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## Final Regulation Agency Background Document

<b>Agency name</b>	Virginia Waste Management Board
<b>Virginia Administrative Code (VAC) citation(s)</b>	9VAC20-60
<b>Regulation title(s)</b>	Virginia Hazardous Waste Management Regulations
<b>Action title</b>	Amendment 18 – Mercury-Containing Lamp Crushing
<b>Date this document prepared</b>	May 20, 2016

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 17 (2014) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

### Brief summary

*Please provide a brief summary of the proposed new regulation, proposed amendments to the existing regulation, or the regulation proposed to be repealed. Alert the reader to all substantive matters or changes. If applicable, generally describe the existing regulation.*

The Virginia Hazardous Waste Management Regulations, 9 VAC 20-60, provide requirements for the effective management of hazardous waste in the Commonwealth, including the management of mercury-containing lamps by recycling facilities or universal waste handlers. This amendment is intended to revise the current management requirements for these lamps in order to provide better protection of human health and the environment. There have been no changes made since the proposed regulation.

### Statement of final agency action

*Please provide a statement of the final action taken by the agency including: 1) the date the action was taken; 2) the name of the agency taking the action; and 3) the title of the regulation.*

On June 20, 2016, the Virginia Waste Management Board adopted the regulatory amendment, Amendment 18 – Mercury-Containing Lamp Crushing, to the Virginia Hazardous Waste Management Regulations under 9VAC20-60.

### Legal basis

*Please identify the state and/or federal legal authority to promulgate this proposed regulation, including: 1) the most relevant citations to the Code of Virginia or General Assembly chapter number(s), if applicable; and 2) promulgating entity, i.e., agency, board, or person. Your citation should include a specific provision authorizing the promulgating entity to regulate this specific subject or program, as well as a reference to the agency/board/person's overall regulatory authority.*

Section 10.1-1402 of the Code of Virginia authorizes the Virginia Waste Management Board (Board) to issue regulations as may be necessary to carry out its powers and duties required by the Virginia Waste Management Act (Act). Virginia code §10.1-1402(11) states:

“The Board shall carry out the purposes and provisions of this chapter and compatible provisions of federal acts and is authorized to:

11. Promulgate and enforce regulations, and provide for reasonable variances and exemptions necessary to carry out its powers and duties and the intent of this chapter and the federal acts, except that a description of provisions of any proposed regulation which are more restrictive than applicable federal requirements, together with the reason why the more restrictive provisions are needed, shall be provided to the standing committee of each house of the General Assembly to which matters relating to the content of the regulation are most properly referable.”

## Purpose

*Please explain the need for the new or amended regulation. Describe the rationale or justification of the proposed regulatory action. Describe the specific reasons the regulation is essential to protect the health, safety or welfare of citizens. Discuss the goals of the proposal and the problems the proposal is intended to solve.*

The Virginia Hazardous Waste Management Regulations, 9VAC20-60, provide the standards for the definition and management of hazardous waste. These regulations incorporate by reference the federal hazardous waste management regulations as promulgated by the Environmental Protection Agency (EPA). In July 1999 (64 FR 36466), EPA added hazardous waste lamps to the list of universal waste regulated under the Resource Conservation and Recovery Act (RCRA). The purpose of the universal waste sections contained in the regulations is to streamline and encourage recycling.

Currently, mercury-containing lamps may be managed in accordance with the universal waste sections of 9VAC20-60 and crushing of these lamps for size reduction is allowed; however, the federal universal waste regulations do not allow crushing. In order to obtain approval for a state-equivalent program, Virginia submitted a request to EPA for the universal waste lamp requirements in 9VAC20-60 which include crushing. In 2003, EPA proposed Virginia's regulations for crushing for approval but later withdrew that proposal due to adverse comments received. As a result, Virginia's regulations do not operate in lieu of the Federal requirements. EPA recommended that Virginia make further changes to its universal waste regulations for mercury-containing lamps in order to address the comments and receive EPA approval for the mercury-containing lamp universal waste program. From 2012 to 2014, the DEQ worked with EPA Region III in order to provide the necessary additional justification for a demonstration of equivalency and to develop reasonable regulatory language. This was a lengthy process and included multiple discussions and meetings with EPA Region III. During this time, the risk based air emission standards for mercury were developed by DEQ and evaluated by EPA. In 2014, EPA indicated that the demonstration of equivalency was adequate and that the proposed regulatory provisions were acceptable.

