

Executive Summary

ES

Introduction

In accordance with the State Environmental Quality Review Act, the State University Construction Fund (SUCF) commissioned this Draft Environmental Impact Statement (DEIS) to analyze the potential significant environmental impacts associated with implementation of a new Waste Management Facility (“the Facility”) at the Cornell College of Veterinary Medicine, Ithaca, New York. This DEIS identifies the mitigation measures that would be taken to avoid or minimize significant impacts, and discusses a range of Alternatives to the Proposed Action that have been considered in the project-planning process.

The content of this DEIS reflects input given by the general public and Involved Agencies during the project’s scoping process and subsequent development stages. The overall goal of this document is to provide the means for the public and Involved Agencies to review and comment on the Proposed Action, and to provide a sound basis for informed decision-making. During the DEIS review process spanning February 28 – April 24, 2002, the SUCF will accept written and verbal comments, which will be addressed in the Final EIS. The review process will include a Public Hearing to be held on April 10, 2002 in Ithaca, New York.

Summary of the Proposed Action

At the request of the Cornell College of Veterinary Medicine (CCVM), the SUCF proposes to develop a new Waste Management Facility for the treatment and destruction of pathological waste (i.e., animal carcass and bedding wastes) and conventional regulated medical waste (cRMW) at the CCVM. The new facility would replace the

CCVM's existing Incinerator Facility, which currently incinerates pathological waste and coordinates shipment of cRMW to an off-site, commercial treatment facility.

The new Waste Management Facility would use the Alkaline Hydrolysis process to treat approximately 600,000 lb/yr of carcass waste at the CCVM, with a maximum capacity to treat approximately 10,000 lb/day of carcass wastes. The Facility would use the Internal Steam Sterilization process to treat approximately 5,000 lb/yr of bedding and 150,000 lb/yr of cRMW, with a maximum capacity to treat approximately 1,000 lb/day. The project would involve the installation of these processes adjacent to the CCVM Necropsy Facility at Schurman Hall, in the location of the CCVM Incinerator Facility, and removal of the existing incinerator. The types and character of wastes currently received by the CCVM would not change under the Proposed Action.

Summary of Alkaline Hydrolysis

The Alkaline Hydrolysis technology dissolves carcass waste in a high temperature, high pressure, alkaline environment. The non-infectious byproducts of the process include a brine-like wastewater (i.e., "hydrolysate"), and solid byproducts known as "cremains" consisting of bone fragments and non-degradable matter such as cellulose materials (e.g., grass). This technology has demonstrated effectiveness in treating infectious carcass waste at multiple full-scale installations and was pilot-tested at the CCVM in July 2000.

Summary of Internal Steam Sterilization

The Internal Steam Sterilization (ISS) technology sterilizes bedding waste and conventional regulated medical waste (cRMW) in the presence of high temperature steam. The process, which does not significantly change the physical or chemical characteristics of the wastes, has demonstrated effectiveness at multiple installations. Following treatment in an ISS unit, cRMW is shredded into an unrecognizable state so it can be safely landfilled.

Reasons for Change

Since 1985, the CCVM Incinerator Facility has supported the mission of the CCVM by effectively disposing of pathological wastes. However, the incinerator is approaching the

end of its useful life, and consistently requires major maintenance under the State Maintenance Management Program to operate in compliance with applicable regulations. New pathological waste treatment facilities are needed to provide a long-term, cost-effective solution to meet the CCVM's waste management requirements and the challenges posed by emerging disease agents (e.g., prions) in an environmentally responsible manner.

In addition, for over a decade, the CCVM has shipped its cRMW to an off-site, commercial facility for treatment. This method involves the transportation of untreated medical wastes over public roads, which, compared to on-site treatment, has an increased risk of public exposure to infectious wastes. The CCVM has determined that on-site treatment of cRMW can eliminate this risk at reasonable cost, and therefore has requested the installation of on-site cRMW treatment facilities.

Conceptual Design of New Waste Management Facility

Implementation of the Proposed Action would involve installation of the Alkaline Hydrolysis and Internal Steam Sterilization technologies in the same general area as the existing Incinerator Facility, centrally located in close proximity to major CCVM waste generators. The new Facility would also include several support systems, including: boiler, chemical delivery and containment, and ventilation systems.

