

Report to the Vermont Legislature:
BEYOND WASTE ADVISORY GROUP

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I. Executive Summary

Through the Universal Recycling law (Act 148 of 2012) the Vermont General Assembly charged the Secretary of the Agency of Natural Resources (ANR) with adopting a revised Solid Waste Management Plan (referred to as the Materials Management Plan, or MMP) under 10 V.S.A. §6604. Within that section, ANR was directed to “set forth a comprehensive statewide strategy for the management of waste,” which included the requirement to reduce “the state’s reliance on waste disposal to the greatest extent feasible,” and to promote “waste processing to reduce the volume or toxicity of the waste stream necessary for disposal.” (10 V.S.A. §6604(1)(D) and (F)). The resulting MMP, adopted in June 2014, committed to initiating a process by which stakeholders would be convened to evaluate materials that do not fall under the disposal bans adopted under the Universal Recycling law. This commitment was also made in the November 2013 report: *Report to the Vermont Legislature: Act 148 Implementation*. The MMP states:

ANR will host a stakeholder process convening during 2014 to direct legislative consideration of additional programs to increase diversion of difficult-to-manage materials and offset the expenses incurred by solid waste management entities and taxpayers (MMP, 2014).

While Vermont has made progress in reducing and diverting solid waste since the passage of its first robust solid waste management law in 1987¹, much remains to be done. For ten years, Vermont’s recycling and reuse rate (“diversion rate”) has been stuck between 30-36%. The amount of waste that Vermonters generate remains significant at 5.18 pounds per person per day. With the passage of the Universal Recycling law and the Architectural Waste Diversion law², the State aims to increase recycling and reuse statewide, reaching 50% diversion of municipal solid waste by 2022. The remaining 50% disposed is comprised of materials not captured by existing infrastructure, resulting in a material type that is difficult to manage. The Beyond Waste Advisory Group (Advisory Group), formed in the fall of 2014, focused on diverting these wasted materials from the landfill. The multiple efforts to reduce Vermont’s disposal rate and ensure adequate infrastructure to manage the amount and variety of materials disposed, will better protect our groundwater and air quality, curb greenhouse gas emissions, elongate the life of our landfill, and grow new Vermont jobs.

Beyond Waste Advisory Group

The Beyond Waste Advisory Group (see [Appendix A](#)) considered the impacts and management of materials that may not be covered by the disposal bans outlined in the Universal Recycling law or the Architectural Waste Ban law. Materials evaluated are difficult-to-manage due to characteristics that contribute to their high volume, toxicity, limited end markets, and limited collection and processing infrastructure among other things.

Goals and Process

The Advisory Group was charged with developing a method by which to evaluate difficult-to-manage materials and to utilize that method to identify a select list of materials to recommend to the ANR Secretary for the prioritization of individualized reuse and recycling strategies. The process drew upon state and regional efforts to date, effectively engaged Vermont-specific stakeholders, and recognized the State’s unique characteristics. Decisions were made by consensus.

Criteria and Recommended Priority Materials

ANR Solid Waste Program staff prepared a comprehensive list of difficult-to-manage materials that have been considered in other similar prioritization processes in New England (see [Appendix B](#)). To prioritize the materials, the Advisory Group established a matrix consisting of eight elements divided into two categories (Characteristics of Material & Existing Infrastructure). The first category relates to the inherent characteristics of the material that impacts its ability to be diverted from the landfill. The second category encompasses infrastructure related factors. “Likelihood of success”- the likelihood a collection program would be able to get off the ground and implemented, was also considered.

¹ Act 78

² Architectural Waste Law (Act 175) was adopted in 2014

Categories & Criteria	Sub Criteria
Characteristics of Material	
Environment & Human Health	Product toxicity and potential impact on human health and the environment, including GHG emissions
Value	Inherent value in the material; existing markets and potential of the market to expand
Recyclability	Able to be recycled, reprocessed or repurposed
Volume	Impact on existing landfill capacity; amount currently diverted. Weight is often used as a proxy because volume data is difficult to collect. Though there are instances where low weight high volume materials impact landfill capacity
Existing Infrastructure	
Low Recovery Rate	Material reflects a low recovery, or diversion rate
Opportunities to Expand Existing Programs	Opportunity exists to improve under-performing programs; access to programs is low; importance of assessing program effectiveness; and existing recovery rate
Infrastructure Readiness	Collection and processing logistics
Cost	Cost to consumers, manufacturers, municipalities all effect diversion rates. Is there a more costs effective way to handle the material and maintain a high diversion rate

