State of Utah

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DIVISION OF AIR QUALITY
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DAQE-MN154460001-17

MEMORANDUM

To: **Stericycle Tooele Facility Source File (15446)**

Through: **Marty Gray, Manager, Permitting Branch, UDAQ**

From: **Jon L. Black, Manager, Major New Source Review Section, UDAQ** JLB 8/2/17

Date: **August 2, 2017** DPB 8/3/17

Subject: **Response to Public Comments**

An Approval Order (AO) for Stericycle Incorporated (Stericycle) Tooele Facility was proposed with a public comment period starting on March 24, 2016 and extending through May 20, 2016. In addition, the Utah Division of Air Quality (UDAQ) held a public hearing on April 18, 2016 starting at 5:30 P.M. in the Auditorium of the Tooele High School, 301 W. Vine Street, Tooele, Utah. UDAQ extended the public comment period beyond the regular 30 days to May 20, 2016 to accommodate the requests for additional time to review the proposed permit. UDAQ considered each comment received before final issuance of the AO.

The comments received, both written and those made orally at the hearing, are identified below along with UDAQ's response to each comment. The public comments are recorded, documented, and addressed in this memorandum.

Oral Comments

1) Commenter addressed the possible failure of the plant and pollution it would create. Commenter asked where the pollutants would go in a worst-case scenario if the plant's equipment failed in the event of natural disasters. Commenter also asked if pollution would be created within 263 miles of the waste disposal facility. Commenter was concerned that the facility would fail at some point and referred to the nuclear reactor disaster in Japan.

UDAQ Response: UDAQ evaluates project proposals based on the Clean Air Act (CAA) requirements, state statutes, and regulations, assuming a full-scale operation. This evaluation yields the maximum potential-to-emit (PTE) associated with the facility. UDAQ determined that

the Stericycle's Toole facility meets all state and federal requirements. In the event of an equipment failure, the facility will account for the cause and nature of the failure and any emissions (total and excess) as required under Utah Administrative Code (UAC) R307-107 General Requirements: Breakdowns. The Stericycle project is defined as a Hospital, Medical and Infectious Waste incinerator and therefore any comparisons to a nuclear power facility are unwarranted.

2) Commenter addressed the current pollution in the Grantsville area and relocation of the plant. Commenter was concerned about pollution from Wal-Mart Distribution Center, AMAX (chlorine gas), and the chemical plant. He complained of chlorine gas odor from AMAX and blue smoke from the chemical plant. Commenter also inquired about the possible relocation of the plant to the CAMDS South area.

UDAQ Response: As stated previously, UDAQ evaluated the Stericycle project in accordance with the state and federal requirements. All potential emission rates of criteria pollutants and Hazardous Air Pollutants (HAPs) were below the emission levels found in the UDAQ modeling requirements in UAC R307-410-4 and 5. UDAQ does not regulate a company's choice of plant location in Utah. Instead, it determines if the plant could operate in compliance with the state and federal requirements at the location proposed by the applicant in the Notice of Intent (NOI). In this case, Stericycle met all the applicable requirements for plant construction and operation at the proposed site location.

The commenter should direct any concerns about air pollution from other sources to UDAQ's compliance section.

3) Commenter addressed the lack of a start-up, shutdown, and "maintenance"[1] plan in the NOI and availability of this plan to the public. According to the commenter, the plan was required because Stericycle was subject to Maximum Achievable Control Technology (MACT) and National Emission Standards of Hazardous Air Pollutant (NESHAP) requirements. Commenter stated that the law requires UDAQ to have a complete application to impose permit conditions in compliance with the state and federal requirements.

Commenter claimed UDAQ did not provide the plan at commenter's request. Specifically, the commenter stated, "The Director Bryce Bird, of the Division of Air Quality conduct this into the Division of Air Quality rules on June 4, 2015. If the Division of Air Quality is to presume that there is no public request for the startup, shutdown, or malfunction plan they are sadly mistaken. It was done on March 31, 2016 by an email."

UDAQ Response: UDAQ disagrees with this comment. Stericycle submitted an NOI along with additional information, which resulted in a complete NOI application on February 18, 2016. The complete paper copy of the NOI application was available for viewing at any time at the UDAQ offices. An electronic copy was also available upon request. The Intent to Approve (ITA) Document DAQE-IN154460001-16 along with the project file and fact sheet were also available on the UDAQ's website at the following location:

http://168.178.3.241:8080/DAQ_NOI/DocViewer?IntDocID=92555&contentType=application/pdf

[1] UDAQ assumes that the commenter refers to the start-up, shutdown, and malfunction plan.

Commenter does not cite any state or federal rules that require Stericycle to submit a start-up, shutdown, and malfunction plan. Therefore, the completeness of the NOI and the permitting process do not depend on a start-up, shutdown, and malfunction plan.

Commenter's request for this plan prior to the public hearing was discussed in a telephone conversation between the commenter and the permitting engineer Jon Black on March 31, 2016. The March 31, 2016, e-mail specifically referenced requirements which *"excluded HMIWI units from having to comply with standards during periods of SSM, provided that no hospital waste or medical/infectious waste was being charged to the unit during those SSM period."* This language is quoted from the Utah State Bulletin (June 1, 2014), Vol. 2014, No. 11, p. 122, where Utah proposed an amendment to UAC R307-101-3 to incorporate the most current version of the Code of Federal Regulations into Utah environmental quality rules. The proposed rule summarized the changes the Environmental Protection Agency (EPA) made to the Code of Federal Regulations, including removal of section 60.56c(d)(2) of Subpart Ec, which excluded HMIWI units from start-up, shutdown, and malfunction (SSM) requirements as long as no waste "was being charged to the unit during those SSM periods." Utah State Bulletin, Vol. 2014, No. 11, p. 122. The commenter misinterprets this proposed rule because it does not include a requirement for Stericycle to provide a SSM plan for the Tooele facility. The commenter incorrectly assumes that there is such requirement. The commenter did not cite any legal requirement for Stericycle to prepare and submit a SSM plan.

4) Commenter raised concerns with Stericycle's past compliance history in North Salt Lake. The commenter did not want the public to be misled regarding possible emissions from the plant in Tooele as the public was in North Salt Lake. Lastly, the commenter requested that the robust monitoring procedure and data be made available to the public immediately.

UDAQ Response: UDAQ recognizes the commenter's concerns; however, the comment period and the public hearing were on the proposed Stericycle's plant in Tooele County. Therefore, this permitting action does not address Stericycle's North Salt Lake plant compliance history. Stericycle's Tooele plant is required to operate in compliance with its AO (DAQE-AN154460001-16). The AO requires the facility to maintain records of plant operation at all times, including periods of SSM. *See* AO, Condition I.4. These records must be made available to the Director upon request. *See id.*, Condition I.5. AO Condition II.B.1 lists specific site-wide requirements that Stericycle must comply with, including operation of emissions control equipment, emission limitations and testing, and continuous emissions monitoring requirements. At the completion of the construction of the Tooele facility, all emission sources will be evaluated, monitored, and stack tested within 180 days of start-up to ensure that the plant complies with the AO's operational limitations.

Additionally, the UDAQ will monitor Stericycle's compliance status and will communicate with the facility to ensure the facility is operating properly. Any continuous emissions monitoring data for NO_x and CO emissions will be reviewed quarterly by UDAQ's compliance section. The public can obtain and review any public records (records collected by UDAQ) that contain operating and emissions data from UDAQ by filing a GRAMA request.

5) Commenter asked if future growth of Tooele was considered when evaluating the Stericycle's plant. The commenter stated that Tooele was expecting an additional 100,000 new residents in the next 20-25 years and inquired as to how this projected

growth would affect air quality. Lastly, the commenter stated that she would like to obtain the original "agreement" with Stericycle's approved and not the proposed plant.

UDAQ Response: UDAQ did not consider projected population growth in Tooele County because there is no requirement to do so, and the commenter does not identify any such requirement. UDAQ evaluates NOI applications under UAC R307- 401-5, which includes all requirements for an AO. Stericycle has submitted an NOI in accordance with R307-401-5 and met all the requirements of this rule.

UDAQ interprets the commenter's statement about Stericycle's original "agreement" to refer to the 2014 Settlement Agreement (Administrative Settlement Order No. 2013051501), which requires Stericycle to move its operations from North Salt Lake to a new location in Tooele County. A copy of this document is available at

http://www.deq.utah.gov/businesses/S/Stericycle/docs/2014/12Dec/Stericycle_Settlement_Agreement.pdf.

6) Commenter was concerned that air quality would be affected by Stericycle's plant because of what the commenter heard about Stericycle's North Salt Lake plant. Commenter wanted the new Stericycle plant to be cleaner than the North Salt Lake plant and asked if the issues experienced at the North Salt Lake facility would also be experienced at Tooele facility. Finally, the commenter stated that Stericycle's operation was not good even if it was within the state's guidelines.

UDAQ Response: *See* Response to Comments #2, #4, and #5. UDAQ evaluated BACT for the new plant and determined that the proposed equipment for this plant meets all state and federal air quality standards. The new equipment is expected to operate more efficiently than the North Salt Lake plant, as it has been designed to meet more stringent air quality limitations established in 40 C.F.R. 60 Subpart Ec (Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced after June 20, 1996). Stericycle must meet these standards and will be monitored as explained in Response to Comment #4.

7) Commenter lived in North Salt Lake next to Stericycle's plant and moved due to son's health issues and his daily headaches. Commenter was concerned that the son's headaches might return if the plant was allowed to operate in Tooele. Commenter was not sure of Stericycle's plant location but was concerned of any operation within 10 miles of an elementary school in Tooele or Grantsville. Commenter also wondered if Stericycle was incinerating all the medical waste or using other methods of disposal and if there were better methods for disposing of medical waste. Lastly, the commenter thought that the medical waste should not be burned because "deadly things [were] put into the atmosphere and [could] travel 300 miles from the location." Consequently, the commenter did not want the permit to allow double of the North Salt Lake facility's production rate, considering all the counties and people within this 300-mile radius.

UDAQ Response: The Stericycle's Tooele plant location as identified in the NOI is at 9250 Rowley Road in Tooele. It was also listed in the ITA and the newspaper notice announcing the 30-day comment period. The Rowley Road location is approximately 21 miles from Grantsville Elementary School and 23 miles away from Willow Elementary School in Grantsville. It is also approximately 30 miles away from Northlake Elementary School in Tooele.

The Stericycle plant incinerates medical waste delivered to the plant location. Other methods of medical waste disposal include heat methods (steam autoclaves, microwave systems, and plasma arc technology) and use of chemical agents (chlorine compounds, ozone, alkali, etc.). While these methods are used in many locations, they all have their advantages and disadvantages. UDAQ is required to evaluate Stericycle's proposed project and NOI under current state and federal law. UDAQ does not design the medical waste plant or determine which type of plant Stericycle must operate in Utah. UDAQ has evaluated Stericycle's application under state and federal law and determined that the proposed Tooele plant meets all the regulatory requirements.

Moreover, at UDAQ's request, Stericycle has provided additional discussion of why alternative methods to incineration are not viable for the specific waste stream Stericycle is planning to treat at its Tooele facility. *See* Stericycle's Response to Request for Additional Information on Project Number DAQE-1N1544600001-16 (Stericycle's Response Letter), Attachment 3 (June 23, 2017), attached to this memorandum; UDAQ Request for Additional Information on Project Number DAQE-IN1544600001-16 (UDAQ Letter) (June 5, 2017) also attached to this memorandum; *see also* Response to Comment #16.B.ii (discussing Stericycle's waste stream and infeasibility of the alternative methods).

In preparing the Source Plan Review (SPR), UDAQ examined all potential emission rates of criteria pollutants and HAPs. The commenter does not identify any emissions that were not evaluated. UDAQ concluded that under UAC R307-410 (Permits: Emissions Impact Analysis), all potential emissions would be below the allowable threshold limit values at the fenceline of the Stericycle's property. The commenter provides no science or research to support the commenter's general statements about increased production and effect of these increased emissions on public health within 300-mile radius.

8) Commenter expressed disappointment that the North Salt Lake plant fine was cut in half. The commenter also asked if any future fine for Stericycle would be stiffer.

UDAQ Response: UDAQ understands this comment to refer to the Stericycle's North Salt Lake plant. Consequently, it does not address the operational conditions of the proposed Stericycle Tooele plant AO but it is noted. All future compliance monitoring and potential fines for the Tooele facility will be addressed through the UDAQ Compliance Section.

9) Commenter felt there was lack of justification for some of the claims made by Stericycle. The commenter advocated for more "detailed" and "independent" review of the control technologies and their cost. Commenter also stated that UDAQ relied on the wrong standard when imposing BACT by not requiring maximum extent practicable, which is a tougher standard than what UDAQ applied. Commenter thought that UDAQ should have considered accumulate control potential, which would lower control costs. Commenter claimed that Stericycle had failed to submit a "detailed medical waste separation plan." Lastly commenter asked if the UDAQ accounted for organic HAPs and if they were reflected correctly in the VOC reporting. Commenter believed that organic HAPs were not accounted for independently and the claimed controlled emissions might be incorrect.

UDAQ Response: UDAQ disagrees with this comment. *See* Response to Comment #11 regarding the control technologies associated with the BACT determination.

The commenter's claim that BACT for the Stericycle facility must reflect the "maximum extent practicable" is not warranted. UAC R307-401-8 recognizes BACT as the appropriate method of evaluation for control of point source and fugitive emissions. UDAQ must adhere to this definition and apply it when evaluating BACT for proposed facilities. Commenter provides no legal basis or support for her statements. *See also* Response to Comment #12 regarding UDAQ reliance on the wrong standard. Additionally, the commenter fails to recognize or address any point in the BACT analysis that is inadequate and does not discuss how "accumulate control potential" would lower the control costs.

Response to Comment #10.H discusses a medical waste separation plan.

Lastly, all potential-to-emit calculations for VOC and HAP emissions from the incinerators were established using AP-42 Chapter 2.3 (Medical Waste Incinerator) emission factors. These emission factors include all relevant sources of emissions associated with the operation of medical waste incinerators, including organic HAPs.

This concludes the response to oral comments received at the public hearing. The remaining comments were submitted to the UDAQ in writing.

Written Comments

UDAQ received 530 e-mailed and written comments and documents on the Stericycle's Tooele proposed plant. The comments submitted are addressed below, followed by UDAQ's response to each comment. UDAQ has summarized and responded to similar comments collectively. Copies of the e-mails and written comments are attached to this memorandum.

10) Many comments were submitted to the UDAQ through two (2) forms of an electronic template. The template comments are as follows:

The business of incinerating medical waste has been exposed in recent years as a completely unnecessary hazard to public health. Even with new incinerators using maximal pollution control technologies, operated by a company demonstrating impeccable practices and integrity, incineration still suffers from these simple facts:

A. "Incineration actually spreads disease rather than prevents it. Hardly any toxins are actually destroyed, most are concentrated, mobilized, and redistributed into the environment, and new ones like dioxins are created that didn't exist in the waste originally."