This regulatory amendment also addresses mercury-containing lamp recycling facilities. Requirements have been added to insure the proper management of mercury-containing lamps by these recycling facilities. The regulatory amendment revises various sections of 9VAC20-60 to provide: (i) appropriate storage criteria for facilities that manage mercury-containing lamps prior to recycling; (ii) additional requirements for mercury-containing lamp recycling; and, (iii) revised requirements for small and large quantity handlers and destination facilities that crush or otherwise manage universal waste mercury-containing lamps. The sections of the regulations that have been revised by this amendment are Sections 261, 264, 265, 273, and 1505. The proposed regulation was approved for public comment by the Waste Management Board at their January 2015 meeting. The regulation went through Executive Review and was approved to be published for public comment. The proposed regulation was published in the Virginia Register on November 2, 2015. Public comment ended on January 4, 2016.

## Substance

*Please briefly identify and explain the new substantive provisions, the substantive changes to existing sections, or both.*

In order to obtain EPA's authorization for Virginia's universal waste program for mercury-containing lamps and to ensure the safe management of mercury-containing lamp recycling facilities, this amendment revises 9VAC20-60, as follows:

- Revises and adds additional requirements for mercury-containing lamp recycling facilities including testing, operational, closure and recordkeeping criteria, and if applicable, financial assurance requirements; and,
- Revises and adds requirements for small and large quantity universal waste handlers and destination facilities that manage mercury containing lamps.

The sections of the regulations that have been revised by this amendment are Sections 261, 264, 265, 273, and 1505.

## Issues

*Please identify the issues associated with the proposed regulatory action, including: 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions; 2) the primary advantages and disadvantages to the agency or the Commonwealth; and 3) other pertinent matters of interest to the regulated community, government officials, and the public. If there are no disadvantages to the public or the Commonwealth, please indicate.*

The primary purpose of this regulatory action is to develop a set of performance standards and requirements that will allow for the crushing of mercury-containing lamps, such as fluorescent bulbs, in a manner that is protective of human health and the environment. Crushing of mercury-containing lamps has several benefits for businesses and will help to encourage recycling by making it more economical as compared to recycling of intact lamps which is costly. Encouraging recycling is a main benefit of this amendment as recycling these lamps results in the reduction of mercury in the environment which is important for protection of human health and the environment.

The advantages to businesses include: 1) reduces storage space over that needed to accumulate intact lamps; 2) reduces time and labor costs; 3) reduces emissions from lamp breakage that can occur during storage as well as during transportation; 4) reduces transportation costs; and 5) makes recycling more economical. Advantages to the general public include a reduction of mercury in the environment. Disadvantages to businesses may include additional regulatory requirements associated with lamp crushing, particularly the annual mercury monitoring requirements and associated costs and additional record keeping requirements. The disadvantages may be offset by the cost advantages of crushing and proper management of mercury-containing lamps. Advantages to the Commonwealth are the promotion and encouragement of recycling; particularly the recycling of mercury which has known public health and environmental consequences if not disposed of properly. In addition, recycling promotes the Commonwealth's stated waste management hierarchy (i.e., recycling is preferred over incineration or landfill disposal). Additionally, during the notice of intended regulatory action, no comments regarding small business impacts were submitted.

This regulatory amendment is necessary in order for Virginia to obtain Federal authorization for its universal waste lamp crushing regulations. Under federal rules, crushing is not allowed, but states can demonstrate that they have regulatory requirements and controls in place that provide the same level of protection. Currently, businesses in Virginia that are crushing mercury-containing lamps under the Virginia regulations may risk possible enforcement action by EPA as Virginia's universal waste program for mercury-containing lamps is not yet approved by EPA to operate in lieu of the federal program.

### Requirements more restrictive than federal

*Please identify and describe any requirement of the proposal which is more restrictive than applicable federal requirements. Include a rationale for the need for the more restrictive requirements. If there are no applicable federal requirements or no requirements that exceed applicable federal requirements, include a statement to that effect.*

This regulatory amendment is not more restrictive than the federal requirements. It establishes requirements and control that provide the same level of protection as the federal rules as was proven by the equivalency demonstration.

### Localities particularly affected

*Please identify any locality particularly affected by the proposed regulation. Locality particularly affected means any locality which bears any identified disproportionate material impact which would not be experienced by other localities.*

The requirements of this regulatory amendment are applicable through-out the Commonwealth. Any locality which chooses to use a lamp crushing unit for the management of their universal waste lamps will be subject to the provisions of this amendment for handlers of universal waste lamps.

### Changes made since the proposed stage

*Please list all changes that made to the text of the proposed regulation and the rationale for the changes; explain the new requirements and what they mean rather than merely quoting the proposed text of the regulation. \*Please put an asterisk next to any substantive changes.*

There have been no significant changes made since the proposed stage. The only change made since the proposed stage was a deletion of the word "that" in subdivision 264.B.34.b(3)(b).

### Public comment

*Please summarize all comments received during the public comment period following the publication of the proposed stage, and provide the agency response. If no comment was received, please so indicate.*

The public comment period for this regulation began on November 2, 2015 and ended on January 4, 2016. Two commenters submitted 26 comments. A summary of the comments received and DEQ's response to the comment is provided below.