Facility Operations

The new Waste Management Facility would intermittently receive waste deliveries during the course of each day, and treat wastes in batch mode on an as-needed basis. The Facility would receive monthly deliveries of an alkaline chemical (e.g., potassium hydroxide) for use in the Alkaline Hydrolysis process, and would ship non-infectious, treated solid wastes (i.e., cremains and treated cRMW) off-site for landfill disposal.

Additionally, operation of the new Facility would involve sanitary sewer discharge and aerobic biological treatment of hydrolysate wastewater at the Ithaca Area Wastewater Treatment Facility (IAWWTF). If determined to be feasible through ongoing treatability testing at the IAWWTF, the CCVM could also transport hydrolysate to the IAWWTF for anaerobic biological treatment. Results of this treatability testing program are expected

in Spring 2002. If anaerobic treatment is determined feasible, the CCVM would maintain the option to either discharge to the sewer or haul hydrolysate to the IAWWTF. The impacts of both options were evaluated in this DEIS.

Significant Potential Positive Impacts

Implementation of the Proposed Action would result in several significant positive impacts on the environment and human health, as discussed below.

Increased Protection of Public Health

Under the Proposed Action, potentially infectious cRMW would be treated at the Waste Management Facility in lieu of off-site transportation and treatment, reducing the potential for public exposure to cRMW. Also, as discussed below, decommissioning of the existing CCVM incinerator would result in a drastic decrease in air emissions compared with the existing Incinerator Facility and improve air quality in the greater-Ithaca area. The significant reduction in air pollutants and greenhouse gases (e.g., NO_x and CO₂) would result in a positive impact on public health.

Moreover, the Proposed Action would provide more reliable treatment of animal remains infected with prions, the causative agents of “Mad Cow Disease” and other Transmissible Spongiform Encephalopathies (TSEs) compared with current treatment (i.e., incineration) based on research published to date, and would protect public health to the maximum extent in the event that prion-infected wastes were received by the CCVM.

Finally, the new Waste Management Facility would continue to support animal disease control efforts by providing the most effective treatment of pathological waste and cRMW currently available. By effectively treating wastes potentially infected with zoonotic diseases (i.e., diseases that can be transmitted from animals to humans), the Waste Management Facility would continue to protect public health.

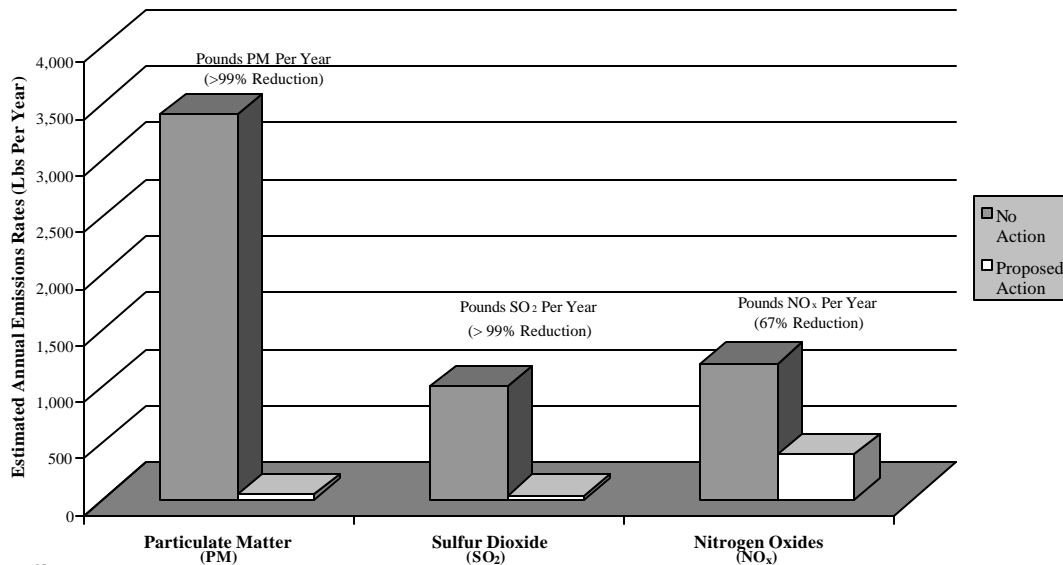
Improved Air Quality

By demolishing the CCVM's existing incinerator and implementing non-combustion treatment technologies (i.e., Alkaline Hydrolysis and Internal Steam Sterilization), implementation of the Proposed Action would correspond to a substantial reduction in air pollutant emissions including, but not limited to:

- Carbon dioxide (CO₂)
- Sulfur dioxide (SO₂)
- Nitrogen oxides (NO_x)
- Particulate matter
- Dioxins
- Metals (including mercury, cadmium and lead)
- Hydrochloric acid (HCl)

Figure ES-1 on the following page (Comparison of Facility Combustion Emissions: No Action and Proposed Action) graphically illustrates estimated emissions reductions for selected pollutants. In addition to reducing Facility air emissions, the Proposed Action would reduce local truck traffic associated with Facility operations, corresponding to a significant decrease in local vehicular emissions.

**Figure ES-1
Comparison of Facility Combustion Emissions: No Action and Proposed Action
CCVM Waste Management Facility EIS
State University Construction Fund**



Notes:
 1) No Action would involve continued operation of the CCVM incinerator.
 2) Proposed Action would involve natural gas combustion in a boiler system to generate steam and plant heat, and demolition of the CCVM incinerator.
 3) Particulate Matter emissions rate under No Action Alternative assumes a worst-case scenario involving the CCVM incinerator emitting PM at its NYSDEC Title V Permit limit of 0.08 grains/dry standard cubic foot, at its typical stack flow rate of 2,000 dry standard cubic feet per minute.
 4) This analysis includes major incinerator and boiler air contaminants. Proposed Action would also result in a significant reduction in other air pollutants including dioxins, metals, and carbon dioxide.

Overall, the Proposed Action’s significant reduction in emissions compared with the CCVM Incinerator Facility would correspond to an overall improvement in air quality in the greater-Ithaca area. Moreover, by substantially reducing the release of air pollutants and greenhouse gases (e.g., NO_x and CO₂), implementation of the Proposed Action would result in a positive impact on human health and the environment, and the associated character of neighboring areas.

Increased Protection of Occupational Safety and Health

The Proposed Action would significantly increase the protection of worker safety and health from biological and chemical hazards compared with the existing CCVM Incinerator Facility. For instance, it would decrease operator handling of potentially infectious cRMW materials, thereby increasing protection from biological hazards. Implementation of the Proposed Action would also involve installation of fail-safe treatment systems that would remain closed in the event of upset conditions. This change would constitute an improvement over the existing incinerator system, which under

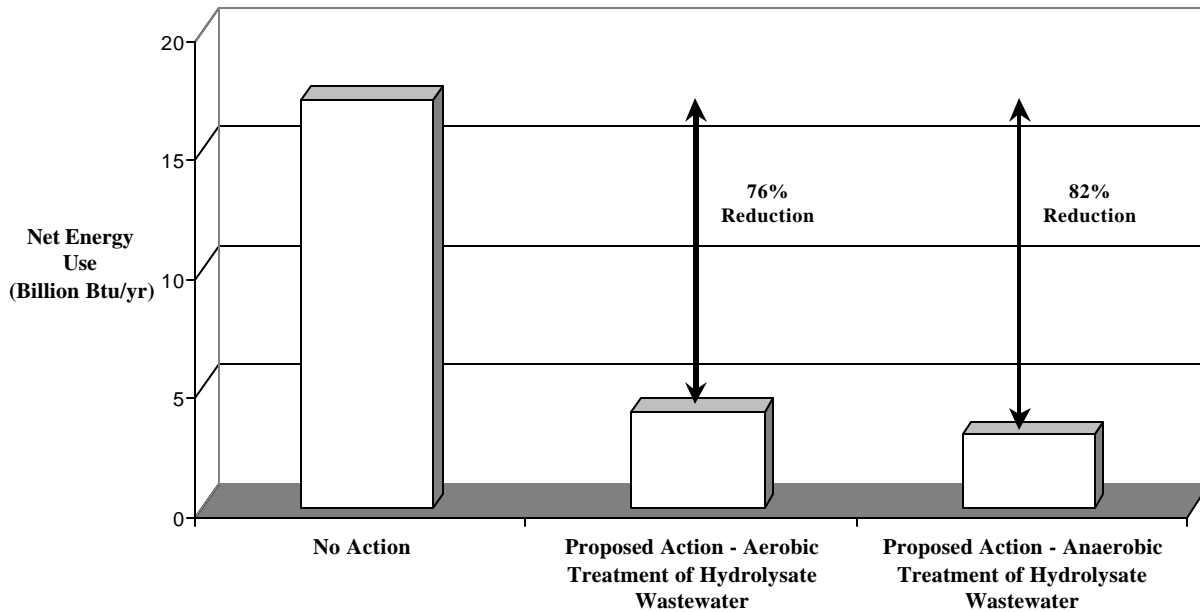
certain circumstances could require CCVM operators or maintenance staff to access the inside of the unit to remove untreated carcass wastes and make repairs, thereby increasing their risk of exposure to biological hazards.