ANR was asked to score the list of difficult-to-manage materials using three different systems: 1-5 (1=most challenging, 5=least challenging), “high,” “medium,” and “low” (high = most challenging, low = least challenging), and “yes” or “no” (yes means challenging or concerning, no means not challenging or concerning). This process narrowed the 16 materials listed to a list of eight, in no particular order: printed materials, paper, paper and non-paper based packaging, construction and demolition debris, tires, agricultural plastics and film, pharmaceuticals, household hazardous waste, textiles, oil and oil filters (see [Appendix B](#) for material listings before and after prioritization). The Advisory Group reviewed the listed materials, and considered the related management challenges and opportunities.

Recommendations

The materials recommended by the Beyond Waste Advisory Group for additional individualized management strategies were chosen because of their high volume or hazardous nature, and therefore pose the greatest risk to or stress on Vermont’s waste (materials) management system and natural resources. The following materials were identified by Advisory Group participants that attended the third, and final, stakeholder meeting of the series.

Priority Materials:

- Textiles
- Construction & Demolition Debris (beyond architectural waste)
- Tires
- Household Hazardous Waste, Oil and Oil Filters.

The group also agreed by consensus that the following materials warranted further discussion:

- Pharmaceuticals
- Agricultural Plastics
- Printed Material, Paper and Packaging (paper-based and non-paper based)

The Advisory Group noted that as the materials management landscape evolves, ANR should use its discretion regarding the order in which these and other difficult to manage materials are addressed in greater depth.

II. Background and Scope

Background - Act 175 of 2014 and Act 148 of 2012

While Vermont has made progress in reducing and diverting solid waste since the passage of its first robust solid waste management law in 1987³, much remains to be done. For the past ten years, Vermont's diversion rate – the amount of material kept out of landfills or incinerators – has been stuck between 30-36%. The amount of waste that Vermonters generate is significant at 5.18 pounds per person per day. With the passage of the Universal Recycling law (Act 148 of 2012) and architectural waste diversion law (Act 175 of 2014)⁴, the State aims to increase its diversion rate. With full implementation of the Universal Recycling law, Vermont is anticipated to reach 50% diversion of municipal solid waste by 2022. The remaining 50% disposed is comprised of materials that do not lend themselves easily to reuse or recycling through the existing infrastructure, resulting in a material type that is difficult to manage. Architectural waste is an example of the additional 50% disposed that needs further collection systems and infrastructure to manage. The ultimate goal of the MMP and the Universal Recycling law is to reduce the amount of material needing to be disposed of and ensure adequate infrastructure to manage the amount and variety of materials disposed. Realizing these goals will better protect our groundwater and air quality, curb greenhouse gas emissions, elongate the life of our landfill, and grow new Vermont jobs.

Universal Recycling Law

Vermont passed a Universal Recycling law⁵ in 2012 to improve the capture and diversion rates for valuable materials and prevent them from being landfilled. This is the first law of its kind in the country.

The law phases out landfilling of recyclables, food scraps, and leaf and yard debris, ensures “parallel collection” (collection of these materials at locations where trash is collected), and incentivizes diversion through variable rate pricing (commonly called “pay-as-you-throw”). A timeline for implementing Universal Recycling can be found in [Appendix C](#).

The Universal Recycling law also seeks to provide increased recycling and composting options for Vermont residents and businesses and more consistent statewide materials management services. The law requires the separation and diversion of materials (recycling and organics). Implementation of the law is phased-in, allowing time to expand collection services and processing facilities for managing recyclables and food, leaf, and yard materials. By 2020, all Vermont households and businesses will need to separate food scraps from their trash for composting as they will be banned from the landfill. The following materials are banned under the Universal Recycling law, and were not of primary consideration by the Advisory Group. However, paper and printed material as well as packaging (paper-based and non-paper based) were included in the Beyond Waste Advisory Group priority materials considered due to their high landfill volume in Vermont.