**Comment 1 – Scott Beierwaltes, AirCycle Corp:** The scope of this action as it pertains to the activity of crushing universal waste lamps is understood. Additionally, it is understood that the proposed protectiveness standards are risk-based and that they stand alone regardless of management practices and background levels that might exist. However, the reality is that all handlers of lamps will have baseline mercury emission levels from the management of intact lamps. Lamps being handled intact routinely are broken during removal, storage, and transport resulting in chronic/baseline levels in storage and other areas. AirCycle has performed studies on their Bulb Eater® product which demonstrates that there are significantly less mercury emissions from their product compared to the emissions from bulbs being shipped intact which have routinely broken during handling. The commenter recommends inserting a paragraph in the town hall document after the end of the paragraph that begins "Advantages to the Commonwealth."

“The Commonwealth recognizes that when properly controlled and when employing proper devices that lamp crushing can significantly reduce the amount of mercury emissions that are inappropriately dispersed to the environment. Conversely, management of intact lamps can result in substantial accidental breakages during handling, storage and transport activities.”

**Response:** The DEQ notes that this comment has asked for a change to the Town Hall document, TH-02, and not the regulation. However, as the comment does relate to the background conditions of the risk assessment developed to calculate the emission limits for bulb crushing operations, the DEQ has considered the issue. Including as background the emissions of mercury from those facilities which recycle intact universal waste lamps was considered by the DEQ during the equivalency demonstration. However, the DEQ concluded that it is not appropriate to factor in or add “background” mercury emissions that may or may not be protective. When background is considered in the DEQ’s risk assessments, it is based on concentrations from an un-impacted area of a site, not from an area with a potential similar release. The risk based emission limits have been developed to be protective of the risks related to mercury exposure from the lamp crushing operations which is the scope of this regulatory amendment. Therefore, the risk assessment has not been changed as explained above.

**Comment 2 – Scott Beierwaltes, AirCycle Corp:** The proposed regulation includes an exemption from the monitoring requirement for those facilities that crush less than 2 hours a month and less than 220 lbs per month, (the amount equivalent to a Conditional Exempt Small Quantity Generator (CESQG)). The regulation also includes requirements for:

- notification/registration
- a separate ventilation system
- filtration prior to outdoor storage
- training/recordkeeping/labeling requirements
- requirement to manage filters separately (presumably as HW).

A typical CESQG user of the Bulb Eater® would be unwise to handle lamps as Universal Waste with all of these additional requirements and associated costs, the net result of the regulation will be to discourage responsible crushing of universal waste lamps for these smaller generators. If they decide to stop crushing, will they continue to recycle their lamps? The commenter recommended that CESQG’s be exempt from the measures listed above, except for the requirements for notification/registration and the requirements for training, recordkeeping, and labeling.

**Response:** The DEQ has reviewed the comment and finds the assertion that CESQG’s will be unable or unwilling to comply with the revised requirements for waste lamp crushing to be unfounded. CESQG’s currently crushing waste lamps already follow training, recordkeeping and labeling requirements and the proposed language changes only formalize these requirements by requiring a maintenance schedule to be developed and require annual training at a minimum. The DEQ does not find these requirements to be an undue burden on CESQG’s crushing waste lamps for size reduction.

Finally, DEQ does not concur with the last assertion that the proposed regulatory changes will encourage any CESQG’s to stop recycling mercury containing waste lamps. Intact lamps can still be recycled. Any disposal of mercury-containing lamps, which would meet the definition of a hazardous waste, as a non-hazardous solid waste would constitute a violation of the Virginia Hazardous Waste Management Regulations (VHWMR). This violation may result in an enforcement action from DEQ to the hypothetical facility which would serve as a practical reminder to other CESQG’s of their obligation to manage hazardous waste lamps appropriately in accordance with the VHWMR.

**Comment 3 – Scott Beierwaltes, AirCycle Corp:** 9VAC20-60-1505.B.7.b requires filtration through a separate ventilation system prior to discharge to the outside. The time and cost to construct and maintain a secondary capture and filtration system would far outweigh any benefits that might ever be realized from such a process. It is the commenter’s opinion that direct venting to the outside is the preferable means of directing any residual emissions and that any additional filtration would be impractical and pointless; therefore, the commenter recommends removing the words “after filtration” from Section 1505.B.7.b.

**Response:** The requirements for a separate ventilation system and filtration prior to the air in the crushing room being discharged to ambient air in the proposed language of 9 VAC 20-60-1505.B.7.b may also be met using an alternate design if the requirements listed in 9 VAC 20-60-1505.B.7.b parts (1)-(3) are met. The DEQ finds that

allowing for alternate designs which can be demonstrated to be as protective as the regulation requires should allow CESQG's to safely and economically handle their waste lamps. No changes were made to the proposed regulation based on this comment.