Finally, the Proposed Action would improve indoor air quality compared to existing conditions, which periodically expose CCVM incinerator operators to smoke and fugitive dust. The comprehensive ventilation system proposed for the new Waste Management Facility would create a more comfortable environment for CCVM workers.

Decreased Energy Consumption

As illustrated in Figure ES-2 on the following page (Comparison of Energy Consumption: No Action and Proposed Action), the Proposed Action would substantially decrease energy consumption by replacing the existing incinerator, which consumes significant volumes of natural gas, with the Alkaline Hydrolysis technology, and treating cRMW and bedding on-site in lieu of off-site shipment and treatment. Additionally, treatment of hydrolysate wastewater at the IAWWTF would generate methane gas to be used to generate heat and power at the IAWWTF. Anaerobic biological treatment of hydrolysate, if determined to be feasible, would maximize energy production associated with the Proposed Action.

**Figure ES-2
Comparison of Energy Consumption: No Action and Proposed Action
CCVM Waste Management Facility EIS
State University Construction Fund**



Notes:

- 1) No Action would involve continued operation of CCVM incinerator.
- 2) Proposed Action would involve dismantling of the CCVM incinerator and implementation of the Alkaline Hydrolysis and Internal Steam Sterilization technologies.
- 3) Proposed Action assumes aerobic biological treatment of hydrolysate wastewater at the Ithaca Area Wastewater Treatment Facility. Anaerobic biological treatment of the hydrolysate wastewater, if feasible, would result in an additional reduction of almost 1 Billion Btu/year.

Financial Resources

The Proposed Action’s significant reduction in natural gas use would correspond to a significant decrease in operations costs compared with the existing Incinerator Facility. This change would have a positive overall impact on New York State’s financial resources.

Significant Potential Adverse Impacts And Mitigation Measures

Implementation of the Proposed Action would have the potential to result in significant adverse impacts. This DEIS analyzed these impacts and identified mitigation measures to protect the environment to the maximum extent practicable.

Air Quality Impacts

Implementation of the Proposed Action would result in air emissions attributable to the operation of Alkaline Hydrolysis and Internal Steam Sterilization systems and a natural gas-fired boiler system. Since these treatment technologies were not well understood with respect to air emissions characteristics, this DEIS involved emissions sampling and estimating, and quantitative ambient air quality impact modeling to assess potential air quality impacts. Based on computer modeling results, the Facility would generate emissions that would not cause, or contribute to, violation of state or federal air quality standards, and would have no adverse short-term or long-term affect on air quality. Additionally, implementation of the Proposed Action would include construction and operation of a comprehensive ventilation system to adequately mitigate odor impacts.

Surface Water Quality Impacts

The Proposed Action would involve treatment of non-infectious, high-strength hydrolysate wastewater at the Ithaca Area Wastewater Treatment Facility (IAWWTF). Specifically, the Proposed Action includes sewer discharge and aerobic biological treatment of hydrolysate at the IAWWTF. Additionally, if determined to be feasible through ongoing treatability testing at the IAWWTF, hydrolysate could also be transported to the IAWWTF and treated via anaerobic biological treatment. The impacts of both options were analyzed in this DEIS.