Recyclables that are banned as of July 1, 2015 include:

- Aluminum and steel cans
- Aluminum foil and aluminum pie pans
- Glass bottles and jars from food and beverages
- PET and HDPE plastic containers, bottles and jugs
- Corrugated cardboard
- White and mixed paper
- Newspaper, magazines, paper mail, and envelopes
- Box board

³ Act 78

⁴ Architectural Waste Law (Act 175), adopted 2014.

⁵ Act 148 (universal Recycling law), adopted 2012.

- Paper bags

Leaf and yard debris and clean wood waste will be banned by July 1, 2016, and food scraps will be banned by 2020, initiated in phases.

Architectural Waste Diversion Law

Construction and demolition (C&D) waste is produced from the construction, repair, and demolition of structures of all sizes -- from backyard sheds to large apartment complexes, roads, and bridges, and includes asphalt, concrete, painted and unpainted wood, metal, and a host of other materials. Every year C&D projects in Vermont generate approximately 50,800⁶ tons of waste material. This amounts to 10% of the state's residential waste and 15% of the state's industrial, commercial, and institutional waste. Often, these materials can be separated and salvaged or recycled. Minimizing C&D waste conserves landfill space and saves energy and resources.

The Vermont Legislature passed Act 175 in 2014 with the goal of increasing reuse and recycling of wastes generated from building construction and demolition projects. This will be achieved by targeting certain materials from commercial projects that are within 20 miles of a facility that recycles these materials. It is anticipated that this will promote development of more C&D recycling facilities. Act 175 can be viewed as a stimulus for raising awareness amongst designers, developers, contractors, waste haulers, and the public at large, of the amount of C&D waste being produced and the variety of tools and techniques for reducing that amount. Foremost, in keeping with the vision outlined in the 2014 Vermont Materials Management Plan, is to consider C&D debris as valuable material, not waste.

The law considers "architectural waste" as a subset of construction and demolition waste, comprised of "discarded drywall, metal, asphalt shingles, clean wood, plywood, and oriented-strand board (OSB)," and targets these initial materials for reuse and recycling. The purpose of the law is to divert C&D from larger projects that are near a recycling facility.

Beyond Waste Advisory Group

The Beyond Waste Advisory Group (Advisory Group) was formed following the recommendation of the November 2013 ANR report: *Report to the Vermont Legislature: Act 148 Implementation*, and the statewide Materials Management Plan of 2014, which stated:

ANR will host a stakeholder process over the next year to direct legislative consideration of additional programs to increase diversion of difficult to manage materials and offset the expenses incurred by municipal solid waste districts and taxpayers.

The Agency of Natural Resources (ANR or Agency) initiated the stakeholder process in the summer of 2014. The Agency contracted with Cindy Cook of Adamant Accord, a U.S. Environmental Protection Agency-recognized third-party meeting facilitator. Advisory Group members included a state representative, agency staff, municipal solid waste representatives, select industry representatives and environmental groups (See Appendix A). ANR Solid Waste Program staff provided the group with background information regarding the variety collection systems used to manage materials, as well as information regarding the characteristics of materials that have been identified by previous groups as needing further management options. Those groups included Vermont Product Stewardship Council, Connecticut Department of Energy and Environmental Protection, and the Northeast Waste Management Officials Association.

Goals and Process

The Advisory Group was charged with developing recommendations to the ANR Secretary for the 50% materials not covered by the Universal Recycling or Architectural Waste Diversion laws, which should be prioritized for additional individualized management strategies. Today, these materials often suffer from inconsistent, inconvenient, or limited

⁶ [2013 Vermont Waste Composition Study](#), DSM Environmental Services, Inc.

collection systems, which are not cost effective. The ultimate goal of Act 148, Act 175 and the Advisory Group is to increase statewide recycling and reuse, creating new jobs and markets for the currently hard-to-manage and wasted materials.

