

B. Approval of Tax Credits

~~C. †Rule Adoption: Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act~~

~~D. †Rule Adoption: Air Quality General Conformity Rules~~

E. **†Rule Adoption:** Adoption of Hardboard Particulate Emissions Rule Revision

F. **Action Item:** Variance for Coos County Municipal Solid Waste Incineration Facility

G. **‡Informational Item:** 1995-1997 Budget Briefing

H. Commission Report (Oral)

I. Director's Report (Oral)

†Hearings have already been held on the Rule Adoption items; therefore, any testimony received will be limited to comments on changes proposed by the Department in response to hearing testimony. The Commission also may choose to question interested parties present at the meeting.

‡The Commission does not usually take public comment on informational items

The Commission has set aside March 2-3, 1995, for their next meeting. The location has not been established.

Copies of staff reports for individual agenda items are available by contacting the Director's Office of the Department of Environmental Quality, 811 S. W. Sixth Avenue, Portland, Oregon 97204, telephone 229-5395, or toll-free 1-800-452-4011. Please specify the agenda item letter when requesting.

If special physical, language or other accommodations are needed for this meeting, please advise the Director's Office, (503)229-5395 (voice)/(503)229-6993 (TDD) as soon as possible but at least 48 hours in advance of the meeting.

January 12, 1995

State of Oregon
Department of Environmental Quality Memorandum

Date: January 6, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Rigid Plastic Container Reports and Related Topics (Agenda Item 1)

The Department of Environmental Quality was asked by the 1993 Legislature to prepare two reports concerning the Rigid Plastic Container Law to be presented to the 1995 Legislature. In addition, the Department had a consultant prepare a report determining the rigid plastic container recycling rate for compliance purposes for 1995.

These reports are attached for the Commission's information and comments. Because of the tight deadline, they have not been reviewed by the Division Administrators, so we are requesting that the Commission consider the recommendations from the Interim Director.

Included in this packet are:

1. Implementation of Rigid Plastic Container Law: Proposed Commission Recommendations, memo from Lydia Taylor to Environmental Quality Commission.

2. "Implementation of Oregon's Rigid Plastic Container Law," Report to the 1995 Oregon Legislature.

3. "Recovery Technologies and the Economic and Environmental Impacts of Recycling," Report to the 1995 Oregon Legislature.

4. "Pyrolysis of Plastics" (expands on the information in Item 3).

5. Determination of the 1995 Rigid Plastic Container Recycling Rate for Compliance Purposes for the State of Oregon, prepared for DEQ by Harding Lawson Associates with ECO Northwest.

Attachments

State of Oregon
Department of Environmental Quality Memorandum

Date: January 4, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Implementation of Rigid Plastic Container Law: Proposed Commission Recommendations

At your December 2, 1994 meeting you considered a draft Report to the 1995 Legislature on "Implementation of Rigid Plastic Container Law, including Status of Plastic Recycling" (Implementation Report). You requested two things: 1) an executive summary of the report, including information on what percentage of current recycling of rigid plastic containers is due to Oregon's bottle bill; and 2) "recommended recommendations" to be included with the Legislative report. The recommendations were to cover the issue areas of major interest to Commission members, and a recommendation on overall program direction.

The Implementation Report has been slightly revised from the November 1994 draft, to incorporate work done in the meantime on determining the rigid plastic container recycling rate for compliance purposes, as well as to add the requested executive summary. The revised Implementation Report is attached. The recommendations constitute the rest of this memo.

"Proposed Recommendations"

The recommendations cover the first five issues discussed in the Implementation Report, as those were identified as being of greatest interest to the Commission at its October 20, 1994 work session on the Rigid Plastic Container Law. There is also a recommendation for broader program direction, following the specific issue ones.

1. Federal Regulation of Containers and Federal Preemption

The issue is whether to recommend that the Legislature exempt from Oregon's Law those rigid plastic containers which are also subject to certain federal regulations. The major federal laws which industry has cited as creating compliance difficulties are the Federal Food, Drug and Cosmetic Act (FDA) covering foods and cosmetics; the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) covering pesticides; and the Hazardous Materials Transportation Act administered by the US Department of Transportation (US DOT) covering hazardous materials.

RECOMMENDATION: No exemptions; keep Law as it is.

RATIONALE: 1) Those containers also subject to federal regulations constitute a large majority of all rigid plastic containers sold in Oregon. If they were exempted few containers would be left to comply with Oregon's Law. 2) Keeping broad coverage of rigid plastic containers has been and will remain crucial to achieving a recycling rate greater than 25 percent. The Department believes that the lack of exemptions has been the driving force behind increasing the recycling rate; precisely because other options (e.g. recycled content) were not readily available to many product manufacturers due to federal regulations, it has been in everyone's interest to contribute to the overall recycling rate. If that broad interest is reduced, industry support for plastic recycling programs may wane.

2. Reduced Container Exemption

The issue is whether to expand this source reduction exemption. Current Law and rule require that the comparison to determine whether a container is "source reduced" be based on a container used for that product **five years previously.** Therefore only products in existence for at least five years are potentially eligible.

RECOMMENDATION: Relax the five year requirement for those containers in existence on January 1, 1995 ("existing containers"). Allow existing containers to demonstrate a 10 percent source reduction from whenever the original product was introduced, even if less than five years previously. Do not relax the five year requirement for new (i.e. "non-existing") containers. (Option 2.b in Implementation Report)

RATIONALE: 1) This exemption was meant as a "grandfather" exemption for only those containers in existence when the Law was originally passed (mid-1991). It was not meant to be on-going, as evidenced by its being an *exemption* rather than a compliance option. 2) However, the five-year comparison is over-restrictive, in that it prevents some "existing" containers from using this exemption, if they were originally introduced later than January 1, 1990. The recommended change would remedy that. 3) While source reduction is preferred over recycling in the State's solid waste hierarchy, the ten percent reduction is extremely difficult to track. It is in many cases all but impossible to determine whether a product is the "same product," as consumer products are continually evolving. Likewise the containers in which they are sold are continually modified (size, shape, materials). If a product and associated container are able to receive a five-year exemption, chances are good that they may never have to comply, since they are likely to evolve into a "new" product within that timeframe. 4) Economics drives source reduction; that is why many packages have already been reduced as much as feasible. 5) New products should be designed to comply with one of the compliance options at the time they are introduced into

commerce.

3. Compliance for Point-of-Sale Packagers

The issue is whether some statutory relief should be provided to point-of-sale packagers such as the foodservice industry, many of whom are small businesses and who have special problems in complying and documenting compliance.

RECOMMENDATION: Exempt low-volume product manufacturers from compliance. (Option 3.b in Implementation Report)

RATIONALE: 1) Current rule provides administrative relief for product manufacturers selling fewer than 500 rigid plastic containers a day (reduced recordkeeping requirements, lower penalty schedule). These low-volume product manufacturers should be exempt by law from having to comply, as it is disproportionately burdensome for them to assure compliance and keep records. The 500-container compliance threshold should be based on sales by all "affiliates" (per existing rule). Thus individually-owned low-volume foodservice providers (and small in-store delis) would be exempt, but foodservice companies with several outlets might be covered. The latter are more likely to be able to perform activities required for compliance. 2) This maintains equity between pre-packaged food (such as potato salad) sold in grocery stores and similar bulk food items packaged at point of sale in in-store delis. 3) Single-service containers should not receive a blanket exemption from the Law as they are an appreciable and visible part of the rigid plastic container waste stream, and recycling programs are beginning to be established for them.

4. Pyrolysis

The issue is whether all products of pyrolysis of plastics should count as "recycling" in calculating the aggregate rigid plastic container recycling rate. Advice from the Attorney General is that only those pyrolysis products other than fuel or energy use may be considered "recycling" under current Law.

RECOMMENDATION: No change; keep Law as it is.

RATIONALE: 1) Pyrolysis has some potential advantages over conventional recycling in recovery of plastics (can accept food-contaminated containers, the need to sort by resin is eliminated or reduced, low-value mixed plastics can be pyrolyzed). But it is not commercially proven at this time. 2) Most of its products are fuels or energy. Energy recovery is preferable to landfilling, but it is not "recycling." 3) Re-defining the overall pyrolysis process as "recycling" would have broad implications

for the State's recycling and recovery programs which currently are based on the solid waste management hierarchy (where recycling is preferred over energy recovery). County programs to meet the statewide recovery goal have been established under a statute which excludes energy recovery from "counting" towards the rate unless there is no viable recycling market. 4) Pyrolysis does not need any particular encouragement. If pyrolysis proves economically viable where conventional recycling does not, counties may under current law direct their recovered materials to pyrolysis and have them count towards the recovery rate.

5. Definition: "Rigid Plastic Container"

The issue is whether the definition of a rigid plastic container should be changed to exclude items which may not be a "complete package" without additional packaging material except a lid or closure; and possibly to introduce other changes (such as the requirement to "store" a product) to match the California definition.

RECOMMENDATION: No change; keep Law as it is.

RATIONALE: 1) The broad definition was supported by the public who in general want increased opportunities to recycle plastic packaging. Items not subject to the Law are currently less likely to be accepted by processors for recycling. 2) The broad definition helps ensure that all container and product manufacturers have an equal interest in meeting the aggregate recycling rate. Similarly to the comment in Section 1 above on the effect of exemptions, the Department believes the broad definition has also had an effect in making it in everyone's interest to contribute to the overall recycling rate. The Department believes this is vital in maintaining industry support for plastic recycling programs.

6. Overall Program Direction

In considering options for the overall direction for the future of the rigid plastic container Law, the purpose of Senate Bill 66 should be taken into account and general questions should be posed to evaluate the program.

PURPOSE OF SB 66: Meet state's solid waste management goals of reduce, reuse, recycle; create markets for recycled plastic (through a menu of compliance options). A secondary goal may be to satisfy the public's desire to have opportunities to recycle plastics.

The Department has asked the following questions to help in evaluating the merit of the Law.

A. Is it working?

Yes. Recycling of rigid plastic containers is increasing, from 27 percent in 1993 to an estimated 32 percent in 1995. On the other hand, rigid plastic containers are being recovered at a rate well below other packaging materials (except for tinned cans):

Material	Recovery Rate (est. for 1993)
Glass containers[1]	56%
Aluminum "	66%
Tinned cans	21%
Cardboard/kraft/hi grade paper	58%

The overall recovery goal for the State is 50 percent by the year 2000. It is reasonable that plastics should contribute their fair share to this goal.

Currently, markets are being subsidized. The hope is that they will become self-sustaining over time. Recycled resin markets are strong, due partly to "recycled content" laws in Oregon, California, Florida and Wisconsin.

The public still wants more opportunities to recycle plastic.

B. Is it equitable? (Are all parties treated fairly?)

Yes. If the option of choice is the recycling rate, everybody is covered, everybody complies. (May not be equitable for those who made substantial investments in their own packages [e.g. source reduction]; they could have done nothing and still comply. On the other hand, manufacturers who made changes to begin using recycled content are contributing to market demand helping create the recycling market.) Much of the investment in plastics recycling in Oregon has

[1] Senate Bill 66 specified recycled content requirements for glass containers (35% in 1995, 50% after 2000).

come from large resin manufacturers who sell to a broad spectrum of industry. So presumably the cost is incorporated into their product (resins).

C. Is it efficient? (Best impact for least cost?)

Reliance on the recycling rate is efficient in the following respects:

- Individual container and product manufacturers do not have to go through their product lines to determine which option each individual container can use to comply, and then devote resources to implementing those options.

- Individual container and product manufacturers do not have to keep separate records on compliance. They can rely on the Department's recycling rate.

- Some manufacturers will choose to use other compliance options so their containers comply "on their own." The availability of options lets them choose the most efficient path for their situation.

- DEQ's administrative burden is greatly lessened. The Department does not have to request and review records for compliance (which could require weeks or months for each manufacturer); or to move to enforcement for any non-complying manufacturer. All comply.

- DEQ's responsibilities are three-fold: 1) conduct a waste composition study biennially; 2) determine a recycling rate for compliance purposes annually; and 3) determine an actual recycling rate for each calendar year (includes processor census).

From a natural resources standpoint (materials and energy), it is more efficient to reuse recovered materials than to use virgin materials. This Law is contributing to that result.

D. Will the improved recycling rate last?

It's too soon to tell. By their nature, markets vary. There is optimism that the subsidy should be able to go away. Reliance on the rate (determined annually) maintains everyone's stake in supporting plastics recycling. If the rate isn't met, then other options must be used to comply, along with the difficulties that poses for some containers (e.g. those subject to federal regulations). Once infrastructure is in place and markets are developed, the recycling rate has a better chance of maintaining itself (more stake-holders).

The challenge will be to maintain plastic recycling infrastructure when industry support goes away. May need higher collection fees (if curbside collection of plastics increases) or longer-term commitment from industry.

E. How much more recycling is feasible?

DEQ estimates that about 72 million pounds of waste rigid plastic containers will be generated in the State in 1995. It is further estimated that 32 percent of these, or 23 million pounds, will be recycled. This leaves the following amounts to be landfilled (**1995**, estimated):

Resin	Pounds Landfilled (millions)	Percent of Resin
PET	6.2	36%
HDPE	31.2	75%
PVC	0.8	97%
LDPE	0.7	89%
PP	1.2	94%
PS	6.4	89%
Other, mixed	2.9	92%
All resins	49.3	69%

Recovering substantial additional amounts of HDPE and polystyrene (PS) appears feasible.

F. Is there a better way to achieve the purposes of Senate Bill 66?

The Department believes that the current approach is working. It cuts a broad swath in covering all rigid plastic containers in Oregon (with very limited exceptions). This gives all regulated parties common cause to work towards

either the aggregate recycling goal, or if they are more comfortable with an option over which they have individual control, to work towards 25% recycled content. On the other hand, if the legislation were changed to allow extensive exemptions, the industry incentive to support recycling would diminish and the rate might not be met for those remaining regulated containers.

Alternative program structures outlined in the Implementation Report tend to require extensive bureaucratic structures to carry them out (e.g. limiting compliance to a "recycled content," with product/container manufacturers who can't comply paying a fee instead).

There is some concern that markets for recycled plastics markets cannot maintain themselves in the long run. However if recycled content remains a compliance option, this should maintain some base level of demand. The public may be called on to pay higher collection fees for the opportunity to recycle rigid plastic containers.

There may also be some public concern that it was "too easy" to meet the 25 percent recycling rate; nearly half of the rate is due to the recycling of PET soft drink containers under the bottle bill. There is a large discrepancy between the PET recycling rate and the rate for other resins. HDPE (used for milk jugs), for example, is the most common resin in the waste stream by weight, and 75 percent of it is being landfilled. It might be interesting to look at a rigid plastic container recycling rate over and above that achieved by the bottle bill.

Accurate determination of the rigid plastic container recycling rate is crucial to implementation of the Law in its present form. The Department has encountered difficulty in obtaining accurate information from processors on the amount of rigid plastic containers (and resin types) recycled.

RECOMMENDATION: Retain the basic structure of the program with the changes proposed in Sections 2 and 3 above. Grant the Department explicit statutory authority to require specific recordkeeping measures from processors for this program in order to increase the accuracy of the recycling rate determination.

This would keep it to all the players' advantage to cooperate in meeting the recycling rate. The program should be allowed to operate for at least two years to get established. At that time the level of the required rigid plastic container recycling rate should be reexamined to see whether it is increasing incrementally or stagnating.

IMPLEMENTATION OF OREGON'S RIGID PLASTIC CONTAINER LAW

REPORT TO THE 1995 OREGON LEGISLATURE

RE-DRAFT

Department of Environmental Quality

January 1995

Table of Contents

EXECUTIVE SUMMARY

IMPLEMENTATION OF OREGON'S RIGID PLASTIC CONTAINER LAW

This Report fulfills the requirements of Section 4, Chapter 568, Oregon Laws 1993 to report to the 1995 Legislature on the status of plastic recycling programs in Oregon, the implementation of Oregon's Rigid Plastic Container Law (ORS 459A.650 to 459A.665), and, based on the implementation, any recommendations for statutory changes.

This requirement was part of the 1993 amendments to the original Rigid Plastic Container Law contained in 1991 Senate Bill 66, referred to as the 1991 Recycling Act. The overall purpose of the Act was to increase recovery of materials from Oregon's waste stream and stimulate markets for recycled materials. It established minimum content requirements for various commodities including minimum recycling, reuse or recycled content requirements for rigid plastic containers. The latter are the compliance "options" for rigid plastic containers sold in Oregon.

The Rigid Plastic Container Law (the Law) goes into effect on January 1, 1995. The Department developed rules to implement the Law during 1994. Three Task Forces were established to help with rule development. The Task Forces identified a number of major issues during this process to be addressed in this Report. These issues could not be resolved by rule either because of conflicting interests among the affected parties, or because they could not be accommodated under Oregon Law. Many of the issues stem from the concern of the regulated community that provisions of the rules and/or statute prevent or make very difficult their compliance with some of the options provided in the Law. These issues are:

1. Federal preemption of federally-regulated packaging (FDA, FIFRA, US DOT and USDA).

2. Use of "reduced container" exemption by products and containers introduced after January 1, 1990.

3. Regulation of point-of-sale packagers such as take-out food vendors.

4. Pyrolysis of plastics and definition of recycling.

5. Definition of "rigid plastic container."

6. Compliance for newly-introduced products and containers.

7. Corporate averaging for compliance, across product lines and/or across options.

8. Hazardous materials in plastic containers which may enter the rigid plastic

container recycling stream.

9. Compliance and enforcement timing.

10. Other enforcement issues: third-party cause of action, and enforcement against retailers.

11. Timing of the Department's waste composition study.

12. Enforceability of data collection from plastics processors.

13. "Appeal" process (waste composition study/recycling rate).

This Report discusses these issues and presents a range of options for dealing with them.

It should be noted that if rigid plastic containers in the aggregate are recycled in Oregon at a 25 percent rate, *all* rigid plastic containers are deemed to comply with the Law. The "recycling rate for compliance purposes" for 1995 was determined by the Department to be 32 percent. Since the rate exceeds 25 percent, the compliance difficulties cited in this Report are much diminished as long as the recycling rate remains at or above that rate.

Still, the recycling rate must remain at 25 percent in subsequent years for compliance to continue. The new recycling programs and the stability of plastics processors are vulnerable to a market still in its developmental stages. There needs to be thought on how best to maintain an on-going market for recycled plastics once the initial program structure is in place.

The Department suggests that options for dealing with the above include: (Only Option 1 was discussed by the Task Forces)

1. Retain existing "options" structure, but consider legislative changes to address issues identified in this Report.

2. Retain existing "options" law, but increase the recycling rate (e.g. from 25 to 40%) effective three to five years in the future.

3. Remove the "options" aspect and change to a straight "recycled content" law, with fees on containers which do not or cannot comply.

4. Mandate curbside pickup of some or all rigid plastic containers for recycling.

5. Change to a recycling fee program for rigid plastic containers similar to Florida program, including provision of exemptions from the fee if a certain recycling rate is achieved.

STATUS OF PLASTICS RECYCLING PROGRAMS IN OREGON

Plastics collection in Oregon has expanded greatly in recent years, from seven curbside programs and about 20 drop-off depots in 1990 to 50 curbside and 31 drop-off depots in 1994. Continued expansion is anticipated in 1995. This has resulted the Department's determination of a 32 percent rigid plastic container recycling rate for compliance purposes for 1995. Nevertheless much of that is due to the return of PET (resin #1) soft drink bottles under Oregon's bottle deposit law, which are being recycled at a rate of about 94 percent.

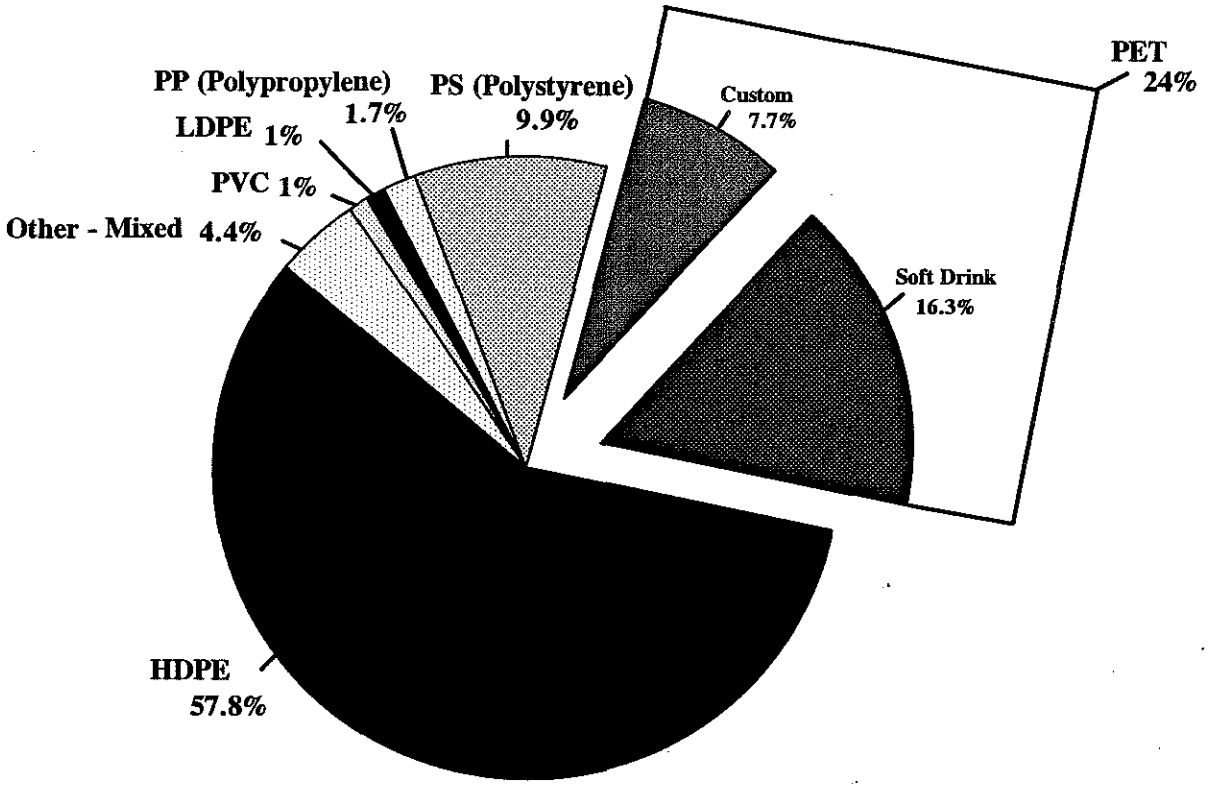
The Rigid Plastic Container Law has contributed to the new and expanded recycling programs for plastics through the desire of the regulated community to comply.

Continued support is necessary to sustain this momentum and to capture more of the recoverable plastics still in the wastestream.

The following Tables show the estimated share, by resin, contributed to generation of rigid plastic conctainers (RPC) in Oregon in 1995; and the estimated share, by resin, of RPCs disposed of (i.e. potentially available for recycling) in 1995. PET has been broken out into "soft drink" and "custom" to show the effect of the bottle bill.

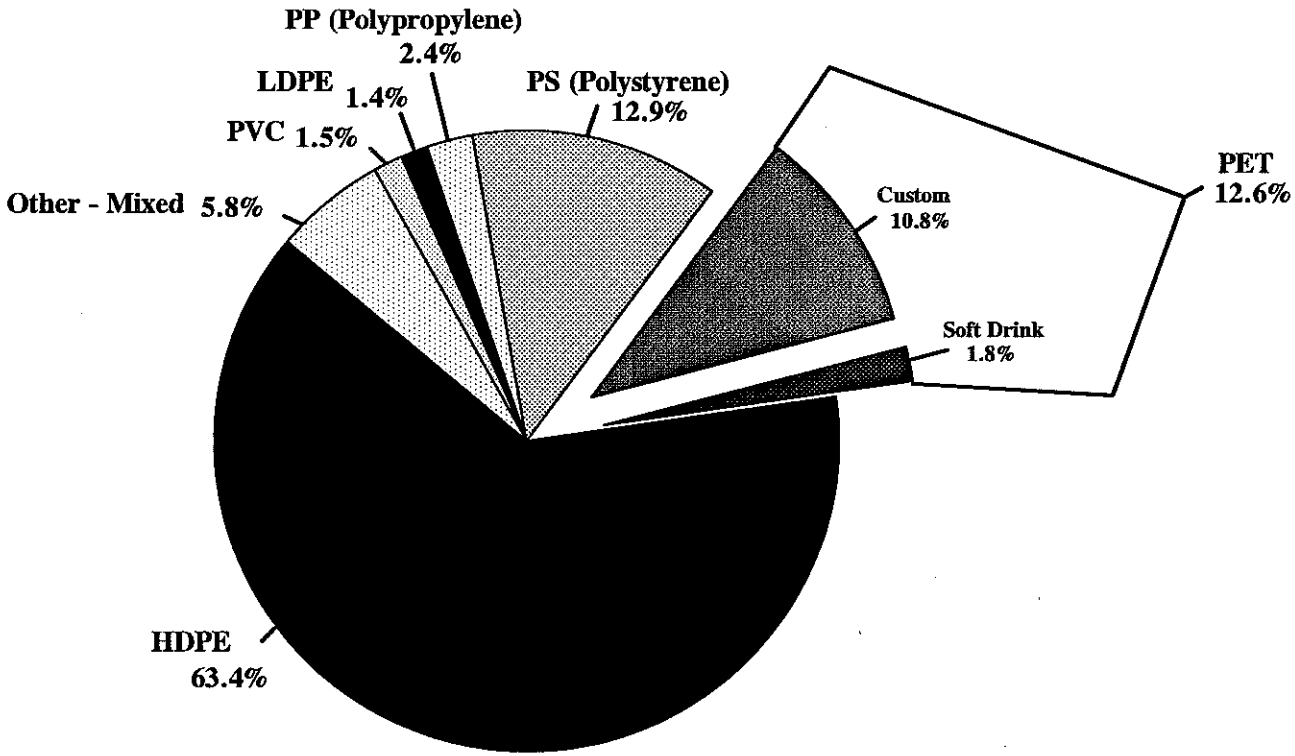
execsum.rp2

Estimated RPC Generation in Oregon
1995



Total: 72 million lbs

Estimated RPC Disposed of in Oregon
1995



Total: 49 million lbs

Purpose

The purpose of this Report is to comply with direction from the 1993 Oregon Legislature for the Department of Environmental Quality (Department, DEQ) to report to the 1995 Legislature on the implementation of Oregon's Rigid Plastic Container Law, and, based on that implementation, any recommendations for statutory changes. The Report is also to cover the status of plastic recycling programs in Oregon.

Background

The 1991 Oregon Legislature passed the Rigid Plastic Container Law (the Law) as part of the Oregon Recycling Act (1991 Senate Bill 66). This was a comprehensive Act establishing statewide solid waste reduction goals and rates. It also established minimum recycled content requirements for various commodities including paper and glass.

The Rigid Plastic Container Law, as a result of compromise, included a number of compliance alternatives for rigid plastic containers, including a minimum aggregate recycling rate, reuse, or recycled content requirements. The Law required the Department to report to the 1993 Legislature on whether to grant an exemption from the criteria established for rigid plastic containers that cannot meet the recycled content criterion and remain in compliance with United States Food and Drug Administration regulations. In that Report[1] the Department recommended reducing the options to two (recycled content or reuse), with a recycling fee for product manufacturers unable to meet either of those options. The recycling fee would be assessed on product manufacturers, and would help create a level playing field within the market between manufacturers who meet and do not meet the standards. It would be based on the estimated number of non-complying containers sold in Oregon. Funds from the recycling fee would be used to enhance plastics recycling programs and stimulate markets for recycled plastics.

The 1993 Legislature did not enact the Department's recommendation, but did amend the Law adding certain exemptions and delaying enforcement action by DEQ.

The Law requires that by January 1, 1995 rigid plastic containers comply with one of the following options:

a. Use 25% recycled content, or

[1] "Rigid Plastic Container Exemption Report," Report to the Legislature by Oregon Department of Environmental Quality, December, 1992. See attached Executive Summary.

b. Meet a 25% recycling rate, or

c. Be reusable/refillable, or

d. Be reduced (exemption provision under ORS 459A.660(3)(d)).

Under the recycling rate option, the 25 percent recycling rate can be met by rigid plastic containers as a whole, by a certain type of container, by a certain resin type, or by an individual company (or brand).

In analyzing the statute and its implementation during rulemaking and in preparing the 1993 Report to the Legislature and this Report, it became evident that not all the options are available to all product manufacturers. For example, the minimum recycled content may not be available to food and cosmetic manufacturers for health and safety reasons. As a practical matter, the recycling rate option will probably be the principal compliance option chosen by most product manufacturers.

Many of the issues addressed in this Report stem from the concern of the regulated community that provisions of the rules and/or statute prevent or make very difficult their compliance with some of the options provided in the Law. Industry has argued that the Oregon Law is federally preempted in some respects and that various types of products should therefore be exempted from the Law because not all product manufacturers can avail themselves of all options (see body of Report). If all containers that cannot use recycled content were exempted from compliance, this would exempt a very large part of the rigid plastic container wastestream. It should be noted that if rigid plastic containers in the aggregate are being recycled in Oregon at a 25 percent rate, *all* rigid plastic containers are deemed to comply with the Law. Program rules require the Department to determine a "recycling rate for compliance purposes" by January 1, 1995. The recycling rate for compliance purposes for 1995 was determined to be 32 percent, and was released by the Department on December 22, 1994. Since the rate is over 25 percent, the compliance difficulties cited in this Report are much diminished for 1995 and as long as the recycling rate remains at or above 25 percent.

In considering options for the future shape of the Rigid Plastic Container Law, the Department suggests that the following basic approaches exist:

1. Leave the Law as it is, considering "fixes" discussed in this Report to make it work better.

2. Retain existing "options" law, but increase the recycling rate so plastics is comparable to other packaging materials.

3. Change the Law to a straight "recycled content" law, with a recycling fee on containers which cannot comply (per 1993 Legislative Report).

4. Mandate curbside recycling of rigid plastic containers.

5. Change the Law to include a recycling fee for otherwise non-compliant rigid plastic containers to be used for market enhancement for plastics.

Rule Development/Implementation

DEQ established three Task Forces in November 1993 to help develop rules to implement the Law. The Task Forces met approximately monthly until September 1994. Their membership was diverse, and included representatives of the regulated community. A number of major issues arose during rule development which could not be resolved.

At its final meeting on September 14, 1994 the Implementation Task Force considered issues which should be included in this Report to the Legislature. They felt these included issues which arose during the rule development and which needed to be addressed and resolved, but which could not be done by rule either because of lack of consensus among affected parties or because they could not be accommodated due to the specificity of the statute itself. As a representative of the Attorney General's office pointed out at the October 21, 1994 EQC meeting, statute establishing the Rigid Plastic Container law is very specific, spelling out definitions, mandates and exemptions; it is not a "delegative" law in the sense of providing broad discretion for the EQC to establish policy by rule. Issues identified for inclusion in this Report are:

1. Federal preemption of federally-regulated packaging (FDA, FIFRA, US DOT and USDA).

2. Use of "reduced container" exemption by products and containers introduced after January 1, 1990.

3. Compliance or exemption for point-of-sale packagers such as take-out food vendors.

4. Pyrolysis of plastics and definition of recycling.

5. Definition of "rigid plastic container:" any container meeting the basic criteria and holding between 8 oz. and 5 gallons vs. "complete package."

6. Compliance for newly-introduced products and containers.

7. Corporate averaging: allowing a company to achieve compliance by averaging across product lines and/or across compliance options (e.g. use over 25% recycled content in some containers to balance out other containers which cannot use recycled content because of federal regulations, for an overall "average" of 25% recycled content).

8. Hazardous materials in containers which may enter the rigid plastic container recycling stream.

9. Compliance and enforcement: timing.

10. Enforcement: other issues.

11. Timing of waste composition study: Annual? Fiscal year, calendar year, other?

12. Enforceability of data collection.

13. "Appeal" process (waste composition study/recycling rate).

The first five of the above issues were identified by the Commission at its October 20, 1994 work session as areas requiring additional discussion.

Issues and Discussion/Options

This Report discusses the issues listed above, focusing on why they are a problem, why they could not be resolved by rule, and giving options to address them. A number of the issues and options were presented to and discussed by the Rigid Plastic Container Task Forces in their work developing the rule. Concepts in this Report are not, however, restricted to those which were subject to Task Force discussion. Others were identified during the public comment process and still others have been included to give the Legislature a more complete although not necessarily exhaustive picture of possible ways to achieve reuse, reduction and recycling of rigid plastic containers.

1. FEDERAL REGULATION OF CONTAINERS AND FEDERAL PREEMPTION.

While there are no federal packaging standards applying specifically to rigid plastic containers as a general class of material, a number of federal regulations apply to packaging of various categories of consumer products. Many of these regulations severely restrict or prevent use of some of the compliance "options" for rigid plastic containers in the Law. The Department's Rigid Plastic Container Exemption Report to the 1993 Legislature examined federal regulations affecting the use of recycled content in rigid plastic containers; that Report noted that over half of the rigid plastic containers sold in Oregon contain state or federally regulated products. A Department memo to the Implementation Task Force (February 9, 1994) further discussed "Compliance with Rigid Plastic Container Law When also Regulated by Federal Government."

During the public comment period on the proposed rules, affected industries submitted information to the Department describing how federal regulations impede compliance with various "options" of the Rigid Plastic Container Law, and stating their belief that federal regulations preempt state Law in this area.

Following is a summary of these federal regulations, and then a summary of the preemption issue.

A. Federal Food, Drug and Cosmetic Act. Food packaging is regulated as an indirect food additive under this Act. The Food and Drug Administration (FDA) must ensure that the products it regulates are wholesome, safe and effective. FDA regulates food packaging through the food additive petition process. Manufacturers are required by law to obtain approval from FDA for all the materials used in direct-contact food packages before they can be marketed. The Code of Federal Regulations (CFR) contains all the specific requirements for food packaging materials. In the case of plastic polymers, these regulations do not currently address the source of the material. Thus the FDA does not currently approve or disapprove the use of recycled polymers or plastics for food. In the few cases where FDA has reviewed the use of recycled plastics for food use, the process has resulted in a letter of no objection. Such a letter is not binding, but rather an indication of current enforcement policy.

Cosmetic manufacturers also have a legal obligation to produce safe products (including ingredients and packaging) under this Act. This includes ensuring that contaminants do not migrate from the packaging to the product in a manner that will compromise the safety of the product. There is no "non-objection" or approval process in FDA for cosmetic packaging. Neither has the FDA issued guidelines for use of recycled content in cosmetics packaging.

B. Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Pesticides are covered under FIFRA and must be registered. Proposed federal rules would regulate some aspects of packaging of pesticides. The proposed federal regulation would specifically regulate certain container design requirements for non-refillable and refillable pesticide containers. (See also Section 8, Recycling of Hazardous Material Containers)

C. Hazardous Materials Transportation Act. Regulates the transportation of hazardous materials. In general the regulatory environment for hazardous material packaging is very detailed. Performance specifications relate to stress, minimum thicknesses, ability to withstand pressure and impact, and extreme temperatures. Most general requirements place independent and additional obligations on the person offering a hazardous material for transportation to ensure that such packaging is compatible with its contents and that no significant chemical reactions between the materials and the contents of the package will occur. The federal Department of Transportation (US DOT) has adopted regulations (49 CFR 41) that prohibit use of post-consumer recycled content in certain packages.

D. US Department of Agriculture (USDA). Regulations govern dairy, poultry and meat products. In contrast to FDA, USDA requires food packagers to submit letters of guarantee and limitations from the package manufacturer. The letter must state that the material in the package meets federal regulations and the conditions under which the package can be used.

Federal Preemption. A number of affected persons commented that some or all of the federal regulations noted above "occupy the field" vis-a-vis packaging of the products they regulate.

In particular, language in the FIFRA statute (Section 24(b)) speaks to the "Authority of States," and reads as follows:

> (b) Uniformity. -- Such State shall not impose or continue in effect any requirements for labeling or packaging in addition to or different from those required under this subchapter." (Emphasis added)

The Rigid Plastic Container Law specifically spells out several exemptions, including drugs, medical devices, medical food and infant formula. No other exemptions were specified for products regulated under the above federal regulations. The Attorney General's Office researched this issue and has provided the Department with written advice that FIFRA, the Food, Drug, and Cosmetic Act (FDC), and US DOT's regulations for hazardous materials do not preempt ORS 459A.655. The "short answers" provided stated that:

a. Oregon Law (ORS 459A.655) does not clearly impose "additional" or "different" packaging requirements proscribed by FIFRA.

b. The FDC Act and implementing rules reveal no congressional intent to completely preempt the field for packaging. They may prevent use of recycled content plastic containers for some products, but Oregon Law provides alternative compliance options.

c. Because Oregon Law does not directly regulate the transportation of hazardous materials, the US DOT Act and regulations do not appear to preempt it. Conflicts with the federal rules would occur only if US DOT regulations mandated use of a specified rigid plastic container for sale of a product and that container failed to comply under Oregon Law.

While federal preemption is not necessarily a legal issue (based on the above Attorney General's advice), the Department agrees that certain of the existing compliance options may be precluded by these federal laws. The recycling rate option is available to all product manufacturers.

Others have argued the preemption issue differently. For example, they point out that all containers (included rigid plastic containers) used to ship hazardous materials must meet prescribed US DOT standards. They maintain that this requirement and similar provisions under FIFRA create de facto if not de jure preemptions.

Options:

a. Keep Law as it is. The Attorney General has advised the Department that federal preemption is not necessarily an issue.

b. Declare that products regulated by FIFRA and/or US DOT are exempt from regulation under the Rigid Plastics Container Law.

c. Change the implementation date for FDA and/or US DOT-regulated products to offer additional time (e.g. two years) for compliance other than with the recycling rate option. These products may be able to use compliance options such as recycled content if given more time. (Packaging holding foods and cosmetics has a two-year compliance waiver and US DOT-regulated products a one-year exemption in California.)

d. Provide additional compliance options for federally regulated products (e.g. a reduced container compliance *option*, recycling fee [see discussions in Sections 2 and 3]). (Not discussed by Task Forces)

e. Exempt federally regulated containers in cases where the only realistically available compliance option is the recycling rate, since individual manufacturers do not totally control that rate.

2. REDUCED CONTAINER EXEMPTION

Problems with use of the recycled content compliance option were noted in the previous Section for some types of products (notably food and cosmetics products). Manufacturers of some of these products have said that, if the overall recycling rate is not met, the only realistic option they have is to switch to a "reduced container," which would allow a five-year exemption. In their view, this exemption does not work for products introduced after January 1, 1990, effectively leaving them with no compliance options (other than the aggregate recycling rate, over which the product manufacturer has little control). The impediment is the statutory requirement for a five-year comparison to be made in order to calculate the container's 10 percent "reduction."

A container reduced by 10% as compared to the container used for the same product by the same product manufacturer **five years previously** is eligible for a five-year exemption. (ORS 459A.660(5)(d)) This means that if a product and container were not in existence on January 1, 1990, that product is not eligible to use the "reduced container" exemption on the effective date of the Law (January 1, 1995). The container could potentially qualify for a "reduced container" exemption once five years had expired after its introduction, so that the required five-year comparison could be made. However, the container would have to use another compliance option in the meanwhile.

The legislative intent of the exemption was interpreted differently by different DEQ Task Force members. Some felt the Legislature had not meant to exclude newly introduced products from taking advantage of the exemption. They argued that it would discourage innovation, and be unfair to those who wanted to comply by using reduced containers for products that had not been on the market for five years. Requiring a non-reduced container to be on the market for five years before reducing its weight (to qualify for the exemption) seems to thwart the intent of the Law which is to reduce the amount of waste packaging material. The "solid waste management hierarchy" (ORS 459.915(2)) places source reduction before recycling; use of the reduced container exemption would follow that priority. Other Task Force members felt the exemption was meant to be one-time for products in existence on January 1, 1990. They said that the problem with plastics in landfills is based on their volume, not their weight, and that the real problem is that plastics recycling lags behind recycling of other packaging materials. During the public comment process some members of the public said that a 10 percent reduction in container weight does little to solve the problem of low recycling rates for plastics and thus should not qualify

for an exemption. Expanding use of the exemption, in their view, would not contribute to recyclability or demand for recycled content. They would prefer this exemption to be eliminated, or to require a larger reduction (e.g. 20%) to qualify.

The Oregon Attorney General's Office advised the Department that the timing of the exemption under the statute is not entirely clear; however, the statutory provision is specific that a reduced container must be compared to a container used for the same product by the same packager five years earlier.

Product manufacturers have noted that a new product introduced into the market today cannot use the "reduced container" exemption. They reason that there should be some compliance option (other than the recycling rate) for new products in containers prevented from using recycled content or unable to be reused or refilled. Suggestions have ranged from allowing some period of time from the product's introduction (e.g. one to five years) for the manufacturer to develop a "reduced container," to establishing a compliance waiver (e.g. one year) for newly-introduced products. See Section 6 for further discussion of newly introduced products.

Options:

a. Leave Law as it is. The "source reduction" exemption was apparently meant for containers in existence when the original law was passed. Containers introduced after January 1, 1990 must use one of the "compliance options" rather than being allowed to use an exemption.

b. Modify the "reduced container" exemption. Allow a container introduced after January 1, 1990 and reduced by 10% by January 1, 1995 to qualify for the exemption. This removes the "prejudice" against containers not in existence on January 1, 1990, but does not address containers introduced after the effective date of the Law.

c. Modify the "reduced container" exemption. Allow a container introduced after the effective date of the law a given period of time (e.g. 60 days as allowed by California, or one year, etc.) to make a 10% reduction. This allows newly introduced containers, for which it may be difficult or impossible to use other compliance options other than the recycling rate, to qualify for this exemption.

d. Remove the reduced container *exemption* altogether. Change it to an on-going compliance option (with some given period of time in which newly introduced containers could come into compliance); the option could be renewable if the container met additional reduction criteria.

e. Increase the required weight reduction (e.g. from 10% to 20%). Some feel that 10% is not significant enough and an increase would make this exemption more comparable to other options in addressing plastics in the waste stream. (Not discussed by Task Forces)

3. COMPLIANCE FOR POINT-OF-SALE PACKAGERS.

Oregon statute defines a "product manufacturer" as "the producer or generator of a rigid plastic container for a packaged product that is sold or offered for sale in Oregon." A "package" is "any container used to protect, store, contain, transport, display or sell products." In general terms a product manufacturer is a person who puts a product into a rigid plastic container for sale. This includes retailers such as food vendors who use rigid plastic containers for take-out foods and deli products. The product manufacturer is the person responsible for keeping records and reporting to the Department on compliance with the Law. (See DEQ Discussion Paper: "Point of Sale Product Manufacturer," February 3, 1994)

The foodservice, grocery and plastic industries have commented on the difficulty of compliance with the Law by point-of-sale packagers (foodservice industry, take-out foods, etc.). It may be problematic for them even to determine whether the containers they use comply with the Law. There are inherent differences between the generic containers normally used by the foodservice industry and other regulated rigid plastic containers. The former are generally purchased from distributors, so there is usually no relationship between the packager and the container manufacturer. Therefore recordkeeping to document compliance may be impossible. These are often small businesses, and documentation of compliance could be extremely burdensome.

Some commented that the Legislature had not intended to cover point-of-sale packagers as "product manufacturers;" they do not "fabricate" anything, as implied by the term "manufacture." The Department believes that legislative intent appears clear to include single-service containers, while recognizing that small point-of-sale packagers may have few resources to implement the Law. The rigid plastic container rules as adopted ease the compliance burden for small-volume product manufacturers in two ways:

a. Recordkeeping. A product manufacturer selling fewer than 500 rigid plastic containers per day is not required to keep records of container compliance beyond quantity, brand name, product number, and source of purchase.

b. Penalty schedule. The enforcement schedule reduces the impact on small businesses by establishing a threshold of daily sales of rigid plastic containers

(500) to determine whether a violation would be a Class II or a Class III violation. Class III violations are considered less severe, have a lower civil penalty schedule and in most cases do not result in a civil penalty.

Although not discussed by the DEQ Task Forces, a recycling fee might be one option for addressing compliance for rigid plastic containers, such as those used by point-of-sale packagers, which now cannot avail themselves of some of the existing options. Similar to the concept put forward in the Department's 1993 Report to the Legislature, a recycling fee could be assessed on packaging not meeting reduction, reuse, recycled content or recycling goals. The fee is meant to promote those goals. Its rationale is that the price of packaging (especially packaging using virgin materials) doesn't include all the true costs of producing and using the packaging (e.g. resource extraction, packaging production, disposal). The fee could be used to support recycling programs for point-of-sale rigid plastic containers or to otherwise promote markets for plastic recycling. The fee would normally be assessed on the container manufacturer (in the case of point-of-sale packagers) or on the product manufacturer. Containers complying with recycled content requirements (or other specified options) would not be subject to the fee; other containers would. For example, the State of Florida imposes a fee with a unit charge of $.01 for each packaging item not meeting recycling or recycled content goals. (Note: as of October 1994, 60% of Florida's container industry had met those goals and qualified for exemptions to the fee.)

Options:

a. Leave Law as it is. There are equity issues involved in treating products equally (e.g. potato salad sold in a rigid plastic container in the dairy section of a grocery store vs. bulk potato salad sold in the deli section and put into a rigid plastic container upon purchase). The public perceives single-service food containers to be a disposal problem. The rules offer relief to small-volume product manufacturers.

b. Exempt small point-of-sale packagers. Could either exempt on number of rigid plastic containers sold, overall sales volume, or other factors. Would further relieve small businesses from burden of recordkeeping, from potentially having to switch type of packaging used, etc.

c. Exempt all point-of-sale packaging by stating that a container must "store" a product to be regulated under the Law. The California rule states that a container "stores" a product if it "normally holds the product for more than seven days."

d. Put a recycling fee on point-of-sale containers, exempt them from further compliance, and use fee proceeds to increase recycling options for single-service rigid plastic containers. (Not discussed by Task Forces)

(Note: Options dealing with food packaging discussed in other Sections, such as FDA regulation, would address point-of-sale packaging concerns as well.)

4. PYROLYSIS

Pyrolysis involves the heating of plastic material to produce liquid hydrocarbons, carbon black and gas that is used as the energy source for the pyrolysis process. The liquid hydrocarbons can be sold to refineries and petrochemical facilities for conversion into a variety of materials including fuel, monomers for plastic products and synthetic materials for clothing.

There was discussion during the 1993 Oregon legislative session as to whether pyrolysis of plastics should be classified as "recycling." The Legislature declined to make that declaration, but, in a budget note, required the Department to report to the 1995 Legislature on the success of all recovery technologies (including pyrolysis) which increase the amount of solid waste diverted from landfills. This separate report, "Recovery Technologies and the Environmental and Economic Impacts of Recycling," includes a section on pyrolysis at the Conrad Industries Facility in Chehalis, Washington, as well as further discussion of pyrolysis and its impacts.

This question also arose during development of the rigid plastic container rules: can the pyrolysis of rigid plastic containers count toward the rigid plastic container 25 percent recycling rate compliance option? The Attorney General's Office advised the Department that energy recovery is not "recycling" under Oregon law, and the Department cannot give recycling credit for energy recovery. However, to the extent that the end product of pyrolysis is not energy recovery but is further processed into plastic feedstock, it could contribute to the recycling rate. This provision is included in the Department's adopted rule.

Representatives of the plastics industry and others in the regulated community strongly disagree. They argue that pyrolysis constitutes recycling because it creates a "new product" (liquid hydrocarbons), pursuant to the statutory definition of "recycling." They maintain that some rigid plastic containers cannot be physically recycled into new products by pelletizing and remelting; these may be of "mixed" resins or be very contaminated. Pyrolysis may accept such plastics, with the possible exception of vinyl chlorides (#3 resin). They argue that encouraging pyrolysis would contribute to diverting plastics from landfills by returning plastics to the material from whence they originated, a liquid petroleum product which can be directly

substituted for virgin petroleum. Therefore, they believe that all products of pyrolysis are appropriately included in calculating the recycling rate.

Members of the recycling community and the public have questioned the need to reduce plastics to their original feedstock (through pyrolysis) and then reprocess them into plastic materials, when they can be pelletized and remelted directly into plastics. The Environmental Quality Commission received petitions with approximately 26,000 signatures on this issue in spring of 1994.

Options:

a. Leave Law as it is. Current recycling and solid waste law relies on distinctions between energy recovery and recycling in establishing requirements on which the State's waste reduction goals are based.

b. Modify the solid waste management hierarchy to classify all products of pyrolysis (including those that utilize the heat content or other forms of energy) as "recycling" rather than "energy recovery."

c. Change the rigid plastic container "rate" compliance option from "recycling rate" to "*material recovery* rate," and increase the rate. This would automatically include energy recovery as well as recycling in the *rate*. (Not discussed by Task Forces)

5. DEFINITION OF RIGID PLASTIC CONTAINER: "COMPLETE PACKAGE"?

The definition of "rigid plastic container" determines which containers must comply with the Law, and which containers are to be counted in calculating the rigid plastic container recycling rate.

The following are defined in the Law: (ORS 459A.650)

> (1) "Package" means any container used to protect, store, contain, transport, display or sell products.
>
> (7) "Rigid plastic container" means any package composed predominantly of plastic resin which has a relatively inflexible finite shape or form with a minimum capacity of eight ounces and a maximum capacity of five gallons, and that is capable of maintaining its shape while holding other products.

The rules establish criteria that **any** package must meet to qualify as a "rigid plastic container:"

a. It is designed to hold a product for sale;

b. It has a volume of not less than eight ounces and not more than five gallons;

c. It is composed predominantly of plastic resin; and

d. It is able to maintain its shape, whether empty or full, under normal usage, independent of any product which it contains or other external support.

The Task Forces felt further refinement might be helpful to clarify whether various packaging items would be regulated as "rigid plastic containers" or not, but consensus was not reached regarding additional criteria. A major issue was whether a rigid plastic container also had to be a "complete package" (i.e. completely contain the product) in order to be regulated under this Law. Two approaches were put forward for public comment. The first, or more inclusive, approach (supported by a majority of the Implementation Task Force) did not require that a rigid plastic container be a "complete package." The second, or less inclusive, approach (supported by representatives of the plastics industry) required a "complete package."

Members of the recycling community and the general public preferred the first approach which included a broader range of rigid plastic containers. They commented that this would help keep these items out of landfills. They felt that the

public expected such things as plastic cookie trays to count regardless of whether they were also in a paper bag, and that there was no reason why a container must completely contain a product. They also commented that adoption of this approach would simplify the Department's waste composition study (see Section 11), as the surveyors would not have to worry as much about exemptions. Comment was also received that the definition should also include lids outright, as they are part of the container and are generally as easy to recycle as the bottom of containers.

Representatives of the plastics industry and the regulated community preferred the second approach, with its concept that the product must be contained in a "complete package" to be covered by the Law. They felt this eliminated ambiguity, in that it excludes items not normally considered containers in and of themselves (e.g., cookie trays or other types of trays which "brace" or support a product, but require additional packaging for the product to be "contained"). Some also commented that the definition should require a container to be capable of multiple reclosure, as required by the California rigid plastic packaging container program, as this is an important distinguishing attribute of rigid plastic containers. They said this would provide concrete guidance for determining which containers are regulated.

The Department recommended, and the Commission adopted as rule, the first approach with the broader definition of "rigid plastic container." The adopted definition includes trays and lids, if they otherwise meet the criteria for a "rigid plastic container." The following considerations were taken into account by the Department in arriving at its recommendation. The Department did not believe that the notion of a "complete container" is necessarily inherent in the law. The first approach better conforms to the public's perception of a "rigid plastic container," as expressed during the public comment process. It encourages recycling and will facilitate waste sort decisions. Some elements of the California law pertaining to what qualifies as "rigid plastic container" are less broad than Oregon Law which includes the concepts of "protect, store, contain, transport, display *or* sell products" [emphasis added]. Trying to make Oregon's definition conform to California's would require an unjustified degree of interpretation. In considering the issue, some members of the Commission commented that the definition in the first approach might not correspond to what they would have chosen. However the broader definition was supported because it matches what the public perceives as rigid plastic containers.

Options:

a. Leave Law as it is. The statutory definition of "rigid plastic container" as clarified in the adopted rule is implementable, will meet public expectations, and will contribute to state recycling goals.

b. Change definition of "rigid plastic container" to match California's. This would cover a narrower universe, but would still regulate the vast majority of rigid plastic containers. (Note: the California definition excludes "point-of-sale" packaging. See discussion in Section 3 above.)

c. Broaden definition to include all lids, as lids are an intrinsic part of many rigid plastic containers and should be recycled. This could also facilitate compliance by product manufacturers choosing the "recycled content" option, as it may be easier to use recycled content in lids than in the body of a container. (Not discussed by Task Forces)

6. NEWLY INTRODUCED PACKAGES

Product manufacturers have pointed out that compliance options for new products are limited under the Oregon Law as currently written. The refill/reuse option and the source reduction exemption require a base against which to measure. Since containers must comply on the date of introduction, new products and containers are precluded from using these options, leaving only the recycled content or the recycling rate option. Especially in the case of FDA-regulated products, use of recycled content is expensive and time-consuming, and may not be possible. They note that this acts to constrain introduction of new products in rigid plastic containers into the Oregon market.

Product manufacturers have further emphasized that introduction of new consumer products into the marketplace is the result of extensive market research, product development and technological innovation; test marketing of a new product is done with risk and expense. Not all new products are successful. Manufacturers have said they need time to understand how the product will perform in the marketplace before making an additional economic commitment to add recycled content.

As mentioned under Section 2 ("Reduced Container Exemption") above, product manufacturers believe there should be some provision allowing newly introduced products to comply with the Law. They recommend a "grace period" for new products. This is allowed under the California program.

Options:

a. Leave Law as it is. This may inhibit new products in rigid plastic containers from being introduced into the Oregon marketplace if the 25 percent aggregate recycling rate is not met.

b. Allow a one-year "grace period" for any container introduced after the effective date of the Law to comply with any option. This offers a phase-in period for new products and containers.

7. CORPORATE AVERAGING.

Corporate averaging would allow a firm to average across product lines (and perhaps across compliance options) to achieve compliance. It is most often mentioned in conjunction with the 25 percent recycled content compliance option. Corporate averaging would allow a manufacturer to use more than 25 percent recycled content in containers where that was possible, in order to "average out" for those containers (e.g. food, cosmetics) which cannot use recycled content because of federal regulations or technical constraints. Some product manufacturers also supported allowing averaging across *all* compliance options, as allowed in California.

Many industry representatives commented that corporate averaging was essential for them to comply. They said it provides maximum flexibility for a manufacturer to use whatever compliance method achieves the greatest gains at least risk and cost. Several companies noted that they can't use other compliance options, but do have the capability of using more than 25 percent recycled content in certain containers. They said that this would encourage the use of post-consumer resins. Some commented that corporate averaging should be allowed at both the product manufacturer and container manufacturer level.

Some Oregon manufacturers have expressed opposition to the concept of corporate averaging. Corporate averaging may tend to give large manufacturers with many product lines an unfair advantage over smaller manufacturers who may have only food lines and therefore could not take advantage of averaging for recycled content. Smaller manufacturers feel they would be at a competitive disadvantage if their product had to use less advantageous (or more expensive) packaging just because their product lines did not give them the ability to use corporate averaging. Or worse yet, they might have to discontinue some product lines if no complying plastic package could be found. They do not want other manufacturers with more lines to be able to use different rules. The recycling community expressed doubt as to whether corporate averaging would produce better markets for post-consumer recycled plastics in Oregon, and they oppose its use if it results in no change from the status quo.

Other product manufacturers have argued that allowing averaging across compliance options would facilitate use of corporate averaging by "food-only" manufacturers (whether large or small). This would let them average refill/reuse achievements or perhaps any "excess" source reduction (beyond 10 percent, in cases where such reductions are feasible) with containers incapable of using those or other options. They believe this would provide maximum flexibility for manufacturers while maintaining the overall intent of the Law. Members of the recycling community have questioned whether any option other than perhaps recycled content should be considered for corporate averaging. They point out that source reduction is an exemption, and its test is whether this container is reduced compared to one five years earlier; they conclude that averaging across container lines would not be appropriate to qualify for this exemption.

Allowing corporate averaging by *container* manufacturers might partially address this sort of potential inequity. A container manufacturer might produce "Oregon-compliant" containers by averaging 100% recycled content in, for example, paint buckets, with 0% recycled content in food containers. Both large and small product manufacturers could purchase the same complying food containers.

Corporate averaging was discussed by the Department's three Task Forces in the course of rule development. (See DEQ Discussion Paper, "Company-wide/Multiple-Packaging-Line Averaging," 3/7/94) The Task Forces did not come to agreement on a recommendation to include corporate averaging. The national and local manufacturers have strong, opposing, feelings on this issue. The Oregon Law does not specify "averaging" as a method of calculating compliance; neither does it specifically preclude the use of corporate averaging to calculate compliance.

The Department did not find an application of corporate averaging which would ensure equity for both large national and small local manufacturers. Therefore the Department did not recommend (and the Commission did not adopt) any provision for corporate averaging in the rigid plastic container rules.

Options:

a. Leave Law as it is. A solution that would not create a competitive disadvantage for either small or large product manufacturers is not readily apparent.

b. Allow corporate averaging for product manufacturers across product and/or container lines for the recycled content option only. This would encourage broadest use of recycled content.

c. Allow company-wide multiple-product-line averaging for all compliance options. This would provide greatest flexibility to manufacturers and promote efficient use of their resources.

d. Allow corporate averaging for container manufacturers across container lines for the recycled content option only.

e. Allow corporate averaging as in Option b., but extend it "beyond corporate boundaries" by the following: any "excess" recycled content (i.e. beyond the average 25 percent needed for compliance) could be used by another, separate, corporation which was unable to comply on its own. Tonnage of the "excess" content would be determined by the first corporation, and that amount would be available for the second corporation to "average" into its containers. This "excess" (or "credit") could be sold at market price. This would allow large corporations with various types of containers to invest in technology to increase recycled content as much as possible, and give them an economic incentive for doing so. It would give smaller firms which may not be able to use recycled content in their containers a compliance option they do not have under existing Law. (Not discussed by Task Forces)

f. Allow corporate averaging, but increase the required amount of recycled content for containers that can use it (e.g. detergent containers). This would create flexibility for product manufacturers but would still require some additional effort from those manufacturers and would support markets for recycled plastic material. (Not discussed by Task Forces)

8. RECYCLING OF HAZARDOUS MATERIAL CONTAINERS.

As noted in above Section 1, Federal Preemption, Oregon law does not exempt from regulation under the rigid plastic container Law those containers which may contain hazardous materials. Neither did the Oregon Attorney General find a specific federal preemption for those products; thus they are regulated under the adopted rule.

Some members of the Department's Task Forces expressed concern about regulating rigid plastic containers containing hazardous materials. If included under the rigid plastic container rules, they believe that such containers may be encouraged to enter the plastic container recycling stream. Even though operators of recycling programs explicitly exclude these containers, the public may nevertheless bring them to recycling depots or include them in curbside collections. This is not a desirable result, as such containers inevitably include residues which may contaminate the entire recycling stream. Such containers might also create health hazards for persons handling them in general plastic recycling programs. If such containers are to be recycled, this should be done through special programs where they are handled

properly and it can be assured that they go to an end use where any residues are not a problem.

Operators of recycling programs believe that the public would include this sort of container in plastic recycling collections whether or not they are regulated under the Oregon Law. They reason that if such containers are required to meet one of the compliance options, the product manufacturers using these containers may be more likely to create appropriate, separate, recycling programs for these containers which, together with their residues, would otherwise end up in landfills or illegally discarded.

Options:

a. Leave Law as it is. The current program structure indirectly encourages establishing separate recycling programs.

b. Encourage (e.g. through recycling fees which could be used for grants to enhance collection and recycling programs) separate recycling programs for rigid plastic containers holding problematic products such as pesticides or oil. (Not discussed by Task Forces)

c. Mandate separate recycling programs for such containers. (Not discussed by Task Forces)

d. Exempt rigid plastic containers holding problematic products from regulation under this Law.

e. Consider whether this issue could be better dealt with through amendment of Recycling and Waste Reduction rules (e.g. OAR 340-90-090, Collection of Recyclable Materials).

9. COMPLIANCE AND ENFORCEMENT: TIMING

The Law contains contradictory language concerning when enforcement is to occur and when records showing compliance must be kept. This affects compliance dates and the timing of DEQ's calculation of the rigid plastic container recycling rate for calendar year 1995. As a result, the issue of timing of compliance and enforcement was the subject of much discussion during the public comment period on the proposed rule.

Compliance Timing Problems. All rigid plastic containers must comply with the Law on and after January 1, 1995. Product manufacturers and container manufacturers must maintain records demonstrating how all rigid plastic containers comply with the

Law, beginning March 1, 1995. The Department may take enforcement action, audit or request copies of the records kept by a manufacturer after: (1) January 1, 1996; **and** (2) after DEQ has calculated rigid plastic container recycling rates for calendar year 1995. (The Director of the Department issued a directive on August 26, 1994, stating that any enforcement actions taken by the Department shall be based solely upon a manufacturer's compliance status beginning January 1, 1996.)

Because of federal regulations to which their product packaging is subject, some product manufacturers have very limited ability to use most compliance options, leaving the 25 percent aggregate recycling rate as their most valid compliance option. For all compliance options other than the recycling rate, the product manufacturer is in control and clearly can and must demonstrate that a container complies on and after January 1, 1995. However, a manufacturer choosing to comply by relying on the aggregate recycling rate is faced with contradictory statutory dates: he or she must comply with the Law on January 1, 1995, and keep records of which compliance option is used by March 1, 1995. The Department must calculate an aggregate rigid plastic container recycling rate for calendar year 1995, which, logistically, cannot be completed until mid-1996. If that aggregate recycling rate must be used to determine compliance, a product manufacturer must base his or her actions, on January 1, 1995, on a rate that will not be determined for another year and a half. Then, if in mid-1996 it is calculated that the 25 percent rate is not met, the manufacturer could be subject to retroactive enforcement actions for being out of compliance. The timing contradiction is true not only for 1995, but persists for the duration of the Law, if compliance for any year is based on the recycling rate for that calendar year. There would be no way of avoiding a retroactively applied recycling rate, and retroactive enforcement.

This appears not to comport with the plain language of the statute.

Department/Task Force Solution. The recycling rate compliance option in statute states that an individual container complies if "rigid plastic containers, in the aggregate, are being recycled in the state at a rate of 25 percent by January 1, 1995." (ORS 459A.655(2)(a)) This language appears to envision fixing a date for calculating a recycling rate in order to allow affected parties to prospectively determine their compliance with the Law and whether the packaging they are using is in compliance. With encouragement from the Task Forces, the Department devised an administrative solution to the above dislocation in timing. This solution is for the Department to determine a *"recycling rate for compliance purposes"* by January 1, 1995 and each year thereafter. This determination will be based on best available information concerning rigid plastic container recycling in the aggregate and by specified resin type. A product manufacturer may rely on this rate to comply with the Law, until the Department determines a new "recycling rate for compliance purposes."

As soon as feasible in 1995, the "aggregate recycling and specified resin type rates for calendar year 1994" will be calculated, pursuant to OAR 340-90-380 and -390. These recycling rates will not be used for compliance, but rather as a partial basis for determining the coming year's "recycling rate for compliance purposes."

Although not specifically provided for in the Law, the administrative approach of prospectively determining a "recycling rate for compliance purposes," is, in the view of the Department, the most fair way to implement the rigid plastic container Law and is consistent with legislative intent. However, since this approach is not in statute, it could be open to interpretation or challenge.

Advantages of "Recycling Rate for Compliance Purposes" Approach. As mentioned above, the "recycling rate for compliance purposes" for 1995 was determined to be 32 percent. This allows manufacturers to know beforehand that the aggregate recycling rate can be used for compliance purposes after January 1, 1995. Since the rate has been met, any product manufacturer may use the aggregate recycling rate as the compliance option for all their rigid plastic containers, and many of the problems discussed elsewhere in this Report become moot.

Recordkeeping Dates. A related issue is the statutory date of March 1, 1995 by which manufacturers "shall maintain the records...that demonstrate for all rigid plastic containers of the manufacturer, how the manufacturer has complied with one or more of the requirements [options]...or for what reason, if any, the containers were exempt...during the preceding calendar year." (ORS 459A.660(1)) It is unclear whether a manufacturer must show compliance only annually, or at any given time after the effective date of the Law. The Department's rule states that a product manufacturer must document that its containers "are in compliance," which implies that compliance must be continual (whenever the Department requests records). Clarification of statutory intent would clarify recordkeeping and timing of compliance by the regulated community.

Options:

a. Leave Law as it is. The issue is addressed administratively.

b. Amend the Law to incorporate a specific provision for calculating a recycling rate annually against which compliance would be determined. Would create explicit consistency between rule and the Law.

c. Amend the Law to clarify how the timing of recordkeeping requirements fits into overall compliance requirements (e.g. specify that compliance must be demonstrated once a year, for the previous calendar year; or that recordkeeping must demonstrate continual compliance). (Not discussed by Task Forces)

10. ENFORCEMENT: OTHER ISSUES

Two other concerns related to enforcement were identified that could not be fully addressed by rule:

a. Is there a third-party cause of action?

b. Enforcement of the Law against retailers (other than those qualifying as product manufacturers).

Third-party Cause of Action. Affected parties expressed concern that a third party could initiate an enforcement action against a product or container manufacturer. The Law neither establishes nor prohibits a third-party cause of action. Some Task Force members felt there should be clarification that a third party could not bring such a suit.

Enforcement against Retailers. The Law provides that unless exempted, any rigid plastic containers sold, offered for sale, or used in association with the sale or offer for sale of products in Oregon must comply with one of the recycling (etc.) options. Product and container manufacturers are specifically required to keep records documenting compliance by their containers. Civil penalties are established for any person violating the Rigid Plastic Container Law or rules.

The issue arose of whether retailers who were not otherwise "product manufacturers" (such as a retailer who simply stocks products sold in rigid plastic containers, but who is not a "point-of-sale" packager) were subject to enforcement under this Law. Enforcement language in the statute does not specifically mention retailers. The Attorney General has advised that the Law does not appear to contemplate enforcement against persons other than product or container manufacturers. Thus,

a retailer not otherwise a product or container manufacturer would probably not be subject to enforcement for selling a product in a noncomplying container [emphasis added]. (Memo from Larry Edelman, DOJ, to Jacquie Moon, DEQ, February 8, 1994, "Enforcement of ORS 459A.660 as Amended") Retailers wanted more assurance that they would not be subject to civil penalty for merely selling non-complying containers if they did not otherwise qualify as a "product manufacturer." A more positive response is not possible given current statutory wording.

Options:

a. Leave Law as it is. It is unlikely that either of these situations will arise.

b. Amend the Law to clarify that retailers who merely sell non-complying containers are not subject to enforcement actions.

c. Amend the Law to clarify that third-party actions either **are** or **are not** allowed.

11. WASTE COMPOSITION STUDY: TIMING

The Department is required by ORS 459A.035 to conduct a waste composition study at least once every two years. The study may include a measurement of the per capita waste disposal rate, or a statewide survey of the amount of waste reduced through material and energy recovery. This requirement was established to generate information which would be useful to entities needing more information about their wastestream in order to better target material recovery programs. It was not *specifically* created to provide information needed to calculate the rigid plastic container recycling rate, although it was part of the original legislation (1991 SB 66) which also included the Rigid Plastic Container Law. The waste composition study has been budgeted for once a biennium ($180,000 per biennium).

The study must be conducted over a four-quarter time period to capture seasonal variations in the wastestream. Currently DEQ and Metro cooperate in providing a statewide waste composition study, with Metro's study covering the Portland metropolitan area. Because of the budgeting cycle, the study has been conducted on a **fiscal year** basis (July through June), with final results available in the fall. DEQ is required to calculate a **calendar year** rigid plastic container recycling rate, so the time periods do not coincide.

As can be seen from Section 9 above, calculation of a rigid plastic container recycling rate is essential to implementation of the Law. The recycling rate is calculated using an annual census of plastic processors (to determine the amount of rigid plastic containers recycled), and data from the waste composition study on the

amount of rigid plastic containers disposed of in the wastestream. The rules also provide that adjustments to a previous composition study may be used as a substitute for a new composition study, since budgetary resources may not be available for annual composition studies. Task Force members stressed the importance of having information that is as current as possible. If the waste composition study is not updated annually, this may result in calculation of an inaccurate -- too low -- recycling rate (assuming that the real rate increases over time, as anticipated). Such an erroneously low rate could have severe economic consequences for manufacturers relying on the recycling rate for compliance.

The regulated community strongly supported annual studies if at all possible, to correspond to the annual determination by the Department of the recycling rate for compliance purposes.

Options:

a. Leave Law as it is. Current rule addresses differences in timing between waste composition study and calculation of recycling rates.

b. Change the Law to ensure comparable timeframes for the various studies to be conducted in implementing the Law.

c. Allocate additional resources to increasing the accuracy of the rigid plastic container recycling rate. Options for increasing accuracy:

i. Conduct the waste composition study every year.

ii. Devote more resources to obtaining better plastics recycling data (assisting processors with data tracking, etc).

d. Require industry to pay for studies (including consulting contracts) to determine rigid plastic container recycling rates. (Not discussed by Task Forces.)

12. ENFORCEABILITY OF DATA COLLECTION

Another element essential to determining the recycling rate is the total weight of rigid plastic containers recycled in Oregon. The rigid plastic container rule states that the Department may use an annual recycling census of all parties directly involved in brokering, processing, or recycling post-consumer rigid plastic containers on which to base this weight. The Department will request that respondents submit information on the total amount of rigid plastic they receive.

Members of the regulated community were concerned about the Department's authority to require reporting of this information, and about the accuracy of the information. The Department does have authority, for purposes of calculating waste recovery rates, to require reporting from recycling facilities on type and amounts of recycled material collected. (ORS 459A.050(6)) The Department also has authority to bring an enforcement action against a company misreporting information in response to a recycling survey. (ORS 468.953) Violation would be subject to civil penalty. The Department does not have explicit statutory authority to specify how records should be kept, but may have implied authority to do so in its ability to survey recycling facilities.

The practical problem remains that the accuracy of some records may be poor, which may or may not be evident to the Department from the recycling numbers reported. Likewise, the Department may not be able to tell if information has been omitted or if misrepresentation has occurred. If processors do not keep accurate records over the course of the year, it is impossible to calculate an accurate recycling rate.