Since hydrolysate would contain significant concentrations of organic matter and nutrients, this DEIS included an analysis of the potential to overload, or interfere with operations at, the IAWWTF. The evaluation concluded that the aerobic biological treatment system at the IAWWTF would have sufficient capacity for removal of major hydrolysate wastewater pollutants (e.g., biochemical oxygen demand, total suspended solids, ammonia and phosphorus), with reserve capacity remaining. The analysis also indicated that treatment of hydrolysate would not interfere with operations at the IAWWTF or adversely affect the ability of the facility to comply with its NYSDEC State Pollutant Discharge Elimination System (SPDES) Permit.

Additionally, ongoing treatability testing at the IAWWTF will definitively determine whether hydrolysate could also be treated via anaerobic biological treatment at the

IAWWTF with no significant impacts. This alternative, which preliminary results of the testing indicate to be feasible, would provide significant additional benefits. Overall, through either aerobic treatment or anaerobic treatment (if found to be feasible with no adverse impacts), the IAWWTF has the capacity to provide reliable, effective treatment of hydrolysate while continuing to protect the water quality of Cayuga Lake.

The Proposed Action would also involve infrequent (i.e., monthly) delivery of a bulk alkaline chemical (e.g., potassium hydroxide) to the CCVM for use in the Alkaline Hydrolysis process, corresponding to potential surface water quality impacts associated with chemical spills that could occur during chemical transportation on public roads and deliveries at the CCVM. The spill prevention measures planned under the Proposed Action would effectively minimize the likelihood of chemical spills. In the event of a spill, the proposed response procedures would effectively mitigate potential impacts, resulting in no significant impact on surface water quality.

Groundwater Quality and Soil Quality Impacts

As discussed above, implementation of the Proposed Action would involve infrequent (i.e., monthly) delivery of a bulk alkaline chemical (e.g., potassium hydroxide) to the CCVM for use in the Alkaline Hydrolysis process. This DEIS included an evaluation of the potential groundwater and soil quality impacts that would result from a spill during chemical transportation on public roads and deliveries at the CCVM. The spill prevention measures planned under the Proposed Action would effectively minimize the likelihood of chemical spills. In the event of a spill, the proposed response procedures would effectively mitigate potential impacts, resulting in no significant impact on soil or groundwater resources. Additionally, implementation of the Proposed Action would involve a negligible increase in the amount of non-infectious bedding waste composted and land-applied at Cornell. This change would also result in no significant impact on groundwater and soil resources.

Short-term Construction Impacts

Under the Proposed Action, the existing Incinerator Facility would be decommissioned concurrent with the construction of the proposed Waste Management Facility. Construction would be phased to accommodate pathological waste treatment and cRMW

shipping operations throughout the entire construction process in accordance with NYSDEC regulations. Temporary, short-term impacts caused by construction of the new facility would to some extent be unavoidable. The project would involve implementation of on-site mitigation measures to effectively minimize the following impacts: surface water quality (i.e., from erosion and runoff), traffic, air quality (i.e., from dust), noise (i.e., from construction equipment operation), and visual resources.

Potential Impacts Associated with Treatment of Infectious Wastes

During this SEQR process, particular concern has been expressed regarding the risks to workers and the general public associated with treating infectious materials, including those infected with “Mad Cow Disease” and other prion-based diseases at the CCVM. The proposed CCVM Waste Management Facility would be constructed and operated to provide the most effective treatment available for all infectious materials at the Facility, including prion-infected wastes. In particular, the CCVM Alkaline Hydrolysis system would meet or exceed conditions recommended by the World Health Organization and U.S. Centers for Disease Control and Prevention for prion inactivation. Even under upset conditions, the Proposed Action would not release infectious agents into the environment, corresponding to no significant biological hazard to human health.

Financial Resources

Construction of the new Waste Management Facility would require significant capital expenditures through the State University Construction Fund for equipment purchase and installation, plus major architectural, structural, mechanical, electrical and site work. While implementation of the Proposed Action would have an unavoidable, significant impact on financial resources, this financial commitment is necessary to provide a long-term, environmentally-responsible solution to the CCVM’s complex waste management requirements.

