

**Report to the Vermont Legislature**

**on**

**Architectural Waste Recycling**

**2014 Act 175, Section 3**

**Submitted to the**

**House and Senate Committees on Natural Resources and Energy**

**December 30, 2016**

**Prepared by:**

**Solid Waste Management Program**

**Department of Environmental Conservation**

**Vermont Agency of Natural Resources**

**Table of Contents**

Executive Summary.....1

Authority and Scope.....2

A Summary of the Implementation of Act 175.....3

An estimate of the amount of architectural waste recycled or reused since January 1,  
2015.....7

Whether viable markets exist for the cost-effective recycling or reuse of additional components  
of the waste stream from commercial projects.....7

A recommendation as to whether architectural waste should be banned from landfill disposal....8

Any other recommended statutory changes to the requirements of this section.....8

## **Executive Summary:**

10 V.S.A. §6605m (2014 Act 175) became effective on January 1, 2015, and requires the recycling of “architectural waste” from construction projects that produce more than 40 cubic yards of architectural waste, if that project is within 20 miles of an architectural waste recycling facility. Architectural waste is defined in statute as “discarded drywall, metal, asphalt shingles, clean wood, and plywood, and oriented strand board derived from the construction or demolition of buildings or structures.” 10 V.S.A. §6605m(a)(1).

The law has resulted in diverting additional architectural waste (metal, clean wood, drywall, asphalt shingles, plywood and oriented-strand board), but only in a very limited geographic area of the state. The volume of architectural waste recycled more than doubled from 2015 through the first three quarters of 2016 (from 6,983 tons in 2015 to 19,337 tons for the first 9 months of 2016). Recycling markets for some architectural waste materials are not robust and the lack of in-state recycling facilities has consequently restricted the success of the law. The Vermont Department of Environmental Conservation (DEC) is not recommending legislative revisions to Act 175 this year; however, without improved materials markets, and future revisions to the statute that encourage the establishment of additional recycling facilities, it is unlikely that architectural waste recycling will become institutionalized in Vermont.

Asphalt shingles have been recycled into locally available road construction products in some states, and represents the most stable architectural waste recycling market. In 2016, the Vermont Agency of Transportation (VTrans) conducted two pilot projects using asphalt shingles, and plans to conduct additional projects in 2017. Upon positive findings of these projects and in order to increase the law’s effectiveness, the Department of Environmental Conservation is recommending that asphalt shingles be banned from disposal, beginning January 1, 2020.

Further, in a five-year timeframe, depending on market conditions, consideration should be given to mandating that solid waste facilities capable of managing 40 cubic yard or greater loads of waste make provisions to recycle incoming architectural waste.

Working with waste haulers and facilities, contractors, solid waste planning entities, and other State agencies, the Department of Environmental Conservation will continue to develop sustainable markets for all architectural waste types.

## **Authority and Scope:**

The [2014 Vermont Materials Management Plan](#)<sup>1</sup> identifies construction and demolition (C&D) waste as one of five material streams that require improved statewide management. C&D debris represents 25% or more of the waste that is sent to the landfill, yet past waste reduction efforts have had limited success in reducing this disposal volume.

In response, the Legislature enacted 10 V.S.A. §6605m (“Act 175”), effective January 1, 2015, which mandates that specific components of the C&D waste stream be recycled. These components, collectively termed “architectural waste,” are drywall, metal, asphalt shingles, “clean” wood, oriented strand board (OSB), and plywood. If a commercial project, or two or more-unit residential project, produces 40 cubic yards or more of architectural waste, and is within 20 miles of a facility that recycles architectural waste, then these materials must be brought to such a facility. Alternatively, these architectural wastes may be recycled or reused in a way that the Agency of Natural Resources (ANR) deems an appropriate market or end use, including being sent to an out-of-state recycling facility. The Act also requires ANR to publish informational materials regarding the need to properly manage hazardous wastes inherent in architectural waste.

Act 175 also requires the Secretary of ANR to submit a report to the Legislature by January 1, 2017. The report must include.

- 1) a summary of the implementation of the requirements of 10 V.S.A. § 6605m for the recycling of architectural waste;
- (2) an estimate of the amount of architectural waste recycled or reused since January 1, 2015;
- (3) whether viable markets exist for the cost-effective recycling or reuse of additional components of the waste stream from commercial projects;
- (4) a recommendation as to whether architectural waste should be banned from landfill disposal; and
- (5) any other recommended statutory changes to the requirements of this section.

This report addresses each topic in turn.