Options:

a. Leave Law as it is. DEQ has authority to require reporting and enforce accuracy. The DEQ will continue to seek ways to increase the accuracy of the data.

b. Specify by rule what kind of recordkeeping is required from plastics processors. (Not discussed by Task Forces.)

c. Allocate additional budgetary resources to increase accuracy of reporting. (See Option 11.d above)

13. "APPEAL" PROCESS

As part of implementing the Law, the Department will conduct a waste composition study at least every two years, and will determine a "rigid plastic container recycling rate for compliance purposes" by January 1, 1995 and each year thereafter. It will also calculate a calendar year aggregate rigid plastic container recycling rate annually on a calendar year basis beginning with calendar year 1994.

Methodologies for conducting the above are spelled out in the rigid plastic container rules (OAR 340-90-380 and -390). The rigid plastic container recycling rates are of great importance to the regulated community. Members of the plastics industry and recyclers helped the Department in developing the methodologies included in rule. The rule specifies that the Department shall publish a report discussing potential errors associated with calculation of the total tons of municipal solid waste disposed of in Oregon, information on the recycling and disposal data collection and analysis methodologies and margin of error for the percent composition of rigid plastic containers.

The Recycling Rate Task Force helped the Department in developing rules to calculate the recycling rates. The Department will call on their advice again as the calendar year 1994 recycling rate is calculated in 1995. The Department hired a contractor to develop the "rigid plastic container recycling rate for compliance purposes," and brought together an advisory Work Group to give input into that process. The Work Group's membership overlaps with that of the Recycling Rate Task Force.

The issue has arisen of how a recycling rate determined by DEQ could be appealed if an affected person does not agree with its results. The Attorney General's Office has advised that a product manufacturer could seek to challenge a rate if the Department used the rate to bring an enforcement action for non-compliance (i.e., the manufacturer relies on the recycling rate as a compliance option, but the DEQ-determined rate is less than 25 percent). Some persons felt that DEQ should provide a mechanism to receive public comment or challenge on the recycling rate before it is officially published, which would allow adjustments for errors or omissions to be made.

Options:

a. Leave Law as it is. Administrative processes exist to address these concerns.

b. Change Law to require publishing of a draft of the calendar year aggregate recycling rate with a public comment period.

Options: Future of the Program

The above are issues that could generally not be resolved in the rules because the Rigid Plastic Container Law is so specific. The variety and complexity of the issues point to the variety and complexity of the material.

The American Plastics Council has devoted considerable resources over the past several months to increasing the rigid plastic container recycling rate. Their actions and the actions of others have resulted in increased recycling opportunities for rigid plastic containers, as can be seen in the following Section, "Status of Plastic Recycling Programs in Oregon." The Department has determined that the rigid plastic container "recycling rate for compliance purposes" for 1995 is 32 percent. Since this rate exceeds 25 percent, all rigid plastic containers are deemed to be in compliance with the Rigid Plastic Container Law starting January 1, 1995. This should alleviate many of the implementation problems discussed in this Report.

Still, even though the recycling rate has been met, it must remain at or over 25 percent in subsequent years for compliance to continue. The new recycling programs and the stability of plastics processors are vulnerable to a market still in its developmental stages, as evidenced by recent business difficulties or failures of some plastic processors. There needs to be thought on how best to maintain an on-going market for recycled plastics once the initial program structure is in place.

The Department suggests that options for dealing with the above include: (Only Option 1 was discussed by the Task Forces)

1. Retain existing "options" structure, but consider legislative changes to address issues identified in this Report. Revisit the level of recycling again in two years to see whether the rate has continued to increase or has stagnated.

2. Retain existing "options" law, but increase the recycling rate effective three to five years in the future. The present law has caused a significant increase in the opportunity to recycle plastics, and a higher rate would likely have the same effect. This would make plastics meet the same recycling rate required of other packaging materials. Options to increase the recycling rate include:

    a. Across-the-board (e.g. from 25 to 40 percent).

    b. Apply the 25 percent recycling rate to rigid plastic containers in the aggregate but exclude PET soda bottles (#1 resin) from this calculation. PET soda bottles are being recycled at a 93 percent rate under the bottle bill, and this alone constitutes nearly half of the rigid plastic container recycling in the State. PET soft drink containers are

only 16 percent of the rigid plastic containers generated in Oregon; the other 84 percent of the rigid plastic containers generated in the state are expected to be recycled at a 20 percent rate in 1995. A recycling rate of 25 percent for all non-bottle bill rigid plastic containers would have the effect of increasing the across-the-board RPC recycling rate to 36 percent.

3. Remove the "options" aspect and change to a straight "recycled content" law, with fees on containers which do not or cannot comply (per 1993 DEQ Report to the Legislature). The same conditions and arguments hold true as were presented in that Report. This would considerably simplify the Law, eliminating the need for language to deal with every special circumstance.

4. Mandate curbside pickup of some or all rigid plastic containers for recycling. Could be considered either in addition to or instead of existing mandated manufacturer compliance. Integrate rigid plastic container and solid waste collection with market development programs. It would be essential to establish a source of funding to support the recycled plastics market (as it currently will not sustain itself) if elimination of the manufacturer mandate is considered.

   Mandating curbside is the most direct way to increase the recovery rate for plastics, and would contribute to market development by guaranteeing a steady source of "raw material."

5. Change to a recycling fee program for rigid plastic containers similar to Florida program, including provision of exemptions from the fee if a certain recycling rate is achieved. This fee could be used for market enhancement for plastics. (See discussion in Section 3, Point-of-Sale Packagers)

Status of Plastic Recycling Programs in Oregon

LOCAL COLLECTION PROGRAMS

Plastics collection in Oregon has expanded greatly in recent years. The following quotation is taken from a document which was produced in late 1990:

> *"In Oregon, at least seven curbside programs and more than 20 drop-off depots accept milk jugs. Several drop sites also take dairy tubs and detergent and shampoo bottles...As 1990 ends, Oregon programs collect mostly HDPE...several drop-off depots in the Portland area accept LDPE, PS, PP and PVC."* (Decisionmaker's Guide to Recycling Plastics, produced jointly by the Oregon Department of Environmental Quality (DEQ) and the US Environmental Protection Agency (EPA) Region X, December, 1990.)

Information from annual County Recycling Reports (1993), as updated in October and November, 1994, by Department staff and the American Plastics Council, indicates that there now are over 50 curbside programs in 17 counties, and drop-off depots in 31 out of the 36 Oregon counties. Collection program introduction or expansion is anticipated in at least eight counties in 1995.

As in 1990, the majority of local curbside programs collect milk jugs. Milk jugs also are the material most commonly collected at drop-off depots, followed by other types of HDPE.

While opportunities to recycle plastics are greatest in the Willamette Valley, all counties west of the Cascade Mountains offer at least one curbside and/or depot collection program. Thirteen counties located east of the mountains have at least one depot taking some type of plastic resin. There also are three local curbside programs in Eastern Oregon. However, residents in five other Eastern Oregon counties are provided no collection opportunities for plastics other than the #1 PET collected under the state's bottle deposit law (Oregon Bottle Bill, 1971).

1. DATA COLLECTION

Under the 1991 Recycling Act (SB66, 1991 Oregon Legislature), the state was given the authority and resources to collect data on materials collected and recovered for recycling. Data have been collected each year since 1992. Resources also were directed towards an annual waste composition study to determine which materials remained in the wastestream. The results of those studies indicate the following:

Plastics Recovery Rates. In 1992, annual resin recovery rates[2] ranged from a high of 3,329.23 tons for #1 PET beverage containers to a low of 25 tons for #3 PVC. In 1993, material rates remained consistent: a high of 4,404.2 tons for #1 PET beverage containers to a low of 12.0 tons for #3 PVC. (See chart, next page) The annual recovery rates for 1994 will be available in the third quarter of 1995.

Resin Types Recovered, by Tons, 1992 and 1993:

	1992	1993
#1 PET Beverage	3,329.23	4,404.2
#1 PET Other*	58.5	-
#2 HDPE Milk Jugs	1,940.4	2,616.5
#2 HDPE Other	1,841.5	1,806.9
#3 PVC	25	12
#4 LDPE	1,196	1,405.7
#5 PP	359.9	340
#6 PS	471.3	399.

**Reporting methods changed*

2. PLASTICS IN THE WASTESTREAM

Results of the Oregon Solid Waste Characterization and Composition Study, 1992-93, indicated that municipal waste in the state (by weight) consisted of approximately 7.8 percent plastic in 1992. Among the four waste substreams (generator categories) studied, plastic made up 8.8 percent of commercial hauler loads surveyed and 6.9 percent of residential hauler loads surveyed. This study was conducted outside the Portland metropolitan area, as Metro, the regional government serving the Portland area, conducted a composition study in that area.

Conclusions and Recommendations

Local programs grew more rapidly as the Department began implementing the plastics portion of the 1991 Recycling Act. Most of the activity over the last four years occurred as rules were written and adopted in 1994. There were 20 new or expanded local plastics collection programs during that year, and at least eight new or expanded programs in six counties are anticipated for 1995. Clearly the existing law has helped focus attention on the delivery of plastics recycling opportunities at the local level.

To sustain this momentum, the state must work to insure a sustainable recycling system through upholding the 1991 Recycling Act and rules, and maintain a commitment to public

[2] Includes all plastics, not just rigid plastic containers.

education which both encourages responsible behavior and instructs participants in the proper techniques for recycling plastics. Data clearly indicate that recovery rates are increasing---and that there are still recoverable plastics in the wastestream. These support the need to continue to develop and strengthen the recycling infrastructure. The Department's commitment to data collection and analysis is vital to formulating new policies and recommendations based on hard fact.

The level of communication and cooperation in information-gathering among all entities also has also been strengthened in the past four years. Valid data and sound cooperation among public and private groups on local, state, and federal levels can only serve to strengthen a shared commitment to preserving the environment through sound solid waste management.

Attachments

- Executive Summary, "Rigid Plastic Container Exemption Report" to the 1993 Legislature, DEQ, December, 1992.
- Local Plastics Collection Programs in Oregon.

Reference Documents (available upon request)

- DEQ memo to Implementation Task Force, "Compliance with Rigid Plastic container Law When also Regulated by Federal Government," 2/9/94.
- DEQ Discussion Paper: "Point of Sale Product Manufacturer," 2/3/94.
- October 4, 1994 Report to the Environmental Quality Commission, Adoption of Rules to Implement Oregon's Rigid Plastic Container Law.
- Attorney General's 9/28/94 Memorandum to DEQ regarding federal preemption (included in above 10/4/94 Report).
- DEQ Discussion Paper: "Reduced Container Exemption," 2/3/94.
- DEQ Discussion Paper: "Company-wide/Multiple-Packaging-Line Averaging," 3/7/94.
- Attorney General's 1/20/94 letter to Fred Hansen, "Recycling of Plastics and Pyrolysis."
- Memo from Larry Edelman, DOJ, to Jacquie Moon, DEQ, February 8, 1994, "Enforcement of ORS 459A.660 as Amended."

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EXECUTIVE SUMMARY
RIGID PLASTIC CONTAINER EXEMPTION REPORT

This report fulfills the requirements of Oregon Laws, Chapter 385, Section 34(e)(1) which states:

> "On or before January 1, 1993, the department shall report to the Legislative Assembly on whether to grant an exemption from the *criteria* established by section 34b of this 1991 Act [ORS 459A.655] for rigid plastic containers that cannot meet the *recycled content criterion* and remain in compliance with United States Food and Drug Administration regulations." (emphasis added)

This requirement is part of Senate Bill 66, referred to as the 1991 Recycling Act. The overall purpose of this Act is to increase the recovery of materials from Oregon's waste stream and to stimulate markets for recycled materials. Increased material recovery is to be achieved through improved recycling programs. Recycling markets are to be stimulated by requiring the utilization of recycled material in new products. The materials targeted to meet the recycled content requirement are newsprint, telephone directories, glass containers, and rigid plastic containers. This report deals only with the requirements for rigid plastic containers, and whether or not rigid plastic containers which hold products that are regulated by the US Food and Drug Administration (FDA) should be exempt from ORS 459A.655.

The Department submitted two draft reports for public comment during the Summer and Fall of 1992. Based on public comment and the Department's analysis, two points are very clear. First, Oregonians want increased plastics recycling opportunities and improved recycled plastics markets. Second, most of the industries which fall under FDA regulation (food, drug, cosmetic) say they cannot meet the recycled content criterion by the January 1, 1995 compliance date and remain in compliance with FDA or other federal regulations governing packaging; and, many affected parties claim they cannot meet the other criteria (options) for compliance: reuse, 25% recycling rate, or the statutory exemption if a 10% reduction in container weight is made.

The Department initially tried to address the relatively straightforward issue of whether to recommend an exemption; or if not an outright exemption then an extension of the January 1, 1995, compliance date.

From the volume of testimony received, it soon became clear that the issue is not straightforward and that basic changes are needed to this part of the law - changes which acknowledge the difficulty in obtaining FDA approvals but which also move the plastics industry toward achieving the SB66 recycling rates.

The Department recommends replacing the options in ORS 459A.655 with the requirement that all rigid plastic containers sold in Oregon contain 25% recycled content or be reusable by January 1, 1995. Any container manufacturer or product packager whose rigid plastic containers

are not reusable or do not meet the minimum content requirement by January 1, 1995 would be required to pay an annual licensing fee as of that date. Revenue from that fee would be used to improve plastics recycling in Oregon. The Department recommends setting the fee high enough to encourage manufacturers to aggressively attempt to gain FDA approval.

Some containers are exempt from meeting the options in ORS 459A.655. The Department recommends that the exemptions in ORS 459A.660(3)(a)(b)(c) be retained: (a) containers for prescribed medications; (b) containers for shipment outside the state; and (c) tamper resistant packaging. The Department recommends modifying ORS 459A.660(a) "the packages are used for medication prescribed by physicians" to "the packages are used for medication prescribed by licensed prescribing entities." The Department also recommends that containers for medical devices, infant formula and medical food be exempted to match the exemptions in the California law which is similar to this Oregon law.

The law currently requires manufacturers of rigid plastic containers to meet at least one of the criteria of ORS 459A.655 (25% recycled content, 25% recycling rate, or be reusable) by January 1, 1995. Unless the Legislature takes action and grants an exemption or, as recommended in the Department's report, makes basic changes to the law, the standards set forth in ORS 459A.655 will remain in place.

Attachment

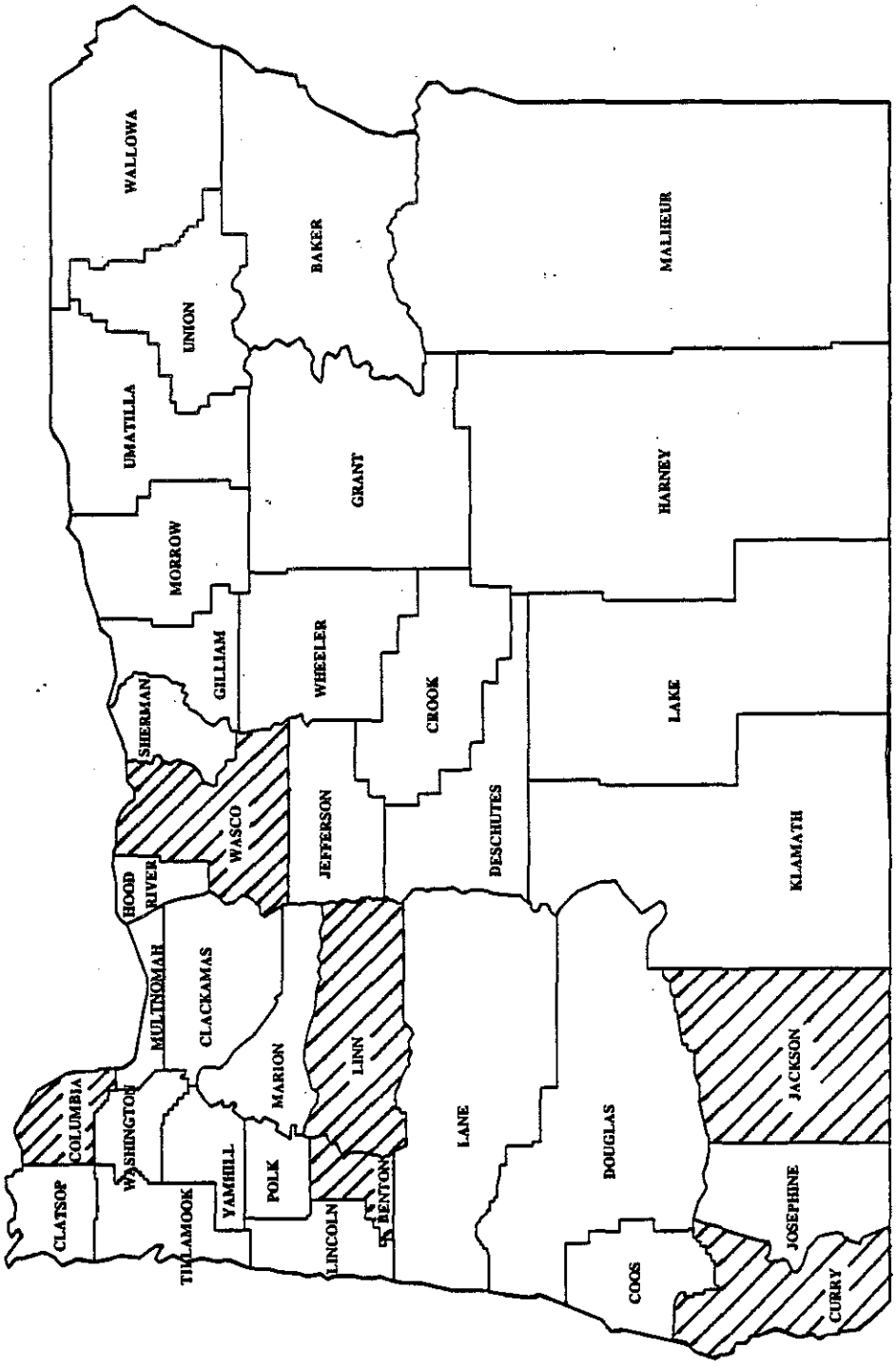
LOCAL PLASTICS COLLECTION PROGRAMS IN OREGON

November, 1994

Collection of Resins #1 and #2
(refer to other listings for counties collecting these and additional resins).

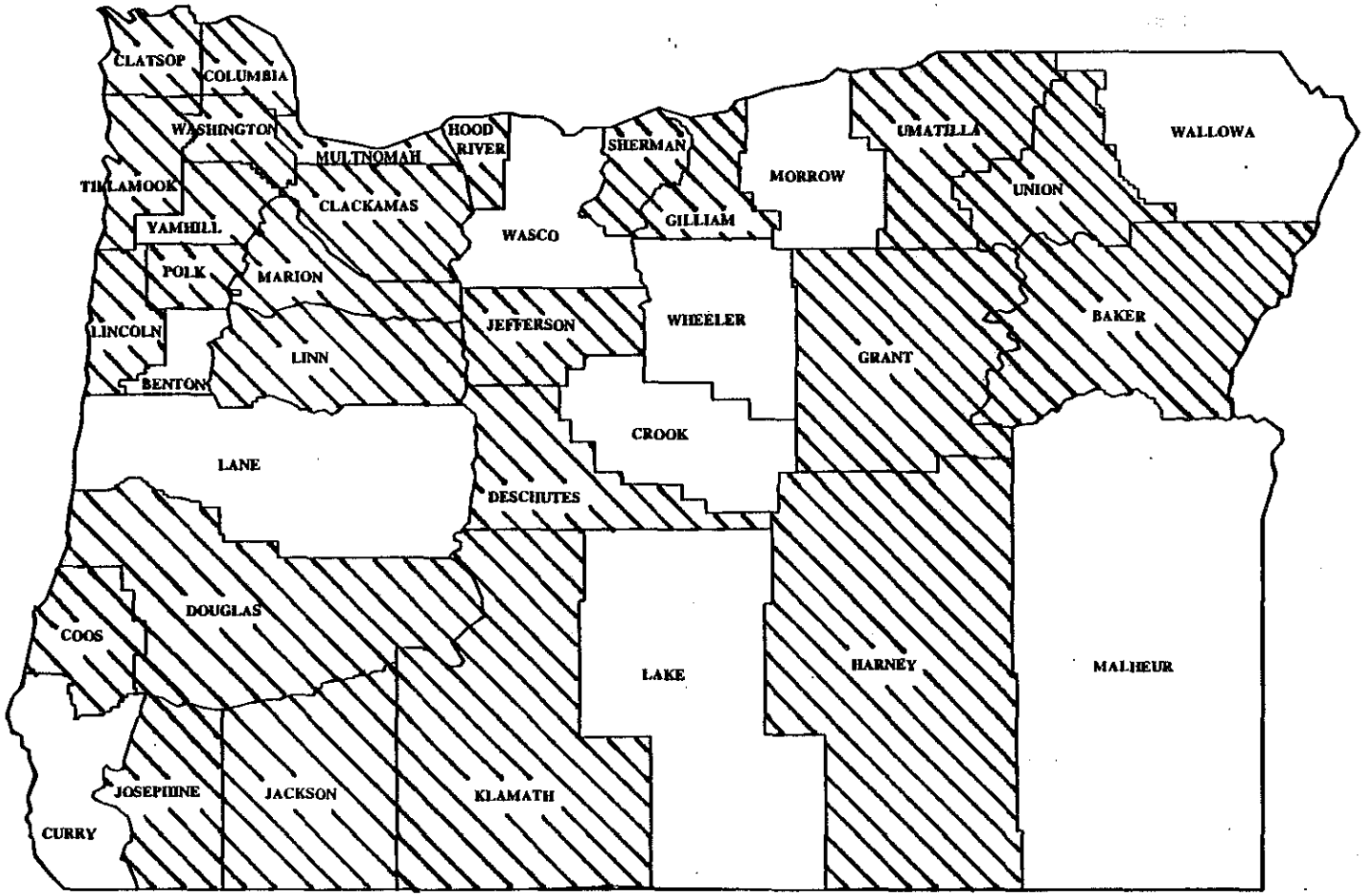
Benton County: curbside, depot
Columbia County
    curbside: Rainier
Curry County: depot
    curbside: Brookings, Gold Beach
Jackson County
    depot: Ashland
Linn County
    curb, depot: Albany
Wasco County
    depot: The Dalles (#1 and #2 milk jugs)

Resins #1 and 2



Collection of (only) Resin #2
(milk jugs unless otherwise noted; refer to other listings for counties collecting this as well as additional resins).

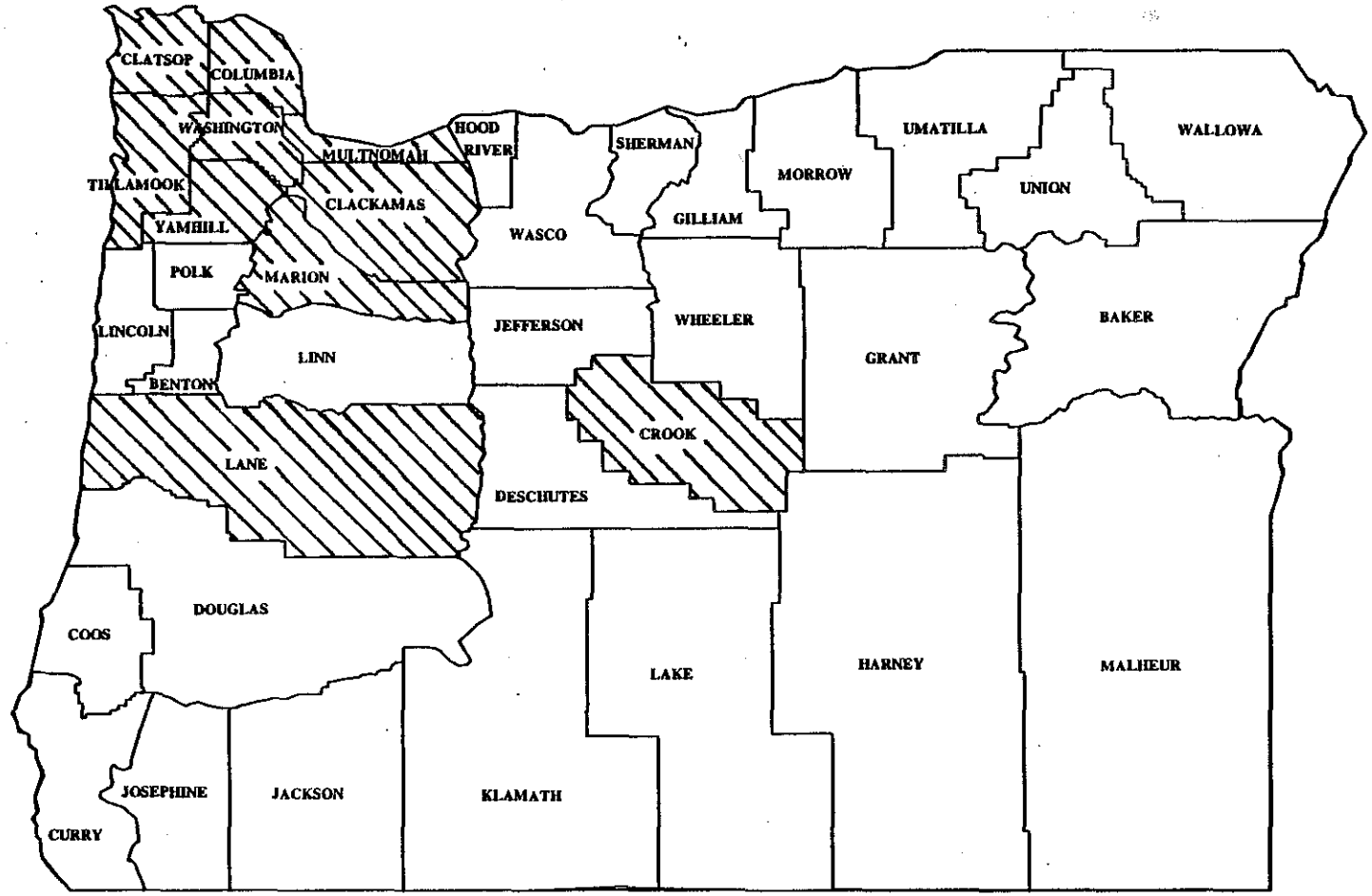
Baker County: depot
Clackamas County
curbside: Lake Oswego (all #2), Wilsonville
Clatsop County
depot: Astoria
Columbia County
depot: St. Helens
Coos County
curbside, depot: Coos Bay
Deschutes County
curbside, depot: Bend, Redmond
depot: Sunriver
Doulgas County
depot, Roseburg (all #2)
Gilliam County
depot: Arlington, Condon
Grant County: depot
Harney County: depot
Hood River County: depot
Jackson County: depot
curbside: Ashland, Central Point, Jacksonville, Medford, Phoenix, White City
Jefferson County: depot
Josephine County: depot
curbside: Cave Junction, Glendale, Gold Hill, Rogue River, Shady Cove
Klamath County: depot
curbside: Klamath Falls
Lincoln County: depot (all #2)
Linn County
curbside: Brownsville, Halsey, Harrisburg, Jefferson, Lebanon, Lyons, Scio, Sweet Home
Marion County
depot: Keizer
curbside: Aumsville, Aurora, Gervais, Hubbard, Mt. Angel, Scotts Mills, Silverton, Sublimity, Stayton, Woodburn
Multnomah County
curbside: Fairview, Gresham, Portland, Troutdale, Wood Village
Polk County
curbside, depot: Dallas, Independence, Monmouth
Sherman County
depot: Wasco
Tillamook County
curbside: Tillamook
Umatilla County
curbside, depot: Milton-Freewater
depot: Pendleton
Union County
depot: La Grande
Washington County
curbside: Aloha, Beaverton, Durham, Forest Grove, Hillsboro, King City, North Plains, Tualatin, Wilsonville
Yamhill County
curbside, depot: Amity, Carleton, Dayton, Dundee, Sheridan, Willamina, Yamhill
curbside: McMinnville, Newberg


CLATSOP
COLUMBIA
WASHINGTON
MULTNOMAH
HOOD RIVER
SHERMAN
MORROW
UMATILLA
WALLOWA
TILLAMOOK
CLACKAMAS
UNION
YAMHILL
WASCO
GILLIAM
POLK
MARION
JEFFERSON
WHEELER
BAKER
LINCOLN
LINN
GRANT
BENTON
CROOK
LANE
DESCHUTES
DOUGLAS
COOS
LAKE
HARNEY
MALHEUR
JOSEPHINE
JACKSON
KLAMATH
CURRY

Resin #2

Collection of Resins #1 through #7
(bottles unless otherwise noted)

Clackamas County
curbside: Canby, West Linn
depot, all #1-7, through Thriftway program in Gladstone, Lake Oswego, Milwaukie, Mollala, Oregon City, Sandy, West Linn, Wilsonville
Clatsop County:
depot, all #1-7, through Thriftway program in Seaside
Columbia County
depot, all #1-7, through Thriftway program in Scappose
Crook County
depot, all #1-7, through Thriftway program in Prineville
Lane County: depot, for bottles, trays and jars
curbside: for bottles, trays and jars, in Cottage Grove, Florence, Eugene, Springfield
Marion County
depot, all #1-7, through Thriftway program in Aumsville, Canby, Salem
Multnomah County
depot, all #1-7, through Thriftway program in Portland, Troutdale, Welches
Tillamook County
depot, all #1-7, through Thriftway program in Tillamook
Washington County
depot, all #1-7, through Thriftway program in Aloha, Beaverton, Tigard
Yamhill County
depot, all #1-7, through Thriftway program in McMinnville, Newberg


CLATSOP
COLUMBIA
WASHINGTON
MULTNOMAH
HOOD RIVER
TILLAMOOK
CLACKAMAS
YAMHILL
POLK
MARION
LINCOLN
LINN
BENTON
LANE
DOUGLAS
COOS
CURRY
JOSEPHINE
JACKSON
KLAMATH
WASCO
SHERMAN
GILLIAM
MORROW
UMATILLA
UNION
WALLOWA
JEFFERSON
WHEELER
GRANT
BAKER
CROOK
DESCHUTES
LAKE
HARNEY
MALHEUR

Resins #1 - 7

Collection of Resins #2,4,6
(refer to other listings for counties collecting these as well as additional resins).

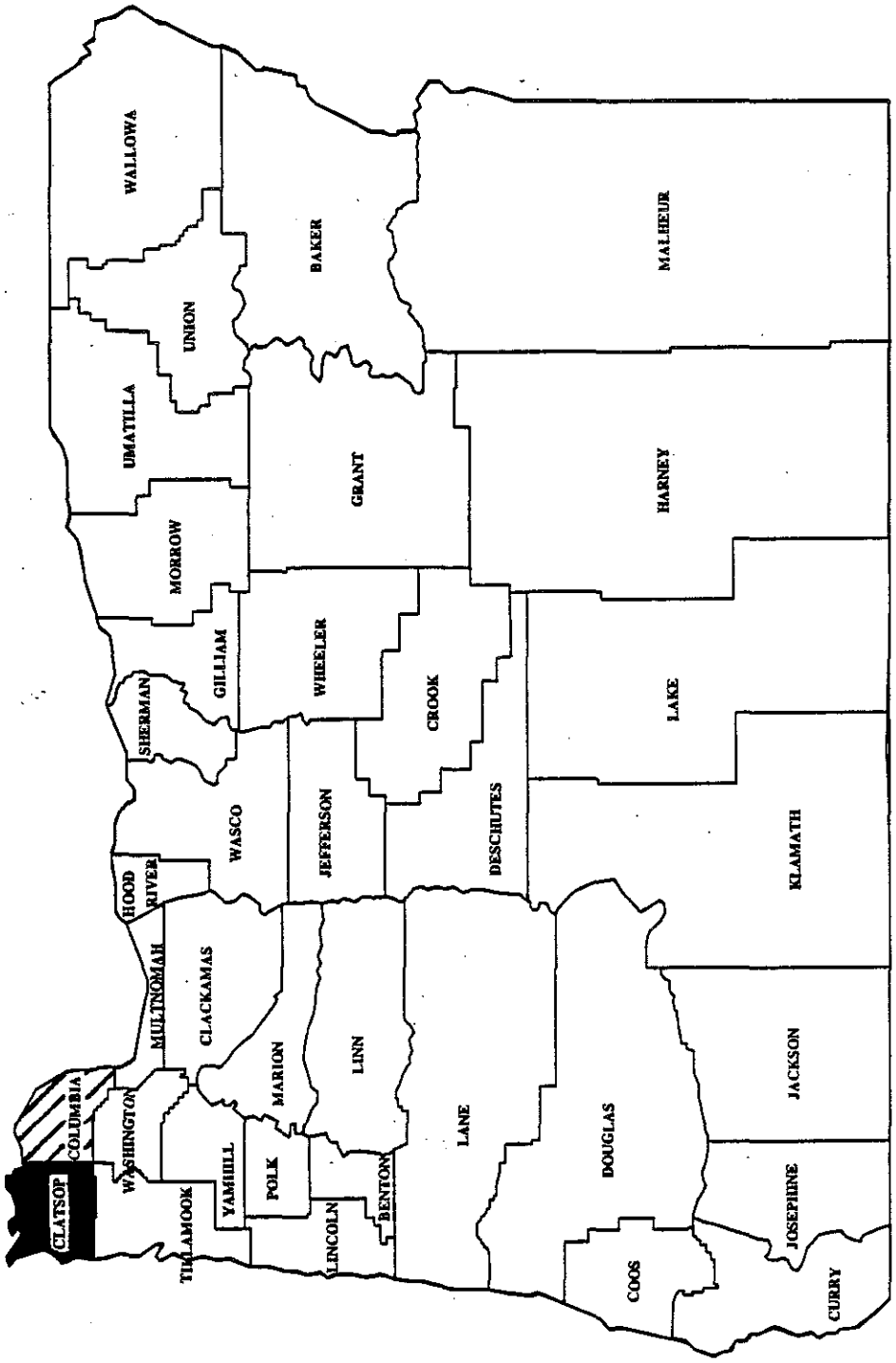
Clatsop County
curbside: Seaside

Collection of Resins #2,4,5

Columbia County
depot: Vernonia

Resins #2, 4, & 6

Resins #2, 4, 5, & 6: ▨



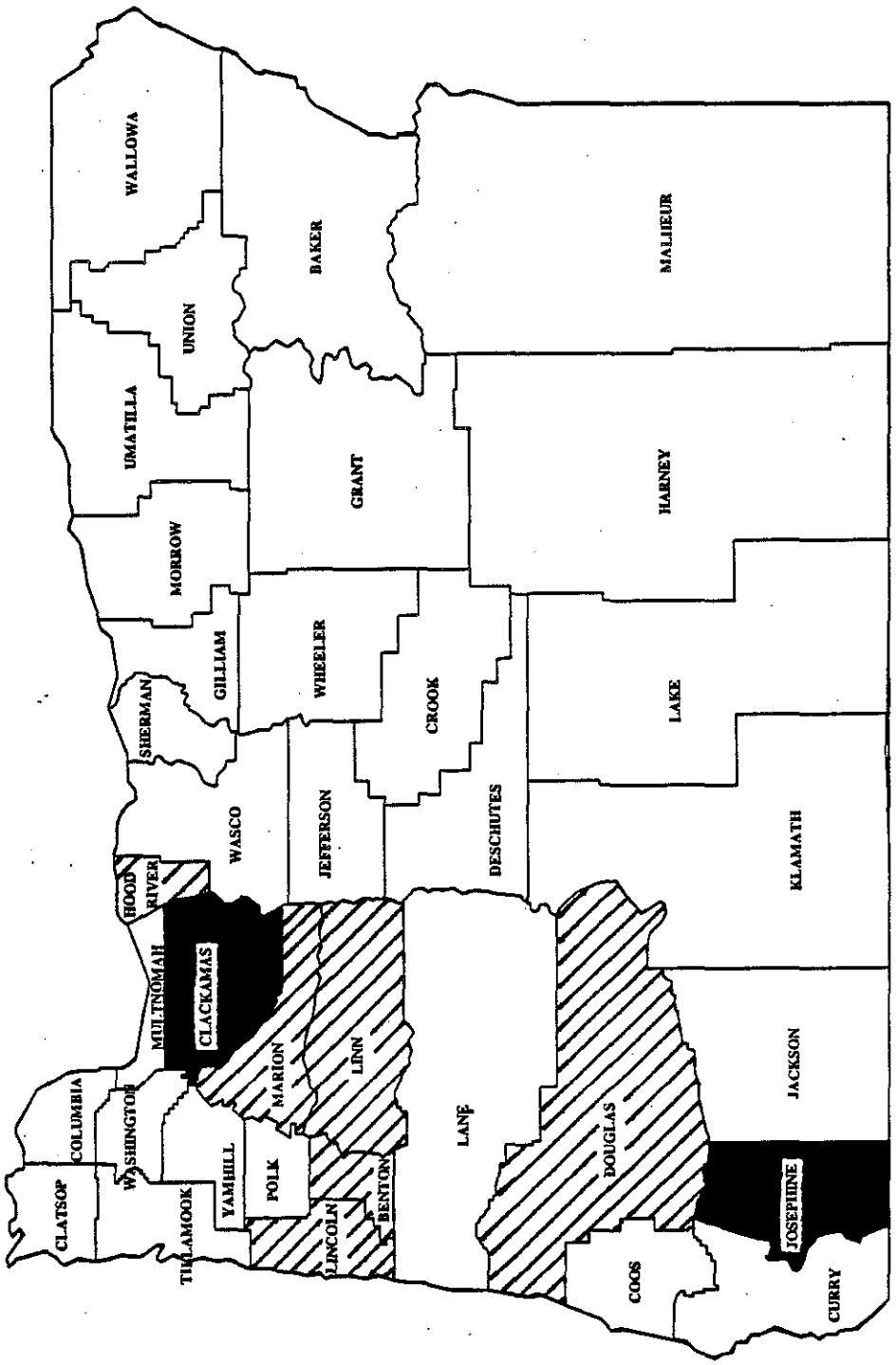
Anticipated New or Expanded Programs for Resins #1-#7, 1995

Benton County
    curbside, #1-7: Corvallis
Douglas County
    curbside, depot, #1-7: Roseburg
Hood River County: depot, #1-7
Lincoln County
    depot, #1-7, Newport
Linn County: curbside
Marion County: curbside

Anticipated New or Expanded Programs for Resin #2 (Milk Jugs), 1995

Clackamas County: curbside
Josephine County
    curbside: Grants Pass

New or Expanded Programs, 1995
Resins #1 - 7, Resin #2



LOCAL PLASTICS COLLECTION PROGRAMS IN OREGON

The information below was compiled from 1993 County Recycling Reports submitted to the Department of Environmental Quality in February 1994. It was reviewed and updated by DEQ staff and the American Plastics Council in October and November 1994, then verified by DEQ staff telephone calls to each program in November, 1994. Programs that began or were expanded in 1994 are marked below, while those anticipated to begin or expand in 1995 are in parenthesis.

resin type

program location	*#2 (milk jugs)*	*#1,2*	*#1-7 bottles*	*#2,4,5*	*#2,4,6*
Baker County	depot				
Benton County Corvallis		depot/curb	('95 curb)		
Clackamas County	('95 curb)		depot, all #1-7: Gladstone, Lake Oswego, Milwaukie, Mollala, Oregon City, Sandy, West Linn, Wilsonville		
Canby			curb		
Lake Oswego	curb				
Wilsonville	curb				
West Linn			curb		

program location	*only #2 (milk jugs)*	*#1,2*	*#1-7 bottles*	*#2,4,5*	*#2,4,6*
Clatsop County Astoria Seaside	depot		depot, all #1-7		curb
Columbia County Rainier St. Helens Scappose Vernonia	depot	curb	depot, all #1-7	depot	
Coos County Coos Bay	curb/depot				
Crook County Prineville			depot, all #1-7		
Curry County Brookings Gold Beach		depot curb 10/94 curb 12/94			
Deschutes County Bend, Redmond Sunriver	depot curb/depot depot				
Douglas County Roseburg	depot (all #2)		('95 curb/depot)		
Gilliam County Arlington, Condon	depot				
Grant County	depot				
Harney County	depot				

program location	*only #2 (milk jugs)*	*#1,2*	*#1-7 bottles*	*#2,4,5*	*#2,4,6*
Hood River County	depot		('95 depot)		
Jackson County Ashland Central Point, Jacksonville, Medford, Phoenix, White City	depot curb 8/94 curb	depot 10/94			
Jefferson County	depot				
Josephine County Grants Pass Cave Junction, Glendale, Gold Hill, Rogue River, Shady Cove	depot ('95 curb) curb				
Klamath County Klamath Falls	depot curb				
Lane County Cottage Grove, Eugene, Florence, Springfield			depot 5/94, incl. trays and jars curb 5/94, incl. trays and jars		
Lincoln County Newport	depot (all #2)		(depot '95)		

program location	*only #2 (milk jugs)*	*#1,2*	*#1-7 bottles*	*#2,4,5*	*#2,4,6*
Linn County Albany Brownsville, Halsey, Harrisburg, Jefferson, Lebanon, Lyons, Scio, Sweet Home	 curb	 curb	('95 curb)		
Marion County Salem Aumsville, Aurora, Gervais, Hubbard, Mt. Angel, Scotts Mills, Silverton, Sublimity, Stayton, Woodburn	 curb		('95 curb) depot 9/94 depot, all #1-7: Aumsville, Salem, Canby		
Multnomah County Fairview, Gresham, Portland, Troutdale, Wood Village	 curb		depot, all #1-7: Portland, Troutdale, Welches		
Polk County Dallas, Independence, Monmouth	 curb/depot				
Sherman County Wasco	 depot				

program location	*only #2 (milk jugs)*	*#1,2*	*#1-7 bottles*	*#2,4,5*	*#2,4,6*
Tillamook County Tillamook	curb		depot '94, all #1-7		
Umatilla County Milton-Freewater Pendleton	curb/depot depot				
Union County LaGrande	depot				
Wasco County The Dalles		depot (#1 and milk jugs)			
Washington County Aloha, Beaverton, Durham, Forest Grove, Hillsboro, King City, North Plains, Tualatin, Wilsonville	curb '94		depot, all #1-7: Aloha, Beaverton, Tigard		
Yamhill County McMinnville, Newberg Amity, Carleton, Dayton, Dundee, Sheridan, Willamina, Yamhill	curb curb/depot		depot, all #1-7: Newberg, McMinnville		

RECOVERY TECHNOLOGIES

AND THE ECONOMIC AND ENVIRONMENTAL IMPACTS OF RECYCLING

REPORT TO THE LEGISLATURE

DEPARTMENT OF ENVIRONMENTAL QUALITY

January, 1995

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BACKGROUND

Through a budget note, the 1993 Legislature required the Department of Environmental Quality to report on the success of solid waste recovery technologies such as energy recovery and recycling, including the pyrolysis plant in Chehalis, Washington.

Recovery technologies are those technologies which remove material from the waste stream, process the materials for recycling, or that utilize the materials as input to energy recovery or composting.

Section I of this report offers a brief description of available technologies presently used in Oregon and other technologies used on a national or international basis. The recovery success of the different technologies used in Oregon is outlined as well.

Section II provides a review of pyrolysis used both at the Conrad facility in Chehalis, Washington and other facilities.

Section III reviews information on the fiscal impact of not recovering reusable materials by reviewing a number of studies on the economic and environmental impact of material recovery.

The budget note reads as follows:

> DEQ shall report to the Emergency Board and the 1995 Legislative Assembly on the success of all recovery technologies which reduce the amount of solid waste now being diverted from landfills and on attaining the broad objectives of ORS 459.015. The report will focus on, but not be limited to, new technology such as the pilot plant in Chehalis, Washington. In addition, the report shall address the fiscal impacts of not recovering reusable materials.

Broad Objectives of 459.015 The broad objectives of this statute are to provide Oregonians the opportunity to recycle, to reduce the amount of material being landfilled, to conserve natural resources, and in the interest of public health, safety and welfare, to manage solid waste in accordance with the following hierarchy:

(a) reduce the amount of waste generated
(b) reuse material for the purpose originally intended
(c) recycle material that cannot be reused
(d) compost material that cannot be reused or recycled
(e) recover energy from solid waste that cannot be reused, recycled, or composted
(f) dispose of solid waste that cannot be reused, recycled, composted or from which energy cannot be recovered

SECTION I RECOVERY TECHNOLOGIES

Technologies Presently Used in Oregon

The solid waste management hierarchy was adopted in Oregon. The purpose of the hierarchy is to encourage solid waste management officials to reduce the reliance on landfills as the only management option. Technological developments in the last two decades have focused on the recycle, compost, energy recovery and landfill components of the hierarchy.

A. RECYCLING: The methods used to collect, and prepare recyclable materials include source separation and mixed material recovery. Source separation is the separation of materials by the generator (e.g., colors of glass, paper, tin, etc.) before they are collected at the curb or drop box. Mixed material recovery can vary in terms of the generator responsibility. Some programs, for example, mix containers in one bin (glass, tin and plastic) while the paper and cardboard remain source separated. Regardless of the combination of materials in the mixed bin, the final sort is done at a material recovery facility (see intermediate facilities below). From the beginning of curbside recycling in Oregon, source separation has been the chosen collection method. The materials collected are high quality and contamination problems are significantly lower with this method.

Recovery Success
EPA estimated in 1990 that on a nationwide basis about 17 percent of materials were being recycled, and projects a national recovery rate between 20 and 30 percent by 1995.

Oregon has a goal of 50% recovery by the year 2000. In 1993 Oregon achieved a statewide recovery rate of 29.9% which is up from the 1992 rate of 27%. The total amount of waste disposed in Oregon in 1993 was 2,280,228 tons and 974,694 tons were recovered.

Intermediate processing facilities: These facilities typically are sorting and processing centers. The methods vary from material dumped on a facility floor and manually sorted to mechanical sorting or a combination of both. Some locations sort only paper materials while others separate mixed materials.

Recovery Success
Oregon has more than 40 facilities throughout the state that sort, clean, chip or bail materials in preparation for remanufacturing.

B. COMPOSTING is biological conversion of organic matter. There are two types of composting: composting yard debris and clippings, and mixed organic and paper composting from the municipal solid waste (MSW) stream. Sometimes either is mixed with sewage sludge. Composting ranks in the waste management hierarchy below reduction, reuse and recycling but is preferred above energy recovery and landfilling.

Yard Debris requires collection of organic yard materials which is then shredded, ground, mixed, and then placed in long piles, watered and periodically turned. The markets for the final product are generally good.

Recovery Success

Yard debris composting has proven to be a successful technology in Oregon. Yard waste makes up about 10% of the material disposed in the state. Of the total material recovered in 1993, 15.7% was yard debris. Benton, Curry, Linn, Lane and Multnomah Counties presently have residential curbside collection of yard debris. Some disposal sites collect yard debris from self-haulers and drop boxes may be used. Oregon has about 10 sites that process yard and wood waste for commercial compost. Certainly, back yard composting has also increased in the state. While this is the most cost efficient and environmentally sound way to manage organics -- since the material doesn't have to be hauled or processed -- there have been no studies to determine how extensively backyard composting is practiced. DEQ has given grants to local governments to promote both backyard composting and worm composting of school cafeteria waste.

Municipal Solid Waste (MSW) composting facilities accept a commingled stream of solid waste, and compost the organic portion. A study by the New York based Environmental Institute found source separated programs -- households separate compostable material, recyclable and landfill material -- produce a higher quality product without the concern of heavy metal that may be in mixed composting and are generally less expensive to construct and operate. (9, pg 40) As of October 1993, there were 17 operating plants around the country processing from 5 tons a day to 2,600 tons a week. (26, pg 56)

Recovery Success

Oregon's one MSW composting facility proved unsuccessful. The site located in the Portland metropolitan region has been closed. Metro's MSW plant shut down due to many factors --- the vendor's parent company had financial problems, the facility had some technical problems and the nearby citizens mobilized against the facility because of odor problems. The facility first received waste in April of 1991 and closed the next year. While MSW compost doesn't have the same air and water quality impacts as landfills or waste to energy facilities, siting composting facilities have not escaped the "not in my backyard" (NIMBY) opposition.

D. WASTE TO ENERGY (WTE): facilities' pretreatment of the MSW includes inspection and simple separation to remove unacceptable materials. The energy produced is generally used for electrical power generation. The 1980's showed large increases in the siting of WTEs. In 1990 there were 140 operational facilities in the United States. However, 248 projects were canceled between 1982 and 1990. (32, pg 4).

Recovery Success
Oregon has one energy recovery facility in Marion County. In 1993, the facility disposed of 170,131 tons which was 7% of the state's total waste disposed, and produced approximately 13 megawatts of energy. In addition the county recovered 62,542 tons of recycled materials. Inert ash residue, which is approximately 10% of the original volume, is disposed of in a lined ash monofill. The state also has one incinerator or mass burn facility located in Coos County. Unlike a WTE technology, this facility has no energy recovery capacity. The Coos County facility incinerates approximately 26,000 tons annually. The resulting ash is cooled and disposed on site in unlined trenches. The county has recently decided to upgrade the facility and install costly new emission control devices to meet air quality standards.

Because energy can be recovered, waste to energy facilities are given greater value than landfills in the solid waste management hierarchy. However, energy recovery facilities tend to have as much public resistance as landfills and must meet stringent federal and state environmental standards. Protection of the public health and safety continue to be an issue with these facilities, particularly in the areas of air emissions. The Supreme Court ruled on May 2, 1994 that WTE ash is not exempted from hazardous waste determination requirements which could result in additional constraints

Sanitary Landfilling

While disposing of waste in a landfill is not considered to be a recovery technology the increasing costs and the environmental impacts of this solid waste management method affect recycling systems and programs.

Landfill disposal is considered the least effective way to manage solid waste and is therefore below energy recovery in the solid waste management hierarchy. There are approximately 6,000 operating landfills in the nation. EPA estimates that 80 percent of the MSW is landfilled with a average cost of about $48 per ton. This compares to average per ton cost of $60 for waste to energy (WTE) facilities in 1990. (31) In Oregon, at the end of 1992, 86 active municipal solid waste landfill facilities and five construction and demolition landfill facilities were operating. (18, pg 86). Landfill siting costs and political obstacles such as "NIMBY" continue to make siting new landfills difficult in many parts of the United States.

For Oregon, the implementation of Subtitle D of the Resource Conservation and Recovery Act which requires landfill liners, daily cover, leachate control and groundwater monitoring, could contribute to the loss of 1,043,845 ton of local, in-county disposal capacity, or 34% of current capacity. However, Oregon's two large regional sites have the potential to handle well over 2 million tons of waste annually for the next 40 years. (18, pg 86). The total number of landfill sites in the state declined by 25 percent between 1984 and 1991. Subtitle D standards may mean the additional closure of small sites and transporting wastes longer distances increases the cost of disposal. Presently, tipping fees range from about $16/ton to $75/ton. (18, pg 186-187)

On a national level, about 160 gas-to-energy facilities are operating or plan to operate at landfill sites. This system permits the collection of between 30% and 85% of the methane, carbon dioxide and other organic gases from a site, however, this is generally done only at very large sites. (6, pg. 7) In Oregon, Short Mountain Landfill in Eugene is the only site that captures gas for energy purposes. Short Mountain, in a joint project with Emerald Utilities, has constructed four units which generate approximately 800 kilowatts each on an annual basis. Coffin Butte Landfill located in Corvallis has a methane gas recovery system presently under construction.

Recovery Technologies Presently Not Used in Oregon

A. Cofiring Refuse Derived Fuel (RFD) with Coal is the most successful technology of the less common management options. There are presently about 40 plants in the United States that make RDF or use it as a fuel source. RFD can be effectively mixed with coal and burned in existing coal-fired utility boilers that produce electricity. The disadvantages are that it is difficult to overcome the engineering concerns about performance and reliability, and the unwillingness of utilities to risk public objection to these facilities. (5, pg 163)

B. Anaerobic Digestion is a biological process similar to the decomposition that takes place in a landfill. Its advantage over landfill with gas to energy recovery is that there is more efficient methane formation, and it can produce 2 to 4 times as much methane from a given volume of material in less than 3 weeks as a landfill can produce in 2-7 or more years. (6, pg 11)

C. Pyrolysis is a medium- to high-temperature (500-1000 degree C) process for converting solid feedstocks into a mixture of solid, liquid and gaseous products. For pyrolysis to maximize production of liquid fuels and chemical feedstocks directly from a feedstock requires careful reaction control and fast heating and cooling rates to prevent the liquids that do form from breaking down gases. (5, pg 164) The process has been used commercially with coal, and wood chips. It was used in the U.S. in the 1970s, but the plants failed to achieve acceptable technical or

economic performance, and all have shut down. (5, pg 165). Pyrolysis is presently being used at Conrad Industries in Chehalis, Washington. Because of the plant's location, Oregon is a potential source of materials for the facility.

SECTION II PYROLYSIS AT THE CONRAD INDUSTRIES FACILITY IN CHEHALIS, WASHINGTON

Plant History

Conrad Industries built the existing tire pyrolysis plant in 1986. In May 1993, the American Plastics Council, in a joint venture with Conrad, upgraded the facility and began a demonstration project at the plant which incorporated plastics into the pyrolysis process. Unlike other pyrolysis facilities that utilize coal and wood chips the Conrad system proposes to mix tires with plastics.

Materials Produced

The pilot system was proposed to mix 25% plastic to 75% tires with an output of 20% gases, 3-8 percent carbon and 80% petroleum feedstock. According to Conrad, 40-50 percent of the petroleum material has "monomer value" and can go back into plastics or other refinery purposes, another 30-40 percent of the material could be sent to refineries to make gasoline, kerosene and other fuels. (19) Carbon black makes up from 3-8 percent and about 17 percent is light gas. Part of the gas would be used to provide heat for the system while the rest is flared.

The Success of Pyrolysis

Since this is a demonstration project, the facility's "success" as a recovery method has not been determined. Listed below is a number of issues associated with the process in general and specific issues related to Oregon.

Technology

- Pyrolysis facilities used wood chips and coal in the 70's; the Conrad facility is the first pyrolysis facility to propose the inclusion of recycled plastics. A number of other countries including Japan and Germany are developing similar processes. The Conrad facility pilot mixes 75% tires with 25% plastics which are heated in an oxygen-deficient chamber. The company projects that about three million pounds of plastic can be processed on an annual basis.

Economics

- Although carbon black has many uses (deactivated carbon, inks, pigments, rubber product and oil remediation), research indicates that it may be difficult to market due to low demand.

- The Vice President of the Conrad facility has stated that it is feasible the facility will charge a tipping fee for incoming plastics. (18, pg.4) The German facility charges a 13 cent per pound tipping fee. The only other recovered material in Oregon that has a tipping fee is yard debris.

- The process has the advantage of not requiring cleaning or separating of materials since labels, glue, and similar materials do not impede the process.

Environmental

- The facility must meet Washington State environmental standards and reportedly will have no pollution equipment except for an outside flare for burning excess gas. No continuous emissions monitoring systems are needed.

Regulatory

- The question of whether pyrolysis of plastics would be considered recycling under Oregon law arose during the 1993 legislative session. Oregon reuse and recycling statutes (ORS 459A) stipulate minimum content requirements for newsprint, directories, glass, and plastics. The law requires that by 1995 rigid plastic containers contain 25% recycled content, be recycled at a 25% rate or be reusable. The American Plastic Council requested that the pyrolysis process be defined as recycling. The question was whether pyrolysis would fall under the statutory definition of recycling or was energy recovery.

The definitions in Oregon statute read:

"Recycling" means any process by which solid waste materials are transformed into *new products* in such a manner that the original products may lose their identity." (ORS 459.005 (25)(c), pg 36-442). (italic added)

"Energy Recovery" means the recovery in which all or a part of the solid waste materials are processed to *utilize the heat content, or other forms of energy*, of or from the material. (ORS 459.005 (25)(a), pg 36-442). (italic added)

Attorney General Determination

The Department of Environmental Quality requested that the Attorney General provide guidance on the questions, "Does the pyrolysis of plastic material constitute recycling? What authority, if any does the Environmental Quality have to define the circumstances under which pyrolysis might constitute recycling? The Attorney General's office advised that: "Pyrolysis of plastics is not recycling to the extent the end product of the process is a form of energy." (36)

SECTION III THE ECONOMIC AND ENVIRONMENTAL IMPACT OF NOT RECOVERING REUSABLE MATERIALS

Oregon uses a number of methods to achieve a reduction in waste. While historical data are available on waste disposal, a baseline on recovery was not established until 1992.

There is little statewide data on the success of reduction, reuse and composting efforts. Therefore, national studies along with data available from DEQ on waste composition and recovery rates are included in this report to determine the impact of not recovering reusable material. Representatives of the glass, paper and metals industries were contacted to get an understanding of the impact of not recovering these materials in Oregon. Further, a number of studies on the fiscal and environmental impact of recycling to landfilling are reviewed.

Economic Impacts

- A study conducted by the Clean Washington Center examined the cost of recycling and disposal and the costs of using recycled materials as a substitute for virgin materials. The study looked at curbside collection programs (which is typically more expensive) rather than drop-off/buy-back recycling. The cities included in the study were Seattle, Spokane, Bellingham and Vancouver. The Washington study used a tip fee of $90.94 a ton. Oregon tip fees run from under $20 to $75 a ton.

Three of the four Washington cities studied showed: The average net cost per ton for recycling in 1992 was lower than the cost for disposal by a range of $25 to $65 per ton. The one city that experienced higher recycling costs collected commercial waste with residential and averaged the cost. Collecting commercial waste tends to be lower because the recycler can collect larger amounts with fewer stops. In addition, yard waste composting was cheaper than disposal by $21 per ton in 1992. (28, pg 7).

◆ In comparing recycling with the alternatives of incineration or landfill, a Yale study showed that the disposal-only systems were neither less nor more expensive than recycling. (33, pg.67) While local governments would not be expending funds on recovery programs, they would have to expend tip fee funds for every non-recovered ton that would go to the landfill.

◆ A study conducted by the Keep America Beautiful Inc. found that curbside collection and transportation costs dominate the fiscal impact of recovery programs and are generally more costly than conventional landfill disposal. Overall, recycling saves landfill space while the most significant potential energy and environmental effects are in using recovered materials to replace virgin materials. (28)

◆ It is projected that Oregon's larger landfill sites have significant long-term capacity; however, any reduction in material recovery would directly impact the state's landfill capacity. On a national level the impact would be greater, meaning increased need for incinerators and landfills and increased siting and operation costs. A number of municipalities are exploring "landfill mining". This process captures recyclable materials out of the landfill and expands the site's capacity.

◆ The Clean Washington study found that generally the use of recycled material for products tends to be more expensive than virgin because of the risk of contamination and the smaller available number of suppliers. Also, there are increased transaction costs when dealing with a number of smaller-scale recycled materials suppliers rather than one or a few virgin material suppliers. (28, pg 10).

On the product output side, prices for recycled-content products varied little, if at all, from prices of virgin-content products. Virgin feedstocks have only recently begun to be more expensive than recycled feedstocks for some products. However, manufacturers have been reluctant to switch to using recycled feedstocks. (28, pg 10).

◆ The Institute for Local Self-Reliance found in the study "The Economic Benefits of Recycling", that recycling on a per-ton or per-dollar invested basis creates more jobs than incineration or landfilling. Recycling lowers operating costs, employs more people and offers the potential for high-wage manufacturing jobs (27, pg 1).

Research shows that for every 15,000 tons of solid waste, the following jobs can be created depending on how the waste is managed. (26, pg 8)

Processing recyclables	9 jobs
Composting Yard Waste	7 jobs
Incineration	2 jobs
Landfill	1 job

◆ In Oregon and Washington the paper fiber industry projects its capital investment in the construction of recycling facilities to be $1.1 billion between 1989 and 1995. Scrap paper (and scrap metal) are at times Oregon's largest export material. Recycled materials are needed to maintain the same levels of production. (10)

◆ The Owens Brockway glass plant in Portland has constructed a plant to use recycled materials. The capital investment for the processing plant is between $1.2 and $1.5 million (without land costs).

The vast majority of the recycled material for the Owens Brockway plant comes from within Oregon. Without this material, the company would have to obtain materials from other states or use raw materials to make glass. Transportation costs would be a significant expense.

Using raw materials generally is less efficient because glass can be reproduced from recycled materials at nearly a ton-for-ton basis. Also, using recycled material extends the life of the plant furnace.

◆ The Garten Foundation, in Salem, Oregon is a paper processing facility that has been in business since 1976. The company has invested more than three quarters of a million dollars on equipment and rolling stock and employs more than 70 workers including 50 disabled workers.

◆ The American Plastics Council is investing more than $800,000 for plastic recycling facility at the Garten Foundation and additional funds in compactors, chippers and other equipment to process and transport plastics.

◆ The Cascade Steel Rolling Mills and Oregon Steel Mills are both designed to use virtually all scrap steel and almost no iron ore. All steel production requires scrap material -- there is no longer a technology to use only raw materials.

◆ The State, Metro, local governments and many non-profit organizations have contributed funds and time in developing the extensive recycling network that collects materials in every wasteshed within Oregon. While data is unavailable on regional and local expenditures, between 1991 and 1994 DEQ distributed nearly $450,000 in grant funds alone to small communities to help establish recycling programs.

◆ Additional state funds have been available through recycling tax credits. There are three tax credit incentive programs to offset the cost of recycling investments for Oregon businesses. DEQ administers the Pollution Control Tax Credit (PCTC) which provides a 50% investment tax credit for facilities (including recycling) constructed to reduce pollution. More than $50,000,000 of eligible

costs have been claimed since 1975. In 1985 the Oregon Legislature authorized DEQ to issue investment tax credits for equipment used to reclaim plastics. About $3 million has been certified in that program. The Oregon Department of Energy (ODOE) oversees the Business Energy Tax Credit (BETC) program. BETC is a 35% tax credit for businesses for the cost for equipment used to process or transport recyclable materials. More than $68,000,000 has been certified in the last eleven years of the program.

Environmental Impacts

◆ When the Yale University study looked at the environmental impacts of collecting, transporting, and processing of recycling material and compared them to the same impacts of collecting, transporting and disposing of material in landfills it found that recycling was no more environmentally advantageous than disposal. (33, pg. 56) However, using recycled content in the production process dramatically reduces environmental impacts. The study concluded that using recycled materials could reduce the natural resource impacts of virgin material from 43% to 518%. (33, pg.60)

◆ Most of the large paper fiber facilities in Oregon and Washington are using from 40 to 60% recycled content. The region's contribution to the facilities is at the following levels:

newsprint and corrugated	less than	50%
office paper	more than	50%
magazines	more than	50%
waste paper*	less than	50%

*(Waste paper is expected to increase as more programs come on line.)

◆ Nearly 50 percent of the material the Owens Brockway glass plant uses to make containers comes from containers that Oregon consumers have recycled. (11) Any raw materials used must be shipped into the state and there is more process waste created with the raw materials.

◆ A new study by the Steel Recycling Institute reported that the North American steel industry has invested more than $10 billion on environmental and production improvements in the last two decades and has resulted in significant reduction in the consumption of natural resources and energy, along with reductions in the generation of air emissions. From the 1980's carbon dioxide emissions from a single plant were reduced 28 percent, sulfur oxide emissions fell by 95 percent and solid waste by 84 percent. Oregon's two steel mills must use scrap, which removes reliance on virgin materials. (15)

- If Oregon reaches its statewide goal of 50% recovery by the year 2000, more than 1,500,000 tons (or more than a half a ton per person) of raw materials could be saved on an annual basis.

In order to achieve this goal, ORS 459A assigned wasteshed recovery rates to local communities ranging from 7 to 40 percent. In 1993, Oregon recovered 974,694 tons of material for a recovery rate of 29.9% up from the 1992 recovery rate of 27%. All material categories showed increased recovery in 1993.

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PYROLYSIS OF PLASTICS

I. Background

THE PROCESS. *Pyrolysis* (also called "destructive distillation") is a process of thermal decomposition. In pyrolysis organic materials such as tires, wood chips or plastic are heated at medium to high temperatures (500 - 1000°C) in an enclosed chamber in the absence of oxygen. This causes the complex organic compounds to decompose into lower molecular weight components and vaporize. Then the vapors are condensed forming new organic compounds (e.g. gas and oil). As gas is produced it may be recovered and used to heat the firing chamber. The source material and the process used (temperature, etc.) dictate the product mix derived from the process.

When plastics is the feedstock, polymers are converted back into short-chain chemicals, breaking down the waste plastics into other organic materials including **liquid hydrocarbons** (similar to high-grade crude oil), light **gases** (similar to methane or natural gas) and solid residues (**char**, or **carbon black**).

There are three thermochemical processes somewhat similar to pyrolysis that could potentially return waste plastics into usable materials: (3)

1. *Cracking*. Operates at 400 - 600°C at pressures slightly above atmospheric. Creates up to 95% waxy liquids suitable for further "cracking." Can accept plastic flake direct from conventional recyclers. Plants must be special-built, with some under development in England. A Japanese plant at Aioi has been in operation since 1992, producing 50% gasoline, 25% kerosene and 25% gas oil.

2. *Gasification*. Operates at 900 - 1400°C under pressure in an oxygen and steam atmosphere. Produces mostly carbon monoxide and hydrogen. Texaco has a pilot gasification plant in White Plains, NY.

3. *Hydrogenation*. Operates at 300 - 500°C under pressure in a hydrogen atmosphere. Produces mix of 65 to 90% oil, 10 - 20% gases, and up to 20% solid residue. Commercial-scale trial runs have been completed in Germany using commingled plastics from Germany's nationwide collection network.

In pyrolysis, commingled waste plastics (that is, resins of various types) can be processed together, except that vinyl chlorides may in some cases contaminate the process and thus may have to be sorted out. Various different types of organic material may also be able to be pyrolyzed together (e.g. tire chips and plastics). Because a variety of organic

materials can be accepted in the process, organic materials such as labels and food wastes adhering to post-consumer waste plastic containers do not act as "contaminants" but are pyrolyzed along with the other materials.

The properties of the eventual products, and the degree of refinement the material must undergo, depend on the quality of the in-coming organic feedstock. In plastic pyrolysis the **liquid hydrocarbons** produced can be burned directly as fuel and/or used by refineries and petrochemical facilities to be refined and eventually converted into a variety of materials, including fuels, lubricants, chemical feedstocks and plastic feedstocks. Of all the oil refined in the U.S., about 3-5% goes to create plastics; thus if liquid hydrocarbons from pyrolysis were reprocessed into plastic resins at the same percentage as in the U.S. oil supply overall, about 3-5% of those liquid hydrocarbons would eventually be returned into plastics. Potentially a higher percentage of pyrolysis products could be used to make plastics. For example, products of pyrolyzed polystyrene may yield as high as 50 percent styrene monomers. An obstacle may be the need to ship pyrolysis products long distances to reach an appropriate refinery. The **gas** produced is used partly as the energy source for the pyrolysis system. Depending on its quality, the **carbon black** may have commercial uses such as activated carbon or in rubber goods. If markets cannot be found, these materials could be burned or landfilled (in the case of carbon black).

Emissions from pyrolysis include vent gas, flare gas (if excess gas is burned off rather than being recovered), emissions from burning the gas, and possibly water from scrubbing the gas. Pollution control devices are not required for the exhaust system if the material being pyrolyzed contains no harmful materials. However all post-consumer plastic streams contain some halogens in the form of polyvinyl chlorides (PVC), halogenated additives, food wastes, etc. So the gases from pyrolysis of that waste stream must be scrubbed to remove the halogens.(14) (See also page 3 for effect of PVCs)

HISTORY. Pyrolysis is not a new technology; it was used in the early 19th century to study the structure of natural rubber. A 1983 US Department of Energy Report (10) reviews the many studies done on pyrolysis. During the '70's and '80's there was interest in using the process to convert waste tires to useful materials, and as many as 34 pyrolysis projects have been proposed, designed or built in the United States by such companies as Union Carbide Carborundum Co. and Monsanto. The above report noted that many of these projects were abandoned for technical and/or economic reasons. As far as could be determined, none are operational in the U.S. on a commercial scale at present. Successful tire pyrolysis operations in Germany, Japan and England have been heavily subsidized by their respective governments. (9)

At least three projects to pyrolyze waste tires were begun in the Portland area, at RMAC in Troutdale (sometimes characterized as "gasification"), another by Bob Lindahl of ETI in Portland, and another by Hi Tech Systems in northeast Portland. Hi Tech also

reportedly manufactured and sold pyrolysis units to processors in other states. None of these Portland operations proved commercially successful and all have ceased operation.

Kleenair Products Co. of Portland, Oregon and Conrad Industries, Inc. of Centralia, Washington also jointly developed and manufactured a pilot pyrolysis system which was installed at Conrad Industries' plant in Chehalis, Washington. This plant has pyrolyzed scrap tire chips, and more recently has run waste plastics (or a combination of waste tires and plastics). Research to date using plastics shows: (11)

1. Yields:

   a. **Liquid hydrocarbon**: 70-80 percent of input volume.

   b. **Gas** (Btu level near that of natural gas): ~17 percent[1].

   c. **Carbon black**: 3-8 percent.

2. PVC levels above 2 percent of input result in too much chlorine in the oil.

3. Costs (to pyrolyze plastics collected in curbside programs):

   a. Processing - $.071/lb.
   b. Capital ($4.5M, 16 million pound/year plant) - $.062/lb.

   Although estimates of the value of the distillate vary, one source put it at $.05/lb.(16) Another source estimated that at current oil prices, Conrad Industries would need a five-cent-per-pound tipping fee to break even.(11)

It has been stated that the liquid from the plant "is shipped to refineries and plastic production facilities for use in producing new products such as synthetic fibers, new plastics and other petroleum-based products."[2] And the carbon "can be sold for use in the production of activated carbon, pigments, rubber goods and application in oil remediation and agriculture." (14)

Wayne Technology Corp. in Rochester, NY has developed equipment, the Wayne Recycling Convertor, that processes waste plastics through a pyrolysis process. During 1992 they operated a demonstration system in upstate New York pyrolyzing mixed plastics from packaging, with #1 and #2 resins mainly excluded. Their process reduces

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[1] Material from Conrad Industries states that a typical machine uses only 10 to 15 percent of the gas vapor produced, a low energy consumption per operating hour.