Together, the Advisory Group:

- Reviewed previous efforts by other states and organizations to establish criteria and set priority materials.
- Identified a broad list of materials that are difficult for the state to collect and manage in a way that diverts them from the landfill if reusable, recyclable, or compostable, or poses a hazard to human health and the environment.
- Identified and established criteria for material prioritization.
- Utilized the Advisory Group-developed criteria to narrow down the broad list of materials to priorities for individualized strategy development.

The overall process drew upon state and regional efforts to date, while effectively engaging Vermont-specific stakeholders and recognizing the State's unique characteristics. Decisions were made by consensus. Advisory Group members invested a great deal of time, energy, travel, and expense to discuss existing challenges faced by Vermont in managing materials that are not easily collected, marketed for reuse, or pose hazards to human health and the environment. The timeline was short and task at hand challenging. For example, the types of management tools used to reduce waste and increase diversion could change depending on how infrastructure evolves trends in product manufacturing, and initiation by industry to produce materials that are easier to recycle or reuse. In spite of these limitations this report summarizes recommendations for next steps that ANR should take in addressing difficult to manage materials. Looking forward, development of individualized materials strategies will include some of the same and some new stakeholders.

III. Materials, Criteria and Ranking

Difficult to Manage Materials

ANR Solid Waste Program staff prepared a comprehensive list of difficult-to-manage materials that have been considered in other similar prioritization processes in New England. (Refer to Appendix B for the list of materials). This list included:

Carpet; Compressed gas cylinders; Construction and demolition waste; Furniture; Household Hazardous Waste/Conditionally Exempt Generator (Small Business) Hazardous Waste Pesticides; Pharmaceuticals; Medical sharps; Mattresses; Memory and other upholstery foam; Oil, oil containers and oil filters; Packaging and Printed Materials; Phone Books; Plastic films (including agricultural plastics) and bags; Smoke Detectors; Spray paint; Textiles; and Tires

Additional materials were identified by the Advisory Group as being of concern. Due to time limitations and vastly limited information on the degree to which these materials impact Vermont they were not part of the high level review conducted for the final Advisory Group meeting. Those additional materials identified by the Advisory Group include:

Biodegradable packaging; Black Plastic (#5); Books; Diapers and Sanitary Products; Gable-top Cartons; Non-UR Law Covered Materials; Plastics #3-#7; Small Appliances; and White Goods.

The Advisory Group reviewed these materials, and considered the related management challenges and opportunities. Criteria for prioritization were developed by the Advisory Group and put into a matrix containing those criteria. The 16 materials identified above were assessed utilizing the criteria. This process narrowed and prioritized the materials list. The Advisory Group acknowledged that available data on these materials is limited and the timeframe for review did not allow for a thorough analysis. As individualized management strategies are developed for the prioritized materials, the Group encouraged an in depth look at the available and proxy data to evaluate management methods that might be cost effective, and convenient in diverting the material.

Prioritization Criteria

ANR Solid Waste Program staff provided the Advisory Group with the criteria used in the Vermont Product Stewardship Council, Connecticut Department of Energy and Environmental Protection, and the Northeast Waste Management Officials Association prioritization processes (links to all criteria documents can be found on the [Beyond Waste Advisory Group web page](#)). The Group discussed and evaluated these criteria and agreed to eight that were a blend of those used in the previous prioritization processes. An additional criterion was also developed- “likelihood of success,” the likelihood a collection program would be able to get off the ground and implemented. These criteria are what the Advisory Group directed ANR to use to evaluate future materials for further management assistance. The criteria selected by the Advisory Group include:

Categories & Criteria	Sub Criteria
Characteristics of Material	
Environment & Human Health	Product toxicity and potential impact on human health and the environment, including GHG emissions
Value	Inherent value in the material; existing markets and potential of the market to expand
Recyclability	Able to be recycled, reprocessed or repurposed
Volume	Impact on existing landfill capacity; amount currently diverted. Weight is often used as a proxy because volume data is difficult to collect. Though there are instances where low weight high volume materials impact landfill capacity
Existing Infrastructure	
Low Recovery Rate	Material reflects a low recovery, or diversion rate
Opportunities to Expand Existing Programs	Opportunity exists to improve under-performing programs; access to programs is low; importance of assessing program effectiveness; and existing recovery rate
Infrastructure readiness	Collection and processing logistics
Cost	Cost to consumers, manufacturers, municipalities all effect diversion rates. Is there a more costs effective way to handle the material and maintain a high diversion rate