UDAQ Response: This is a general statement regarding incineration. The commenter neither identifies applicable law nor provides additional information that would lead UDAQ to conclude that claims made in this comment are correct. The commenter also does not tie the comment to any terms or conditions in the proposed permit.

B. "There are safer ways to neutralize hospital based pathogens."

UDAQ Response: This is a general statement regarding medical waste disposal. Stericycle submitted a NOI under UAC R307-401 for a medical waste incinerator, which is the review the UDAQ performed. *See also* Response to Comment #7.

C. "Emissions from incinerators are probably the most toxic type of air pollution there is, including the deadliest compounds known to science including dioxins, furans, heavy metals, and radioactive elements."

UDAQ Response: As addressed above, the commenter is making a general statement but does not address any specific terms or conditions in the proposed permit.

D. "Incinerator emissions have been proven to travel hundreds of miles, Wasatch Front residents will still be exposed by this new facility."

UDAQ Response: The potential dispersion of emissions depends on meteorological conditions, location of the plant, emission stack heights, stack parameters, stack flow rates, etc. As addressed in Response to Comment #7, the UDAQ concluded that under UAC R307-410 (Permits: Emissions Impact Analysis), all potential emissions are below the allowable threshold limit value at the fenceline of Stericycle's property. The commenter does not offer any evidence to the contrary.

E. "A doubling of capacity is not fair to Tooele residents."

F. "The total production of the site should NOT be increased. The Settlement Agreement specifically defines the "facility" as the existing facility. Therefore, this more than doubling of capacity for the new site is not acceptable under the current definition. Please restrict Stericycle to a throughput limit identical to the limit of its current permit and do not double it!"

UDAQ Response: UDAQ disagrees with comments 10.E and 10.F. Stericycle may submit a NOI containing a proposal to construct and operate a new facility. If the proposal meets all applicable state and federal regulations, the source may operate under the terms of the AO issued under these regulations. For the Tooele plant, Stericycle has demonstrated that it can operate in accordance with all applicable regulations. *See* Source Plan Review (March 23, 2016).

The referenced Settlement Agreement is an agreement between UDAQ and Stericycle to resolve a compliance matter at Stericycle's North Salt Lake plant. *See* 2014 Settlement Agreement (No. 2013051501), available at:

http://www.deq.utah.gov/businesses/S/Stericycle/docs/2014/12Dec/Stericycle_Settlement_Agreement.pdf.

The commenter may not use this public comment period to challenge or interpret the terms of this Settlement Agreement or Stericycle's compliance with it because the commenter was not a party to this agreement. In any event, the commenter's interpretation of the Settlement Agreement is incorrect. Condition #2 of the Settlement Agreement states, "Stericycle operates a hospital/medical/infectious waste incinerator located at 90 North Foxboro Drive, North Salt Lake, Davis County, Utah ("Facility")". Condition #13 states, "In order to ensure prompt and diligent efforts to relocate the Facility from its current location in North Salt Lake, Stericycle agrees to comply with the following…" These conditions do not determine, define, or discuss the size, production rate, or type of incineration equipment to be allowed at the Tooele facility. Therefore, Stericycle complied with the Settlement Agreement by submitting the NOI dated March 7, 2014, to begin the permitting process and relocation to Tooele County. *See also* Response to Comments #5 and #7.

G. "The state shows very little documentation or justification for some very important claims from Stericycle – such as the company's claims that certain control technologies that they could order are too costly. There needs to be more independent, detailed review of Stericycle's claims, including vendor estimates. Specifically, for the dangerous air pollutant, dioxin, we believe there are additional pollution controls which Stericycle didn't consider. We also think they didn't consider their cumulative control potential, which would make the cost cheaper."

UDAQ Response: UDAQ disagrees with this comment. The commenters refer to control equipment and techniques not considered due to cost, but they fail to identify which control equipment, control efficiency, and costs need further analysis. The commenters did not explain what the control equipment should consist of. These comments are only noted for the record because of a lack of specific information that would lead UDAQ to conclude that the BACT review was deficient.

H. "Stericycle is not worthy of public trust. They claim that they will separate the medical waste at the source to prevent certain materials from being burned, but fails to offer a detailed plan or mechanism for ensuring compliance. This is a requirement of the New Source Performance Standards."

UDAQ Response: The comment refers to a NSPS requirement to separate medical waste at the source but provides no citation. UDAQ relies on regulations, engineering data, and demonstrated operating procedures when developing permit conditions. To ensure compliance with permit conditions, UDAQ conducts inspections and requires a source to maintain records. In this case, 40 C.F.R. § 60.55c requires a waste management plan. This regulation does not require that the waste management plan be submitted with the NOI or reviewed and approved prior to issuance of the AO document, but does require the source to develop such plan and train its operators prior to operating the plant. Stericycle has also been directed to submit a separate waste management plan that satisfies the requirements of 40 C.F.R. § 60 Subpart Ec. *See* Response to Comment #18 for more detail on this issue.

11) Commenter stated that the BACT analysis must begin, but not end with New Source Performance Standards (NSPS) under UAC R307-401. The commenter argues that the standards set in Subpart Ec represent technology from 1996 and 2008 and emission limitations from 1996. The comment suggests the emission limitations established in Subpart Ec are outdated and argues that UDAQ cannot assume that Subpart Ec's emission limitations represent BACT. The commenter also argues that because the NSPS represents the "best demonstrated technology," Subpart Ec only represents the BACT floor for analysis and emission limitations. Additionally, commenter stated that the analysis failed to result in an emission limitation reflective of BACT and lastly, the BACT analysis was insufficient because it failed to document the basis for BACT review, including cost estimates.

Commenter also referenced capital cost estimates for wet scrubber from "RTI International," ranging approximately from $260,000 to $453,000 in 2009.[2] The commenter argued that these estimates were far below Stericycle's estimate provided in the NOI, quoting $1,200,000 in capital investment for wet scrubbing. The commenter could not corroborate this estimate due to lack of vendor's data. The commenter also quoted an article that referenced wet scrubber costs for Stericycle's facility in Missouri at $500,000 in June of 2000. The commenter reasoned that it was logical to assume that the costs of technology would diminish over time and not drastically increase to $1,200,000. The commenter asked for clarification of these discrepancies, documentation of cost assumptions, and reconsideration of the cost data used in the BACT review.

UDAQ Response: UDAQ disagrees with these comments. The comment presents a general interpretation of one element in UAC R307-401-2's definition of BACT. It focuses on the following language: "In no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 [NSPS] and 61 [NESHAPS]." UAC R307-401-2.

This language requires that a BACT determination must result in emission limitations that are at least equal to the emission limitations imposed by an otherwise applicable NSPS or NESHAP. In

[2] https://www3.epa.gov/airtoxics/129/hmiwi/comply_costs_existing.pdf

evaluating the proposed project, UDAQ found that BACT was triggered and that Subpart Ec was an applicable NSPS for the proposed HMIWI. Consequently, the language identified by the comment requires that the emission limitations imposed on the HMIWI as a result of the BACT analysis cannot be less stringent than the applicable emission limitations expressed in Subpart Ec. All the emission limitations established in the Approval Order for the HMIWI are as stringent as the applicable emission limitations established in Subpart Ec. *Compare* 40 C.F.R. § 60.52c(a)(2) and Table 1B (establishing emission limitations for HMIWI constructed after December 1, 2008) *with* Approval Order, Condition II.B.1.f (establishing the same emission limitations for the HMIWI units). Consequently, the ITA satisfies the UAC R307-401-2 requirement that the comment identifies.

Furthermore, Subpart Ec emission standards represent limitations that are more stringent than those required solely pursuant to NSPS. That is the case because the Subpart Ec standards derive from Section 129 of the Clean Air Act, 42. U.S.C. § 7429, which requires that emission standards for HMIWI must be more stringent than those established pursuant to Section 111 of the Clean Air Act alone, *see id.* § 7411. Section 129(a)(2) requires that emission limitations for HMIWI must represent "maximum degree of reduction in emissions" or MACT standard. *See id.* § 7429(a)(2). The MACT standard establishes emission limitations that are more stringent than BACT or section 111's "best system of emission reduction." *Id.* § 7411(a)(1). This is especially true for new HMIWI where standards "shall not be less stringent than the emissions control that is achieved in practice by the *best controlled* similar unit." *Id.* § 7429(a)(2).

The comment goes on to argue that Subpart Ec represents potentially outdated technology (from 1996 and 2008) and emission limitations (from 1996) and, therefore, UDAQ cannot assume that Subpart Ec currently represents BACT. Subpart Ec does not represent "1996-era emission limitations," as suggested by the comment. EPA originally enacted Subpart Ec in 1997. On October 6, 2009, EPA finalized revisions to Subpart Ec. In revising Subpart Ec, EPA evaluated "whether new technologies and processes and improvements in practices have been demonstrated at sources subject to the emission limits." 74 Fed. Reg. 51,368, 51,372 (Oct. 6, 2009). EPA imposed new, more-stringent emission limitations for HMIWI constructed after December 1, 2008, or modified after April 6, 2010. *See* 40 C.F.R. §§ 60.50c(a)(3)-(4), 60.52c(a)(2), Table 1B. Subpart Ec represents emission limitations and operations from 2009. In the time since EPA revised Subpart Ec, UDAQ is aware of no information that would justify imposing more stringent emission limitations than those imposed in the ITA, and the commenter did not provide any.

Furthermore, UDAQ did not automatically assume that the emission limitations established in Subpart Ec represent BACT. BACT is determined on a case-by-case basis and varies depending on the source, pollutant, and emission unit under review. In this permitting action under UAC R307-401-5(2)(d), Stericycle conducted and submitted a BACT analysis in its NOI. UDAQ reviewed the NOI BACT analysis and made its BACT conclusions and set emissions limitations based on 40 C.F.R. 60 Subpart Ec as necessary. Stericycle has yet to construct the HMIWI plant and therefore has no operating data. When there is no waste stream data available, allowing the source to evaluate the concentration of pollutants, it is necessary to default to the federal NSPS emission limitations for the HMIWI plant. Additionally, the UDAQ established emission limitations for the HMIWI units based on the BACT control options selected. These limitations can be found in the Emission Limitations of Condition II.B.1.f of the AO document.

The BACT analysis for the HMIWI was a five-step top-down analysis, evaluating all potentially feasible controls for HMIWI. That analysis included a review of the RACT/BACT/LAER

clearinghouse for possible control equipment and emission limitations. UDAQ's BACT analysis did not identify any additional controls that were not considered in the NOI for the HMIWI and did not identify any sources with more stringent emission limitations than those proposed in the ITA. Consequently, UDAQ is aware of no similarly-sized HMIWI that is subject to more stringent emission limitations. Furthermore, the commenter has not provided any information that identifies similarly-sized HMIWI that are subject to more stringent emission limitations.

The BACT analysis examined the HMIWI plant and its associated emissions control equipment. The plant equipment consists of two of each of the following: HMIWI unit, SNCR system, waste heat boiler, carbon injection system, dry sorbent injection system, baghouse, wet gas absorber, carbon bed unit, one (1) emergency diesel engine, and tub washer. UDAQ BACT decisions for this equipment are found in the BACT Evaluation table below. All the potential HMIWI emissions were examined to determine the appropriate control equipment requirement, if applicable. The commenter speaks generally of BACT for the other emissions units, but does not explain on a pollutant-by-pollutant basis why it considers the BACT analysis to be insufficient.

BACT Evaluation Table

Equipment	**Pollutant(s)**	**BACT Control**	**Emission Limitation(s)**
HMIWI Unit	Nitrogen Oxide (NO_x)	Selective Non-Catalytic Reduction (SNCR) SNCR is a post combustion technology which uses the injection of urea or ammonia at high furnace temperatures. NO_x reductions as high as 30 to 50 percent are possible before ammonia slip starts.	140 Parts per million by volume (ppmv)
		Selective Catalytic Reduction (SCR) SCR technology works on the same principle as SNCR with the addition of a catalytic converter section and can achieve NOx reduction rates as high as 60 to 80 percent before ammonia slip becomes a problem. The catalyst used in	Not selected; therefore, no applicable emission limit.

		SCR must be operated downstream of the particulate control device to avoid fouling of the catalyst. This plant design does not allow for this type of catalyst to be installed as the SCR would be installed prior to the baghouse causing fouling of the catalyst.	
		Wet Scrubber Wet scrubbing is the most complex of the possible control options and would require significant operator labor. Wet scrubbing would require large quantities of reagent to control NOx. The capital investment is estimated at $1,200,000, which results in an annualized cost of approximately $23,800 per ton of NO_x removed.	Not selected due to cost; therefore, no applicable emission limit.
		Good Combustion Practices	Eliminated as technically infeasible because Stericycle is already controlling CO emissions through good combustion practices. Minimizing NO_x while simultaneously minimizing CO through good combustion practices causes operational problems.