[2] As far as could be determined, this has been done only on an experimental basis.

plastics to their constituent components, principally oil. The oil was sold for fuel, not feedstock; the carbon black could be burned, but would have to be upgraded for use as carbon black. Their device has since been dismantled, and the company is negotiating to build operating pyrolysis plants. A Wayne Technology spokesperson said it is "very profitable compared to the recycling alternatives," but a tipping fee is necessary, of about what it would cost to landfill the material.(15)

II. Commercial Status

Plastics pyrolysis has been advocated as a source of low-cost liquid chemicals which could be substituted for virgin hydrocarbons for refining, and the technology continues to draw interest.

A number of projects are under development:

1. Fluidized bed technology for pyrolyzing plastics into monomers for reuse in virgin polymers. Work being done by the Energy and Environmental Research Center, a non-profit group in Grand Forks, ND.

2. Five European resin makers are pooling resources to commercialize a BP pyrolysis process: Petrofina, DSM, Elf Atochem, Enichem and BP. It is expected that a $100 to $200/ton charge for disposal of commingled plastics waste would cover operating costs for a 55 million pound per year pyrolysis unit. (2) In Germany pyrolysis requires a subsidy of around $245/ton of feedstock.

3. A 40,000 metric tonne per year low-temperature plastics pyrolysis plant is planned for a site adjacent to the German hydrogenation plant mentioned in Section I above.

To the Department's knowledge there is no plastics pyrolysis plant in the U.S. under commercial production.

Commercial operation of pyrolysis units has been hampered through the following:

1. High capital costs ($3 to 4.5 million for a unit such as Conrad Industries').

2. Lack of markets for byproducts. They face competition from cheaply produced, virgin materials with established purchasing and distribution systems.

3. Uneven quality of the products. End products from pyrolysis have not yet met standards for consumer use (although Conrad Industries has recently reported a "pretty good market" for carbon black used in recycled products).

4. Low price of the directly competing virgin material: crude oil. In 1993 crude oil ($20/55 gallon drum) as a feedstock for plastics manufacturing was 6 cents a pound. At that level operating costs of pyrolysis would have to be subsidized by $.05-.09/lb of plastics to compete with virgin stocks.(8)

5. Technological problems such as fires and down-time (waste tire pyrolysis operations).

Plastics pyrolysis may be too new to know what its long-term costs are. However, waste tire pyrolysis plants have apparently failed to be commercially competitive with the price of its major competitor, crude oil, even when a $1 per tire tipping fee is charged. Sources have generally assumed that a plastics pyrolysis plant would also have to charge a tipping fee.

III. Advantages of Pyrolysis

Traditional plastics recycling is done mechanically, by collecting plastic containers (either in curbside programs or depots), sorting by resin types and by color, granulating into a uniform particle size, cleaning, drying, heating and compressing the particles at a relatively low temperature, extruding them into pellets at about 475°F, and finally molding the pellets into new plastic products. The pelletizing step is not always necessary; "clean flake" can sometimes be used immediately to produce new products. Not every company does all these steps. This technology is labor-intensive, especially if hand-sorting is required, adding to its expense. The costs of processing may be above the price the market is willing to pay for the reclaimed flake. A relatively clean stream of post-consumer plastics is required to produce a high quality product; if contaminated by food residues or other resin types, the recycled plastic particles lose much or all of their market value. In order for this process to be economical, there must be sufficient market demand for the recycled resin. Recycled "mixed" (i.e. unsorted) plastic flake may be used for such things as plastic lumber, but have a low market value. Thus, "mechanical" recycling can be a rather complex and costly process. Mechanical recycling is decentralized, and the reclaimed materials (resins) are sold by processors directly to brokers or manufacturers.

Pyrolysis advocates note that pyrolysis is a way of processing plastics which have not been separated by resin or color, for which there is insufficient technology and economic incentive with traditional "mechanical" recycling. Pyrolysis may be capable of taking unwashed waste plastics and containers with labels, eliminating cleaning procedures. Pyrolysis eliminates some of the grinding, shredding and extruding processes used in mechanical recycling (although plastic feedstock may need to be ground for use in pyrolysis units). It has been claimed that rather than gradually penetrating niche markets, pyrolysis can create feedstocks that put plastics back into commodity streams that require minimal marketing or product differentiation.

Proponents state that the chemicals yielded by pyrolysis are just as good as the originals, while mechanical recycling always produces some degradation in resins. Pyrolysis has the theoretical potential to absorb vast quantities of post-consumer waste, and in fact may need large quantities to be viable.

Pyrolysis could be integrated with "mechanical" recycling where collection programs exist for items with stable markets such as milk jugs. Existing recyclers could pull out of a mixed waste stream those resins that have good market value in conventional markets. The mixed plastic hard-to-recycle "tailings" could go to pyrolysis. This might reduce landfilling and transportation costs.

Depending on location, the excess gas produced by pyrolysis could be used for process heat by nearby industry.

The greatest value of pyrolysis may lie in its potential to provide a clean, transportable fuel for use in another location. Pyrolysis liquids may be a source of valuable chemicals, although laboratory studies are still underway.

IV. Drawbacks of Pyrolysis

Although pyrolysis may process mixed plastics, some pre-sorting may be desirable to improve operations. Inclusion of #3 resin (vinyl, PVCs) which creates hydrochloric acid has been noted as a potential problem, but may be eliminated by the addition of wet scrubbers. In addition, test runs on a PET-rich plastics mix has shown interference with scrubbers, as well as producing less-valuable products; minimizing PET presence in the stream may be desirable.(14)

The US Department of Energy study mentioned above noted that (tire) pyrolysis is technically feasible, and a fairly well established technology. The lack of widespread use of this technology is due to some major economic problems relating to product marketability, product quality, and product prices. (See Section II above) The economics appear to be favorable only when disposal fees are collected and the tire pyrolysis products are used on site, although they improve if higher value hydrocarbon products are refined from the pyrolytic oil. (10)

Although technically feasible, pyrolysis has yet to prove itself commercially in the U.S. It will likely require tipping fees and/or other subsidies to operate.

It is always more energy intensive to reduce a material back into its component parts rather than to grind it up and reuse (remold) it at that lesser stage of processing. Thus it is more energy efficient to use plastic regrind pellets (thus saving virgin materials required to make new pellets), rather than to reduce plastics to their original feedstocks, and then re-process them into pellets to be melted and made into containers. The more

processing, the more energy lost. (See following Section)

There is concern that pyrolysis could undermine plastics recycling. Currently there is unmet demand nationwide for recycled resins. It is generally considered that pyrolysis would need to sustain relatively large-scale operations in order to become economically feasible. The Northwest has a relatively small population and thus generates relatively little waste plastic; that may be why Conrad Industries studied using a mix of 25% plastics to 75% tires. If a large-scale pyrolysis operation were successful, it might divert substantial amounts of collected post-consumer plastics making it more difficult for the market for recycled plastics to obtain enough post-consumer plastics to sustain itself.

A "plastics recovery facility" (PRF) has just been established at The Garten Foundation in Salem with financial assistance from the American Plastics Council (APC). The most advanced of its kind in the U.S., this facility automatically sorts post-consumer waste plastics by resin type and color. It has the theoretical capacity to process up to about 18 percent[3] of the rigid plastic containers generated in Oregon which are not currently being recycled, and is seeking sources of plastic collection from the entire northwest. Currently there are healthy markets for recycled plastics of all resin types, including "mixed." During its initial three years of operation the APC will subsidize market prices for the reclaimed plastics sold. At the end of that time the PRF is expected to be able to sustain itself economically. However, increased levels of curbside collection of plastics will likely be needed for it to be commercially viable.[4] Diversion of any significant part of the Oregon plastics waste stream to a pyrolysis facility could adversely affect the economic future of the PRF.

The PRF is state-of-the art technology, and does not have a proven track record of long-term operation. While markets are currently good for recycled plastic resins, such markets have historically been volatile and will likely continue to be so. It is premature to conclude that the PRF will solve all plastics recycling problems in Oregon. But the infrastructure to support the PRF seems to be moving into place.

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[3] The PRF's capacity could be doubled by the addition of a new parallel line.

[4] The incremental cost of adding plastic bottles to one existing curbside program has been estimated to be $1.07 per household per year (20); average costs of 22 other programs were estimated at $.25 per household per month ($3.00 per year) (21).

V. Energy and Material Loss Considerations

Recycling is based upon using secondary material from waste products to replace the virgin raw material in the manufacture of a similar product. The fewer steps between the recovery of the first product and the manufacture of the second product, the higher the level of waste utilization.

Any time a physical or chemical transformation takes place, energy is used and lost. Energy is required in all phases of the recycling as well as the pyrolysis process and other related technologies. Typical gasifiers (e.g. methane from coal) achieve about 75% conversion of the original energy in the solid materials to the energy in the product gas (gasifier alone, exclusive of preparation and ancillary processing equipment). In gasification of solid materials, the gas is often converted on site to electricity. Since the original materials could be directly combusted to produce electricity, that procedure is energy-inefficient.

There is little material loss in "mechanical" recycling when a plastic bottle is recycled back into a plastic bottle by using the plastic from the first bottle. The used bottle is granulated into flakes (and perhaps pelletized) and the flakes (or pellets) are then fed into a machine which remelts them and molds a new bottle. The bottle-to-bottle process requires relatively little energy, only the amount needed to grind, wash and remelt the plastic.

Pyrolysis is less energy efficient. Again, the plastic bottle is granulated, and then subjected to heat in the absence of oxygen. It breaks down into organic gases, some of which are burned to fuel the pyrolysis process. Some is condensed into oil. The oil is transported to be rerefined, with some further material loss, into various materials which can include a feedstock used to manufacture plastic resin, again with some material loss. The energy required for grinding and remelting is the same as for mechanical recycling. Otherwise, this process is comparatively energy-intensive, considering the total pyrolysis/rerefine/remanufacture process.

The Department has been unable to find information directly examining net energy balance in pyrolysis. Some work has been done comparing energy requirements to produce recycled-content versus virgin-content products, as well as comparisons of the energy saved by recycling waste versus the energy produced by incinerating waste (waste-to-energy).(13) Energy balance calculations have been done based on primary energy used to extract, process and transport virgin raw materials, and the full heat, light and power requirements of production processes for recycled-content vs. virgin-content products. These show the following energy savings for recycled-content plastics:

Material	Energy Conserved in Recycled-Content Mfg (vs. Virgin) (kilowatt hours per ton)	Less energy for: Collection, transp. (kwh/ton)	
PET	7,203	20	<1/mile
HDPE	6,232	"	"
Other plastic containers	5,277	"	"

If those waste plastic materials were instead used to **directly generate energy (electricity)**, i.e. in a waste-to-energy plant, the amount of energy generated would be less than the energy (kwh) savings from using the waste materials as recycled content:

Material	Energy Generated (kilowatt hours per ton)
PET	1,761
HDPE	1,761
Other plastic containers	1,407

VI. Pyrolysis: "Recycling" in Oregon?

Senate Bill 66, Oregon's comprehensive 1991 recycling Act, set recycled content requirements for packaging materials other than plastics. At the time of passage of SB 66, the recycling infrastructure for plastics was limited and thus rather than requiring minimum recycled content, the Law set a number of options for compliance for rigid plastic containers. One option was a 25% **recycling** rate (not a **recovery** rate) for rigid plastic containers. This was to improve collection and market development of recycled plastics. A recovery rate may under some circumstances include composting or energy recovery, which are separate from and lower than "recycling" in the state's solid waste management hierarchy (see discussion below).

In the context of rule development for the plastics Law, the Oregon Attorney General's (AG) Office was asked whether pyrolysis could count as recycling. The AG's advice that pyrolysis does not constitute "recycling" for purposes of Oregon law is based on the existing waste management statute. This statute establishes a hierarchy for the management of solid waste which distinguishes between recycling and energy recovery, and gives preference to the former. The AG advice was that only non-fuel or non-energy products of pyrolysis could count as "recycling" for purposes of Oregon law in calculating the rigid plastic container **recycling** rate. Most of the products from pyrolysis appear to be energy or fuel. Thus allowing pyrolysis in general to count as "recycling" would erode the hierarchy by eliminating the distinction between recycling and energy recovery.

This distinction is important in determining the state-mandated by-county **recovery** rate. The recovery rate is based on materials recovered from the waste stream. Energy

recovery counts towards the recovery rate only if there is not a viable market for recycling a material. "Viable market" means a place within a county that will pay for the material or accept the material free of charge, or a place outside a county that will pay a price for the material that, at a minimum, covers the cost of transportation of the material. Material used for energy recovery may not be included in the recovery rate if more than half of the materials could have been recycled if properly source separated. These provisions were the result of compromise, and would have to be revisited if all the products of pyrolysis were to be considered "recycling."

Counties where a "viable market" for plastics does not exist may currently send waste plastics to be pyrolyzed and have them count towards the county (and State) material recovery rate.

As noted in the previous Section, recycling is generally a more efficient, less wasteful use of materials than energy recovery. It preserves as much of the value added from the original product as possible. Value added includes incorporated energy and physical or chemical structure. Recycling keeps the materials out of the landfill, and also conserves all the energy, resources and virgin raw materials that would otherwise have been used to make new products. If a product is dismantled down to its basic components which are then used to manufacture a new product, all value added in the original product is lost; a new product is being manufactured out of recycled raw materials. If the latent energy in waste plastic is reclaimed, it may displace new energy resources; but more virgin raw materials must be extracted to make replacement new plastic materials. Destructive waste utilization and energy recovery do not preserve or take advantage of the full value of a waste product.

VII. Summary

To summarize the issues surrounding plastics pyrolysis:

1. Natural resources are recovered.

2. It can use waste plastics containing high levels of organic contamination.

3. Sorting by resin type and color is not required, except possibly for PVCs or PET.

4. Marketable products are produced, although they may not be cost competitive compared with virgin materials.

5. Resins manufacturered from pyrolysis products are as good as the originals.

6. The technology is feasible, although its commercial viability is not proven and markets for by-products have traditionally been elusive even though it has been tried (for tires and other materials) over many years.

7. Could be used to augment existing recycling programs, recycling post-consumer plastics currently not widely recycled.

8. Commercial-scale operation could require a large plastics stream, diverting plastics from existing traditional recycling markets.

9. From the perspective of plastic resin manufacturers, mitigates potential market share loss that recycling and the resultant availability of recycled resin could create for virgin plastics sales.

10. Using recycled materials to make new products with recycled content is more material- and energy-efficient than making new products out of virgin materials. It is also more energy-efficient than recovering the energy content from those recycled materials.

11. Treating all products of the pyrolysis technology as "recycling" would erode the state's current solid waste hierarchy and require revisiting the state's "recovery rate" mandate.

pyrolysi.rpt

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State of Oregon
Department of Environmental Quality Memorandum[†]

Date: January 12, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Acting Director

Subject: Information Agenda Item 2, January 20, 1995, EQC Meeting

Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act.

Statement of Purpose

Provide information on the status of proposed rules to be considered for adoption by the EQC at the March 3, 1995, meeting.

Background

WHAT IS TRANSPORTATION CONFORMITY?

Transportation conformity ensures that state/local transportation plans and funding are consistent with state/local air quality plans.

WHERE WILL THE PROPOSED RULES APPLY?

The proposed rules apply only to those areas in the state of Oregon that are classified as "nonattainment" or "maintenance" areas under the 1990 Clean Air Act amendments. Currently, the following areas are affected: Portland, Salem, Eugene-Springfield, Medford-Ashland, Klamath Falls, La Grande, Grants Pass, Lakeview, and Oakridge.

WHY IS DEQ PROPOSING RULES GOVERNING TRANSPORTATION CONFORMITY?

On November 24, 1993, the Environmental Protection Agency (EPA) and the U.S. Department of Transportation jointly issued rules to implement the Clean Air Act's

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[†]Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

conformity requirements. These rules and the Clean Air Act both require states to adopt transportation conformity rules.

HOW WERE THE PROPOSED RULES DEVELOPED?

The rule was developed with the assistance of an advisory committee representing diverse interests. The committee was chaired by Susan Brody of the Oregon Transportation Commission; representation included all the Metropolitan Planning Organizations (MPOs) in the state, Lane Regional Air Pollution Authority, Tri-Met, Oregon Department of Transportation, League of Oregon Cities, Association of Oregon Counties, and interested business and public interest organizations. The Federal Highway Administration (FHWA) and EPA also were involved in the development of the rules. The advisory committee met nine times over the course of six months to discuss and debate various policy issues with respect to these proposed rules.

The base text for the proposed conformity rule was the federal rule promulgated in November 1993.

WHAT WILL THE PROPOSED RULES REQUIRE?

The Clean Air Act requires areas exceeding health-based air quality standards to develop and submit to EPA State Implementation Plans (SIPs) demonstrating how these standards will be achieved and maintained. Each area is required to allocate a certain quantity of emissions to motor vehicle use in its SIP thus, establishing a motor vehicle emissions budget.

The proposed rules require that emissions from a proposed transportation system are consistent with the emissions allocated to motor vehicle use in the SIP. In addition, the rule ensures that transportation projects will not cause or increase localized violations of air quality standards. Transportation projects that are not found to conform under the rule can not be approved or receive federal funding. Finally, the proposed rule requires implementation of transportation control strategies identified in an area's SIP as necessary to achieve healthy air.

In metropolitan areas transportation conformity is linked to the transportation planning requirements under the Intermodal Surface Transportation Efficiency Act (ISTEA). ISTEA requires the United States Department Of Transportation to designate Metropolitan Planning Organizations (MPOs) in areas with more than 50,000 inhabitants. These MPOs distribute large amounts of federal money to develop and construct a region's transportation system. Pursuant to ISTEA, MPOs are required to adopt long-

range regional transportation plans covering a 20-year period and transportation improvement programs addressing the next 3-7 years. The former describe planned facilities and policies and the latter allocate money to specific projects. The Clean Air Act requires that both the long-range plan and the transportation improvement program be assessed for their consistency with the air quality plans of an area.

In non-metropolitan areas of the State similar analyses are required. In these areas, the regional air quality analysis is linked to the Statewide transportation plan and improvement program, also required under ISTEA.

HOW ARE THE PROPOSED RULES DIFFERENT THAN THE FEDERAL RULES?

For the most part, the proposed rules are identical. In a few areas, they are more stringent to ensure adequate protection of air quality.

The proposed rules would require all "regionally significant" transportation projects to meet the criteria of the rule regardless of funding source. The determination of "regionally significant" projects will be made through interagency consultation with affected parties. It is the Department's intent that only large scale projects be considered "regionally significant." The proposed rules would require some "regionally significant" locally funded or approved projects to be evaluated for localized air quality impacts. This is not required by the federal rules. In addition, under the federal rule "regionally significant" locally approved projects may proceed even if a region has not developed a transportation system which meets air quality goals. The proposed rules would prevent these projects from going forward in the absence of an approved transportation system. Without this criterion, "regionally significant" locally approved projects (not federally funded) could go forward even if they cause localized violations and may place an additional burden to achieve reductions from the system as a whole.

Second, the proposed rules shorten the time frame for compliance with a mobile source emissions budget once a maintenance SIP has been approved by the Environmental Quality Commission (EQC). Since the mobile source emissions budget is the most accurate benchmark for ensuring compliance with national ambient air quality standards, the advisory committee agreed that the budget should govern during the time period when EPA is reviewing the maintenance submittal. This criterion is crucial since EPA has often taken years to approve SIP submittals.

Third, the proposed rule shortens the time frame for demonstrating timely implementation of transportation control measures (TCMs) once the EQC adopts a SIP

revision which adds TCMs. Where DEQ has identified additional TCMs as necessary to achieve and/or maintain healthy air quality, it is important that these measures are implemented in a timely manner. Since EPA review of SIPs is often time consuming, implementation should move forward during EPA review.

Finally, the proposed rule requires timely implementation of all transportation control measures (TCMs) identified as necessary to achieve or maintain air quality standards, regardless of their eligibility for federal transportation funding. At the present time, this will primarily affect road sanding control measures in areas experiencing particulate matter pollution problems. The federal rule merely requires timely implementation of those TCMs eligible for federal transportation funds. A majority of the advisory committee agreed that once a commitment has been made to particular measures necessary for healthful air quality, the rule should require that these measures be implemented.

Authority of the Commission with Respect to the Issue

The Commission will be responsible for adopting rules governing the conformity of transportation plans, programs and projects. The Department will be establishing mobile source emissions budgets and selecting transportation control measures in consultation with all affected local agencies. Once these are agreed upon, the Commission will be responsible for adopting State Implementation Plans establishing mobile source emissions budgets as well as, selecting Transportation Control Measures.

Alternatives and Evaluation

For each of the issues identified above, the Commission could direct DEQ to develop rules that do not exceed the minimum federal requirements.

First, if the rules fail to address locally funded or approved projects, only federally funded projects above a certain size would be analyzed for their localized air quality impacts. In addition, locally approved projects could proceed even if a region has not developed a transportation system which meets air quality goals. Therefore, such projects could go forward thereby making it more difficult for the system as a whole to comply with air quality goals. Since the potential does exist for major highway construction to be privately funded in the future, these criteria are necessary to ensure healthful air quality. The advisory committee agreed that it is important to hold all projects, regardless of funding source, to the same standards.

Second, the rules could retain the federal rule language requiring maintenance areas to comply with a mobile source emissions budget only after it has been approved by EPA. If the proposed rules did contain this criterion, projects which increase emissions could go forward while EPA is reviewing a maintenance plan and make it more difficult, if not impossible, for an area to comply with the budget later. The advisory committee unanimously supported this criterion.

Third, if the proposed criterion shortening the time frame for a regional transportation plan to provide for implementation of transportation control measures is not retained, funding for these measures could be delayed until 18 months after EPA approves such a SIP revision. Since EPA review of SIPs is time consuming, sometimes taking several years, implementation should move forward during EPA review. The advisory committee unanimously supported this criterion.

Finally, if the federal rule provisions limiting timely implementation of transportation control measures to those eligible for federal funding is adopted, conformity could be demonstrated even if these measures were not being implemented. A majority of the advisory committee agreed that once a commitment has been made to particular measures necessary for healthful air quality, the rule should require that these measures be implemented. Two members of the advisory committee, the Oregon Department of Transportation and Mid-Willamette Valley Council of Governments, stated their position that it is not appropriate to hold up federal funding due to a failure to implement measures that are not eligible for such funds.

Summary of Public Input Opportunity

Over 40 interested parties were identified by the Department and received all advisory committee materials. Each advisory committee meeting agenda set aside time for public comment. More than 300 people received the proposed rule and "chance to comment" package. More than 30 days were provided prior to the public hearings on the proposed rules. Two public hearings (one in Medford and one in Portland) were held on January 5, 1995, both a 7:00 p.m.

The public hearings on these proposed rules were held on January 5, 1995, in Medford and Portland. Five people testified at the hearing in Medford and one person testified in Portland. All parties that testified also submitted written testimony, except for one party who submitted only oral testimony. In total, 25 parties submitted written testimony. Following are the major issues presented in the testimony and the Department's responses:

1. Five parties, all from the Salem area, submitted the following comment. Seven commentors (including AOI) supported the applicability to "regionally significant" locally approved projects. This requirement enjoyed unanimous support from the advisory committee.

   Comment: The rule should not require project level conformity determinations for local projects. This is not required under the federal rules.

   Response: The proposed rule does retain the requirement that "regionally significant" projects approved or adopted by a recipient of federal transportation funds (all cities and counties) to comply with the rule. A subset of these projects will have to be analyzed for their localized impacts (those on a facility where the Level of Service is or will be D, E, or F and any intersections identified in an applicable State implementation plan).

   This language is retained because DEQ as well as, the advisory committee unanimously recognized the policy implications of not expanding applicability to these projects. In the absence of this requirement, locally approved projects (not specifically funded with federal transportation funds) may go forward in the absence of a conformity transportation plan and program. Since these projects would have to be accounted for in the next conformity determination (as most recent planning assumptions), any emissions increases resulting from these projects would make it more difficult to demonstrate conformity of future transportation plans. The determination of regional significance will be made through interagency consultation and will likely vary from locality to locality. The federal definition of "regionally significant" is retained to allow flexibility. This requirement is intended only to bring in large scale projects and not smaller projects where application of conformity is unnecessary.

2. Six parties, including ODOT, submitted the following comment. Four parties supported the requirement that timely implementation be demonstrated for all transportation control measures (TCMs) regardless of their eligibility for federal funds. All but two (ODOT and Mid-Willamette Valley Council of Governments) advisory committee members supported this requirement.

   Comment: The rule should not require TCMs which are not eligible for federal funds to be implemented in a timely manner. This is not required under the federal rule.

Response: The rule retains the requirement that all TCMs satisfy the timely implementation criterion regardless of their eligibility for federal funding. Since these measures will be selected in consultation with all affected agencies, there should be agreement on the need for all TCMs in order to ensure air quality standards are achieved and maintained. DEQ's only existing enforcement mechanism is the citizen suit provision of the Clean Air Act and this is not viewed as adequate. The rule does provide flexibility in satisfying the timely implementation criterion since the decision of whether implementation obstacles are being overcome will be made through interagency consultation.

3. Several people commented on the definition of "regionally significant" stating that it did not provide adequate certainty. Some parties felt that the rule should establish bright line criteria for determining "regionally significant" projects.

Response: Several options for defining "regionally significant" projects were explored with the advisory committee. The rule retains the federal language because it provided the greatest degree of flexibility. This flexibility is thought to be appropriate since the term may mean something different in each affected area of the state depending on local circumstances. In addition, the definition of "regionally significant" projects may change over time as an area's transportation modeling capabilities are improved.

Finally, no adverse comments were received on the other two proposed criteria that go beyond the federal rule; 1) Shortened timeframe for complying with an emissions budget included in a maintenance plan adopted by the EQC; 2) Shortened time frame for demonstrating timely implementation of transportation control measures (TCMs) once the EQC adopts a SIP revision which adds TCMs.

A detailed discussion of comments and responses will be included in the staff report accompanying the rule package to be considered for adoption by the EQC.

Conclusions

DEQ staff concludes that the criteria discussed above are necessary to ensure healthful air quality for all Oregonians.

Intended Future Actions

The Department will be asking the Environmental Quality Commission to consider adoption of these rules at the March 3, 1995 meeting. The Department will be developing attainment and maintenance strategies for the Commission's consideration that will identify specific transportation control measures and allocate emissions to motor vehicles.

Department Recommendation

It is recommended that the Commission accept this report, discuss the matter, and provide advice and guidance to the Department as appropriate.

Reference Documents (available upon request)

Federal transportation conformity rules 58 Fed. Reg. 62188 Nov. 24, 1993.

Approved:

Section: Howard W. Harris

Division: Gregory A. Green

Report Prepared By: Annette Liebe

Phone: 229-6919

Date Prepared: January 5, 1995

AL:al
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January 5, 1995

PROPOSED TRANSPORTATION CONFORMITY RULE

PRESENTATION TO THE ENVIRONMENTAL QUALITY COMMISSION

JANUARY 20, 1995

Advisory Committee Membership

CHAIR: Susan Brody
Associated Oregon Industries
Oregon Department of Transportation
METRO
Sensible Transportation Options for People
Rogue Valley Council of Governments
Tri-Met
League of Oregon Cities
1000 Friends of Oregon
Association of Oregon Counties
Sierra Club
Lane Council of Governments
LRAPA
Mid-Willamette Valley Council of Governments

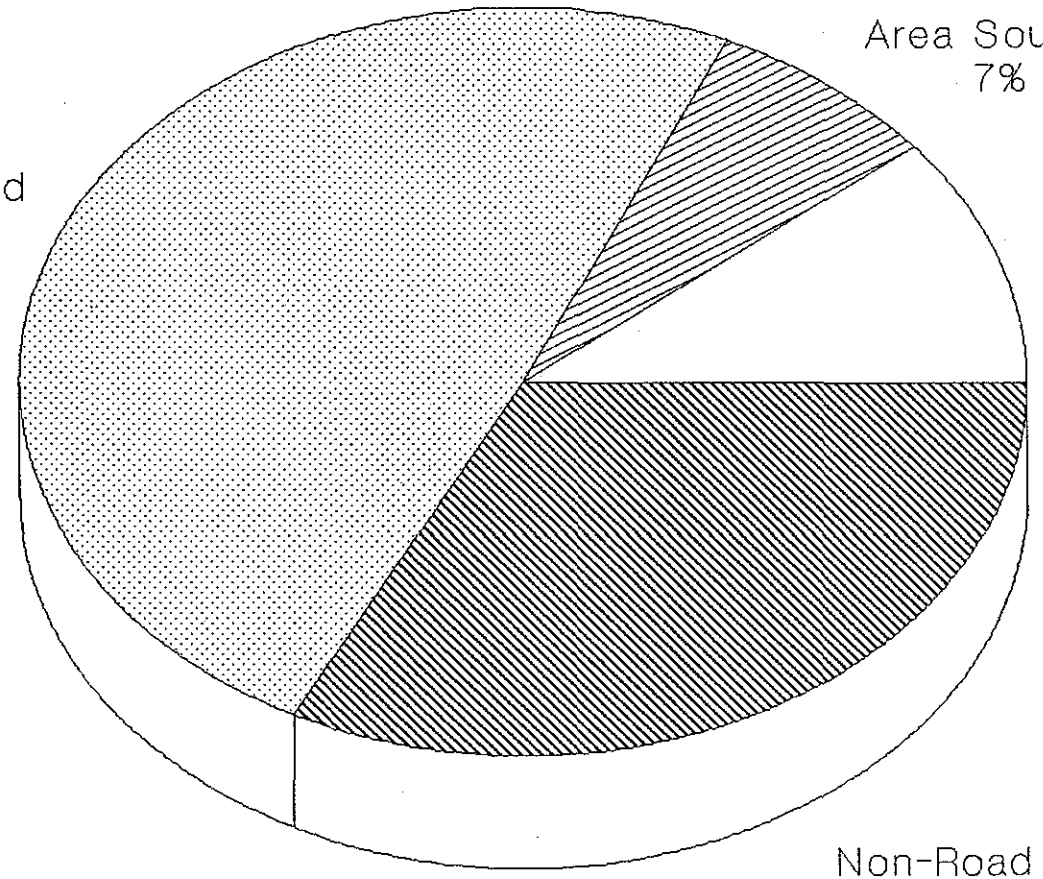
Objective of Transportation Conformity Rule

Ensure that Transportation Plans and Projects and their associated emissions are consistent with Air Quality nonattainment and maintenance plans (SIPs).

Why is this objective important?

Transportation Plans/Projects that have higher emissions than are allocated to motor vehicles in a SIP would cause or contribute to nonattainment.

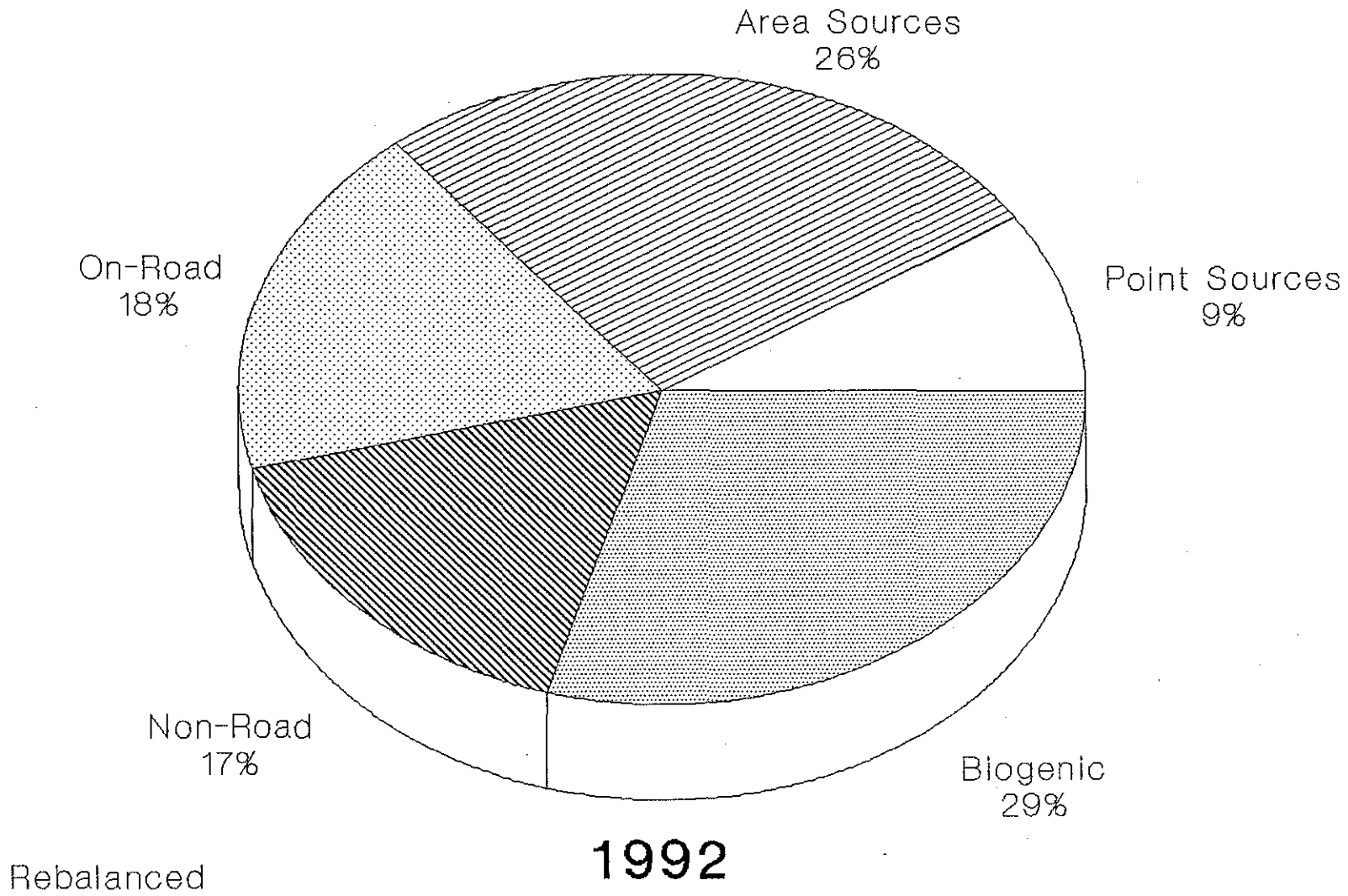
PORTLAND-VANCOUVER NOx EMISSIONS



1992

Rebalanced

PORTLAND-VANCOUVER VOC EMISSIONS



1992

Rebalanced

Why is DEQ proposing these rules?

These rules are required by:

1. 1990 Clean Air Act Amendments;

2. Joint USEPA/DOT implementing regulations. 58 FR 62188

Overview of Transportation Planning Under the Intermodal Surface Transportation Efficiency Act

Metropolitan areas (more than 50,000 pop.):

1. Regional Transportation Plan (RTP)

   * covers 20 year period;
   * Describes planned facilities and policies;
   * conformity must be redetermined every 3 years.

2. Transportation Improvement Program (TIP)

   * generally cover 3 -7 years;
   * allocate funding for specific projects;
   * conformity must be redetermined every 2 years.

Non-Metropolitan areas:

Regional emissions analysis is linked to statewide transportation plan and statewide transportation improvement program

OR

is determined on a case-by-case basis.

Overview of Air Quality Planning

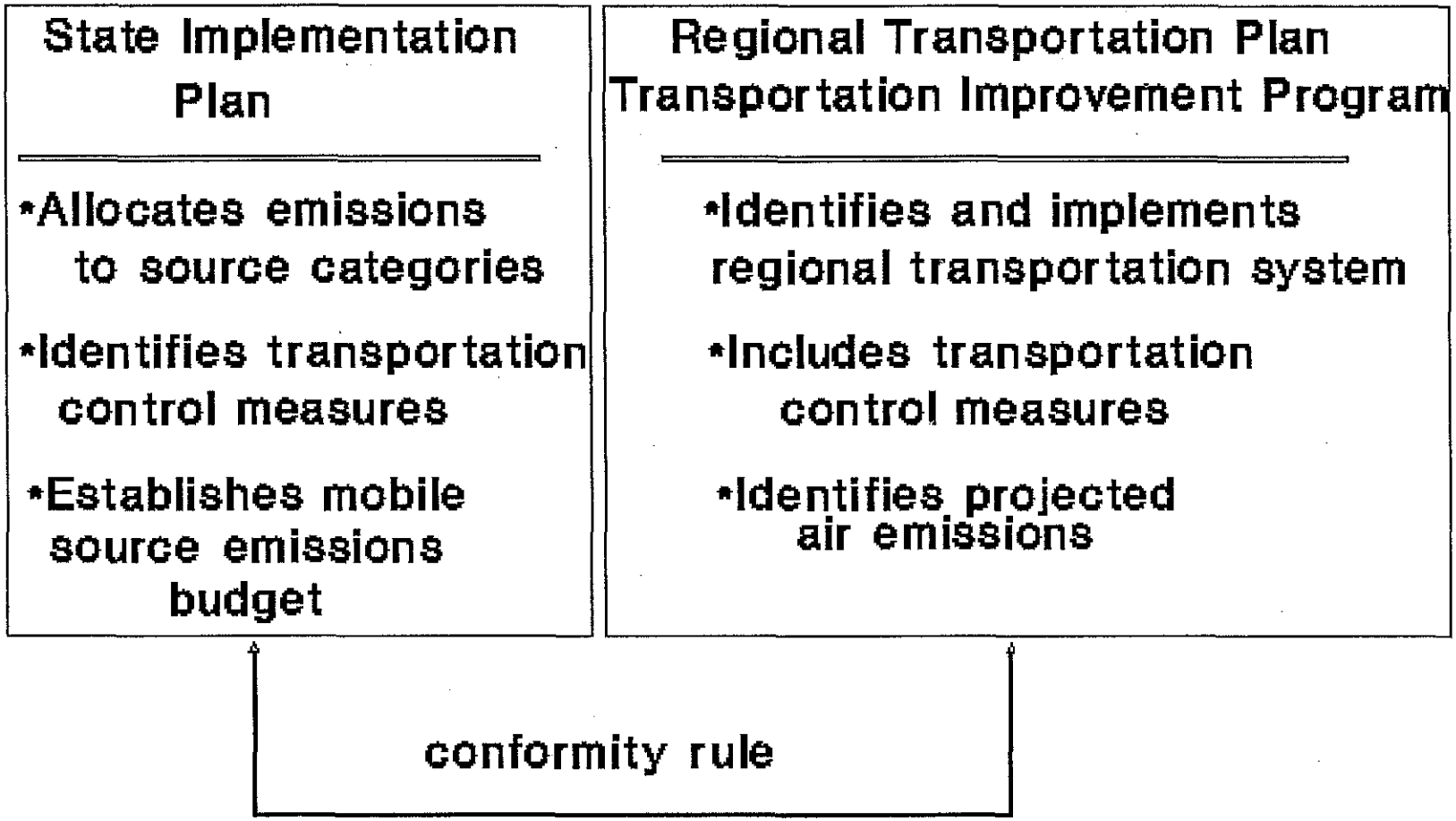
State Implementation Plans in Nonattainment and Maintenance Areas:

* allocate emissions among source categories (i.e. stationary, area, and mobile sources);

* establish mobile source emissions budgets;

* identify transportation control measures (TCMs).

Conformity Rule Function



Requirements of the federal rule:

1. Applies to nonattainment and maintenance areas.

2. Requires States to develop interagency consultation procedures to address several issues, in particular:

   * establishing a mobile source emissions budget;

   * determining projects that are "regionally significant;"

   * selecting transportation control strategies;

   * determining if obstacles to implementation of transportation control measures are being overcome.

Phase I Requirements

Applicable until a post-1990 attainment or *maintenance* plan is submitted to EPA.

1. build/no-build analysis

2. reductions from 1990 levels

3. timely implementation of TCMs.
   regardless of eligibility for federal funding

Transitional Requirements

Applicable while EPA is reviewing post-1990 attainment *or maintenance* plans.

1. build/no-build analysis

2. reductions from 1990 levels

3. consistency with emissions budget

4. timely implementation of TCMs.

regardless of eligibility for federal funding

Control Strategy Requirements

Applicable once EPA approves a post-1990 attainment or maintenance plan.

1. consistency with emissions budget

2. timely implementation of TCMs.
   regardless of eligibility for federal funding

Project level requirements.

Federally funded or approved projects	"regionally significant" projects not federally funded
1. conformity determination required	*1. conformity determination required*
a. included in a regional analysis	a. included in a regional analysis
b. no interference with TCMs	*b. no interference with TCMs*
c. localized analysis for projects LOS D, E, or F	*c. localized analysis for projects LOS D, E, or F*

Consequences of failure to demonstrate conformity.

Regional Transportation Plan not approvable by USDOT.

Resulting in no federal funding of RTP.

Transportation Improvement Program not approvable by USDOT.

Resulting in no federal funding of TIP.

Transportation project not approvable by USDOT

or local governments.

RESULT:

RTP, TIP or project must be reconfigured
to reduce emissions.

6TH ANNUAL ENVIRONMENTAL CLEANUP REPORT

JANUARY
1995

SIXTH ANNUAL

ENVIRONMENTAL CLEANUP REPORT

January 1995

submitted to:

Governor John Kitzhaber

•

Oregon Legislative Assembly

•

Environmental Quality Commission

by:

Lydia Taylor, Interim Director
Department of Environmental Quality

Mary Wahl, Administrator
Waste Management and Cleanup Division

printed on recycled paper

Forward

The Department of Environmental Quality's (DEQ) Environmental Cleanup Program has been in operation for nearly seven years. During that time, many improvements have taken place. Improvements will continue to be made as the program evolves. Environmental Cleanup Program priorities are:

- Continue to conduct site cleanups that protect public health and the environment in the most cost effective manner possible
- Provide adequate funding for the Orphan Site Cleanup program

DEQ is committed to improving the efficiency of the cleanup program and reducing costs for responsible parties wherever possible. An example of some improvements already made and those planned are:

- Adoption by the Environmental Quality Commission of Lender Liability Rule Amendments
- Full implementation of the Voluntary Cleanup Program, currently overseeing the cleanup of over 100 sites
- Revision of risk assessment procedures
- Improvement of the remedy selection process through written policy and guidance and, where appropriate, authorization of the use of "presumptive remedies"
- Submission to the Legislature for approval to develop and implement a low interest loan program for local governments wishing to clean up "brownfields" and return them to productive use

This report also summarizes the Environmental Cleanup Program's priorities and accomplishments. A four year plan of proposed cleanup activities and staffing and funding needed to accomplish those activities is also presented.

Respectfully,

Lydia Taylor
Interim Director
Department of Environmental Quality

Introduction

Oregon's Environmental Cleanup program was established in 1988 by the Department of Environmental Quality (DEQ) and given the responsibility of implementing Oregon's environmental cleanup law (ORS 465.200-900). This report presents cleanup program priorities and accomplishments during the past fiscal year (July 1993-June 1994). It summarizes cleanup activities that are in progress, those that have been completed during the current fiscal year, and those projected for completion through June 1995. This report also presents a projected four year plan of action for environmental cleanup through June 1999.

Cleanup Priorities

- Implement cleanup programs and regulations designed to protect public health and the environment in the most cost-effective manner possible

- Provide adequate funding for the Orphan Site Account

DEQ 's environmental cleanup program has been and will continue to be dynamic. Improving the effectiveness and efficiency of the environmental cleanup program is a primary focus for DEQ. Continual updating of the cleanup process and assuring sound program financing are integral to its success. The following is a brief description of the program's history, cleanup process improvements already implemented, and those planned.

Improving the Environmental Cleanup Process

In 1988, the legislature enacted the environmental cleanup program, charging DEQ with discovering and cleaning up sites contaminated with hazardous substances.

During the program's early years, site discovery and evaluation were emphasized. Given the staffing and funding resources at the time, the program could address only a portion of the worst sites. Other sites--both voluntary and enforcement--had to be wait-listed until additional resources were made available.

As the cleanup program evolved and more was understood about environmental contamination and its remedies, the cleanup process has changed. The charts on pages 6-8 of this report illustrate these changes.

Improvements Implemented

In June 1992, the Environmental Quality Commission amended the environmental cleanup rules by adopting numeric soil cleanup levels. These numeric levels apply to cleanups at qualifying sites with soil contamination only in place of the potentially lengthy remedial investigation/ feasibility study method.

The Environmental Quality Commission approved Lender liability rule amendments later in 1992. The amendments clarified the scope of cleanup liability exemption for financial institutions and other persons holding security interests in property. The amendments significantly increased the certainty for banks and other financial institutions about the extent, if any, that real property loan transactions would carry cleanup liability.

Established in 1991 to help responsible parties complete environmental cleanups and facilitate redevelopment of contaminated land, the Voluntary Cleanup Program became fully operational in 1993. Currently, the program oversees the investigation or cleanup of more than 100 sites, allowing property transfers and development to occur more quickly. Responsible parties are given an estimated budget of total DEQ oversight costs in the beginning, providing a greater degree of certainty of program costs. Oregon's program serves as a model for the U.S. Environmental Protection Agency (EPA) and other states.

In 1994, the Soil Cleanup Manual was completed to guide responsible parties cleaning up under the numeric soil cleanup levels.

Brownfields. The Voluntary Cleanup Program also facilitates the redevelopment of vacant, contaminated land know as "Brownfields". Brownfield sites are typically industrial and are often located in developed urban areas. Because of cleanup expense and potential liability, brownfields may lie unused for an indefinite period.

DEQ, through the Voluntary Cleanup Program is committed to working with owners of brownfields to get these areas cleaned up and back into productive use.

DEQ has conducted preliminary assessments at several brownfield sites to determine the nature and extent of contamination. This allows potential developers to be more certain of cleanup costs.

Brownfields Example. The Bald Knob Mill, more than 100 acres in size, is located in the City of Oakridge. The operation is currently going through bankruptcy. The City wishes to obtain the property and redevelop it for mixed commercial/light industrial use. DEQ will provide financial assistance to perform a preliminary investigation of the site to determine the nature and extent of contamination. Based on the results of the investigation, the City of Oakridge can decide whether to go forward with the redevelopment.

In the fall of 1994, DEQ implemented OPENS--Oregon Public Environmental System. OPENS allows the public to access and print the most current reports from DEQ computer databases containing detailed information about environmental cleanup program sites. The OPENS computer terminal is located in DEQ Headquarters in downtown Portland and is available weekdays from 8:30 a.m. to 4:30 p.m. Additional computers in other DEQ offices are planned.

Improvements Planned

DEQ proposes to continue program improvement by accomplishing the following:

- DEQ has submitted a legislative proposal to initiate a program that would provide local governments with low interest loans to pay for preliminary assessments at brownfield sites;
- Continue to revise and improve risk assessment procedures. DEQ has initiated research to incorporate newly available scientific information that will increase the certainty and decrease the costs of establishing cleanup levels;
- Authorize use of presumptive remedies where appropriate. "Presumptive remedies" are preferred cleanup technologies for common categories of sites. The technologies are based on historical patterns of remedy selection and engineering evaluation of performance data on implementation. When cleanups are accomplished using presumptive remedies, the more lengthy and complex RI/FS process isn't necessary;
- Improve the remedy selection process through guidance addressing protective levels, cost effectiveness, and areas of principle threat (hot spots);
- Increase technical and financial assistance to address "brownfields". DEQ is applying to participate in EPA's Brownfields Pilot Project; and
- Promote federal Superfund reforms, including delegation of programs to the state.

Providing Stable Funding for the Orphan Site Cleanup Program

The 1987 Legislature created the Orphan Site Account (OSA) to help pay for high priority cleanups where the responsible parties are unknown, unwilling, or unable to pay for cleanup. DEQ issued pollution control bonds in 1992 for 7.3 million dollars and again in 1994 for five million dollars. Debt service on the bonds was to be paid from the OSA which was funded by three fees: the petroleum load fee, the hazardous substance possession fee, and the solid waste disposal fee.

DEQ discontinued collection and use of the petroleum load fee for this purpose in 1993 following an Oregon Supreme Court ruling on the constitutionality of similar petroleum-derived fees.

The 1993 Legislature recognized the need to establish a stable, long-term funding source for the orphan site program. An interim legislative task force was established to develop recommendations for a permanent funding solution. The interim legislative task force has held meetings during 1994. It is expected that industry representatives will offer their recommendation in the near future.

Orphan Site Cleanups

Currently, DEQ is overseeing the investigation and cleanup of 16 known and proposed "orphan" sites. "Orphan" sites are those whose responsible parties are unknown, or are unwilling, or unable to pay for the cleanup. A site declared an orphan by DEQ is of high public health and environmental priority and may be among the worst hazardous substance-contaminated sites in Oregon. Many of these sites have good potential for redevelopment after cleanup. Designated orphan sites have increased from 7 to 14 during the past fiscal year.

Designated Orphan Sites:

• Astoria Plywood	Astoria
• Chambers Oil	North Bend
• East Multnomah County Area Groundwater	Portland/Gresham
• Industrial Battery	Portland
• Lakewood Estates	Aurora
• Lebanon Area Groundwater	Lebanon
• McCormick and Baxter	Portland
• Milwaukie Area Groundwater	Milwaukie
• Montezuma West Spill	Central Point
• Nu-Way Oil	Portland
• Rogue Valley Circuits	Medford
• Rose City Plating	Portland
• Technical Images	Newberg
• Vadis Pole Yard	North Plains

Cleanup work has also begun at these proposed orphan sites:

• Fashion Cleaners	Klamath Falls
• Wolf Creek Removal	Grants Pass

Refer to the map on page 27 of the Appendix for locations of the orphan sites.

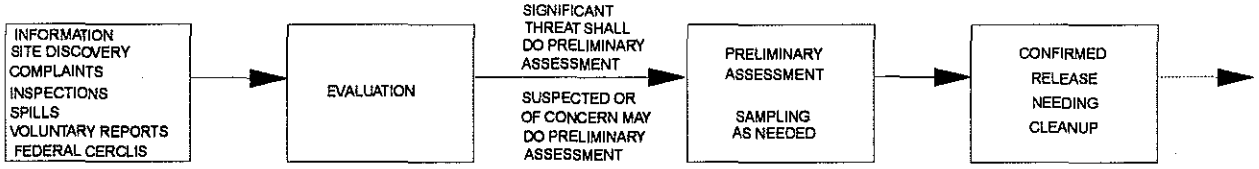
Heating Oil Tanks

In 1993, the legislature enacted the home sale disclosure law which requires that owners with homes offered for sale must disclose the presence of heating oil tanks. Since passage of this law, DEQ has received numerous requests for technical assistance from homeowners who, for example, may wish to decommission abandoned tanks. In September 1994, the Northwest Region Office received 235 phone calls requesting technical assistance.

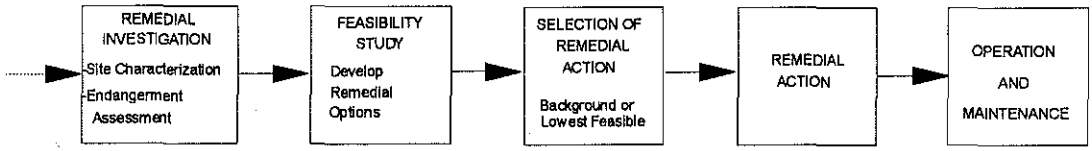
However, no funding nor staff exist to implement this program. DEQ is attempting to respond to these requests with resources from other cleanup programs, primarily the underground storage tank cleanup program.

OLD ENVIRONMENTAL CLEANUP PROCESS

ASSESSMENT PHASES

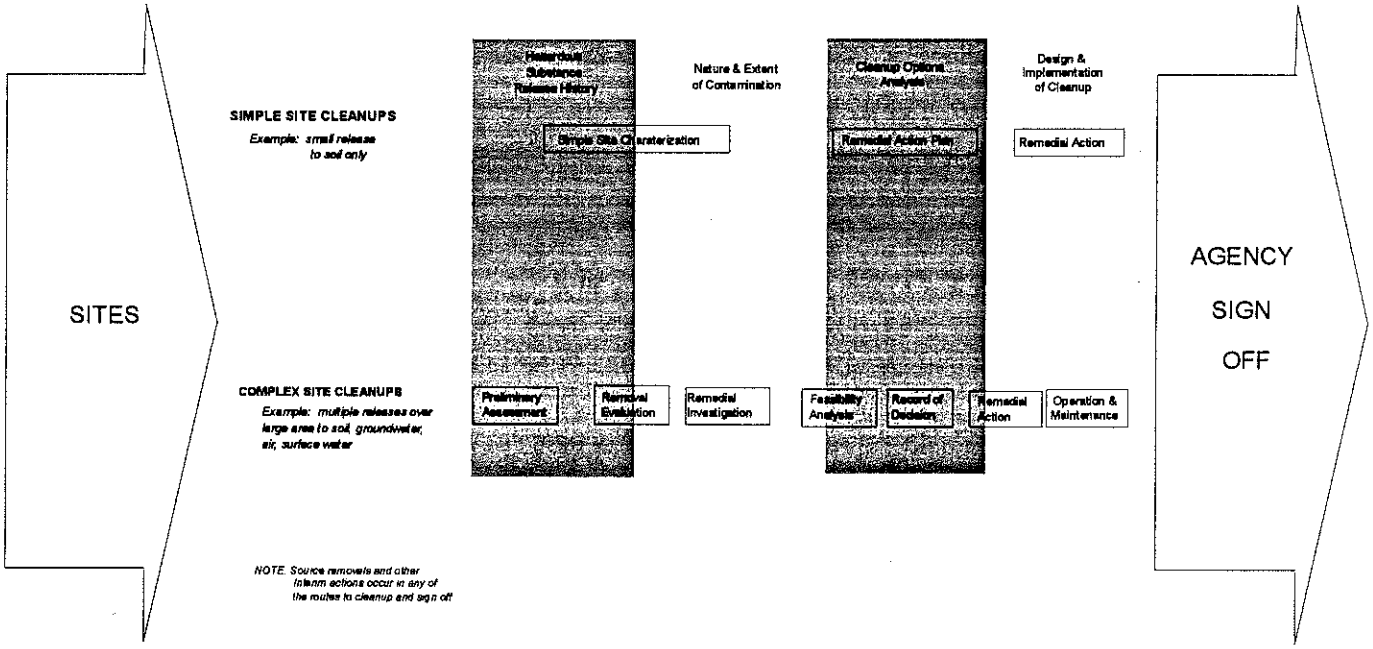


INVESTIGATION AND REMEDIAL ACTION PHASES



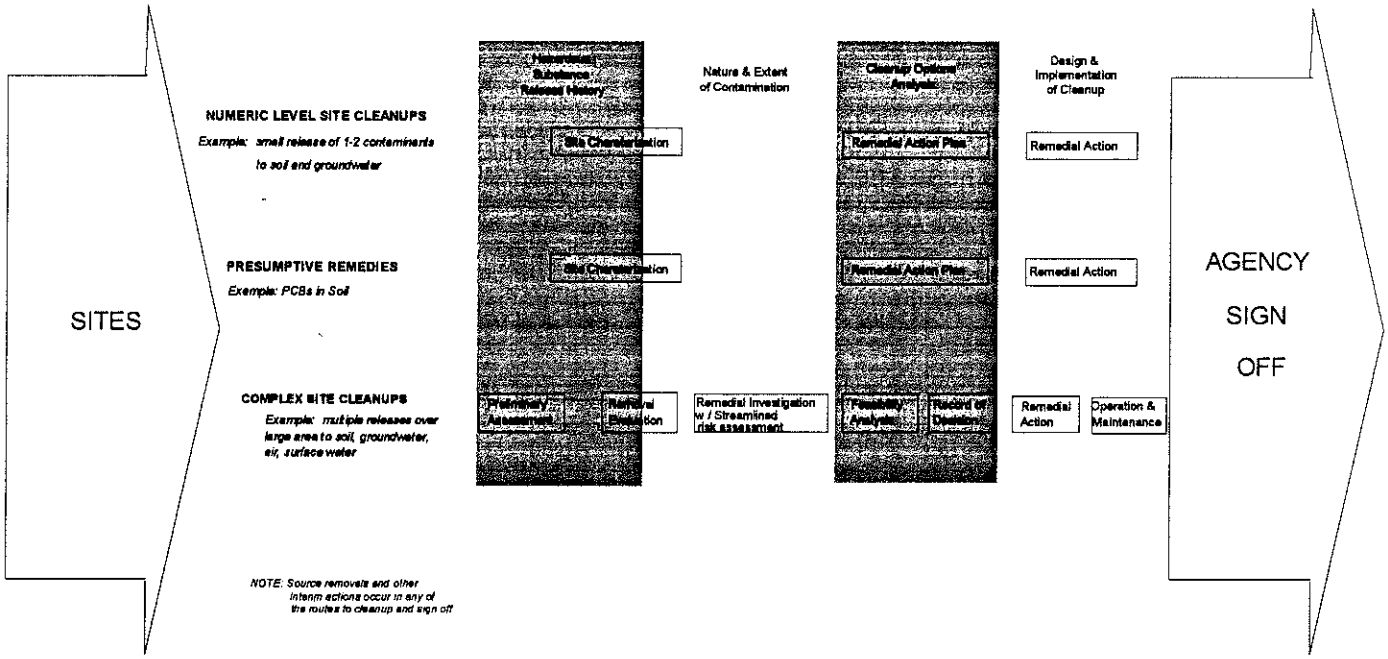
CURRENT

ROUTES TO ENVIRONMENTAL CLEANUP

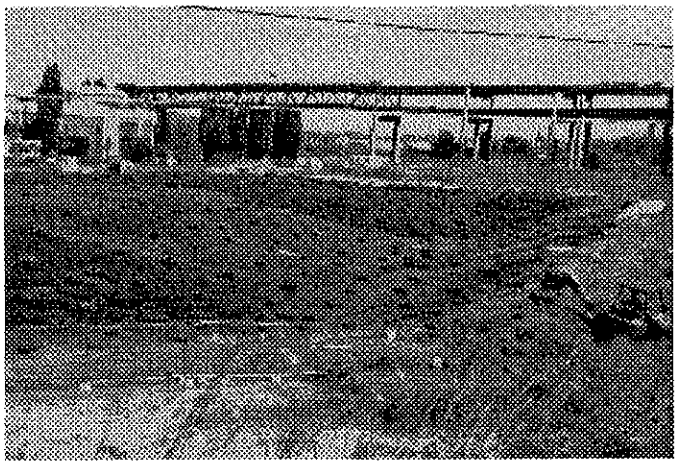


THE FUTURE

IMPROVING THE PROCESS



Voluntary Cleanup Case Study: South Waterfront Redevelopment Area



BEFORE

The South Waterfront Redevelopment Area Project (SWR) demonstrates how DEQ works with responsible parties to get sites cleaned up and back into productive use. In many cases, cleanup can be integrated into development plans and timelines as was done in the SWR project.

SWR, located in Portland on the west bank of the Willamette River near the Marquam Bridge, has had a long and varied history of industrial uses dating back to the late 1800s.

Since 1900, the site has been filled in stages to its present elevation. A portion of the site was occupied by the Pacific Power and Light Lincoln Steam Plant where Bunker C, diesel, and natural gas were used as fuel (see above photo). The sources of industrial fill materials and the sequence of fill events are unknown.

The Portland Development Commission (PDC) entered into an agreement in 1988 for oversight of an environmental investigation of the area. DEQ agreed to conduct the investigation in phases and to address cleanup by subparcels of land to accommodate PDC's development plans. The investigations at the site have confirmed the presence of metals and petroleum hydrocarbons in soil and petroleum hydrocarbons in groundwater.

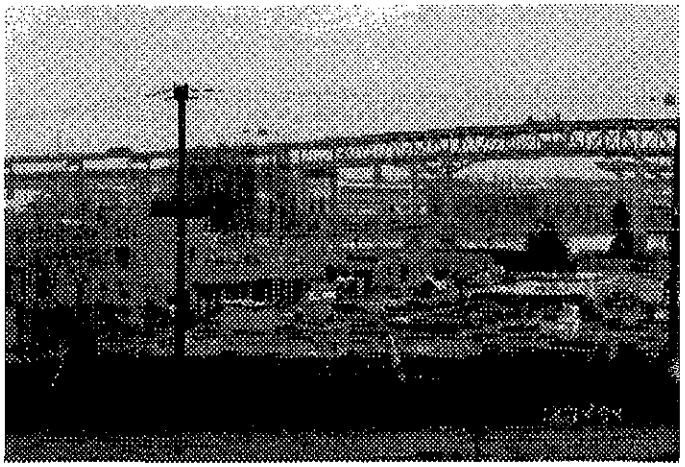
After review of the nature and extent of contamination and the proposed development plans, DEQ approved construction in areas with slightly elevated levels of metals in soils only and in an area where no contamination had been found.

In 1989, DEQ agreed that the proposed buildings and roads would successfully isolate or cap onsite soil contamination and would divert a significant portion of surface water from the site to the city storm water system. To assure adequate construction and continued maintenance of the structures, DEQ established strict design limitations and required that a notice of site conditions and operation and maintenance requirements be attached to the deed.

As a result, roadways, apartment buildings, retail shops, and a parking structure have been built. A multi-unit townhouse and studio apartment residential development is currently under construction (see photo below).

The remaining investigation--the area in the vicinity of the old steam plant (now demolished)--was completed in January 1994. DEQ is in the process of evaluating the risk assessment and feasibility study and expects to be able to select a remedy by spring 1995.

AFTER



Site Response Case Study: Bergsoe Metal Corporation

BEFORE

The Bergsoe Metal Corporation (Bergsoe) cleanup demonstrates how DEQ works with a responsible party to return a contaminated site to beneficial use.

Bergsoe operated a lead smelter to recycle batteries and scrap lead in St. Helens from 1982 to 1986. Batteries, battery plates, lead scrap and slag were delivered to the 43-acre site for smelting, refining, alloying, and subsequent sale.

Following an initial investigation by the United States Environmental Protection Agency (EPA) in 1988, soils were found to be contaminated with lead, arsenic and cadmium. Lead, cadmium, and sulfates have also been detected in groundwater, but levels have varied over time.

Lead and cadmium are probable human carcinogens, and arsenic is known to cause cancer in humans, according to EPA.

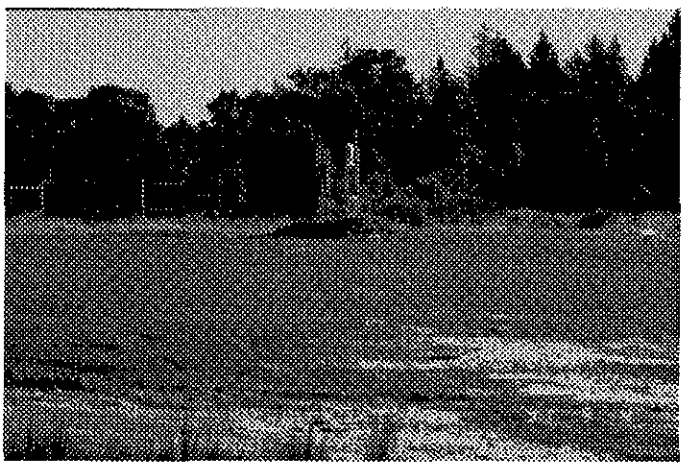
Contaminated waste products from a Bergsoe furnace had been stockpiled at one corner of the site (see above photo). In 1991, DEQ entered into a consent agreement with Bergsoe for the removal of more than 30,000 tons of slag, matte and soil. The excavated pile was removed in May 1991, the area covered with a two foot cap of clean soil (to contain remaining contamination), and seeded with grass.

Other cleanup activities completed on the site are:

- Removal and disposal of contaminated material and debris (3,000 to 4,000 tons) stored in a silo building.
- Cleaning and removal of all processing and air pollution control equipment.
- Excavation and removal of the perimeter road surface, the concrete slag storage pad and surrounding paved area.
- Cleaning of building interiors.
- Removal of the silo building lead- contaminated floor and one to three feet of sub-grade.
- Cleaning of the storm water catch system. Rain gutters were replaced and all storm drains were cleaned.
- Removal of lead-contaminated sediment from the surge pond.
- Removal of lead-contaminated surface soil with concentrations higher than 2,000 parts per million.

Cleanup of the site is nearly complete. When cleanup is finished, the site can be re-occupied for an industrial use.

AFTER



Cleanup Program Accomplishments

Tables A and B show cleanup activities conducted since the environmental cleanup program was created, as well as cleanup work that is projected through the end of the current fiscal year (June 1995).

Site Assessment/ Environmental Cleanup Site Information System (ECSI)

The site assessment process includes discovery of potentially contaminated sites, initial screening and assigning priority, performing preliminary assessments (PA) when appropriate, and determining if further investigation and/or cleanup is necessary.

The Environmental Cleanup Site Information System (ECSI) is an electronic filing system or database of sites contaminated or potentially contaminated by hazardous substances. During the fiscal year July 1993 through June 1994, DEQ added 178 new sites to ECSI with an estimated 126 more to be added by June 1995. Currently there are 1,451 sites in ECSI.

The Confirmed Release List (CRL), a subset of ECSI, is a list of sites where contamination has been verified. Thirty-four new sites were added to the CRL during the 1993-94 fiscal year. Twenty-nine more are estimated to be included by June 1995. The CRL currently has 172 sites.

The "inventory," also a subset of ECSI, is a list of sites where contamination has been confirmed through a preliminary assessment (PA) and the need for further action has been verified. The Inventory increased by 21 new sites during fiscal year 1993-94 with approximately another 18 to be added by June 1995. There are currently 103 sites on the inventory.

The CRL and Inventory do not include all sites in the cleanup process. Responsible parties at some sites perform cleanup on their own without DEQ oversight. At some simple sites, cleanup is done before the listing process is completed.

Site screening categorizes sites by high, medium, and low priority. PAs are conducted only on the highest priority sites, so that cleanups may begin earlier. During the fiscal year July 1993 to June 1994, 210 site screenings were completed. By June 1995, 152 more are expected to be completed.

Between July 1993 and June 1994, 85 preliminary assessments were completed. Fifty-two additional PAs are expected to be completed by June 1995, bringing the total for the biennium to 137.

The 1991 Four Year Plan projected a total of 200 PAs to be completed during the 1993-1995 biennium. During the current biennium, DEQ has concentrated on completing more site screenings to get to cleanup more quickly on the highest priority sites. This practice explains the drop in the number of PAs actually completed during the current biennium.

Voluntary Cleanup

The Voluntary Cleanup Program (VCP) is currently overseeing 104 active projects. New projects are initially placed in the project development (PD) phase. Activities such as negotiations, file review, and work plan approvals occur in the PD phase. VCP had 49 projects which completed the PD phase during the fiscal year 1993-94 and expects to have an additional 36 completed during the fiscal year 1994-95.

Early investigation work done during the PD phase may determine that some projects do not need

further cleanup work. In these cases, sites which complete the PD phase are classified as completed projects.

For the fiscal year ending June 1994, five removals were completed. Eight remedial investigations and three feasibility studies were also completed. For the fiscal year ending June 1995, DEQ projects completion of seven removals, 20 remedial investigations and five feasibility studies. Five remedial actions also are expected to be completed. There are currently 15 projects on the VCP "waiting list." About 3 new projects enter the program each month. VCP completes about 10 projects each year.

Evidenced by the number of projects in progress and the length of the waiting list, the voluntary cleanup program continues to be in demand. The program is funded by responsible parties who request DEQ oversight, allowing staff resources to match the demand for cleanup oversight.

The Voluntary Cleanup Program began operating in February 1991. Therefore, the January 1991 Four Year Plan did not evaluate voluntary cleanup projections.

Voluntary Cleanup Success Story: Tri-Met Westside Light Rail Project

The Tri-County Metropolitan Transportation District of Oregon (Tri-Met) is constructing the Westside Light Rail Project between downtown Portland and S.W. 185th Ave. in Washington County. Construction began in 1993 and is scheduled for completion in 1997. A multi-disciplinary project team was established to provide timely response to the many regulatory and technical issues anticipated on the project. DEQ was included so cleanups could occur beforehand and not delay light rail construction.

The following actions have been completed with DEQ oversight:

1. An underground storage tank removal and cleanup has been completed at the former Rasmussen site located at S.W. Morrison Street in Portland.

2. An underground storage tank investigation was completed and a cleanup plan implemented at the former Roy's Service Station located on S.W. Salmon Street in Portland.

3. A hazardous substance investigation was completed and cleanup implemented at the former Peterkort Nursery located at the intersection of Highways 26 and 217.

4. Hazardous substance removals were completed at sites in two Beaverton locations.

5. Investigation is in progress at the Carson Oil site located in Beaverton.

6. Preliminary investigations have been completed at eight locations in Beaverton and one just outside of Beaverton on Barnes Road.

The Voluntary Cleanup Program's ability to work with Tri-Met to incorporate cleanup into light rail construction has enabled environmental goals to be achieved while meeting the schedule of the Westside Light Rail Project.

Site Response

Site Response is responsible for overseeing the cleanup of the state's worst hazardous substance contaminated sites, including Federal National Priorities List sites, state orphan sites and other high priority enforcement cleanups. The Site Response Section (SRS) is currently overseeing cleanup work at 88 sites. For the fiscal year ending June 1994, SRS completed 12 remedial investigations and one feasibility study. By the end of June 1995, another seven remedial investigations and six feasibility studies are projected for completion.

This exceeds the 1991 Four Year Plan projections of eight remedial investigations and five feasibility studies completed for the 1993-1995 biennium.

During the fiscal year 1993-94, ten removals were finished. Another ten removals should be completed by June 1995. The 1991 Four Year Plan estimated three removals would be completed during the 1993-1995 biennium. Since 1991 more removals have been conducted whenever possible to reduce environmental hazards and to speed the cleanup process. Often, a removal will serve as the final cleanup for a site so that further remedial action is not necessary.

SRS completed three remedial designs/remedial actions during fiscal year July 1993 through June 1994. Two additional remedial designs/remedial actions should be completed by July 1995. For the 1993-1995 biennium, the 1991 Four Year Plan estimated that 12 remedial designs/remedial actions would be completed. The decrease in the number of remedial actions from previous projections represents DEQ's shift toward conducting more removals early in the cleanup process.

Follow up monitoring or operation and maintenance (O&M) activities have been started at two sites during the previous fiscal year. By June 1995, O&M activities will begin at three additional sites.

As mentioned, SRS is conducting more interim cleanup actions such as soil removals, stabilization, site security, and groundwater treatment systems during the investigation phase at complex sites. When it is apparent an interim cleanup action will prevent the spread of contamination or achieve a significant degree of cleanup early in the process, DEQ selects that action. Interim cleanup actions allow final cleanups to occur more quickly which may also reduce costs.

In addition to the removals stated above, 17 interim cleanup actions have been conducted during the current biennium.