**Comment 4 – Scott Beierwaltes, AirCycle Corp:** While it is understood that filters used during various treatment functions are typically viewed as hazardous wastes, this view should not apply in the case of universal waste lamps. The phosphor powder (containing mercury) and glass particles captured by the filter are the same materials that we are treating as universal wastes. The only thing different is a cloth/paper filter. Summarily, a requirement to handle the filters separately does nothing for the environment, increases costs for the operator, and is inconsistent with current lamp recycling practices. The commenter recommends striking section 9VAC20-60-1505.B.7.I.

**Response:** The assertion that all wastes generated during the crushing operation, such as residues and filters, will have to be handled as a hazardous waste is misinterpretation of the proposed regulatory language. The proposed language in Section 1505.B.7.I states: "...Any waste materials generated as part of the crushing operation that are determined to be hazardous waste shall be managed under this chapter, as hazardous waste or if not hazardous waste, as a solid waste under the Solid Waste Management Regulations, 9VAC20-81." This language allows for a facility to make a determination that the wastes generated during the crushing operation are not a hazardous waste and may instead be managed as a solid waste and disposed of accordingly. No changes were made to the proposed regulation based on this comment.

**Comment 5 – Scott Beierwaltes, AirCycle Corp:** It was noted that the separate ventilation system provisions of Section 1505.B.7.b requires the direct venting. The commenter contends that such a system will be not be viable for some operators and the construction of a separate HVAC system would be financially impractical for the majority of small-scale operators. It was noted that any mercury emissions generated at the point of crushing will be diluted by the building's ventilation system (by a factor equal to the volume of the entire building). Additionally, it was also noted that there is no potential for emissions when the crushing device and crushed lamps are not in operation. Therefore, there is no potential for spreading emissions to other areas of a building. Therefore, the commenter recommends inserting an additional provision to Section 1505.B.7.b(1):

(1) The air in the immediate area of the crushing operation can be effectively isolated during operation, maintenance, and drum and filter changes.

After the last provision for alternative approval, include text that exempts CESQG equivalent of the requirement to require direct venting of ambient air: "This provision does not apply to generators or facilities that crush two hours or less and no more than 220 pounds/100 kilograms (CESQG equivalent) of bulbs per month."

**Response:** The purpose of the requirement is to minimize any possible mercury exposure to those persons who are not involved in the crushing operations. As a result, the regulations require that drum top crushers be located in a room with adequate ventilation and have a ventilation system that is segregated from the system from other parts of the building and which does not re-circulate the air. Please note, the regulations as drafted do contain a provision allowing for the DEQ to review and approve an alternate design if the requirements listed in Section 1505.B.7.b(1) through (3) are met. Use of these alternate design requirements may be used if the requirements of Section 1505.B.7.b are found to be technically or financially impracticable for a particular facility and if approved by the DEQ. Therefore, no changes were made to the proposed regulation based on this comment.

**Comment 6 – Scott Beierwaltes, AirCycle Corp:** Section 1505.B.7.b does allow for the DEQ to consider an alternate design. The alternative filtration system that has been discussed in the stakeholders meetings (the dental office air purifier) is an option that might be viable for some operations but the \$1500-\$2000 price tag of these machines would be impractical for most small-scale operators. Bulb Eaters® are capable of running purge cycles after crushing of lamps is complete. The purge cycle would essentially provide secondary filtration of the ambient air in and around the device. The purge cycle could provide the necessary air filtration and mercury removal as specified in the regulation, and it could be used in conjunction with simple, practical measures such as blocking doors and air intakes during and after crushing. The commenter recommends DEQ allow for technologies that have built in secondary filtration and capabilities to run a purge cycle after active lamp crushing.

**Response:** As noted previously, any facility may submit an alternate design to the DEQ for its consideration. A facility may submit an alternate design that demonstrates that the purge cycle meets the requirements listed in Section 1505.B.7.b. and may provide supporting information to Department substantiating this alternate design proposal at any time. An alternate design submittal will be considered by the Department and, if approved, the

alternate design may be used by the facility for its lamp crushing operations. Therefore, no change was made to the regulation as a process exists to consider these alternate designs.

**Comment 7 – Scott Beierwaltes, AirCycle Corp:** AirCycle’s device, the Bulb Eater®, easily achieves all of the limits proposed by the protectiveness standard during crushing. However, it was pointed out that the acute exposure ceiling limit may be exceeded during drum change-outs and during certain maintenance operations. Efficient change-outs can be completed in less than 15 seconds, and documented spikes are typically limited to times ranging from 10-60 seconds. The most recent revisions to the proposed regulation include a provision to show that compliance with the acute standard can be documented statistically. It was noted that while this sounds very promising, little has been explained about how this determination would be calculated and what variables would be used. Additionally, this type of calculation represents an additional requirement that would be very confusing for most operators. The commenter recommends regulatory guidance be developed which fully addresses the calculation of the 95% upper confidence level of the mean and include tables with basic parameters and examples that will clarify this issue.