HMIWI Unit (cont.)	Carbon Monoxide (CO)	Good Combustion Practices These practices increase efficiency of the combustion process, which reduces the emissions of CO by minimizing Incomplete combustion.	11 ppmv
		CO Oxidation Catalysts These catalysts provide add-on control for CO emissions and are typically only effective for large emissions streams of CO such as turbines and power producers. These have also not been applied to HMIWI units as the CO emissions are very low (1.93 tpy in this case).	This is a small emission source for CO therefore no requirement for installation of oxidation catalysts.
HMIWI Unit (cont.)	Particulate Matter ($PM/PM_{10}/PM_{2.5}$), lead, cadmium, and particulate phase mercury	Baghouse A baghouse utilizes specially designed bags to capture particulate and heavy metal emissions as the gas passes through the bags. Baghouses are typically 99.9% + efficient at removing these pollutants.	$PM/PM_{10}/PM_{2.5}$ 18 mg/dscm 0.0080 gr/dscf Lead 0.00069 mg/dscm 0.00030 grains per thousand dry standard cubic feet (gr/10^3 dscf) Cadmium 0.00013 mg/dscm 0.000057 gr/10^3 dscf Mercury 0.0013 mg/dscm 0.00057 gr/10^3 dscf

		Electrostatic Precipitator (ESP) ESPs utilize the force of an induced electrical charge to remove particles from the gas stream. An ESP is typically 95 – 99.0% efficient at removing these pollutants.	The ESP was not selected as a control measure and therefore, there is no applicable emission limitation.
		Wet Venturi Scrubber A wet venturi scrubber utilizes a specially designed duct shape in conjunction with a scrubbing liquid which contacts the gas stream and removes the pollutants from it. A wet scrubber is typically 80 – 95% efficient at removing these pollutants.	Not selected; therefore, no applicable emission limit.
		Cyclone/Multiclone A cyclone/multiclone removes particulates from the gas stream by rotating the gas at speeds that allow gravity to push the particulate matter to the outside and drop out. Cyclone/multiclones are typically 50% + efficient at removing particulate matter.	Not selected; therefore, no applicable emission limit.
HMIWI Unit (cont.)	Mercury (gaseous phase)	Carbon Injection This control process involves injecting activated carbon into the gas stream to adsorb the gaseous	Mercury emission limitation is stated above and includes the controls of Carbon Injection and a Carbon Bed System

		mercury. Carbon provides additional surface area for adsorption of gaseous mercury. Use of carbon injection must be accompanied with use of a baghouse for dry particulate control. Some applications have estimated a very conservative control efficiency of 60 – 85 % using carbon injection.	0.0013 mg/dscm 0.00057 gr/10^3 dscf
		Carbon Bed System This system uses activated carbon as an adsorption source to control gaseous mercury emissions. It is most effective when processing a "clean" gas stream usually following a scrubber or baghouse. Control efficiencies are estimated at 85%.	See above emission limitation.
		Wet Scrubbing A wet scrubber utilizes a scrubbing liquid which contacts the gas stream and removes the pollutants from it. A wet scrubber is typically 80 – 85% efficient at removing gaseous mercury emission.	Not selected; therefore, no applicable emission limit.
HMIWI Unit (cont.)	Sulfur Dioxide (SO_2) Hydrogen Chloride (HCl)	Dry Scrubber/Baghouse A dry scrubber uses the injection of dry sorbent prior to a baghouse, so that the	SO_2 8.1 ppmv HCl 5.1 ppmv

		sorbent collects on the outside of the baghouse filter bags and creates a "cake" through which acid gases pass and are neutralized. This control method can achieve up to 80% control efficiency.	Dry sorbent injection followed by a dry scrubber/baghouse utilized in series with a wet gas absorber was selected as control.
		Wet Gas Absorber A wet gas absorber uses a caustic scrubbing liquid, which contacts the gas stream and neutralizes the acid gases.	See above.
HMIWI Unit (cont.)	Dioxin/Furans (CDD/CDF)	Carbon Bed System This system uses activated carbon as an adsorption source to control emissions of CDD/CDF. Carbon Injection Carbon injection involves injecting activated carbon into the gas stream to adsorb CDD/CDF that may be formed. Activated carbon may bind with CDD/CDF and is collected by a baghouse. This method can achieve up to 90% control efficiency.	Dioxin/Furans 9.3 Nanograms per dry standard cubic meter total dioxin/furans (ng/dscm) 4.1 grains per billion dry standard cubic feet (gr/10^9 dscf) or 0.035 ng/dscm TEQ 0.015 gr/10^9 dscf TEQ Note: Emission levels are achieved using Carbon Injection and a Baghouse.
		Baghouse with Catalyst-Impregnated Bags Specially designed bags entrained with a catalyst to capture particulate matter emissions, including	This technology is ruled out as the expense of catalyst-impregnated bags exceeds a reasonable cost per ton removal expense ($280,000,000 per ton

		activated carbon containing adsorbed CDD/CDF, as the gas passes through. Control efficiencies are above 99.99%.	of CDD/CDF removed).
		Baghouse Uses specially designed bags to capture particulate matter emissions, including activated carbon containing adsorbed CDD/CDF, as gas passes through. Control efficiencies are above 99.9%.	This technology was accepted for control of particulate matter ($PM/PM_{10}/PM_{2.5}$), lead, cadmium, and particulate phase mercury. The respective emissions limits are found above. The emission limits for activated carbon containing adsorbed CDD/CDF can be achieved using carbon injection along with the baghouse.
Emergency Generator Engine	$PM_{10}/PM_{2.5}$ NO_x SO_2 CO VOC	Compliance with 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ combined with good combustion practices. Tier 4 engines provide an estimated 90% reduction of PM and NO_x emissions. All emission rates are below 0.5 tons per year.	Installation of Tier 4 engine
Dry Sorbent Silo	$PM_{10}/PM_{2.5}$	Baghouse A baghouse has a collection efficiency of 99% or greater. This operation is intermittent to account for pneumatic loading of dry sorbent.	Installation of a baghouse is not required as the expense of power and the unit itself far outweighs the benefit of particulate emission removal.

		Bin Vent A bin vent is very similar to a baghouse but is installed on a silo to capture exhaust air from pneumatic loading of dry sorbent. The collection efficiency of a bin vent is 99%.	A bin vent was selected as BACT and will be installed on the Dry Sorbent Silo. No emission limitation is necessary for a minimal source of particulate emission. 10% opacity will serve as a necessary BACT requirement.

Lastly, UDAQ evaluated the comment regarding the costs of the wet scrubbers and concluded that "RTI International's Revised Compliance Costs and Economic Inputs for Existing HMIWI Memorandum, dated July 6, 2009"[3] (hereinafter RTI 2009 Memo) only examined costs associated with a wet scrubbing device (packed-bed scrubber) for HCl and SO_2 removal. Commenter is comparing the RTI analysis with the BACT analysis Stericycle performed for NO_x removal only. The following is the relevant excerpt from the RTI analysis:

> **Packed-bed wet scrubbers. Packed-bed wet scrubbers are especially effective at reducing emissions of acid gases such as HCl, and also provide limited control of PM, metals, and SO_2 (if present at high enough concentrations). These wet scrubbers can also be installed either alone or after a dry scrubber/fabric filter. Wet scrubber costs are presented for each model HMIWI in Table 3 and were estimated based on algorithms in the *Model Plant Description and Control Cost Report* for HMIWI and a memo update. The wet scrubber capital costs from these algorithms were updated to 2007 dollars using the Chemical Engineering Plant Cost Index (CEPCI) and range from approximately $260,000 to $453,000.**

RTI 2009 Memo at 2. The document does not provide an analysis of the costs of installing and operating a wet scrubber that controls NO_x from an HMIWI; the wet scrubber analyzed in the RTI document was an acid gas scrubber that can control an HMIWI's HCL emissions, and to a lesser extent a HMIWI's PM, metals, and SO_2 emissions. The only NO_x control evaluated in the document was Selective Non-Catalytic Reduction (SNCR), which is the NO_x control selected as BACT for the proposed HMIWI. Therefore, because the BACT analysis was performed for an entirely different pollutant, the associated costs, design, and purpose of the wet scrubber control device are not comparable with the RTI analysis.[4] Additionally, commenter's assumption that costs of technology would diminish over time is unsubstantiated as commenter provides no data to validate this assumption. No further analysis is required for the wet scrubbing device.

As to the commenter's citation to the June 21, 2000, article by the Riverfront Times entitled, *Getting Burned*, the article states,

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[3] Available at https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OAR-2006-0534-0384&contentType=pdf.

[4] RTI International Memorandum Revised Compliance Costs and Economic Inputs for Existing HMIWI dated July 6, 2009; Table 2 Summary of Model HMIWI Control Option Costs.

> **Indeed, Stericycle plans on spending $500,000 to install additional pollution- control devices, including a new wet scrubber, to ensure that its incinerator meets the new pollution standards that go into effect in Missouri on Sept. 1.**

The text of the article does not state that the wet scrubber was a NO_x scrubber and the commenter has not provided information supporting such a conclusion. UDAQ contacted Stericycle regarding the type of scrubber utilized at the facility referenced in the article. *See* UDAQ Letter. While the Missouri facility is no longer in operation (2002 plant closure), as stated in Stericycle's response letter dated June 23, 2017, Stericycle verified that a wet scrubber for NO_x control would not have been installed at the facility. *See* Stericycle's Response Letter. Stericycle further stated that all wet scrubbers employed by Stericycle incinerator facilities control either particulate and/or soluble acid gases, specifically hydrogen chloride and sulfur oxides. It may be noted that the ITA for the proposed Tooele facility requires a wet gas scrubber for this purpose.

The commenter also suggests that the BACT analysis was insufficient due to lack of vendor data to substantiate cost-effectiveness step of the analysis. UDAQ requested further cost information and documentation from Stericycle to support the analysis. *See* UDAQ Letter. Stericycle submitted cost estimates prepared by El Dorado Engineering Inc., for SNCR, SCR, wet NOx scrubber, and catalyst impregnated bags. *See* Stericycle's Response Letter, Attachment 1. The El Dorado Engineering estimates are consistent with UDAQ's experience with these controls.

Additionally, Stericycle incorporated the El Dorado Engineering estimates into a revised cost-effectiveness analysis for SCR, wet NOx scrubber, and SNCR. While the El Dorado Engineering estimates and the associated revised cost-effectiveness analyses differ slightly from that provided in the NOI, the changes do not alter UDAQ's BACT determination as to the economic infeasibility of installing SCR, wet NOx scrubber, or catalyst impregnated bags.

The updated equipment cost estimate for SCR is $933,300 compared to the estimate included in the NOI of $1,008,400. *See* Stericycle's Response Letter, Attachment 2, Table G-1a; NOI, App'x G, Table G-1. The updated cost effectiveness estimate is $18,556 per ton (at 90% control efficiency) and $20,875 per ton (at 80% control efficiency). *See* Stericycle's Response Letter, Attachment 2, Table G-1a. This compares to the cost effectiveness estimate in the NOI of $22,902 per ton (at 80% control efficiency). *See* NOI, App'x G, Table G-1. The updated cost effectiveness for SCR is sufficiently high to justify exclusion of the technology as a viable option for NO_x control.

Stericycle also provided updated equipment cost for a wet scrubbing system for NO_x, as well as an updated cost effectiveness analysis. *See* Stericycle's Response Letter, Attachment 2, Table G-2a. The updated cost effectiveness estimate is $21,350 per ton (at 75% control efficiency) and $26,687 per ton (at 60% control efficiency). *See id.* This compares to the cost effectiveness estimate in the NOI of $23,876 per ton (at 75% control efficiency). *See* NOI, App'x G, Table G-2. The updated cost effectiveness for a wet NO_x scrubber is sufficiently high to justify exclusion of the technology as a viable option for NO_x control.

The vendor equipment cost for SNCR ranges from $38,400 to $86,000, depending on the option chosen (liquid vs. vapor injection), compared to the estimate included in the NOI of $20,000. *See* Stericycle's Response Letter, Attachment 1 (Options 1 and 2 in the Table); NOI, App'x G, Table G-3. The cost effectiveness analysis has been recalculated using the lower end of the range of $38,400. *See* Stericycle's Response Letter, Attachment 2, Table G-3a. The updated cost effectiveness estimate is $3,262 per ton compared to the cost effectiveness estimate in the NOI of $2,645 per ton.

***See id.*; *see also* NOI, App'x G, Table G-3. The SNCR remains cost effective and is, therefore, selected as BACT for the HMIWI's NO_x emissions.**

The NOI and SPR also evaluated the costs associated with controlling Dioxins/Furans (CDD/CDF) by installing catalyst impregnated bags at the baghouse. *See* NOI, App'x G at G-21, Table G-4; SPR at 14-15. The estimated cost for utilizing catalyst impregnated bags in the baghouse is $190,000. *See* Stericycle's Response Letter, Attachment 1 (Option 4 in the Table). This is higher than the cost estimate included in the NOI of $20,000 and, therefore, the economic impact of catalyst impregnated bags remains sufficiently high to justify exclusion of this technology. *See* NOI, App'x G, Table G-4. Additionally, the top three controls for dioxin/furan control (good combustion practices, carbon injection followed by a baghouse, and carbon bed) are being utilized as BACT. *See* NOI, App'x G at G-22; SPR at 15.

12) The commenter argued that the BACT analysis conducted by UDAQ is legally deficient because UDAQ failed to make the emission limitations practically enforceable.

UDAQ Response: In response to the commenter's suggestion that the emission limitations are not practicably enforceable, UDAQ directs the commenter to the Condition II.B.1.f of the ITA, establishing emission limitations for nine pollutants. The ITA expressly details how the owner/operator will demonstrate compliance with each of the proposed emission limitations. ITA, Condition II.B.1.g (establishing initial and subsequent stack testing requirements); Condition II.B.2.a (establishing requirements to operate CO and NO_x CEMS); Condition II.B.2.f (requiring the owner/operator to establish and reestablish site-specific operating parameters pursuant to section 60.51c); Condition II.B.2.e (establishing a requirement for the owner/operator to obtain continuous process operations monitoring data). The commenter does not identify any condition that is deficient in this regard.

13) The commenter argues that UDAQ's BACT analysis is not based on an objective analysis of the costs and benefits of the potential controls for the HMIWI because it only evaluates the economic impact of the controls and does not provide an analysis of the environmental and energy impacts of the potential controls.

UDAQ Response: The BACT selection process considers energy, environmental, and economic impacts where the top control is rejected as part of step 4 of a BACT analysis. The three factors serve as a basis to reject an otherwise feasible control option. *See e.g.*, EPA NSR Workshop Manual B.26-29 ("In the event that the top candidate is shown to be inappropriate, due to energy, environmental, or economic impacts . . ."), B.46-47 (discussing the scope of an environmental impacts analysis). Consistent with this BACT selection process, where an applicant proposes to install the top control option, as Stericycle did for the HMIWI's CO, PM, Cd, Hg, SO_2, HCl, and Dioxin/Furan emissions, there is no need to provide an in-depth evaluation of the other controls. *See e.g.*, *id.* B.8 ("[A]n applicant proposing the top control alternative need not provide cost and other detailed information in regard to other control options.").

In several instances, the applicant provided cost information that demonstrated to UDAQ's satisfaction that a particular control technology was not economically justified. To further substantiate its analysis, Stericycle provided additional and updated information in response to UDAQ's request regarding cost-effectiveness of SCR, wet NO_x scrubber, SNCR, and catalyst impregnated bags. *See* Stericycle's Response Letter, Attachments 1, 2. This additional information further supported UDAQ's review of Stericycle's BACT analysis, which eliminated SCR, wet NO_x

scrubber, and catalyst-impregnated bags due to their high cost. *See* NOI, App'x G, G-6 and G-7, Tables G-1 and G-2 (eliminating SCR and wet NO_x scrubber as not cost-effective for controlling NO_x emissions from HMIWI); *id.*, App'x G, G-21, Table G-4 (eliminating catalyst-impregnated bags as not cost-effective for controlling dioxin/furan emissions from HMIWI); *see* Stericycle's Response Letter, Attachment 2, Tables G-1a, G-2a. Based on this additional information, the cost for catalyst-impregnated bags was even higher than originally estimated and thus, those controls would be even less cost-effective than originally determined. *See id.* at 2.

Neither UDAQ nor the applicant identified any energy or environmental considerations that would invalidate an otherwise viable control technology. Nor does the commenter identify any potentially unusual or adverse environmental or energy impacts that would support eliminating any of the selected BACT controls.