Underground Storage Tank (UST) Cleanups

During the fiscal year ending June 1994, DEQ received reports of 655 releases of petroleum from underground storage tanks. Reports of an additional 500 releases are projected by June 1995. 107 cleanups were completed during fiscal year July 1993 through June 1994. For the July 1994 through June 1995 fiscal year 200 completed cleanups are projected.

Soil pile treatment cleanups provide a lower cost option for responsible parties. Approximately 2000 site files were reviewed to determine contaminated soil treatment status. 487 on-site inspections were conducted. More than 1500 soil pile sites were brought into compliance with DEQ soil treatment requirements since the beginning of the current biennium.

Spill Response and Drug Lab Cleanups

To better facilitate communication between the local responders and DEQ, DEQ has identified staff in the Regional Offices to serve as Spill Coordination Team Leaders. These Team Leaders serve as liaisons between the Department and local hazmat teams. Spill Coordination Team Leaders respond to emergency spills of hazardous substances by providing technical assistance, resource coordination, and providing standards for environmental cleanup and restoration.

A DEQ representative attends Hazardous Material Emergency Response Team Technical Assistance Group meetings to identify and resolve problems and to better coordinate local responder and DEQ responses to spill incidents.

Most spills are cleaned up by responsible parties. DEQ cleans up only a small portion of the hundreds of emergency spills of hazardous materials reported annually by arranging cleanups when no responsible

party is available. Additionally, DEQ's spill response program oversees cleanup and disposal activities performed by responsible parties.

For the fiscal year ending June 1994, DEQ's contractors cleaned up 43 emergency spills, totalling $208,545.

DEQ continues to provide technical assistance and chemical disposal services for law enforcement agencies taking action against illegal drug manufacturing labs. During the fiscal year ending June 1994, 40 illegal drug labs were cleaned up at a cost of $71,568.

Table A: Projects Completed

			Current Biennium		4-year plan Projections		
Site Assessment	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Suspected Releases Added	957	279	178	126	300	300	2140
Confirmed Release List Additions	33	63	34	29	60	60	279
Facilities added to Inventory	24	38	21	18	35	35	171
Site Screenings	126	251	210	152	350	350	1439
Preliminary Assessments	181	136	85	52	120	120	694
Voluntary Cleanup	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Project Development	1	48	49	36	50	50	221
Removals	0	7	5	7	5	5	26
Remedial Investigations	1	7	8	20	12	12	56
Feasibility Studies	0	2	3	5	12	12	29
Remedial Actions	0	1	3	5	22	33	63
Site Response	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Removals	11	9	10	10	16	20	76
Remedial Investigations	7	21	12	7	14	18	79
Feasibility Studies	6	8	1	6	14	16	51
Remedial Design & Remedial Action	6	6	3	2	6	8	31
Underground Storage Tank Cleanup	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Releases Reported	2487	2004	655	500	1000	1200	7846
Cleanups	746	608	107	200	400	500	2561

Table B: Projects Initiated

	Current Biennium		4-year plan Projections			
Site Assessment	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Site Screenings	118	93	232	155	356	356	1310
Preliminary Assessments	91	170	89	60	138	138	686
Voluntary Cleanup	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Project Development	13	52	48	21	50	50	234
Removals	1	8	6	2	5	5	27
Remedial Investigations	2	28	27	10	25	25	117
Feasibility Studies	0	2	22	5	12	12	53
Remedial Actions	0	5	11	5	22	33	65
Site Response	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Removals	14	18	12	13	30	30	117
Remedial Investigations	43	19	22	8	16	16	124
Feasibility Studies	18	6	2	4	16	16	62
Remedial Design & Remedial Action	15	11	4	6	12	12	60
Underground Storage Tank Cleanup	**1/88-6/91**	**7/91-6/93**	**7/93-6/94**	**7/94-6/95**	**7/95-6/97**	**7/97-6/99**	**TOTAL**
Cleanups	1172	1209	552	400	800	900	5033

Four Year Environmental Cleanup Plan

A four year plan of action for the environmental cleanup program is included in this report as required by ORS 465.235. The last four year plan of action was completed in 1991 for the 1991-1993 and 1993-1995 biennia. This report's four year plan covers the 1995-1997 and 1997-1999 biennia.

The plan estimates the number of preliminary assessments, remedial investigations, feasibility studies and remedial actions initiated and completed during the next four years. The plan also includes information about leaking underground storage tank cleanups.

As previously stated, the cleanup program has accomplished much since its beginning in 1988.

- The state is overseeing cleanup at 192 sites--a record number.
- The Voluntary Cleanup Program continues to respond to an increasing demand--104 active cleanups with 15 on the waiting list.
- The number of orphan site cleanups has grown from 7 to 16 over the last biennium.
- Improving the efficiency and effectiveness of the cleanup process has been a continuing goal:
  * Soil Cleanup Rules
  * Voluntary Cleanup Program
  * Lender Liability Rules
  * Soil Cleanup Manual
  * DEQ Work Group formed to improve risk assessment procedure and develop remedy selection guidance.
  * DEQ/Local Government collaboration to address "Brownfields" cleanups.

Direction

Site Assessment will continue to use site screenings as a tool to identify the highest priority sites. Those sites will then be referred to the appropriate cleanup program. Cleanup of high priority sites will begin sooner.

Voluntary Cleanup anticipates steady growth in projects and will continue to look for ways to improve the process. Voluntary Cleanup expects to have 210 active projects by the end of the 1995-97 biennium.

Site Response expects to conduct more emergency removals. Many of these will be orphan sites. Since the beginning of the current biennium, the number of orphan site cleanups has doubled.

Underground Storage Tank Cleanup will continue to work with soil pile treatment cleanups. Soil pile treatment is often a lower cost cleanup option for responsible parties. Other goals are to improve the initial site screening process to better identify high priority sites and to continue working with heating oil tank issues.

Four-Year Projections

Tables A and B predict the number of cleanup activities for the preliminary assessment, voluntary cleanup, site response, and underground storage tank cleanup programs.

Site assessment expects to complete 350 site screenings during the 1995-1997 biennium and 350 during the 1997-1999 biennium. Preliminary assessments projected to be conpleted are 120 for each biennium.

With ***voluntary cleanups*** increasing, 22 remedial actions are expected to be completed during the 1995-1997 biennum with 33 finished during the 1997-1999 biennium. The Voluntary Cleanup Program has experienced steady growth in new projects--approximately three new projects per month--since 1992.

Site Response expects to continue with "time-critical" removals into the next two biennia and will continue to oversee more orphan site cleanups. Site Response estimates that 16 removals and/or interim remedial actions will be completed during the 1995-1997 biennium and 20 during the 1997-1999 biennium. Six Remedial designs/remedial actions are expected to be completed during the 1995-1997 biennium with eight more during the 1997-1999 biennium.

Besides continuing to address soil pile cleanups, the underground storage tank cleanup program expects to complete 400 cleanups during the 1995-1997 biennium and about 500 during the 1997-1999 biennium.

Staffing and Funding

To continue cleanup programs at current levels, the 1995-1997 budget will need to maintain current staffing and funding levels.

To meet the projected Voluntary Cleanup demand of 125 active projects by the end of this biennium, DEQ has requested 14 existing limited duration staff to be made permanent and also has requested 11 new limited duration staff.

To increase DEQ's response to Brownfields, DEQ has requested a position to develop and implement a local government loan program. Low interest loans would be granted to qualifying local governments to help assess the extent of contamination and estimate the cost of returning contaminated property to beneficial use.

Site Response proposes to make permanent five new positions to meet the anticipated demand of one to two new projects per month over the next biennium.

Underground Storage Tank Cleanup proposes to add two staff to manage petroleum contaminated soil treatment (soil piles) cleanups.

Finally, DEQ has requested authorization to sell pollution control bonds to provide for the continued cleanup of orphan sites.

Table C is an overview of the 1995-1997 Agency Requested Budget for the environmental cleanup program.

TABLE C: ENVIRONMENTAL CLEANUP PROGRAM

AGENCY REQUESTED BUDGET

(1995-1997)

ACTIVITY	Requested Budget*	FTE	Funding
Hazardous Substance Cleanups (High priority enforcement; Orphans Sites; Voluntary)	$26.5 million	103.6	HSRAF** Orphan Site Account Cost Recovery
	$989,000	0.0	Federal
UST Cleanup (Heating oil tanks; Soil pile treatment; petroleum USTS)	$1.2 Million	10.62	HSRAF Cost Recovery
	$1.9 Million	12.6	Federal
Emergency Response (Spills)	$89,311	.50	General Fund;
	$51,932	.00	Petroleum load fee;
	$667,940	2.25	HSRAF
Illegal Drug Lab Cleanup	$115,000	0.0	Illegal drug asset forfeiture Illegal drug cleanup fund

* Base Budget and Program Option Packages
** Hazardous Substance Remedial Action Fund

Appendix

Environmental Cleanup Glossary

Maps of Active Sites

Environmental Cleanup
GLOSSARY

aquifer: an underground bed or layer of earth, gravel or porous stone that contains water.

background: the level of hazardous substance occurring naturally in the environment prior to a spill or release.

brownfield: vacant, contaminated property that is typically industrial and is located in a developed urban area.

confirmed release list: a list of properties where it has been verified that a hazardous substance has been released into the environment. Sites on the confirmed release list do not necessarily require any cleanup action.

consent order: A legal document that specifies a responsible party's obligations when entering into a cleanup settlement with the state.

corrective action plan: a work plan specifying exactly how a site contaminated with petroleum products will be cleaned up.

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act--commonly known as Superfund; the federal law passed in December 1980 authorizing identification and cleanup of abandoned hazardous waste sites.

DEQ: Department of Environmental Quality; the Oregon state agency established to restore, enhance, and maintain the quality of Oregon's air, water and land.

EPA: United States Environmental Protection Agency; the agency responsible for enforcing federal laws protecting the environment.

EQC: Environmental Quality Commission; the five-member citizen panel appointed by the Governor to set the environmental policies and regulations for Oregon.

feasibility study (FS): a study conducted to determine different options for cleaning up a site; it is based on information gathered during the "remedial investigation." The FS examines different levels of cleanup, cost effectiveness, permanence and level of protection, as well as available technology.

groundwater: the mass of water in the ground that fills saturated zones of material such as sand, gravel or porous rock.

inventory: the list of sites where release of a hazardous substance has been confirmed and further investigation is necessary.

LUST: leaking underground storage tank.

NPL: National Priorities List; the EPA's official list of hazardous waste sites nationwide to be addressed under the Superfund law.

numeric cleanup standards: a matrix used in simple soil cleanups that defines "how clean is clean" by setting a pre-approved cleanup level.

orphan site: a site contaminated with hazardous substances where the owner/operator is unknown, unwilling or unable to pay for cleanup.

plume: the extent or boundaries of the spread of contamination in groundwater.

preliminary assessment (PA): the initial determination to confirm whether a hazardous substance has been released into the environment, and whether further action is necessary.

presumptive remedy: a preferred cleanup technology for common categories of sites.

release: a hazardous substance that has spilled, leaked or otherwise been discharged into the environment.

remedial action (RA): work done at a contaminated site to permanently clean up, control or contain the hazardous substances.

remedial investigation (RI): an environmental investigation that includes information on the types and concentrations of hazardous substances, the geology and hydrology of the area, and an evaluation of potential risks to human health and the environment.

removal: work done at a contaminated site to clean up or remove a release of hazardous substances, including but not limited to security fencing or other means of limiting access and instigating measures to prevent contamination spread.

risk assessment: a comprehensive evaluation that examines potential risk to human health and the environment in terms of routes of exposure, populations at risk, and degree of harmful effects.

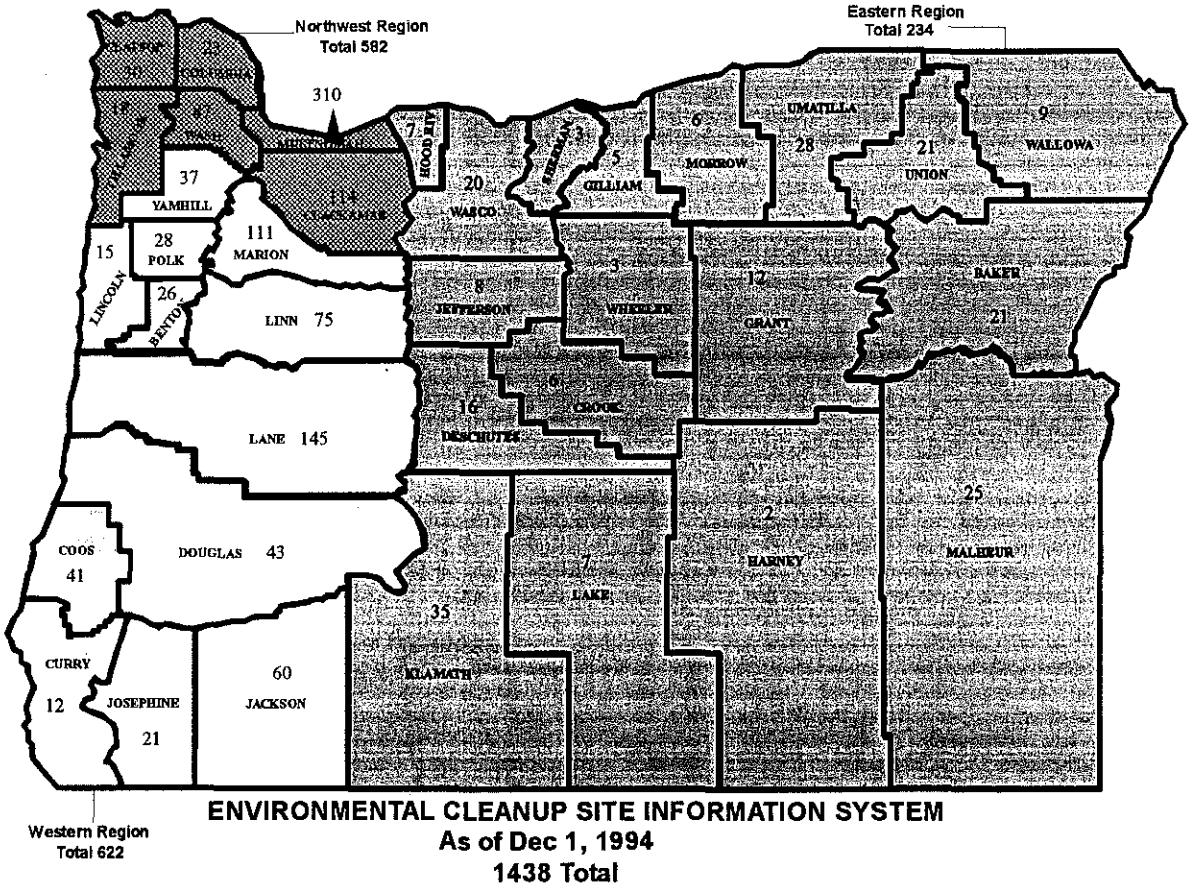
SARA: Superfund Amendments and Reauthorization Act (1986); federal law reauthorizing and expanding the jurisdiction of CERCLA.

site investigation: an environmental investigation that includes information to determine whether a site should proceed to the next stage of investigation or whether it should be placed in a No Further Action status. A site investigation may be performed when a full RI/FS is not required.

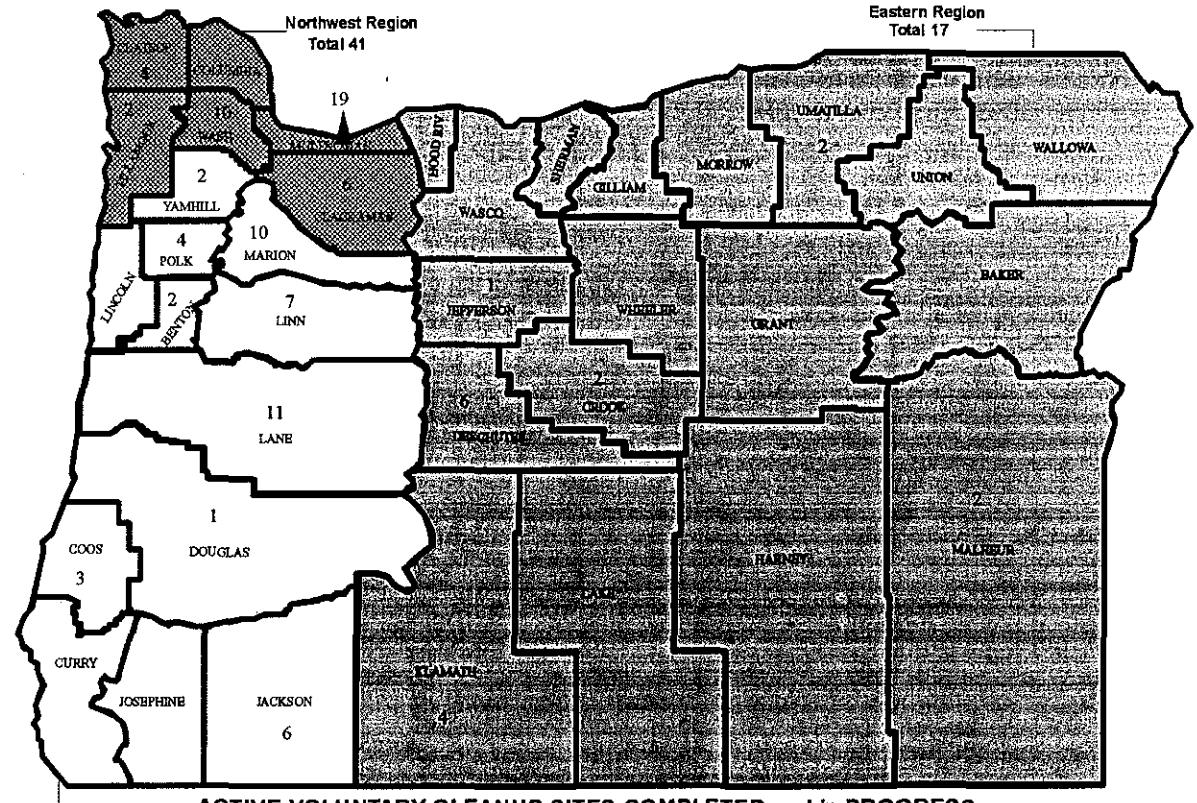
Superfund: see CERCLA

ust: underground storage tank

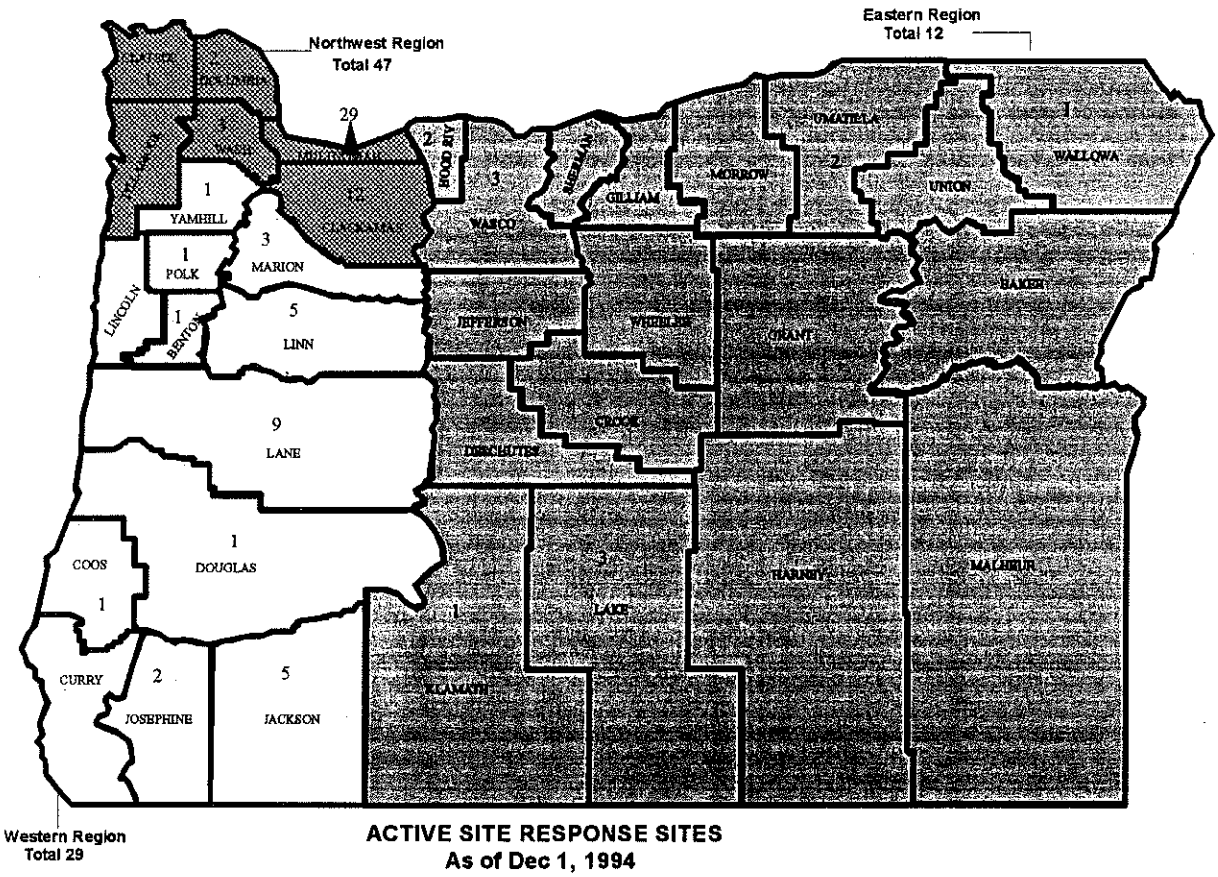
work plan: a detailed report including a schedule for completing an investigation, a description of sampling methods, quality control measures, and safety procedures.



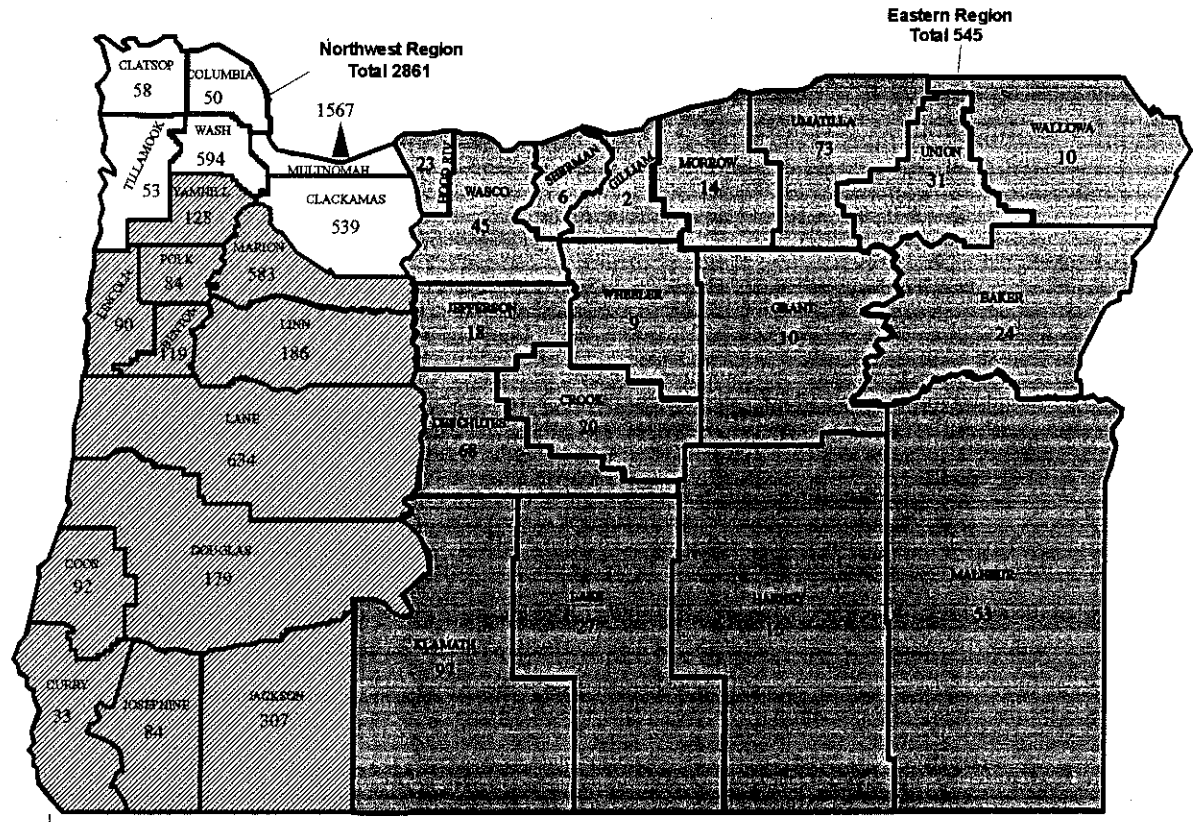
ENVIRONMENTAL CLEANUP SITE INFORMATION SYSTEM
As of Dec 1, 1994
1438 Total



ACTIVE VOLUNTARY CLEANUP SITES COMPLETED and In PROGRESS
As of Dec 1, 1994
104 Active

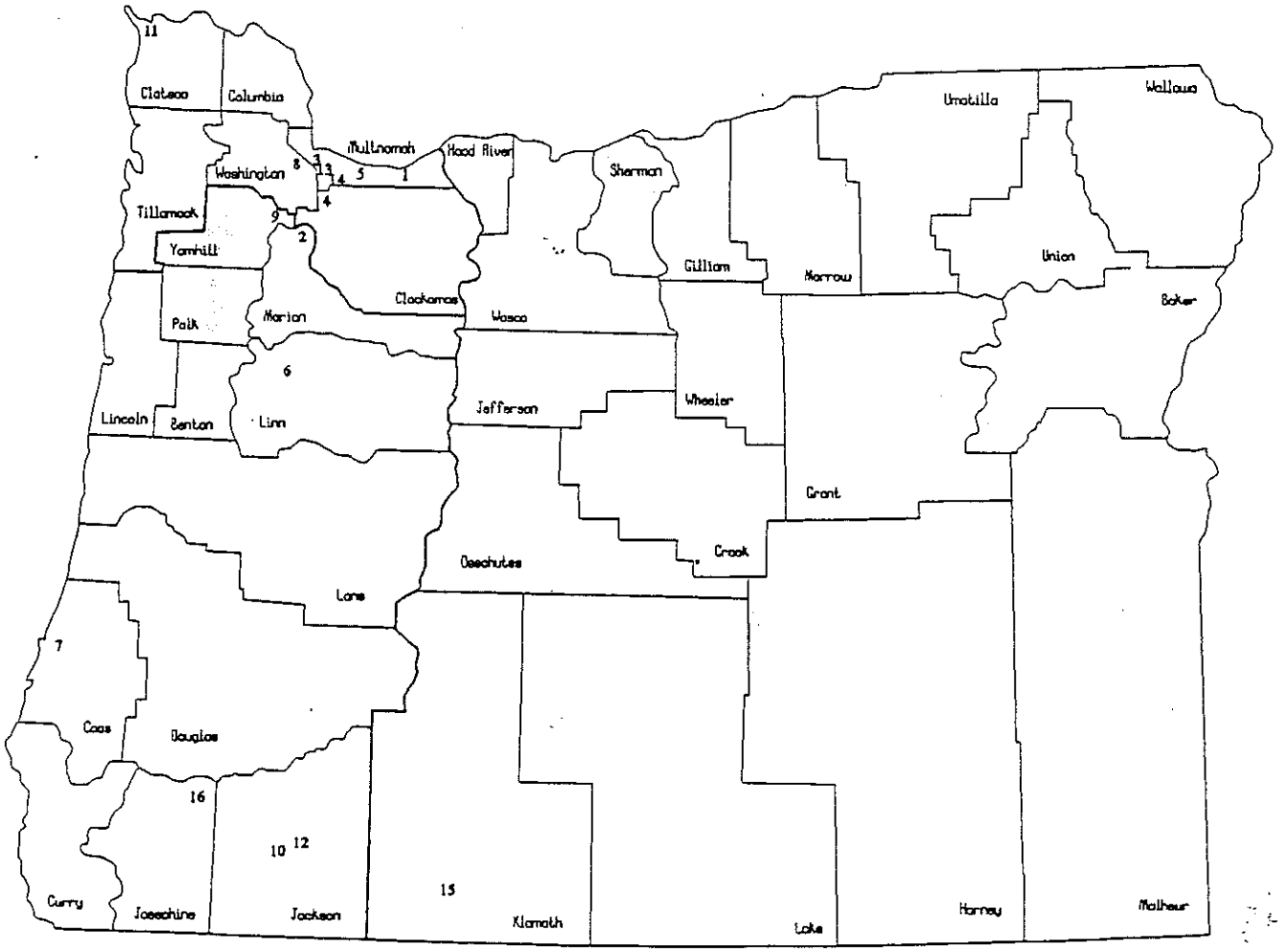


ACTIVE SITE RESPONSE SITES
As of Dec 1, 1994
88 Active



SITES CONTAMINATED BY RELEASES FROM ALL PETROLEUM TANKS
As of Dec 1, 1994 Total: 5925 Sites

Location Of Active Orphan Sites



Existing Sites

1 East Multnomah County Area Groundwater
2 Lakewood Estates
3 McCormick and Baxter
4 Milwaukie Area Groundwater
5 Nu-Way Oil
6 Lebanon Area Groundwater
7 Chambers Oil
8 Vadis Pole Yard
9 Technical Images
10 Rogue Valley Circuits
11 Astoria Plywood
12 Montezuma West Spill
13 Industrial Battery
14 Rose City Plating

Proposed Sites

15 Fashion Cleaners
16 Wolf Creek Removal

12/9/94

SOUTH WATER FRONT - PAGE 11 OF THE ENVIRONMENTAL CLEANUP REPORT

BERGSOE METAL - PAGE 12 OF THE ENVIRONMENTAL CLEANUP REPORT

Oregon Department of Environmental Quality
Brownfield's Strategy

What is a Brownfield

1. Inactive industrial site.
2. Abandoned.
3. Contaminated.
4. Existing infrastructure.
5. Economic redevelopment potential.

Voluntary Cleanup Program Initiatives

1. Be Responsive - redevelopment projects are a high priority
2. Provide enhanced technical assistance -
   - consultant selection
   - liability/cost recovery strategy
   - conferences on cleanup issues
3. Provide Local Gov't Financial Assistance - loans and grants
4. Clarify/Limit Liability
5. Help Shape National EPA Cleanup/Economic Redevelopment Strategies

Prospective Purchaser Agreements

Release "innocent" purchaser from State Liability for:

a. Sites in need of cleanup
b. Cleanups performed with State oversight
c. Cleanups resulting in "substantial benefits":

   - property would not otherwise be cleaned
   - private sector finances cleanup
   - reuse of property results in economic redevelopment

Examples

1. Bald Knob Mill Site - City of Oakridge
   - prospective purchaser agreement
   - site assessment loan
2. Tri-Met Light Rail - Metro/Portland
   - immediate response
   - streamlined investigation/cleanup agreement
3. John Battin Power Service/Home Depot
   - immediate response
   - prospective purchaser agreement

Key Projects Underway

1. State submittal of EPA Brownfield's Grant
2. Legislative Program Package for Local Gov't Assistance
3. State development of Bona-Fide Prospective Purchaser Strategy

Approved	✓
Approved with Corrections	

Minutes are not final until approved by the EQC

ENVIRONMENTAL QUALITY COMMISSION

Minutes of the Two Hundred and Forty First Meeting
December 2, 1994

Regular Meeting

The Environmental Quality Commission regular meeting was convened at 8:30 a.m. on Friday, December 2, 1994, in Conference Room 3A, Oregon Department of Environmental Quality (DEQ), 811 S. W. Sixth Avenue in Portland, Oregon. The following Commission members were present:

William Wessinger, Chair
Emery Castle, Vice Chair
Henry Lorenzen, Commissioner
Linda McMahan, Commissioner
Carol Whipple, Commissioner

Also present were Michael Huston, Assistant Attorney General, Oregon Department of Justice, Lydia Taylor, Interim Director, DEQ, and other DEQ staff.

Note: Staff reports presented at this meeting, which contain the Department's recommendations, are on file in the Office of the Director, DEQ, 811 S. W. Sixth Avenue, Portland, Oregon 97204. Written material submitted at this meeting is made a part of this record and is on file at the above address. These written materials are incorporated into the minutes of the meeting by reference.

Chair Wessinger called the meeting to order.

A. Approval of minutes.

Commissioner Whipple moved approval of the minutes of the special meeting held May 16, 1994; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

Michael Huston, Assistant Attorney General, made a correction to page 9 of the October 20 and 21 work session and regular meeting minutes. Page 9, last paragraph, second line should read as follows:

... container law is not a ~~[delegated]~~ ***delegative*** statute; that is, ...

Commissioner Castle moved approval of the corrected minutes for the October 20 and 21 work session and regular meeting; Commissioner Whipple seconded the motion. The motion was unanimously approved.

B. Approval of tax credits.

The Department recommended issuance of the following tax credit applications:

Application Number	Applicant	Description
TC 2900	A.E. Staley Manufacturing Company ($206,568)	A water pollution facility for industrial waste treatment and disposal consisting of irrigation sprinklers, flowmeters, pumps and associated piping, monitoring equipment, a tractor, hay baler, rake and a 59 acre irrigation field.
TC 4082	Pacific Rim Trading ($5,950)	A reclaimed plastic product facility consisting of three plastic injection molds for manufacturing plastic parts.
TC 4119	H.C.R., Inc. Dba Hergert's Industries, Inc. ($64,266)	A reclaimed plastic product facility consisting of a plastic injection mold for manufacturing lids and bases for compost bins.
TC 4221	Hayden Saab Services, Inc. ($3,996 /82%)	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.

Application Number	Applicant	Description
TC 4233	Wayne E. Burger Dba Fast Stop Gas ($19,803 /82%)	An underground storage tank (UST) facility consisting of two fiberglass tanks and doublewall fiberglass piping, spill containment basins, a tank gauge system, overfill alarm, automatic shutoff valves, monitoring wells, sumps and Stage II vapor recovery piping.
TC 4238	Stein Oil Co., Inc ($7,719)	An air pollution control facility consisting of an above ground Stage II vapor recovery balance type system.
TC 4244	Energy Systems NW ($1,655)	An air pollution control CFC facility consisting of a machine that removes air conditioner or commercial refrigerant coolant.
TC 4246	Les and Terry's Chevron Service, Inc. ($147,989 /89%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and doublewall flexible piping, spill containment basins, a tank gauge system, overfill alarm, automatic shutoff valves, line leak detectors and monitoring wells.
TC 4250	Jesse's Auto Service ($2,295)	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.

Application Number	Applicant	Description
TC 4256	Radio Cab Company ($146,140 /94%)	An underground storage tank (UST) facility consisting of a two-compartment doublewall STI-P3 tank and doublewall fiberglass piping, spill containment basins, a tank gauge system, automatic shutoff valves, line leak detectors, monitoring wells, sumps and Stage I and II vapor recovery equipment.
TC 4257	Stein Oil Company, Inc. ($69,131 /99%)	An underground storage tank (UST) facility consisting of doublewall fiberglass piping, spill containment basins, line leak detectors and Stage II vapor recovery equipment.
TC 4258	Stein Oil Company, Inc. ($117,388 /89%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and piping, spill containment basins, underground preparation for a tank gauge system, automatic shutoff valves, line leak detectors, turbine leak detectors, monitoring wells, sumps and Stage I and II vapor recovery equipment.
TC 4259	John's Automotive Service ($3,525 /80%)	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.

Application Number	Applicant	Description
TC 4262	Truax Harris Energy Co. ($160,826 /88%)	An underground storage tank (UST) facility consisting of four doublewall fiberglass tanks and flexible doublewall piping, spill containment basins, a tank gauge system, overfill alarm, turbine leak detectors, monitoring wells, sumps, an oil/water separator and Stage I and II vapor recovery equipment.
TC 4263	Fairgrounds Service, Inc. ($78,474 /81%)	An underground storage tank(UST) facility consisting of three doublewall fiberglass coated steel tanks, doublewall flexible piping, spill containment basins, a tank gauge system, automatic shutoff valves, monitoring wells with overfill alarm, sumps and Stage I and II vapor recovery piping.
TC 4272	West Central Service, Inc. ($113,149 /81%)	An underground storage tank (UST) facility consisting of four fiberglass tanks, doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, automatic shutoff valves, turbine leak detectors, sumps and monitoring wells.
TC 4273	Western Stations Company ($100,733 /92%)	An underground storage tank (UST) facility consisting of two fiberglass clad steel tanks, doublewall flexible piping, spill containment basins, a tank gauge system, line leak detectors, sumps, and Stage I and II vapor recovery equipment.

Application Number	Applicant	Description
TC 4274	Western Stations Company ($94,707 /99%)	An underground storage tank (UST) facility consisting of cathodic protection on three steel tanks, doublewall flexible piping, spill containment basins, a tank gauge system, overfill alarm, automatic shutoff valves, line leak detectors, sumps and Stage I and II vapor recovery equipment.
TC 4276	Truax Harris Energy Co. ($32,106)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.
TC 4277	Truax Harris Energy Co. ($15,814)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.
TC 4278	Truax Harris Energy Co. ($16,298)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.
TC 4279	Truax Harris Energy Co. ($17,361 /96%)	An underground storage tank (UST) facility consisting of a tank monitor system with alarm.
TC 4280	Truax Harris Energy Co. ($17,895)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.
TC 4281	Truax Harris Energy Co. ($18,594)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.

Application Number	Applicant	Description
TC 4282	Truax Harris Energy Co. ($29,538)	An air pollution control facility consisting of an above-ground Stage II vapor recovery balance type system.
TC 4283	Truax Harris Energy Co. ($29,853 /97%)	An underground storage tank (UST) facility consisting of a tank monitoring system with alarm and Stage II vapor recovery equipment.
TC 4284	Truax Harris Energy Co. ($36,059 /98%)	An underground storage tank (UST) facility consisting of a tank monitoring system with alarm and Stage II vapor recovery equipment.
TC 4285	Truax Harris Energy Co. ($36,267 /98%)	An underground storage tank (UST) facility consisting of a tank monitoring system with alarm and Stage II vapor recovery equipment.
TC 4286	Truax Harris Energy Co. ($58,017 /98%)	An underground storage tank (UST) facility consisting of a tank monitoring system with alarm and Stage II vapor recovery equipment.
TC 4292	Obie's Import Repair, Inc. ($1,995 /65%)	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4293	Truax Harris Energy Co. ($22,066 /98%)	An underground storage tank (UST) facility consisting of a tank monitoring system with alarm and Stage II vapor recovery equipment.
TC 4294	Truax Harris Energy Co. ($28,237)	An underground storage tank (UST) facility consisting of Stage II vapor recovery equipment.

Application Number	Applicant	Description
TC 4295	Truax Harris Energy Co. ($35,755)	An air pollution control facility consisting of an above-ground Stage II vapor control vacuum assist type system.
TC 4297	Ware's Auto Body, Inc. ($1,995 /65%)	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4298	Winnoco, Inc. ($16,990 /97%)	An underground storage tank (UST) facility consisting of a tank gauge system and line leak detectors.
TC 4301	Carmichael Columbia Oil, Inc. ($99,220 /74%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks (including one dual compartment tank), piping, spill containment basins, a tank gauge system, automatic shutoff valves, line leak detectors, sumps, an oil/water separator and Stage I and II vapor recovery piping.
TC 4306	WWDD Partners ($42,083)	A reclaimed plastic product facility consisting of a Freightliner Model FL-70 truck with van and liftgate.
TC 4309	Dale A. Eisiminger ($6,500 /80%)	An air quality field burning facility consisting of a Case IH Model 770 offset disk.

Application Number	Applicant	Description
TC 4310	Western Stations Company ($133,507 /91%)	An underground storage tank (UST) facility consisting of three fiberglass clad steel tanks, doublewall flexible piping, spill containment basins, a tank gauge system with built-in line leak detection, an overfill alarm, automatic shutoff valves, and Stage I and II vapor recovery equipment.
TC 4311	Truax Harris Energy Co. ($112,399 /87%	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, spill containment basins, upgrades of a tank gauge system, an overfill alarm, monitoring wells, sumps and Stage I and II vapor recovery equipment.
TC 4312	Truax Harris Energy Co. ($121,967 /88%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, a tank gauge system, monitoring wells, sumps and Stage I and II vapor recovery equipment.
TC 4313	Truax Harris Energy Co. ($182,997 /93%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, spill containment basins, upgrades for a tank gauge system, monitoring wells, sumps, turbine leak detectors, an oil/water separator and Stage I vapor equipment.

Application Number	Applicant	Description
TC 4314	Dennis Thompson Dba Tigard Arco ($57,719)	An underground storage tank (UST) facility consisting of sumps and Stage I and II vapor recovery equipment.
TC 4315	Truax Harris Energy Co. ($99,362 /87%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, monitoring wells, sumps and Stage I and II vapor equipment.
TC 4316	Truax Harris Energy Co. ($219,570 /93%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, spill containment basins, a tank gauge system with overfill alarm, turbine line leak detectors, monitoring wells, sumps, an oil/water separator and Stage I and II vapor recovery equipment.
TC 4317	Truax Harris Energy Co. ($201,060 /93%)	An underground storage tank (UST) facility consisting of three doublewall fiberglass tanks and flexible doublewall piping, spill containment basins, a tank gauge system with overfill alarm, turbine line leak detectors, monitoring wells, sumps, an oil/water separator and Stage I and II vapor recovery equipment.
TC 4318	Lyle D. Neuschwander ($49,865 /62%)	An air quality Field Burning facility consisting of a John Deere 4850 200 HP tractor.

Tax credit applications with facility costs over $250,000:

Application Number	Applicant	Description
TC 4138	DBD Leasing ($276,500)	A reclaimed plastic product facility consisting of a 6' 30:1 L/D Sterling/Davis-Standard Extruder and associated equipment and a GALA ES6/80 underwater pelletizing system for converting scrap plastic into uniform pellets.
TC 4175	International Paper Corporation ($479,131)	A water pollution control industrial wastewater facility consisting of 25 linear feet of 36 inch diameter stainless steel pipe, 1500 linear feet of 36' HPDE pipe, an 8'x 21' concrete inlet structure and a carbon steel outlet weir box.
TC 4194	South Coast Lumber Company ($255,427)	An air pollution control facility consisting of a Pneumafil #16-648-12 baghouse, two Twin Cities #660-HIB-24 fans and fire protection for the baghouse.
TC 4235	Intel Corporation ($554,406)	An air pollution control facility consisting of two Harrington Model ECH913-5LB acid scrubbers and a Flanders Model ES4X3CGF4 arsenic dust collector.
TC 4243	Oregon Steel Mills, Inc. ($12,017,469)	A solid waste recycling facility consisting of an electric arc furnace (EAF) baghouse dust glassification plant.
TC 4252	Willamette Industries, Inc. ($11,986,792)	A solid waste recycling facility consisting of modifications to and the expansion of a waste paper recovery and utilization system for used corrugated cardboard.

Application Number	Applicant	Description
TC 4300	Neste Resins Corporation ($958,105)	An air pollution control facility consisting of a Durr regenerative thermal oxidizer (RTO) and ducting for control of formaldehyde, phenol and methanol emissions (classified as volatile organic compounds (VOC) and hazardous air pollutants (HAP)).

The Department recommended that the actual cost of tax credit certificate 2295, Carmichael Columbia Oil, Inc., be reduced from $27,572 to $2,000 (98 percent allocable) to reflect that, except for an element of the claimed facility that was placed in use at a new site, 510 Marine Drive, the remainder of the previously approved facility has been removed from service.

Commissioner Whipple moved approval of the tax credit applications excluding application numbers 2900, 4243 and 4252; the motion was seconded and unanimously approved.

The tax credit applications set aside for specific discussion were TC 2900, A.E. Staley; TC 4243, Oregon Steel Mills; and TC 4252, Willamette Industries, Inc. The latter two were set aside because of the monetary size. In regard to tax credit application 2900, Commissioner Whipple asked whether there might be residual value in the forage left on the field after the hay had been harvested. Charles Bianchi of the Department's Water Quality Division responded that the value of the residual forage would be insufficient to affect the value of the claim via the cost allocation formula. Commissioner Whipple moved approval of tax credit application 2900; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

In regard to tax credit application 4243, Bill Bree, formerly of the Department's Waste Management and Cleanup Division (WMCD), provided a brief explanation of Oregon Steel Mills' recycling process. Commissioner Whipple moved approval of tax credit application 4243; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

Concerning tax credit application 4252, it was noted in the staff report that in certain cases such as TC 4252, the percentage of the claim allocable to pollution control is very sensitive to minor shifts in the years of useful life identified for the claimed facility. Commissioner Lorenzen asked about Willamette's useful life parameters and wanted to know when this situation (i.e, only a few years difference in estimated useful life would make a significant difference in the cost allocable percentage) might be expected to arise. Mr. Bianchi indicated that when the cash flow is a high percentage of the eligible cost but is still below the amount that would reduce the percent allocable. Chair Wessinger, Commissioner Lorenzen and Interim Director Taylor agreed that for those cases in which there might be some question as to whether the applicant's estimate is reasonable, an external accounting review firm should be asked to render an opinion.

Commissioner Lorenzen moved approval of tax credit application 4252; Commissioner McMahan seconded the motion. The motion was unanimously approved.

Commissioner Castle asked about the Commission's responsibility to report to the legislature about the tax credit program. He asked that the Department to prepare a statement reflecting the Commission's desire in regard to this program for Governor-elect Kitzhaber.

C. Rule adoption: Acid rain/stratospheric ozone protection/radionuclide NESHAP.

These proposed rules would adopt by reference the federal rules for acid rain, stratospheric ozone protection and radionuclide National Emissions Standards for Hazardous Air Pollutants (NESHAPs). Adoption of these rules would provide the Department with the legal authority to place these federal regulations in federal operating permits as required under Title V of the 1991 Clean Air Act Amendments. Air Quality Administrator Greg Green and Patti Seastrom and John Kinney from the Department's Air Quality Division provided brief introductions to this agenda item.

Mr. Kinney presented an amendment to the Emission Standards and Procedural Requirements for Hazardous Air Contaminants Regulated Prior to the 1990 Amendments to the Federal Clean Air Act, 340-32-5520(1), (2) and (3) and Emission Standards for Airborne Radionuclides, 340-32-5585(1)(a)(A). He indicated that the addendum is applicable only to major sources in Title V permits. Cindi Carrell of the Oregon Metals Industry Council indicated to the Commission that the amendment addressed the concern she had with that section of the rules.

Commissioner Whipple moved approval of the acid rain, stratospheric ozone protection, radionuclide NESHAP and amendment; Commissioner Castle seconded the motion. The motion was unanimously approved.

D. Rule adoption: Criteria for financial assurance for closure and post-closure care.

The proposed rule amendments would implement changes in provision of financial assurance required by 1993 legislation and integrate those with federal regulations. They would establish criteria and procedures for provision of financial assurance for closure, post-closure care and corrective action by permittees of solid waste land disposal sites. They would also require permittees to prepare two kinds of closure and post-closure plans in order to estimate costs of closure and post-closure maintenance.

Deanna Mueller-Crispin and Bob Danko of the WMCD presented this item to the Commission. Ms. Mueller-Crispin noted that written comments had been presented by five parties. Chair Wessinger asked whether Mr. Leonard (one of the commenters) had been satisfied. Ms. Mueller-Crispin responded that Mr. Leonard would have to be the judge of that, but that some of the issues he brought up were broader than this rulemaking and could more appropriately be considered by the Solid Waste Advisory Committee.

Chair Wessinger also asked how much more this solid waste rule would need to be amended to accommodate the federal Subtitle D regulations. Ms. Mueller-Crispin said that would depend on the U. S. Environmental Protection Agency's (EPA's) timing in three proposed rulemaking procedures they are currently conducting.

Commissioner Castle moved approval of the solid waste rule amendments: criteria for financial assurance for closure and post-closure care; Commissioner McMahan seconded the motion. The motion was unanimously approved.

E. This item was removed from the agenda.

F. Rule adoption: Proposed temporary rule adopting the federal universal treatment standards and toxicity characteristic waste treatment standards.

On September 19, 1994, the EPA promulgated a final rule amending the Hazardous Waste Land Disposal Restrictions (LDR) program found in 40 **Code of Federal Regulations** (CFR) Par 268. The Department is proposing to temporarily adopt the EPA amendments to the LDR program which establish universal treatment standards and organic toxicity characteristic waste treatment standards to be followed with

permanent rulemaking in May of 1995. Because the EPA rule takes effect in Oregon on December 19, 1994, it will create confusion within the regulated community between the Department's currently effective LDR program and the EPA's newly revised LDR program unless the Commission adopts the EPA rule.

Mary Wahl, administrator of the WMCD and Roy Brower of the WMCD provided a brief explanation of the temporary rule. Don Haagensen told the Commission that this temporary rule will make complying with the new rule by the regulated community easier. He said that Department staff put out extra effort to bring the temporary rule to this Commission meeting.

Commissioner Lorenzen moved approval of the temporary rule adopting the federal universal treatment standards and toxicity characteristic waste treatment standards and accompanying statement of need and justification and findings; Commissioner Castle seconded the motion. The motion was unanimously approved.

G. Temporary rule adoption: Temporary suspension of operator certification rule fee increase.

The Department proposed that the Commission adopt a temporary rule amendment which would suspend implementation of the recently adopted fee schedule increase under Oregon Administrative Rules (OAR) 340-49-065 for a period of 180 days or until May 30, 1995. The temporary rule amendment would also reinstate the fees that were in place prior to the effective date of the new fee schedule (November 30, 1994).

The temporary rule amendment is in response to the legislative Emergency Board's request for the Department to delay implementation of fee increases, allowing the legislature the opportunity to consider the increase through their regular legislative budget review process. The temporary rule would enable the Department to maintain continuity in administering the certification program and would help alleviate concerns and confusion regarding fees for persons interested in certification.

Tom Lucas and Steve Desmond of the Department's Water Quality Division were present to answer any questions. Interim Director Taylor provided the Commission with background information about this item.

Commissioner Castle moved approval of the temporary rule and statement of need, justification and findings; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

Note: Chair Wessinger took time out from the meeting to address Department staff and the audience. He said that three things were affecting the Department now: losing the director, legislative direction and the impact of Ballot Measure 8. Chair Wessinger said he wanted to give his own feelings about the situation and that as far as the latter was concerned, it is a tragedy. He said he wished he could do something about it but could not. The Chair indicated from his standpoint he will continue to say that Department staff are the best he has ever worked with. He asked Interim Director Taylor to take that message back to the staff. Chair Wessinger said that he believed he spoke for every Commission member that Department staff do a great job, and it is appreciated. He concluded by saying that there is a very strong feeling of support and admiration for all staff.

H. Action item: Standards and criteria for hiring new director.

The Commission indicated that they wished to meet in executive session to interview candidates and deliberate on the selection of a director. Prior to meeting in executive session, state law requires an opportunity for public comment on the standards, criteria, policy directives and hiring procedures to be used in this process. After consideration of public comments, the Commission may adopt and use these standards and procedures in recruiting and selecting a director and may, therefore, meet in executive session for this purpose.

Interim Director Taylor provided the Commission with a proposed schedule of events leading up to the actual interviews and selection.

Commissioner Castle moved approval of the standards and criteria for hiring the new director; Commissioner McMahan seconded the motion. The motion was unanimously approved.

I. Information item: Legislative report on rigid plastic containers.

This report was in response to direction from the 1993 legislature to report on the implementation of Oregon's Rigid Plastic Container Law and based on that implementation, any recommendations for statutory changes; and on the status of plastic recycling programs in Oregon. The Commission at its October 21, 1994, meeting considered adoption of rules implementing the rigid Plastic Container Law and also identified issues which had arisen during the rulemaking. Those issues are incorporated into the report.

Through a budget note, the 1993 legislature also required a report on the success of all recovery technologies (including pyrolysis) which reduce the amount of solid waste now being diverted from landfills and on attaining the broad objectives of Oregon Revised Statutes (ORS) 459.015. That report will be the subject of an informational item at the Commission's January 1995 meeting.

Bob Danko and Deanna Mueller-Crispin were available to answer Commission questions.

Chair Wessinger indicated that the report might benefit from an executive summary which could be provided in two parts: the current status of plastics recycling (with charts) and options for the program.

The possibility was discussed that the 25 percent recycling rate for rigid plastic containers will be met; Chair Wessinger expressed interest in knowing what part of plastics recycling was due to the Bottle Bill, what has come from existing programs, and if progress was being made with recycled items of little market value.

Commissioner Lorenzen asked about the resources the Department is drawing upon in preparing the other report to be considered at the January meeting which will include pyrolysis. He said that he hoped there would be an in-depth analysis and expressed puzzlement over why so much opposition to using this technology existed.

The Commission discussed how options should be presented and whether they should make any recommendations. Commissioner McMahan commented that the draft report lists the options as if they were all equal when they are not; she said that the more desirable options should be highlighted. Interim Director Taylor noted that the options could be ranked or an advocacy position could be taken for some options.

The Commission commented that the legislature should know the range of options; however, Commissioner Lorenzen said the Commission has ultimate responsibility. He said the report should focus on the three or four contentious issues and make recommendations. The full range of options could be listed, but focus could be on the choices preferred by the Commission. Commissioner McMahan said the

Department should make the decision in regard to recommendations. Mr. Danko noted that the task forces did not have recommendations, as their membership was too varied. Commissioner Whipple said the Commission had made difficult decisions on some of the options and that did not come through in the draft report.
Chair Wessinger said the recommendations should be kept to a small number of issues. Mr. Danko suggested that those might be the issues highlighted by the Commission during rule adoption; that is, federal preemption, reduced container exemption, point-of-sale packagers, and maybe pyrolysis.

J. Information item: Update on implementation of House Bill 2214 (development of a plan to maintain attainment with federal air quality standards in the Portland area).

John Kowalczyk of the Department's Air Quality Division gave a slide presentation on developing a plan to maintain federal air quality standards in the Portland area.

K. Commission reports.

Commissioner Whipple talked briefly about the Governor's Watershed Enhancement Board (GWEB). She indicated that the Department was one of the strong supporters of the GWEB. Commissioner Whipple said the Commission should be proud of what the GWEB is doing and that it was a well received, beneficial program.

Commissioner Lorenzen commented that it was important for the Commission to understand the Department's budget and to assist the Department with legislators during the upcoming legislative session. Interim Director Taylor told the Commission that the Department would provide the Commission with information and/or questions being asked of the Department.

L. Director's report.

National Estuary Program: The states of Oregon and Washington are considering a new nomination to include the Lower Columbia River in the National Estuary Program (NEP). The EPA is expected to open the nomination process in early December. The NEP is a local/state/EPA partnership to protect and enhance estuaries of national significance. EPA, state and other funds would be used to develop a comprehensive conservation and management plan and to oversee its implementation.

The Department has been working with the Lower Columbia River Bi-State Steering Committee to develop the nomination. Recommendations from the Steering Committee, along with comments from the public, will be forwarded to the governor's offices in Oregon and Washington.

Water Quality Limited List: Two environmental groups have filed suit against the EPA because the DEQ has not submitted a new list of Water Quality Limited Waters, known as the 303(d) list. When a water body is placed on the list, the Department must establish a Total Maximum Daily Load for the pollutants of concern. The list was due to the EPA in April.

DEQ staff have developed a draft list and guidelines that will be used to finalize the list. A public notice has been issued seeking comment on the draft list and guidelines. The Department is also contacting agencies and interest groups who may have additional data on water quality. The new data will be reviewed and the draft list revised for a second public review period in March of next year. The final list will be submitted to the EPA in May with subsequent updates to be made in the normal 305(b) reporting process that occurs every other year. Andy Schaedel has taken a special assignment to lead this effort.

Bindanna Update: The Bindanna Corp. which operates a recreational vehicle park north of Eugene and was the subject of an October report to the Commission has been found in violation of the Stipulated Final Order (SFO) related to planning and constructing a new sewage treatment system. The violation are currently under review by the Attorney General's office. The SFO outlines stipulated penalties for violations.

Salt Caves Update: The Federal Energy Regulatory Commission (FERC) issued an order on November 14 holding its Salt Caves license proceeding in abeyance until conclusion of the Wild and Scenic River litigation. The FERC also denied the state's November 2 motion to dismiss the city's license application. That leaves the 401 certification issue back at the DEQ. The Department has requested additional information from the city on their 401 application. The city's response is due December 5.

Senate Agriculture Committee: The DEQ appeared before the Senate Agriculture Committee on November 23 to provide an overview of implementation of the environmental crimes act and on the implementation of House Bill 2214, the Portland air quality attainment strategy. Joining the DEQ at the table on the crimes issue was the Multnomah and Marion county district attorneys, John Bradley and Dale Penn.

Cities and Counties: DEQ staff participated on a variety of League of Oregon Cities panels at their annual conference. The DEQ was given a round of applause at the wastewater panel in recognition of the positive changes in the relationship between the DEQ and cities. Regional division administrators later met with several city representatives interested in learning about the early warning team.

Meantime, representatives of the counties and DEQ staff are forming a DEQ-AOC liaison Team. The next meeting will be December 13. The team is based on the successful early warning team model. The goal of the team is to strengthen relations and avoid disputes.

Air Quality Monitoring Projects: The Laboratory has launched several air quality monitoring projects around the state. They are all intensive surveys which are designed to monitor poor ventilation episodes. The monitoring project will continue through March.

Bend Air Quality Project. This EPA sponsored project will provide the basis for developing a local air quality management plan, an analytical tool for evaluating pollutant impacts in small urban areas and a prototype program to be used in other cities. It involves 12 sampling sites for PM_{10}, meteorological data, carbon monoxide and chemical mass balance. The chemical mass balance survey will provide data to help us determine the sources of the PM_{10} in the area.

Medford Basin	20 sampling sites for PM_{10}
Salem Area	12 sampling sites for CO
Hillsboro Area	11 sampling sites for PM_{10}

HEARING AUTHORIZATIONS

- Prevention of Significant Deterioration (PSD) Rule Amendments: The proposed rulemaking covers four areas.

  1) Revising the particulate matter PSD Increments by replacing Total Suspended Particulate (TSP) with PM10 to make the state rule consistent with federal rules.

  2) Revising the Class I boundary date to reflect Congressional increases in the size of Oregon Class I areas since 1977.

3) Revising the PSD baseline date for the Blue Mountains of Oregon to reflect a more representative baseline for regulating PM10 emissions from future forest land burning to address forest health problems.

4) Adopting an amendment to the Oregon Smoke Management Program made by Oregon Department of Forestry which incorporates prescribed burning emission limits and smoke management/air quality monitoring improvement for areas in and around the Blue Mountains in northeastern Oregon.

- Federal Transit Act Conformity Rules: The proposed rule establishes criteria and procedures for determining whether transportation plans, programs and projects are in conformity with air quality plans. The rules are required by the federal Clean Air Act (CAA) and will become part of the State Implementation Plan (SIP).

- Conformity of federal actions to state or federal Air Quality Implementation Plans: The rule would establish criteria and procedures for the state to use to determine whether federal actions conform to the requirements of the SIP. The rules are required by the CAA. The rule affects federal agencies which are proposing certain activities which would emit a nonattainment pollutant in a nonattainment area, or federal agencies planning prescribed burning on federal lands in an attainment area.

There was no further business, and the meeting was adjourned at approximately noon.

Environmental Quality Commission

☐ Rule Adoption Item
X Action Item
☐ Information Item

Agenda Item B
January 20, 1995 Meeting

Title:
Approval of Tax Credit Applications

Summary:
New Applications - tax credit applications with a total facility cost of $198,402.00 are recommended for approval as follows:

- 1 Air Quality facility with facility cost of: $ 94,402
- 1 Field Burning related facility recommended by the Department of Agriculture with a total facility cost of: $ 104,000

There are no applications with claimed facility cost exceeding $250,000 presented in this report.

A table summarizing key aspects of the tax credit program is included as an attachment to this report and a discussion of the data presented in the table as well as of other issues discussed at the December 2, 1994 meeting is provided in the background section of this report.

Department Recommendation:
Approve issuance of tax credit certificates for 2 applications as presented in Attachment A of the staff report.

Report Author | Division Administrator | Director

January 20, 1994

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum†

Date: January 20, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Agenda Item B, January 20, 1995 EQC Meeting

Approval of Tax Credit Applications

Statement of the Need for Action

This staff report presents the staff analysis of pollution control facilities tax credit applications and the Department's recommendation for Commission action on these applications. The following is a summary of the applications presented in this report:

Tax Credit Application Review Reports:

Application Number	Applicant	Description
TC 4290	Cascade Corporation ($94,402)	An air pollution control facility consisting of a gas-fired convection paint curing oven (with piping) installed to comply with VOC permit requirements.
TC 4324	Mr. & Mrs. Gary J. Kropf ($104,000/70%)	A field burning air pollution control facility consisting of a John Deere 8770 300 hp tractor.

Tax Credit Application Review Reports With Facility Costs Over $250,000 (Accountant Review Reports Attached).

There are no review reports with facility costs that exceed $250,000 included in this report.

†A large print copy of this report is available upon request.

Background

Willamette Industries Revisited

The following discussion addresses questions that were raised during the evaluation of Willamette Industries' tax credit application (TC 4252) at the December 2, 1994 meeting of the Commission. At that meeting Commissioner Lorenzen asked under what circumstances would a small difference in the estimated useful life of a facility make a large difference in the allocability of cost to pollution control. The answer is that the greatest impact is seen when the cash flow generated by the pollution control facility is significant but is still below the level required to impact the return on investment constraints.

In the case of Willamette Industries, the cash flow estimate that most closely reflected the methodology required by the Rules showed that the average cash flow for the facility was estimated to be $1,076,797 per annum for a facility having an adjusted facility cost of $11,986,792. Using a ten year expected useful life the facility is 100% allocable as indicated by the following calculation as required under the Rules: $11,986,792 divided by $1,076,797 = 11.132 (return on investment factor). This factor is used in conjunction with the expected useful life/return on investment table (table 1) to determine the percentage allocable. For a facility having a 10 year expected useful life as claimed by Willamette Industries the factor exceeds the 10.000 factor below which cost allocability would become a factor producing a 0% return on investment and allowing the facility to be 100% allocable to pollution control. In fact the facility could have generated an average 5-year estimated cash flow of more than $1,190,000 before being negatively impacted by the cost allocation methodology under these parameters.

However, for a facility having a 13 year expected useful life (the IRS' estimate for similar facilities) the percentage return would have been 2.25% and the percentage allocable 59% for a facility constructed in 1993 (the year of construction of Willamette's facility). Whereas, for a 15 year facility the percentage return is 4.0% and the percentage allocable 27%. Finally, for a facility constructed in 1993 having an expected useful life of 18 years and the same cash flow parameters the percentage allocable would be zero and the facility would have been ineligible for a tax credit because of the cost allocability constraints.

The basic equation is: the greater the number of expected useful years of a facility, the greater the number of positive cash flows that must be discounted to obtain the net present value of the investment and, therefore, the higher the internal rate of return on the investment in the facility. Consequently, when the cash flow of a facility is high

(and especially when the cash flow is high but is still below the level recognized in Table 1 as impacting the percentage allocable) a difference of a few years in estimated useful life can make a large difference in the percentage allocable and, for large dollar value projects, a large difference in the value of the tax credit.

A second issue that was raised relates to the definition of "useful life". On this the Rules are unambiguous. Useful life is defined as the, "number of years the claimed facility is capable of operating before replacement or disposal". The only ambiguity is how this determination is made. Under current rules applicants make this determination, generally if not always, to their advantage. A CPA firm may offer a differing opinion in cases where the applicant is egregiously distorting the truth, as perhaps indicated by significantly differing treatment in accounting for the allocation of costs for the facility for a different accounting purpose. An external engineering firm would probably have a more comprehensive knowledge of useful life norms. However, uniform treatment can only be guaranteed by establishing by rule or statute a useful life table under which all facilities would be subsumed and defined under broad general categories.

End of year Summary

A summary of the tax credits certified in 1994 is presented in a table provided as an attachment to this report. The table shows that in 1994 four (4) tax credit projects,each exceeding $1,000,000 in certified facility costs, comprised 66% of the total certified costs approved under the program; while nine (9) facility projects exceeding $500,000 in costs consumed 76% of the program's benefits. In 1994, the Commission approved 141 tax credit requests. Therefore, approximately 6% of the total number of approved tax credit requests accounted for more than three quarters of the benefits of the program. Moreover, the 11 firms that received gross tax credit benefits exceeding $500,000 garnered approximately 83% of the benefits of the program for 1994.

Authority to Address the Issue

ORS 468.150 through 468.190 and OAR 340-16-005 through 340-16-050 (Pollution Control Facilities Tax Credit).

ORS 468.925 through 468.965 and OAR 340-17-010 through 340-17-055 (Reclaimed Plastic Product Tax Credit).

Alternatives and Evaluation

None.

Summary of Any Prior Public Input Opportunity

The Department does not solicit public comment on individual tax credit applications during the staff application review process. Opportunity for public comment exists during the Commission meeting when the applications are considered for action.

Conclusions

- The recommendations for action on the attached applications are consistent with statutory provisions and administrative rules related to the pollution control facilities and reclaimed plastic product tax credit programs.

o Proposed January 20, 1995, Pollution Control Tax Credit Totals:

Certificates	Certified Costs*	Certified Allocable Costs**	No.
Air Quality	$ 94,402	$ 94,402	1
CFC	0	0	0
Field Burning	104,000	72,800	1
Hazardous Waste	0	0	0
Noise	0	0	0
Plastics	0	0	0
SW - Recycling	0	0	0
SW - Landfill	0	0	0
Water Quality	0	0	0
UST	0	0	0
TOTALS	$198,402	167,202	2

o Calendar Year Totals Through December 31, 1994:

Certificates	Certified Costs*	Certified Allocable Costs**	No.
Air Quality	$ 4,995,126	$ 4,995,126	21
CFC	$ 51,779	$ 45,434	20
Field Burning	$ 2,227,892	$ 1,043,473	18
Hazardous Waste	43,024	43,024	1
Noise	1,014,378	1,014,378	2
Plastics	$ 751,576	$ 751,576	14
SW - Recycling	$24,441,233	$24,441,233	5
SW - Landfill	$ 0	0	0
Water Quality	$ 4,045,676	$ 4,045,676	14
UST	$ 3,938,344	$3,543,871	46
TOTALS	$41,509,028	$39,923,791	141

*These amounts represent the total facility costs. The actual dollars that can be applied as credit is calculated by multiplying the total facility cost by the determined percent allocable and dividing by 2.

**These amounts represent the total eligible facility costs that are allocable to pollution control. To calculate the actual dollars that can be applied as credit, the certifiable allocable cost is multiplied by 50 percent.

Recommendation for Commission Action

It is recommended that the Commission approve certification for the tax credit applications as presented in Attachment A of the Department Staff Report.

Intended Followup Actions

Notify applicants of Environmental Quality Commission actions.

Attachments

A. Pollution Control Tax Credit Application Review Reports.

Reference Documents (available upon request)

1. ORS 468.150 through 468.190.
2. OAR 340-16-005 through 340-16-050.
3. ORS 468.925 through 468.965.
4. OAR 340-17-010 through 340-17-055.

Approved:

Section:

Division:

Report Prepared By: Charles Bianchi
Phone: 229-6149
Date Prepared: December 19, 1994

Charles Bianchi
DECEQC
December 19, 1994

Application No. TC-4290

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

---

1. Applicant

Cascade Corporation
P.O. Box 20187
Portland, OR 97220

The applicant owns and operates a facility that manufactures lift truck attachments in Troutdale, OR.

Application was made for tax credit for an air pollution control facility.

2. Description of Facility

The facility was installed to facilitate the conversion from solvent based paints and coatings that contained volatile organic compounds (VOC) to water based paints. In order to use the water based paints, a curing oven was required. Stainless steel piping systems were also required to provide protection against rusting.

Claimed Facility Cost: $94,402

Accountant's Certification was provided.

The applicant indicated the useful life of the facility is 10 years.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Installation of the facility was substantially completed on December 15, 1992 and placed into operation on December 15, 1992. The application for final certification was received by the Department on September 14, 1994. The application was found to be complete on December 9, 1994, within two years of substantial completion of the facility.

4. Evaluation of Application

a. Rationale For Eligibility

The facility is eligible because the principal purpose of the facility is to comply with requirements imposed by the Department of Environmental Quality to reduce air pollution. This is in accordance with the requirements found in Addendum No. 1, paragraph 4.c, of the applicant's Air Contaminant Discharge Permit Number: 26-3038. This paragraph refers to meeting the requirements set forth in OAR Chapter 340, Division 22, Section 170, which requires that surface coating operations emitting over 10 tons per year of VOC comply with limits called out in OAR 340-22-170. Addendum No. 1 of Cascade's Air Contaminant Discharge Permit requires that by December 15, 1992, they shall demonstrate continuous compliance. The emission reduction is accomplished by the elimination of air contaminants as defined in ORS 468A.005.

The principal purpose of the facility is to eliminate over 18 tons of VOC emissions per year. This reduction is accomplished by the replacement of the paints and coatings that contain VOCs with water based paints and coatings. The conversion to the water based system required the claimed facility. The claimed facility consists of a gas-fired convection paint curing oven. This is required because the water based paints and coatings need to be cured at 130°F for 30 minutes. The remaining portion of the claimed facility consists of a new stainless steel piping system required by the water based paint.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The facility does not recover or convert waste products into a salable or usable commodity.

2) The estimated annual percent return on the investment in the facility.

The average annual cash flow is a negative $600 which results from no income being generated by the facility and an annual operating cost of $600. There is no income or savings associated with the installation of the facility and there is no annual return on investment. As a result, the percent allocable is 100%.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

A powder coating method was considered, however this technology did not allow for the coating of all of the applicant's parts. A powder coating system would have required considerably more capital investment.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

There is no savings from the facility. The cost of maintaining and operating the facility is $600 annually.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air pollution.

There are no other factors to consider in establishing the actual cost of the facility. The claimed facility cost of $94,402 has been determined to be 100% allocable. The principal purpose of the facility is to prevent a substantial quantity of air pollution.

The actual cost of the facility properly allocable to pollution control as determined by using this factor or these factors is 100%.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department to prevent air pollution.

c. The facility complies with DEQ statutes, rules and Air Contaminant Discharge Permit requirements.

d. The portion of the facility cost that is properly allocable to pollution control is 100%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $94,402 with 100% allocable to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4290.