---

<sup>1</sup> <http://dec.vermont.gov/waste-management/solid/planning>

## (1) “A summary of the implementation of Act 175”

Act 175 became effective on January 1, 2015. Prior to that date, DEC began efforts at outreach and education to those parties that would be affected by the law: contractors, developers, solid waste facility operators, solid waste haulers, and municipal solid waste management entities. These efforts included the publication and dissemination of two guidance documents: *Architectural Waste - Summary and FAQs*<sup>2</sup> and *Architectural Waste in Vermont – A Primer*<sup>3</sup>. Both documents can be found on the Solid Waste Management Program’s webpage<sup>4</sup> on construction and demolition debris.

In the fall of 2015, DEC invited stakeholders to join a Construction and Demolition Waste Management Stakeholder Group, with the objectives of “developing policies or legislative direction to reduce the amount of C&D waste generated and to increase the diversion of these materials to beneficial reuses and recycling markets.” The Stakeholder Group met on four occasions from November 2015 to February 2016, discussing markets for recycled materials, waste prevention, other States’ programs, and the implementation of, and potential changes to, Act 175. Stakeholders had significant input on two referenced documents that the DEC published, the March 2016 *ANR’s Next Steps with C&D Management* and the August 2016 *Policies on Architectural Waste Recycling*.<sup>5</sup> Stakeholders were also sent a draft of this report for their input, which was considered and incorporated as deemed fit.

*ANR’s Next Steps with C&D Management* outlines goals and a work plan for the Solid Waste Management Program for the remainder of 2016. The document identified seven items to be commenced or accomplished within the year. The items, and brief status, are:

- a. **Define an Architectural Waste Facility** – Prior to Act 175, there was no use of the “architectural waste recycling facility,” necessitating a definition, certification requirements, and operational standards for this category of facility. These were included in the *Policies on Architectural Waste Recycling*.
- b. **Determine Thresholds for Compliance with Act 175** - Not all architectural waste can be separated at the site of generation, and not all architectural waste can be processed for recycling at a facility. (Small pieces of drywall, for example.) The compliance expectations for both generators and in-state and out-of-state facilities are contained in the *Policies on Architectural Waste Recycling*.

---

<sup>2</sup> <http://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Act175-FactSheet.pdf>

<sup>3</sup> <http://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Arch-Waste-Recycling-Primer.pdf>

<sup>4</sup> <http://dec.vermont.gov/waste-management/solid/materials-mgmt/construction-waste>

<sup>5</sup> <http://dec.vermont.gov/sites/dec/files/wmp/SolidWaste/Documents/Act175%20AD%20ADPolicyFinal.pdf>

- c. **Complete this legislative report** – Done.
- d. **Create Incentives for Deconstruction/Salvage** – DEC has and will continue to encourage potential architectural waste generators to first explore deconstruction and salvage when undertaking renovation or demolition projects, and will assist in facilitating the connections between the waste generator and professional deconstruction and salvage entities.
- e. **ANR will partner with local governments, Vermont League of Cities and Towns, Solid Waste Management Districts, Regional Planning Commissions, and industry in promoting sound construction and demolition waste management practices** - An ongoing effort to which DEC needs to devote additional time and resources. Partnering with Solid Waste Management Districts has occurred, but DEC’s focus has been resolving implementation challenges of Act 175 before initiating outreach action. With the stakeholders’ objectives met, *Policies on Architectural Waste Recycling* developed, and this report to the legislature complete, DEC will immediately begin to focus on outreach to those entities directly and indirectly involved in architectural waste.
- f. **Foster architectural waste market development** – DEC and VTrans have worked together to advance the use of Recycled Asphalt Shingles in road construction in the State. DEC continues to have dialogs with architectural waste recycling entities to explore reuses and recycling markets for the six architectural waste types. ANR will continue to monitor Districts’ progress in attaining the State Material Management Plan’s requirement that shingle and drywall collection be institutionalized statewide by the end of their 5-year Implementation Plan period.
- g. **Continue to work with Act 250 applicants to ensure their project’s compliance with Act 175** – Act 250 applicants are informed of Act 175’s existence, and are offered technical assistance in developing a cost-effective waste management plan that minimizes landfill disposal of waste, to the degree practicable.

The *Policies on Architectural Waste Recycling* were developed to establish standards of compliance with Act 175 for both architectural waste generators and recyclers. The Policies affirm DEC’s positions that burning architectural waste (other than clean wood) for energy or using recyclable architectural waste as landfill cover is not compliant with Act 175. The Policies set standards for determining whether the 40 cubic yard threshold of architectural waste per project is reached, and differentiates the level of effort expected to divert demolition wastes versus wastes from new construction. The Policies allow architectural wastes to be recycled out-of-state, but only if the recycling facility meets the same standards as a Vermont facility. As Act 175 allows the DEC to sanction other “appropriate end uses,” the Policies address this

determination. Lastly, the Policies set certification and operational standards for architectural waste recycling facilities; what qualifies as an architectural waste recycling facility, what is required in a certification application, and what operational standards are appropriate to be compliant with Act 175.