EPA acknowledged in the preamble to the final HMIWI rule that there would be water, solid waste, secondary air, and energy impacts associated with a new source employing controls. 74 Fed. Reg. 51,398, 51,399. According to the preamble, these impacts include additional wastewater and solid waste, additional electricity, and additional natural gas usage. The Tooele facility will result in minor energy and environmental impacts consistent with EPA's expectations in the preamble; however, these impacts do not disqualify the selected control technologies, as EPA expects these impacts to occur in order to minimize emissions of air pollutants. In addition to natural gas and electricity usage for the overall control system, the SNCR system will result in small quantities of ammonia emissions, referred to as ammonia slip, which consist of unreacted ammonia from incomplete reaction with NO_x. Emissions of ammonia are expected to be approximately 1 ppm or 0.07 tons per year. *See* NOI App'x C at C-3, Table C-1; SPR 29. The use of a fabric filter baghouse will require disposal of collected fly ash and used bags, which will be sampled for hazardous compounds prior to disposal. *See* NOI App'x A at A-3 (also attached to SPR).

14) The commenter claims that the NOI for the proposed HMIWI lacks data on uncontrolled emissions, which prevents an accurate calculation of the amount of pollution removed and cost of the removal for purposes of BACT.

UDAQ Response: UDAQ disagrees with this comment because the NOI provides information on the proposed facility's uncontrolled emissions. *See* NOI, Table C-1 (providing a pollutant-by-pollutant calculation of the proposed facility's "Uncontrolled Potential to Emit" and "Controlled Potential to Emit"); Table D-1 (providing a pollutant-by-pollutant calculation of the proposed facility's "Uncontrolled Emissions").

Furthermore, the BACT analysis identified and evaluated the amount of reductions where an economic analysis of the pollution controls was necessary. *See* NOI Tables G-1, G-2, G-3, and G-4. A BACT analysis following a five-step, top-down methodology ranks technically feasible controls by effectiveness in step 3 of the analysis. (The commenter did not take issue with this step of the BACT analysis.) At step 4, the controls are further evaluated to determine if economic, environmental, or energy impacts of the controls are sufficient to justify the exclusion of the most-effective control option. But, as noted above, if the source proposes to accept the most-effective control option, there is no need to conduct an economic analysis to determine the cost-per-ton of pollutant removed by each control.

In conducting a BACT analysis for the proposed HMIWI, NO_x is the only pollutant for which Stericycle did not propose to install the most effective control option. In other words, the selection

of controls for all other pollutants ended at step 3 of the analysis where the most effective control was chosen (for these pollutants, the BACT analysis continued by imposing an emission limitation for each pollutant as well). As a consequence of Stericycle's proposal to install the most effective controls for the HMIWI's CO, Hg, Dioxin/furans, HCl, SO_2, PM, Pb, and Cd, there was no need to evaluate the costs of installing and operating controls for those pollutants. There was, however, a need to evaluate the cost-per-ton of NO_x emissions for the three technically feasible NO_x controls. As a result, the NOI provided an analysis of the cost effectiveness for NO_x controls determined to be technically feasible. This included providing an estimate of the HMIWI's uncontrolled potential to emit NO_x. *See* NOI, Tables G-1 to G-3. As explained above, Stericycle supplemented cost-effectiveness analysis by obtaining vendor data and updated cost-effectiveness calculations, which further supported the original BACT analysis. *See* Stericycle's Response Letter, Attachments 1, 2.

15) The commenter states that this source is subject to 40 C.F.R. § 60 Subpart Ec, which requires a Siting Analysis. The commenter claims that UDAQ failed to require the siting analysis by allowing Stericycle to satisfy it through BACT and not requiring any documentation in support of the siting analysis. The commenter argues that BACT cannot replace the siting analysis because section 60.54c requires consideration of "air pollution control alternatives that minimize, on a site-specific basis, *to the maximum extent practicable*, potential risks to public health or the environment...." The commenter concludes that Subpart Ec's siting requirement imposes a "tougher" standard than BACT.

UDAQ Response: UDAQ disagrees with this comment. Section 60.54c(b) authorizes UDAQ to rely on other analyses as long as they satisfy Subpart Ec's siting requirements and include consideration of air pollution control alternatives. Section 60.54c(b) reads, "Analyses of facility impacts prepared to comply with State, local, or other Federal regulatory requirements may be used to satisfy the requirements of this section, as long as they include consideration of air pollution control alternatives specified in paragraph (a) of this section." Paragraph (a) specifies that the air pollution control alternatives must "minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment." *See* 40 C.F.R. 60.54c(a). The analysis of such alternatives "may consider costs, energy impacts, non-air environmental impacts, or any other factors related to the practicability of the alternatives." *See id.*

Consistent with these provisions, UDAQ determined that the BACT analysis for the HMIWI satisfied Subpart Ec siting requirements. *See* SPR, Comment N. 12 ("The Siting requirement has been fulfilled through the BACT analysis which considers the potential control equipment options for this proposed facility."). A comparison of Subpart Ec's siting requirement with the BACT requirement of UAC R307-401 demonstrates that if a project satisfies BACT, Subpart Ec is necessarily satisfied. The analyses required for BACT and Subpart Ec siting requirements are functionally equivalent, as demonstrated in the table below, showing operative elements of both requirements.

UAC R307-401-2: BACT	40 C.F.R. 60.54c(a): Siting Analysis
analysis of potentially available pollution controls	consider air pollution control alternatives
maximum degree of reduction of each air contaminant	minimize . . . to the maximum extent practicable
case-by-case basis	site-specific basis
taking into account energy, environmental, and	may consider costs, energy impacts, non-air

economic impacts and other costs	**environmental impacts, or any other factors related to the practicability of the alternatives**

Both analyses require evaluation of air pollution control options by taking into account several factors (energy, environmental and economic impacts and considerations) in order to, in the case of BACT, achieve "the maximum degree of reduction of each air contaminant," and, in the case of the Ec-Siting Analysis, "minimize ... to the maximum extent practicable, potential risks to public health or the environment." Under both provisions, the focus is on conducting an evaluation of air pollution controls that result in a minimization of emissions.

The BACT analysis used in this permitting action satisfies Subpart Ec's siting requirements. By following the five-step top-down methodology, the BACT analysis evaluated all potentially feasible control options and alternatives to control HMIWI emissions. Furthermore, by achieving the maximum degree of reduction for each air pollutant consistent with the specified criteria, BACT controls will necessarily minimize, to the maximum extent practicable, potential risks to public health and the environment. In other words, BACT results in the maximum reduction in each air contaminant, minimizing exposure and corresponding risk to public health and the environment.

There are no geographic site-specific characteristics in this case that would alter the control alternatives analysis and the commenter has not suggested otherwise. Furthermore, the analysis of controls is site-specific to the material to be incinerated and the incinerator process and equipment to be utilized.

Addressing the comment that the record does not include documentation supporting the siting analysis, Subpart Ec allows a BACT analysis to satisfy the siting analysis obligation. Consequently, because the BACT analysis is being relied on to satisfy the siting analysis, the applicable documentation is contained in the BACT analysis. As explained in other responses to comments, the BACT analysis for the proposed HMIWI is fully documented and complete.

16) Commenter states that the Director did not require Stericycle to comply with 40 C.F.R. 60.54c Siting Requirements.

A. Commenter stated ". . . the Division has failed to require Stericycle to meet the NSPS Ec siting requirements. After all, under 40 CFR 60.54c (b) . . . Stericycle must still undertake consideration of air pollution control alternatives that 'minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment.' 40 CFR 60.54c(a). There is nothing in the record to show that this analysis occurred or that consideration of 'best available control technology' is anything like an analysis of 'alternatives that minimize, on a site-specific basis, to the maximum extent practicable, potential risks to public health or the environment.'"

Commenter also stated that the BACT was deficient and should not have been used as a proxy for meeting the "maximum extent practicable" standard. The commenter stated that the UDAQ's BACT determination did not evaluate risk to public health or environment, but rather deferred to exaggerated cost information that had no support in the record.

Commenter also stated that the Director did not comply with 40 CFR 60.54c(c) as this regulation referenced 40 CFR 60.58c(a)(1)(iii), which required Stericycle to submit all documentation produced as a result of the siting requirements of 60.54(c).

DAQ Response: *See* Response to Comment #15.

B. Commenter also states "The record does not include:

i. Any analysis of pollution controls and costs at other Stericycle plants;

UDAQ Response: UDAQ disagrees with the comment. BACT analysis in UAC R307-401-5 does not require the source to compare its proposal with other operations of the same source throughout the country. It only requires an applicant to analyze possible pollution controls for site-wide operations. Additionally, the record contains RTI Document Revised Compliance Costs and Economic Inputs for Existing HMIWI which does include an analysis of other existing Stericycle facilities and their associated control equipment.

ii. Analysis of waste disposal alternatives to incineration;

UDAQ Response: The commenter fails to cite any requirement to consider waste disposal alternatives to incineration in a BACT analysis. Stericycle has proposed a HMIWI to treat specific categories of wastes. As explained in response to Comment 7, Stericycle proposed to construct an incinerator, as opposed to an alternative type of facility relying on alternative processes, equipment, and controls, because the discrete categories of wastes intended for incineration are most effectively treated by incineration when compared to other alternatives. *See* Stericycle's Response Letter, Attachment 3 (discussion of the facility's objective, basic design, and purpose).

iii. Any basis for cost estimates;

UDAQ Response: UDAQ disagrees with this comment. Appendix G, Tables G-1, G-2, G-3, and G-4 address the cost estimates used for the BACT analysis conclusions. In addition, Stericycle provided an updated economic and feasibility review of the cost effectiveness of SCR, wet NOx scrubber, and SNCR in a letter dated June 23, 2017. The data included estimated vendor cost information provided by El Dorado Engineering located in West Jordan, Utah. The resulting data confirmed that BACT conclusions established in the SPR on pages 6 through 13 and the ITA document are valid and accurate. *See also* Response to Comment #11.

Additionally, except for the cost estimates for wet scrubbing for NO_x, the commenter has not offered information on costs. As discussed elsewhere in these responses, the two references supplied by the commenter suggesting lower costs for a NO_x wet scrubber do not, in fact, address a NO_x scrubber and are, therefore, not relevant. *See* Response to Comment #11.

iv. Any basis for cost per ton removal estimates;

UDAQ Response: UDAQ disagrees with this comment. The BACT analysis found on pages 6 through 13 of the SPR includes cost per ton removal numbers where appropriate and makes conclusions regarding these totals based on the proposed project. *See also* Response to Comments #11 and #16.B.iii.

v. Documentation or references;

UDAQ Response: UDAQ disagrees with this comment. The comment makes the general statement that there is no documentation or references in the record but it is not clear whether the comment is directed at any part of the BACT analysis or the entire record. In any event, the record contains all direct and indirect costs, including employee, equipment, maintenance, and operational costs, vendor estimates, and EPA Air Pollution Control Cost Manual (OAQPS Cost Control Manual), Sixth Edition, January 2002. *See also* Response to Comment #16.B.iii.

vi. Emission limits achieved at other similar facilities;

UDAQ Response: UDAQ disagrees with this comment. All emission limitations were evaluated based on the type of control equipment proposed along with all state and federal requirements in UAC R307-401 and 40 C.F.R. 60 Subpart Ec. The final emission limitation requirements of Subpart Ec meet all site-wide emissions impact limitations of R307-410 (Permits: Emissions Impact Analysis). Therefore, the Subpart Ec emission limitations were accepted and included in AO Condition II.B.1.f, which are appropriate for this plant. Emission limitations achieved at other plants are based upon the volume of waste processed and the individual plant configuration along with the type of control equipment installed.

vii. Any basis for claims about efficiency, emission rate, and emission reductions.

UDAQ Response: UDAQ disagrees with this comment. UDAQ reviews the proposed BACT based on the industry standards and available control options, source-specific plant operations, control efficiencies, emission rates, emission reductions, energy impacts, and economic impacts. The source claims for efficiency, emission rate, and emission reductions are consistent with previously established operations for these types of control equipment. Therefore, the commenters' claim that there is no basis for efficiency, emission rate, and emission reductions is incorrect. *See also* Response to Comments #11, #12, and #16.

The basis for the control efficiencies for the controls that were eliminated based on cost effectiveness are as follows:

Control	Table in NOI/ Table in Stericycle's Response Letter	Reference for Control Efficiency
SCR	G-1/G-1a	*See* "Cost of Selective Catalytic Reduction (SCR) Application for NO_X Control," EP/600/R-01/087 (Oct. 2001) (referencing "design efficiencies greater than 80 percent and up to 95% of NOx removal") 4, 11, available at: https://nepis.epa.gov/Exe/ZyPDF.cgi/2000CYYO.PDF?Dockey=2000CYYO.PDF; *see also* NOI, App'x G, Table G-1.

		Updated cost effectiveness based on 80% and 90% control efficiencies. *See* Stericycle's Response Letter, Attachment 2, Table G-1a.
Wet Scrubbing (NO_x)	**G-2/G-2a**	**Vendor information identifies control efficiency >60%. *See* Stericycle's Response Letter, Attachment 1, Table, Option 5. Updated cost effectiveness based on 60% and 75% control efficiencies. *See* Stericycle's Response Letter, Attachment 2, Table G-2a.**
Catalyst Impregnated Bags	**G-4**	***See* Gore Remedia website at:** **https://www.gore.com/products/dioxin-furan-filters-for-crematoriums-incinerations-metals-processing** **(last visited on August 3, 2017) ("The GORE® REMEDIA® Catalytic Filtration System destroys up to 99% of gaseous dioxins and furans"); *see also* NOI, App'x G, Table G-4 (Cost effectiveness based on 99% control.).**

Additionally, it may be noted that, even assuming a 100% control efficiency, SCR, wet NO_x scrubbing, and catalyst impregnated bags would not be cost effective. The following table shows the cost effectiveness based on the control efficiencies as presented in the NOI/ITA (including the updated cost/cost effectiveness information provided by Stericycle) and the cost effectiveness if 100% control were assumed.

Control	Table in NOI	Cost Effectiveness as Calculated in NOI/ITA		Cost Effectiveness Based on Assuming 100% Control ($/ton)[5]
		Control Efficiency*	Cost Effectiveness ($/ton)	
SCR	G-1a	90%	18,556	16,699
Wet Scrubbing (NOx)	G-2a	75%	21,350	16,011
Catalyst Impregnated Bags	G-4	99%	287,693,691	284,816,754

***Where multiple control efficiencies are used to calculate cost effectiveness, the highest is shown.**

17) Commenter stated that by setting BACT emission limitations with NSPS Ec without analysis in the record, the Director has violated BACT and the 40 C.F.R. 60.54c(a) siting requirement.

UDAQ Response: UDAQ disagrees with this comment. *See* Response to Comments #11 and #13.

18) Commenter stated that a waste management plan had not been provided, which violated Title V requirements for NSPS.

[5] The numbers in this column were calculated by dividing the Total Annualized Cost of controls by potential (i.e. uncontrolled) NO_x or CDD/CDF emissions. *See* Stericycle's Response Letter, Attachment 2, Tables G-1a and G-2a; NOI, App'x G, Table G-4.