Dennis E. Cartier
SJO Consulting Engineers

December 19, 1994

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Mr. & Mrs. Gary J. Kropf
30659 Wyatt Drive
Harrisburg, Oregon 97446

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for an air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is a John Deere 8770 300 hp tractor, located at 30659 Wyatt Drive, Harrisburg, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: $104,000
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 249 perennial acres and 786 annual acres of grass seed under cultivation. Until recent years, the applicant open field burned as many acres as the weather and smoke management program permitted. The applicant began to experiment with alternatives to open field burning such as propane flaming, baling, plowing, flail chopping and composting.

The tractor was purchased to elevate full straw load plow-down as an alternative to open field burning and propane flaming from the experimental level to an annual farm practice. The applicant plows the flail chopped full straw load under followed by disking and rolling four times over. The tractor enables the applicant to perform these activities in a timely manner on more than 500 acres.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on September 16, 1994. The application was submitted on November 7, 1994; and the application for final certification was found to be complete on November 18, 1994. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in oAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $11,928 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   The established average annual operating hours for tractors is set at 450 hours. To obtain a total percent allocable the annual operating hours per implement used in reducing acreage open field burned is as follows:

Implement	Worked	Hour	Operating Hours
Hight bottom plow	500	8	63
Disc/roller	2000 (500x4)	8	250
Total annual operating hours			313

The total annual operating hours of 313 divided by the average annual operating hours of 450 produces a percent allocable of 70%.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 70%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 70%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $104,000, with 70% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4324.

Jim Britton, Manager
Smoke Management Program
Natural Resources Division
Oregon Department of Agriculture
(503) 378-6792
FAX: (503) 378-2590

JB:bk4324
November 21, 1994

ATTACHMENT A

TABLE 1

Tax Credit Benefits by Applicant for 1994

Applicant	Gross Tax Credit Benefits *	Nr. tax credits approved
Willamette Industries	$ 12,174,977	2
Oregon Steel Mills, Inc.	12,017,469	1
J.R. Simplot Company	2,342,511	1
Truax, Harris Energy Company	1,144,579	12
Taylor Lumber & Treating, Inc.	1,010,220	1
Neste Resins Corporation	958,105	1
Fujitsu Microelectronics, Inc.	943,490	1
Kinzua Corporation	862,560	1
Jeld Wen, Inc.	592,861	3
Intel Corporation	554,406	1
Texaco Refining & Marketing, Inc.	518,614	4
Total:	$ 33,119,792	37
Total Program (1994):	$ 39,923,791	141
% of Total Benefits:	83%	

* The figures in this column reflect Certified Allocable Costs as defined in the tables of the periodic Memorandum Reports to the Commission. The actual dollar value of credits provided is 50% of the amount(s) shown, amortizable, in general, over a 10 year period.

TABLE 2

Tax Credits Approved for Major Projects in 1994**

Project Description	Type	Applicant	Certified Facility Cost
Glassification plant	SW	Oregon Steel Mills, Inc.	$ 12,017,469
Cardboard recycling facility	SW	Willamette Industries	11,986,792
Holding lagoon liner & facility	WQ	J.R. Simplot Company	2,342,511
Drip Pad & liner system	HzW	Taylor Lumber & Treating	1,010,220
Buildings & Equipment	FB/AQ	Eichler Hay Company	979,603
Regenerative thermal oxidizer for VOC	AQ	Neste Resins Corporation	958,105
Process exhaust nitric (PEN) system	AQ	Fujitsu Microelectronics	943,490
Electrostatic precipitator	AQ	Kinzua Corporation	862,560
Acid scrubbers & arsenic filtration system	AQ	Intel Corporation	554,406

Total Cost of Major Projects:	$ 31,655,156
Total Program Certified Facility Costs (1994):	$ 41,509,028
Percent of Total Certified Costs of Major Projects:	76%

** In this context a major project is defined as one having a certified facility cost that exceeds $500,000. The term "certified facility cost" has the same definition as presented in the Memoranda Reports to the Commission i.e., it is the value of facility that is eligible for a pollution control facility tax credit as has been certified by the Commission.

#c

This item was removed from the agenda.

#D

This item was removed from the agenda.

Environmental Quality Commission

☒ Rule Adoption Item
☐ Action Item
☐ Information Item

Agenda Item E
January 20, 1994 Meeting

Title:

Adoption of Hardboard Particulate Emissions Rule Revision

Summary:

In setting emission standards for the Hardboard Industry it was incorrectly assumed that the exhaust from vents above the hardboard presses were negligible. The Department is proposing to correct this oversight by changing the emission limit to be the sum of the vent emissions and the lesser of baseline non-vent emissions or 1.0 lb/ksf (the original limit). In no case could the emission limit exceed 2.0 lb/ksf. Actual current emissions will not increase, and it is the intent of the Department to hold existing hardboard sources to what their baseline emissions would have been had the press vent emissions been properly accounted for at the time.

Department Recommendation:

It is recommended that the Commission adopt the rules/rule amendments regarding the particulate matter emission standard for press vent emissions as presented in Attachment A of the Department's Staff Report.

Report Author	Division Administrator	Director

December 28, 1994

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum†

Date: January 5, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Agenda Item E, January 20, 1995, EQC Meeting

Adoption of Hardboard Particulate Emissions Rule Revision

Background

On August 12, 1994, the Director authorized the Air Quality Division to proceed to a rulemaking hearing on proposed rules which would revise the particulate emissions standard regarding emissions from press vents at hardboard plants.

Pursuant to the authorization, hearing notice was published in the Secretary of State's Bulletin on August 1, 1994. The Hearing Notice and informational materials were mailed to the mailing list of those persons who have asked to be notified of rulemaking actions, and to a mailing list of persons known by the Department to be potentially affected by or interested in the proposed rulemaking action.

A Public Hearing was held September 20, 1994, with Patti Seastrom serving as Presiding Officer. The Presiding Officer's Report (Attachment C) summarizes the oral testimony presented at the hearing.

Written comment was received through 5:00 pm, September 23, 1994. An index of written comments received is included as Attachment D. (A copy of the comments is available upon request.)

Department staff have evaluated the comments received. A summary of the comments and the Department's response are included in Attachment E.

The following sections summarize the issue that this proposed rulemaking action is intended to address, the authority to address the issue, the process for development of the rulemaking proposal including alternatives considered, a summary of the rulemaking proposal presented for public hearing, a summary of the significant public comments and the changes proposed in response to those comments, a summary of how the rule will

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†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

work and how it is proposed to be implemented, and a recommendation for Commission action.

Issue this Proposed Rulemaking Action is Intended to Address

In 1971, the DEQ adopted a statewide particulate emissions standard for the hardboard industry of 1.0 lb/ksf (1.0 pounds of particulate per 1,000 square feet of finished product). A more stringent rule applies in the Medford-Ashland PM10 non-attainment area. In setting the standard, the Department incorrectly assumed that emissions from exhaust vents above hardboard presses were negligible. The limit could therefore not serve its intended purpose as an accurate reference standard. This rulemaking is intended to correct that error by setting a new particulate standard that takes emissions from press vents into account.

Relationship to Federal and Adjacent State Rules

These rules are part of the federally approved State Implementation Plan (SIP). Approval by the Environmental Protection Agency (EPA) is required before the amendment can be implemented on a state level. Because the allowable emissions will increase, EPA has indicated that it will view this revision as a technical relaxation of the SIP. DEQ will be required to submit a technical demonstration to EPA to show that air quality standards and increments will not be exceeded. The technical demonstration may include supplements to the Klamath Falls and Medford PM_{10} attainment plans, or may require an additional revision to the SIP.

Authority to Address the Issue

The EQC has authority to adopt this rule under ORS 468.020 and 468A.035.

Process for Development of the Rulemaking Proposal (including Advisory Committee and alternatives considered)

The rule proposal was initially discussed with representatives from hardboard plants. The Department took industry suggestions into consideration when drafting the revision. The standing Industrial Source Advisory Committee (ISAC - see Attachment F for list of members) reviewed and made recommendations on this rule. While the majority of ISAC members supported the proposed revision, some members opposed any perceived relaxation of the hardboard rule.

Summary of Rulemaking Proposal Presented for Public Hearing and Discussion of Significant Issues Involved.

This revision raises the particulate emissions limit for existing hardboard plants in order to correct an error made when the original limit was set. The original hardboard particulate emissions limit was intended to be a reference standard, not to require controls; all plants were thought to be in compliance.

The limit was based on the assumption that emissions from exhaust vents above the hardboard presses were negligible. When actual press vent emissions are included in plant emissions totals, many plants cannot meet the emissions limit. The proposed rule revision is intended to correct the original error in setting the limit. The proposed revision would have kept the current limit as a limit for non-vent emissions (the emissions it was based on). A second limit would have been added for the total of vent and non-vent emissions. The total limit would have been set by adding each plant's baseline vent emissions to the current limit, with a maximum of 2.0 lb/ksf (.55 lb/ksf in Medford).

The Department's intent is that actual emissions will not increase. The revision is intended to account for press vent emissions which already exist. If hardboard plants were required to meet the current limit, emissions controls would have to be installed to keep the total of vent and non-vent emissions within the current limit. The Department feels that, since the current limit was based on a mistaken assumption, it is neither equitable nor cost effective to require plants to meet it.

An alternative put forth by a member of ISAC was also public noticed. Under this alternative, the limit for all sources within a hardboard plant, including press vents, would be the lower of 2.0 lb/ksf or the baseline emissions rate (actual emissions from all sources within the plant during the 1977/78 baseline period). The difference in the two alternatives is in their effect on the non-vent emissions rate (emissions from all sources other than press vents). For plants that had a baseline non-vent emissions rate below 1.0 lb/ksf, the original proposal would allow them to increase non-vent emissions up to 1.0 lb/ksf. The alternative would restrict the plants to their baseline emissions rate, and not allow the increase to 1.0 lb/ksf.

Summary of Significant Public Comment and Changes Proposed in Response

Several comments were received concerning the proposed increase in allowable emissions of fine particulate matter. Several stated that hardboard plants should not be permitted to increase emissions. Most objected on the basis of the potential respiratory health effects of fine particulate less than 2.5 microns in size. These comments assumed an

increase in emissions which is not going to occur. These comments also assumed that a significant portion of the particulate emissions from press vents are 2.5 microns in size or smaller, and that the U.S. Environmental Protection Agency will adopt a new particulate standard based on 2.5 microns in the near future.

Another comment suggested that the Department not set a specific standard for hardboard press vents, but set an outer limit within which a source could "bubble" emissions in order to meet the standard.

The intent of the proposed rule is to not allow for any actual increase in emissions. Press vent emissions are in the airshed and are not easily controlled in a cost effective manner. The Department's intent is to hold existing hardboard sources to what their baseline emission rates would have been had press vent emissions been properly accounted for at the time.

After reviewing the proposed rules in light of the public comments, the Department has determined that it would be more protective to the environment to revise the proposal. The revision would create a new limit calculated from baseline emissions. The limit would be the sum of vent emissions and the lesser of baseline non-vent emissions or 1.0 lb/ksf (the original limit). In no case could the emission rate exceed 2.0 lb/ksf. The effect would be to hold total emissions to what they would have been at baseline had press/cooling vents emission been taken into account, or less if baseline non-vent emissions were greater than 1.0, or if the total exceeds 2.0 lb/ksf.

Using this method, a newly built plant, since it did not exist at baseline, would have an emission rate of 0 lb/ksf; no new plants could be built. To avoid this problem, new hardboard plants will continue to be held to the current limit of 1.0 lb/ksf, or to more stringent limits set under New Source Review. This is the same outcome that would have occurred under the original proposal.

Because there is only one statewide emissions rate, the Department believes that the above alternative also accommodates the comment suggesting that statewide sources be allowed to "bubble" total particulate matter emissions. For example, a plant would be able to increase the non-vent emissions rate if it correspondingly decreased vent emissions. Under the original proposal, non-vent emissions could not increase above 1.0 lb/ksf, no matter how great the decrease in vent emissions.

The proposed rule for the Medford-Ashland PM_{10} non-attainment area would set two limits for sources located within that area: a limit of 0.25 lb/ksf for non-vent emissions, and a limit of 0.55 lb/ksf for the total of vent and non-vent emissions.

Summary of How the Proposed Rule Will Work and How it Will be Implemented

DEQ will incorporate the new limit into Air Quality Discharge Permits or Title V Permits and PSELs required of all affected sources. The amendments will have no effect on DEQ's enforcement or compliance strategies. The revisions will be implemented upon approval of the rules as a revision to the SIP by EPA.

Recommendation for Commission Action

It is recommended that the Commission adopt the rules/rule amendments regarding the particulate matter emission standard for press vent emissions as presented in Attachment A of the Department Staff Report.

Attachments

A. Rule Amendments Proposed for Adoption
B. Supporting Procedural Documentation:
    1. Legal Notice of Hearing
    2. Public Notice (Memo to Interested Persons)
    3. Rulemaking Statements (Statement of Need)
    4. Fiscal and Economic Impact Statement
    5. Land Use Evaluation Statement
    6. Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements
C. Presiding Officer's Report on Public Hearing
D. List of Written Comments Received
E. Department's Evaluation of Public Comment
F. Advisory Committee Membership
G. Rule Implementation Plan

Reference Documents (available upon request)

Written Comments Received (listed in Attachment D)
(Other Documents supporting rule development process or proposal)

Approved:

Section: John Kowalczyk 1-3-95

Division: Gregory A. Green

Report Prepared By: Yone C. McNally

Phone: 229-5143

Date Prepared: January 5, 1995

DRAFT AMENDMENTS

Chapter 340, Division 25, Statewide Rules

Board Products Industries
(Veneer, Plywood, Particleboard, Hardboard)

Definitions

340-25-305 As used in OAR 340-25-305 through 340-25-325:

(1) "Average Operating Opacity" means the opacity of emissions determined using EPA Method 9 on any three days within a 12-month period which are separated from each other by at least 30 days; a violation of the average operating opacity limitation is judged to have occurred if the opacity of emissions on each of the three days is greater than the specified average operating opacity limitation.

(2) "Baseline emissions rate" means the actual emissions rate during the baseline period, as defined in OAR 340-28-110, expressed as pounds of emissions per thousand square feet of finished product, on a 1/8" basis.

~~[(2)]~~**(3)** "Department" means Department of Environmental Quality.

~~[(3)]~~**(4)** "Emission" means a release into the outdoor atmosphere of air contaminants.

~~[(4)]~~**(5)** "EPA Method 9" means the method for Visual Determination of the Opacity of Emissions From Stationary Sources **described as Method 9 (average of 24 consecutive observations) in the Department Source Sampling Manual (January, 1992)** ~~[promulgated by the U.S. Environmental Protection Agency in **Title 40 of the Code of Federal Regulations, Part 60, Appendix A, Method 9**]~~.

~~[(5)]~~**(6)** "Fuel Moisture Content By Weight Greater Than 20 Percent" means bark, hogged wood waste, or other wood with an average moisture content of more than 20 percent by weight on a wet basis as used for fuel in the normal operation of a wood-fired veneer dryer as measured by ASTM D4442-84 during compliance source testing.

~~[(6)]~~**(7)** "Fuel Moisture Content By Weight Less Than 20 Percent" means pulverized ply trim, sanderdust, or other wood with an average moisture content of 20 percent or less by weight on a wet basis as used for fuel in the normal operation of a wood-fired veneer dryer as measured by ASTM D4442-84 during compliance source testing.

~~[(7)]~~**(8)** "Fugitive Emissions" means dust, fumes, gases, mist, odorous matter, vapors or any combination thereof not easily given to measurement, collection, and treatment by conventional pollution control methods .

~~[(8)]~~**(9)** "Hardboard" means a flat panel made from wood that has been reduced to basic wood fibers and bonded by adhesive properties under pressure.

~~[(9)]~~**(10)** "Maximum Opacity" means the opacity as determined by EPA Method 9

(average of 24 consecutive observations).

~~[(10)]~~**(11)** "Opacity" means the degree to which an emission reduces transmission of light or obscures the view of an object in the background.

~~[(11)]~~**(12)** "Operations" includes plant, mill, or facility.

~~[(12)]~~**(13)** "Particleboard" means matformed flat panels consisting of wood particles bonded together with synthetic resin or other suitable binder.

~~[(13)]~~**(14)** "Particulate Matter" means all solid or liquid material, other than uncombined water, emitted to the ambient air as measured in accordance with the Department Source Sampling Manual **(January, 1992)**. Particulate matter emission determinations shall consist of the average of three separate consecutive runs. For sources tested using DEQ Method 7, each run shall have a minimum sampling time of one hour, a maximum sampling time of eight hours, and a minimum sampling volume of 31.8 dscf. For sources tested using DEQ Method 8, each run shall have a minimum sampling time of 15 minutes and shall collect a minimum particulate sample of 100 mg. Veneer dryers, wood particle dryers, fiber dryers and press/cooling vents shall be tested with DEQ Method 7; and air conveying systems shall be tested with DEQ Method 8.

~~[(14)]~~**(15)** "Person" includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, and the Federal Government and any agencies thereof.

~~[(15)]~~**(16)** "Plywood" means flat panel built generally of an odd number of thin sheets of veneers of wood in which the grain direction of each ply or layer is at right angles to the one adjacent to it.

(17) "Press/Cooling Vent" means any opening through which particulate and gaseous emissions from plywood, particleboard, or hardboard manufacturing are exhausted, either by natural draft or powered fan, from the building housing the process. Such openings are generally located immediately above the board press, board unloader, or board cooling area.

~~[(16)]~~**(18)** "Special problem area" means the formally designated Portland, Eugene-Springfield, and Medford AQMAs and other specifically defined areas that the Environmental Quality Commission may formally designate in the future. The purpose of such designation will be to assign more stringent emission limits as may be necessary to attain and maintain ambient air standards or to protect the public health or welfare.

~~[(17)]~~**(19)** "Tempering oven" means any facility used to bake hardboard following an oil treatment process.

~~[(18)]~~**(20)** "Veneer" means a single flat panel of wood not exceeding 1/4 inch in thickness formed by slicing or peeling from a log.

~~[(19)]~~**(21)** "Wood fired veneer dryer" means a veneer dryer which is directly heated by the products of combustion of wood fuel in addition to or exclusive of steam or natural gas or propane combustion.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 26, f. 3-31-71, ef. 4-25-71; DEQ 132, f. & ef. 4-11-77; DEQ 7-1979, f. & ef. 4-20-79; AQ 12-1992, f. & ef. 11-13-91; AQ 1-1993, f. & ef. 3-9-93

Particleboard Manufacturing Operations

340-25-320

(1) Truck Dump and Storage Areas:

(a) Every person operating or intending to operate a particleboard manufacturing plant shall cause all truck dump and storage areas holding or intended to hold raw materials to be enclosed to prevent windblown particle emissions from these areas from being deposited upon property not under the ownership of said person;

(b) The temporary storage of raw materials outside the regularly used areas of the plant site is prohibited unless the person who desires to temporarily store such raw materials first notifies the Department of Environmental Quality and receives written approval for said storage:

(A) When authorized by the Department of Environment Quality, temporary storage areas shall be operated to prevent windblown particulate emissions from being deposited upon property not under the ownership of the person storing the raw materials;

(B) Any temporary storage areas authorized by the Department shall not be operated in excess of six (6) months from the date they are first authorized.

(c) Any person who proposes to control windblown particulate emissions from truck dump storage areas other than by enclosure shall apply to the Department for authorization to utilize alternative controls. The application shall be submitted pursuant to OAR [~~*340-20-020 to 340-20-030*~~]**340-28-800 through 340-28-820**, and shall describe in detail the plan proposed to control windblown particulate emissions and indicate on a plot plan the nearest location of property not under ownership of the applicant.

(2) Other Emission Sources:

(a) No person shall cause to be emitted particulate matter from particleboard plant sources including, but not limited to, hogs, chippers, and other material size reduction equipment, process or space ventilation systems, particle dryers, classifiers, presses, sanding machines, and materials handling systems in excess of a total from all sources within the plant site of three (3.0) pounds per 1000 square feet of particleboard produced on a 3/4 inch basis of finished product equivalent;

(b) Excepted from subsection (2)(a) of this rule are truck dump and storage areas, fuel burning equipment, and refuse burning equipment.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 26, f. 3-31-71, ef. 4-25-71; DEQ 130, f. & ef. 3-22-77; DEQ 4-1993, f. & cert. ef. 3-10-93

Hardboard Manufacturing Operations

340-25-325

(1) Truck Dump and Storage Areas:

(a) Every person operating or intending to operate a hardboard manufacturing plant shall cause all truck dump and storage areas holding or intended to hold raw materials to be enclosed to prevent windblown particle emissions from these areas from being deposited upon property not under the ownership of said person;

(b) The temporary storage of raw materials outside the regularly used areas of the plant site is prohibited unless the person who desires to temporarily store such raw materials first notifies the Department of Environmental Quality and receives written approval:

(A) When authorized by the Department of Environmental Quality, temporary storage areas shall be operated to prevent windblown particulate emissions from being deposited upon property not under the ownership of the person storing the raw materials;

(B) Any temporary storage areas authorized by the Department shall not be operated in excess of six (6) months from the date they are first authorized.

(c) Alternative Means of Control. Any person who desires to control windblown particulate emissions from truck dump and storage areas other than by enclosure shall first apply to the Department for authorization to utilize alternative controls. The application shall be submitted pursuant to OAR ~~[340-20-020]~~**340-28-800** through ~~[340-20-030]~~**340-28-820**, and shall describe in detail the plan proposed to control windblown particulate emissions and indicate on a plot plan the nearest location of property not under ownership of the applicant.

(2) Other Emission Sources:

(a) **Hardboard plants which did not exist during the baseline period.** No person shall cause **or permit the total emissions rate of** ~~[to be emitted]~~ particulate matter from **a** hardboard plant ~~[sources including, but not limited to, hogs, chippers, and other material size reduction equipment, process or space ventilation systems, particle dryers, classifiers, presses, sanding machines, and materials handling systems, in excess of a total from all sources within the plant site of one]~~ **which did not exist during the baseline period to exceed** one (1.0) pound per 1000 square feet of

hardboard produced on a 1/8 inch basis of finished product equivalent~~[;]~~.

(b) Hardboard plants which existed during the baseline period.

No person shall cause or permit the total emissions rate of particulate matter from a hardboard plant which existed during the baseline period to exceed the lesser of:

(A) two (2.0) pounds per 1000 square feet of hardboard produced on a 1/8 inch basis of finished product equivalent; or

(B) the sum of the baseline emissions rate of the press/cooling vent and the lesser of:

(i) the baseline emissions rate from the hardboard plant excluding the press/cooling vents; or

(ii) one (1.0) pound per 1000 square feet of hardboard produced on a 1/8 inch basis of finished product equivalent.

~~(b)~~**(c)** Excepted from subsections ~~[(2)]~~(a) **and (b)** of this ~~[rule]~~**section** are truck dump and storage areas, fuel burning equipment, and refuse burning equipment.

(3) Emissions from Hardboard Tempering Ovens:

(a) No person shall operate any hardboard tempering oven unless all gases and vapors emitted from said oven are treated in a fume incinerator capable of raising the temperature of said gases and vapors to at least 1500° F. for 0.3 seconds or longer;

(b) Specific operating temperatures lower than 1500° F. may be approved by the Department upon application, provided that information is supplied to show that operation of said temperatures provides sufficient treatment to prevent odors from being perceived on property not under the ownership of the person operating the hardboard plant;

(c) In no case shall fume incinerators installed pursuant to this section be operated at temperatures less than 1000° F.;

(d) Any person who proposes to control emissions from hardboard tempering ovens by means other than fume incineration shall apply to the Department for authorization to utilize alternative controls. The application shall be submitted pursuant to OAR ~~[340-20-020]~~**340-28-800** through ~~[340-20-030]~~**340-28-820**, and shall describe in detail the plan proposed to control odorous emissions and indicate on a plot plan the location of the nearest property not under ownership of the applicant.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 26, f. 3-31-71, ef. 4-25-71; DEQ 130, f. & ef. 3-22-77; AQ 1-1993, f. & ef. 3-9-93

Chapter 340, Division 30, Medford/Grants Pass Rules

Definitions

340-30-010 As used in this Division:

(1) "Air contaminant" means a dust, fume, gas, mist, odor, smoke, vapor, pollen, soot, carbon, acid or particulate matter, or any combination thereof.

(2) "Air Conveying System" means an air moving device, such as a fan or blower, associated ductwork, and a cyclone or other collection device, the purpose of which is to move material from one point to another by entrainment in a moving airstream.

(3) "Average Operating Opacity" means the opacity of emissions determined using EPA Method 9 on any three days within a 12-month period which are separated from each other by at least 30 days ; a violation of the average operating opacity limitation is judged to have occurred if the opacity of emissions on each of the three days is greater than the specified average operating opacity limitation.

(4) "Charcoal Producing Plant" means an industrial operation which uses the destructive distillation of wood to obtain the fixed carbon in the wood.

(5) "Collection Efficiency" means the overall performance of the air cleaning device in terms of ratio of weight of material collected to total weight of input to the collector.

(6) "Department" means Department of Environmental uality.

(7) "Design Criteria" means the numerical as well as verbal description of the basis of design, including but not necessarily limited to design flow rates, temperatures, humidities, contaminant descriptions in terms of types and chemical species, mass emission rates, concentrations, and specification of desired results in terms of final emission rates and concentrations, and scopes of vendor supplies and owner-supplied equipment and utilities, and a description of any operational controls.

(8) "Domestic Waste" means combustible household waste, other than wet garbage, such as paper, cardboard, leaves, yard clippings, wood, or similar materials generated in a dwelling housing four (4) families or less, or on the real property on which the dwelling is situated.

(9) "Dry Standard Cubic Foot" means the amount of gas that would occupy a volume of one cubic foot, if the gas were free of uncombined water at standard conditions.

(10) "Emission" means a release into the outdoor atmosphere of air contaminants.

(11) "EPA Method 9" means the method for Visual Determination of the Opacity of Emissions From Stationary Sources **described as Method 9 (average of 24 consecutive observations) in the Department Source Sampling Manual (January, 1992)**~~[promulgated by the U.S. Environmental Protection Agency in Title 40 of the Code of Federal Regulations, Part 60, Appendix A, Method 9]~~.

(12) "Facility" means an identifiable piece of process equipment. A stationary source may be comprised of one or more pollutant-emitting facilities.

(13) "Fuel Burning Equipment" means a device which burns a solid, liquid, or gaseous fuel, the principal purpose of which is to produce heat, except

marine installations and internal combustion engines that are not stationary gas turbines.

(14) "Fuel Moisture Content By Weight Greater Than 20 Percent" means bark, hogged wood waste, or other wood with an average moisture content of more than 20 percent by weight on a wet basis as used for fuel in the normal operation of a wood-fired veneer dryer as measured by ASTM D4442-84 during compliance source testing.

(15) "Fuel Moisture Content By Weight Less Than 20 Percent" means pulverized ply trim, sanderdust, or other wood with an average moisture content of 20 percent or less by weight on a wet basis as used for fuel in the normal operation of a wood-fired veneer dryer as measured by ASTM D4442-84 during compliance source testing.

(16) "Fugitive Emissions" means dust, fumes, gases, mist, odorous matter, vapors, or any combination thereof not easily given to measurement, collection and treatment by conventional pollution control methods.

(17) "General Arrangement", in the context of the compliance schedule requirements in section 340-32-045(2), means drawings or reproductions which show as a minimum the size and location of the control equipment on a source plot plan, the location of equipment served by the emission-control system, and the location, diameter, and elevation above grade of the ultimate point of discharging contaminants to the atmosphere.

(18) "Grants Pass Urban Growth Area" and "Grants Pass Area" means the area within the Grants Pass Urban Growth Boundary as shown on the Plan and Zoning Maps for the City of Grants Pass as of 1 February 1988.

(19) "Hardboard" means a flat panel made from wood that has been reduced to basic wood fibers and bonded by adhesive properties under pressure.

(20) "La Grande Urban Growth Area" means the area within the La Grande Urban Growth Boundary as shown on the Plan and Zoning Maps for the City of La Grande as of 1 October 1991.

(21) "Lowest Achievable Emission Rate" or "LAER" is defined ~~[by section 340-20-225]~~**in OAR 340-28-110.**

(22) "Maximum Opacity" means the opacity as determined by EPA Method 9 (average of 24 consecutive observations).

(23) "Medford-Ashland Air Quality Maintenance Area" and "Medford-Ashland AQMA" is defined as beginning at a point approximately one mile NE of the town of Eagle Point, Jackson County, Oregon, at the NE corner of Section 36, T35S, R1W; thence south along the Willamette Meridian to the SE corner of Section 25, T37S, R1W; thence SE along a line to the SE corner of Section 9, T39S, R2E; thence SSE to the corner of Section 22, T39S, R2E; thence south to the SE corner of Section 27, T39S, R2E; thence SW to the SE corner of Section 33, T39S, R2E; thence NW to the NW corner of Section 36, T39S, R1E; thence west to the SW corner of Section 26, T39S, T1E; thence west to the SW corner of Section 12, T39S, R1W; thence NW along a line to the SW corner of Section 20,

T38S, R1W; thence west to the SW corner of Section 24, T38S, R2W; thence NW along a line to the SW corner of Section 4, T38S, R2W; thence west to the SW corner of Section 5, T38S, R2W; thence NW along a line to the SW corner of Section 31, T37S, R2W; thence north along a line to the Rogue River, thence north and east along the Rogue River to the north boundary of Section 32, T35S, R1W; thence east along a line to the point of beginning.

(24) "Modified Source" means any source with a ~~["]~~major modification~~["]~~ as defined in OAR ~~[340-20-225]~~**340-28-110**.

(25) "New Source" means any source not in existence prior to April 7, 1978 or any source not having an Air Contaminant Discharge Permit as of April 7, 1978.

(26) "Odor" means that property of an air contaminant that affects the sense of smell.

(27) "Offset" is defined ~~[by]~~**in** OAR ~~[340-20-225]~~**340-28-110**.

(28) "Opacity" means the degree to which an emission reduces transmission of light and obscures the view of an object in the background as measured in accordance with the Department's Source Sampling Manual **(January, 1992)**.

(29) "Open Burning" means burning conducted in such a manner that combustion air and combustion products may not be effectively controlled including, but not limited to, burning conducted in open outdoor fires, burn barrels, and backyard incinerators.

(30) "Particleboard" means matformed flat panels consisting of wood particles bonded together with synthetic resin or other suitable binders.

(31) "Particulate Matter" means all solid or liquid material, other than uncombined water, emitted to the ambient air as measured in accordance with the Department Source Sampling Manual **(January, 1992)**. Particulate matter emission determinations shall consist of the average of three separate consecutive runs. For sources tested using DEQ Method 5 or DEQ Method 7, each run shall have a minimum sampling time of one hour, a maximum sampling time of eight hours, and a minimum sampling volume of 31.8 dscf. For sources tested using DEQ Method 8, each run shall have a minimum sampling time of 15 minutes and shall collect a minimum particulate sample of 100 mg. Wood waste boilers and charcoal producing plants shall be tested with DEQ Method 5; veneer dryers, wood particle dryers, fiber dryers and press/cooling vents shall be tested with DEQ Method 7; and air conveying systems shall be tested with DEQ Method 8.

(32) "Person" includes individuals, corporations, associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, and the federal government and any agencies thereof.

(33) "Press/Cooling Vent" means any opening through which particulate and

gaseous emissions from plywood, particleboard, or hardboard manufacturing are exhausted, either by natural draft or powered fan, from the building housing the process. Such openings are generally located immediately above the board press, board unloader, or board cooling area.

~~[(33)]~~**(34)** "Rebuilt Boiler" means a physical change after April 29, 1988, to a wood-waste boiler or its air-contaminant emission control system which is not considered a "modified source" and for which the fixed, depreciable capital cost of added or replacement components equals or exceeds fifty percent of the fixed depreciable cost of a new component which has the same productive capacity.

~~[(34)]~~**(35)** "Source" means any structure, building, facility, equipment,installation or operation, or combination thereof, which is located on one or more contiguous or adjacent properties and which is owned or operated by the same person, or by persons under common control.

~~[(35)]~~**(36)** "Standard Conditions" means a temperature of 60 degrees Fahrenheit (15.6 degrees Celsius) and a pressure of 14.7 pounds per square inch absolute (1.03 Kilograms per square centimeter).

~~[(36)]~~**(37)** "Veneer" means a single flat panel of wood not exceeding 1/4 inch in thickness formed by slicing or peeling from a log.

~~[(37)]~~**(38)** "Veneer Dryer" means equipment in which veneer is dried.

~~[(38)]~~**(39)** "Wood-fired Veneer Dryer" means a veneer dryer which is directly heated by the products of combustion of wood fuel in addition to or exclusive of steam or natural gas or propane combustion.

~~[(39)]~~**(40)** "Wigwam Waste Burner" means a burner which consists of a single combustion chamber, has the general features of a truncated cone, and is used for the incineration of wastes.

~~[(40)]~~**(41)** "Wood Waste Boiler" means equipment which uses indirect heat transfer from the products of combustion of wood waste to provide heat or power.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The Publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 4-1978, f. & ef. 4-7-78; DEQ 9-1979, f. & ef. 5-3-79; DEQ 3-1980, f. & ef. 1-28-80; DEQ 14-1981, f. & ef. 5-6-81; DEQ 22-1989, f. & cert. ef. 9-26-89; AQ 8-1992, f. & ef. 11/13/91; AQ 1-1993, f. & ef. 3-9-93

Wood Waste Boilers

340-30-015

(1) No person shall cause or permit the emission of particulate matter from any wood waste boiler with a heat input greater than 35 million BTU/hr in excess of 0.050 grain per dry standard cubic foot of exhaust gas, corrected to 12 percent carbon

dioxide.

(2) No person owning or controlling any wood waste boiler with a heat input greater than 35 million BTU/hour shall cause or permit the emission of any air contaminant into the atmosphere for a period or periods aggregating more than 3 minutes in any one hour equal to or greater than 10 percent opacity, unless the permittee demonstrates by source test that the emission limit in paragraph (1) of this section can be achieved at higher visible emissions, but in no case shall emissions equal or exceed 20% opacity for more than an aggregate of 3 minutes in any one hour. Specific opacity limits shall be included in the Air Contaminant Discharge Permit for each affected source.

(3) In accordance with the compliance schedule in 340-30-046(2), no person shall cause or permit the emission of particulate matter from any boiler with a heat input greater than 35 million Btu/hour unless the boiler has been equipped with emission control equipment which:

(a) Limits emissions of particulate matter to LAER as defined by the Department at the time the Department approves the control device; and

(b) Limits visible emissions such that their opacity does not exceed 5% for more than an aggregate of 3 minutes in any one hour, unless the permittee demonstrates by source test that emissions can be limited to LAER at higher visible emissions, but in no case shall emissions equal or exceed 10% opacity for more than an aggregate of 3 minutes in any one hour. Specific opacity limits shall be included in the Air Contaminant Discharge Permit for each affected source.

(c) For purposes of OAR ~~[340-20-265]~~**340-28-1020** and ~~[340-20-310]~~**340-28-1980**, the boiler mass emission limits shall be based on particulate matter emissions of 0.030 grains per standard dry cubic foot, corrected to 12% CO_2.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 4-1978, f. & ef. 4-7-78; DEQ 29-1980, f. & ef. 10-29-80; DEQ 14-1986, f. & ef. 6-20-86; DEQ 22-1989, f. & cert. ef. 9-26-89; AQ 8-1992, f. & ef. 11/13/91; AQ 1-1993, f. & ef. 3-9-93

The Medford-Ashland Air Quality Maintenance Area and the Grants Pass Urban Growth Area

Hardboard Manufacturing Plants

340-30-031

(1) **Emissions from Hardboard plants excluding press vents.** No person shall cause or permit the total emissions of particulate matter from ~~[all facilities at]~~a hardboard plant, **excluding press/cooling vents,** to exceed 0.25 pounds per 1,000 square feet of hardboard produced on a 1/8" basis of finished product equivalent.

(2) **Emissions from Hardboard plants including press vents. No person shall cause or permit the total emissions of particulate matter from a hardboard plant, including press/cooling vents, to exceed 0.55 pounds per 1,000 square feet of hardboard produced on a 1/8" basis of finished product equivalent.**

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 14-1981, f. & ef. 5-6-81; DEQ 14-1986, f. & ef. 6-20-86; AQ 1-1993, f. & ef. 3-9-93

Control of Fugitive Emissions (Medford-Ashland AQMA Only)

340-30-043

(1) Large sawmills, all plywood mills and veneer manufacturing plants, particleboard and hardboard plants, charcoal manufacturing plants, stationary asphalt plants, stationary rock crushers, and sources subject to OAR 340-21-245 or 340-30-230 shall prepare and implement site-specific plans for the control of fugitive emissions. (The air contaminant sources listed are described in OAR ~~[340-20-155]~~**340-28-1720**, Table ~~[1]~~**4**, paragraphs 10a, 14a, 14b, 15, 17, 18, 29, 34a and 42a, respectively.)

(2) Fugitive emission control plans shall identify reasonable measures to prevent particulate matter from becoming airborne. Such reasonable measures shall include, but not be limited to the following:

(a) Scheduled application of asphalt, oil, water, or other suitable chemicals on unpaved roads, log storage or sorting yards, materials stockpiles, and other surfaces which can create airborne dust;

(b) Full or partial enclosure of materials stockpiled in cases where application of oil, water, or chemicals are not sufficient to prevent particulate matter from becoming airborne;

(c) Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;

(d) Adequate containment during sandblasting or other similar operations;

(e) Covering, at all times when in motion, open bodied trucks transporting materials likely to become airborne; and

(f) Procedures for the prompt removal from paved streets of earth or other material which does or may become airborne.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 6-1983, f. & ef. 4-18-83; DEQ 22-1989, f. & cert. ef. 9-26-89; AQ 1-1993, f. & ef. 3-9-93

Emission Offsets

340-30-111 In the Medford-Ashland AQMA, emission offsets required in

accordance with OAR [~~*340-20-240*~~]**340-28-1930** for new or modified sources shall provide reductions in emissions equal to 1.2 times the emission increase from the new or modified sources.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 22-1989, f. & cert. ef. 9-26-89; AQ 1-1993, f. & ef. 3-9-93

Upset Condition

340-30-480 Emission of air contaminants in excess of applicable standards as a result of equipment breakdown shall be subject to OAR [~~*340-20-350*~~]**340-28-1400** through [~~*340-20-380*~~]**340-28-1460**.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 61, f. 12-5-73, ef. 12-25-73,, Renumbered from 340-28-060; AQ 1-1993, f. & ef. 3-9-93

NOTICE OF PROPOSED RULEMAKING HEARING

(Rulemaking Statements and Statement of Fiscal Impact **must** accompany this form.)

Department of Environmental Quality — Air Quality Division

OAR Chapter 340

DATE:	**TIME:**	**LOCATION:**
9/20/94	11 a.m.	DEQ Offices, Rm 10A, 811 SW Sixth Avenue, Portland

HEARINGS OFFICER(s): Patti Seastrom

STATUTORY AUTHORITY: ORS 468.020 and 468A.025

ADOPT:

AMEND: OAR 340-20-047, 340-25-305, 340-25-325, 340-30-010, 340-30-031

REPEAL:

☒ This hearing notice is the initial notice given for this rulemaking action.
☐ This hearing was requested by interested persons after a previous rulemaking notice.
☒ Auxiliary aids for persons with disabilities are available upon advance request.

SUMMARY:

The current particulate emissions standard for the hardboard industry was set based on an incorrect assumption that emissions from exhaust vents above hardboard presses were negligible. Because of the error, the limit could not serve its intended purpose as an accurate reference standard. This rulemaking is intended to correct that error by setting a new particulate standard that takes emissions from press vents into account. Several housekeeping changes are included which update crossreferences within rules.

LAST DATE FOR COMMENT: September 23, 1994
DATE PROPOSED TO BE EFFECTIVE: Upon filing with the Secretary of State after adoption by the Environmental Quality Commission.

AGENCY RULES COORDINATOR: Chris Rich, (503) 229-6775
AGENCY CONTACT FOR THIS PROPOSAL: Yone C. McNally, (503) 229-5143
ADDRESS: Air Quality Division
811 S. W. 6th Avenue
Portland, Oregon 97204
TELEPHONE: (503) 229-5143
or Toll Free 1-800-452-4011

Interested persons may comment on the proposed rules orally or in writing at the hearing. Written comments will also be considered if received by the date indicated above.

Signature _____ Date _____

State of Oregon
Department of Environmental Quality Memorandum†

Date: August 15, 1994

To: Interested and Affected Public

Subject: Rulemaking Proposal - Hardboard Particulate Emissions Rule Revision

This memorandum contains information on a proposal by the Department of Environmental Quality (DEQ) to adopt new rules/rule amendments regarding the particulate emissions limit for hardboard plants, including housekeeping and conforming amendments to related rules. This proposal would raise the emissions limit by the amount of each plant's baseline press vent emissions to more accurately reflect actual emissions. This change may also require conforming changes and other revisions to the Klamath Falls and Medford PM_{10} attainment plans in order to account for the increase in allowable emissions from the hardboard plants in those areas.

What's in this Package?

Attachments to this memorandum provide details on the proposal as follows:

Attachment A	The actual language of the proposed rule (amendments).
Attachment B	The "Legal Notice" of the Rulemaking Hearing. (required by ORS 183.335)
Attachment C	The official Rulemaking Statements for the proposed rulemaking action. (required by ORS 183.335)
Attachment D	The official statement describing the fiscal and economic impact of the proposed rule. (required by ORS 183.335)
Attachment E	A statement providing assurance that the proposed rules are consistent with statewide land use goals and compatible with local land use plans.

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

Attachment F Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

Hearing Process Details

You are invited to review these materials and present written or oral comment in accordance with the following:

Date: September 20, 1994
Time: 11 a.m.
Place: Room 10A, DEQ Offices, 811 SW Sixth Ave, Portland

Deadline for submittal of Written Comments: 5 p.m., September 23, 1994

In addition to any general comments, DEQ is specifically interested in receiving comments concerning its proposal as compared to an alternative proposal, both of which are described in greater detail in the "How was this Rule Developed" section of this report. In particular, DEQ is interested in the rationale for supporting either approach and the feasibility of achieving compliance with either approach.

Patti Seastrom will be the Presiding Officer at this hearing. Following close of the public comment period, the Presiding Officer will prepare a report which summarizes the oral testimony presented and identifies written comments submitted. The Environmental Quality Commission (EQC) will receive a copy of the Presiding Officer's report and all written comments submitted. The public hearing will be tape recorded, but the tape will not be transcribed.

If you wish to be kept advised of this proceeding and receive a copy of the recommendation that is presented to the EQC for adoption, you should request that your name be placed on the mailing list for this rulemaking proposal.

What Happens After the Public Comment Period Closes

The Department will review and evaluate comments received, and prepare responses. Final recommendations will then be prepared, and scheduled for consideration by the Environmental Quality Commission (EQC).

The EQC will consider the Department's recommendation for rule adoption during one of their regularly scheduled public meetings. The targeted meeting date for consideration of this rulemaking proposal is December 2, 1994. This date may be delayed if needed to provide additional time for evaluation and response to testimony received in the hearing process. You will be notified of the time and place for final EQC action if you present oral testimony at the hearing or submit written comment during the comment period or ask to be notified of the proposed final action on this rulemaking proposal.

The EQC expects testimony and comment on proposed rules to be presented **during** the hearing process so that full consideration by the Department may occur before a final recommendation is made. The EQC may elect to receive comment during the meeting where the rule is considered for adoption; however, such comment will be limited to the effect of changes made by the Department after the public comment period in response to testimony received. The EQC strongly encourages people with concerns regarding the proposed rule to communicate those concerns to the Department at the earliest possible date so that an effort may be made to understand the issues and develop options for resolution where possible.

Background on Development of the Rulemaking Proposal

What is the problem

In 1971, DEQ adopted the current particulate emissions standard for the hardboard industry of 1.0 lb/ksf (1.0 pounds of particulate per 1,000 square feet of finished product). In calculating the standard, DEQ assumed that emissions from the exhaust vents above the hardboard presses were negligible and did not include those emissions in the calculation. When press vents were later tested, DEQ discovered its assumption was incorrect and emissions were shown not to be negligible. It was realized the standard was too low for existing plants to demonstrate compliance.

Since the original intent of the rule was not to require press vent controls and there is no air quality need for reduction at this time, it is necessary to revise the rule to account for press vents. If the rule is not revised, plants will be required to reduce emissions unnecessarily due to Title V permitting procedures. Press vents are not cost effective to control because they are a high volume/low concentration emissions source.

Accompanying this revision are housekeeping changes in the affected divisions. These changes have been made necessary due to extensive renumbering of Chapter 340,

Division 20 to Chapter 340, Division 28. These housekeeping changes update cross references to current rule numbers.

How does this proposed rule help solve the problem

This revision corrects the limit so that it takes press vent emissions into account. The revision keeps the current limit as applied to all non-vent emissions, and limits vent emissions at each plant to their current level or a set maximum level. This revision does not allow for any new emissions into the air. It is only intended to account for emissions which were existing at the time the standard was established but were mistakenly excluded from the calculation.

How was the rule developed

DEQ has worked with a hardboard industry committee to develop the rule revisions. DEQ's proposal for the statewide rule would maintain the existing limit of 1 lb/1000 square feet for all sources within a hardboard plant other than press vents, and would allow additional emissions from the press vents. The additional emissions would be limited to the lower of 1 lb/ 1000 square feet or the actual emissions of the press vents during the 1977/78 baseline period. A similar approach is proposed for the Medford rule. DEQ believes that this approach is consistent with the intent of the original rule, and reflects the limit which would have been established had the press vents emissions been taken into account at the time.

This approach was presented to the Air Quality Industrial Source Control Advisory Committee (ISAC) in April, and July, 1994. During its deliberations on this approach, an alternative was put forth by a member of the Committee and discussed. Under this alternative, the limit for all sources within a hardboard plant, including press vents, would be the lower of 2 lbs/1000 square feet or the actual emissions of all sources within the plant during the 1977/78 baseline period. This alternative would result in a lower limit for plants at which non-press vent emissions were less than 1 lb/1000 square feet during the baseline period.

During the July, 1994, ISAC meeting, a member also had several additional concerns regarding the regulation of particulate emissions, and hardboard plants in particular. One concern was whether stricter limits for hardboard plants should exist for sources in or near PM_{10} nonattainment areas. Currently, stricter limits only exist in the Medford PM_{10} nonattainment area because it is necessary for demonstrating attainment. Klamath

Falls, the only other PM_{10} nonattainment area with hardboard plants within or near its boundary, does not require the stricter limit in order to demonstrate attainment.

Another concern was whether additional emission reductions from hardboard plants would be necessary in Medford because the PM_{10} attainment demonstration does not show that the standard will be met in all locations. In response, DEQ reported that it is updating the modeling done for the Medford attainment demonstration due to anomalies in the original modeling. If the revised modeling does show that additional reductions are necessary, DEQ will evaluate all possible emission reduction options to determine the most cost effective option for additional control. As discussed above, hardboard press vents are an unlikely candidate for additional control. The revised modeling is expected to be completed prior to the earliest possible adoption date of these rule amendments.

A third concern was that press vents emissions are potentially a source of Hazardous Air Pollutant (HAP) emissions. While it is likely that hardboard plants will be subject in the next 5 to 10 years to HAP regulations adopted by EPA, any current concern about existing HAPs would be better addressed through a specific HAP rule concerning particulate emissions, rather than indirect control through the hardboard regulations.

The final concern was that the Klamath Falls PM_{10} nonattainment boundary should be expanded to include a nearby Weyerhaeuser facility which includes a hardboard plant. This issue is being addressed in a different forum and is considered separate from the proposed hardboard rule revision. However, DEQ is currently conducting additional analysis to determine whether Weyerhaeuser has a significant impact on the existing nonattainment area. The results of this analysis will be addressed in the appropriate forum apart from this current rulemaking proposal.

How does it affect the public, regulated community, other agencies

The rule change is intended to account for actual emissions existing at the time the standard was originally established. The public will not be affected by the rule. The regulated community (hardboard plants) will continue to operate as at present. Other agencies will not be affected.

How does the rule relate to federal requirements or adjacent state requirements

These rules are part of the federally approved State Implementation Plan (SIP). Approval by the Environmental Protection Agency (EPA) is required before the amendment can be implemented on a state level. Because the allowable emissions will

increase, EPA has indicated that it will view this revision as a technical relaxation of the SIP. DEQ will be required to submit a technical demonstration to EPA to show that air quality standards and increments will not be exceeded. The technical demonstration may include supplements to the Klamath Falls and Medford PM_{10} attainment plans, or may require an additional revision to the SIP.

The rule is more stringent than federal requirements. No other state has a specific limit for hardboard plants.

How will the rule be implemented

DEQ will incorporate the new limit into Air Quality Discharge Permits or Title V Permits and Plant Site Emission Limits required of all affected sources. The amendments will have no effect on DEQ's enforcement or compliance strategies. The revisions will be implemented upon approval of the rules as a revision to the SIP by EPA.

Are there time constraints

Yes. This rulemaking must be completed expeditiously in order for EPA to approve the revision prior to the Title V permit application deadline for hardboard plants. If the Title V permits are issued prior to EPA approval, affected sources will be required to comply with the existing standard.

Contact for more information

If you would like more information on this rulemaking proposal, or would like to be added to the mailing list, please contact:

Yone C. McNally, (503) 229-5143

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Hardboard Particulate Emissions Rule Revision

Rulemaking Statements

Pursuant to ORS 183.335(7), this statement provides information about the Environmental Quality Commission's intended action to adopt a rule.

1. Legal Authority

This revision is proposed pursuant to ORS 468.020 and 468A.025.

2. Need for the Rule

The current particulate emissions standard for the hardboard industry was set based on an incorrect assumption that emissions from exhaust vents above hardboard presses were negligible. Because of the error, the limit could not serve its intended purpose as an accurate reference standard. This rulemaking is intended to correct that error by setting a new particulate standard that takes emissions from press vents into account.

3. Principal Documents Relied Upon in this Rulemaking

The Department relied on data from hardboard plant source tests, and the Klamath Falls and Medford Attainment strategies. All are available from the Air Quality Division of DEQ in Portland.

4. Advisory Committee Involvement

The Air Quality Industrial Sources Advisory Committee commented on Department proposals for a revision, and approved the revision.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Hardboard Particulate Emissions Limit Rule Revision

Fiscal and Economic Impact Statement

Introduction

The current particulate emissions standard for the hardboard industry was set based on an incorrect assumption that emissions from exhaust vents above hardboard presses were negligible. Because of the error, the limit could not serve its intended purpose as an accurate reference standard. This rulemaking is intended to correct that error by setting a new particulate standard that takes emissions from press vents into account.

General Public

This revision will have no economic impact on the general public. Because there will be no economic impact on plants, prices of hardboard will not be affected by this revision.

Small Business

All the hardboard plants affected by this revision are large businesses. There will be no economic impact on small businesses.

Large Business

All the hardboard plants affected by this revision are large businesses. This revision will allow them to continue operating as they do at present, and will therefore have no economic impact on the plants. No other large businesses are affected by the rule.

Local Governments

This revision will have no economic impact on local governments. The rule will not affect hardboard plant income or wage expenditures.

State Agencies

DEQ will continue to operate as as at present. There will be no change in staff enforcement or oversight responsibilities. No changes in personnel will be needed. The revision will not cause a change in revenues or expenses.

No other agency will be affected by this revision.

Assumptions

Adoption of this rule revision will have no economic impact. Hardboard plants will not need to install control equipment beyond what they already have or have planned. The Department will not need changes in oversight or enforcement mechanisms or personnel.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Hardboard Particulate Emissions Rule Revision

Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

The current particulate emissions standard for the hardboard industry was set based on an incorrect assumption that emissions from exhaust vents above hardboard presses were negligible. Because of the error, the limit could not serve its intended purpose as an accurate reference standard. This rulemaking is intended to correct that error by setting a new particulate standard that takes emissions from press vents into account.

2. Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program?

   Yes XX No____

   a. If yes, identify existing program/rule/activity:

Air Contaminant Discharge Permit program.

   b. If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules?

   Yes XX No____ (if no, explain):

   c. If no, apply the following criteria to the proposed rules.

Staff should refer to Section III, subsection 2 of the SAC document in completing the evaluation form. Statewide Goal 6 - Air, Water and Land Resources is the primary goal that relates to DEQ authorities. However, other goals may apply such as Goal 5 - Open Spaces, Scenic and Historic Areas, and Natural Resources; Goal 11 - Public Facilities and Services; Goal 16 - Estuarine

Resources; and Goal 19 - Ocean Resources. DEQ programs or rules that relate to statewide land use goals are considered land use programs if they are:

1. Specifically referenced in the statewide planning goals; or

2. Reasonably expected to have significant effects on

   a. resources, objectives or areas identified in the statewide planning goals, or

   b. present or future land uses identified in acknowledged comprehensive plans.

In applying criterion 2. above, two guidelines should be applied to assess land use significance:

- The land use responsibilities of a program/rule/action that involves more than one agency, are considered the responsibilities of the agency with primary authority.
- A determination of land use significance must consider the Department's mandate to protect public health and safety and the environment.

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

3. If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.

No new procedures will be needed.

Gregory A. Green — Air Quality Division

Intergovernmental Coord.

8/10/94 — Date

Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

The following questions should be clearly answered, so that a decision regarding the stringency of a proposed rulemaking action can be supported and defended:

Note: If a federal rule is relaxed, the same questions should be asked in arriving at a determination of whether to continue the existing more stringent state rule.

1. *Are there federal requirements that are applicable to this situation? If so, exactly what are they?*

   Federal rules require the submission of State Implementation Plans (SIP) to attain and maintain ambient air quality standards. The hardboard rules are included in the federally approved SIP. The amendments represent a revision to the SIP. Revisions must be submitted to the Environmental Protection Agency and approved before they can be implemented in Oregon.

2. *Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?*

   The existing federally enforceable rule is performance based, requiring plants to meet a specified emission rate per unit of production.

3. *Do the applicable federal requirements specifically address the issues that are of concern in Oregon? Was data or information that would reasonably reflect Oregon's concern and situation considered in the federal process that established the federal requirements?*

   Not applicable.

4. *Will the proposed requirement improve the ability of the regulated community to comply in a more cost effective way by clarifying confusing or potentially conflicting requirements (within or cross-media), increasing certainty, or preventing or reducing the need for costly retrofit to meet more stringent requirements later?*

   Yes. Because the proposed amendments are intended to reflect emissions currently in the air, it allows sources to demonstrate compliance without retrofitting costly controls.

5. *Is there a timing issue which might justify changing the time frame for implementation of federal requirements?*

   No.

6. *Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?*

   The proposal will include, if necessary, conforming revisions to the Klamath Falls and Medford attainment plans which will account for emissions. In making these changes, it may be necessary to use some of the existing growth margins contained in the plans. The remaining growth margins can be used for accommodation of uncertainty and future growth.

7. *Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)*

   Yes.

8. *Would others face increased costs if a more stringent rule is not enacted?*

   No.

9. *Does the proposed requirement include procedural requirements, reporting or monitoring requirements that are different from applicable federal requirements? If so, Why? What is the "compelling reason" for different procedural, reporting or monitoring requirements?*

   No.

10. *Is demonstrated technology available to comply with the proposed requirement?*

    Not applicable.

11. *Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost effective environmental gain?*

    The proposal is intended to have no effect on current conditions.

State of Oregon
Department of Environmental Quality Memorandum

Date: September 21, 1994

To: Environmental Quality Commission

From: Patti Seastrom

Subject: Presiding Officer's Report for Rulemaking Hearing

Hearing Date and Time: September 20, 1994, 11 a.m.
Hearing Location: 811 S.W. Sixth Avenue, Rm. 10A
Portland, Oregon

Title of Proposals: Hardboard Rule Revision
Acid Rain Rule Adoption
Stratospheric Ozone Protection Rule Adoption
Radionuclide Rule Adoption

The rulemaking hearing on the above titled proposals was convened at 11 a.m. People were asked to sign witness registration forms if they wished to present testimony. People were also advised that the hearing was being recorded and of the procedures to be followed.

One person was in attendance and chose to submit written comments by the deadline rather than testify.

Prior to closing the hearing, staff responded to questions from the audience regarding the hardboard rule revisions and discussed analytical strategies.

The hearing was closed at 11:45 a.m.

INDEX OF COMMENTS RECEIVED

1. Dr. Bob Palzer
   Air Quality Coordinator
   Oregon Chapter, Sierra Club

2. Janice R. Young, RRT, RCP
   Ashland, Oregon

3. Wallace Skyrman
   Coalition to Improve Air Quality
   Central Point, Oregon

4. Vera Morrell
   Chair
   Coalition to Improve Air Quality
   Medford, Oregon

5. Nancy Spieler
   Member, DEQ Industrial Source Advisory Committee
   Forest Grove, Oregon

6. Marc F. Prevost
   Vice Chair
   Soda Mountain Wilderness Council
   Ashland, Oregon

7. Phyllis M. Hughes
   Member, Executive Committee
   Rogue Group, Sierra Club
   Jacksonville, Oregon

8. Frank H. Hirst
   Air Quality Chair
   League of Women Voter
   Ashland, Oregon

9. Tim Raphael
   Program Director
   OSPIRG
   Portland, Oregon

10. Lisa Brenner
    Member, DEQ Industrial Source Advisory Committee

Oregon Environmental Council
Portland, Oregon

11. Kevin Godbout
Environmental Manager
Weyerhaeuser
Tacoma, Washington

SUMMARY OF COMMENTS RECEIVED AND THE DEPARTMENT'S RESPONSE

1. Comment: A change in the standard for particulate matter emissions in order to accommodate the source with the highest current particulate matter emissions inadvertently will allow all hardboard plants to increase their emissions from press vents. The rule should be modified to adjust the emission standard for each plant on a case-by-case basis in order to assure that each source is held to baseline levels of emissions. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

   Response: The Department agrees that particulate matter emissions should be held to baseline levels. The Department also agrees that the commentors' suggested way of holding emissions to baseline may be more protective of the environment. The Department has changed its proposed rules to reflect the comment.

2. Comment: Because of changes in the supply and raw materials available, hardboard products are increasing in market share. As plants shift to higher levels of hardboard production, any relaxation of the rule will allow an increase in particulate emissions. 1, 3, 6, 10

   Response: The change in the emission standard does not free sources to increase production at will. Production increases and other increases in emissions are addressed in the Plant Site Emission Limit and New Source Review rules. Any proposed increases in emissions must be approved by the Department before they can take place.

3. Comment: Current research suggests that particulate matter 2.5 microns or less in size has a greater adverse health effect. Press vent particulate emissions are likely mostly of this nature. Also, these emissions likely contain a variety of hazardous air pollutants including polycyclic aromatic hydrocarbons and formaldehyde. EPA is studying the possibility of changing the current particulate matter standard to be measured at 2.5 microns. 1, 2, 7, 8

   Response: The current rule revision is intended to address a technical error made when the rule was first adopted. At this time, the particulate standard is not measured at 2.5 microns or less in size. The Department will address any changes to the particulate matter standard after EPA takes final action concerning the standard.

4. Comment: No changes should be made to the current hardboard rules, especially within the Medford PM_{10} nonattainment area, without requiring controls on press vents, including BACT. Rules regarding press vent emissions should be strengthened, not weakened. 2, 3, 6, 7

   Response: Press vent emissions are not easily controlled. Currently, no technology exists which can effectively control emissions at the press vents in a cost effective

manner. If, at some point in the future, the Department determines that hardboard plants need to further control particulate emissions, other sources of emissions will be evaluated for further control before the Department will attempt to regulate emissions directly at the press vents.

5. Comment: Rules should require more controls on hardboard sources in or near nonattainment areas. Much of the improvement of the air quality in these areas is a result of a depressed economy, not the effectiveness of control strategies weighted toward controlling woodstove emissions. As the economy improves and hardboard production increases, increases in press vent emissions will threaten the air quality and the Department's attainment strategies in these areas. 1, 3, 7,

   Response: Current emissions from hardboard plants are accounted for in the Department's attainment strategies. Should conditions demonstrate that further reductions in emissions are needed in these areas, it is unlikely that the Department will choose reducing emissions at press vents. As stated in the response to comment 4, press vent emissions are not easily controlled.

6. Comment: Revise Klamath Falls Attainment Plan to include the Weyerhaeuser hardboard plant within the nonattainment area boundary. 1

   Response: The Department does not believe this action is necessary at this time as the area has reached attainment with its current control strategy. Should this action become necessary in the future, a separate rulemaking will be initiated.

7. Comment: The hardboard rules should be amended to set the emission standard at an outer limit and let sources "bubble" within the plant to meet the emission standard. This would give the sources the flexibility to meet the standard in the most cost effective manner. 11

   Response: The Department has revised the statewide rule proposal to eliminate the one pound per thousand square feet standard for existing plants. Because there will be only one emissions limit, for total emissions, rather than one limit for non-vent emissions *and* one for total emissions, plants will be able to trade decreases in one kind of emissions (e.g. vent emissions) for increases in another (e.g. cyclone emissions). This allows more flexibility than the original proposal, which permitted only limited trade-offs.

8. Comment: The rule should explicitly reference a technical testing methodology. 11

   Response: Testing methodology is specified in the definition of 'particulate matter.'

9. Comment: The rule should allow the Department to choose between an emission rate of 1.0 lb/ksf plus the baseline rate and 2.0 lb/ksf rather than requiring the lower of the

two. This would allow the Department to choose an emission rate most applicable to an individual source. 11

By setting each plant's specific rate on a case by case basis, calculated from baseline emissions, the Department is choosing the emission rate most applicable to each individual source. Allowing a rate of 2.0 lb/ksf rather than a lower baseline rate would allow some sources to increase their emission rates above baseline levels, contrary to the intent of the rule.

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Air Quality Industrial Source Advisory Committee III
Members

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Judge Jacob Tanzer
Ball, Janik & Novack
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State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for
Hardboard Particulate Emission Rule Revision

Rule Implementation Plan

Summary of the Proposed Rule

This revision raises the particulate emissions limit for hardboard plants in order to correct an error made when the original limit was set.

Proposed Effective Date of the Rule

Upon filing with the Secretary of State, approximately January 26, 1994. The rule may not be implemented until approved by EPA as a SIP revision.

Proposal for Notification of Affected Persons

All affected sources are currently aware of the proposed changes and are awaiting adoption. As the adoption of these revisions requires no action on the part of the sources involved, no notification procedures have been contemplated at this time.

Proposed Implementing Actions

After approval of the revision by EPA, the revised standards will be placed in Air Pollution Control Discharge and Federal Operating Program permits as these permits come up for renewal or issuance.

Proposed Training/Assistance Actions

None necessary.

Environmental Quality Commission

☐ Rule Adoption Item
☑ Action Item
☐ Information Item

Agenda Item F
January 20, 1995 Meeting

Title:

Variance for Coos County Municipal Solid Waste Incinerator

Summary:

Coos County will be unable to comply with the requirements of OAR 340-25-860 through 885, "Incinerator Regulations", by the March 13, 1995 deadline specified in OAR 340-25-885. Coos County is requesting a nine (9) month variance pursuant to ORS 468A.075 to meet the requirements of the incinerator regulations.

Department Recommendation:

The Department recommends that the Commission approve the variance granting Coos County a nine month extension to comply with the requirements of OAR 340-25-885 and Air Contamination Discharge Permit 06-0099.

Tom Peterson	Stu Greenwood	Fred Hansen
Report Author	Division Administrator	Director

*January 6, 1995

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum†

Date: January 9, 1995

To: Environmental Quality Commission

From: Lydia Taylor, Interim Director

Subject: Agenda Item F, Coos County Municipal solid Waste Incinerator Variance, January 20, 1995, EQC Meeting

Statement of the Issue

Coos County will be unable to comply with the requirements of OAR 340-25-860 through 885, "Incinerator Regulations", by the March 13, 1995 date specified in OAR 340-25-885. Coos County is requesting a nine (9) month variance to meet the requirements of this regulation pursuant to ORS 468A.075. ORS 468A.075 gives the Commission the authority to grant specific variances which may be limited in time from the particular requirements of any rule or standard to such specific persons or class of persons or such specific air contamination source, upon such conditions as it may consider necessary to protect the public health and welfare. The commission shall grant such specific variance only if it finds strict compliance with the rule or standard is inappropriate because:
(a) Conditions exist that are beyond the control of the persons granted such variance; or
(b) Special circumstances render strict compliance unreasonable, burdensome or impractical due to special physical conditions or cause; or
(c) Strict compliance would result in substantial curtailment or closing down of a business, plant or operation; or
(d) No other alternative facility or method of handling is yet available.
Coos County's application meets all of criteria (a) through (d).

Background

Coos County presently operates a municipal solid waste incineration facility located approximately 7 miles north of Bandon, OR at Beaver Hill. OAR 340-25-885 requires such facilities to meet specific emission limits, monitoring equipment installation, and testing deadlines by March 13, 1995. The Air Contaminant Discharge Permit for this facility (ACDP # 06-0099) requires Coos County to meet the final deadline as well as

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†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

several interim deadlines for increments of progress. Coos County, because of extenuating circumstances, was not able meet these interim deadlines and will not be able to meet the final deadline required by rule.

Coos County was not able to hire consultants to develop the plans necessary or make the required financial commitments prior to the passage of a bond measure on March 22, 1994. Further delays were caused by unresolved Prevention of Significant Deterioration (PSD) issues resulting from past operations of the Beaver Hill facility. These issues were brought about by inaccurate reporting of annual tonnages by the county. Until the Department was able to resolve these issues by determining that no significant emission rates were exceeded, no construction could commence. To commence construction includes entering into binding agreements which cannot be cancelled or modified without a substantial loss to the owner. The result of these delays was that Coos County was not able to issue purchase orders or enter into construction contracts as soon as necessary to meet the requirements of the incinerator rule. Coos County immediately entered into contractual agreements following Department approval to proceed.

Coos County is currently on a path that they believe will bring them into full compliance with OAR 340-25-860 through 885. Coos County has entered into an agreement with Interel Environmental Technologies, Inc. to supply and install the equipment necessary for compliance. Coos County is requesting a variance to extend the compliance dates for a period of nine (9) months.

Authority to Address the Issue

The Environmental Quality Commission is given authority to grant variances from air contamination rules and standards to protect the public health and welfare by ORS 468A.075. Because the incinerator rule is not in the State Implementation Plan (SIP), the Environmental Protection Agency does not have oversight responsibilities in this action.

Alternatives and Evaluation

The alternatives to granting the variance are the operation of the facility out of compliance with regulations, or the temporary or permanent closure of the facility. The Beaver Hill facility is the only solid waste disposal site in Coos County. Closure of the facility could therefore result in an accumulation of refuse that could cause a threat to the public health.

Alternatives and Evaluation

The alternatives to granting the variance are the operation of the facility out of compliance with regulations, or the temporary or permanent closure of the facility. The Beaver Hill facility is the only solid waste disposal site in Coos County. Closure of the facility could therefore result in an accumulation of refuse that could cause a threat to the public health.

Summary of Any Prior Public Input Opportunity

The request for a variance has not been previously presented for public review or input. Coos County's plans for the incinerator control equipment and compliance strategy were presented at public hearings and debated extensively in Board of Commissioners' meetings prior to the March 22, 1994, bond measure vote. On March 22, 1994, the voters of Coos County approved the bond measure to spend up to seven million dollars to improve the Beaver Hill facility to comply with environmental requirements.

Conclusions

- Despite their best efforts, Coos County will not be able to comply with the deadline for compliance specified in OAR 340-25-885

- Coos County is an attainment area for all pollutants.

- The granting of the variance will not cause an exceedance of any ambient air quality standards, and will likely have a negligible effect on the air quality in the Beaver Hill area.

- Granting the variance will prevent the accumulation of refuse and the associated potential for public health effects.

Proposed Findings

The Environmental Quality Commission hereby finds that strict compliance with OAR 340-25-885 by Coos County is inappropriate because conditions exist that are beyond the control of Coos County. These conditions are the delays caused by the necessary passage of a bond measure to provide funding for the control equipment, and time for

the Department to make a determination of possible violations of PSD requirements. Also, strict compliance is inappropriate because it would result in the closing down of a operation, and no other facility or method of handling municipal solid waste is currently available in Coos County. A nine month variance from the compliance date will provide the time necessary for Coos County to bring the Beaver Hill municipal solid waste incinerator facility into full compliance with OAR 340-25-860 through 340-25-885.

Recommendation for Commission Action

It is recommended that the Commission approve the proposed variance granting Coos County a nine month extension to comply with the requirements of OAR 340-25-885 and Air Contamination Discharge Permit 06-0099. This will require Coos County to demonstrate compliance with all requirements for municipal solid waste incinerators by December 13, 1995.