**Response:** The DEQ does not believe that this provision will be confusing to most operators as these operators are already required to apply statistical tests to their environmental monitoring data to ensure compliance with other standards when process upsets occur. The 95% confidence interval is a fairly standard statistical test and the variables to be used are simply the mercury concentrations detected during the monitoring required. However, the DEQ will be preparing guidance for implementation of these regulations and will include procedures for a statistical demonstration as recommended. No changes to the regulation were necessary based on this comment.

**Comment 8 – Scott Beierwaltes, AirCycle Corp:** Drumtop crushing of lamps represents a significant investment in technology and the environment both to the manufacturer and facility-level users. These operators are aware of the challenges of managing lamps properly, and they have invested in a technology and a process that provides a much better way. While considering the additional provisions of the proposed regulation, please also consider that each requirement represents an additional burden to the operators that are using this technology as there continue to be no safety controls or other secondary filtration measures required for intact lamp management.

**Response:** The DEQ acknowledges that the requirements represent an additional burden to facilities which choose to crush their waste lamps in lieu of shipping them intact. However, it is also recognized that these regulatory burdens and the costs may be offset by the reduction in cost to ship and store crushed lamps versus managing intact lamps. Regardless, this current regulatory action is related to demonstrating that lamp crushing can be as protective of human health and the environment as compared to not crushing. As such, more stringent standards are required for a process which allows the lamp to be crushed and which carries a potential slight risk of mercury contamination. Therefore, the regulations allow the crushing of lamps in appropriately maintained units and ensure the proper management of the lamp crushing operation by providing standards and provisions for crushing.

**Comments 9, 10, and 11 – Sean S. Heaney, Department of the Navy:** The commenter has requested that definitions be added to the regulation for recycling, mercury-containing lamp recycling facility, and reclamation.

**Response:** The DEQ notes that these terms are defined in the federal regulations which are incorporated by reference into 9VAC20-60. For instance, in 40 CFR 261.1(c) (7), a material is recycled if it is used, reused, or reclaimed. A mercury-containing lamp recycling facility reclaims mercury from mercury containing lamps. For the purposes of this regulatory action the term “mercury-containing lamp recycling facilities” refers to all facilities which meet the regulatory definition of a destination facility which is defined in 40 CFR 273.9 and which is incorporated by reference into 9VAC20-60. Therefore, no changes were made to the regulation based on these comments.

**Comment 12 – Sean S. Heaney, Department of the Navy:** It is not clear if the language in 9VAC20-60-264, Part 34.a.(3) b refers to the owner or operator of the mercury-containing lamp recycling facility or “to a facility other than a mercury reclamation facility”, clarification is requested.

**Response:** The DEQ notes that the correct reference is Section 264.B.35.b of 9VAC20-60. This provision explicitly notes that the responsibility for determining whether the processed materials constitute a hazardous waste falls onto the owner or operator of the mercury-containing lamp recycling facility. This owner or operator shall meet the provisions of Section 264.B.35.b prior to shipment to a facility which is not a mercury reclamation facility. Therefore, no change to the proposed regulation has been made.

**Comment 13 – Sean S. Heaney, Department of the Navy:** The chart presented in 9VAC20-60-264, Part 34.e is similar to an OSHA workplace standard for worker exposure and not an environmental protectiveness standard. The commenter recommends a reference to the existing OSHA workplace standards to eliminate the duplicative exposure standards and to remove any conflict with OSHA workplace standards in the future.

**Response:** While the chart listed in Section 264.B.35 does appear to be similar to the OSHA standards, please note that the DEQ risk assessors calculated the acute exposure levels presented in the revised regulations through a risk assessment process which was independent of the OSHA standards with the goal of ensuring protection of human health and the environment, unlike the OSHA standards which are for worker protection. Therefore, no changes were made to the regulation.

**Comment 14 – Sean S. Heaney, Department of the Navy:** These references in the 9VAC20-60-273 Part B.3.d refer to standards for owners and operators of hazardous waste treatment, storage and disposal facilities. The standards are for hazardous waste and not for universal wastes in 40 CFR Part 273 or for recycling materials. Requiring a closure plan similar to a hazardous waste treatment, storage and disposal facility for mercury-containing lamp recycling facility is excessive for a lamp crushing operations. The commenter recommends removing this requirement in this subsection or proposes less onerous closure requirements be developed.