Other Potential Impacts

Pursuant to SEQR requirements, this EIS also evaluates potential impacts on land use and zoning; traffic; community services; utilities and infrastructure; topography, vegetation

and wildlife; visual resources; and socioeconomic conditions. The Proposed Action would have no significant adverse impacts in these areas.

Alternatives Considered

This DEIS evaluated a range of waste treatment and residuals disposal alternatives to the Proposed Action:

The No Action Alternative: Would continue the release of air pollutants and greenhouse gases from the existing CCVM incinerator, corresponding to continued air quality impacts. Recent CCVM experience shows that the existing incinerator, which is nearing the end of its useful life, is increasingly likely to have operational problems due to its age and condition. Under such conditions, it is possible for the unit to release significant quantities of particulate-laden smoke and products of incomplete combustion above normal emissions levels. Therefore, the No Action Alternative could result in more significant pollutant loadings to the environment in the future, corresponding to further impacts on air quality in the greater-Ithaca area.

No Action would also correspond to increased future biological risks to CCVM operators and maintenance staff. For instance, under certain failure modes such as a major refractory collapse during a burn cycle, CCVM operators and/or maintenance staff would be required to access the inside of the unit for repairs. Such problems are increasingly likely due to the aging condition of the incinerator. This type of maintenance procedure would involve significant risk of worker exposure to potentially infectious materials, thereby increasing biological hazards in the future.

Finally, long-term operation of the existing incinerator is not feasible. In the foreseeable future, the unit would require major overhaul and/or replacement to maintain waste treatment operations at the CCVM. This change would correspond to unavoidable, significant capital expenditures through the State University Construction Fund, along with other impacts of continued incineration.

Carcass Treatment Alternatives: Two alternative carcass treatment methods (Pressure Rendering Treatment and Utilization of the Existing Incinerator in Emergency Conditions) were considered. Pressure Rendering would treat carcass materials under

heat and pressure to generate a thick, greasy slurry to be subsequently landfilled, and would have significantly greater impacts on solid waste management, air quality, and occupational safety and health compared with the Proposed Action, with no increase in treatment effectiveness. Because Pressure Rendering has not proven effective in treating wastes infected with prions or intact, large animal carcasses, Alkaline Hydrolysis would probably also be installed for treatment of these waste types. Overall, this DEIS found that there is neither data nor performance history to indicate that Pressure Rendering would meet the performance criteria required by the CCVM as effectively as Alkaline Hydrolysis, and would have greater potential for environmental impacts.

The other carcass treatment Alternative considered herein would implement Alkaline Hydrolysis as proposed, plus maintain the existing incinerator as a back up to the Alkaline Hydrolysis system for use in emergency situations only. The Alkaline Hydrolysis system would be installed adjacent to the existing incinerator, and Waste Management Facility infrastructure would be modified to provide adequate access to, and proper operation of, both systems. Due to the significant space limitations in the area surrounding the incinerator, this alternative would preclude the installation of the Internal Steam Sterilization system included in the Proposed Action, and would likely require continued off-site shipment and treatment of conventional regulated medical waste. Due to the proven reliability of the Alkaline Hydrolysis technology, it is likely that this option would involve minimal utilization of the incinerator and would have environmental impacts comparable to the Proposed Action. Consequently, this Alternative would correspond to an inefficient use of valuable space resources that could otherwise be available for on-site treatment of cRMW and/or other beneficial full-time activities.

Anaerobic Biological Treatment of Hydrolysate Wastewater at the IAWWTF: This DEIS evaluated the potential benefits and impacts of treating hydrolysate wastewater via anaerobic biological treatment at the Ithaca Area Wastewater Treatment Facility. The distinct advantage of this option is the opportunity to generate significant amounts of methane gas via anaerobic treatment of hydrolysate. The methane would be used as fuel in the IAWWTF's boilers and electricity cogeneration system to offset energy consumption and costs. In comparison, the Proposed Action (i.e., sanitary sewer discharge and aerobic treatment of hydrolysate wastewater) would generate far lower quantities of methane gas and result in the consumption of significant amounts of energy in the IAWWTF's aerobic biological treatment system. This alternative would have no

significant potential for adverse environmental impacts beyond that of the Proposed Action.