Reference Documents (available upon request)

1. Statutory Authority: ORS 468A.075
2. Applicable Rule(s): OAR 340-25-850 through 340-25-885
3. Supporting Technical References: ACDP 06-0099

Approved:

Section: _____

Division: Gregory A. Green

Report Prepared By: Tom Peterson

Phone: 776-6010

Date Prepared: November 21, 1994

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DEPARTMENT OF ENVIRONMENTAL QUALITY

SUMMARY OF GOVERNOR'S REQUEST BUDGET 1995-7

AIR QUALITY

	FTE	GF	FF	OF	TOTAL
BASE	192.00	3,920,194	5,090,712	15,561,136	24,572,042
POPS - OPTION PKGS					
VIP BOUNDARY EXPANSION	8.00			679,525	679,525
TOTAL:	200.00	3,920,194	5,090,712	16,240,661	25,251,567

POSITION LOCATION:	TOTAL	HQ	VIP	REGION	LAB
BASE	192.00	46.00	54.00	60.62	26.97
Program Option Packages:	8.00		8.00		
TOTAL	200.00	46.00	62.00	60.62	26.97

File Z:\Bud7\Govrec\Summary.xls
Prepared by G.Logan
1/20/95

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUMMARY OF GOVERNOR'S REQUEST BUDGET 1995-7

WATER QUALITY

	FTE	GF	FF	OF	TOTAL
BASE	163.79	9,400,505	4,072,406	11,645,371	25,118,282
PROGRAM OPTION PACKAGES					
Non-Point	9.50		1,106,522		1,106,522
Permit Processing	7.00		684,421	119,476	803,897
On-Site Enhancement	12.00			1,223,069	1,223,069
Lower Columbia NEP	1.00		1,321,186		1,321,186
TOTAL:	193.29	9,400,505	7,184,535	12,987,916	29,572,956

POSITION LOCATION:	TOTAL	HQ	REGION	LAB
Base	163.79	52.54	87.05	24.20
Program Option Packages:	29.50	10.00	18.00	1.50
TOTAL	219.96	62.54	105.05	25.70

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Prepa by G.Logan
1/20/95

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUMMARY OF GOVERNOR'S REQUEST BUDGET 1995-7

WASTE MANAGEMENT & CLEANUP

	FTE	GF	FF	OF	TOTAL
BASE	219.96	1,650,320	4,911,850	38,428,138	44,990,308
PROGRAM OPTION PACKAGES					
High Priority Cleanup	7.00			958,882	958,882
Voluntary Cleanup	23.18			4,461,990	4,461,990
Pollution Prevention	3.00		63,647	363,457	427,104
UST Financial	1.00			2,891,560	2,891,560
TOTAL:	254.14	1,650,320	4,975,497	47,104,027	53,729,844

POSITION LOCATION:	TOTAL	HQ	REGION	LAB
Base	219.96	91.12	118.33	10.5
Program Option Packages:	34.18	11.92	22.25	
TOTAL	254.14	103.04	140.58	10.5

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Prepared by G.Logan
1/20/95

DEPARTMENT OF ENVIRONMENTAL QUALITY

SUMMARY OF GOVERNOR'S REQUEST BUDGET 1995-7

AGENCY MANAGEMENT

	FTE	GF	FF	OF	TOTAL
BASE	67.00	2,195,640	-	8,711,501	10,907,141
PROGRAM OPTION PACKAGES					
Business Efficiencies	3.00		-	765,565	765,565
TOTAL:	70.00	2,195,640	-	9,477,066	11,672,706

POSITION LOCATION:	TOTAL	HQ
Base	67.00	67.00
Program Option Packages:	3.00	3.00
TOTAL	70.00	70.00

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1/20/95

DEPARTMENT OF ENVIRONMENTAL QUALITY
SCHEDULE OF FEE INCREASES 1993-5

DESCRIPTION OF FEE	WHO PAYS FEE	AUTHORITY	ADVISORY	PREVIOUS INCREASE	1993-5 EST REVENUE	1995-7 EST REVENUE	COMMENTS
Air Contaminant Discharge Permit	Industrial sources of air contamination	ORS 468.065 & 468.065(2)	Industrial Source Advisory Committee, review and approval	1991	1,965,065	2,100,000	To maintain quality of program with decreased state funds available
Asbestos Certification	Contractors and workers dealing with asbestos and those who train them	ORS 468.745 & 468.750	Industrial Source Advisory Committee, review and approval	1988	630,000	691,000	To maintain quality of program with decreased state funds available.
Gasoline vapor recovery and Oxy-fuel fees	Owners of tanker units, owners of State I/II gasoline facilities and gasoline terminals	ORS 468.020, 468A.045, 468A.040	Advisory Committee whose members included regulated community	1992	208,400	396,200	Changed emphasis to Stage I/II permitting, begin those fees, repeal and reduce some fees for Oxyfuel (1993-5 revenue changes raises $90,900, eliminates $133,600)
Industrial Waste Discharge Permit	Industrial sources that discharge water.	ORS 468.065	Associated Oregon Industries Environment Committee	1991	2,002,574	3,698,400	Inequity between Municipal sources supporting 74% of costs and Industrial sources supporting 30%; increases raised Industrial support to 60% of cost

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Prepared by G Logan
1/18/95

DEPARTMENT OF ENVIRONMENTAL QUALITY

SCHEDULE OF FEE INCREASES 1993-5

DESCRIPTION OF FEE	WHO PAYS FEE	AUTHORITY/ADVISORY		DATE OF LAST INCR	1993-5 EST REVENUE	1995-7 EST REVENUE	COMMENTS
Subsurface Sewage Disposal	Individuals who have on-site sewage disposal systems for residences and commercial establishments	ORS 454.625 & 454.745	No Advisory Group; had requests from two counties.	1991	3,113,838	4,364,990	To provide 2 week turn around where previously had backlogs of at least 6 weeks holding up new home construction.
Wastewater System Operator Certification ---- NOT ADOPTED----	Individuals who seek certification to work at wastewater treatment plants.	ORS 448.410	Wastewater System Operator Certification Advisory Committee	Est 1988	103,000	172,540	Environmental Quality Commission adopted a temporary rule on 12/2/94 that suspends imposition of fee increase 180 days or until 5-30-95, at request of Emergency Board.

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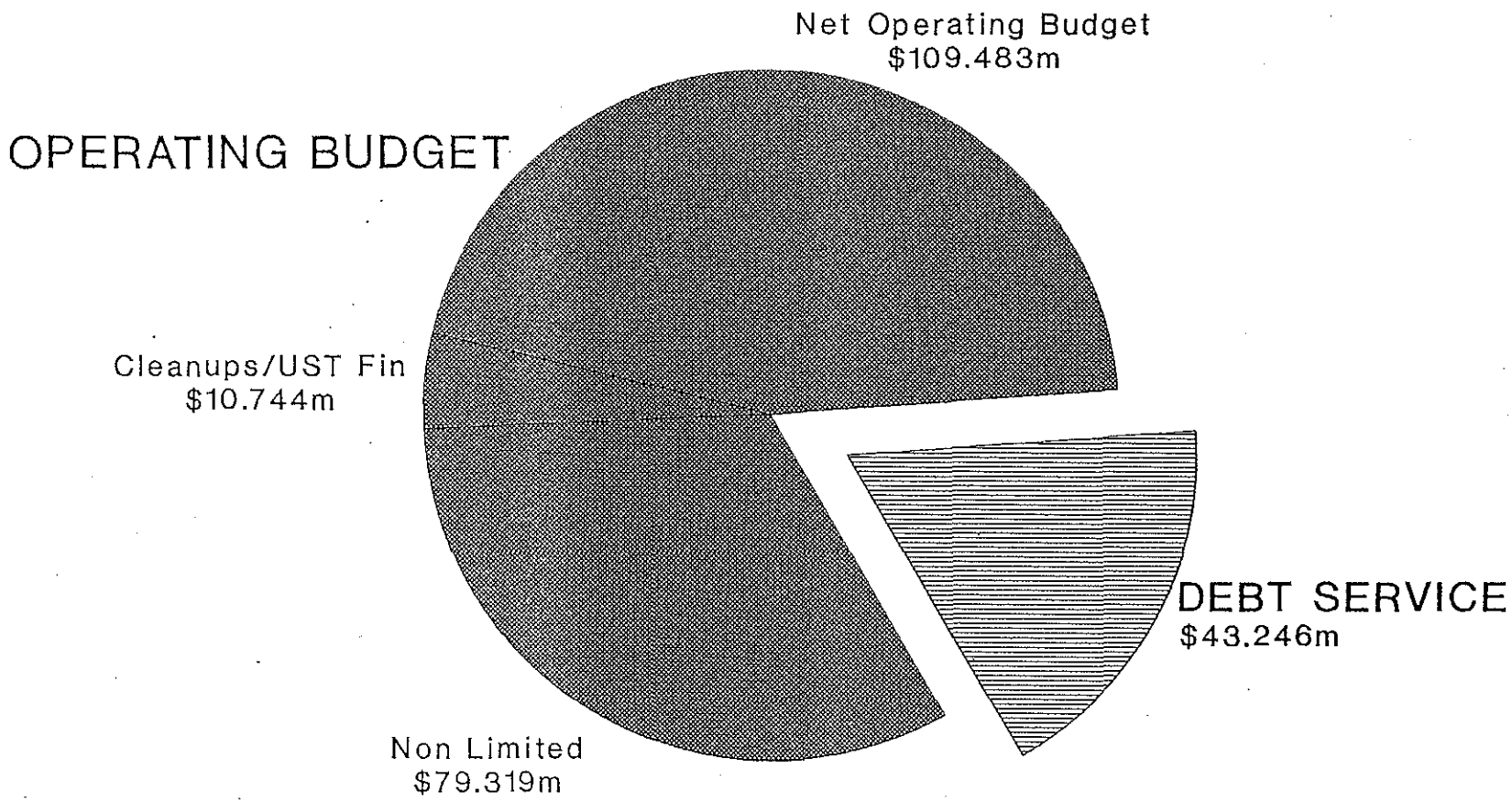
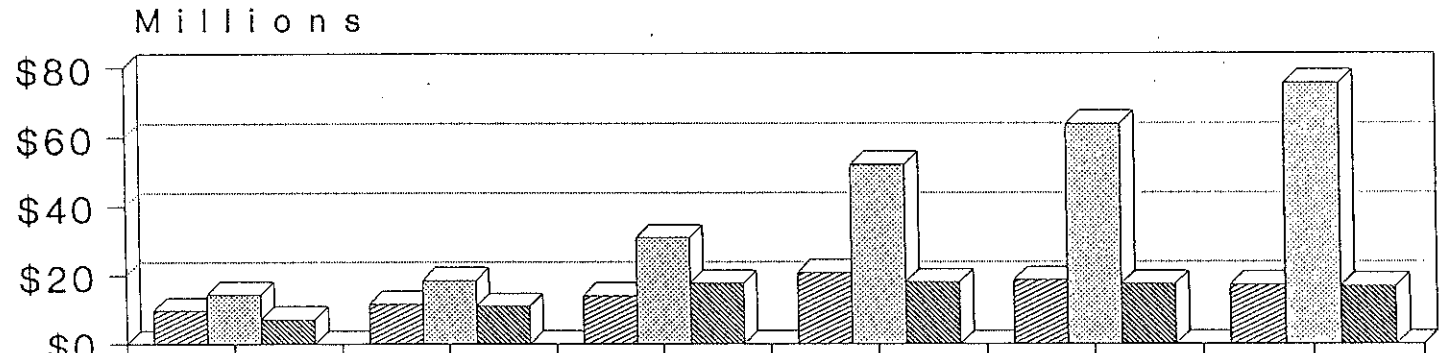
Prepared by G Logan

DEPARTMENT OF ENVIRONMENTAL QUALITY
1995-97 Governor's Recommended

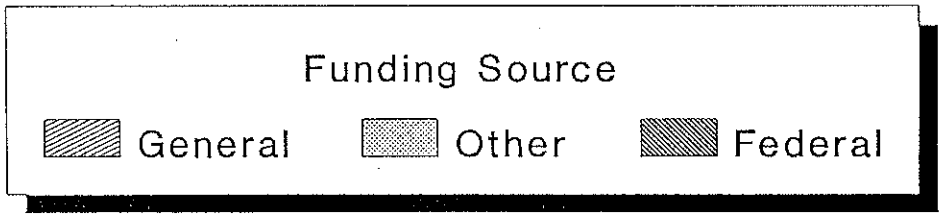


DEQ NET OPERATING BUDGET

Dollar Comparison by Fund



BIENNIUM	85-87	87-89	89-91	91-93	93-95*	95-97**
General	$9.728	$11.695	$14.052	$20.714	$18.614	$17.167
Other	$14.435	$18.515	$30.839	$52.061	$63.705	$75.438
Federal	$7.197	$11.018	$17.674	$18.049	$17.527	$16.879
Total	$31.359	$41.228	$62.565	$90.824	$99.846	$109.483

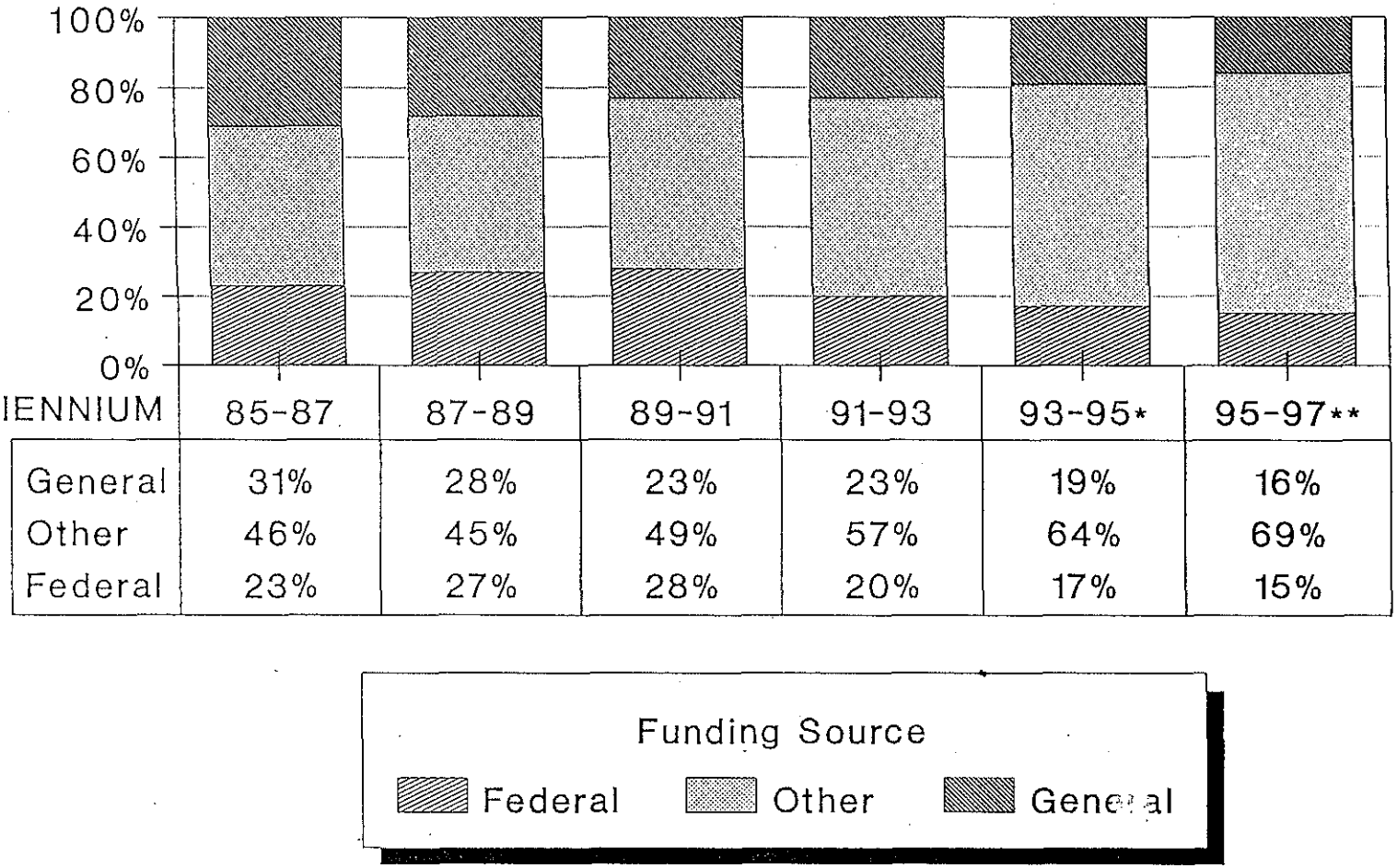


Net Operating Budget excludes
UST Financial Payments and Cleanup Costs

*93-95 Legislatively Approved Budget
**95-97 Governor's Recommended

DEQ NET OPERATING BUDGET

Percentage By Fund



BIENNIUM	85-87	87-89	89-91	91-93	93-95*	95-97**
General	31%	28%	23%	23%	19%	16%
Other	46%	45%	49%	57%	64%	69%
Federal	23%	27%	28%	20%	17%	15%

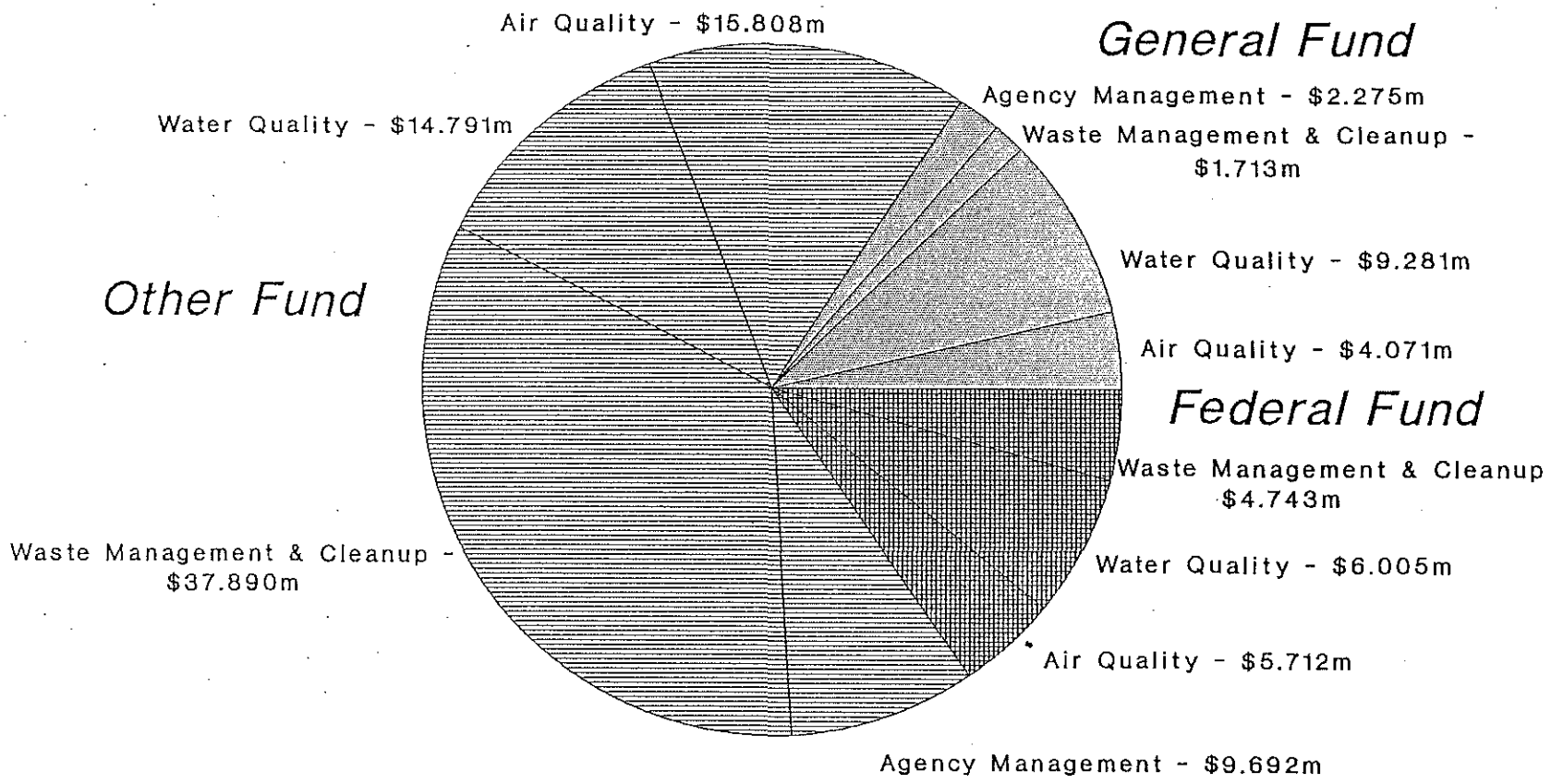
Net Operating Budget excludes
UST Financial Payments and Cleanup Costs

*93-95 Legislatively Approved Budget
**95-97 Governor's Recommended

DEPARTMENT OF ENVIRONMENTAL QUALITY

1995-97 Governor's Recommended

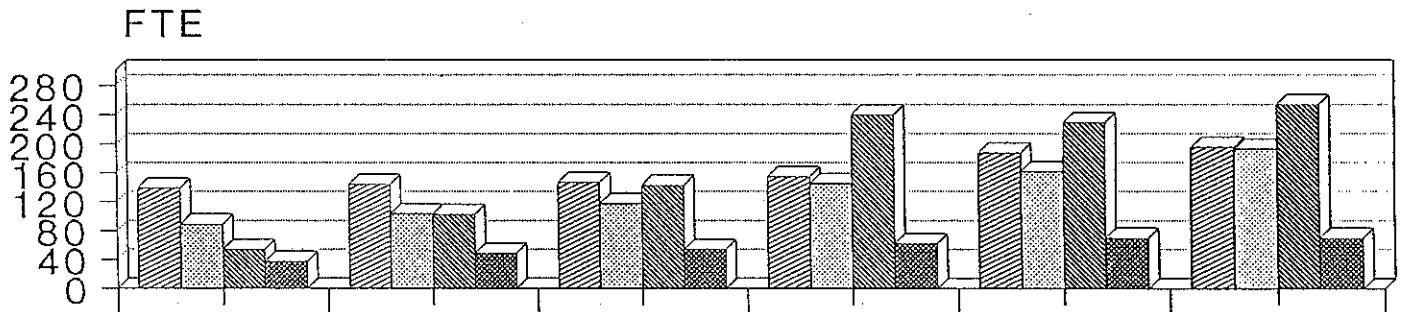
Net Operating Budget - $109.5m



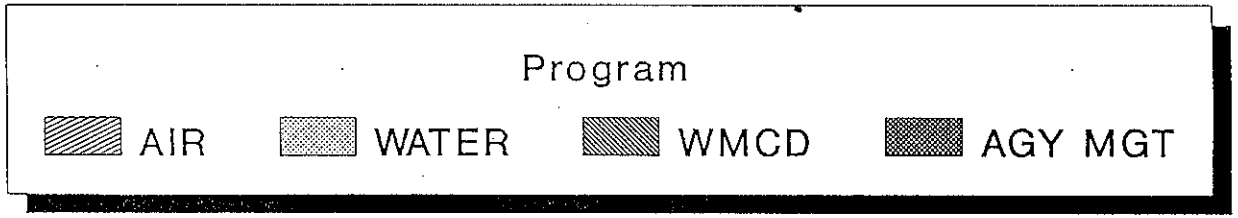
Net Operating Budget excludes UST Financial Payments and Cost of Cleanups.

DEQ NET OPERATING BUDGET

FTE by Program



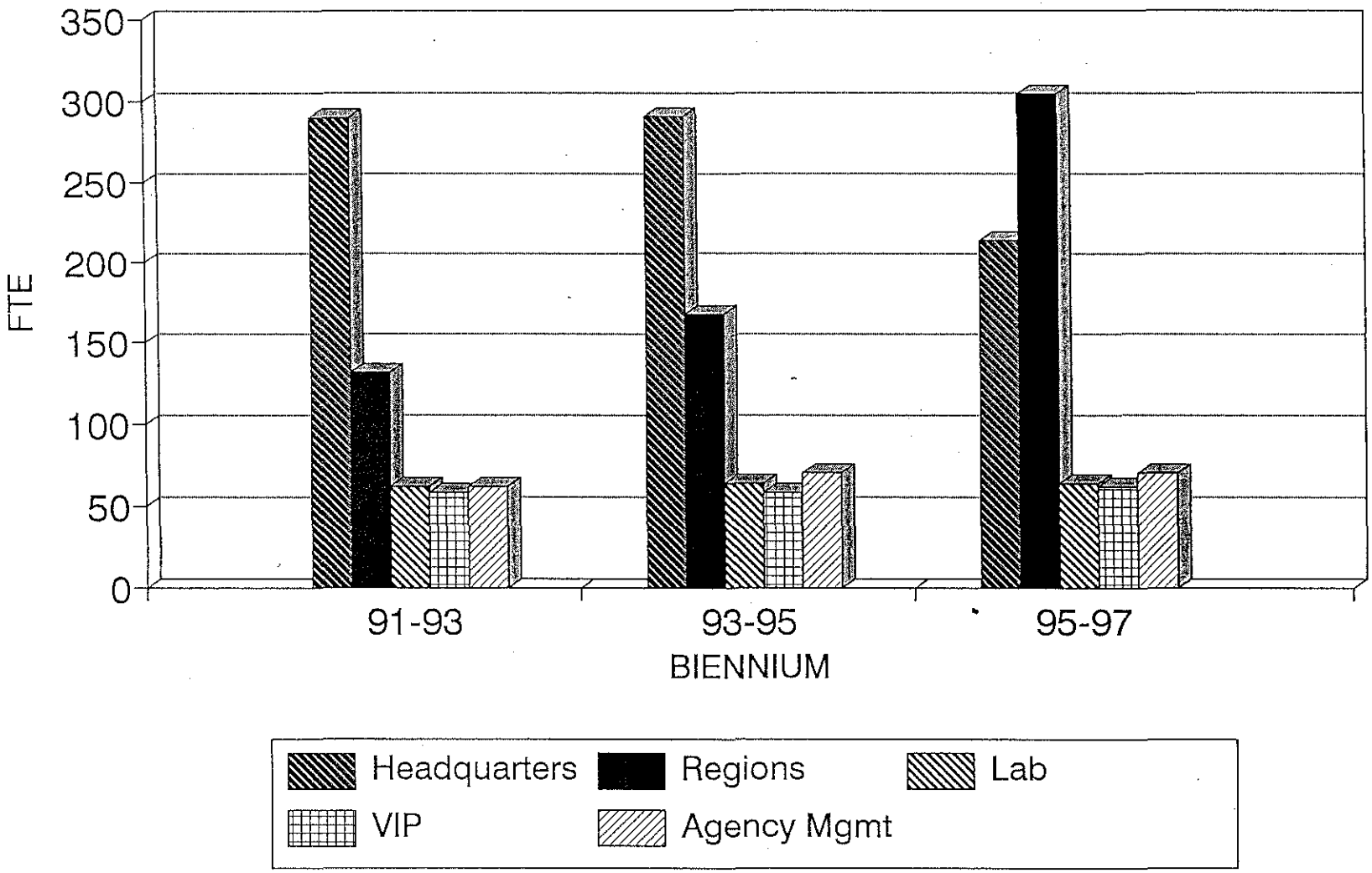
BIENNIUM	85-87	87-89	89-91	91-93	93-95*	95-97**
AIR	139	144	147	155	188	196
WATER	89	104	118	145	162	193
WMCD	54	103	143	240	229	254
AGY MGT	37	49	54	62	70	70
TOTAL	319	400	462	602	649	713



*93-95 LEGISLATIVELY APPROVED BUDGET
**95-97 GOVERNOR'S RECOMMENDED

DEPARTMENT OF ENVIRONMENTAL QUALITY

Positions by Location



OREGON ENVIRONMENTAL COUNCIL

January 16, 1995

Environmental Quality Commission
811 SW Sixth
Portland, OR 97204

Re: Controlling Motor Vehicle Emissions in Portland

Dear Commissioners,

I am writing regarding the upcoming decisions you will have to make regarding motor vehicle emissions in the Portland region. Specifically, the commission is mandated, pursuant to HB 2214, to adopt rules regarding employer-based commute trip reductions (the so-called "ECO" program) and parking ratios. As you probably know, both these programs have been the subject of intense scrutiny by DEQ staff and advisory committees throughout much of 1994.

These programs were enacted by the legislature in 1993 because certain legislators were unwilling to impose mileage-based emissions fees on motorists. Though such a strategy was recommended by the Governor's Task Force on Reducing Motor Vehicle Emissions in the Portland Region, legislators on a special House committee backed away from it, choosing instead to shift the burden of control from all motorists to smaller subsets, i.e. some commuters and shoppers.

OEC has been convinced for the past two years that these two programs will prove to be expensive, difficult to administer, and relatively ineffective. Therefore, despite the actions of previous legislative bodies, we have continued to search for market-oriented, incentive-based policies that might be politically acceptable.

Attached is a concept paper that describes our latest attempt. Unlike previous versions considered by the Governor's Task Force or any other group, this concept calls for using all emissions fee revenue for tax-free rebates to every resident of the metropolitan region, to compensate them for their personal and property losses associated with pollution. Our hope is that this will create such a powerful financial incentive that people will be strongly motivated to reduce their pollution, in order to receive

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503-222-1963 • FAX 503-222-1405

more in rebates than they contribute in emissions fees.

Also, since our proposal suggests deferring implementation of the ECO and parking ratio programs indefinitely, we anticipate a higher-than-usual level of interest within the business community.

The purpose of this letter is to solicit feedback from the Commission and DEQ staff, during the public testimony period of the January 20 meeting. If this concept is to go anywhere this session, we need to get the idea into final form, find sponsors, and begin to build a coalition behind it. We would like incorporate any suggestions that you might have into the draft before we submit it to legislative counsel.

Thank you for taking the time to consider this material. I look forward to discussing it with you on Friday.

Sincerely,

John A. Charles

John A. Charles
Executive Director

cc: Lydia Taylor
Greg Green
John Kowalczyk
Olivia Clark
Mike Hollern

HARNESSING THE POWER OF THE MARKET: CLEANING PORTLAND'S AIR WITH MILEAGE-BASED FEEBATES

a Legislative Proposal
Oregon Environmental Council
January 1995

I. SUMMARY

The Oregon Environmental Council proposes that the legislature authorize the Oregon Department of Transportation (ODOT) to collect mileage-based emissions fees from all motorists within the boundaries of the Portland vehicle inspection and maintenance (I/M) program. The fees should be designed to pay for the environmental and public health damage caused by air, water and noise pollution of motor vehicles.

The revenues should be used exclusively to provide annual cash rebates to all residents (including children) of the Tri-county area, to compensate them for personal and property losses associated with motor vehicle pollution.

At the same time the emissions fee program is enacted, requirements for DEQ to develop and implement programs for employer-based commute trip reductions and parking ratios (mandated in HB 2214, 1993 session) should be delayed to a point three years past the implementation date of the emissions fee program. This will allow DEQ time to determine the effectiveness of emissions fees, and the need for additional air pollution strategies for motor vehicles.

II. NEED FOR LEGISLATION

The Portland metropolitan region is currently in violation of federal law due to unhealthy levels of ground-level ozone. Motor vehicle emissions are the primary cause of ozone formation. According to calculations done by DEQ for the Governor's Motor Vehicle Emissions Task Force in 1992, the region must reduce emissions of volatile organic compounds (VOCs) by 37.1% and oxides of nitrogen (NOx) by 20.6% by 2010, in order to accommodate population growth and economic development. Failure to reach these targets will result in continued noncompliance, resulting in federally imposed growth sanctions.

New regulatory programs enacted by the legislature in 1993 to mandate employer-based commute trip reductions and parking ratios in the Portland region are likely to be expensive, difficult to administer, and relatively ineffective. Many of the individuals who worked with DEQ during 1994 to implement these programs now believe that alternative approaches should be explored. In particular, there is a perceived need for policies that involve all motorists in the solution (not just commuters), and which utilize financial incentives.

III. OEC'S FEEBATE PROPOSAL

OEC's proposal is designed to send accurate price signals to motorists about the true costs of their driving. Those costs include health and property damage, regulatory burdens shifted to other parties (such as industrial sources), the devaluation of property as a result of motor vehicle noise, and increased sewering costs associated with contaminated stormwater runoff (which, in Portland alone, is translating into a $750 million capital program that will be borne by homeowners, not motorists).

OEC believes that, as in every other sector of the economy, if consumers are given realistic price signals, they will make choices that allocate scarce resources (such as air, water and road space) in an efficient and equitable manner. The types of choices they make will be up to them; they will not be required to do anything different then they are doing today.

Elements of the Program

A. Scope

This proposal covers all motor vehicles registered within the newly expanded boundaries of the Portland I/M program. For vehicles currently exempt from the I/M program, which includes pre-1974 vehicles and those using diesel fuel, default values can be assigned for estimated emissions, and used in conjunction with self-reported odometer readings at the time of vehicle registration.

B. Testing Vehicles

The principal environmental impacts of driving are air, water and noise pollution. Air and noise impacts can be highly variable, depending on model year and owner operation, and can be measured at the time the vehicle is run through the I/M program. Impacts on water, such as oil leaks and minute particles of heavy metals, are probably less variable and more difficult to measure. Therefore, the costs associated with water pollution can be estimated and assigned as "default values."

At the time each vehicle is tested, the odometer will be checked, readings taken, and emissions values assigned for each mile driven in the previous two years. In order to re-register the vehicle, the owner will have to pass the DEQ emissions test, as well as pay the emissions fee.

C. Estimated Fees

Many researchers who have studied the subject estimate that the societal cost of vehicle-related pollution ranges from $ .007 to $ .035 per mile for air pollution impacts, depending on the emissions characteristics of the vehicle. Accounting for noise and water impacts will increase this somewhat. Thus, people who drove 10,000 miles per year in a previous biennium would likely owe somewhere between $160 and $780.

Although this is a sizable amount of money, it is important that the fees be directly linked to both emissions and mileage, and that no caps or exemptions be allowed. Motorists must feel the incentive at all levels of driving, and those with highly polluting cars must pay more than those with low-emitting cars. Otherwise, the impacts of the program will be diluted, forcing DEQ to enact additional regulatory programs that will cost the region much more in the long run.

D. Use of the Revenue

Since the primary purpose of the emissions fee is to charge motorists for the environmental impacts of their driving, the revenue should be used to mitigate those impacts. The most direct way to do that is through cash rebates to every resident of the region. This gives them cash that they can spend as they please, yet does not distort the disincentive effect of the emissions fee.

Assuming that each individual in the region suffers approximately equal welfare losses from pollution, the pool of revenue should simply be divided up and rebates mailed annually to each household, with one payment for each member of the household.

This additive methodology is appropriate because: (a) children and elderly dependents suffer from pollution as much (and probably more) than do healthy adults, and thus should be compensated, and (b) larger families are more likely to drive more, and thus pay more fees into the fund. Since much of their driving will be related to dependent care, it's only fair that they be allowed to collect rebates for each dependent.

IV. FEEBATES ARE PROGRESSIVE

One important benefit of such a program is that it directly addresses a major inequity built into the current system: affluent people tend to drive more than poor people, yet lower income residents are impacted (in many cases disproportionately) by vehicle-related pollution. Under a feebate system, all residents in the region will receive compensation -- likely to be in excess of $250 per rebate -- even if they pay no emissions fees or income taxes. Thus, the very poorest members of the community will be demonstrably better off under this proposal.

V. PROGRAM ADMINISTRATION

The **Environmental Quality Commission (EQC)** would be given rule-making authority to adopt a schedule of emissions fees for all vehicles registered within the Portland I/M boundaries, and a methodology for testing vehicles to comply with the new program.

DEQ would continue to administer the I/M program, but add testing for odometer tampering and noise emissions to the checklist of duties to perform.

ODOT would continue to collect all vehicle registration and I/M certification forms, as it does now, plus the emissions fees.

The individual rebates would be processed by whichever agency is best suited to administer it, based on existing data bases and ongoing interactions with taxpayers. For example, it may be desirable to have the Oregon Department of Revenue process rebates, since they already have the infrastructure for mailing income tax refunds.

VI. TAX TREATMENT OF REBATES

Since the rebates are designed to compensate people for the environmental damage associated with ambient pollution, they should not be treated as income for purposes of state taxation. To the extent that it is possible to make the rebates exempt from federal taxation as well, that should also be written into the bill.

VII. ESTIMATED EFFECTS ON AUTO EMISSIONS

When emissions fees were analyzed by DEQ in 1992 for the Governor's Task Force, the department estimated that smog fees averaging $200 by the year 2000 would result in emissions reductions of 5.0% for VOC's and 5.5% for NOx. Given that the department's modelling was based only on emissions fees for air, it's likely that the effects of fees based on air, water and noise would be greater.

Since the level of both emissions fees and rebates will be substantial (in terms of dollars), it will create a powerful dynamic, whereby each motorist tries to be a net winner by reducing driving and/or emissions to a level where his/her emissions fees are lower than the rebates. Once people are fully aware of this relationship, we expect a series of behavioral changes that, over time, may push the emissions reductions levels well beyond those estimated by DEQ during 1992, especially since the DEQ modelling did not assume that any of the fee revenue would be rebated to individuals.

VIII. RELATIONSHIP OF THIS PROGRAM TO THE PARKING RATIO AND TRIP REDUCTION REGULATIONS

If the emissions fee program is as successful as estimated above, it is likely that the parking ratio and trip reduction regulations could be delayed indefinitely.

Therefore, the bill should include a provision postponing the implementation of the parking ratio and trip reduction regulations to a date at least three years after the implementation date of the emissions fee program. This will give DEQ adequate time to determine the impacts of emissions fees on VMT, trip starts and regional emissions. If the fee program is highly effective, then subsequent legislative bodies may wish to repeal the regulatory programs in their entirety.

IX. EMISSIONS FEES ARE A HIGHLY COST-EFFECTIVE APPROACH TO MOBILE SOURCE CONTROL

Virtually every major technical analysis of mobile source emissions controls in the past five years has concluded that mileage-based emissions fees are one of the most cost-effective methods for reducing vehicle-related pollution. One study released last June concluded that:

> "The most economically attractive ways of reducing motor vehicle emissions would be directed at cars already on the road and would require extensive use of economic incentives. Emissions-based registration fees hold much promise. Such a policy could achieve substantial emissions reductions at relatively low cost....

"Until emissions-based registration fees and other economic-incentive approaches are investigated, it would be a serious mistake for states to commit themselves prematurely to command-and-control approaches, which may prove to be costly, ineffective, and difficult to back away from."[1]

X. CONCLUSION

The feebate approach has a number of appealing features. It is:

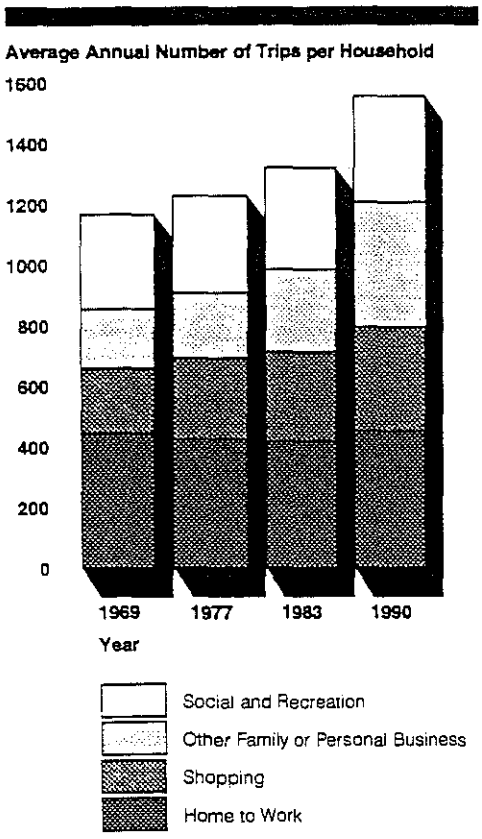
* comprehensive
* progressive
* incentive-based
* revenue-neutral
* fair
* cost-effective
* non-regulatory

A program of this nature has never been implemented anywhere in the world. This is an opportunity for Oregon once again to be a leader in environmental policy.

---

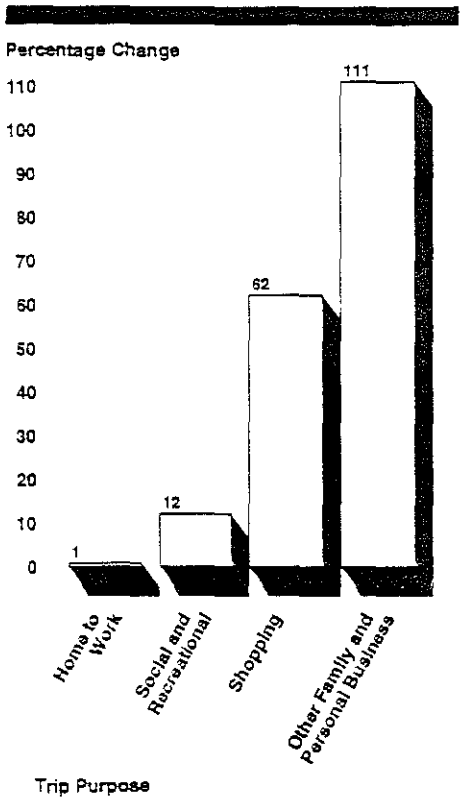
[1] Harrington, Winston and Margaret A. Walls, **Shifting Gears: New Directions for Cars and Clean Air,** Resources, Resources for the Future, Washington, D. C., Spring, 1994, p. 6.

Figure II.2: Average Annual Number of Vehicle Trips per Household, by Trip Purpose, 1969-90

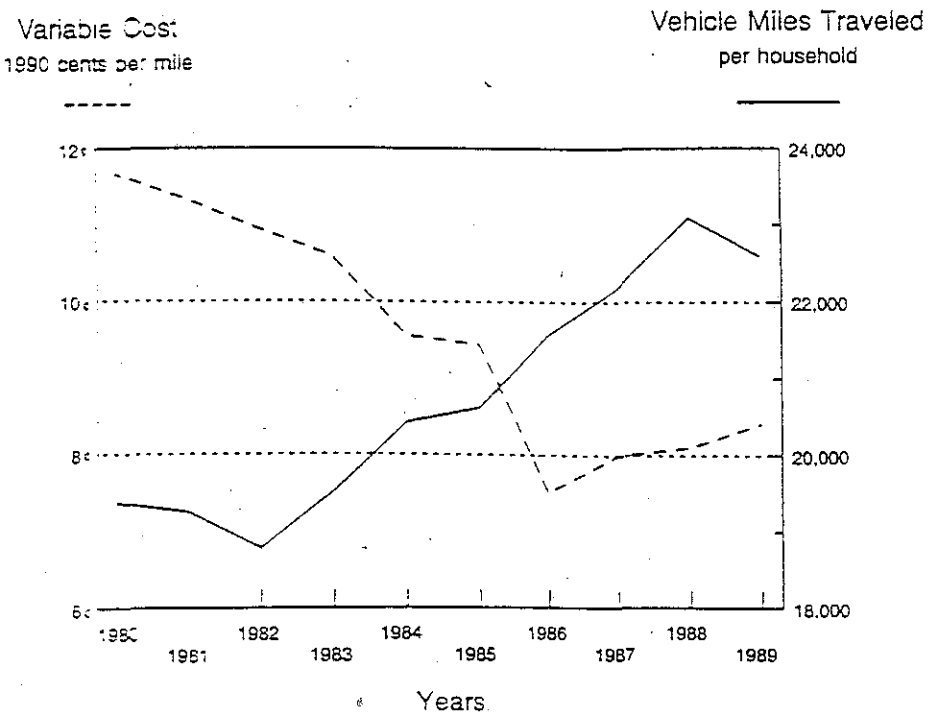


Source: GAO presentation of FHWA data.

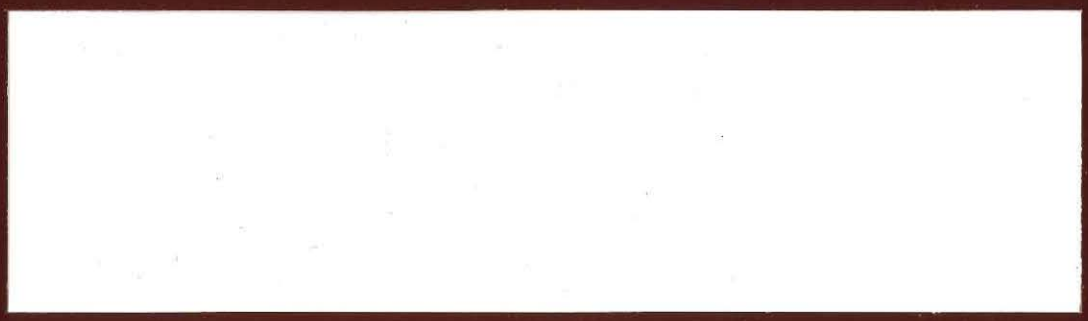
Figure II.3: Percentage Change in Average Annual Number of Vehicle Trips per Household, by Trip Purpose, 1969-90



Source: GAO presentation of FHWA data.


Variable Cost
1990 cents per mile
Vehicle Miles Traveled
per household
24,000
22,000
20,000
18,000
1981
1982
1983
1984
1985
1986
1987
1988
1989
Years

Harding Lawson Associates



Engineering and Environmental Services

HLA

Determination of the 1995 Rigid Plastic Container Recycling Rate for Compliance Purposes for the State of Oregon

Prepared for

Oregon Department of Environmental Quality
Waste Management and Cleanup Division, 9th Floor
811 SW 6th
Portland, Oregon 97204

HLA Project No. 29896.1

Prepared with

ECO
NORTHWEST
99 W Tenth, Suite 400
Eugene, Oregon 97401

December 30, 1994

Harding Lawson Associates
Engineering and Environmental Services
227 SW Pine Street, 3rd Floor
Portland, Oregon 97204 - (503) 227-1326

CONTENTS

TABLES

FIGURES

APPENDIXES

DISTRIBUTION

Source-separated rgid plastic containers delivered to a recyclables depot await transport for processing and marketing. Rigid plastic containers in Oregon are expected to be recycled at a rate of 31.9% (23.1 million pounds) in 1995. This success is due to the efforts of Oregonians who participate in a wide variety of recycling activities, including bottle deposit returns, recyclables drop-off, and curbside collection programs.

The weight of these rigid plastic containers sorted from waste delivered to a transfer station will be used to estimate the pounds of this material that is disposed of. With 68.1% (49.3 million pounds) of rigid plastic containers still destined for disposal, considerable improvement and continued expansion of collection and processing systems for these materials are needed.

1.0 SUMMARY

Rules adopted by the Oregon Environmental Quality Commission (EQC) on October 21, 1994 pertain to implementation of Oregon's Rigid Plastic Container Law. These rules require that the Department of Environmental Quality (DEQ) calculate a recycling rate for compliance purposes for rigid plastic containers (RPC) by January 1, 1995. The purpose of calculating the RPC recycling rate for compliance purposes is to inform manufacturers of regulated containers, prior to the compliance date, of the container-compliance status. RPC are defined in the rules as plastic bottles, jars, cups, tubs, pails, "clamshell" containers, or other plastic containers that meet a number of identified criteria.

The rules specify that compliance be measured prospectively, that is, that RPC recycling be forecast for 1995 and that that rate be compared to the target of 25 percent (the percent by weight of all post-consumer RPC waste generated in Oregon that is recycled).

In October through December of 1994, DEQ conducted an analysis to estimate the 1995 recycling rate for compliance purposes of RPC within the State of Oregon. Information used in this analysis included data collected on RPC recycling and disposal in 1993, prior to adoption of the rules; assumptions and adjustments needed to apply these data in addressing the rules; and projections on how RPC recycling and generation within the state are expected to change during calendar years 1994 and 1995. The results of that analysis, the 1995 RPC recycling rate for compliance purposes, and the calculations are presented in this report.

The analysis results in an estimated RPC recycling rate for compliance purposes within the State of Oregon of 31.9 percent for 1995. Table 1 summarizes the annual recycling rates for 1993 and the 1995 recycling rates for compliance purposes determined through this project, both for all RPC and for resin types identified in the rules.

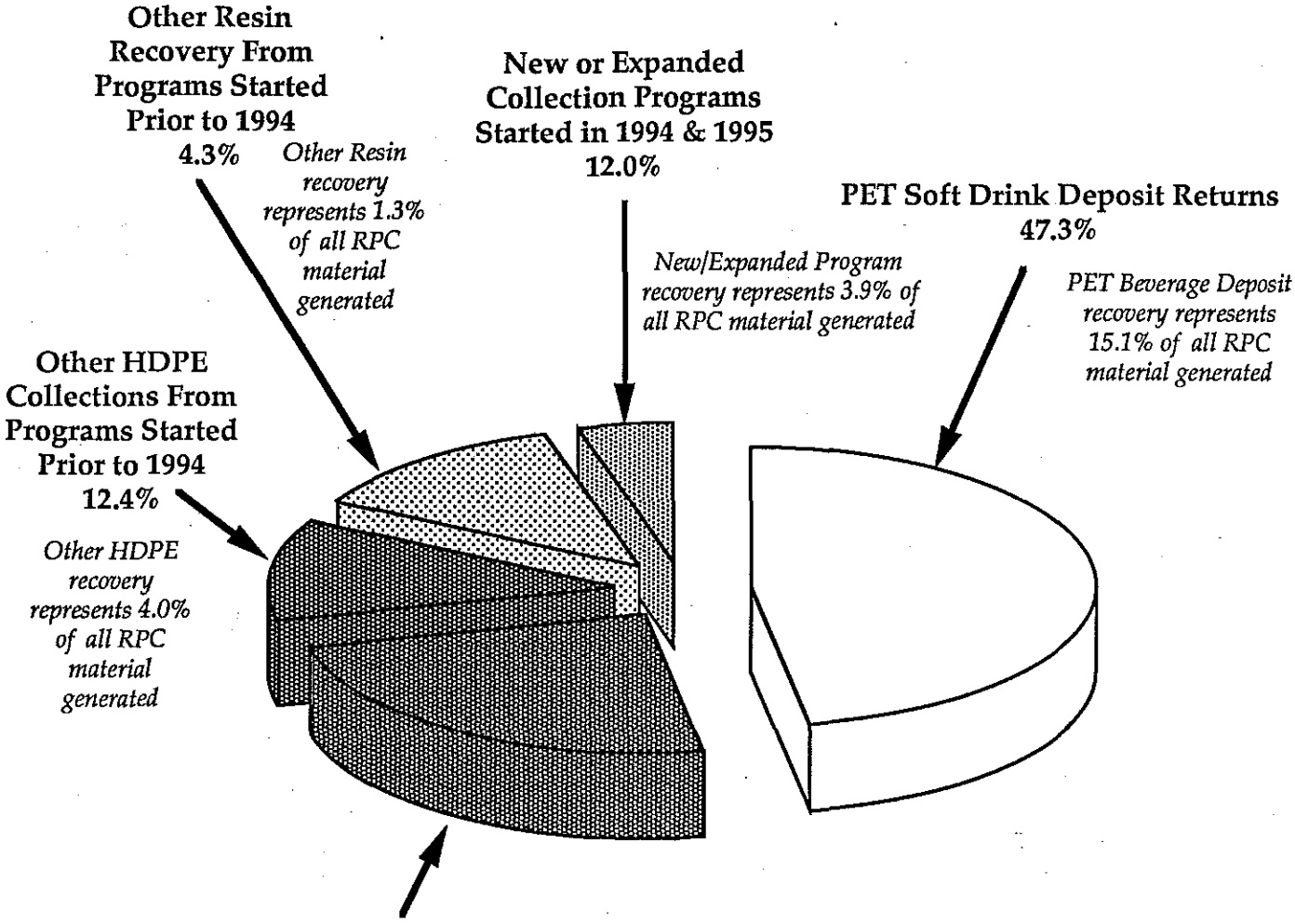
As discussed in the methods and assumptions sections of this report, the actual rate could be below or above this figure. A sensitivity analysis was performed to quantify the uncertainties of the calculations and indicates a 99.9 percent probability that the 1995 recycling rate for compliance purposes, for all RPC resins, will be greater than 25 percent. The most significant uncertainty of the analysis is the inability to project the 1994 and 1995 growth rates in the manufacture and consumption of plastic containers that result in RPC waste generation within Oregon. However, given the mature recovery systems for PET soft drink and HDPE milk jugs that exist in much of Oregon, it is reasonable to expect that increased growth in generation of these materials will be matched by increases in the growth of recovery.

The following pie chart summarizes the contributions of various collection programs and recovery efforts to the aggregate RPC recycling rate for compliance purposes that is projected for 1995.

Table 1 Summary of Results

Rigid Plastic Container Category/Parameter	Estimated 1993 Recycling Rate	Estimated 1995 Recycling Rate for Compliance Purposes
PET (#1 - soft drink and custom)	63.8%	64.3%
HDPE (#2 - natural and pigmented)	20.1%	25.4%
Combined Rate for other resins: PVC, LDPE, PP, PS and mixed/other	7.5%	9.7%
Aggregate - All RPC Resins	26.9%	31.9%

Contributions to 1995 Recycling Rate for Compliance Purposes



Recovery from all of these contributions combine to yield a Rigid Plastic Container (RPC) Recycling Rate for Compliance Purposes in 1995 of 31.9% of all RPC material generated in Oregon.

2.0 BACKGROUND

Describing how to calculate an accurate and defensible material-specific recycling rate is easier than gathering the data and doing the actual calculations. The recycling rate is defined as the amount of the material (in pounds) recycled during a period divided by the amount of the material generated as waste (also in pounds) during the same period. The amount generated can be calculated by summing the amount recycled and the amount disposed of during the period.

Because it is far too costly to make direct observations and records of every pound of RPC as it is recycled, disposed of, or generated as waste, indirect methods of measurement are required. The quantity of RPC *disposed of* in Oregon is estimated using the results of waste composition studies that estimate the percentages of RPC in the municipal and construction/demolition waste streams in various regions of the state, along with reports from more than 80 disposal site operators on the quantities of all wastes disposed of for the time period. The quantity of RPC *recycled* is estimated on the basis of voluntary reports submitted by more than 200 collectors and processors currently handling plastics from Oregon.

Within all of these data collection and reporting systems there is plenty of opportunity for error. For example:

- Data reported by collectors, processors, or disposers can contain errors or may be based upon recollection and estimation rather than upon actual weights and detailed records
- Materials recovered or disposed of can be categorized incorrectly
- Volumes can be converted to weights using incorrect density assumptions
- Reporting time periods may not correlate
- Waste composition or material recovery estimates may be in error because of contaminants (e.g., food or moisture) weighed along with containers
- Materials collected for recycling may be handled by out-of-state markets that are not surveyed, or may be stockpiled, downgraded, or disposed of prior to being marketed
- Industrial scrap plastics, non-RPC plastic containers, or other recycled materials may be reported incorrectly, along with targeted RPC resin recovery figures (for example, in the 1993 survey, handlers were not asked to report HDPE RPC recovery separate from other HDPE recovery; that is expected to change in the 1994 survey)
- Some rigid plastic containers that are littered, illegally dumped, or burned in burn barrels are not included in the "disposed-of" figures

Accurate estimation of the pounds of RPC disposed of for the 1993 reference period and for future analyses is complicated due to two factors:

- Sampling errors and biasing errors affect the accuracy of waste composition studies and many other statistical sampling methodologies. DEQ's 1992-93 waste characterization study included 823 samples of between 200 and 300 pounds each. This resulted in the actual weighing of just 120 tons to represent the composition of nearly 2,300,000 tons of waste actually disposed of within the state. The study's design does all that it can to provide results as accurate as possible for reported material composition; however, there are obvious limits on how accurate such studies can be.
- The timing and frequency of waste composition study scheduling for the state may make it difficult to clearly see changes in RPC recovery reflected in the disposal waste stream.

In developing assumptions and projections that attempt to extrapolate from recycling rates in prior periods for which there are "complete" records to

current or future periods, there is also opportunity for error. For example:

- Material consumption and disposal patterns may change
- Recent or historic rates of growth may not be sustained in future years , especially if they have been at levels of 10 percent, 20 percent, or higher
- Existing programs for collecting and processing RPC may increase or decrease activities or performance due to a number of factors
- Anticipated new programs may or may not start up according to schedule and may or may not have the anticipated level of success in recovery or generator participation
- Anticipated changes in economic or population growth that would affect RPC recovery and disposal may not be as forecast

These complexities were recognized by DEQ staff, Oregon recyclers, and the plastics industry prior to adoption of the rules. A Recycling Rate Task Force met several times in early 1994 to consider issues of the proposed rules that would affect the ability to determine RPC recycling rates for Oregon. This led to some clarification in the rules of how the recycling rate would be determined, though many technical issues of the analysis remained unresolved.

After rule adoption, DEQ hired the consultant team (Harding Lawson Associates and ECO Northwest) and formed a Recycling Rate Workgroup to advise DEQ and its consultants on a specific methodology and the assumptions used to calculate the 1995 recycling rate for compliance purposes. Members of this group, each of whom is familiar with various technical complexities of plastic recycling rate calculation, met five times during the development of this report to review approaches being taken and to provide a balance of inputs and perspectives. The Work Group has not been asked to specifically endorse the results of this analysis, though they have played an important and essential role in shaping the methodology and in defining the assumptions that are integral to the report's findings.

The consultants wish to acknowledge and thank the following individuals for their role in completion of this effort:

Oregon Department of Environmental Quality

Pat Vernon, Project Manager

Work Group members:
Deanna Mueller-Crispin
Peter Spendelow

Other DEQ staff members, who provided assistance in supplying data and performing surveys

Recycling Rate for Compliance Purposes Work Group

Marc Daudon, Cascadia Consulting Group
Ron Perkins, American Plastics Council
Jerry Powell, Resource Recycling Magazine
Chris Taylor, OSPIRG
Kathy Thomas, Thomas/Wright, Inc.

Recycling Businesses, Public Agencies, and Organizations Participating in Oregon's Efforts to Recycle Rigid Plastic Containers

Many individuals and groups contributed to the study through answering specific questions of DEQ and the consultant and through participation in ongoing efforts of "routine" data collection and reporting.

Thanks to all of you!

The Consultant Team

Harding Lawson Associates
Rich McConaghy, Project Manager
Delyn Kies
Susan Kramer
Catherine Murphy

ECO Northwest
Carl Batten
Terry Moore

3.0 METHODS

Given the charge to estimate the 1995 recycling rate for compliance purposes, the consultant team, working with DEQ staff and members of the Work Group, recognized the impossibility of determining perfectly accurate numbers on the recycling rate for compliance purposes for all RPC and the various RPC resin types:

1. Polyethylene terephthalate (PET)
2. High-density polyethylene (HDPE)
3. Polyvinyl chloride (PVC)
4. Low-density polyethylene (LDPE)
5. Polypropylene (PP)
6. Polystyrene (PS)

The agreed-upon goal was to objectively calculate the best numbers possible given existing information and reasonable adjustments or assumptions that could be made within the time and budget available. It was also understood that the methods used would need to be applied or modified in future years to obtain recycling rates for compliance purposes for 1996, 1997, and succeeding years. Therefore the methodology should be clear, straightforward, and repeatable.

The basic approach is identified in Figure 1. It begins with a determination of a recycling rate for a reference period for which a whole year of data were available (in this case 1993), based on pounds of RPC recycled and pounds of RPC disposed of from within Oregon during the period. The disposed-of pounds plus the recycled pounds of RPC in the reference period are used as a basis to forecast RPC generation in the compliance (or pro forma) period (in this case 1995) for which the recycling rate for compliance purposes must be determined. Estimated pounds of RPC to be recycled in the compliance period are calculated based upon known or planned changes in recovery programs, and their projected performance, between the reference period and the compliance period.

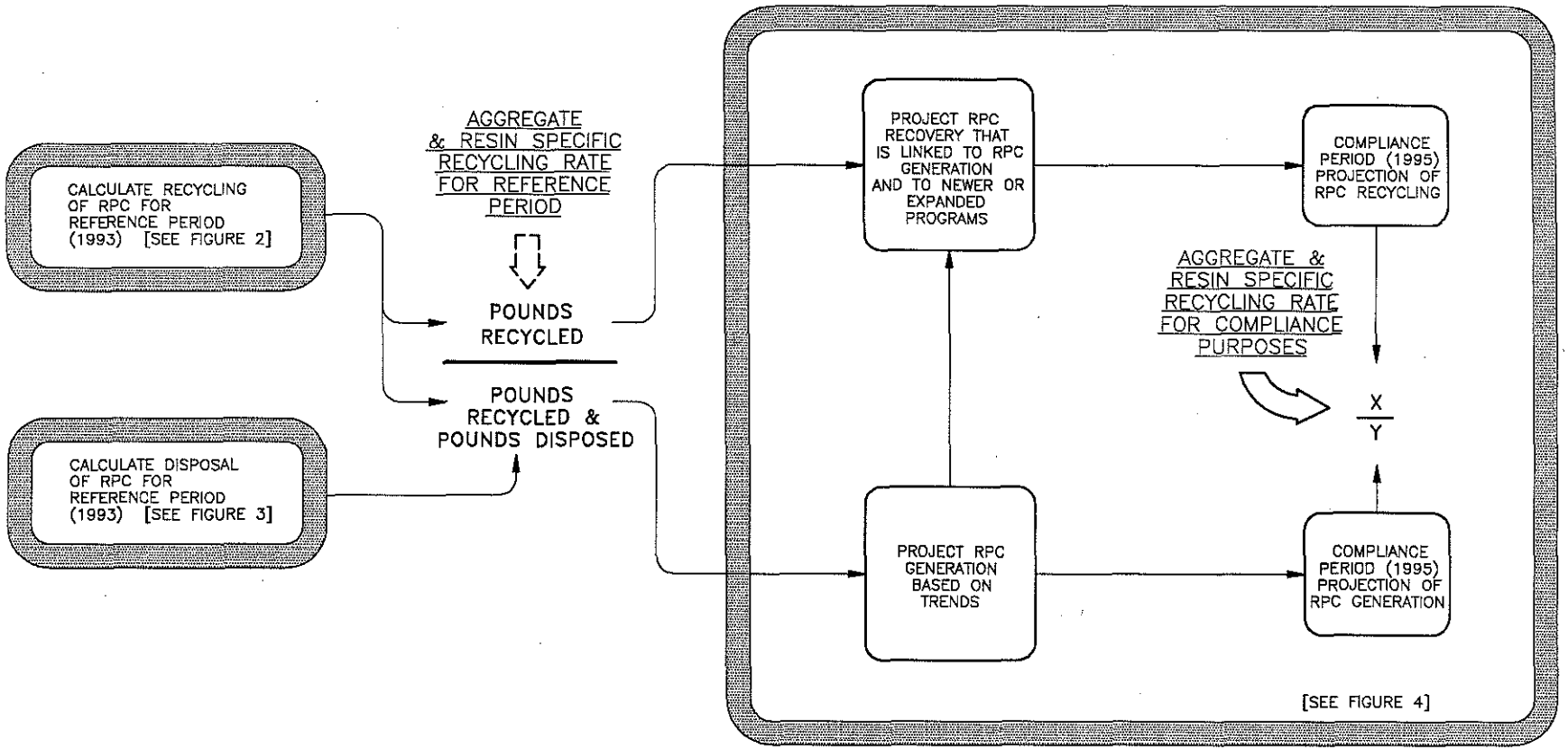
Figure 2 identifies the data sources and adjustment factors evaluated in calculating the pounds of RPC recycled during the reference period. Figure 3 identifies factors evaluated in calculating the pounds of RPC disposed of during the reference period. Figure 4 summarizes the steps taken in projecting a rigid plastic container recycling rate for the compliance period.

A spreadsheet model was developed to perform the calculations and to provide documentation on the assumptions, data, and values used to calculate the RPC recycling rates for 1993 and the RPC recycling rate for compliance purposes for 1995. Printouts of this model are provided in Appendix A.

Within the modeling effort, a sensitivity analysis was undertaken to quantify and evaluate the uncertainty associated with various data, assumptions, estimates, and projections used to derive the results displayed in Section 1. The sensitivity analysis is discussed and summarized in Appendix B. Appendix C provides summaries of the principal data sources and referenced reports that were used in obtaining data or information needed to calculate the results.

In the process of following the outlined methodology and evaluating the appropriateness of particular assumptions and the availability of information relevant to other assumptions, certain factors identified in Figures 1 through 4 were considered to have a limited impact on the rate calculation or to be inappropriate for including in the actual calculation. Other factors were considered critical to derivation of the best possible results. Section 4, Key Assumptions, summarizes the assumptions that were the most essential in defining and driving the methodology used to make the calculations. As noted, quantitative assumptions and values used for various adjustments and projections are included in the pages of the model printouts contained in Appendix A.

FIGURE 1. OVERVIEW OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES



(AS NOTED, REFER TO FIGURES 2, 3 AND 4 FOR ADDITIONAL DETAIL.)

FIGURE 2. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

CALCULATING POUNDS RECYCLED DURING THE REFERENCE PERIOD

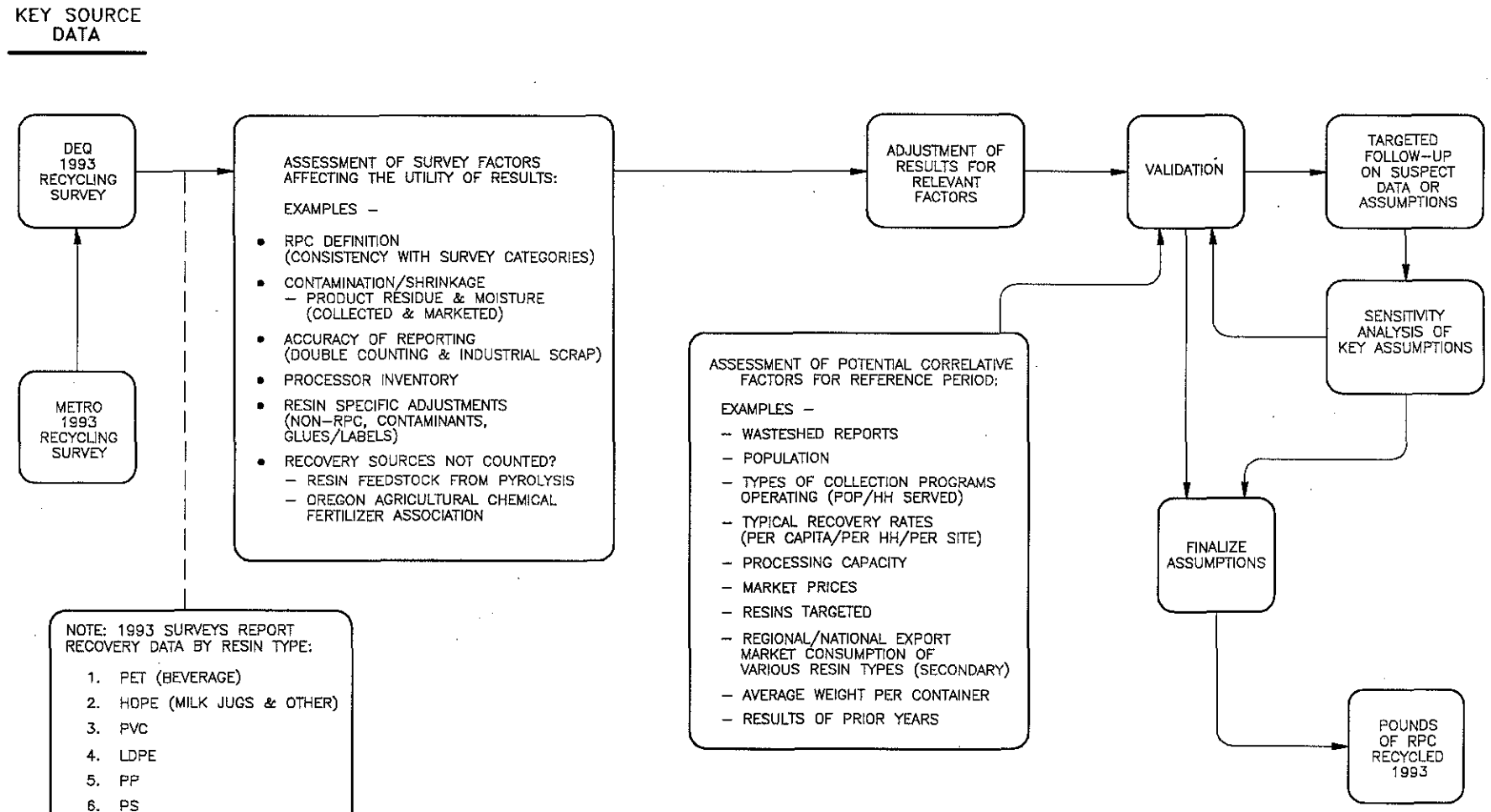


FIGURE 3. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

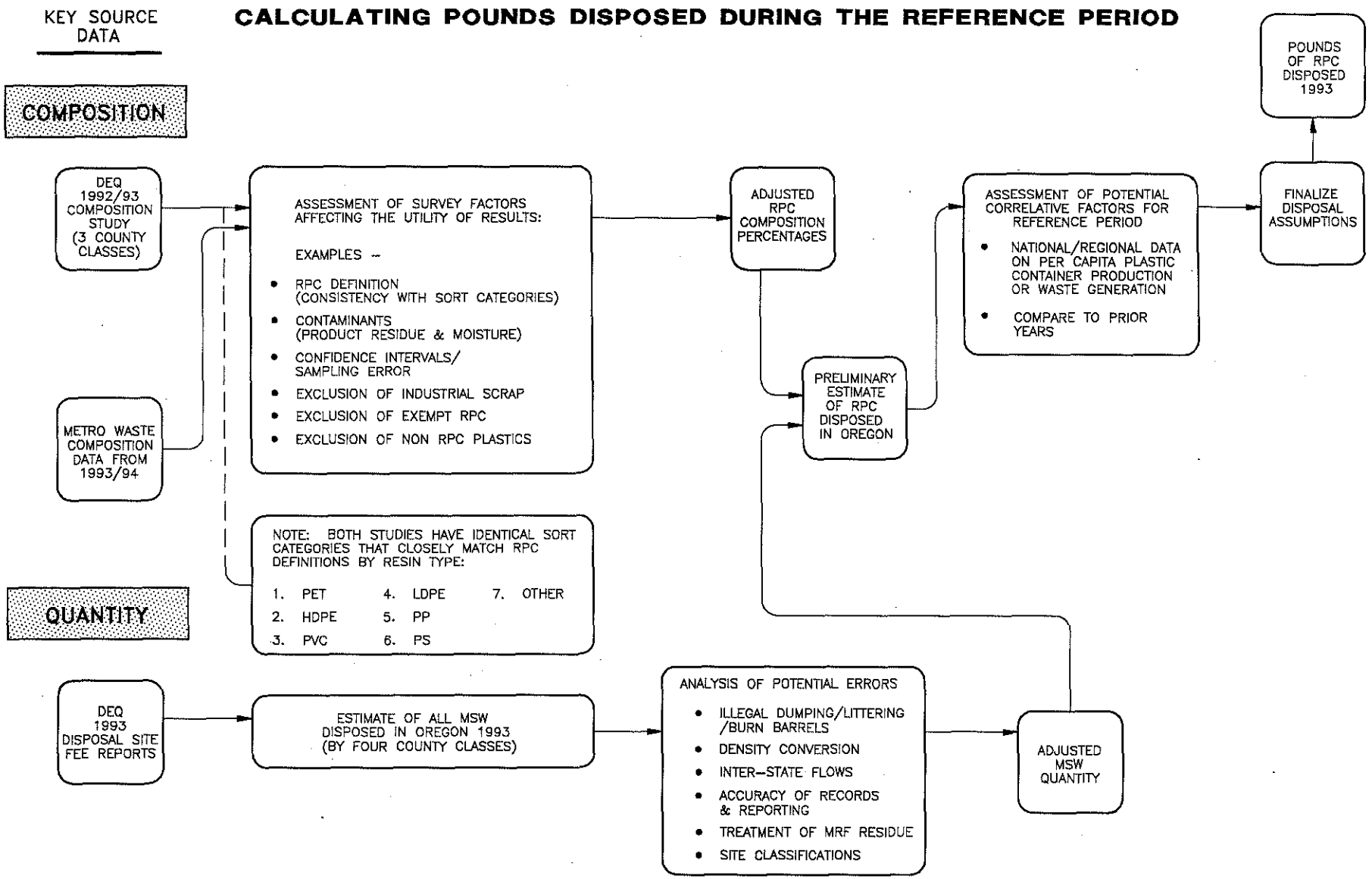
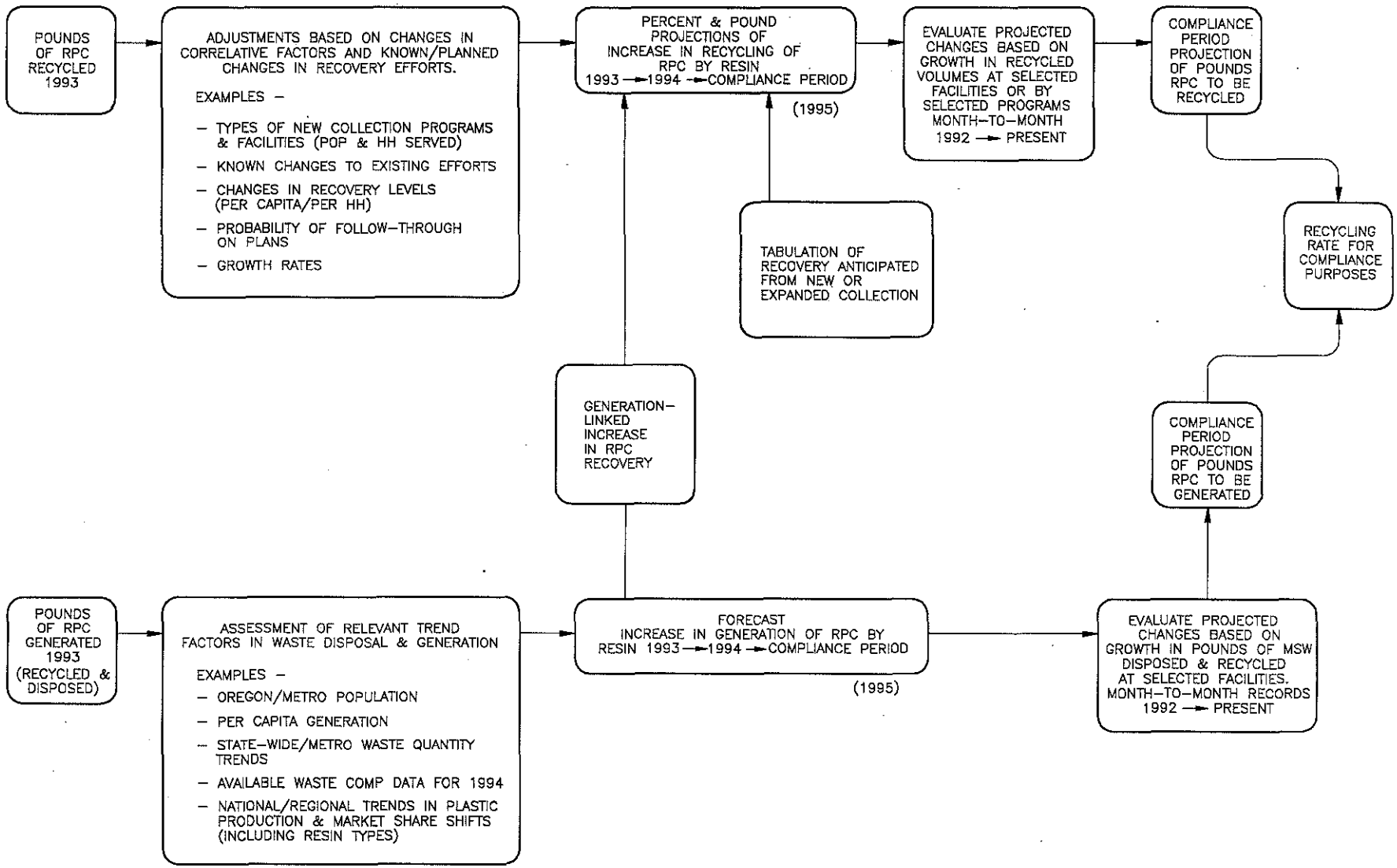


FIGURE 4. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

CALCULATING THE RECYCLING RATE FOR THE COMPLIANCE PERIOD



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4.0 KEY ASSUMPTIONS

4.1 Time Periods

1. The Oregon RPC recycling rate for compliance purposes is based on a projection of a recycling rate(s) for calendar year 1995 (January 1 through December 31 inclusive). 1995 is referred to as the compliance period.