UDAQ Response: UDAQ disagrees with this comment. *See* Response to Comment #10.H. The commenter believes that the Title V program requires Stericycle to prepare a waste management plan (WMP) as part of the approval order process. While the proposed Tooele County facility will be a Title V source, Title V does not dictate UDAQ's issuance of an approval order and does not impose any substantive requirements. Under Utah's Title V program, Stericycle will not be required to submit a Title V permit application for twelve months after becoming subject to the Title V program i.e., after becoming operational. *See* UAC R307-415-5a(1)(a). At this time, there are no Title V requirements applicable to this source as it does not have a Title V permit.

As to the WMP, UDAQ initially understood that the Solid Waste Incinerator Permit that Stericycle has applied for from the Utah Division of Waste Management and Radiation Control (DWMRC) would satisfy the WMP of Subpart Ec. *See* SPR, Comment No. 12. UDAQ has determined that Stericycle shall meet the requirements for submittal of the WMP in accordance with 40 C.F.R. §60.58c(c)(3). In addition, Stericycle's response letter dated June 23, 2017, indicated that it will submit such plan no later than 60 days after initial performance test as required by 40 C.F.R. §60.58c(c)(3). *See* Stericycle's Response Letter at 2.

Subpart Ec does not require that the Waste Management Plan be subject to public comment. When EPA originally adopted Subpart Ec on September 15, 1997, EPA stated the following regarding the WMP:

> **A copy of the waste management plan would be submitted to EPA along with the results of the initial performance test demonstrating compliance with the emission limits. In addition, the waste management plan may be reviewed by the Joint Commission on Accreditation of Health Care Organizations during the accreditation process.**

62 Fed. Reg. 48,348, 48,359 (Sept. 15, 1997). EPA codified the timing of the submission of the WMP in section 60.58c(c): "The owner or operator of an affected facility shall submit the following information specified in paragraphs (c)(1) through (c)(4) of this section no later than 60 days following the initial performance test. . . . (3) The waste management plan as specified in § 60.55c." EPA's preamble statement and the condition show that EPA did not intend the WMP to be subject to public comment because it must be submitted to the agency after construction and commencement of operation. Furthermore, the text of Subpart Ec does not state that the WMP must be subject to public comment.

19) Commenter stated that a Startup, Shutdown, and Malfunction (SSM) Plan had not been provided. Commenter additionally stated that according to MACT standards "the owner or operator of an affected source must develop a written startup, shutdown, and malfunction plan that describes, in detail, procedure for operating and maintaining the source during periods of startup, shutdown, and malfunction…." Commenter concluded by saying that the record was missing evidence of this plan and potential emissions from the SSM plan.

UDAQ Response: UDAQ disagrees with this comment. In the SPR, UDAQ identified the applicable federal requirements for the Tooele Stericycle facility. *See* SPR at 3. Stericycle is subject to the NESHAP or MACT requirements found in 40 C.F.R. § 63 Subpart A (General Provisions) and Subpart ZZZZ (National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines). But these requirements do not apply to

HMIWI. The NSPS regulations applicable to the HMIWI are promulgated pursuant to Part 60, which also does not require a SSM. Furthermore, EPA specifically declined to use the Part 63 General Provisions as a basis for regulation of HMIWI. *See* 74 Fed. Reg. at 51,395.

The reason UDAQ listed these provisions is because the proposed facility includes a 500-kW emergency generator subject to these requirements. *See* 40 C.F.R. § 63.2 (definition of the "affected source"). No other on-site equipment associated with the HMIWI plant is subject to a NESHAP or MACT. The generator is a separate emissions unit from the HMIWI and is limited to 300 hours of operation annually and is intended to minimize the use of the emergency bypass stack during power interruptions. This generator will be subject to Part 63, Subpart ZZZZ. However, EPA exempted generators subject to Subpart ZZZZ from the SSM plan provisions of the Part 63 General Requirements. *See* 40 C.F.R. Part 63, Subpart ZZZZ, Table 8 (excluding section 63.6(e), which includes the SSM requirements, from applying to Subpart ZZZZ sources); 40 C.F.R. § 63.6665.

UDAQ has also evaluated all additional applicable state and federal NSPS, NESHAP, and MACT requirements and determined that this source category does not require a SSM plan. Any potential emissions associated with the emergency generator were included and accounted for in the SPR document, and the UDAQ does not otherwise impose SSM requirements on emergency generators. *See* SPR at 28, 30, C-7; *see also* Response to Comment #3.

Additionally, there is a requirement to minimize emissions during all phases of operation including during SSM. *See* ITA, Condition I.5, R307-401-4. There is a requirement that Stericycle "maintain documentation at the facility that address[es] ... [p]rocedures for responding to periodic malfunction or conditions that may lead to malfunction." 40 C.F.R. § 60.53c(h)(7). There is also a requirement that Stericycle provide operator training and maintain documentation of startup and shutdown procedures. *See e.g.*, *id.* §§ 60.53c(c) & 60.53c(h)(4). Stericycle will be required to comply with this and all other requirements of Subpart Ec. *See* ITA Condition II.B.1.b ("The owner/operator shall operate in accordance with 40 CFR 60 Subpart Ec ..."). However, there is no requirement that such documentation be developed prior to the facility being permitted and constructed, or that it be made available during the public comment period on the ITA. *See e.g.*, 40 C.F.R. § 60.53c(j) (requiring that such documentation "shall be available for inspection by the EPA or its delegated enforcement agent upon request.").

20) Commenter referenced a proposed rule published in the Utah State Bulletin, amending UAC 307-101-3 to incorporate the most current version of the Code of Federal Regulations into the Utah environmental quality rules. *See* Utah State Bulletin (June 1, 2014), Vol. 2014, No. 11, p. 122. This proposed rule described the changes EPA made to the Code of Federal Regulations, including the following change: "The final action removed section 60.56c(d)(2) of subpart Ec which excluded HMIWI units from having to comply with standards during periods of SSM provided that no hospital waste or medical/infectious waste was being charged to the unit during those SSM periods. The EPA had meant to delete this exemption in the 2009 NSPS but inadvertently failed to do so." *Id.* Commenter believes that this proposed rule requires Stericycle to prepare and submit a SSM plan to UDAQ.

UDAQ Response: The proposed rule in the Utah State Bulletin addressed a correction to the standards the HMIWI plants are subject to during times of SSM. The proposed rule did not require Stericycle to provide a SSM plan for Tooele facility. It is the assumption of the commenter that such a requirement exists and no law or reference to such a law is provided. *See also* Response

to Comment #3. The comment concerning a submittal of SSM plan to UDAQ for review is also discussed in Response to Comment #19.

21) Commenter stated that the control technologies for dioxin/furans are insufficient to meet regulatory standards.

C. Commenter stated that "for dioxin and furan compounds, federal law requires 'boiler or industrial furnace burning hazardous waste must achieve a destruction and removal efficiency of 99.99% for all organic hazardous constituents in the waste feed.'[6] The control technologies listed do not meet this requirement, as the baghouse control efficiency is estimated at >99% and the wet venture scrubber is estimated at 80-95%. Therefore, these dangerous pollutants have the potential to be emitted into the surrounding environment."

UDAQ Response: UDAQ disagrees with this comment. Stericycle is subject to 40 C.F.R. § 60 Subpart Ec as specified in AO Condition II.B.1.b., which is specific to Hospital/Medical/Infectious Waste Incinerators. The commenter contends that the federal regulations require a 99.99% destruction efficiency based on the RCRA requirement found under 40 C.F.R. § 266.104a. This regulation does not apply to the HMIWI. The provision cited by the commenter only applies to "hazardous waste burned or processed in a boiler or industrial furnace (as defined by section 260.10)." 40 C.F.R. § 266.100(a). The HMIWI meets neither the definition of a boiler nor an industrial furnace under section 260.10. The HMIWI's dioxin/furan emissions are subject to the emission limitations established in Subpart Ec and the Approval Order. *See* 40 C.F.R. § 60 Subpart Ec, Table 1B; AO, Condition II.B.1.f. Neither Subpart Ec nor the Approval Order impose a control efficiency requirement.

D. Commenter stated that "the assumption that the residency time and temperature in the secondary combustion chamber will be sufficient to control dioxin and furan emissions ignores the reality that conditions are not always optimal. There is a physical impossibility that all dioxins/furans can be reduced and destroyed because optimum conditions do not exist at all times. Moreover, nothing in the NOI or the Engineering Review establishes the control efficiency of this technique or provides monitoring, recordkeeping and reporting requirements necessary to ensure continuous compliance with the residency time measure."

UDAQ Response: UDAQ disagrees with this comment. AO Condition II.B.1.e requires the residence time of the gas in the secondary chamber to be "at least two seconds above 1,800 degrees F." The minimum secondary chamber temperature will be established during performance testing as per Condition II.B.1.e. Note that the industry standard for destruction of dioxins/furans is 1650 degrees F.[7]

Recognizing that it is difficult to operate under optimal conditions for dioxin/furan destruction, each HMIWI incinerator is designed to operate above the temperature established during performance testing at all times. This design ensures that the dioxin/furan emission limitation in 40 C.F.R. § 60 Subpart Ec will be met.

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[6] 40 CFR 266.104(a) https://www.law.cornell.edu/cfr/text/40/266.104
[7] EPA Risk Burn Guidance for Hazardous Waste Combustion Facilities - July 2001.

Additionally, the two-second residency time in the secondary chamber is assured through the incinerator's design. The secondary chamber will be sized to assure two seconds of residence time at the maximum temperature and gas flow rate. Accordingly, under lower temperatures and gas flow rates, the residence time will increase, ensuring a minimum residency time of two seconds under all operating conditions. Hence the residence time is inherent to the physical design of the HMIWI, and therefore, not subject to the variability that the comment suggests.

The commenter also does not recognize that Condition II.B.1.e requires monitoring and recording of the secondary chamber temperature at all times for each HMIWI unit operation. Therefore, this source is subject to monitoring, recordkeeping and reporting requirements to ensure compliance with dioxin/furan emission limits. *See also* BACT Evaluation Table in Response to Comment #11.

E. The commenter stated that UDAQ did not consider additional pollution controls or cumulative controls potentials. As an example, the commenter referred to a report prepared for the Dioxins and Furans Incineration Review Group, commissioned by the Canadian Council of Ministers of the Environment,[8] where several technologies were considered. One of the technologies is carbon based systems that are effective for PCDD/F (dioxin/furan) control. The commenter explained,

> The two main variants of this technology are PAC injection into the gas stream and carbon bed filters known commercially as activated char reactors [ACR] or absorbers. Recently a new carbon system, the ADIOX process, has been developed in Europe. This system has been applied in many European wet cleaning systems where the scrubber elements have been replaced by carbon impregnated polypropylene elements. Another control measure, the catalytic reactor, destroys the PCDD/F molecules. However, the BACT review failed to consider the majority of the technologies listed.

UDAQ Response: UDAQ disagrees with this comment. As noted by the commenter, the CCME Report specifically identifies carbon based systems as being effective for dioxin/furan control noting that, "[t]he two main variants of this technology are PAC injection into the gas stream and carbon bed filters." In fact, the BACT determination requires that both technologies be employed (in addition to good combustion practices and a baghouse). Furthermore, the CCME Report states that activated carbon bed systems have the highest known removal efficiency for dioxins and furans (>99.9%). Consequently, the CCME Report supports that the BACT determination for dioxin/furans in this proposed permit required the use of the most effective control technology. UDAQ's BACT review for dioxin/furans included equipment previously utilized and proven for controlling dioxin/furan emissions in HMIWI operations. The commenter does not provide information and documentation as to the control effectiveness and costs of the equipment it cites as an example of additional technology. UDAQ researched this technology and concluded that the "ADIOX process" is a technology currently used in Europe to reduce PCDD/F emissions here was no specific control efficiency established for use of this technology, but it was stated that the

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[8] The report is available at http://www.ccme.ca/files/Resources/air/dioxins_furans/waste_incinerators_coastal_pulp/1395_d_f_review_chandler_e.pdf. Referred to as CCME Report.

PCDD/F limitation being met through use of ADIOX in the European Union was 0.1 ng/M^3 TEQ. *See* "Dioxin Removal in Hazardous Waste Incineration Using Adiox" Report at Summary. Stericycle's current emission limitation for PCDD/F is 0.035 ng/M^3 TEQ in AO Condition II.B.1.f. UDAQ notes that the PCDD/F emission limitation for the Stericycle's Tooele plant is 65% lower than the limitation on a source that used ADIOX as control technology. The current dioxin/ furan BACT analysis for the proposed Tooele facility requires carbon injection into the waste gas stream, a baghouse, and a carbon bed (or equivalent) system. This dioxin/furan control system is designed to meet a lower emission limitation than the limitation the commenter is presenting in the example from the CCME Report. This further demonstrates that the BACT review properly considered all required technologies for controlling of dioxin/furan emissions.

Further, with respect to the ADIOX process, the CCME Report explains that this process is another form of carbon adsorption that scrubbing elements in wet scrubbers are replaced with carbon particles homogeneously embedded in polypropylene. The CCME Report cites to a limited number of cases where the ADIOX material is used and provides data that supports that it is less effective than the use of traditional activated carbon systems proposed for BACT in this case.[9] Additionally, it should be noted ADIOX technology has a significant drawback. Specifically, the absorber is prone to scaling if the liquor pH exceeds 7.5 which can happen either from over-injection of caustic during a pH control overshoot or by absorption of alkaline components in the flue gas. Any scaling would deposit on the carbon impregnated packing and render it ineffective.

The catalytic reactor control technology cited in the CCME Report utilizes a catalyst to oxidize organics at lower temperatures than what would otherwise be required. This approach has come to be known as SCR DeDiox technology. *See* CCME Report at 47. The CCME Report suggests inferior removal efficiencies ranging from 88% to approximately 99.5% (compared to > 99.9% cited in the CCME report for carbon adsorption beds). *See id.* at 45, 47-48. Furthermore, the BACT analysis contained in the NOI and the SPR include an estimate of the cost for catalyst impregnated bags, which supported this technology not being cost effective. *See* NOI, Table G-4. In addition, the commenter did not show that either the catalytic reactor nor the ADIOX process technologies were currently in operation in the United States. Review of unproven control equipment is not required for the BACT analysis under UAC R307-401-5.

F. The commenter stated that there was no data to suggest that Stericycle would be able to minimize incomplete combustion at all times. Commenter requested that the AO address the requirements for "good combustion practices."