The IAWWTF is performing treatability testing that will provide a definitive indication of the technical feasibility of this option. If this testing, which will conclude in first or second quarter 2002, has positive results, the CCVM would have the option to either discharge hydrolysate to the sanitary sewer (i.e., the Proposed Action), or transport hydrolysate to the IAWWTF for anaerobic treatment at the IAWWTF due to the significant methane-generation potential and corresponding energy benefits of the hydrolysate waste stream.

Other Hydrolysate Wastewater and Cremains Disposal Alternatives: Another Alternative to the Proposed Action would involve off-site hauling and treatment of hydrolysate at a wastewater treatment facility located outside of Tompkins County. This DEIS found that this Alternative would have no significant potential for adverse environmental impacts beyond that of the Proposed Action, assuming the receiving wastewater treatment facility could effectively treat high-strength hydrolysate on a routine basis. However, this option would involve routine long-distance hauling of hydrolysate, corresponding to a significant increase in diesel fuel use and transportation costs compared to the Proposed Action.

This DEIS also found that seasonal land application of hydrolysate wastewater is currently not feasible, due to the limited availability of property for land application in the Ithaca area. Even if property became available in the future, the CCVM could only apply a small fraction of its annual hydrolysate load over a very large parcel of land. The costs and benefits of obtaining and using such a large parcel of property to dispose of a relatively low volume of hydrolysate would likely be critical factors in determining the future feasibility of this option.

This DEIS found that seasonal land application of cremains (i.e., solid residual byproduct of the Alkaline Hydrolysis process) is also currently infeasible due to the limited availability of property for land application in the Ithaca area.

cRMW and Bedding Treatment Alternatives: External Steam Sterilization (ESS) was considered for the treatment of cRMW and bedding waste. This technology would have comparable environmental impacts to Internal Steam Sterilization (i.e., the Proposed

Action), but could involve increased risks to occupational safety and health associated with manual handling of infectious wastes, and increased maintenance requirements. Additionally, ESS has more limited experience in applications similar to the CCVM compared with Internal Steam Sterilization.

Another cRMW and bedding treatment Alternative would involve on-site treatment of bedding using Internal Steam Sterilization and continued off-site treatment of cRMW (i.e., in lieu of treating both wastes with ISS under the Proposed Action). This evaluation found that this approach would not be cost effective, since the minimal amount of infectious bedding (i.e., 5,000 lb/yr) received at the Facility could more efficiently be co-mingled and shipped off-site with the relatively larger amount of cRMW (i.e., 150,000 lb/yr).

Approvals Required

Prior to construction, the CCVM and/or SUCF would perform the following to address applicable regulatory requirements:

- Obtain from NYSDEC a 6NYCRR Part 360 Solid Waste Disposal Facility Permit to Construct and Operate the proposed Waste Management Facility.
- Address NYSDEC requirements for air emissions from the new facility under 6NYCRR Part 212 (General Process Emissions Sources).
- Coordinate NYSDOH approval of the specific Alkaline Hydrolysis unit proposed for installation at the CCVM.
- Obtain NYSDEC and NYSDOH approval of a written validation-testing program for both the alkaline hydrolysis and steam sterilization treatment units.

In addition, the CCVM would perform validation testing and submit results to NYSDEC and NYSDOH for approval prior to routine operation.

Tentative Schedule

The Proposed Action has the following tentative schedule:

<u>Date:</u>	<u>Milestone:</u>
February 28, 2002	Joint Notice of Completion of DEIS and Notice of Public Hearing (Start DEIS Public Comment Period)
April 10	Public Hearing Regarding DEIS <i>[Minimum review prior to hearing, per 6NYCRR Part 617, is 15 days. This assumes 45 days.]</i>
April 24	End of Public Comment Period <i>[Public comment period to remain open at least 10 days after hearing.]</i>
Week of May 20	Publication of Final EIS for public review <i>[FEIS to be completed within 45 days of hearing.]</i>
Week of June 10	Findings statements due from all Involved Agencies <i>[Agencies to be allotted a reasonable time, no less than 10 days, to issue findings statements. This assumes 21 days.]</i>
Winter/Spring 2003	Facility Design: Construction Document Phase
Spring/Summer 2003	Start Construction
Spring/Summer 2005	Complete Construction and Perform Validation Testing