Two existing solid waste management facilities are considered as Architectural Waste Recycling Facilities: the Myers C&D Recycling Facility in Colchester, and the Casella C&D Recycling Facility in Williston. Because of these facilities location and proximity, Act 175 currently applies to all of Chittenden County and portions of Addison, Franklin, and Washington Counties. Although several solid waste facilities in other areas of the State may recycle one or two types of architectural waste, only these two facilities are capable of processing all six waste types for the recycling market. Architectural waste recycling facilities must report on the quantities of architectural waste reused or recycled, and what the markets are for the wastes.

Markets for the majority of the six architectural waste types continue to be a challenge:

- Historically, **metal** was the one waste type that was consistently profitable to segregate for recycling from construction or demolition projects. While prices for recycled **metal** fell sharply after the 2008 recession, and have not rebounded, it remains economically worthwhile to remove all metals from the waste stream for recycling.
- **Clean wood** is banned from landfills, and can be burned for energy either in a biomass facility or in homes, processed into engineered wood products, or chipped for a carbon source in composting, if well segregated from contaminants. Clean wood collected at the two operating architectural waste facilities is, for the most part, commingled with OSB, plywood, and other painted and treated wood for out-of-country markets. Other facilities around the State that collect clean wood may chip it for on-site composting operations, or broker the material to commercial composting facilities.
- **Recycled Asphalt Shingles (RAS)** can be utilized in the production of various road construction products. ANR and VTrans have been working together to encourage the use of asphalt shingles in State highway projects. During the 2016 construction season, a blend of 20% RAS and 80% natural aggregate was used as a shoulder mix on a VT 14 paving project, and as the driving surface on the reconstruction of unpaved VT 65 in Brookfield. The material is performing successfully; however, higher costs and material quality are issues that need resolution if this market is to flourish. Additional RAS shoulder mix will be used in paving projects on VT 63 and VT 64 during the 2017 construction season, and, as a trial, RAS will be introduced in hot mix asphalt in a one or two VTrans District leveling projects in 2017.
- **Drywall** collected for recycling in Vermont is transported to Pennsylvania for production of an agricultural soil amendment, or transported to Canada for an ingredient in absorbent products. Although gypsum is an inexpensive virgin mined material and is also

generated as a waste product in flue gas desulfurization, scrap drywall is generated at job sites in a compressed timeframe, making collection in a separate “drywall only” container very feasible. The 2014 Vermont Materials Management Plan requires the establishment of drywall collection locations within each Solid Waste Management Entity’s jurisdiction by the end of the Entity’s Solid Waste Implementation Plan term, and DEC will be working in the interim to secure additional drywall recycling markets.

- **Oriented-Strand Board (OSB)** and **Plywood** have limited recycling markets. Nearly all OSB plywood, and painted/stained wood that is recycled in Vermont – and in New England – is marketed to Tafisa, the North America’s largest particle board manufacturer, located in Megantic, Quebec.

Other recent Architectural Waste-related advancements include:

- In 2015, the Burlington International Airport undertook a noise impact mitigating project involving the demolition of 96 homes in the proximity of the airport. Act 175 was a significant factor in increasing the amount of demolition waste diverted from disposal. To comply with the law, the Airport’s contractors were required to salvage all metals, remove and recycle any asphalt shingle roofs, and recycle the roof sheathing, wooden rafters, and collar ties. The Airport was encouraged to, and did, contract with the non-profit ReSource to salvage reusable goods and materials from the houses, pre-demolition, which further reduced landfill disposal. Excluding the materials salvaged before demolition began, 49.4% of the waste was diverted from landfill disposal.
- In conjunction with the application of Act 175 in the region, the Chittenden Solid Waste Management District has amended its Ordinance to ban the disposal of asphalt shingles, clean wood, unpainted/untreated plywood and oriented-strand board, in any quantity, and from any location within the District.
- Act 250 Land Use Permit applications that involve greater than 5000 square feet of building demolition and/or new construction are required to include a Construction Waste Management Plan or contract specifications that address waste management during construction or demolition. Although this has been a long standing obligation, applicants are now informed of Act 175 requirements and – regardless if Act 175 applies – potential Architectural Waste Recycling Facility for the project’s waste stream. In essence, the existence of two Architectural Waste Recycling Facilities in Chittenden County has drawn recyclable construction and demolition wastes from a larger radius than Act 175 compels.
- Although not directed by Act 175, DEC makes every effort to encourage building owners to consider the systematic “deconstruction” of structures and the recovery and reuse of the salvaged building materials. Local reuse of building materials is environmentally



preferable to transporting these materials to often distant markets for processing into sometime marginal products. Unfortunately, not all buildings are candidates for full deconstruction due to their condition, value of their components, the time demanded, and often higher cost for deconstruction. Further, the number of deconstruction entities working in Vermont is limited.