**Response:** The closure plan standards for large quantity handlers of universal waste lamps have been developed because of the potential of mercury contamination in the area of the facility where the lamps will be accumulated. The DEQ finds that requiring a closure plan and financial assurance for only those universal waste handlers that are large quantity handlers of waste lamps mitigates the problems that can occur when there is a sudden closure of such a facility. Without a closure plan and financial assurance, there would be no financial means to properly close the site. A closure plan is only required of those large quantity handlers who accumulate 5000 kilograms or more of universal waste lamps (not 5000 kilograms of all universal waste). No change to the regulation has been made.

**Comment 15 – Sean S. Heaney, Department of the Navy:** The two statements regarding the prohibition on the mobile crushing units in 9VAC20-60-1505, Part B.2 are not clear to the commenter. For example, the Army, Navy and Air Force have lamp crushing units that are not permanently affixed in a room. Prohibition of mobile units that are protective of the environment appears to prohibit a potential industry opportunity for Virginia. The commenter recommends providing clarification as to whether the movement of the lamp crushing unit is prohibited or the use of a lamp crushing unit that is not permanently affixed is prohibited.

**Response:** The use of lamp crushing units which are not permanently affixed to a room is allowed. However, this unit may not be designed to move to another off-site, non-contiguous facility, such as by having wheels affixed to the unit or having the unit attached to a portable skid or trailer. The intent of the requirement is to prevent a mobile crushing unit which may be moved from facility to facility or transporting of a unit for use at multiple off-site facilities, i.e., providing a mobile lamp crushing "service." However, moving the unit throughout a contiguous facility is allowed provided the provisions are met such as the containment requirements for any room where lamp crushing takes place.

**Comment 16 – Sean S. Heaney, Department of the Navy:** The term "hermetically sealed" typically refers to a manufacturer's action in ensuring that equipment is cut off from outside atmosphere and its use in 9VAC20-60-1505, Part B.7.a does not seem to meet this typical meaning. The commenter recommends use of the word "sealed" would suffice as there are at least two openings in a lamp crushing unit.

**Response:** Hermetically sealed refers to an actual technical classification of seal which prevents oxygen and other gasses from entering the chamber. The seal can be tested to verify that no gasses are entering from the surrounding ambient atmosphere of the room. As mercury, at standard conditions, exists in the liquid phase, the requirement for a hermetic seal as well as maintaining negative pressure in the crushing unit while the drum is attached to the crusher will mitigate any potential fugitive emissions from the unit while in normal operation. Therefore, the DEQ has not made any change to the regulation based on this comment.

**Comment 17 – Sean S. Heaney, Department of the Navy:** External discharge of the air from the lamp crushing unit may have air permit implications. The commenter recommends providing for an exemption without requiring an approved variance if the emissions are covered under an existing facility air permit.

**Response:** It would not be appropriate at this time to include a blanket exemption as the air permit conditions may vary and an exemption such as that suggested has not been thoroughly evaluated. These types of conditions may be accommodated by the allowance for an alternate design and on a case-by-case basis. Therefore, the DEQ has not made any change to the regulation based on this comment.

**Comment 18 – Sean S. Heaney, Department of the Navy:** The prescribed air pollution control description limits the technology available to meet this condition. This precludes the use of "Best Available Technology". The commenter recommends adding "or technology of equivalent performance" to the regulatory language in 9 VAC 20-60-1505, Part B.7.c.

**Response:** The proposed regulatory language establishes a minimum technical standard for the particulate and vapor phase emissions of mercury which facilities must meet if they choose the crush waste lamps. However, the language does not limit facilities from using additional air pollution controls to ensure greater capture of the mercury emissions using best available control technology and simply ensures that a minimum retention rate and emissions limit standard will be met using currently effective and available technology. No changes were made to the regulation based on this comment.

**Comment 19 – Sean S. Heaney, Department of the Navy:** If the units are sealed to prevent losses, outdoor or indoor use would not pose a concern. The commenter recommends allowing the use of lamp crushing unit outdoors with appropriate protection from the environment.

**Response:** Allowing crushing operations outdoors negates the secondary capture of mercury emissions through filtration from the isolated lamp crushing room prior to discharging to the outside. This would allow more mercury emissions to enter the environment and for the potential of an incident in a situation when the drum is compromised or the drum top crushing unit is not properly operation. In these instances, the result could be a possible release of mercury to the environment.

**Comment 20 – Sean S. Heaney, Department of the Navy:** The training requirements in 9VAC20-60-1505, Part B.7.k.should focus on those written procedures currently captured in 9VAC20-60-1505 Part B.7.i. The commenter recommends revising the sentence: "Each unit operator shall receive initial and annual training for procedures identified in Part B.7.i of this section, including emergency procedures and proper procedures for cleaning up broken mercury-containing lamps."