2. Available data on RPC recycled quantities and disposed-of quantities for the State of Oregon in calendar year 1993, the reference period, is used as the primary basis for the projection of a 1995 recycling rate for compliance purposes. Where available, this data is supplemented with reliable year-to-date data from 1994.

3. Consistent with the methodology used in the DEQ material recovery survey, material is counted as recycled in the year that it is collected, so long as there is a reasonable expectation that it will be recycled after being held in processor inventory. The transfer of material from a collector to a processor is generally the point at which recycling/diversion from landfilling is to be counted. Material that has been collected but is stockpiled awaiting shipment, sorting, regrinding, or other treatment, is considered recycled for the period. (DEQ surveys show very few collectors with more than one ton of material in inventory at the end of the year.)

4.2 Material Streams

4. Pounds, rather than tons, hundredths of tons, or the number of containers, is used as the unit of measure in calculating the recycling rate for compliance purposes. Where data on recovery or disposal are available in other units, those units will be converted to pounds using standard or best available assumptions.

5. Based upon the availability of data to provide a finer level of detail, the RPC recycling rate for compliance purposes is presented as an *aggregate* figure for RPC of all resin types and as a *resin-specific* figure for RPC in three categories: PET #1, HDPE #2, and other identified resins (PVC #3, LDPE #4, PP #5, PS #6, and mixed/other #7). The analysis does not attempt to provide RPC recycling rates for other classes or categories of commodity, product-associated, or manufacturer-specific containers.

6. It is intended that only post-consumer RPC be counted in both the recycling and disposal quantities considered in calculating the RPC recycling rate for compliance purposes.

4.3 Adjustments

7. Available data and reasonable assumptions are used to adjust reported recycling and disposal quantities for the reference period to correspond with the RPC definition contained in the rules. Similarly, adjustments are made for possible errors in estimating the total tonnage of municipal solid waste disposed of in the state for the reference period. For the 1995 analysis, it is assumed that 100 percent of PET container recovery is RPC, 90.3 percent of HDPE recovery is RPC, 90 percent of PVC recovery is RPC, 2 percent of LDPE recovery is RPC, 15 percent of PP recovery is RPC, 75 percent of PS recovery is RPC, and 50 percent of mixed/other-plastics recovery is RPC. Within the HDPE category, it is assumed that 100 percent of milk jug recovery is RPC and that 75 percent of "Other HDPE" recovery is RPC.

8. RPC resin recovery figures reported to DEQ generally exclude nonplastic contaminants pulled from collected volumes prior to the first point of material transfer. These "shrinkage" factors are not intended to be included in the recycling quantity number. As with other recovered materials, process losses experienced by end users through removal of contaminants, neck rings, labels or adhesives, or through other processes conducted after material has been accepted for end use, are counted toward recycling, except as far as typical material marketing specifications allow for certain minimal

levels of contamination (for plastics, this allowance is generally 2 percent). As appropriate to various RPC resin categories, minor adjustments are made to reported recovery figures to account for typical contaminant or shrinkage levels including nonplastic materials, dirt, baling wire, and moisture that are inherent in baled product. This adjustment is intended to be consistent with the treatment of contaminants for disposed-of RPC noted in assumption 9. Adjustments are not made for the losses in yield experienced by end users of marketed RPC material. For the 1995 analysis, it is assumed that 5 percent of reported resin recovery is lost to "shrinkage" or contamination in marketed supplies.

9. Based upon the availability of data and upon reasonable assumptions, adjustments are made in the pounds of RPC disposed of, specific to various resin types, to account for the contributions of two factors of the waste composition analysis. Reported field data on RPC resin samples includes some amount of product residue and/or moisture that adheres to or is contained in RPC supplies. Some items, such as lids, are inappropriately counted as RPC in the field. These are considered a contamination or throw-out factor. Also during field sampling, some RPC material amounts are counted within other categories, such as food, because the container is such a small fraction of the primary disposed-of item. This is considered a throw-in factor.

   Fine or secondary sorts of disposed-of waste sampled in September 1994 at a lab provide valuable data for making this adjustment. For the 1995 analysis, an average deduction of 14 percent is made in pounds of RPC disposed of to account for the fine-tuning of waste composition data to account for throw-ins and throw-outs. By resin type, this adjustment ranges from 12 percent to 24 percent.

10. Plastic containers specifically exempted from the RPC rules (including containers for drugs, medical devices, medical food, infant formula, containers for products sold outside of Oregon, packaging that provides a tamper-resistant seal, and containers that are source-reduced) are considered to represent a small portion of the overall volume of plastics within the waste stream. Per AOR 340-90-380(3)(a), no adjustments will be made in the recycled (numerator) or the generated (denominator) figures to account for their presence or absence. RPC reuse, an alternative form of compliance open to RPC manufacturers meeting certain standards, does not currently constitute a significant volume of RPC recycling or RPC disposal. No containers have currently been identified as meeting the standards for reuse, so it is not possible, for the first year of this calculation, to treat them separately from other RPC materials. Therefore no adjustments are made in the numerator or denominator to account for their presence or absence.

4.4 Projections

11. Estimates are made for increased and decreased levels of RPC recycling and decreased and increased levels of RPC disposal that can be anticipated from new, expanded, or reduced/curtailed collection and processing operations known and/or still planned for calendar year 1994 and planned for calendar year 1995. The effects of these efforts are projected on the basis of implementation experience for similar efforts and the time their impacts will have to develop within the compliance period. As much as is possible, anticipated effects are evaluated as net impacts to local recovery systems (for example, anticipated new recovery from curbside efforts is estimated as a net amount after accounting for any anticipated decreases in recovery from pre-existing drop-off networks). Attempts are made to evaluate the certainty and likely effectiveness of new or planned collection and processing efforts (see assumption number 15).

    For the 1995 analysis, Table 2 summarizes available data on performance of reference programs while Table 3 summarizes

assumptions made for new and expanded collection efforts that will contribute to increased recovery in 1994 and 1995. No plastics collection efforts in 1993 were identified that would be reduced or discontinued in 1995. The effects of the planned program of the Oregon Dairy Council to promote the statewide recycling of HDPE milk jugs is difficult to project, as it will not provide direct collection service. However, it is considered important in attaining the projected level of recovery.

12. It is assumed that the base level of RPC recycling experienced in the reference period will be sustained and will keep pace with anticipated growth in RPC generation in the compliance period. This is referred to as a generation-linked increase. If reliable data are available to suggest major near-term changes in demand or supply factors affecting RPC recovery, it is assumed that the base level of recycling experienced in the reference period could be affected in the compliance period. Such demand factors include secondary resin prices, end-market capacities, and regional processing and transportation capabilities; supply factors include generator support of and participation in RPC recycling and the provision of hauler and recycler RPC programs and services.

    For the 1995 analysis, it is assumed that the generation-linked increase in recycling will be the same as the projected increase in RPC generation. For example, as PET generation increases at a high rate for two years (see Appendix A, Generation Forecast), it is assumed that recycling will keep pace with this growth so that the net recycling rate for existing programs remains the same. As noted in Table 3, only two existing programs, Lane County's and Thriftway's, had obtained sufficient data to project increases for 1994 independent of expanded efforts.

13. RPC waste generation (recycled pounds plus disposed pounds) determined for the reference period is used as the primary basis to forecast generation for the compliance period. Population growth rates, per-capita waste-generation growth rates, and regional and national trends in plastic packaging production or resin utilization are considered in making this forecast. Available regional or national data on industry trends, such as changing market shares for various packaging types or resins and per-capita generation or recovery, are used as a means of verifying and validating forecasts or other assumptions.

    For the 1995 analysis, national per-capita growth in plastic resin consumption and a correction for Oregon's higher-than-national rate of population growth are used to project RPC generation for 1994 and 1995. For all resins, the assumed increase in generation is 7.5 percent per year. (Separate growth rates are assumed for PET soft drink and other PET RPC categories.) For PET, the increase is projected at 15.5 percent per year. The HDPE generation increase is projected at 5.5 percent per year. Other resin generation growth assumptions are noted in the model (Appendix A, page 5). It is recognized that the higher rates of growth may not be sustained over the long term, so future analyses will require adjustment of these assumptions.

14. Surveys of Oregon processors or collectors are used as a check on the validity of available data and assumptions required to project recovery or disposal figures for the compliance period.

15. A sensitivity analysis approach is integrated into the rate calculation model to deal with the uncertainties associated with various assumptions and data inputs. The results of this effort for the 1995 analysis are summarized in Appendix B.

Table 2
SUMMARY OF RECOVERY ASSUMPTIONS FOR REFERENCE PROGRAMS

Collection Program Type	Applicable Reference Programs		Recovery Data/Basis/Notes		
Curbside Milk Jug Only	City of Portland Current Program		0.63	pounds/hh/mo based on latest 12 mo. stabilized recovery level	Portland data
	West Linn		0.56	pounds/hh/mo	APC report
	Metro Region All curbside		0.56	pounds/hh/mo 1992 - some HH not eligible	SWIS Report
Curbside All Rigid Plastic Containers (Resins 1-7 added to established program)	Lane County Current Program		1.72	pounds/hh/mo May/June '94 data	DEQ Survey , Goodwill & County
Mix of Curbside/Depot/Commercial Collect. Programs Operated by Haulers	Metro Region Varying Service Levels		1.18	pounds/hh/mo 1993 - mix of program types	SWIS Report
Curbside Increment of Adding PET Cust/Bev. Containers to Existing Program	West Linn		0.11	pounds/hh/mo	APC Study
Drop-Off Milk Jug Only (two figures are given - 100% is prior to curbside and 64% is after curbside that targets the same material)	Lake Oswego	100%	3,783	pounds/site/mo	DEQ Survey
		64%	2,409	pounds/site/mo pre-curbside & post-curbside depot volumes	& follow-up call
Drop-Off Limited Plastic Containers But More than Milk Jugs (e.g. bottles)	Thriftway Throughout OR		1,412	pounds/site/mo 2-4-6 program results, 1993 @ 52 sites	Thriftway Data
Drop-Off All Rigid Plastic Containers (or other broadly targeted category)	BRING - Eugene		7,900	pounds/site/mo For large City-wide site	BRING Data
	PRT - Portland		6,495	pounds/site/mo (most recent 3 weeks)	
			3,248	pounds/site/mo (1st 6 weeks of program) For N. Portland site - volume accelerated after all plastic bottles targeted	DEQ Survey
	Thriftway In Oregon/Wash.		1,861	pounds/site/mo (based on 12 mo) 1-7 RPC based on partial 1994 increases	
	BRING - Eugene		500	pounds/site/mo Network of 7 depots at schools	BRING Data

Table 3

FORECAST OF RIGID PLASTIC CONTAINER RECOVERY FROM NEW OR EXPANDED OREGON PROGRAMS IN 1994 AND 1995

PROGRAM DESCRIPTION	Key Recovery Assumptions (New Recovery Net of Existing Recovery)				Start Date	1994 RECOVERY ESTIMATE					Generation Linked Increase	1995 RECOVERY ESTIMATE				
						Months	Total Pounds	% HDPE	% PET	% Other		Months	Total Pounds	% HDPE	% PET	% Other
NEW PROGRAMS																
DROP-OFF	Lbs/Site/Mo	# of Sites	Pounds/Mo	Basis												
1 Hood River - Milk Jugs	700	1	700	APC per interview	Feb-94	11	7,700	90%	10%		7.48%	12	9,028	90%	10%	
CURBSIDE	Lbs/HH/Mo	# of HH	Pounds/Mo	Basis												
2 Ashland - Milk Jugs	0.32	10,000	3,150	Portland @ 1/2 increment	Aug-94	5	15,750	100%			5.48%	12	39,871	100%		
3 Beaverton - Milk Jugs	0.42	15,000	6,237	Portland @ 2/3rd increment	Apr-94	9	56,133	100%			5.48%	12	78,945	100%		
4 Lake Oswego - Milk Jugs/nat. #2 bottles	0.42	8,800	3,659	Portland @ 2/3rd increment	Sep-94	3.5	12,807	100%			5.48%	12	46,315	100%		
5 City of Medford - MJ & #2	0.42	22,552	9,377	Portland @ 2/3rd increment	Aug-94	5	46,886	100%			5.48%	12	118,692	100%		
6 Washington Co & Forest Grove - Milk Jugs	0.42	36,000	14,969	Portland @ 2/3rd increment	Sep-94	4	59,875	100%			5.48%	12	189,469	100%		
7 City of Roseburg - all bottles	0.86	4,480	3,853	Lane Co. all RPC @ 1/2 increment	Dec-94	1	3,853	80%	10%	10%	7.48%	12	49,692	80%	10%	10%
8 Clackamas Co - Milk Jugs	0.42	50,606	21,042	Portland @ 2/3rd increment	Jan-95							12	252,504	100%		
9 Hillsboro - Milk Jugs	0.42	9,000	3,742	Portland @ 2/3rd increment	Jan-95							12	44,906	100%		
10 Dalles/Wasco Co. - Milk Jugs	0.21	3,650	759	Portland @ 1/3 incrmnt, > hauler est	Jan-95							12	9,106	100%		
11 Curry Co, Brookings - All bottles	0.57	1,500	851	Lane Co. all RPC @ 1/3 increment	Jan-95							12	10,217	80%	10%	10%
OTHER	Tons/mo	# customers	Pounds/Mo	Basis												
12 Portland, MDC commercial	6.15	160	7,300	APC interview net of '93 amounts (-PRT)	Jul-94	6	43,800	80%	10%	10%	7.48%	12	94,152	80%	10%	10%
13 OR Assoc Nursery men - polyethylene/PS	100,000	lbs/year	8,333	DEQ interview for '94 - '95 is uncertain	1994	12	100,000	40%		60%						
14 Lane County Commercial - all resins	100,000	lbs/year	8,333	Estimate by Goodwill - new service	Jan-95							12	100,000	80%	10%	10%
EXPANDED PROGRAMS																
DROP-OFF	Lbs/Site/Mo	# of Sites	Pounds/Mo	Basis												
15 Ashland - Add PET to existing #2	750	1	750	2 months recovery per APC data	Oct-94	3	2,250		100%		15.48%	12	10,393		100%	
16 Beaverton - Far West all bottles to exist MJ	5,000	1	5,000	Increment by APC per interview	Oct-94	3	15,000	80%	10%	10%	7.48%	12	64,488	80%	10%	10%
17 Lake Oswego PRT - bottles to existing MJ	835	1	835	Increment - 1/3rd of Sept amount	Sep-94	4	3,340	80%	10%	10%	7.48%	12	10,768	80%	10%	10%
18 Garten, Salem - add all RPC to existing MJ	1,221	1	1,221	Increment - 2/3rd of APC interview	Sep-94	4	4,884	80%	10%	10%	7.48%	12	15,748	80%	10%	10%
19 Keizer TS, Marion Co - all btles to exst MJ	1,500	1	1,500	Increment by APC per interview	Sep-94	4	6,000	80%	10%	10%	7.48%	12	19,346	80%	10%	10%
20 Portland - EZ Recycling all bottles to exst MJ	2,000	1	2,000	Increment by APC per interview	Oct-94	3	6,000	80%	10%	10%	7.48%	12	25,795	80%	10%	10%
21 Portland - Recycle Works all bottles to exst MJ	2,000	1	2,000	Increment by APC per interview	Jun-94	6	12,000	80%	10%	10%	7.48%	12	25,795	80%	10%	10%
22 Portland, PRT - all bottles to existing Milk Jugs	3,000	1	3,000	2/3 Incrmnt to DEQ Survey, 12/5 tc	Sep-94	4	12,000	80%	10%	10%	7.48%	12	38,693	80%	10%	10%
23 Portland, Wastech - add PET to exisiting MJ	2,510	1	2,510	Increment by APC per intrvw,12/5 tc	Jun-94	7	17,570		100%		15.48%	12	34,783		100%	
24 Portland, Wastech - add all RPC to PET+MJ	2,436	1	2,436	1/2 Incrmt to PRT average	Jan-95							12	29,229	85%	5%	10%
25 Douglas Co - colored #2 to exising Milk Jugs	45	11	495	APC interview & BRING depot	Feb-94	11	5,445	100%			5.48%	12	6,266	100%		
26 Thriftway - add odds to existing 2-4-6	431	52	22,391	Thriftway data for Jan 93-Oct 94	Jul-94	5	211,746	25%	25%	50%	7.48%	11	264,721	25%	25%	50%
27 Portland, Smurfit - all RPC to exst PET+MJ	130	1	130	DEQ Survey - conservative est.	Dec-94	1	130	80%	10%	10%	7.48%	12	1,677	80%	10%	10%
28 Lincoln County - add bottles to MJ program	500	3	1,500	APC report - increment @ 1/3rd current	Mar-95							10	15,000	80%	10%	10%
CURBSIDE	Lbs/HH/Mo	# of HH	Pounds/Mo	Basis												
29 Lane County - All rigid plastic containers	0.90	51,000	45,707	Calculated increment - '94 data	May-94	8	472,880	80%	10%	10%	7.48%	12	589,511	80%	10%	10%
30 Marion Co- MJ (start mid 93-50% in '93 recov)	0.21	25,000	5,198	Portland 2/3rd increment X 50% yr	Jul-93	12	62,370	100%			5.48%	12	65,788	100%		
31 Albany-Lebanon - All bottles to exst MJ	0.45	16,000	7,200	Per APC - Use Lane County Increment	Feb-95							11	79,200	80%	10%	10%
32 Marion/Polk Co - all bottles curb to exst MJ	0.86	75,000	59,303	Lane Co. all RPC @ 1/2 incrmnt, less #30	Mar-95							10	593,025	80%	10%	10%
TOTAL ANTICIPATED COLLECTIONS							1,178,417	823,041	131,515	223,861			2,933,123	2,337,498	287,031	308,594
ADJUSTMENT FOR ASSUMED SHRINKAGE/CONTAMINATION IN RECOVERED SUPPLIES					95%		1,119,497	781,889	124,939	212,668			2,786,467	2,220,623	272,679	293,164
								70%	11%	19%				80%	10%	11%

Note:

This table is provided as a means of forecasting incremental increases in state-wide RPC recovery for two years. This increment of increase is above the level of recovery that was reported for 1993 for ongoing programs. For new/expanded programs started in 1994, a generation linked increase assumption has been shown for 1994 -- this is consistent with estimates used to project the annual level of short-term growth in RPC generation and recovery in the absence of new efforts.

Assumptions attempt to provide recovery net of current recovery considering alternative collection systems previously available and materials previously collected.

Assumptions noted relate to actual data provided by the program managers or to recovery assumptions used for reference programs shown in Table 2.

Attributable to programs started during 1994: 1,709,940 Based on full year with generation linked increase

Attributable to programs started during 1995: 1,076,528

Note: From entry #13, OR Assoc of Nurserymen, it is estimated that the 60% Other Resins shown for 1994 is all Polystyrene.

APPENDIX A

PRINTOUTS OF THE MODEL FOR THE RIGID PLASTIC CONTAINER RECYCLING RATE FOR COMPLIANCE PURPOSES ANALYSIS

The following pages provide documentation of the assumptions and calculations used in the spreadsheet model of the 1995 Recycling Rate for Compliance Purposes Analysis. The format was developed as a working model and has not been edited or annotated to facilitate understanding by individuals not involved in the rate-calculation process. Significant digits shown within these pages do not reflect the level of accuracy to be associated with particular calculations or tables.

Recycling Rate Table

Reference Period—1993

Resin	Pounds of RPC Recovered in 1993	Pounds of RPC Disposed in 1993	RPC Recycling Rate in 1993
PET	8,367,980	4,758,206	63.75%
PET Beverage	8,367,980	678,368	92.50%
PET Other	0	4,079,838	0.00%
HDPE	7,546,183	30,074,027	20.06%
OTHER RESINS	884,737	10,942,695	7.48%
PVC	20,520	816,947	2.45%
LDPE	59,424	601,076	9.00%
PP	51,870	989,052	4.98%
PS	569,288	6,073,400	8.57%
Other/Mixed	183,635	2,462,221	6.94%
All Resins	16,798,899	45,774,928	26.85%

Compliance Period—1995

Resin	Pounds of RPC Recovered in 1995	Pounds of RPC Disposed in 1995	RPC Recycling Rate in 1995
PET	11,190,160	6,226,541	64.25%
PET Beverage	10,917,481	885,049	92.50%
PET Other	272,679	5,341,492	4.86%
HDPE	10,616,718	31,240,587	25.36%
OTHER RESINS	1,276,355	11,844,262	9.73%
PVC	26,166	764,244	3.31%
LDPE	88,751	678,850	11.56%
PP	79,472	1,170,443	6.36%
PS	802,500	6,360,302	11.20%
Other/Mixed	279,466	2,870,423	8.87%
All Resins	23,083,233	49,311,390	31.89%

Recovery Table

Reference Period—1993

Resin	Wet Tons Recovered	% RPC	Dry/Wet	Dry Pounds Recovered
PET Beverage	4,404.20	100.00%	95.00%	8,367,980
HDPE	4,398.40	90.30%	95.00%	7,546,183
PVC	12.00	90.00%	95.00%	20,520
LDPE	1,563.80	2.00%	95.00%	59,424
PP	182.00	15.00%	95.00%	51,870
PS	399.50	75.00%	95.00%	569,288
Other/Mixed	193.30	50.00%	95.00%	183,635
All Resins	11,153.20	79.27%	95.00%	16,798,899

Compliance Period—1995

Resin	1993 Recovery	Generation-based Increase (annual)	Net New Programs (1993-95)	1995 Recovery
PET Beverage	8,367,980	14.22%	0	10,917,481
PET Other	0	17.31%	272,679	272,679
HDPE	7,546,183	5.48%	2,220,623	10,616,718
PVC	20,520	-2.85%	6,799	26,166
LDPE	59,424	7.80%	19,691	88,751
PP	51,870	9.58%	17,188	79,472
PS	569,288	3.84%	188,638	802,500
Other/Mixed	183,635	9.11%	60,849	279,466
All Resins	16,798,899	7.48%	2,786,466	23,083,233

Disposal Table

Reference Period—1993

Wasteshed	Tons of MSW Disposed	% RPC	Tons of RPC Disposed
Baker	7,513.00	1.53%	114.95
Benton	51,511.40	1.30%	669.65
Clatsop	25,515.80	1.53%	390.39
Columbia	15,260.40	1.53%	233.48
Coos	35,844.50	1.39%	498.24
Crook	6,259.90	1.53%	95.78
Curry	10,687.30	1.53%	163.52
Deschutes	104,665.70	1.39%	1,454.85
Douglas	90,732.70	1.39%	1,261.18
Gilliam	2,395.80	1.53%	36.66
Grant	4,117.60	1.53%	63.00
Harney	2,569.20	1.53%	39.31
Hood River	9,772.20	1.39%	135.83
Jackson	100,058.70	1.39%	1,390.82
Jefferson	6,690.60	1.53%	102.37
Josephine	38,677.30	1.39%	537.61
Klamath	68,370.50	1.39%	950.35
Lake	6,494.90	1.53%	99.37
Lane	264,508.70	1.30%	3,438.61
Lincoln	30,200.40	1.53%	462.07
Linn	69,382.30	1.30%	901.97
Malheur	15,163.30	1.53%	232.00
Marion	170,130.60	1.30%	2,211.70
Milton Freewater	5,040.80	1.53%	77.12
Morrow	4,955.50	1.53%	75.82
Polk	24,219.90	1.30%	314.86
Sherman	850.90	1.53%	13.02
Tillamook	11,608.90	1.39%	161.36
Umatilla	41,661.80	1.39%	579.10
Union	14,417.00	1.53%	220.58
Wallowa	7,058.80	1.53%	108.00
Wasco	16,746.00	1.53%	256.21
Wheeler	767.00	1.53%	11.74
Yamhill	55,685.10	1.30%	723.91
Unspecified	2.10	1.53%	0.03
Non-Metro Totals	1,319,536.60	1.37%	18,025.45
Metro	960,691.00	0.89%	8,550.15
Total	2,280,227.60	1.17%	26,575.60

Note: The Metro RPC% in the disposed stream is observed to be lower due to greater levels of RPC recovery and to the City of Portland Polystyrene ban.

Disposal Table

From '94/'95 Waste Comp Study

Resin	Dirty Wet	Clean Dry	Clean Dry/ Dirty Wet
P1	51.34	47.53	92.58%
P2	189.57	180.11	95.01%
P3	8.17	7.75	94.86%
P4	1.43	1.17	81.82%
P5	11.39	10.24	89.90%
P6	26.11	22.65	86.75%
P7	36.05	34.3	95.15%
PU	4.45	3.68	82.70%
PX	3.72	2.92	78.49%
Grand Total	332.23	310.35	93.41%
P6+PX	29.83	25.57	85.72%
P7+PU	40.5	37.98	93.78%

Note: PX is expanded polystyrene; PU is unknown resin type

Net Adjustment Factor for other material counted as RPC in first sort: 92.57%

Reference Period—1993

Resin	% of Non-Metro MSW	Non-Metro Wet Tons	% of Metro MSW	Metro Wet Tons	Last Sort Dry/First Sort Wet	Dry Pounds Disposed
PET	0.11%	1,431.22	0.14%	1,344.97	85.70%	4,758,206
PET Beverage	(as estimated by Oregon DEQ, based on waste composition studies)					678,368
PET Other	(All PET minus PET beverage estimate)					4,079,838
HDPE	0.86%	11,333.68	0.60%	5,764.15	87.95%	30,074,027
PVC	0.02%	273.05	0.02%	192.14	87.81%	816,947
LDPE	0.02%	300.75	0.01%	96.07	75.74%	601,076
PP	0.02%	306.03	0.03%	288.21	83.22%	989,052
PS	0.26%	3,442.84	0.04%	384.28	79.35%	6,073,400
Other/Mixed	0.07%	937.88	0.05%	480.35	86.81%	2,462,221
TOTAL	1.37%	18,025.45	0.89%	8,550.15	86.12%	45,774,928

Compliance Period—1995

Resin	1995 Generation	1995 Recovery	1995 Disposal
PET Beverage	11,802,530	10,917,481	885,049
PET Other	5,614,171	272,679	5,341,492
HDPE	41,857,305	10,616,718	31,240,587
PVC	790,410	26,166	764,244
LDPE	767,601	88,751	678,850
PP	1,249,915	79,472	1,170,443
PS	7,162,802	802,500	6,360,302
Other/Mixed	3,149,889	279,466	2,870,423
TOTAL	72,394,623	23,083,233	49,311,390

Generation Forecast Table

Plastics In Packaging

Containers	1991	1992	1993	91-92	92-93	Average Annual 91-93	Comparative Resin Adjustment
PET Bev	793	912	1,015	15.01%	11.29%	13.13%	6.51%
PET Other	540	632	729	17.04%	15.35%	16.19%	9.39%
HDPE	3,725	3,868	4,066	3.84%	5.12%	4.48%	-1.64%
PVC	243	235	225	-3.29%	-4.26%	-3.77%	-9.41%
LDPE	314	359	358	14.33%	-0.28%	6.78%	0.53%
PP	455	495	536	8.79%	8.28%	8.54%	2.19%
PS	1,227	1,259	1,298	2.61%	3.10%	2.85%	-3.17%
Other	131	137	153	4.58%	11.68%	8.07%	1.75%
All Resins	7,428	7,897	8,380	6.31%	6.12%	6.22%	0.00%

Source: MODERN PLASTICS January 1993 and January 1994

Basic Growth Rate 7.24%

Resin	1993 Disposal	1993 Recovery	1993 Generation	Resin Adjustment	Adjusted Growth Rate *	1994 Generation	1995 Generation
PET Bev	678,368	8,367,980	9,046,348	6.51%	14.22%	10,332,947	11,802,530
PET Other	4,079,838	0	4,079,838	9.39%	17.31%	4,785,907	5,614,171
HDPE	30,074,027	7,546,183	37,620,209	-1.64%	5.48%	39,682,245	41,857,305
PVC	816,947	20,520	837,467	-9.41%	-2.85%	813,598	790,410
LDPE	601,076	59,424	660,500	0.53%	7.80%	712,040	767,601
PP	989,052	51,870	1,040,922	2.19%	9.58%	1,140,642	1,249,915
PS	6,073,400	569,288	6,642,688	-3.17%	3.84%	6,897,844	7,162,802
Other	2,462,221	183,635	2,645,856	1.75%	9.11%	2,886,893	3,149,889
All Resins	45,774,928	16,798,899	62,573,828	0.22%	7.48%	67,252,117	72,394,623

* It is understood that these adjusted growth rates represent recent historic results and that in some cases they may not be sustainable over a time period of longer than 1 or 2 years. Alternative approaches or assumptions for resin specific growth rates should be considered in future analyses.

APPENDIX B

SENSITIVITY ANALYSIS

Sensitivity Analysis

Rationale

The purpose of this study was to predict the recycling rate for compliance purposes for Rigid Plastic Containers in Oregon in calendar year 1995. Our goal was to produce the best estimate possible given available time and budget, and given the limited real data about the consumption, disposal, and recovery of rigid plastic containers in Oregon. Even though data collection is improving, it will never be possible to determine exactly what percent of rigid plastic containers were recycled in 1995. But by the time actual data have been collected and analyzed (in 1996), a much better estimate can be made.

Even without knowing what the true value being estimated is, the quality of an estimating process may be described and evaluated. Two attributes of such a process define its "goodness." First, it should be unbiased. That is, nothing in the process should lead to systematic over- or under-estimation and any errors that persist should be random and unavoidable. Second, it should be minimum-variance, i.e., the magnitude of those random errors that are present should be kept as small as possible.

The interpretation and usefulness of an estimate or prediction depends on the confidence one has in its accuracy. In the context of this study, where the DEQ must set a recycling rate "for compliance purposes" in advance of the time period to which that rate applies, information about the level of uncertainty inherent in the prediction will be important to policymakers. The real question is whether or not the recycling rate for compliance purposes will be above or below 25 percent. Whatever estimate we produce, there always will be some possibility that the true value will turn out to be on the other side of 25 percent. For this reason, we provide both our best estimate of what the recycling rate for compliance purposes will be and our best estimate of what the likelihood is that the true value will turn out to be 25 percent or greater.

We also tested the sensitivity of the final recycling rate to ten-percent changes in each of several key variables. This test serves two purposes. It identifies those variables, if any, for which small measurement or estimation errors can lead to large errors in the final rate. It also allows one to estimate how big an error in one of the variables would have to be to move the estimated final rate to the other side of 25 percent.

Method

Risk Analysis

To gain an understanding of the level of uncertainty inherent in the final estimate, given that it is a rather complicated combination of uncertain forecasts, survey results, and imprecise measurements, we conducted an informal risk analysis. With input from the Work Group and interested parties, we estimated reasonable ranges around each of the key model variables. The end points of these ranges were used to define a probability density function or bell-shaped curve. A spreadsheet model was then run 1,000 times with varying values randomly selected from under the probability density function. This is known as a Monte Carlo simulation.

While such a procedure implies that we know much more than we actually do about the structure of the errors in our model, it is useful for two reasons: it forces everyone to think about the level of uncertainty and measurement error and it provides the best estimate possible of the degree of uncertainty inherent in the final estimate. The following tables summarize the values used to bracket each of four key model assumptions for performing the risk analysis.

Pounds of RPC Plastic Resins Recovered in 1993	*Low Value*	*Model Value*	*High Value*
PET	7,531,182	8,367,980	9,204,778
HDPE	6,791,564	7,546,183	8,300,801
PVC	18,468	20,520	22,572
LDPE	53,482	59,424	65,367
PP	46,683	51,879	57,057
PS	512,359	569,288	626,216
Other/Mixed	165,272	183,635	201,999

Pounds of RPC Plastic Resins Disposed in 1993	*Low Value*	*Model Value*	*High Value*
PET	4,282,385	4,758,206	5,234,026
HDPE	27,066,624	30,074,027	33,081,429
PVC	735,252	816,947	898,641
LDPE	540,968	601,076	661,183
PP	890,146	989,052	1,087,957
PS	5,466,060	6,073,400	6,680,740
Other/Mixed	2,215,999	2,462,221	2,708,443

Assumed Annual Growth Rate of RPC Generation 1993 to 1995	*Low Value*	*Model Value*	*High Value*
PET - average of beverage and other rates	13.67%	15.19%	16.71%
HDPE	4.93%	5.48%	6.03%
PVC	-3.14%	-2.85%	-2.57%
LDPE	7.02%	7.80%	8.58%
PP	8.62%	9.58%	10.54%
PS	3.46%	3.84%	4.23%
Other/Mixed	8.20%	9.11%	10.02%

Assumed 1995 Recovery, in Pounds, from Planned New/Expanded Programs	*Low Value*	*Model Value*	*High Value*
PET	245,539	272,679	300,103
HDPE	1,999,216	2,220,623	2,443,486
PVC	6,124	6,799	7,484
LDPE	17,734	19,691	21,675
PP	15,479	17,188	18,919
PS	169,890	188,638	207,643
Other/Mixed	54,801	60,849	66,979

Using the risk analysis software, the RPC recycling rate for compliance purposes calculation was made 1,000 times with values for the key variables randomly drawn from the distributions specified above. By examining the results, the following inferences can be made about the distribution of errors in the final estimates of recycling rates.

1995 Recycling Rate for Compliance Purposes (estimated)	*All Resins*	*PET*	*HDPE*
Expected Value	31.89%	64.25%	25.37%
Mean of Simulation	31.91%	65.51%	25.44%
Variance	0.0002	0.0037	0.0004
5th percentile	29.40%	55.94%	22.39%
95th percentile	34.40%	76.14%	28.81%
Probability that value is greater than 25 percent	99.99%	99.99%	57.50%

Sensitivity Analysis

We also wanted to test how sensitive the model was to certain key assumptions and variables. To test the assumptions about which we had some doubts or that seemed controversial in committee discussions, we substituted alternative assumptions and examined the effect on the estimated final recycling rate for compliance purposes. We tested what would happen if we did not include the adjustment to the 1992-93 Waste Composition Study results based on findings from the 1994-95 Study in which significant quantities of non-RPC items were found in the field sorts of RPCs and smaller quantities of RPCs were found in other field-sort categories such as food. We tested the effect of the assumption that recovered materials are "cleaner" (5% shrinkage was assumed) than disposed materials (a net adjustment of 14% was used), by substituting the alternative assumption that recovered materials are just as dirty as disposed materials. We tested the effect of the assumption that 75 percent of the non-milk jug HDPE recovered was other RPCs by substituting the alternative assumption that none of the non-milk jug HDPE was RPCs. Finally, we tested separately the importance of both our assumptions about the consumption-driven increase in recovery from existing programs and the increase in recovery from new programs by setting each to zero. In no case did any of these alternative assumptions, by itself, drive the final estimated recycling rate for 1995 below 25%.

Assumption	*1993 Rate*	*1995 Rate for Compliance Purposes*
Base Conclusions presented in Section 1	26.9%	31.9%
Assume no throw out/throw in adjustments to waste composition percentages for contamination	25.4%	30.4%
Assume recovered materials have a shrinkage factor equal to contaminiation levels of disposed materials (14%) - versus 5%	26.5%	31.6%
Assume that 0% of non-milk jug HDPE is RPC (versus 75%)	23.7%	29.1%
Assume that there is no generation-linked increase in recovery	26.9%	27.1%
Assume that there are no new programs	26.9%	28.0%

We tested the sensitivity of the estimated final recycling rate for compliance purposes to each of the most important variables by changing those variables 10 percent and reporting the resulting percent change in the final 1995 recycling rate for compliance purposes. For example, if the number of tons of MSW disposed in 1993 was actually 10 percent higher than reported by DEQ, the recycling rate would be 5.9 percent lower or 30.0% (31.89%*(1-5.9%)). So for mis-measurement of MSW disposal to drive the recycling rate down to 25%, the quantities reported by DEQ would have to be off by 36.6 percent. This analysis is summarized in the following table.

Impact on Rate Number if noted variables were independently increased by 10%	*1995 Rate for Compliance Purposes*
Pounds of plastic recovered in 1993	+8.8%
Tons of MSW disposed in 1993	-5.9%
Growth rate in generation	+0.1%
New program recovery (pounds)	+1.2%

APPENDIX C
SUMMARY OF PRIMARY DATA SOURCES USED FOR THE RIGID PLASTIC CONTAINER RECYCLING RATE ANALYSIS

Source:	DEQ 1993 Municipal Waste Disposal Site Fee Report Internal data obtained from DEQ staff in October 1994
Description:	Provides a county-by-county summary of total municipal solid waste disposed at general purpose and demolition landfills, as well as at the Brooks incinerator.
Evaluation:	Will be used with waste composition data to calculate pounds of RPC disposed during the reference period. Data is provided by public and private site operators and is used as a basis for payment of per ton fees to DEQ.
Analysis/Trends:	Indicates that 2,280,227.60 total tons of waste were disposed of in Oregon in 1993. In 1992, waste disposed in Oregon, from Oregon, accounted for just 2,263,099 tons of disposal. This growth in disposal represents an annual increase in disposed waste of 0.76% per year. During this same period, Oregon's population growth was estimated at 2.0%.
Implications:	Metro has separate estimates for the amount of material disposed in the Tri-County area that could be used. Metro's estimate reported for the year was slightly less than the volume of waste for which DEQ fees had been paid on. For consistency, DEQ's figures have been used as the basis for determining pounds of RPC disposed in the Tri-County area. Standard density assumptions (e.g. 300 pounds per loose cubic yard) are used to determine annual tonnage for sites that do not use scales for all delivered wastes. This may result in errors in the actual tons disposed. Waste dumped illegally, litter, or waste disposed of on-site or in burn barrels does not get included in the estimate. A decision was made for the analysis to consider "disposed" material as only material that ends up in a permitted site. Inadequate composition data was available to estimate RPC in other streams and it is understood that the quantified stream does include some portion of litter or illegal disposal recovered from prior years.

Source: DEQ 1993 Recovered Material Database
Obtained from DEQ (prior to publishing) in October 1994

Description: Provides summary, by resin type and by county, of total tons of plastic recovered in Oregon during 1993. Special reports were provided detailing plastic collections and transactions for haulers or recyclers handling more than 20 tons and more than 100 tons during the year.

Evaluation: DEQ does checks on reported collections and transactions to eliminate double-counting that may occur. Recycler stocks (inventories) are considered in the analysis. This data provides the most comprehensive information available on recovery and has had a reasonable level of validation.

Analysis/Trends: For 1993 the following tonnages were reported as recovered from within Oregon:

PET (bev) #1	4,404.2 tons	HDPE #2	4,398.4 tons
PVC #3	12.0 tons	LDPE #4	1,563.8 tons
PP #5	182 tons	PS #6	399.5 tons
Mixed plastic	193.3 tons	TOTAL	11,128.2 tons

- Approximately 89% of the PET recovered is collected directly or indirectly (through the supply system) by three recyclers. Only 5 recyclers (including those operating at more than one location) reported handling more than 100 tons of PET during the year. NOTE: all PET recovery was reported as PET beverage containers in 1993.
- Approximately 69% of the HDPE is collected directly or indirectly by just four recyclers. Only 12 recyclers reported handling more than 100 tons of HDPE or milk jugs. Nearly 60% of the reported HDPE recovery (2,626.5 tons) was milk jugs.
- Approximately 87% of the LDPE is collected directly or indirectly by just 4 recyclers.
- Recovery of plastics from the three Metro Counties accounts for 36% of all PET beverage container recovery, 59% of all milk jug recovery, and 81% of all other HDPE recovery - the Metro area comprises 41.7% of the state's population.

Implications: Rigid plastic containers are a varying sized subset of HDPE, PVC, LDPE, PP, and PS resins. Assumptions are provided on this factor within the rate calculation model.

Source: DEQ 1992-1993 Waste Characterization Study
Obtained from DEQ as a published report.

Description: Full year waste stream sort for three categories of Oregon Counties, excluding the Portland Metro Tri-County area.

Evaluation: Data from 1992-93 study are useful as a basis for estimating percentage of RPC in wastestreams outside of the Metro area.

Analysis/Trends: The analysis reports that, by weight, rigid plastic containers contribute to the total disposed waste stream in the following amounts (Table 14):

Material	% In Waste Stream (Dirty/Wet)
#1 PET	0.1085%
#2 HDPE containers	0.8592%
#3 PVC containers	0.0207%
#4 LDPE containers	0.0228%
#5 PP containers	0.0232%
#6 Solid PS containers	0.1008%
#6 Foam PS containers	0.1602%
#7 Other plastic containers	0.0190%
Unidentified containers	0.0521%
Total	1.3666%

Separate Total RPC composition rates for all resins are reported for 3 categories of counties (30 percent, 25 percent, and 7-15 percent). These figures are, respectively, 1.30%, 1.39%, and 1.53%.

Implications: Both sets of information are applied to the DEQ Municipal Waste Disposal Information to estimate pounds of RPC disposed in 1993, the reference period.

Source:	DEQ 1994-1995 Waste Composition Study - Preliminary Data from the First of Four Scheduled Samplings Preliminary data obtained from DEQ in November 1994 prior to completion of project
Description:	The first of four season sorts for three categories of Oregon Counties, excluding the Portland Metro three county area, was completed in time for the analysis. This study includes secondary sorting and measurement, at a lab, of certain samples weighed in the field to determine the amount of moisture or contamination by dirt or food and by non-target materials, to make adjustments in the field sampling data that was reported initially.
Evaluation:	Even though this information is for a separate time period that the 1992-93 basic waste composition data it will be applied against, the preliminary data from 1994-95 study can be used for assumptions on throw-outs and throw-ins affecting contaminant assumptions for the disposed stream.
Analysis/Trends:	Preliminary data indicate that for all RPC's sampled, about 12.69% of the field reported weight was accounted for by non-RPC contaminants that could be separated out before washing and drying (these contaminants are largely lids, food, and product contents). Washing and drying samples reduced the net RPC amount by an additional 5.75% for a net contaminant level in field data of 18.44%. This percentage must be subtracted from waste composition data to correct for these factors. An additional adjustment to the RPC composition figures of 4.91% must be made to account for RPCs that got reported in field data as other materials (for example, a food container with product that was mostly food but some RPC got counted as 100% food in the field). The net correction is therefore 13.53%. DEQ provided this adjustment data by resin type for incorporation into the rate calculation model.
Implications:	This data allows reasonable corrections to be made in the estimated pounds of RPC disposed. Similar corrections will be made for the pounds of recycled RPC that consist of contaminants, moisture or other shrinkage factors.

Source:	Metro Solid Waste Information System Reports Obtained from Metro, through DEQ - published reports.
Description:	Published data histories and forecasts on quarterly recovery by haulers and disposal of materials from various efforts or facilities serving the Tri-County area - Nov. 1992, Aug. 1993, and March 1994 reports were reviewed.
Evaluation:	Useful reference information for projecting rates of annual increases in plastics recovery and in total waste volumes disposed.
Analysis/Trends:	Between the first two quarters of 1992 and the first two quarters of 1993, all hauler collection programs in the Metro area saw a 32% increase in the volume of milk jugs recovered and a 609% increase in the volume of other plastics collected by haulers - this translates to a 171% total increase in plastics recovery by haulers over the intervening year. It is assumed that much of this rate of growth reflects increases due to the targeting of additional materials and expansion of programs to new areas or sectors previously unserved with plastics collection. • Growth during the period from commercial sector programs was 951% (all resins). During the period, depot collections fell 71% (milk jugs decreased by 50% while other resins decreased by 100%). Multi-family collections gained 48%, primarily in milk jugs. Curbside (residential) recovery increased by 44%, also primarily in the milk jug category. Of all plastics recovery accomplished by haulers, 66% is attributed to commercial programs, 29% to curbside programs, 3% to depots, and 2% to multi-family programs. Milk jugs account for 37% of all hauler collected plastics. • From all of 1992 through all of 1993, franchised hauler plastics picked up curbside increased by 107%; this reflects natural growth as well as expanded programs & materials. For 1992 recovery from curbside plastics efforts was .56 lbs/hh/mo, while for 1993 this increased to 1.18 lbs/hh/mo. • Metro's econometric model used for forecasting waste disposal (direct haul) tonnage estimates that the disposed waste stream for the region will increase by 3.96% from 1993 to 1994 and by 1.15% from 1994 to 1995.
Implications:	Metro hauler plastic volumes account for more than 15% of all plastic recovered in Oregon in 1993.

Source:	MODERN PLASTICS, January 1993 and January 1994 issues Obtained from *Resource Recycling* and HLA libraries
Description:	Industry journal that follows and reports on news of and trends in the plastics production, utilization, and recovery industries. Each January, a year-end report is provided that profiles, by resin type, the recent market activity and consumption patterns for major U.S. and North American resin producers and handlers.
Evaluation:	Information is obtained from industry sources on a voluntary basis and is not considered 100% accurate nor exhaustive, though it is generally considered the best available information on the national plastics scene. The information is used in the model to evaluate trends in the growth of resin production (i.e. waste generation).
Analysis/Trends:	As noted in the model assumptions, the recent basic national growth rate for all resins considered as RPC products is estimated to be 7.24% per year for the short-term. When this rate is adjusted for the population growth rate currently seen in Oregon, the annual increase in RPC product availability is 7.48%. By resin type, this rate of growth varies considerably when calibrated for Oregon's population trends. PET displays the fastest growth at 15.19% per year (14.22% for PET soft drink and 17.31% for other PET). HDPE shows a recent growth of 5.48% per year. Other resins show growth trends ranging between -2.9% and +9.6% per year. Clearly certain of these trends are quite dynamic and will not be sustained over the long-term. However, they are considered useful in estimating potential short-term increases in the RPC supply (waste generation) for the compliance period and in estimating how sustained recovery levels for established programs will contribute to "generation-linked" rates of increase in pounds recovered during the compliance period.
Implications:	An assessment was made of how well national trends track with Oregon's generation estimates from disposal and recovered material estimates. PET was the one resin that stuck out as being less available within the Oregon waste stream than might be expected by national per capita consumption figures, even though the growth in custom PET utilization is believed to have arrived here sooner.

Source:	Thriftway Plastics Collection Program Recovery Report Obtained from Waste Matters Consulting in November 1994 based upon reports of material processors
Description:	One page summary of monthly collections Jan 93-Nov 93 and Jan 94-Oct 94 by sort categories (Natural HDPE, Color HDPE, Film, Polystyrene, & Odds - begin Jul 94).
Evaluation:	Useful program data on 2, 4, 6, program operated by Thriftway and the Girl Scouts at 52 stores (note that 10 of the stores are in Washington State). The program was expanded to include 1, 3, 5, 7 category in July of 1994. Collection is not done in December due to holidays, therefore January weights are generally higher. Thriftway has a contract with APC to continue collections through May of 1996.
Analysis/Trends:	From the Jan.-June 1993 period to the Jan.-June 1994 period, program recovery increased by 23.4% . During this time, few changes were noted in sites served or materials targeted. For the RPC categories (excluding film), the program recovered 113,403 pounds more in the first 6 months of 1994 than in the first 6 months of 1993; an average of 18,900 pounds per month more. When odds were added in July of 1994, the average monthly recovery increased to 25,444 pounds per month more than in the same period (Jul-Oct) of the prior year. To estimate increases from the program for 1994, it has been assumed that the 18,900 pound/mo increment was met for six months and that the 25,444 pound/mo increment will be met for five months (the program doesn't operate in December) for a total increase over 1993 of 240,620 pounds (27.3%). For 1995, it will be assumed that the 25,444 pound increment of recovery is sustained for 11 months to total 279,884 pounds (an increase of 31.8% over 1993). The Thriftway increase is attributable to both more materials, added in July of '94 and to increased participation/capture by those who have access to the program.
Implications:	The available detailed program data is adequate to suggest a separate estimation in growth of recovery from the program both prior to and after materials were added.

DISTRIBUTION

Determination of the 1995
Rigid Plastic Container Recycling Rate for the State of Oregon

December 30, 1994

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Determination of the 1995 Rigid Plastic Container Recycling Rate for Compliance Purposes for the State of Oregon

Prepared for

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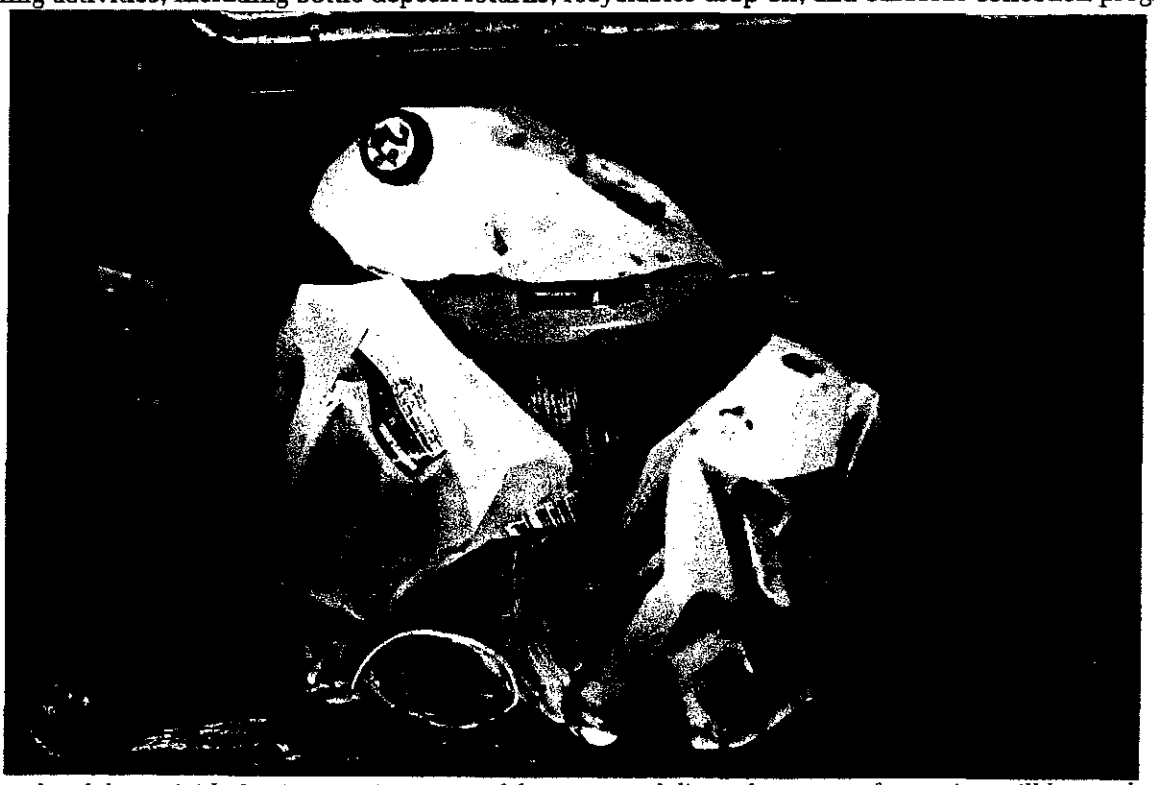
DISTRIBUTION

Source-separated rgid plastic containers delivered to a recyclables depot await transport for processing and marketing. Rigid plastic containers in Oregon are expected to be recycled at a rate of 31.9% (23.1 million pounds) in 1995. This success is due to the efforts of Oregonians who participate in a wide variety of recycling activities, including bottle deposit returns, recyclables drop-off, and curbside collection programs.



The weight of these rigid plastic containers sorted from waste delivered to a transfer station will be used to estimate the pounds of this material that is disposed of. With 68.1% (49.3 million pounds) of rigid plastic containers still destined for disposal, considerable improvement and continued expansion of collection and processing systems for these materials are needed.

1.0 SUMMARY

Rules adopted by the Oregon Environmental Quality Commission (EQC) on October 21, 1994 pertain to implementation of Oregon's Rigid Plastic Container Law. These rules require that the Department of Environmental Quality (DEQ) calculate a recycling rate for compliance purposes for rigid plastic containers (RPC) by January 1, 1995. The purpose of calculating the RPC recycling rate for compliance purposes is to inform manufacturers of regulated containers, prior to the compliance date, of the container-compliance status. RPC are defined in the rules as plastic bottles, jars, cups, tubs, pails, "clamshell" containers, or other plastic containers that meet a number of identified criteria.

The rules specify that compliance be measured prospectively, that is, that RPC recycling be forecast for 1995 and that that rate be compared to the target of 25 percent (the percent by weight of all post-consumer RPC waste generated in Oregon that is recycled).

In October through December of 1994, DEQ conducted an analysis to estimate the 1995 recycling rate for compliance purposes of RPC within the State of Oregon. Information used in this analysis included data collected on RPC recycling and disposal in 1993, prior to adoption of the rules; assumptions and adjustments needed to apply these data in addressing the rules; and projections on how RPC recycling and generation within the state are expected to change during calendar years 1994 and 1995. The results of that analysis, the 1995 RPC recycling rate for compliance purposes, and the calculations are presented in this report.

The analysis results in an estimated RPC recycling rate for compliance purposes within the State of Oregon of 31.9 percent for 1995. Table 1 summarizes the annual recycling rates for 1993 and the 1995 recycling rates for compliance purposes determined through this project, both for all RPC and for resin types identified in the rules.

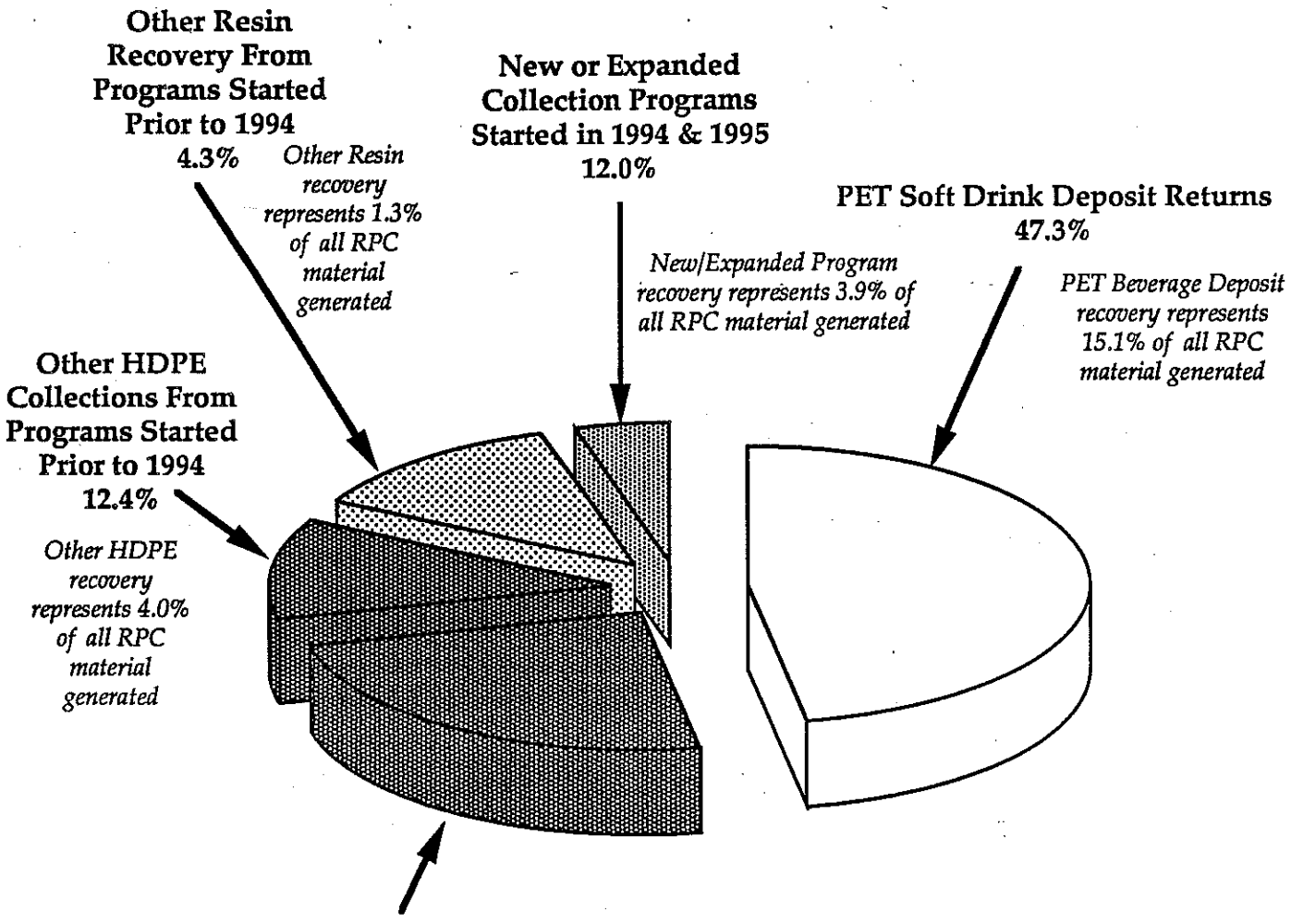
As discussed in the methods and assumptions sections of this report, the actual rate could be below or above this figure. A sensitivity analysis was performed to quantify the uncertainties of the calculations and indicates a 99.9 percent probability that the 1995 recycling rate for compliance purposes, for all RPC resins, will be greater than 25 percent. The most significant uncertainty of the analysis is the inability to project the 1994 and 1995 growth rates in the manufacture and consumption of plastic containers that result in RPC waste generation within Oregon. However, given the mature recovery systems for PET soft drink and HDPE milk jugs that exist in much of Oregon, it is reasonable to expect that increased growth in generation of these materials will be matched by increases in the growth of recovery.

The following pie chart summarizes the contributions of various collection programs and recovery efforts to the aggregate RPC recycling rate for compliance purposes that is projected for 1995.

Table 1 Summary of Results

Rigid Plastic Container Category/Parameter	Estimated 1993 Recycling Rate	Estimated 1995 Recycling Rate for Compliance Purposes
PET (#1 - soft drink and custom)	63.8%	64.3%
HDPE (#2 - natural and pigmented)	20.1%	25.4%
Combined Rate for other resins: PVC, LDPE, PP, PS and mixed/other	7.5%	9.7%
Aggregate - All RPC Resins	26.9%	31.9%

Contributions to 1995 Recycling Rate for Compliance Purposes



Recovery from all of these contributions combine to yield a Rigid Plastic Container (RPC) Recycling Rate for Compliance Purposes in 1995 of 31.9% of all RPC material generated in Oregon.

2.0 BACKGROUND

Describing how to calculate an accurate and defensible material-specific recycling rate is easier than gathering the data and doing the actual calculations. The recycling rate is defined as the amount of the material (in pounds) recycled during a period divided by the amount of the material generated as waste (also in pounds) during the same period. The amount generated can be calculated by summing the amount recycled and the amount disposed of during the period.

Because it is far too costly to make direct observations and records of every pound of RPC as it is recycled, disposed of, or generated as waste, indirect methods of measurement are required. The quantity of RPC *disposed of* in Oregon is estimated using the results of waste composition studies that estimate the percentages of RPC in the municipal and construction/demolition waste streams in various regions of the state, along with reports from more than 80 disposal site operators on the quantities of all wastes disposed of for the time period. The quantity of RPC *recycled* is estimated on the basis of voluntary reports submitted by more than 200 collectors and processors currently handling plastics from Oregon.

Within all of these data collection and reporting systems there is plenty of opportunity for error. For example:

- Data reported by collectors, processors, or disposers can contain errors or may be based upon recollection and estimation rather than upon actual weights and detailed records
- Materials recovered or disposed of can be categorized incorrectly
- Volumes can be converted to weights using incorrect density assumptions
- Reporting time periods may not correlate
- Waste composition or material recovery estimates may be in error because of contaminants (e.g., food or moisture) weighed along with containers
- Materials collected for recycling may be handled by out-of-state markets that are not surveyed, or may be stockpiled, downgraded, or disposed of prior to being marketed
- Industrial scrap plastics, non-RPC plastic containers, or other recycled materials may be reported incorrectly, along with targeted RPC resin recovery figures (for example, in the 1993 survey, handlers were not asked to report HDPE RPC recovery separate from other HDPE recovery; that is expected to change in the 1994 survey)
- Some rigid plastic containers that are littered, illegally dumped, or burned in burn barrels are not included in the "disposed-of" figures

Accurate estimation of the pounds of RPC disposed of for the 1993 reference period and for future analyses is complicated due to two factors:

- Sampling errors and biasing errors affect the accuracy of waste composition studies and many other statistical sampling methodologies. DEQ's 1992-93 waste characterization study included 823 samples of between 200 and 300 pounds each. This resulted in the actual weighing of just 120 tons to represent the composition of nearly 2,300,000 tons of waste actually disposed of within the state. The study's design does all that it can to provide results as accurate as possible for reported material composition; however, there are obvious limits on how accurate such studies can be.
- The timing and frequency of waste composition study scheduling for the state may make it difficult to clearly see changes in RPC recovery reflected in the disposal waste stream.

In developing assumptions and projections that attempt to extrapolate from recycling rates in prior periods for which there are "complete" records to

current or future periods, there is also opportunity for error. For example:

- Material consumption and disposal patterns may change
- Recent or historic rates of growth may not be sustained in future years , especially if they have been at levels of 10 percent, 20 percent, or higher
- Existing programs for collecting and processing RPC may increase or decrease activities or performance due to a number of factors
- Anticipated new programs may or may not start up according to schedule and may or may not have the anticipated level of success in recovery or generator participation
- Anticipated changes in economic or population growth that would affect RPC recovery and disposal may not be as forecast

These complexities were recognized by DEQ staff, Oregon recyclers, and the plastics industry prior to adoption of the rules. A Recycling Rate Task Force met several times in early 1994 to consider issues of the proposed rules that would affect the ability to determine RPC recycling rates for Oregon. This led to some clarification in the rules of how the recycling rate would be determined, though many technical issues of the analysis remained unresolved.

After rule adoption, DEQ hired the consultant team (Harding Lawson Associates and ECO Northwest) and formed a Recycling Rate Workgroup to advise DEQ and its consultants on a specific methodology and the assumptions used to calculate the 1995 recycling rate for compliance purposes. Members of this group, each of whom is familiar with various technical complexities of plastic recycling rate calculation, met five times during the development of this report to review approaches being taken and to provide a balance of inputs and perspectives. The Work Group has not been asked to specifically endorse the results of this analysis, though they have played an important and essential role in shaping the methodology and in defining the assumptions that are integral to the report's findings.

The consultants wish to acknowledge and thank the following individuals for their role in completion of this effort:

Oregon Department of Environmental Quality

Pat Vernon, Project Manager

Work Group members:
Deanna Mueller-Crispin
Peter Spendelow

Other DEQ staff members, who provided assistance in supplying data and performing surveys

Recycling Rate for Compliance Purposes Work Group

Marc Daudon, Cascadia Consulting Group
Ron Perkins, American Plastics Council
Jerry Powell, Resource Recycling Magazine
Chris Taylor, OSPIRG
Kathy Thomas, Thomas/Wright, Inc.

Recycling Businesses, Public Agencies, and Organizations Participating in Oregon's Efforts to Recycle Rigid Plastic Containers

Many individuals and groups contributed to the study through answering specific questions of DEQ and the consultant and through participation in ongoing efforts of "routine" data collection and reporting.

Thanks to all of you!

The Consultant Team

Harding Lawson Associates
Rich McConaghy, Project Manager
Delyn Kies
Susan Kramer
Catherine Murphy

ECO Northwest
Carl Batten
Terry Moore

3.0 METHODS

Given the charge to estimate the 1995 recycling rate for compliance purposes, the consultant team, working with DEQ staff and members of the Work Group, recognized the impossibility of determining perfectly accurate numbers on the recycling rate for compliance purposes for all RPC and the various RPC resin types:

1. Polyethylene terephthalate (PET)
2. High-density polyethylene (HDPE)
3. Polyvinyl chloride (PVC)
4. Low-density polyethylene (LDPE)
5. Polypropylene (PP)
6. Polystyrene (PS)

The agreed-upon goal was to objectively calculate the best numbers possible given existing information and reasonable adjustments or assumptions that could be made within the time and budget available. It was also understood that the methods used would need to be applied or modified in future years to obtain recycling rates for compliance purposes for 1996, 1997, and succeeding years. Therefore the methodology should be clear, straightforward, and repeatable.

The basic approach is identified in Figure 1. It begins with a determination of a recycling rate for a reference period for which a whole year of data were available (in this case 1993), based on pounds of RPC recycled and pounds of RPC disposed of from within Oregon during the period. The disposed-of pounds plus the recycled pounds of RPC in the reference period are used as a basis to forecast RPC generation in the compliance (or pro forma) period (in this case 1995) for which the recycling rate for compliance purposes must be determined. Estimated pounds of RPC to be recycled in the compliance period are calculated based upon known or planned changes in recovery programs, and their projected performance, between the reference period and the compliance period.