**(2) “An estimate of the amount of architectural waste recycled or reused since January 1, 2015”**

The volume of architectural waste recycled increased dramatically from 2015 through the first three quarters of 2016. Based on information obtained from Casella Waste Management, Myers Containers, and the Chittenden Solid Waste District, the amount of architectural waste recycled in 2015 and the first three quarters of 2016 is:

2015:	6,983.37 tons
January 1 – October 31, 2016:	19,337.11 tons

To some degree, all six architectural waste types are collected and reused or recycled directly from certain construction or demolition projects, without being transported to an architectural waste recycling facility. Further, other certified solid waste facilities, not considered as architectural waste recycling facilities, collect and recycle certain architectural wastes, scrap metal and clean wood being most common, with a few facilities collecting scrap drywall. These quantities are not included in the data above.

As many of the markets for recycling architectural waste are located outside of Vermont, there is a degree of uncertainty with any tabulation of the amount of waste actually recycled into new products. Also, unsegregated architectural waste is often shipped to secondary facilities for further processing. Finally, inherently, waste is produced in the conversion of waste material into products, and these data are difficult to obtain.

**(3) “Whether viable markets exist for the cost-effective recycling or reuse of additional components of the waste stream from commercial projects”**

At this point in time, the DEC does not recommend the addition of any new waste types to the six waste types included in the definition of Architectural Waste. Below are examples of other construction and demolition-related waste types, along with reasons for not including these waste types in the definition of architectural waste:

- Asphalt (pavement), brick, and concrete (ABC waste) are inherently recyclable, dense, and costly to dispose of, and these factors encourage its processing into new construction materials.
- Cardboard is another relatively large fraction of the construction and demolition waste stream, and is already banned from disposal in accordance with Act 148, the Universal Recycling Law.

- Carpet represents a sizable and difficult to manage C&D component, and there are sporadic carpet recycling options and programs in other States, but the carpet recycling market is not so established that DEC would advocate for including carpet to the current list of Architectural Wastes.
- Other common materials in the C&D waste stream (various plastics, fiberglass insulation, packaging, flooring) do not represent a significant volume and/or do not have a viable recycling market.

DEC proposes to continue to work to establish stable, statewide reuse and recycling options for the six current Architectural Wastes, before other wastes are incorporated into the list.

**(4) “A recommendation as to whether architectural waste should be banned from landfill disposal”**

**DEC supports a landfill ban on asphalt shingles, effective January 1, 2020, contingent upon a stable, cost-effective market being established in the interim.** As mentioned above, DEC and VTrans have been working together to encourage the use of asphalt shingles in state highway projects. DEC looks forward to ongoing collaboration with VTrans to establish an in-state market for recycled asphalt shingles that would create a sustainable alternative to landfill disposal.

Banning the disposal of other architectural wastes would increase the amount of architectural waste reused or recycled, which may assist with economies of scale, but would be a logistical challenge for small generators, small haulers, and small solid waste facilities. Likewise, reducing the volume threshold for recycling from 40 to 30 cubic yards, or increasing the distance threshold from 20 to 40 miles, would result in an incremental increase in the amount of architectural waste diverted, but would exacerbate logistical inefficiencies of transporting smaller amounts of waste longer distances. Time and resources are needed to upgrade infrastructure to manage architectural waste at facilities unaccustomed to handling the waste stream. As a result, for types of architectural waste other than asphalt shingles, DEC supports expanded recycling infrastructure (below).

**(5) “Any other recommended statutory changes to the requirements of this section”**

**DEC recommends, within a five-year timeframe, that any certified solid waste facility that accepts greater than 40 cubic yards of architectural waste be required to make provisions to recycle that waste to the same standards set forth in the *Policies on Architectural Waste Recycling*.** The presence of architectural waste recycling facilities throughout Vermont would spark Act 175’s mandate to recycle larger volumes of architectural waste that are generated within 20 miles of a recycling facility.

Act 175 currently applies only if waste quantity (40 cubic yards) and access to an architectural waste recycling facility (< 20 miles) criteria are met. At the present time, only two architectural

waste recycling facilities are operational. Mandating that large certified solid waste facilities undertake infrastructure improvements to process architectural waste is therefore a necessary next step to achieve the goals of Act 175 statewide.

Certified solid waste facilities that are able to manage loads greater than 40 cubic yard loads are, with the exception of the Coventry Landfill, large publicly or privately-owned transfer stations. Few of these facilities currently have the capability of segregating or aggregating for market large volumes of architectural waste; however, within a reasonable timeframe, these facilities could make improvements to allow for storage and shipment of architectural waste to a recycling facility, or make improvements to become an architectural waste recycling facility. By improving access to architectural waste recycling, the Legislature can promote convenience and diversion, which will support the Act 175's goal of keeping valuable resources out of our landfills.