**Response:** The training provisions include the items in the proposed regulatory language but may also need to include facility or unit specific training. Limiting the training to be developed to the specific requirements in Section 1505.B.7.i does not account for differences in facilities or lamp crushing units which may require additional safety and health issues to be addressed in the training program.

**Comment 21 – Sean S. Heaney, Department of the Navy:** The mercury-containing materials defined in Subsection 1505.B.7.1, residues, filter media, used equipment and other mercury-containing equipment, are accepted at some reclamation facilities. The generator should choose a recycling/reclamation facility that optimizes mercury recovery for all materials that contain mercury. The commenter recommends allowing facilities to include all mercury containing materials in containers sent for off-site reclamation.

**Response:** As noted in the response to Comment 4, it is the responsibility of the facility to make a determination that the wastes generated during the crushing operation are or are not a hazardous waste and to manage the wastes properly. Therefore, no changes were made to the proposed regulation as proper waste characterization and management is the responsibility of the facility.

**Comment 22 – Sean S. Heaney, Department of the Navy:** The chart presented in 9VAC20-60-1505, Part B.7.n. is similar to an OSHA workplace standard for worker exposure and not an environmental protectiveness standard. It is unclear as to what or whom is being protected. The commenter recommends referring all workplace protection standards to the appropriate OSHA standard.

**Response:** As noted in the response to Comment 13, the DEQ risk assessors calculated the acute exposure levels presented in the revised regulations through a risk assessment process which was independent of the OSHA

standards with the goal of ensuring protection of human health and the environment, unlike the OSHA standards which are for worker protection. Therefore, no changes were made to the regulation.

**Comment 23 – Sean S. Heaney, Department of the Navy:** The distance selected identifies the location at which a certain concentration standard will be applied. "Within five feet" allows variance and therefore inhibits a like-for-like comparison from being made. In contrast, Part B.7.n(2) includes a sentence that states "The following are risk-based protectiveness standards at a distance of five feet from the bulb crushing unit". The commenter recommends changing "within five feet" to "at a distance of five feet" in Part B.7n(1) to pair with Part B.7.n(2).

**Response:** The DEQ acknowledges that variance can occur in the monitoring results given the current regulatory language. Please note, the acute exposure standard was determined using a distance of 5 feet from the crusher so if a monitored value is below the acute exposure standard but is closer than 5 feet away from the unit this would indicate that the air pollution controls on the unit are operating above the minimum requirements established in the proposed language. Five feet is the maximum distance from which a monitoring sample may be taken but the sample may be taken. No change to the regulation is necessary.

**Comment 24 –Sean S. Heaney, Department of the Navy:** The standard applied in 9VAC20-60-1505, Part B.7.n(2) should be workplace related and the ASTDR, OSHA, and Virginia Department of Health references for mercury exposure do not refer to what is shown in the referenced in the citation. The commenter recommends deleting the amendment citation referenced and revising the current table only to identify the PEL and IDHL standards for mercury workplace exposure.

**Response:** As previously explained in Comment 13, the emission limits provided in the regulations are not worker protection standards and were developed to ensure that protection of human health and the environment. Therefore, no changes were made to the regulation.

**Comment 25 – Sean S. Heaney, Department of the Navy:** The DoD strongly urges VADEQ to retain the lamp crushing provisions provided in the current regulations. The DoD has successfully and safely crushed lamps for several years in compliance with the VADEQ's regulations as evidenced by our compliance record.

**Response:** The proposed language has been developed in response to EPA's concerns that the current regulatory language related to universal waste lamp crushing is not adequately protective of human health and the environment. EPA had requested the DEQ to provide an equivalency demonstration and based on the results of this demonstration, the regulations have been revised. The proposed language has been tentatively determined by EPA to demonstrate that mercury-containing lamp crushing is as protective of human health and the environment as not crushing. Therefore, Virginia will be submitting an authorization request to the EPA once the revisions are adopted. Once authorized, facilities will be protected from any potential enforcement action from EPA as the federal regulations do not permit crushing.

**Comment 26 – Sean S. Heaney, Department of the Navy:** DEQ should determine the total number of lamp crushing units in Virginia and calculate the cost/benefit ratio of implementing these regulations. At some point, it is economically not feasible to continue, and lamp crushing operations will simply move and/or lamps will end up in the general solid waste stream."

**Response:** The DEQ's economic analysis indicates that benefits likely outweigh the costs of the proposed changes. Facilities may choose to crush their universal waste lamps in a drum-top crushing unit in accordance with the regulatory provisions. This is strictly an optional management process for these lamps and is not required. If a facility chooses to recycle universal waste lamps, the intact lamps can still be sent for recycling as some facilities currently do today. Stakeholders indicated that crushing provides a cost savings related to off-site disposal or recycling, labor costs, and space requirements. It is up to each facility to determine which method best accommodates their particular set of circumstances for handling their waste lamps.