Once the Advisory Group agreed upon the criteria, ANR was tasked with scoring the list of difficult to manage materials using three different scoring systems. The first scoring method was to rank the material against each criteria using a 1-5 scoring system (1 = most challenging, 5 = least challenging). The second scoring method was to rank the material against each criteria using a “high,” “medium,” and “low” scoring system (high means most challenging, low means least challenging). The third scoring method was to rank the materials against the criteria using a “yes” or “no” scoring system (yes means challenging or concerning, no means not challenging or concerning). This process narrowed the 16 materials listed to eight, in no particular order: printed materials, paper, and paper-based and non paper-based packaging materials, construction and demolition debris, tires, agricultural plastics and film, pharmaceuticals, household hazardous waste, textiles, oil and oil filters (see [Appendix B](#) for material listings before and after prioritization). Note that cost was listed as a criterion but was not evaluated during this initial round of scoring, due to the lack of readily available data for compiling cost information for all the various materials. Cost may be considered in the future when a material is discussed in more detail by a group of stakeholders particularly interested in that specific material.

At the final meeting, the Advisory Group considered the list of the top eight materials resulting from ANR using the scoring methods along with a brief discussion of “likelihood of success” for the materials. At the end of the discussion, the group came to a consensus on a more refined list of priorities.

IV. Recommendations

The materials recommended for additional individualized management strategies were identified by Beyond Waste Advisory Group participants that attended the third and final meeting. (See [Appendix A](#) for list of participants). Those materials are listed below. They were chosen because of their high volume or hazardous nature, and therefore pose the greatest risk to or stress on Vermont's waste (materials) management system and natural resources.

Priority Materials:

- Textiles
- Construction & Demolition Debris (beyond Architectural Waste)
- Tires
- Household Hazardous Waste, Oil and Oil Filters.

The Group at the final meeting also agreed by consensus that the following materials warranted further consideration:

- Pharmaceuticals
- Agricultural Plastics
- Printed Material, Paper and Packaging (paper-based and non-paper based)

The Advisory Group noted that as the materials management landscape evolves, ANR should use its discretion regarding the order in which these and other difficult to manage materials are addressed in greater depth.

V. Conclusions and Next Steps

The Beyond Waste Advisory Group succeeded in fulfilling their charge of providing the Secretary of the Agency of Natural Resources with a recommended prioritized list of difficult-to-manage materials for individualized management strategy development. It is rare and noteworthy that such a diverse group of stakeholders could reach consensus on the criteria, method of high level review, and narrow down priority materials with limited time. (See [Appendix A](#) for list of participants). Their efforts will lead to a comprehensive evaluation of each material recommended, (textiles, construction and demolition debris, tires, household hazardous waste/oil/oil filters) done in consultation with those having vested interest and those with specialized knowledge, to explore options for additional management, ensuring a more convenient collection system for Vermonters, adequate infrastructure, and increasing recycling and reuse rates in Vermont. The options considered should work to better protect our groundwater and air quality, curb greenhouse gas emissions, prolong the life of the sole Vermont landfill, and grow new Vermont jobs.

VI. Appendices

APPENDIX A: List of Beyond Waste Advisory Group Participants and Schedule of Meetings

The following participants contributed to the Beyond Waste Advisory Group discussion. Note that not all participants listed below were able to attend each of the three meetings held. The “*” denotes participants that were present for the final meeting held on December 2, 2014. These participants decided the top four materials for priority discussion and identified four other material types for additional consideration in the near future.