UDAQ Response: UDAQ disagrees with this comment. Stericycle is subject to 40 C.F.R. § 60 Subparts A, Ec, IIII, and 40 C.F.R. § 63 Subparts A and ZZZZ. These regulations require adherence to specific emission limitations for a source to be in compliance. Stericycle's equipment operates on natural gas or diesel fuel and complies with specific maintenance requirements. To ensure that the equipment is operating according to the best practices, Stericycle will keep on-site maintenance records available to UDAQ's compliance inspectors upon request. *See* AO Condition I.4. In addition to the AO conditions, it is typically in the operator's best interest to maintain and operate the fuel combustion equipment at optimum levels to prevent waste and unnecessary fuel

[9] Compare CCME Report at 45 ("ACR systems have the highest known removal efficiency for dioxins and furans (> 99.9%)") with CCME Report at 49 (identifying removal efficiencies for one system utilizing ADIOX packing in a wet scrubber ranging from 65% to 90% and another system having removal efficiencies in excess of 97.5%).

combustion. Therefore, the UDAQ does not see a need to include good combustion practices as an AO condition.

G. The commenter stated that the NOI and ITA do not provide information on what constitutes good combustion practices and consequently the requirement is not enforceable unless the AO explains what constitutes good combustion practices.

UDAQ Response: The BACT analysis determined that good combustion practices represent BACT for several pollutants. An effective way to verify that an owner or operator has implemented good combustion practices is by monitoring CO emissions. Indeed, in evaluating Subpart Ec, EPA stated, "The continuous monitoring of CO emissions is an effective way of ensuring that the combustion unit is operating properly." 73 Fed. Reg. 72,962, 72,986 (Dec. 1, 2008); *see also* 62 Fed. Reg. 48,348, 48,361 (Sept. 15, 1997) (stating that the "best measure or good combustion" for HMIWI is through monitoring CO emissions); 75 Fed. Reg. 31,939, 31,961 (June 4, 2010) (proposing to require commercial and industrial solid waste incinerators to install CO CEMS because the CEMS "would help ensure that the sources are operated well using good combustion practices. Low CO levels are an indicator of complete combustion and that the unit is being operated in a manner that minimizes not only CO emissions, but also emissions of other pollutants."); 70 Fed. Reg. 59,402, 59,461 (Oct. 12, 2005) ("Carbon monoxide and hydrocarbons are widely accepted indicators of combustion conditions. . . . In addition, carbon monoxide and hydrocarbons are used by many CAA standards for combustion sources to control emissions of organic HAP, including: MACT standards for hazardous waste burning incinerators, hazardous waste burning cement kilns, hazardous waste burning lightweight aggregate kilns, Portland cement plants, and industrial boilers; and section 129 standards for commercial and industrial waste combustors, municipal waste combustors, and medical waste incinerators.").

Consistent with the BACT determination and the requirements of Subpart Ec, each HMIWI will be subject to a CO emission limitation of 11 ppmv. *See* AO, Condition II.B.1.f. This is a very low CO concentration and compliance with it will provide assurance that the facility will be employing good combustion practices. Moreover, Condition II.B.2.a requires Stericycle to operate a continuous emission monitoring system (CEMS) for each HMIWI's CO emissions. *See id.*, Condition II.B.2.d ("The owner/operator shall obtain CEMS monitoring data at all times during HMIWI operation in accordance with 40 CFR 60.13. The owner/operator shall monitor and record all emissions data during all phases of source operations, including start-ups, shutdowns, and process malfunctions.). Consequently, the CO emission limitation coupled with the requirement that Stericycle operate a CO CEMS provides the necessary limitations and data that ensures Stericycle is using good combustion practices on a continuous basis for each HMIWI. Additionally, the same limitation and data requirements ensure that the requirement to use good combustion practices is practicably enforceable.

22) Several commenters stated that Stericycle has violated the November 2014 Settlement Agreement (No. 2013051501) because it applied for a permit for a facility that is not equal in size and processing capacity to the North Salt Lake plant. Specifically, one of the commenters noted that the Settlement Agreement defined the facility as a plant operating at North Salt Lake address with a capacity of 2,500 pounds of waste per hour and one incinerator. Consequently, the Tooele plant may not almost double its capacity to 4,100 pounds per hour and may not install two HMIWI units.

One commenter argued that NOI was contrary to the intent and purpose of the 2014 Settlement Agreement because the proposed facility "exceeds the bounds of the Settlement Agreement and provides a financial boon for Stericycle." The commenter stated that the proposed relocation financially rewarded the company when the intent of the Settlement Agreement was to penalize the company for prior violations.

UDAQ Response: UDAQ disagrees with this comment. *See* Response to Comments #6, #10.E, and #10.F. In this permitting action, UDAQ does not address comments on the 2014 Settlement Agreement, nor can the commenter use the public comment period on a permit to attack either the terms of or compliance with the Settlement Agreement.

In any event, the Settlement Agreement allows Stericycle to move its operations to a new location in Tooele County. The commenters assume that the plant equipment and capacity allowed in the North Salt Lake permit (DAQE-AN101420011-14) should remain the same for the Tooele plant. However, the Settlement Agreement did not address the type, size, or equipment of the new plant. As long as Stericycle submits an NOI for the new Tooele location that demonstrates compliance with current state and federal requirements, such new operation is not limited by the production limits, types of equipment, or size of the North Salt Lake plant.

The commenters' assumption that the same plant must be relocated to Tooele is flawed for another reason. The Settlement Agreement under Recital 6 Settlement Discussions states, ". . . if a suitable, remote location could be found for a new incinerator in Utah that would be built with better air pollution control technology than is currently required at the Facility . . . ." The reference to a better air pollution control technology demonstrates that the new incinerator plant will not be the same as the North Salt Lake plant and will be evaluated as proposed by Stericycle. The fact that Stericycle plans to move indicates that a "more suitable location" was found.

23) Commenter stated that the Description of Proposal on page 4 of the UDAQ SPR did not indicate that the use of the bypass stack might be considered a violation of certain emission limits found in 40 C.F.R. § 60 Subpart Ec. Commenter cited to 40 C.F.R. § 60.56c(g)(5) (applicable to facilities with a dry scrubber followed by a fabric filter and a wet scrubber) that considers the use of the bypass stack to be a violation of the PM, dioxin/furan, HCl, Pb, Cd and Hg emission limits.

UDAQ Response: UDAQ evaluated the comment and determined that no change to the SPR or AO Condition is necessary. AO Condition II.B.1.b states:

> **The owner/operator shall operate in accordance with 40 CFR 60 Subpart Ec (Standards of Performance for New Stationary Sources: Hospital/Medical/Infectious Waste Incinerators). All requirements of 40 CFR 60 Subpart Ec including but not limited to Emissions Limits, Operator Training and Qualifications, Siting, Waste Management Plan, Compliance and Performance Testing, Monitoring, Reporting, and Recordkeeping, shall apply at all times of source operation.**

***Id.* This Condition encompasses all requirements of 40 C.F.R. § 60 Subpart Ec, including Sections 60.56c(e)(5), (f)(6) and (g)(5). Thus, UDAQ does not need to specify that 40 C.F.R. § 60.56c(g)(5) applies.**

The use of the bypass is not a permitted mode of operation. However, the potential for bypass events due to a significant process upset or other unforeseeable circumstance causing a process interruption is recognized as a safeguard to prevent injury to plant personnel and protect against possible catastrophic damage to equipment. The potential for bypass incidents is recognized in the applicable federal regulation. *See e.g.*, 40 C.F.R. § 60.58c(b)(2)(xv). Any use of the bypass stack in a manner that is prohibited by Subpart Ec would constitute a violation of the PM, D/F, HCl, Pb, Cd, and Hg emission limitations, 60.56c(g)(5), and would be addressed on a case-by-case basis by UDAQ. *See* UAC R307-107.

Because the use of the bypass is not a permitted mode of operations, emissions associated with malfunction incidents are not included in the estimates for the facility's emissions. Additionally, there is no requirement to directly monitor bypass emissions. This is consistent with Subpart Ec and is in recognition of the practical limitations on monitoring during a short-lived, transient bypass event. *See e.g.*, 74 Fed. Reg. at 51394/2 ("It would be very difficult to do any meaningful testing during [an SSM] event because the exhaust flow rates, temperatures, and other stack conditions would be highly variable and could foul up the isokinetic emissions test methods (thus invalidating the testing)."). For similar reasons (that infrequent and transient events are not permitted as a normal mode of operation) controls on the bypass are not technically feasible. UDAQ is unaware of any HMIWIs that have been designed to incorporate monitoring or emission controls on a bypass stack and commenter has identified none. Finally, and as noted above, Stericycle will be required to document procedures and conduct training addressing startups, shutdowns, and malfunctions. *See* Response to Comment #19.

In the event of a malfunction and the use of the bypass, the operator is under a duty to minimize emissions. *See* 40 C.F.R. § 60.11(d), ITA Condition I.5. The facility operators must be trained in implementing established procedures designed to address malfunction incidents that might occur. *See* 40 C.F.R. § 60.53c. Any use of the bypass must be reported consistent with the requirements of Subpart Ec. *See id.* § 60.58c(d)(8). UAC R307-107-2 requires that an estimate of emission be reported for breakdown incidents, which would include the use of the bypass for a malfunction.

24) Commenter requested clarification on the portion of particulate matter emitted as PM_{10} and $PM_{2.5}$.

UDAQ Response: Total particulate emissions are estimated to be 1.94 tons per year. *See* ITA, Abstract. All particulate matter is conservatively assumed to be PM_{10} and $PM_{2.5}$.

25) Commenter inquired as to the methodology used in conducting evaluations pursuant to UAC R307-410 (Permits: Emissions Impact Analysis).

UDAQ Response: The emissions inventory for criteria and HAP emissions is provided on pages 5 and 6 of the ITA and is detailed in the NOI (Tables C-1 through C-4). The potential to emit criteria air pollutants are below the modeling thresholds specified in UAC R307-410-4. A comparison of the maximum pounds per hour of HAPs emissions compared to the applicable emission threshold values (as calculated in accordance with UAC R307-410-5(1)(c)(i)(C)) is shown in Table J-2 of the NOI. The maximum hourly emissions are less than the threshold emission values in all cases and no further analysis is warranted.

26) Commenter was concerned about determination of operating parameters during performance tests and use of bypass stack during these performance tests.

UDAQ Response: The operating parameters are defined in Subpart Ec and will be established accordingly. *See* 40 C.F.R. § 60.51c (defining various operating parameters in including maximum charge rate). The use of the bypass stack during a performance test would invalidate the performance test results. *See id.* § 60.56c(c)(2). Therefore, operating parameters could not be established based on data collected from a performance test during which the bypass stack was used.

27) Commenter inquired about the applicability of the opacity limits to the bypass stack during the bypass events.

UDAQ Response: Commenter asked whether a bypass stack was exempted from the opacity limits in the permit during bypass events. *See* ITA, *Condition* II.B.1.v (under *). This exemption is found in UAC Rule 307-201-3(7) and applies only to the 20% opacity limitations imposed by Rule 307-201-3(2) (generic 20% opacity limit), Rule 307-201-3(3) (20% incinerator limit), and Rule 307-201-3(5) (20% limit for diesel engines manufactured after January 1, 1973) and not to visible emission limitations imposed by Subpart Ec. The bypass stack is thus not subject to the exemption and the condition in the permit will be revised accordingly to reflect the applicability of the UAC Rule 307-201-3(7) exemption to the opacity limits imposed by this regulation only and not to the opacity limits imposed by Subpart Ec.

28) Commenter asked whether prionic waste would be processed/incinerated at the facility.

UDAQ Response: Prionic waste is within the scope of the term "medical/infectious waste" as defined by Subpart Ec. *See* 40 C.F.R. § 60.51c. Accordingly, under the terms of the approval order and Subpart Ec, prionic waste could be incinerated in the proposed HMIWI. When treating prionic waste, or any other hospital, medical or infectious waste, the HMIWI will be required to comply with all applicable emission limitations.

Furthermore, as noted by the commenter, operation of the HMIWI will also be subject to regulation by the Division of Waste Management and Radiation Control (DWMRC). The proposed Solid Waste Incinerator Permit issued by DWMRC includes Condition I.D.1.b, which requires Stericycle to obtain prior approval from DWMRC before accepting "Prion wastes containing diseases such as 'Mad Cow Disease' (Bovine Spongiform Encephalopathy, BSE) ...."

29) Commenter requested clarification on the distinction between "emergency breakdown," "malfunction," "startup," and "shutdown."

UDAQ Response: Subpart Ec defines the terms startup, shutdown, and malfunction. *See* 40 C.F.R. § 60.51c. The term "emergency breakdown" is included in the comment but is not used in the NOI, ER, or ITA, which is consistent with the Utah regulations that define and utilize the term "breakdown" only. *See* UAC R307-101-2.

30) Commenter made several comments pertaining to the emission inventory requirements of UAC R307-150, including a comment regarding the sulfur dioxide milestone inventory requirements in UAC R307-150-4.

UDAQ Response: The inventory reporting requirements of UAC R307-150 apply as a matter of state law. Additionally, ITA Condition I.7 requires that Stericycle comply with UAC R307-150.

The requirements of R307-150-4 are applicable to sources that have actual emissions of 100 tons or more per year of sulfur dioxide. Estimated emissions of sulfur dioxide for the proposed facility are 2.36 tons per year, making this requirement inapplicable.

31) Commenter asked for clarification on the feed rate for the units.

UDAQ Response: Each unit will have a maximum equipment rating of 2,050 pounds per hour. *See* ITA, Condition II.A.2. Together, both units will be able to process a maximum of 4,100 pounds per hour of hospital/medical/infectious waste. *See id.*, Condition II.B.1.c. Furthermore, Stericycle will be required to establish a maximum charge rate defined as 110 percent of the lowest 3-hour average charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits. *See id.*, Condition II.B.1.d. The actual feed rate will need to comply with these requirements.

This concludes the written comments portion of this memorandum.

NEW SOURCE REVIEW SECTION

SITE ID # AND PROJECT #: N154460001-17
COMPANY NAME: Stericycle-Tooele County Facility
REGARDING: New AO for Hospital, Medical, and Infectious Waste Incinerator Facility

THE ATTACHED DOCUMENT IS CATEGORIZED AS: (PLEASE CHOOSE ONE)

	NEWSPAPER NOTICE (NN)	Office Tech signs cover letter of Newspaper Notice
	INTENT TO APPROVE (ITA)	Cover letter and ITA signed by associated Section Manager
	APPROVAL ORDER (AO)	Copy of purple sheet and cover letter of AO to Teri Weiss
	EXPERIMENTAL AO	Copy of purple sheet and cover letter of AO to Teri Weiss
	CORRESPONDENCE	Signatory varies
	SOIL REMEDIATION	If associated fee, send copy of purple sheet and letter to Teri Weiss
	SALES TAX EXEMPTION (TAX)	
	SMALL SOURCE EXEMPTION	Copy of purple sheet and letter to Teri Weiss
	EMISSIONS BANKING LETTER	Copy of letter to Jon Black
	NAME CHANGE	Copy of purple sheet and letter to Teri Weiss

COPIES TO BE SENT TO THE FOLLOWING PARTIES: (PLEASE CHECK AS THEY APPLY)

√	Manila File Folder (working file)	√	Greens Folder
	Health Department (see letter for which)		EPA – Patrick Wauters
	Compliance (associated Section Manager)		Finance – Teri Weiss
	Name Change Letters: Deborah McMurtrie Susan Weisenberg Dave Beatty		Brett Wilding, Utah State Tax Commission, Technical Research Unit
	Offsets Used? Copy of document(s) to Jon Black		Enter final Name Change Letters in /engineer/aoname
	Copy To:		Enter in /engineer/aocond & in AO Log: (AOs, AO not needed, Replacement in Kind)
	NEWSPAPER NOTICE – COPIES TO: Cities, Counties, Gov. Agencies, & etc./& a copy of Public Official letter with self-addressed envelope E-Mail To: Jodie Swanson, Jenni Potter <u>E-Mail copy & Fax to Newspaper Agencies</u>		PSD PROJECTS: Copy the NOI, Engineering Review, ITA, NOTICE & AO Send to: Patrick Wauters, EPA Don Banks, Bureau of Land Management Chris Hocket, U.S. Forest Service Chris Shaver, National Park Service TITLE V: Check w/ NSR Engineer for which document(s) to be copied.