### All changes made in this regulatory action

Please list all changes that are being proposed and the consequences of the proposed changes. Describe new provisions and/or all changes to existing sections. Explain the new requirements and what they mean rather than merely quoting the proposed text of the regulation.

Current section number	Current requirement	Proposed change and rationale
9VAC20-60-261	Adoption of 40 CFR Part 261 by reference.	Requirements for mercury-containing lamp recycling facilities were added and the definition of hazardous waste clarified for wastes generated in other states. This was necessary to further address issues that arose from the improper management of mercury-containing lamps at facilities that recover or reclaim mercury from lamps.
9VAC20-60-264	Adoption of 40 CFR Part 264 by reference.	Specific requirements for all facilities that recover or reclaim mercury from lamps were added to this section under subdivision B.34 in order to provide proper management requirements for those that engage in mercury-containing lamp recycling. The revision is necessary to deal with issues that arose at mercury-containing lamp recycling facilities which did not have proper management controls.
9VAC20-60-265	Adoption of 40 CFR Part 265 by reference.	Specific requirements for all facilities that recover or reclaim mercury from lamps were added to this section under subdivision B.22 in order to provide proper management requirements for those that engage in mercury-containing lamp recycling. The revision is necessary to deal with issues that arose at mercury-containing lamp recycling facilities which did not have proper management controls.
9VAC20-60-273	Adoption of 40 CFR Part 273 by reference.	Requirements for mercury-containing lamps that are managed as universal waste under subdivision B.3 of this section were revised. The revised requirements allow for crushing of lamps by universal waste handlers in accordance with the revised requirements of 9VAC20-60-1505. These requirements were revised to provide for better management practices for those that manage mercury-containing lamps as universal waste (e.g., having a closure plan and maintaining financial assurance).  A requirement for destination facilities that recycle mercury-containing lamps to comply with the applicable requirements for mercury-containing lamp recycling facilities under sections 264 and 265 of this chapter was added to insure proper management of those facilities that recycle mercury-containing lamps.
9VAC20-60-1505	Additional universal wastes.	Requirements for mercury-containing lamps that are crushed for size reduction by universal waste handlers were added to this section. These requirements were deemed appropriate to minimize any contamination issues that may result from the drum-top crushing of these lamps. These requirements were developed after considerable discussion with EPA regarding the needs for a state-equivalency program for universal lamps.

### Family impact

Please assess the impact of this regulatory action on the institution of the family and family stability including to what extent the regulatory action will: 1) strengthen or erode the authority and rights of parents in the education, nurturing, and supervision of their children; 2) encourage or discourage economic self-sufficiency, self-pride, and the assumption of responsibility for oneself, one's spouse, and one's children and/or elderly parents; 3) strengthen or erode the marital commitment; and 4) increase or decrease disposable family income.

There is no anticipated adverse impact on the institution of the family and family stability.

## Regulatory flexibility analysis

*Please describe the agency's analysis of alternative regulatory methods, consistent with health, safety, environmental, and economic welfare, that will accomplish the objectives of applicable law while minimizing the adverse impact on small business. Alternative regulatory methods include, at a minimum: 1) the establishment of less stringent compliance or reporting requirements; 2) the establishment of less stringent schedules or deadlines for compliance or reporting requirements; 3) the consolidation or simplification of compliance or reporting requirements; 4) the establishment of performance standards for small businesses to replace design or operational standards required in the proposed regulation; and 5) the exemption of small businesses from all or any part of the requirements contained in the proposed regulation.*

This regulatory action is necessary as Virginia's regulations allow crushing of mercury-containing universal waste lamps and in order to obtain Federal authorization for lamp crushing a regulatory amendment is needed. Under the federal universal waste rules, lamp crushing is not allowed; however, states can demonstrate that they have regulatory requirements and controls in place that provide the same level of protection. Currently, businesses in Virginia that are crushing mercury containing lamps may not comply with the federal requirement and risk possible enforcement action by the EPA. Therefore, this regulatory amendment is necessary to demonstrate that Virginia has the regulatory requirements and controls in place and our regulations for crushing can be authorized. Once authorized, Virginia's regulations will be effective in lieu of the federal rules and businesses in Virginia will have more protection as they will not have to risk possible enforcement action by the EPA under the federal rules.

The only other option is not to amend our regulations and allow the continued risk to Virginia businesses from possible action by EPA.

## Acronyms and definitions

*Please define all acronyms used in the Agency Background Document. Also, please define any technical terms that are used in the document that are not also defined in the "Definition" section of the regulations.*

CFR – Code of Federal Regulations  
DoD – Department of Defense  
DEQ – Department of Environmental Quality  
EPA – United States Environmental Protection Agency