Susan Alexander, Lamoille Regional Solid Waste District

Chris Beling, USEPA*

Sylvia Broude, Toxics Action Center*

Clare Buckley, KSE Partners

Amanda Charland, Hanover Co-Op

Joe Choquette, Downs, Rachlin and Martin, and PLLC*

Andrea Cohen, VT Businesses for Social Responsibility*

Jed Davis, Cabot Creamery*

Allison C Demag, Morris & DeMag

Bill Driscoll, Associated Industries of VT*

Rep. Rebecca Ellis, State Representative*

Kevin Goldsmith, RockTenn

Jim Harrison, VT Retail & Grocers Association

Lauren Hierl, VT League of Conservation Voters

Jen Holliday, VT Product Stewardship Council

Karen Horn, VT League of Cities and Towns

John Hurd, PaintCare

Taylor Johnson, VPIRG*

Shaina Kasper, Toxics Action Center*

Ruma Koli, IBM*

Teresa A. Kuczynski, Solid Waste Districts*

Andy MacLean, MMR*

Anne MacMillan, VT Agency of Agriculture*

Chris Rice, MMR

Nick Sherman, KSE Partners*

Abigail Turner, American Forest & Paper Association

Chloe Viner, VT League of Cities and Towns

Wesley Young, Local Search Association*

Beyond Waste Advisory Group Meetings

1. September 16, 2014
2. October 28, 2014
3. December 2, 2014

Minutes from all Beyond Waste Advisory Group meetings can be found on the [Beyond Waste Advisory Group web page](#).

APPENDIX B: List of Materials Reviewed, and those Identified for Prioritization

ANR compiled a list of materials that were evaluated through three previous by various organizations in New England within the last three years. The Advisory Group identified additional materials that it considers needing further evaluation and data gathering. The lists below reflect those materials identified by external organizations that were convened prior to this stakeholder process. Materials identified by the Advisory Group during the final meeting are in addition to those previously identified. Also listed below are materials that the group agreed should take priority as ANR moves forward with a more targeted analysis on the impact these materials have on Vermont.

List of Material Previous Organizations Identified as Concerns

Carpet

Compressed gas cylinders

Construction and demolition waste

Furniture

Household Hazardous Waste / Conditionally Exempt Generator (Small Business) Hazardous Waste Pesticides

Pharmaceuticals

Medical sharps

Mattresses

Memory & other upholstery foam

Oil, oil containers and oil filters

Printed Material, Paper and Packaging (paper-based and non-paper based)

Phone Books

Plastic films (including agricultural plastics) and bags

Smoke Detectors

Spray paint

Textiles

Tires

List of Material Beyond Waste Advisory Group Identified as Additional Concerns

Biodegradable Packaging

Black Plastic #5

Books

Diapers & Sanitary Products

Gable-top Cartons

Non-UR Law Covered Materials

Plastics #3-7

Small Appliances

White Goods

List of Material Beyond Waste Advisory Group Identified as Priority Concerns

TOP PRIORITY:

- **Textiles**
- **Construction & Demolition Debris**
- **Tires**
- **Household Hazardous Waste, Oil and Oil Filters**

STRONGLY RECOMMENDED FOR FURTHER CONSIDERATION:

- **Pharmaceuticals**
- **Agricultural Plastics**
- **Printed Material, Paper, and Packaging (paper-based and non-paper based)**



Universal Recycling Law TIMELINE

JULY 1
2014

- » Transfer stations/Drop-off Facilities must accept residential recyclables at no separate charge
- » Food scrap generators of 104 tons/year (2 tons/week) must divert material to any certified facility within 20 miles

JULY 1
2015

- » Statewide unit based pricing takes effect, requiring residential trash charges be based on volume or weight
- » Recyclables are banned from the landfill
- » Transfer stations/Drop-off Facilities must accept leaf and yard debris
- » Haulers must offer residential recycling collection at no separate charge
- » Public buildings must provide recycling containers alongside all trash containers in public spaces (exception for restrooms)
- » Food scrap generators of 52 tons/year (1 ton/week) must divert material to any certified facility within 20 miles

JULY 1
2016

- » Leaf, yard, and clean wood debris are banned from the landfill
- » Haulers must offer leaf and yard debris collection
- » Food scrap generators of 26 tons/year (1/2 ton/week) must divert material to any certified facility within 20 miles

JULY 1
2017

- » Transfer stations/Drop-off Facilities must accept food scraps
- » Haulers must offer food scrap collection
- » Food scrap generators of 18 tons/year (1/3 ton/week) must divert material to any certified facility within 20 miles

JULY 1
2020

- » Food scraps are banned from the landfill



» For more information, visit www.recycle.vt.gov