REVIEWED BY AND DOCUMENT SIGN OFF DATES:

Completeness determination	October 8, 2015	Jon Black JNS
Modeling review of ITA	August 1, 2017	Modeler NSR
Peer review of project	March 14, 2015	Tad Anderson
Section Manager sign off	March 23, 2016	Martin Gray
Branch Manager sign off		Martin Gray

Dave Beatty 8/3/17 for Marty Gray

NEW SOURCE REVIEW SECTION

SITE ID # AND PROJECT #: N154460001-16
COMPANY NAME: Stericycle-Tooele County Facility
REGARDING: New AO for Hospital, Medical, and Infectious Waste Incinerator Facility

THE ATTACHED DOCUMENT IS CATEGORIZED AS: (PLEASE CHOOSE ONE)

✓	NEWSPAPER NOTICE ~~(NN)~~ HN	Office Tech signs cover letter of Newspaper Notice
	INTENT TO APPROVE (ITA)	Cover letter and ITA signed by associated Section Manager Electronic Copy of ITA sent to Ron Reece
	APPROVAL ORDER (AO)	Copy of purple sheet and cover letter of AO to Teri Weiss
	EXPERIMENTAL AO	Copy of purple sheet and cover letter of AO to Teri Weiss
	CORRESPONDENCE	Signatory varies
	SOIL REMEDIATION	If associated fee, send copy of purple sheet and letter to Teri Weiss
	SALES TAX EXEMPTION (TAX)	
	SMALL SOURCE EXEMPTION	Copy of purple sheet and letter to Teri Weiss
	EMISSIONS BANKING LETTER	Copy of letter to Camron Harry
	NAME CHANGE	Copy of purple sheet and letter to Teri Weiss

HNB

COPIES TO BE SENT TO THE FOLLOWING PARTIES: (PLEASE CHECK AS THEY APPLY)

√	Manila File Folder (working file)	√	Greens Folder
✓	Health Department (see letter for which)		EPA – Mike Owens
	Compliance (associated Section Manager)		Finance – Teri Weiss
	Name Change Letters: Deborah McMurtrie Susan Weisenberg Dave Beatty		Brett Wilding, Utah State Tax Commission, Technical Research Unit
	Offsets Used? Copy of document(s) to Camron Harry		Enter final Name Change Letters in /engineer/aoname
	Copy To:		Enter in /engineer/aocond & in AO Log: (AOs, AO not needed, Replacement in Kind)
✓	NEWSPAPER NOTICE – COPIES TO: TC Cities, Counties, Gov. Agencies, & etc./& a copy of Public Official letter with self-addressed envelope WFRC E-Mail To: dvd.kvd@juno.com, Jodie Swanson, Lori Walker, Debbie Oberndorfer, Bill Sinclair, Beverly Rasmussen & Jen Burge, Donna Spangler, Ron Reece, and Kelly Beck E-Mail copy & Fax to Newspaper Agencies		PSD PROJECTS: Copy the NOI, Engineering Review, ITA, NOTICE & AO Send to: Mike Owens, EPA Don Banks, Bureau of Land Management Chris Hocket, U.S. Forest Service Chris Shaver, National Park Service TITLE V: Check w/ NSR Engineer for which document(s) to be copied.

REVIEWED BY AND DOCUMENT SIGN OFF DATES:

Completeness determination	October 8, 2015	Jon Black
Modeling review of ITA		Modeler NSR
Peer review of project	March 14, 2015	Tad Anderson
Section Manager sign off	March 23, 2016	MB Martin Gray
Branch Manager sign off		Reginald Olsen

NEW SOURCE REVIEW SECTION

SITE ID # AND PROJECT #: N154460001-16
COMPANY NAME: Stericycle-Tooele County Facility
REGARDING: New AO for Hospital, Medical, and Infectious Waste Incinerator Facility

THE ATTACHED DOCUMENT IS CATEGORIZED AS: (PLEASE CHOOSE ONE)

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	EMISSIONS BANKING LETTER	Copy of letter to Camron Harry
	NAME CHANGE	Copy of purple sheet and letter to Teri Weiss

NN3
NN4

COPIES TO BE SENT TO THE FOLLOWING PARTIES: (PLEASE CHECK AS THEY APPLY)

√	Manila File Folder (working file)	√	Greens Folder
✓	Health Department (see letter for which)	✓	EPA – Mike Owens
✓	Compliance (associated Section Manager)		Finance – Teri Weiss
	Name Change Letters: Deborah McMurtrie Susan Weisenberg Dave Beatty		Brett Wilding, Utah State Tax Commission, Technical Research Unit
	Offsets Used? Copy of document(s) to Camron Harry		Enter final Name Change Letters in /engineer/aoname
	Copy To:		Enter in /engineer/aocond & in AO Log: (AOs, AO not needed, Replacement in Kind)
✓	NEWSPAPER NOTICE – COPIES TO: TC Cities, Counties, Gov. Agencies, & etc./& a copy of Public Official letter with self-addressed envelope WFRC E-Mail To: dvd.kvd@juno.com, Jodie Swanson, Lori Walker, Debbie Oberndorfer, Bill Sinclair, Beverly Rasmussen & Jen Burge, Donna Spangler, Ron Reece, and Kelly Beck <u>E-Mail copy & Fax to Newspaper Agencies</u>		PSD PROJECTS: Copy the NOI, Engineering Review, ITA, NOTICE & AO Send to: Mike Owens, EPA Don Banks, Bureau of Land Management Chris Hocket, U.S. Forest Service Chris Shaver, National Park Service TITLE V: Check w/ NSR Engineer for which document(s) to be copied.

REVIEWED BY AND DOCUMENT SIGN OFF DATES:

Completeness determination	June 5, 2015	Jon Black
Modeling review of ITA		Modeler NSR
Peer review of project	March 14, 2015	Tad Anderson
Section Manager sign off		Martin Gray
Branch Manager sign off		Reginald Olsen

State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lieutenant Governor

Department of
Environmental Quality

Alan Matheson
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

FILE COPY

DAQE-GN154460001-17

June 5, 2017

Jay Vance
Stericycle Incorporated
90 North Foxboro Drive
North Salt Lake, UT 84054

Re: Request for Additional Information on Project Number DAQE-IN154460001-16; Intent to Approve: New Approval Order for Hospital, Medical, and Infectious Waste Incinerator Facility Tooele County

Dear Mr. Vance:

The Division of Air Quality (DAQ) is preparing its response to public comments for the above-referenced Intent to Approve (ITA). The DAQ considers its evaluation of the Source Plan Review, ITA, and pending Approval Order (AO) complete. However, considering the submitted public comments, this request for information is being sent to provide additional clarification for the record.

1. **Information on Stericycle's Missouri facility wet scrubber.**

   A comment identified a newspaper article that referenced the planned installation of a wet scrubber at Stericycle Incorporated's (Stericycle) Missouri facility at a cost of $500,000 in June of 2000. The newspaper article does not provide any other details related to this control equipment. The DAQ requests additional information on this scrubber, including its type and the pollutant(s) control.

2. **Information related to the economic feasibility of controls.**

   DAQ requests that Stericycle provide further support, including actual vendor equipment quotes, for the submitted cost effectiveness analysis of the controls eliminated on that basis (Selective Catalytic Reduction, a wet NO_X scrubber, and catalyst impregnated bags).

3. **Waste disposal alternatives.**

   DAQ requests that Stericycle provide a discussion of whether treating the intended waste stream is feasible through methods other than incineration.

Additionally, DAQ has determined that Stericycle will be required to prepare a Waste Management Plan (WMP) that addresses the specific requirements of 40 CFR §60.55c. Such plan will be required to be submitted no later than 60 days following the initial performance test in accordance with 40 CFR § 60.58c (c)(3).

Please submit the requested information at your earliest convenience. If you have any questions, please contact Jon Black at (801) 536-4047 or by e-mail jlblack@utah.gov

Sincerely,

Martin D. Gray, Manager
Major New Source Review

MDG:JB:kw

June 23, 2017

Utah Division of Air Quality
John Black, Engineer
150 N. 1950 West
Salt Lake City, Utah 84114-4820
jlback@utah.gov

RE: Request for Additional information on Project Number DAQE-1N154460001-16; Intent to Approve: New Approval Order for Hospital, Medical, and Infectious Waste Incinerator Facility Tooele County

Stericycle Inc. (Stericycle) filed a Notice of Intent (NOI) requesting approval to construct a new hospital, medical, and infectious waste incinerator (HMIWI) facility in Tooele County, Utah. In a letter dated June 5, 2017, the Utah Division of Air Quality (UDAQ) requested that Stericycle provide additional information related to three issues raised in public comments regarding the proposed HMIWI. Stericycle submits the following information to address these requests.

Item 1. Information on Stericycle's Missouri Facility

A commenter identified a newspaper article published in June 2000 that indicated that Stericycle intended to install a wet scrubber at an HMIWI located in Missouri at a cost of $500,000. UDAQ noted that the newspaper article did not provide any other details related to the wet scrubber and requested Stericycle provide information on the type of scrubber installed and the pollutants controlled.

The HMIWI that was the subject of the newspaper article was closed in approximately 2002 and records are no longer available for that facility. However, Stericycle has confirmed that all wet scrubbers installed at Stericycle's HMIWIs control either particulate emissions or soluble acid gases, such as hydrogen chloride and sulfur oxides. Consistently, the ITA requires Stericycle to install a wet gas absorber, that is, a wet scrubber, to control the HMIWI's hydrogen chloride and sulfur dioxide emissions.

Item 2. Updated Information re Economic Feasibility of Control Equipment

In its June 5, 2017 letter, UDAQ requested Stericycle to provide additional support, including vendor equipment quotes, supporting the cost-effectiveness analysis for Selective Catalytic Reduction (SCR), wet NOx scrubber, and catalyst impregnated bags.

In the NOI, Stericycle conducted a BACT analysis following EPA's 5-step, top-down approach. As part of that analysis, Stericycle provided an evaluation of the economic feasibility of installing SCR, wet NOx scrubbing, and Selective Non-Catalytic Reduction (SNCR) to control the NOx emissions from the HMIWI. The NOI also evaluated the economic feasibility of installing catalyst-impregnated bags in the proposed bag house to further control the HMIWI's D/F (dioxin/furans) emissions.

Stericycle engaged the firm, El Dorado Engineering (El Dorado), a vendor that specializes in the design and construction of air pollution control systems, to provide an updated estimate of the costs associated with the installation of SCR, wet NOx scrubber, SNCR, and catalyst-impregnated bags. The estimates are enclosed as Attachment No. 1.

Stericycle also requested that All4 Inc., its consultant in preparing the NOI, provide an updated cost effectiveness analysis for SCR, wet NOx scrubber, and SNCR based on El Dorado's updated estimates. (An updated cost effectiveness for catalyst-impregnated bags was not completed since the estimated cost of the bags was significantly higher than the original estimates that were already deemed not to be cost effective.) The All4 analysis is contained in the document enclosed as Attachment No. 2, which follow the same format as Tables G-1, G-2, and G-3 of the NOI but are renumbered as Tables G-1a, G-2a, and G-3a, respectively.

Item 3. Waste Disposal Alternatives

UDAQ also requested that Stericycle provide a discussion of the feasibility of utilizing alternatives to incineration for the wastes that Stericycle intends to treat at the Tooele County HMIWI. A discussion is provided in Attachment No. 3, along with a discussion of why other technologies are not suitable.

In its letter of June 5, 2017, UDAQ provided notice to Stericycle of the requirement to prepare a Waste Management Plan (WMP) that addresses the requirements of 40 CFR § 60.55c no later than 60 days following the initial performance test in accordance with 40 CFR § 60.58c(c)(3). Stericycle will submit a WMP as required.

Please call me at (801) 936-1260, extension 17 if you have any questions.

Stericycle, Inc.

Jay Vance

Jay Vance
Compliance Manager

Enclosures

Stericycle

Attachment 1

Pollution Abatement System
Cost Estimates

Tooele County Facility

EL DORADO ENGINEERING

9089 South 1300 West, Suite 150 • West Jordan, Utah, U.S.A. • Tel: (801) 966-8288

To: James W. Nold
Director of Engineering
Stericycle, Inc.

From: Bob Hayes
President
El Dorado Engineering

Subject: PAS Equipment Cost Estimates

Date: June 21, 2017

Jim,

Please find attached cost estimate sheet for requested equipment options with detail regarding technical assumptions and basis of pricing for each line item.

El Dorado Engineering specializes in the design and fabrication of air pollution control systems (APCS), or pollution abatement systems (PAS). Our facilities constructed in the U.S. and abroad, have achieved some of the lowest emissions in their industry.

For each line item, we have listed the principal equipment components which are covered by these cost estimates. The estimates are based on our experience with providing similar or comparable pollution control systems. These represent good faith estimates but do not represent guaranteed quotes. The estimates do not include additional costs that would be incurred for engineering design, site civil work & improvements, installation (including controls integrations), start-up costs (including performance testing), and operating costs. These additional costs, not included in our estimates, can represent significant expenses which should be accounted for in assessing the overall costs of each pollution control technology option.

You are welcome to contact me with any questions.

Best Regards,

Bob Hayes

Bob Hayes
President
El Dorado Engineering

EL DORADO ENGINEERING INC.