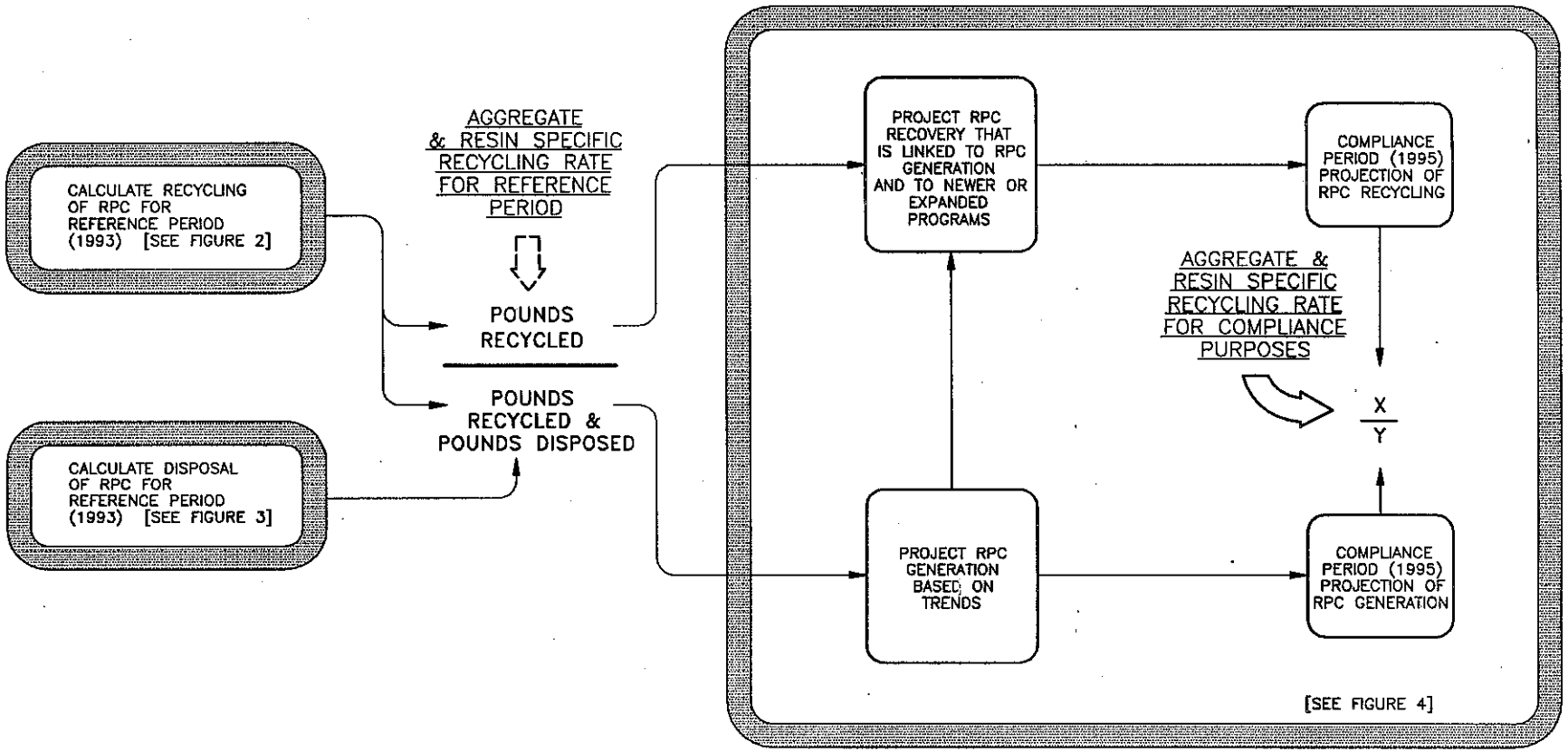
Figure 2 identifies the data sources and adjustment factors evaluated in calculating the pounds of RPC recycled during the reference period. Figure 3 identifies factors evaluated in calculating the pounds of RPC disposed of during the reference period. Figure 4 summarizes the steps taken in projecting a rigid plastic container recycling rate for the compliance period.

A spreadsheet model was developed to perform the calculations and to provide documentation on the assumptions, data, and values used to calculate the RPC recycling rates for 1993 and the RPC recycling rate for compliance purposes for 1995. Printouts of this model are provided in Appendix A.

Within the modeling effort, a sensitivity analysis was undertaken to quantify and evaluate the uncertainty associated with various data, assumptions, estimates, and projections used to derive the results displayed in Section 1. The sensitivity analysis is discussed and summarized in Appendix B. Appendix C provides summaries of the principal data sources and referenced reports that were used in obtaining data or information needed to calculate the results.

In the process of following the outlined methodology and evaluating the appropriateness of particular assumptions and the availability of information relevant to other assumptions, certain factors identified in Figures 1 through 4 were considered to have a limited impact on the rate calculation or to be inappropriate for including in the actual calculation. Other factors were considered critical to derivation of the best possible results. Section 4, Key Assumptions, summarizes the assumptions that were the most essential in defining and driving the methodology used to make the calculations. As noted, quantitative assumptions and values used for various adjustments and projections are included in the pages of the model printouts contained in Appendix A.

FIGURE 1. OVERVIEW OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES



(AS NOTED, REFER TO FIGURES 2, 3 AND 4 FOR ADDITIONAL DETAIL.)

FIGURE 2. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

CALCULATING POUNDS RECYCLED DURING THE REFERENCE PERIOD

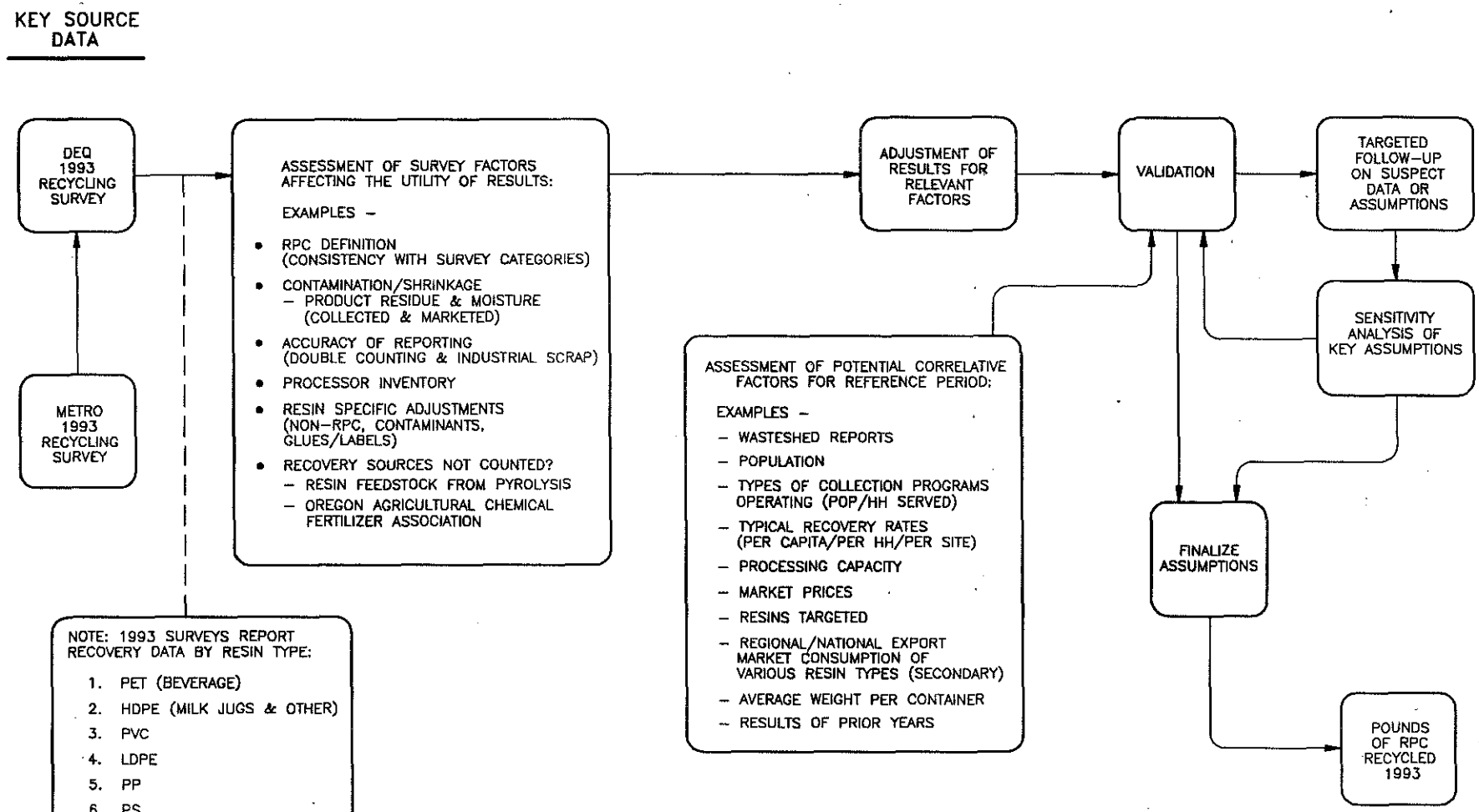


FIGURE 3. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

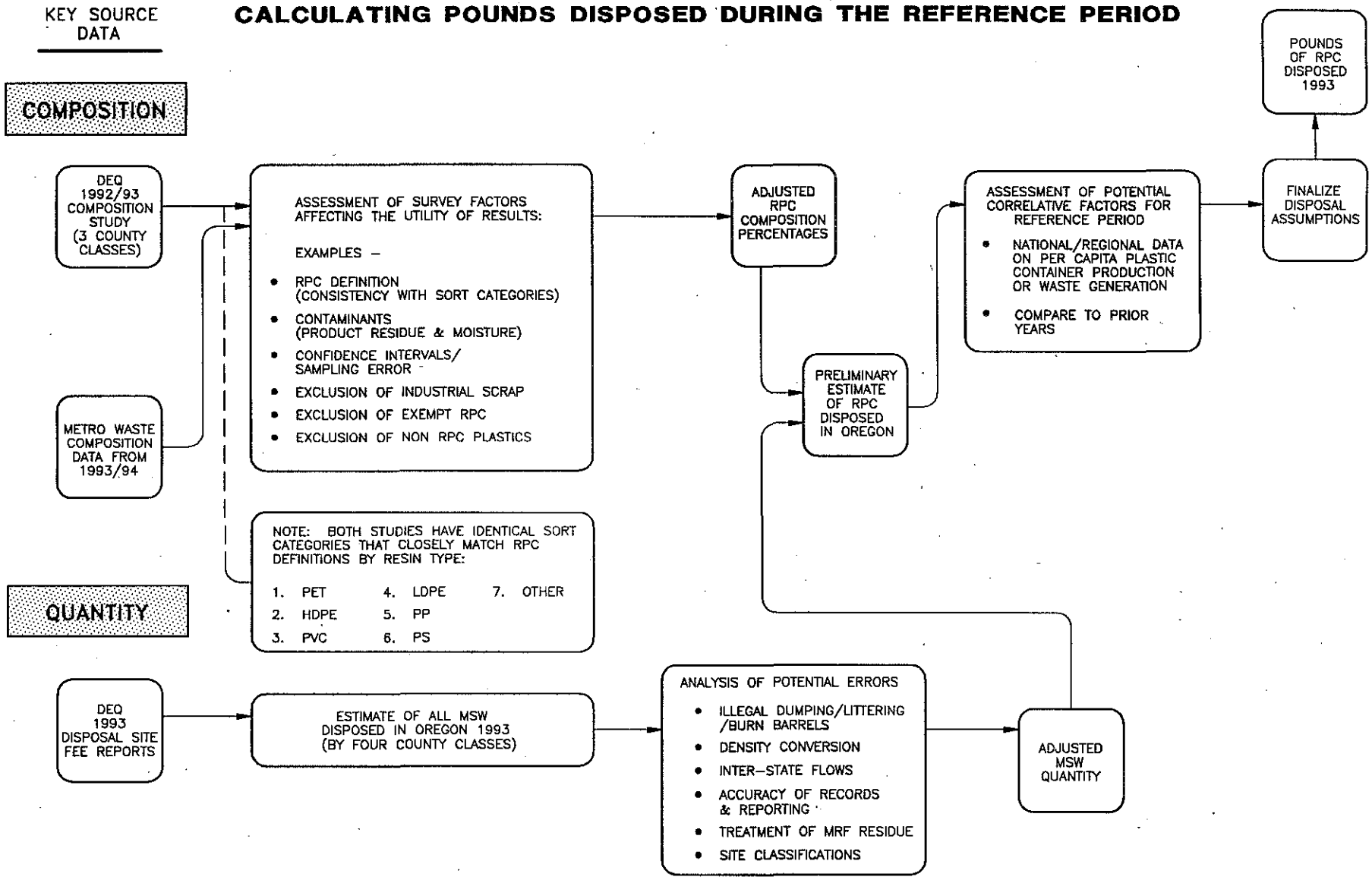
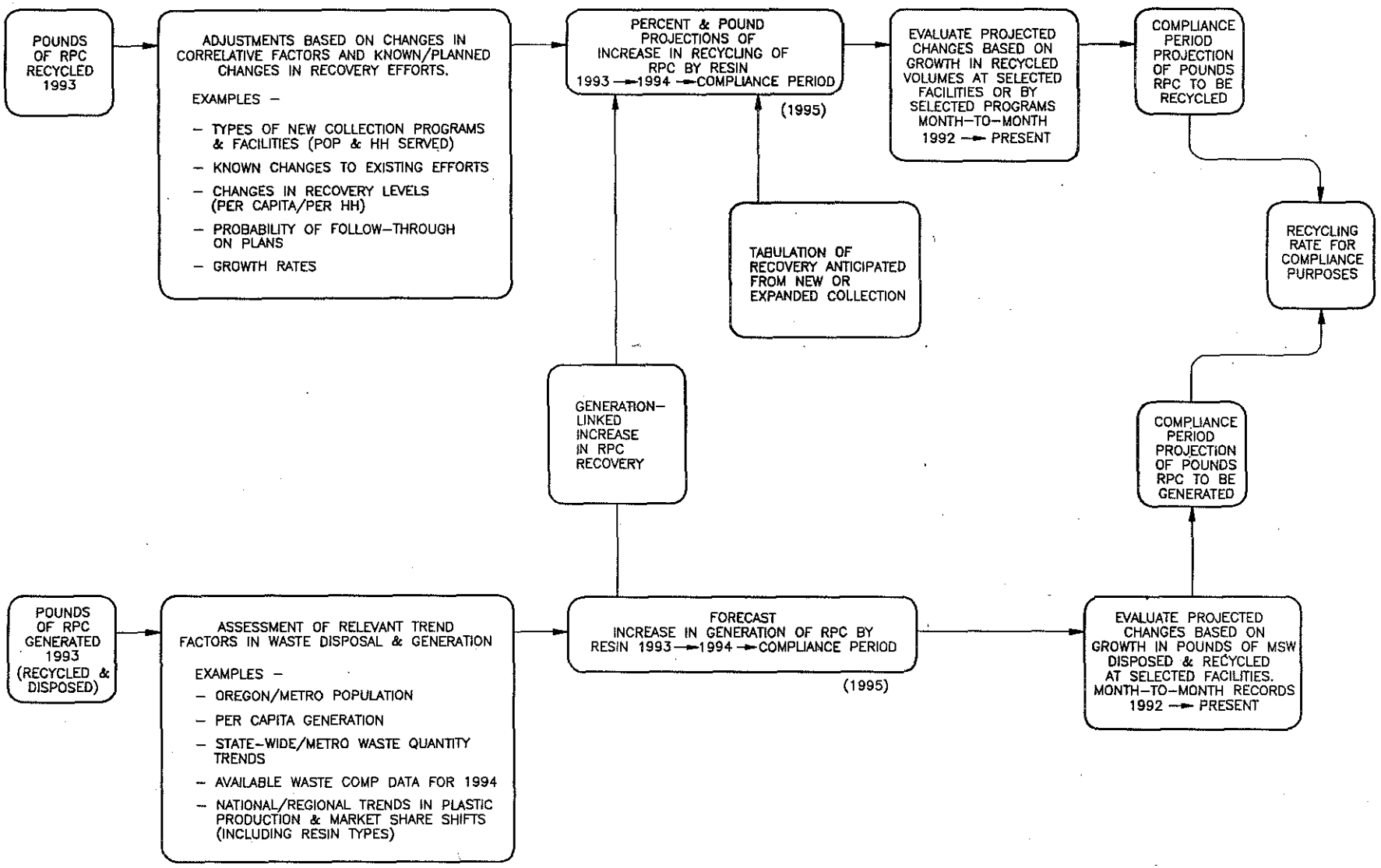


FIGURE 4. DETAIL OF THE METHODOLOGY FOR CALCULATING THE 1995 OREGON RIGID PLASTIC CONTAINER (RPC) RECYCLING RATE FOR COMPLIANCE PURPOSES

CALCULATING THE RECYCLING RATE FOR THE COMPLIANCE PERIOD



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4.0 KEY ASSUMPTIONS

4.1 Time Periods

1. The Oregon RPC recycling rate for compliance purposes is based on a projection of a recycling rate(s) for calendar year 1995 (January 1 through December 31 inclusive). 1995 is referred to as the compliance period.

2. Available data on RPC recycled quantities and disposed-of quantities for the State of Oregon in calendar year 1993, the reference period, is used as the primary basis for the projection of a 1995 recycling rate for compliance purposes. Where available, this data is supplemented with reliable year-to-date data from 1994.

3. Consistent with the methodology used in the DEQ material recovery survey, material is counted as recycled in the year that it is collected, so long as there is a reasonable expectation that it will be recycled after being held in processor inventory. The transfer of material from a collector to a processor is generally the point at which recycling/diversion from landfilling is to be counted. Material that has been collected but is stockpiled awaiting shipment, sorting, regrinding, or other treatment, is considered recycled for the period. (DEQ surveys show very few collectors with more than one ton of material in inventory at the end of the year.)

4.2 Material Streams

4. Pounds, rather than tons, hundredths of tons, or the number of containers, is used as the unit of measure in calculating the recycling rate for compliance purposes. Where data on recovery or disposal are available in other units, those units will be converted to pounds using standard or best available assumptions.

5. Based upon the availability of data to provide a finer level of detail, the RPC recycling rate for compliance purposes is presented as an *aggregate* figure for RPC of all resin types and as a *resin-specific* figure for RPC in three categories: PET #1, HDPE #2, and other identified resins (PVC #3, LDPE #4, PP #5, PS #6, and mixed/other #7). The analysis does not attempt to provide RPC recycling rates for other classes or categories of commodity, product-associated, or manufacturer-specific containers.

6. It is intended that only post-consumer RPC be counted in both the recycling and disposal quantities considered in calculating the RPC recycling rate for compliance purposes.

4.3 Adjustments

7. Available data and reasonable assumptions are used to adjust reported recycling and disposal quantities for the reference period to correspond with the RPC definition contained in the rules. Similarly, adjustments are made for possible errors in estimating the total tonnage of municipal solid waste disposed of in the state for the reference period. For the 1995 analysis, it is assumed that 100 percent of PET container recovery is RPC, 90.3 percent of HDPE recovery is RPC, 90 percent of PVC recovery is RPC, 2 percent of LDPE recovery is RPC, 15 percent of PP recovery is RPC, 75 percent of PS recovery is RPC, and 50 percent of mixed/other-plastics recovery is RPC. Within the HDPE category, it is assumed that 100 percent of milk jug recovery is RPC and that 75 percent of "Other HDPE" recovery is RPC.

8. RPC resin recovery figures reported to DEQ generally exclude nonplastic contaminants pulled from collected volumes prior to the first point of material transfer. These "shrinkage" factors are not intended to be included in the recycling quantity number. As with other recovered materials, process losses experienced by end users through removal of contaminants, neck rings, labels or adhesives, or through other processes conducted after material has been accepted for end use, are counted toward recycling, except as far as typical material marketing specifications allow for certain minimal

levels of contamination (for plastics, this allowance is generally 2 percent). As appropriate to various RPC resin categories, minor adjustments are made to reported recovery figures to account for typical contaminant or shrinkage levels including nonplastic materials, dirt, baling wire, and moisture that are inherent in baled product. This adjustment is intended to be consistent with the treatment of contaminants for disposed-of RPC noted in assumption 9. Adjustments are not made for the losses in yield experienced by end users of marketed RPC material. For the 1995 analysis, it is assumed that 5 percent of reported resin recovery is lost to "shrinkage" or contamination in marketed supplies.

9. Based upon the availability of data and upon reasonable assumptions, adjustments are made in the pounds of RPC disposed of, specific to various resin types, to account for the contributions of two factors of the waste composition analysis. Reported field data on RPC resin samples includes some amount of product residue and/or moisture that adheres to or is contained in RPC supplies. Some items, such as lids, are inappropriately counted as RPC in the field. These are considered a contamination or throw-out factor. Also during field sampling, some RPC material amounts are counted within other categories, such as food, because the container is such a small fraction of the primary disposed-of item. This is considered a throw-in factor.

   Fine or secondary sorts of disposed-of waste sampled in September 1994 at a lab provide valuable data for making this adjustment. For the 1995 analysis, an average deduction of 14 percent is made in pounds of RPC disposed of to account for the fine-tuning of waste composition data to account for throw-ins and throw-outs. By resin type, this adjustment ranges from 12 percent to 24 percent.

10. Plastic containers specifically exempted from the RPC rules (including containers for drugs, medical devices, medical food, infant formula, containers for products sold outside of Oregon, packaging that provides a tamper-resistant seal, and containers that are source-reduced) are considered to represent a small portion of the overall volume of plastics within the waste stream. Per AOR 340-90-380(3)(a), no adjustments will be made in the recycled (numerator) or the generated (denominator) figures to account for their presence or absence. RPC reuse, an alternative form of compliance open to RPC manufacturers meeting certain standards, does not currently constitute a significant volume of RPC recycling or RPC disposal. No containers have currently been identified as meeting the standards for reuse, so it is not possible, for the first year of this calculation, to treat them separately from other RPC materials. Therefore no adjustments are made in the numerator or denominator to account for their presence or absence.

4.4 Projections

11. Estimates are made for increased and decreased levels of RPC recycling and decreased and increased levels of RPC disposal that can be anticipated from new, expanded, or reduced/curtailed collection and processing operations known and/or still planned for calendar year 1994 and planned for calendar year 1995. The effects of these efforts are projected on the basis of implementation experience for similar efforts and the time their impacts will have to develop within the compliance period. As much as is possible, anticipated effects are evaluated as net impacts to local recovery systems (for example, anticipated new recovery from curbside efforts is estimated as a net amount after accounting for any anticipated decreases in recovery from pre-existing drop-off networks). Attempts are made to evaluate the certainty and likely effectiveness of new or planned collection and processing efforts (see assumption number 15).

    For the 1995 analysis, Table 2 summarizes available data on performance of reference programs while Table 3 summarizes

assumptions made for new and expanded collection efforts that will contribute to increased recovery in 1994 and 1995. No plastics collection efforts in 1993 were identified that would be reduced or discontinued in 1995. The effects of the planned program of the Oregon Dairy Council to promote the statewide recycling of HDPE milk jugs is difficult to project, as it will not provide direct collection service. However, it is considered important in attaining the projected level of recovery.

12. It is assumed that the base level of RPC recycling experienced in the reference period will be sustained and will keep pace with anticipated growth in RPC generation in the compliance period. This is referred to as a generation-linked increase. If reliable data are available to suggest major near-term changes in demand or supply factors affecting RPC recovery, it is assumed that the base level of recycling experienced in the reference period could be affected in the compliance period. Such demand factors include secondary resin prices, end-market capacities, and regional processing and transportation capabilities; supply factors include generator support of and participation in RPC recycling and the provision of hauler and recycler RPC programs and services.

    For the 1995 analysis, it is assumed that the generation-linked increase in recycling will be the same as the projected increase in RPC generation. For example, as PET generation increases at a high rate for two years (see Appendix A, Generation Forecast), it is assumed that recycling will keep pace with this growth so that the net recycling rate for existing programs remains the same. As noted in Table 3, only two existing programs, Lane County's and Thriftway's, had obtained sufficient data to project increases for 1994 independent of expanded efforts.

13. RPC waste generation (recycled pounds plus disposed pounds) determined for the reference period is used as the primary basis to forecast generation for the compliance period. Population growth rates, per-capita waste-generation growth rates, and regional and national trends in plastic packaging production or resin utilization are considered in making this forecast. Available regional or national data on industry trends, such as changing market shares for various packaging types or resins and per-capita generation or recovery, are used as a means of verifying and validating forecasts or other assumptions.

    For the 1995 analysis, national per-capita growth in plastic resin consumption and a correction for Oregon's higher-than-national rate of population growth are used to project RPC generation for 1994 and 1995. For all resins, the assumed increase in generation is 7.5 percent per year. (Separate growth rates are assumed for PET soft drink and other PET RPC categories.) For PET, the increase is projected at 15.5 percent per year. The HDPE generation increase is projected at 5.5 percent per year. Other resin generation growth assumptions are noted in the model (Appendix A, page 5). It is recognized that the higher rates of growth may not be sustained over the long term, so future analyses will require adjustment of these assumptions.

14. Surveys of Oregon processors or collectors are used as a check on the validity of available data and assumptions required to project recovery or disposal figures for the compliance period.

15. A sensitivity analysis approach is integrated into the rate calculation model to deal with the uncertainties associated with various assumptions and data inputs. The results of this effort for the 1995 analysis are summarized in Appendix B.

Table 2
SUMMARY OF RECOVERY ASSUMPTIONS FOR REFERENCE PROGRAMS

Collection Program Type	Applicable Reference Programs		Recovery Data/Basis/Notes		
Curbside Milk Jug Only	City of Portland Current Program		0.63	pounds/hh/mo based on latest 12 mo. stabilized recovery level	Portland data
	West Linn		0.56	pounds/hh/mo	APC report
	Metro Region All curbside		0.56	pounds/hh/mo 1992 - some HH not eligible	SWIS Report
Curbside All Rigid Plastic Containers (Resins 1-7 added to established program)	Lane County Current Program		1.72	pounds/hh/mo May/June '94 data	DEQ Survey , Goodwill & County
Mix of Curbside/Depot/Commercial Collect. Programs Operated by Haulers	Metro Region Varying Service Levels		1.18	pounds/hh/mo 1993 - mix of program types	SWIS Report
Curbside Increment of Adding PET Cust/Bev. Containers to Existing Program	West Linn		0.11	pounds/hh/mo	APC Study
Drop-Off Milk Jug Only (two figures are given - 100% is prior to curbside and 64% is after curbside that targets the same material)	Lake Oswego	100%	3,783	pounds/site/mo	DEQ Survey
		64%	2,409	pounds/site/mo pre-curbside & post-curbside depot volumes	& follow-up call
Drop-Off Limited Plastic Containers But More than Milk Jugs (e.g. bottles)	Thriftway Throughout OR		1,412	pounds/site/mo 2-4-6 program results, 1993 @ 52 sites	Thriftway Data
Drop-Off All Rigid Plastic Containers (or other broadly targeted category)	BRING - Eugene		7,900	pounds/site/mo For large City-wide site	BRING Data
	PRT - Portland		6,495	pounds/site/mo (most recent 3 weeks)	
			3,248	pounds/site/mo (1st 6 weeks of program) For N. Portland site - volume accelerated after all plastic bottles targeted	DEQ Survey
	Thriftway In Oregon/Wash.		1,861	pounds/site/mo (based on 12 mo) 1-7 RPC based on partial 1994 increases	
	BRING - Eugene		500	pounds/site/mo Network of 7 depots at schools	BRING Data

Table 3
FORECAST OF RIGID PLASTIC CONTAINER RECOVERY FROM NEW OR EXPANDED OREGON PROGRAMS IN 1994 AND 1995

PROGRAM DESCRIPTION	Key Recovery Assumptions (New Recovery Net of Existing Recovery)				Start Date	1994 RECOVERY ESTIMATE					Generation Linked Increase	1995 RECOVERY ESTIMATE				
						Months	Total Pounds	% HDPE	% PET	% Other		Months	Total Pounds	% HDPE	% PET	% Other
NEW PROGRAMS																
DROP-OFF	Lbs/Site/Mo	# of Sites	Pounds/Mo	Basis												
1 Hood River - Milk Jugs	700	1	700	APC per interview	Feb-94	11	7,700	90%	10%		7.48%	12	9,028	90%	10%	
CURBSIDE	Lbs/HH/Mo	# of HH	Pounds/Mo	Basis												
2 Ashland - Milk Jugs	0.32	10,000	3,150	Portland @ 1/2 increment	Aug-94	5	15,750	100%			5.48%	12	39,871	100%		
3 Beaverton - Milk Jugs	0.42	15,000	6,237	Portland @ 2/3rd increment	Apr-94	9	56,133	100%			5.48%	12	78,945	100%		
4 Lake Oswego - Milk Jugs/nat. #2 bottles	0.42	8,800	3,659	Portland @ 2/3rd increment	Sep-94	3.5	12,807	100%			5.48%	12	46,315	100%		
5 City of Medford - MJ & #2	0.42	22,552	9,377	Portland @ 2/3rd increment	Aug-94	5	46,886	100%			5.48%	12	118,692	100%		
6 Washington Co & Forest Grove - Milk Jugs	0.42	36,000	14,969	Portland @ 2/3rd increment	Sep-94	4	59,875	100%			5.48%	12	189,469	100%		
7 City of Roseburg - all bottles	0.86	4,480	3,853	Lane Co. all RPC @ 1/2 increment	Dec-94	1	3,853	80%	10%	10%	7.48%	12	49,692	80%	10%	10%
8 Clackamas Co - Milk Jugs	0.42	50,606	21,042	Portland @ 2/3rd increment	Jan-95							12	252,504	100%		
9 Hillsboro - Milk Jugs	0.42	9,000	3,742	Portland @ 2/3rd increment	Jan-95							12	44,906	100%		
10 Dalles/Wasco Co. - Milk Jugs	0.21	3,650	759	Portland @ 1/3 incrmnt, > hauler est	Jan-95							12	9,106	100%		
11 Curry Co, Brookings - All bottles	0.57	1,500	851	Lane Co. all RPC @ 1/3 increment	Jan-95							12	10,217	80%	10%	10%
OTHER	Tons/mo	# customers	Pounds/Mo	Basis												
12 Portland, MDC commercial	6.15	160	7,300	APC interview net of '93 amounts (-PRT)	Jul-94	6	43,800	80%	10%	10%	7.48%	12	94,152	80%	10%	10%
13 OR Assoc Nursery men - polyethylene/PS	100,000	lbs/year	8,333	DEQ interview for '94 - '95 is uncertain	1994	12	100,000	40%		60%						
14 Lane County Commercial - all resins	100,000	lbs/year	8,333	Estimate by Goodwill - new service	Jan-95							12	100,000	80%	10%	10%
EXPANDED PROGRAMS																
DROP-OFF	Lbs/Site/Mo	# of Sites	Pounds/Mo	Basis												
15 Ashland - Add PET to existing #2	750	1	750	2 months recovery per APC data	Oct-94	3	2,250		100%		15.48%	12	10,393		100%	
16 Beaverton - Far West all bottles to exist MJ	5,000	1	5,000	Increment by APC per interview	Oct-94	3	15,000	80%	10%	10%	7.48%	12	64,488	80%	10%	10%
17 Lake Oswego PRT - bottles to existing MJ	835	1	835	Increment - 1/3rd of Sept amount	Sep-94	4	3,340	80%	10%	10%	7.48%	12	10,768	80%	10%	10%
18 Garten, Salem - add all RPC to existing MJ	1,221	1	1,221	Increment - 2/3rd of APC interview	Sep-94	4	4,884	80%	10%	10%	7.48%	12	15,748	80%	10%	10%
19 Keizer TS, Marion Co - all btles to exst MJ	1,500	1	1,500	Increment by APC per interview	Sep-94	4	6,000	80%	10%	10%	7.48%	12	19,346	80%	10%	10%
20 Portland - EZ Recycling all bottles to exst MJ	2,000	1	2,000	Increment by APC per interview	Oct-94	3	6,000	80%	10%	10%	7.48%	12	25,795	80%	10%	10%
21 Portland - Recycle Works all bottles to exst MJ	2,000	1	2,000	Increment by APC per interview	Jun-94	6	12,000	80%	10%	10%	7.48%	12	25,795	80%	10%	10%
22 Portland, PRT - all bottles to existing Milk Jugs	3,000	1	3,000	2/3 Incrmnt to DEQ Survey, 12/5 tc	Sep-94	4	12,000	80%	10%	10%	7.48%	12	38,693	80%	10%	10%
23 Portland, Wastech - add PET to exisiting MJ	2,510	1	2,510	Increment by APC per intrvw,12/5 tc	Jun-94	7	17,570		100%		15.48%	12	34,783		100%	
24 Portland, Wastech - add all RPC to PET+MJ	2,436	1	2,436	1/2 Incrmt to PRT average	Jan-95							12	29,229	85%	5%	10%
25 Douglas Co - colored #2 to exisng Milk Jugs	45	11	495	APC interview & BRING depot	Feb-94	11	5,445	100%			5.48%	12	6,266	100%		
26 Thriftway - add odds to existing 2-4-6	431	52	22,391	Thriftway data for Jan 93-Oct 94	Jul-94	5	211,746	25%	25%	50%	7.48%	11	264,721	25%	25%	50%
27 Portland, Smurfit - all RPC to exst PET+MJ	130	1	130	DEQ Survey - conservative est.	Dec-94	1	130	80%	10%	10%	7.48%	12	1,677	80%	10%	10%
28 Lincoln County - add bottles to MJ program	500	3	1,500	APC report - increment @ 1/3rd current	Mar-95							10	15,000	80%	10%	10%
CURBSIDE	Lbs/HH/Mo	# of HH	Pounds/Mo	Basis												
29 Lane County - All rigid plastic containers	0.90	51,000	45,707	Calculated increment - '94 data	May-94	8	472,880	80%	10%	10%	7.48%	12	589,511	80%	10%	10%
30 Marion Co- MJ (start mid 93-50% in '93 recov)	0.21	25,000	5,198	Portland 2/3rd increment X 50% yr	Jul-93	12	62,370	100%			5.48%	12	65,788	100%		
31 Albany-Lebanon - All bottles to exst MJ	0.45	16,000	7,200	Per APC - Use Lane County Increment	Feb-95							11	79,200	80%	10%	10%
32 Marion/Polk Co - all bottles curb to exst MJ	0.86	75,000	59,303	Lane Co. all RPC @ 1/2 incrmnt, less #30	Mar-95							10	593,025	80%	10%	10%
TOTAL ANTICIPATED COLLECTIONS							1,178,417	823,041	131,515	223,861			2,933,123	2,337,498	287,031	308,594
ADJUSTMENT FOR ASSUMED SHRINKAGE/CONTAMINATION IN RECOVERED SUPPLIES					95%		1,119,497	781,889	124,939	212,668			2,786,467	2,220,623	272,679	293,164
								70%	11%	19%				80%	10%	11%

Attributable to programs started during 1994: 1,709,940 — Based on full year with generation linked increase

Attributable to programs started during 1995: 1,076,528

Note:

This table is provided as a means of forecasting incremental increases in state-wide RPC recovery for two years. This increment of increase is above the level of recovery that was reported for 1993 for ongoing programs. For new/expanded programs started in 1994, a generation linked increase assumption has been shown for 1994 -- this is consistent with estimates used to project the annual level of short-term growth in RPC generation and recovery in the absence of new efforts.

Assumptions attempt to provide recovery net of current recovery considering alternative collection systems previously available and materials previously collected.

Assumptions noted relate to actual data provided by the program managers or to recovery assumptions used for reference programs shown in Table 2.

Note: From entry #13, OR Assoc of Nurserymen, it is estimated that the 60% Other Resins shown for 1994 is all Polystyrene.

APPENDIX A

PRINTOUTS OF THE MODEL FOR THE RIGID PLASTIC CONTAINER RECYCLING RATE FOR COMPLIANCE PURPOSES ANALYSIS

The following pages provide documentation of the assumptions and calculations used in the spreadsheet model of the 1995 Recycling Rate for Compliance Purposes Analysis. The format was developed as a working model and has not been edited or annotated to facilitate understanding by individuals not involved in the rate-calculation process. Significant digits shown within these pages do not reflect the level of accuracy to be associated with particular calculations or tables.

Recycling Rate Table

Reference Period—1993

Resin	Pounds of RPC Recovered in 1993	Pounds of RPC Disposed in 1993	RPC Recycling Rate in 1993
PET	8,367,980	4,758,206	63.75%
PET Beverage	8,367,980	678,368	92.50%
PET Other	0	4,079,838	0.00%
HDPE	7,546,183	30,074,027	20.06%
OTHER RESINS	884,737	10,942,695	7.48%
PVC	20,520	816,947	2.45%
LDPE	59,424	601,076	9.00%
PP	51,870	989,052	4.98%
PS	569,288	6,073,400	8.57%
Other/Mixed	183,635	2,462,221	6.94%
All Resins	16,798,899	45,774,928	26.85%

Compliance Period—1995

Resin	Pounds of RPC Recovered in 1995	Pounds of RPC Disposed in 1995	RPC Recycling Rate in 1995
PET	11,190,160	6,226,541	64.25%
PET Beverage	10,917,481	885,049	92.50%
PET Other	272,679	5,341,492	4.86%
HDPE	10,616,718	31,240,587	25.36%
OTHER RESINS	1,276,355	11,844,262	9.73%
PVC	26,166	764,244	3.31%
LDPE	88,751	678,850	11.56%
PP	79,472	1,170,443	6.36%
PS	802,500	6,360,302	11.20%
Other/Mixed	279,466	2,870,423	8.87%
All Resins	23,083,233	49,311,390	31.89%

Recovery Table

Reference Period—1993

Resin	Wet Tons Recovered	% RPC	Dry/Wet	Dry Pounds Recovered
PET Beverage	4,404.20	100.00%	95.00%	8,367,980
HDPE	4,398.40	90.30%	95.00%	7,546,183
PVC	12.00	90.00%	95.00%	20,520
LDPE	1,563.80	2.00%	95.00%	59,424
PP	182.00	15.00%	95.00%	51,870
PS	399.50	75.00%	95.00%	569,288
Other/Mixed	193.30	50.00%	95.00%	183,635
All Resins	11,153.20	79.27%	95.00%	16,798,899

Compliance Period—1995

Resin	1993 Recovery	Generation-based Increase (annual)	Net New Programs (1993-95)	1995 Recovery
PET Beverage	8,367,980	14.22%	0	10,917,481
PET Other	0	17.31%	272,679	272,679
HDPE	7,546,183	5.48%	2,220,623	10,616,718
PVC	20,520	-2.85%	6,799	26,166
LDPE	59,424	7.80%	19,691	88,751
PP	51,870	9.58%	17,188	79,472
PS	569,288	3.84%	188,638	802,500
Other/Mixed	183,635	9.11%	60,849	279,466
All Resins	16,798,899	7.48%	2,786,466	23,083,233

Disposal Table

Reference Period—1993

Wasteshed	Tons of MSW Disposed	% RPC	Tons of RPC Disposed
Baker	7,513.00	1.53%	114.95
Benton	51,511.40	1.30%	669.65
Clatsop	25,515.80	1.53%	390.39
Columbia	15,260.40	1.53%	233.48
Coos	35,844.50	1.39%	498.24
Crook	6,259.90	1.53%	95.78
Curry	10,687.30	1.53%	163.52
Deschutes	104,665.70	1.39%	1,454.85
Douglas	90,732.70	1.39%	1,261.18
Gilliam	2,395.80	1.53%	36.66
Grant	4,117.60	1.53%	63.00
Harney	2,569.20	1.53%	39.31
Hood River	9,772.20	1.39%	135.83
Jackson	100,058.70	1.39%	1,390.82
Jefferson	6,690.60	1.53%	102.37
Josephine	38,677.30	1.39%	537.61
Klamath	68,370.50	1.39%	950.35
Lake	6,494.90	1.53%	99.37
Lane	264,508.70	1.30%	3,438.61
Lincoln	30,200.40	1.53%	462.07
Linn	69,382.30	1.30%	901.97
Malheur	15,163.30	1.53%	232.00
Marion	170,130.60	1.30%	2,211.70
Milton Freewater	5,040.80	1.53%	77.12
Morrow	4,955.50	1.53%	75.82
Polk	24,219.90	1.30%	314.86
Sherman	850.90	1.53%	13.02
Tillamook	11,608.90	1.39%	161.36
Umatilla	41,661.80	1.39%	579.10
Union	14,417.00	1.53%	220.58
Wallowa	7,058.80	1.53%	108.00
Wasco	16,746.00	1.53%	256.21
Wheeler	767.00	1.53%	11.74
Yamhill	55,685.10	1.30%	723.91
Unspecified	2.10	1.53%	0.03
Non-Metro Totals	1,319,536.60	1.37%	18,025.45
Metro	960,691.00	0.89%	8,550.15
Total	2,280,227.60	1.17%	26,575.60

Note: The Metro RPC% in the disposed stream is observed to be lower due to greater levels of RPC recovery and to the City of Portland Polystyrene ban.

Disposal Table

From '94/'95 Waste Comp Study

Resin	Dirty Wet	Clean Dry	Clean Dry/ Dirty Wet
P1	51.34	47.53	92.58%
P2	189.57	180.11	95.01%
P3	8.17	7.75	94.86%
P4	1.43	1.17	81.82%
P5	11.39	10.24	89.90%
P6	26.11	22.65	86.75%
P7	36.05	34.3	95.15%
PU	4.45	3.68	82.70%
PX	3.72	2.92	78.49%
Grand Total	332.23	310.35	93.41%
P6+PX	29.83	25.57	85.72%
P7+PU	40.5	37.98	93.78%

Note: PX is expanded polystyrene; PU is unknown resin type

Net Adjustment Factor for other material counted as RPC in first sort: 92.57%

Reference Period—1993

Resin	% of Non-Metro MSW	Non-Metro Wet Tons	% of Metro MSW	Metro Wet Tons	Last Sort Dry/First Sort Wet	Dry Pounds Disposed
PET	0.11%	1,431.22	0.14%	1,344.97	85.70%	4,758,206
PET Beverage	(as estimated by Oregon DEQ, based on waste composition studies)					678,368
PET Other	(All PET minus PET beverage estimate)					4,079,838
HDPE	0.86%	11,333.68	0.60%	5,764.15	87.95%	30,074,027
PVC	0.02%	273.05	0.02%	192.14	87.81%	816,947
LDPE	0.02%	300.75	0.01%	96.07	75.74%	601,076
PP	0.02%	306.03	0.03%	288.21	83.22%	989,052
PS	0.26%	3,442.84	0.04%	384.28	79.35%	6,073,400
Other/Mixed	0.07%	937.88	0.05%	480.35	86.81%	2,462,221
TOTAL	1.37%	18,025.45	0.89%	8,550.15	86.12%	45,774,928

Compliance Period—1995

Resin	1995 Generation	1995 Recovery	1995 Disposal
PET Beverage	11,802,530	10,917,481	885,049
PET Other	5,614,171	272,679	5,341,492
HDPE	41,857,305	10,616,718	31,240,587
PVC	790,410	26,166	764,244
LDPE	767,601	88,751	678,850
PP	1,249,915	79,472	1,170,443
PS	7,162,802	802,500	6,360,302
Other/Mixed	3,149,889	279,466	2,870,423
TOTAL	72,394,623	23,083,233	49,311,390

Generation Forecast Table

Plastics in Packaging

Containers	1991	1992	1993	91-92	92-93	Average Annual 91-93	Comparative Resin Adjustment
PET Bev	793	912	1,015	15.01%	11.29%	13.13%	6.51%
PET Other	540	632	729	17.04%	15.35%	16.19%	9.39%
HDPE	3,725	3,868	4,066	3.84%	5.12%	4.48%	-1.64%
PVC	243	235	225	-3.29%	-4.26%	-3.77%	-9.41%
LDPE	314	359	358	14.33%	-0.28%	6.78%	0.53%
PP	455	495	536	8.79%	8.28%	8.54%	2.19%
PS	1,227	1,259	1,298	2.61%	3.10%	2.85%	-3.17%
Other	131	137	153	4.58%	11.68%	8.07%	1.75%
All Resins	7,428	7,897	8,380	6.31%	6.12%	6.22%	0.00%

Source: MODERN PLASTICS January 1993 and January 1994

Basic Growth Rate 7.24%

Resin	1993 Disposal	1993 Recovery	1993 Generation	Resin Adjustment	Adjusted Growth Rate *	1994 Generation	1995 Generation
PET Bev	678,368	8,367,980	9,046,348	6.51%	14.22%	10,332,947	11,802,530
PET Other	4,079,838	0	4,079,838	9.39%	17.31%	4,785,907	5,614,171
HDPE	30,074,027	7,546,183	37,620,209	-1.64%	5.48%	39,682,245	41,857,305
PVC	816,947	20,520	837,467	-9.41%	-2.85%	813,598	790,410
LDPE	601,076	59,424	660,500	0.53%	7.80%	712,040	767,601
PP	989,052	51,870	1,040,922	2.19%	9.58%	1,140,642	1,249,915
PS	6,073,400	569,288	6,642,688	-3.17%	3.84%	6,897,844	7,162,802
Other	2,462,221	183,635	2,645,856	1.75%	9.11%	2,886,893	3,149,889
All Resins	45,774,928	16,798,899	62,573,828	0.22%	7.48%	67,252,117	72,394,623

* It is understood that these adjusted growth rates represent recent historic results and that in some cases they may not be sustainable over a time period of longer than 1 or 2 years. Alternative approaches or assumptions for resin specific growth rates should be considered in future analyses.

APPENDIX B

SENSITIVITY ANALYSIS

Sensitivity Analysis

Rationale

The purpose of this study was to predict the recycling rate for compliance purposes for Rigid Plastic Containers in Oregon in calendar year 1995. Our goal was to produce the best estimate possible given available time and budget, and given the limited real data about the consumption, disposal, and recovery of rigid plastic containers in Oregon. Even though data collection is improving, it will never be possible to determine exactly what percent of rigid plastic containers were recycled in 1995. But by the time actual data have been collected and analyzed (in 1996), a much better estimate can be made.

Even without knowing what the true value being estimated is, the quality of an estimating process may be described and evaluated. Two attributes of such a process define its "goodness." First, it should be unbiased. That is, nothing in the process should lead to systematic over- or under-estimation and any errors that persist should be random and unavoidable. Second, it should be minimum-variance, i.e., the magnitude of those random errors that are present should be kept as small as possible.

The interpretation and usefulness of an estimate or prediction depends on the confidence one has in its accuracy. In the context of this study, where the DEQ must set a recycling rate "for compliance purposes" in advance of the time period to which that rate applies, information about the level of uncertainty inherent in the prediction will be important to policymakers. The real question is whether or not the recycling rate for compliance purposes will be above or below 25 percent. Whatever estimate we produce, there always will be some possibility that the true value will turn out to be on the other side of 25 percent. For this reason, we provide both our best estimate of what the recycling rate for compliance purposes will be and our best estimate of what the likelihood is that the true value will turn out to be 25 percent or greater.

We also tested the sensitivity of the final recycling rate to ten-percent changes in each of several key variables. This test serves two purposes. It identifies those variables, if any, for which small measurement or estimation errors can lead to large errors in the final rate. It also allows one to estimate how big an error in one of the variables would have to be to move the estimated final rate to the other side of 25 percent.

Method

Risk Analysis

To gain an understanding of the level of uncertainty inherent in the final estimate, given that it is a rather complicated combination of uncertain forecasts, survey results, and imprecise measurements, we conducted an informal risk analysis. With input from the Work Group and interested parties, we estimated reasonable ranges around each of the key model variables. The end points of these ranges were used to define a probability density function or bell-shaped curve. A spreadsheet model was then run 1,000 times with varying values randomly selected from under the probability density function. This is known as a Monte Carlo simulation.

While such a procedure implies that we know much more than we actually do about the structure of the errors in our model, it is useful for two reasons: it forces everyone to think about the level of uncertainty and measurement error and it provides the best estimate possible of the degree of uncertainty inherent in the final estimate. The following tables summarize the values used to bracket each of four key model assumptions for performing the risk analysis.

Pounds of RPC Plastic Resins Recovered in 1993	*Low Value*	*Model Value*	*High Value*
PET	7,531,182	8,367,980	9,204,778
HDPE	6,791,564	7,546,183	8,300,801
PVC	18,468	20,520	22,572
LDPE	53,482	59,424	65,367
PP	46,683	51,879	57,057
PS	512,359	569,288	626,216
Other/Mixed	165,272	183,635	201,999

Pounds of RPC Plastic Resins Disposed in 1993	*Low Value*	*Model Value*	*High Value*
PET	4,282,385	4,758,206	5,234,026
HDPE	27,066,624	30,074,027	33,081,429
PVC	735,252	816,947	898,641
LDPE	540,968	601,076	661,183
PP	890,146	989,052	1,087,957
PS	5,466,060	6,073,400	6,680,740
Other/Mixed	2,215,999	2,462,221	2,708,443

Assumed Annual Growth Rate of RPC Generation 1993 to 1995	*Low Value*	*Model Value*	*High Value*
PET - average of beverage and other rates	13.67%	15.19%	16.71%
HDPE	4.93%	5.48%	6.03%
PVC	-3.14%	-2.85%	-2.57%
LDPE	7.02%	7.80%	8.58%
PP	8.62%	9.58%	10.54%
PS	3.46%	3.84%	4.23%
Other/Mixed	8.20%	9.11%	10.02%

Assumed 1995 Recovery, in Pounds, from Planned New/Expanded Programs	*Low Value*	*Model Value*	*High Value*
PET	245,539	272,679	300,103
HDPE	1,999,216	2,220,623	2,443,486
PVC	6,124	6,799	7,484
LDPE	17,734	19,691	21,675
PP	15,479	17,188	18,919
PS	169,890	188,638	207,643
Other/Mixed	54,801	60,849	66,979

Using the risk analysis software, the RPC recycling rate for compliance purposes calculation was made 1,000 times with values for the key variables randomly drawn from the distributions specified above. By examining the results, the following inferences can be made about the distribution of errors in the final estimates of recycling rates.

1995 Recycling Rate for Compliance Purposes (estimated)	*All Resins*	*PET*	*HDPE*
Expected Value	31.89%	64.25%	25.37%
Mean of Simulation	31.91%	65.51%	25.44%
Variance	0.0002	0.0037	0.0004
5th percentile	29.40%	55.94%	22.39%
95th percentile	34.40%	76.14%	28.81%
Probability that value is greater than 25 percent	99.99%	99.99%	57.50%

Sensitivity Analysis

We also wanted to test how sensitive the model was to certain key assumptions and variables. To test the assumptions about which we had some doubts or that seemed controversial in committee discussions, we substituted alternative assumptions and examined the effect on the estimated final recycling rate for compliance purposes. We tested what would happen if we did not include the adjustment to the 1992-93 Waste Composition Study results based on findings from the 1994-95 Study in which significant quantities of non-RPC items were found in the field sorts of RPCs and smaller quantities of RPCs were found in other field-sort categories such as food. We tested the effect of the assumption that recovered materials are "cleaner" (5% shrinkage was assumed) than disposed materials (a net adjustment of 14% was used), by substituting the alternative assumption that recovered materials are just as dirty as disposed materials. We tested the effect of the assumption that 75 percent of the non-milk jug HDPE recovered was other RPCs by substituting the alternative assumption that none of the non-milk jug HDPE was RPCs. Finally, we tested separately the importance of both our assumptions about the consumption-driven increase in recovery from existing programs and the increase in recovery from new programs by setting each to zero. In no case did any of these alternative assumptions, by itself, drive the final estimated recycling rate for 1995 below 25%.

Assumption	*1993 Rate*	*1995 Rate for Compliance Purposes*
Base Conclusions presented in Section 1	26.9%	31.9%
Assume no throw out/throw in adjustments to waste composition percentages for contamination	25.4%	30.4%
Assume recovered materials have a shrinkage factor equal to contaminiation levels of disposed materials (14%) - versus 5%	26.5%	31.6%
Assume that 0% of non-milk jug HDPE is RPC (versus 75%)	23.7%	29.1%
Assume that there is no generation-linked increase in recovery	26.9%	27.1%
Assume that there are no new programs	26.9%	28.0%

We tested the sensitivity of the estimated final recycling rate for compliance purposes to each of the most important variables by changing those variables 10 percent and reporting the resulting percent change in the final 1995 recycling rate for compliance purposes. For example, if the number of tons of MSW disposed in 1993 was actually 10 percent higher than reported by DEQ, the recycling rate would be 5.9 percent lower or 30.0% (31.89%*(1-5.9%)). So for mis-measurement of MSW disposal to drive the recycling rate down to 25%, the quantities reported by DEQ would have to be off by 36.6 percent. This analysis is summarized in the following table.

Impact on Rate Number if noted variables were independently increased by 10%	*1995 Rate for Compliance Purposes*
Pounds of plastic recovered in 1993	+8.8%
Tons of MSW disposed in 1993	-5.9%
Growth rate in generation	+0.1%
New program recovery (pounds)	+1.2%

APPENDIX C

SUMMARY OF PRIMARY DATA SOURCES USED FOR THE RIGID PLASTIC CONTAINER RECYCLING RATE ANALYSIS

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SUMMARY OF PRIMARY DATA SOURCES USED FOR THE RIGID PLASTIC CONTAINER RECYCLING RATE ANALYSIS

Source:	DEQ 1993 Municipal Waste Disposal Site Fee Report Internal data obtained from DEQ staff in October 1994
Description:	Provides a county-by-county summary of total municipal solid waste disposed at general purpose and demolition landfills, as well as at the Brooks incinerator.
Evaluation:	Will be used with waste composition data to calculate pounds of RPC disposed during the reference period. Data is provided by public and private site operators and is used as a basis for payment of per ton fees to DEQ.
Analysis/Trends:	Indicates that 2,280,227.60 total tons of waste were disposed of in Oregon in 1993. In 1992, waste disposed in Oregon, from Oregon, accounted for just 2,263,099 tons of disposal. This growth in disposal represents an annual increase in disposed waste of 0.76% per year. During this same period, Oregon's population growth was estimated at 2.0%.
Implications:	Metro has separate estimates for the amount of material disposed in the Tri-County area that could be used. Metro's estimate reported for the year was slightly less than the volume of waste for which DEQ fees had been paid on. For consistency, DEQ's figures have been used as the basis for determining pounds of RPC disposed in the Tri-County area. Standard density assumptions (e.g. 300 pounds per loose cubic yard) are used to determine annual tonnage for sites that do not use scales for all delivered wastes. This may result in errors in the actual tons disposed. Waste dumped illegally, litter, or waste disposed of on-site or in burn barrels does not get included in the estimate. A decision was made for the analysis to consider "disposed" material as only material that ends up in a permitted site. Inadequate composition data was available to estimate RPC in other streams and it is understood that the quantified stream does include some portion of litter or illegal disposal recovered from prior years.

Source: DEQ 1993 Recovered Material Database
Obtained from DEQ (prior to publishing) in October 1994

Description: Provides summary, by resin type and by county, of total tons of plastic recovered in Oregon during 1993. Special reports were provided detailing plastic collections and transactions for haulers or recyclers handling more than 20 tons and more than 100 tons during the year.

Evaluation: DEQ does checks on reported collections and transactions to eliminate double-counting that may occur. Recycler stocks (inventories) are considered in the analysis. This data provides the most comprehensive information available on recovery and has had a reasonable level of validation.

Analysis/Trends: For 1993 the following tonnages were reported as recovered from within Oregon:

PET (bev) #1	4,404.2 tons	HDPE #2	4,398.4 tons
PVC #3	12.0 tons	LDPE #4	1,563.8 tons
PP #5	182 tons	PS #6	399.5 tons
Mixed plastic	193.3 tons	TOTAL	11,128.2 tons

- Approximately 89% of the PET recovered is collected directly or indirectly (through the supply system) by three recyclers. Only 5 recyclers (including those operating at more than one location) reported handling more than 100 tons of PET during the year. NOTE: all PET recovery was reported as PET beverage containers in 1993.
- Approximately 69% of the HDPE is collected directly or indirectly by just four recyclers. Only 12 recyclers reported handling more than 100 tons of HDPE or milk jugs. Nearly 60% of the reported HDPE recovery (2,626.5 tons) was milk jugs.
- Approximately 87% of the LDPE is collected directly or indirectly by just 4 recyclers.
- Recovery of plastics from the three Metro Counties accounts for 36% of all PET beverage container recovery, 59% of all milk jug recovery, and 81% of all other HDPE recovery - the Metro area comprises 41.7% of the state's population.

Implications: Rigid plastic containers are a varying sized subset of HDPE, PVC, LDPE, PP, and PS resins. Assumptions are provided on this factor within the rate calculation model.

Source: DEQ 1992-1993 Waste Characterization Study
Obtained from DEQ as a published report.

Description: Full year waste stream sort for three categories of Oregon Counties, excluding the Portland Metro Tri-County area.

Evaluation: Data from 1992-93 study are useful as a basis for estimating percentage of RPC in wastestreams outside of the Metro area.

Analysis/Trends: The analysis reports that, by weight, rigid plastic containers contribute to the total disposed waste stream in the following amounts (Table 14):

Material	% In Waste Stream (Dirty/Wet)
#1 PET	0.1085%
#2 HDPE containers	0.8592%
#3 PVC containers	0.0207%
#4 LDPE containers	0.0228%
#5 PP containers	0.0232%
#6 Solid PS containers	0.1008%
#6 Foam PS containers	0.1602%
#7 Other plastic containers	0.0190%
Unidentified containers	0.0521%
Total	1.3666%

Separate Total RPC composition rates for all resins are reported for 3 categories of counties (30 percent, 25 percent, and 7-15 percent). These figures are, respectively, 1.30%, 1.39%, and 1.53%.

Implications: Both sets of information are applied to the DEQ Municipal Waste Disposal Information to estimate pounds of RPC disposed in 1993, the reference period.

Source:	DEQ 1994-1995 Waste Composition Study - Preliminary Data from the First of Four Scheduled Samplings Preliminary data obtained from DEQ in November 1994 prior to completion of project
Description:	The first of four season sorts for three categories of Oregon Counties, excluding the Portland Metro three county area, was completed in time for the analysis. This study includes secondary sorting and measurement, at a lab, of certain samples weighed in the field to determine the amount of moisture or contamination by dirt or food and by non-target materials, to make adjustments in the field sampling data that was reported initially.
Evaluation:	Even though this information is for a separate time period that the 1992-93 basic waste composition data it will be applied against, the preliminary data from 1994-95 study can be used for assumptions on throw-outs and throw-ins affecting contaminant assumptions for the disposed stream.
Analysis/Trends:	Preliminary data indicate that for all RPC's sampled, about 12.69% of the field reported weight was accounted for by non-RPC contaminants that could be separated out before washing and drying (these contaminants are largely lids, food, and product contents). Washing and drying samples reduced the net RPC amount by an additional 5.75% for a net contaminant level in field data of 18.44%. This percentage must be subtracted from waste composition data to correct for these factors. An additional adjustment to the RPC composition figures of 4.91% must be made to account for RPCs that got reported in field data as other materials (for example, a food container with product that was mostly food but some RPC got counted as 100% food in the field). The net correction is therefore 13.53%. DEQ provided this adjustment data by resin type for incorporation into the rate calculation model.
Implications:	This data allows reasonable corrections to be made in the estimated pounds of RPC disposed. Similar corrections will be made for the pounds of recycled RPC that consist of contaminants, moisture or other shrinkage factors.

Source: Lane County Curbside and Depot Plastics Recovery - Lane County and Goodwill (a local plastic processing facility) Monthly and annual in-house reports maintained by the County's Waste Management Division and a telephone conversation with Nancy Glines of Goodwill's processing facility for curbside plastics material- November 21 1994

Description: The County has collected quarterly data on curbside collection of plastics for the estimated 51,000 households that receive service. Goodwill has handled processing and marketing of plastics materials from curbside collection programs since 1989 and was able to provide a history of how collections have grown.

Evaluation: Useful data for estimation of probable recovery from new plastics collection programs. Records of recent increases in plastics collection both prior to and after expanded program are used to project incremental 1994 and 1995 RPC recovery for Lane County.

Analysis/Trends: Based upon 1993 curbside recovery figures, 0.97 lbs/hh/mo of plastics had been recovered from the program which collected more than just milk jugs. When the program went to all rigid plastic containers (resins #1-#7) in May of 1995, recovery at the curb increased to 1.72 lbs/hh/mo. Based on this increase and the noted increase in all Lane County efforts during the first 6 months of 1994, monthly recovery for all efforts over 1993 recovery is projected to increase for the following time periods and levels:

Month/Period	Avg. Lbs Recovered
All of 1993	69,580 lbs/mo - actual
Jan-Apr '94	96,386 lbs/mo - actual
May-Dec '94	115,287 lbs/mo (add all #1-#7 RPC) -- projected based on May/June

Implications: Projected increases for 1994 will be based on the above noted assumptions. 1995 estimates of incremental recovery will be based upon the May-Dec '94 figure (45,707 pounds per month increase over the 1993 levels).

Source: Metro 1993-1994 Waste Characterization Study
Obtained memo with table of disposal profile for the region from Metro staff in November 1994, unpublished data.

Description: From October 1993 to September 1994, Metro accomplished a full season sort of waste stream samples to estimate the percentage of various materials disposed in the Tri-County region.

Evaluation: Composition of plastic materials by resin type is determined through use of the same basic sort categories and sampling methodology as was used in the DEQ state-wide waste composition analysis for 1992-93. Because of the anticipated different rates of plastics recovery and generation in the Metro area, it is appropriate to use this data in estimating the tons of rigid plastic containers disposed in this region.

Analysis/Trends: The analysis reports that, by weight, rigid plastic containers contribute to the total disposed Metro region waste stream in the following amounts:

#1 PET	0.14%
#2 HDPE containers	0.60%
#3 PVC containers	0.02%
#4 LDPE containers	0.01%
#5 PP containers	0.03%
#6 Solid PS containers	0.03%
#6 Foam PS containers	0.01%
#7 Other plastic containers	0.01%
Unidentified plastic containers	0.04%
Total	0.89%

For calendar year 1993 the total disposal from the three county area was reported by Metro as 954,175 tons. DEQ's disposal site fee reports indicate a disposal volume for the same period of 960,691 tons.

Implications: The Metro waste composition data should be used along with the DEQ waste quantity number to determine the pounds of rigid plastic containers of the various resin types that were disposed from the Tri-County area during 1993.

Source:	Metro Solid Waste Information System Reports Obtained from Metro, through DEQ - published reports.
Description:	Published data histories and forecasts on quarterly recovery by haulers and disposal of materials from various efforts or facilities serving the Tri-County area - Nov. 1992, Aug. 1993, and March 1994 reports were reviewed.
Evaluation:	Useful reference information for projecting rates of annual increases in plastics recovery and in total waste volumes disposed.
Analysis/Trends:	Between the first two quarters of 1992 and the first two quarters of 1993, all hauler collection programs in the Metro area saw a 32% increase in the volume of milk jugs recovered and a 609% increase in the volume of other plastics collected by haulers - this translates to a 171% total increase in plastics recovery by haulers over the intervening year. It is assumed that much of this rate of growth reflects increases due to the targeting of additional materials and expansion of programs to new areas or sectors previously unserved with plastics collection. • Growth during the period from commercial sector programs was 951% (all resins). During the period, depot collections fell 71% (milk jugs decreased by 50% while other resins decreased by 100%). Multi-family collections gained 48%, primarily in milk jugs. Curbside (residential) recovery increased by 44%, also primarily in the milk jug category. Of all plastics recovery accomplished by haulers, 66% is attributed to commercial programs, 29% to curbside programs, 3% to depots, and 2% to multi-family programs. Milk jugs account for 37% of all hauler collected plastics. • From all of 1992 through all of 1993, franchised hauler plastics picked up curbside increased by 107%; this reflects natural growth as well as expanded programs & materials. For 1992 recovery from curbside plastics efforts was .56 lbs/hh/mo, while for 1993 this increased to 1.18 lbs/hh/mo. • Metro's econometric model used for forecasting waste disposal (direct haul) tonnage estimates that the disposed waste stream for the region will increase by 3.96% from 1993 to 1994 and by 1.15% from 1994 to 1995.
Implications:	Metro hauler plastic volumes account for more than 15% of all plastic recovered in Oregon in 1993.

Source:	MODERN PLASTICS, January 1993 and January 1994 issues Obtained from *Resource Recycling* and HLA libraries
Description:	Industry journal that follows and reports on news of and trends in the plastics production, utilization, and recovery industries. Each January, a year-end report is provided that profiles, by resin type, the recent market activity and consumption patterns for major U.S. and North American resin producers and handlers.
Evaluation:	Information is obtained from industry sources on a voluntary basis and is not considered 100% accurate nor exhaustive, though it is generally considered the best available information on the national plastics scene. The information is used in the model to evaluate trends in the growth of resin production (i.e. waste generation).
Analysis/Trends:	As noted in the model assumptions, the recent basic national growth rate for all resins considered as RPC products is estimated to be 7.24% per year for the short-term. When this rate is adjusted for the population growth rate currently seen in Oregon, the annual increase in RPC product availability is 7.48%. By resin type, this rate of growth varies considerably when calibrated for Oregon's population trends. PET displays the fastest growth at 15.19% per year (14.22% for PET soft drink and 17.31% for other PET). HDPE shows a recent growth of 5.48% per year. Other resins show growth trends ranging between -2.9% and +9.6% per year. Clearly certain of these trends are quite dynamic and will not be sustained over the long-term. However, they are considered useful in estimating potential short-term increases in the RPC supply (waste generation) for the compliance period and in estimating how sustained recovery levels for established programs will contribute to "generation-linked" rates of increase in pounds recovered during the compliance period.
Implications:	An assessment was made of how well national trends track with Oregon's generation estimates from disposal and recovered material estimates. PET was the one resin that stuck out as being less available within the Oregon waste stream than might be expected by national per capita consumption figures, even though the growth in custom PET utilization is believed to have arrived here sooner.

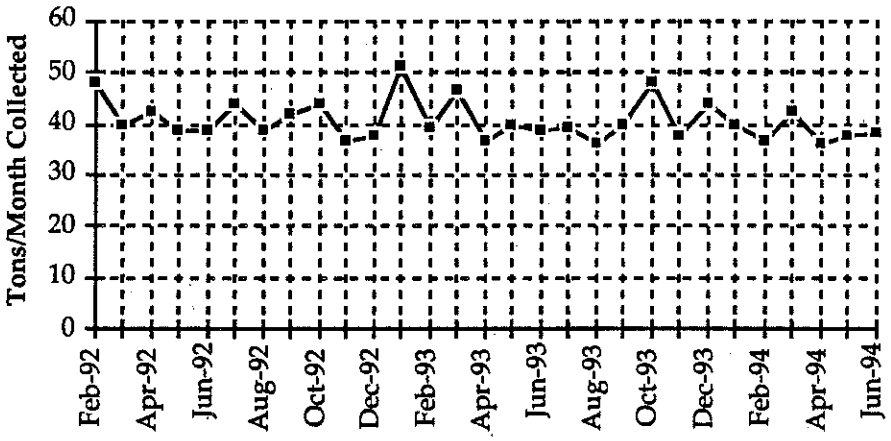
Source: Portland Residential Recycling Data
Obtained from the City of Portland, November 1994

Description: Monthly tonnage figures were provided, by material, for Portland's residential recycling program that currently targets only milk jugs.

Evaluation: Provides useful reference for milk jug only curbside recovery programs.

Analysis/Trends: For the latest 12 month period of July 1993 through June 1994, the Portland program reported a recovery of 476.14 tons. This equates to a recovery rate of 0.63 lbs/hh/mo. Comparing this recovery to the period of July 1992 through June 1993, 495.32 tons, evidences a 4% annual decrease in the amount of material recovered (this change is not considered significant). The following chart summarizes the degree of annual fluctuations in month to month program results for just plastics; other materials display similar variability in month to month recovery.

City of Portland Residential Milk Jug Recovery



Implications: For 1993, City of Portland milk jug collections represented just 4% of all plastics recovered from within Oregon.

Source:	Private Recycler Plastic Drop-Off Site Data - BRING Obtained in November 1994 from Alex Cuyler, BRING General Manager, Eugene
Description:	BRING provided monthly plastic recovery figures, in tons, for the months of May and October for the last four years for both their central (Glenwood) full service recycling site and for 7 other sites collecting plastics at schools and other locations. Plastic volumes handled for curbside collections were also profiled. BRING currently handles a wide range of plastic container types and resins, though milk jugs account for much of the total volume handled.
Evaluation:	Data is useful as a reference for typical or expected recovery levels for both large and small drop sites handling a broad spectrum of resin types and as a reference or benchmark for the annual rate of increase in plastics collections from existing programs.
Analysis/Trends:	The large city-wide drop-off site currently receives about 7,900 pounds of plastics per month. Fluctuations from the spring to fall months can be dramatic (w/ only 4,000 pounds collected in some months). In the second year of drop-off plastics collection volumes increased 120%, however in the last two years the annual increase has averaged about 2.5% The 7 small depots located at mostly schools in the urban area currently average recovery of about 500 pounds per month. The more active sites handle 4 to 5 times the volume of the less active of these sites. Over four years the increase in volumes at these depots has been negligible. Increases in curbside materials delivered by haulers has been dramatic. Between 1992 and 1993, hauler plastics volumes increased 190%; and between 1993 and 1994 hauler plastic volumes have increased 71%.
Implications:	A reasonable range of monthly plastics recovery for drop-off locations can be as broad as 8,000 lbs./mo. to 200 lbs./mo. Curbside collection volumes can grow significantly as a program gains experience, though the rate of increase trends downward over time. In 1993, BRING handled about 0.5% of all plastic recovery in the state, with HDPE being the major resin handled; custom PET recovery is a growth area.

Source:	Thriftway Plastics Collection Program Recovery Report Obtained from Waste Matters Consulting in November 1994 based upon reports of material processors
Description:	One page summary of monthly collections Jan 93-Nov 93 and Jan 94-Oct 94 by sort categories (Natural HDPE, Color HDPE, Film, Polystyrene, & Odds - begin Jul 94).
Evaluation:	Useful program data on 2, 4, 6, program operated by Thriftway and the Girl Scouts at 52 stores (note that 10 of the stores are in Washington State). The program was expanded to include 1, 3, 5, 7 category in July of 1994. Collection is not done in December due to holidays, therefore January weights are generally higher. Thriftway has a contract with APC to continue collections through May of 1996.
Analysis/Trends:	From the Jan.-June 1993 period to the Jan.-June 1994 period, program recovery increased by 23.4% . During this time, few changes were noted in sites served or materials targeted. For the RPC categories (excluding film), the program recovered 113,403 pounds more in the first 6 months of 1994 than in the first 6 months of 1993; an average of 18,900 pounds per month more. When odds were added in July of 1994, the average monthly recovery increased to 25,444 pounds per month more than in the same period (Jul-Oct) of the prior year. To estimate increases from the program for 1994, it has been assumed that the 18,900 pound/mo increment was met for six months and that the 25,444 pound/mo increment will be met for five months (the program doesn't operate in December) for a total increase over 1993 of 240,620 pounds (27.3%). For 1995, it will be assumed that the 25,444 pound increment of recovery is sustained for 11 months to total 279,884 pounds (an increase of 31.8% over 1993). The Thriftway increase is attributable to both more materials, added in July of '94 and to increased participation/capture by those who have access to the program.
Implications:	The available detailed program data is adequate to suggest a separate estimation in growth of recovery from the program both prior to and after materials were added.

DISTRIBUTION

Determination of the 1995
Rigid Plastic Container Recycling Rate for the State of Oregon

December 30, 1994

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