9089 S 1300 W, Suite 150 • West Jordan, UT 84088 • Tel: (801) 966-8288 • www.eldoradoengineering.com

Designation	Unit of Issue	Qty.	Total Price	Comments
Option 1: SNCR - Liquid Injection Equipment: • IBC Tote Cabinet • NH3 Supply System • NH3 Injection System	Lumpsum	1	$ 38,400	Control Efficiency >50% Estimate based on historical project costs for similar SNCR systems supplied to facilities in Louisiana, Donetsk Ukraine, and Zutendaal Belgium. SNCR Systems are custom designed, built and supplied by El Dorado Engineering.
		Option 1 Total	$ 38,400	
Option 2: SNCR - Vapor Injection Equipment: • IBC Tote Cabinet • NH3 Supply System • NH3 Vaporizer • NH3 Injection System	Lumpsum	1	$ 86,000	Control Efficiency >50% Estimate based on historical project costs for similar SNCR systems supplied to facilities in Louisiana, Donetsk Ukraine, and Zutendaal Belgium. SNCR Systems are custom designed, built and supplied by El Dorado Engineering.
		Option 2 Total	$ 86,000	
Option 3: SCR Equipment: • SCR Housing • Catalyst • NH3 Injection System • NH3 Vaporizer • HEPA Filters • Ductwork	Lumpsum	1	$ 933,300	Control Efficiency >90% Estimate based on historical project costs for similar SCR systems supplied to facilities in Louisiana and Zutendaal Belgium. SCR systems are custom designed, built and supplied by El Dorado Engineering. Catalyst pricing is based on 8,000 scfm at 300F.
		Option 3 Total	$ 933,300	
Option 4: Catalyst Impregnated Baghouse Equipment: • Baghouse • Filter Bags • Ductwork	Lumpsum	1	$ 493,700	Control Efficiency >90% Filter bag budgetary prices obtained from bag manufacturer vendor, based on an assumed 8,000 scfm and 350 F inlet temperature, 500m2 of filter area is required for these conditions Vendor pricing for this volume is $320/m2 of filter area. EDE estimate includes, 2% contingency, 6% overhead, 10% profit which equals $190,000 for bags only. Estimated pricing for new Baghouse and ductwork are included in the total as the filter to air ratio for NOx and D&F removal can be significantly different than that for particulate removal, requiring a much larger baghouse. Baghouse pricing is based on historical project costs for similar baghouse systems provided by EDE for recent installations in Louisiana, Belgium, & Ukraine.
		Option 4 Total	$ 493,700	
Option 5: Wet NOx Scrubber Includes: • Stage 1 - Quench Column and Recirculation Tank • Stage 2 - Oxidation Column and Exit M/E • Stage 3 - Caustic Column and Recirculation System • Chemical Feed Pumping Cabinets • Integral Ductwork • Instrumentation and Controls	Lumpsum	1	$ 629,900	Control Efficiency >60% Budgetary pricing based on vendor pricing for wet NOx scrubber system. Based on 8,000 scfm scrubber system. Pricing includes vendor budgetary pricing of $486,000, +10% contingency, EDE labor for specification, review, oversight and management. This pricing includes 6% overhead and 10% profit.
		Option 5 Total	$ 629,900	

Exclusions:

Sales Tax
Engineering
Site Civil Work/Improvements
Installation
Operating Costs
Start-up or Performance Testing

Stericycle

Attachment 2

Updated Cost Effectiveness Analysis
SCR, Wet NOx Scrubber, SNCR

Tooele County Facility

Table G-1a
STERICYCLE, INC.
Control Cost Evaluation (one HMIWI)
Selective Catalytic Reduction (SCR)

CAPITAL COSTS

	COST ITEM	COST FACTOR		COST ($)
Direct Capital Costs				
Purchased Equipment Costs				
(a)	SCR System and installation, including ammonia storage system and catalyst			$933,300
	Purchased Equipment Subtotal		*A*	*$933,300*
(b)	Sales Tax	0 047 A		$43,865
(b)	Freight	0 05 A		$46,665
Total Direct Capital Cost			***B***	***$1,023,830***
Indirect Costs (Installation)				
(b)	General Facilities	0 05 B		$51,192
(b)	Engineering Fees	0 10 B		$102,383
(b)	Process Contingency	0 05 B		$51,192
(b)	Construction and field expenses	0 10 B		$102,383
(b)	Contractor fees	0 10 B		$102,383
(b)	Start-up	0 01 B		$10,238
(b)	Performance test	0 01 B		$10,238
Total Indirect Installation Costs			***IDC***	***$430,009***
(b)	Project Contingency	0 15 (B + IDC)		$218,076
(b)	Total Plant Cost	B+IDC+Proj Cont		$1,671,915
(b)	Preproduction Cost	0 02 (Total Plant Cost)		$33,438
Total Capital Investment			***TCI***	***$1,705,353***

ANNUALIZED COSTS

	COST ITEM	COST FACTOR		UNIT COST	ANNUAL COST ($)
Direct Annual Costs					
Operating Labor					
(c)(d)	Labor, one employee	200 hours/year		$20 00 per hour	$4,000
Maintenance					
(b)(d)	Maintenance Labor and Materials	0 015 TCI			$25,580
(c)(d)	Catalyst Replacement and Disposal	0 02 (Equip Subtotal)			$18,666
(c)(d)	Ammonia Reagent, 29%	134,137 lbs		$0 26 per lb	$34,876
Utilities					
(c)(d)	Electricity	207,692 kWh		$0 08 per kWh	$16,200
(c)(d)	Natural Gas for Flue Gas Reheat	26,809 MMBtu		$6 80 per MMBtu	$182,300
Total Direct Annual Costs				***DAC***	***$281,622***
Indirect Annual Costs					
(b)	Overhead	60% of sum of Operating Labor and Maintenance Costs			$49,873
(b)	Administrative charges	2% of TCI			$34,107
(b)	Property taxes	1% of TCI			$17,054
(b)	Insurance	1% of TCI			$17,054
(b)	Capital recovery factor	0 087	CRF x TCI		$148,680
	Expected lifetime of equipment		20 years at	6 0% interest	
Total Indirect Annual Costs				***IDAC***	***$266,768***
Total Annualized Cost			DAC+IDAC		***$548,390***

Cost Effectiveness ($/ton)		
Control efficiency:	80%	90%
Potential NO_X Emissions:	32.84 tpy	32.84 tpy
Controlled NO_X Emissions:	26.27 tpy	29.55 tpy
Total Annual Costs/Ton Controlled NO_X Emissions:	***$20,875***	***$18,556***

[a] Based on vendor estimate, excludes sales tax, engineering, site civil work/improvements, installation, operating costs, and start-up or performance testing
[b] Based on OAQPS Cost Control Manual, Sixth Edition, January 2002
[c] Cost information provided by Stericycle, Inc
[d] Based on 8,760 hours of operation per year

Table G-2a
STERICYCLE, INC.
Control Cost Evaluation (one HMIWI)
Wet Scrubbing

CAPITAL COSTS

	COST ITEM	COST FACTOR		COST ($)
Direct Capital Costs				
Purchased Equipment Costs				
(a)	Equipment and ID fan		*A*	$629,900
(b)	Sales Tax	0 047 A		$29,605
(b)	Freight	0 05 A		$31,495
	Total Purchased Equipment Cost		*B*	*$691,000*
Total Direct Capital Cost			***DC***	***$691,000***
Indirect Costs				
(b)	Engineering	0 10 B		$69,100
(b)	Construction and field expenses	0 10 B		$69,100
(b)	Contractor fees	0 10 B		$69,100
(b)	Start-up	0.01 B		$6,910
(b)	Performance test	0 01 B		$6,910
(b)	Contingencies	0 03 B		$20,730
(b)	General Facilities	0.05 B		$34,550
Total Indirect Costs			***IC***	***$276,400***
Total Capital Investment			***TCI***	***$967,400***

ANNUALIZED COSTS

	COST ITEM	COST FACTOR		UNIT COST	ANNUAL COST ($)
Direct Annual Costs					
Operating Labor					
(c)(d)	Operator	2000 hours/year		$20 00 per hour	$40,000
Maintenance					
(c)(d)	Maintenance Labor and Material	0 02 A			$12,598
(c)(d)	Chemical Reagents				$154,277
Utilities					
(c)(d)	Electricity	689,848 kWh/yr		$0 08 per kWh	$54,498
(c)(d)	Purge Water and Disposal	200 kgal		$10 00 per kgal	$2,004
Total Direct Annual Costs				***DAC***	***$263,377***
Indirect Annual Costs					
(b)	Overhead	60% of sum of Operating Labor and Maintenance Costs			$124,125
(b)	Administrative charges	2% of TCI			$19,348
(b)	Property taxes	1% of TCI			$9,674
(b)	Insurance	1% of TCI			$9,674
(b)	Capital recovery	0 103	CRF x TCI		$99,606
	Expected lifetime of equipment		15 years at	6 0% interest	
Total Indirect Annual Costs				***IDAC***	***$262,427***
Total Annual Cost				DAC+IDAC	***$525,804***
Cost Effectiveness ($/ton)					
	Control efficiency:	60%	75%		
	Potential NO_X Emissions:	32.84 tpy	32.84 tpy		
	Controlled NO_X Emissions:	19.70 tpy	24.63 tpy		
	Total Annual Costs/Ton Controlled NO_X Emissions:	***$26,687***	***$21,350***		

[a] Based on vendor estimate, excludes sales tax, engineering, site civil work/improvements, installation, operating costs, and start-up or performance testing
[b] Based on OAQPS Cost Control Manual, Sixth Edition, January 2002
[c] Cost information provided by Stericycle, Inc
[d] Based on 8,760 hours of operation per year

Table G-3a
STERICYCLE, INC.
Control Cost Evaluation (one HMIWI)
Selective Non-Catalytic Reduction (SNCR)

CAPITAL COSTS

	COST ITEM	COST FACTOR		COST ($)
Direct Capital Costs				
Purchased Equipment Costs				
(a)	SNCR ammonia-based system including storage and delivery		*A*	$38,400
(b)	Sales Tax	0 047 A		$1,805
(b)	Freight	0 05 A		$1,920
Total Direct Capital Cost			*B*	***$42,125***
Indirect Costs (Installation)				
(b)	General Facilities	0 05 B		$2,106
(b)	Engineering Fees	0 10 B		$4,212
(b)	Process Contingency	0 05 B		$2,106
(b)	Construction and field expenses	0 10 B		$4,212
(b)	Contractor fees	0 10 B		$4,212
(b)	Start-up	0 01 B		$421
(b)	Performance test	0 01 B		$421
Total Indirect Installation Costs			*IDC*	***$17,692***
(b)	Project Contingency	0 15 (B + IDC)		$8,973
(b)	Total Plant Cost	B+IDC+Proj Cont		$68,790
(b)	Preproduction Cost	0 02 (Total Plant Cost)		$1,376
(c)	Inventory Capital	$Vol_{reagent}$ * $Cost_{reagent}$		$600
Total Capital Investment			*TCI*	***$70,766***

ANNUALIZED COSTS

	COST ITEM	COST FACTOR		UNIT COST	ANNUAL COST ($)
Direct Annual Costs					
Operating Labor					
(c)(d)	Labor, one employee	200 hours/year		$20 00 per hour	$4,000
Maintenance					
(b)(d)	Maintenance Labor and Materials	0 015 TCI			$1,061
(c)(d)	Ammonia reagent, 29%	95,573 lbs		$0 26 per lb	$24,849
Utilities					
(c)(d)	Electricity	53,215 kWh		$0 08 per kWh	$4,204
Total Direct Annual Costs				*DAC*	***$34,114***
Indirect Annual Costs					
(b)	Overhead	60% of sum of Operating Labor and Maintenance Costs			***$17,946***
(b)	Administrative charges	2% of TCI			***$1,415***
(b)	Property taxes	1% of TCI			***$708***
(b)	Insurance	1% of TCI			***$708***
(b)	Capital recovery factor	0 087	CRF x TCI		***$6,170***
	Expected lifetime of equipment		20 years at	6 0% interest	
Total Indirect Annual Cost				*IDAC*	***$26,947***
Total Annual Cost				DAC+IDAC	***$61,061***
Cost Effectiveness ($/ton)					
		Control efficiency:	57%		
		Potential NO_x Emissions:	32.84 tpy	Total Annual Costs/Controlled NO_x Emissions:	
		Controlled NO_x Emissions:	18.72 tpy		***$3,262***

(a) Based on vendor estimate for liquid injection, excludes sales tax, engineering, site civil work/improvements, installation, operating costs, and start-up or performance testing
(b) Based on OAQPS Cost Control Manual, Sixth Edition, January 2002
(c) Cost information provided by Stericycle, Inc
(d) Based on 8,760 hours of operation per year

Stericycle

Attachment 3

Discussion of Alternative Methods of Disposal

Tooele County Facility

Stericycle

Discussion of Alternative Methods of Disposal

June 23, 2017

The Utah Division of Air Quality requested that Stericycle provide a discussion on whether treating the intended waste stream is feasible through methods other than incineration.

This question is informed by a discussion of the wastes that Stericycle intends to treat at the HMIWI (hospital, medical, infectious waste incinerator). These wastes represent a fraction of the total waste Stericycle collects and treats. Stericycle receives waste that is collectively referred to as RMW (regulated medical waste) and includes infectious, medical, hospital, and biohazardous waste along with other waste such as confidential records waste with intellectual property, and waste from associated industries. The majority of the materials Stericycle collects are treated with other technologies at Stericycle-owned and operated facilities in other locations. However, the industry that Stericycle serves creates some wastes that are not amenable to effective treatment by other alternative treatment methods, and the proposed HMIWI is designed to treat these specific categories of wastes.

One of the most commonly used technologies for the treatment of medical wastes is steam sterilization, or autoclaving. Stericycle operates many of these types of facilities throughout North America and has extensive knowledge of the capability of the technology. However, autoclaving is not a viable alternative to incineration for certain wastes that Stericycle collects. Autoclave treatment consists of vacuum and pressurized steam cycles, at temperatures of between 250 and 325 degrees for approximately 30-60 minutes. Consequently, autoclaving does not sufficiently alter the physical state of certain materials to satisfy requirements for treatment and disposal.

Waste categories specified for incineration include pharmaceuticals, trace chemotherapy, and pathological wastes. Pharmaceuticals are generally unaltered by the autoclave process, allowing these chemical compounds to be passed through to wastewaters, posing a problem for local publicly-owned wastewater treatment works, and posing a risk to public water supplies. Trace chemotherapy wastes, containing trace amounts of cytotoxics, may be volatized by the autoclave process, posing a potential risk to employees and others involved in the process. Lastly, certain pathological wastes, such as tissues and cultures, can be dense materials resistant to steam penetration, and often are packaged and shipped in a frozen state, making steam sterilization impractical.

Other non-combustion technologies, such as bleach or ammonia disinfection and ozone disinfection, have not been proven to be reliable, cost effective, and commercially viable alternatives to incineration, particularly for large scale generators or commercial treatment providers. Issues such as maintenance costs and downtime, energy costs, shredding of non-treated waste, wastewater generation and treatment, and throughput capacity of these types of treatments are not yet fully understood or proven at the commercial scale. As such, these treatment alternatives remain speculative regarding their technical and commercial viability.