

Sustainability Audit 2007

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INTRODUCTION

For more than 125 years, Northfield Mount Hermon School has provided an education for the head, heart, and hand. Our mission is to awaken in our students their individual passions and a love of learning; to promote their spiritual and social growth; and to cultivate responsibility through our work, outreach, and service programs.

A close connection with the land has been a consistent theme since the school's founding, and farm-to-table efforts and outdoor education are central to NMH programs. In recent years, faculty, staff, and administrators recognized that while we had been making many schoolwide sustainability decisions for decades, this was not translating into a transparent, unified approach to sustainability across campus.

In 2004, environmental responsibility was identified as one of the school's five key strategic goals, and it remains a focus for program development. One year later, Head of School Tom Sturtevant established the NMH Task Force for Sustainability, which created a venue for collaboration between students, teaching faculty, plant facilities staff, dining services, advancement, and the farm, focused on local issues of sustainability. This sustainability audit serves to establish the environmentally conscious practices in place on the Northfield Mount Hermon School campus in 2007, the community's vision for a sustainable campus in 2015, and proposed action steps that will carry us to that final vision.

ENERGY

PRACTICES IN PLACE

Vehicles and fuel consumption

1. An automotive expert on the NMH staff ensures that every campus vehicle is tuned to prime working condition and maximum efficiency for that vehicle's make, model and year.
2. NMH policy is to retire the older, less efficient vehicles from the fleet as replacement vehicles are purchased.
3. Economic analysis of diesel, hybrid, and electric vehicles and their place in the school budget is under way.
4. The NMH tradespeople (carpenters, electricians, and plumbers) combine all trips to the Northfield campus to maximize vehicle efficiency.

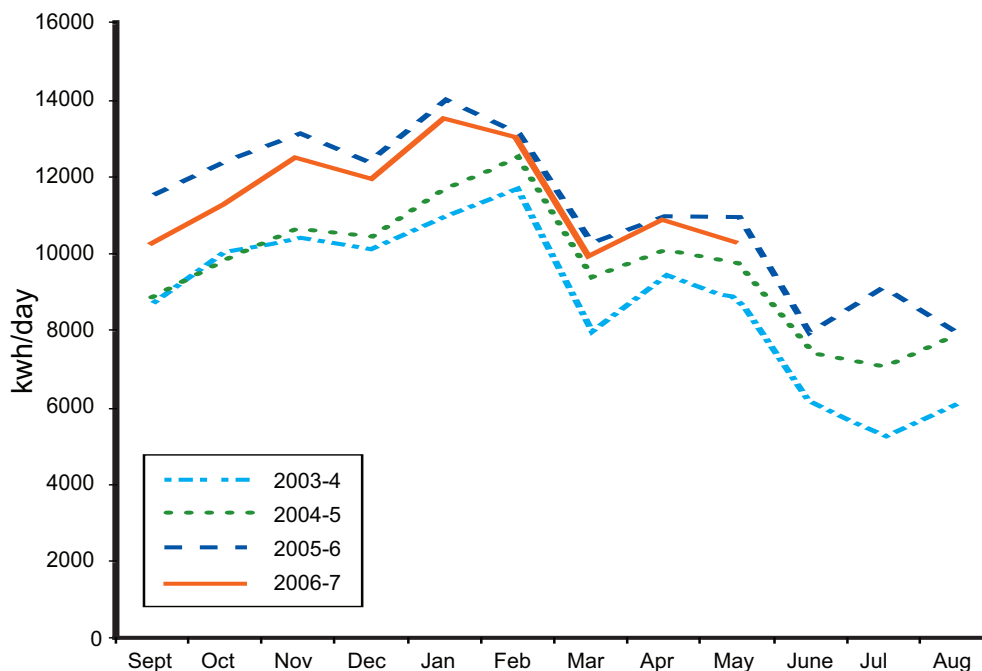
Campus vehicle fleet and fuel use in FY 2006

Department	Fleet	Gallons of Fuel Used in 2006
Athletics	2 8-passenger vans, 1 minibus	2830
	Bus rentals (Kuzmeskus, 38,000 mi, 6 mpg)	6319
Outreach	2 8-passenger vans	797
Farm	2 vehicles	517
Dining Services	3 vehicles (including one refrigerated) and gas-powered golf cart	1817
Health	1 vehicle	656
Golf Course	1 vehicle	409
Carpentry	6 vehicles	1941
Custodial	2 vehicles, supplemented by individuals' vehicles	459+
Electrical	3 vehicles	1039
Grounds	9 trucks Mowers and tools	5822 TBD
Plant	2 vehicles	331
Plumbing	3 vehicles	2445
Intercampus		
"Pony" Mail Service	1 vehicle	914
Security	2 trucks	3809
Utilities	2 vehicles	954
Advancement	1 vehicle	475
Head of School's Office	1 vehicle	456
Information Technology	2 vehicles	575
Admission	2 vehicles	532
Upward Bound	1 vehicle	994
Student Activities	Bus rentals	TBD
Total		27,772 gallons/ year

Electricity

1. In 2006, the Mount Hermon campus (except the wastewater treatment plant) used 4,089,064 kWh, and the waste water treatment plant used 105,000 kWh.
2. The Mount Hermon campus is currently rated at the T2 level for billing purposes, meaning that the maximum allowable peak demand is 1000 kW.
3. Two energy-monitoring systems combine on one platform, to monitor and manipulate electricity and heating systems in campus buildings.
 - a. The METASYS system, designed by Johnson Controls, provides real-time internal monitoring and control over the heating systems in zones in Beveridge, Blake, Crossley, Forslund, and Overtoun.
 - b. The Automated Logic Systems, designed by Yankee Technologies, provides real-time web-based monitoring and control over the heating systems in zones in Cutler, Hayden, Shea, MacKinnon, and Alumni Hall.
 - c. Automated Logic also provides electricity monitoring in Overtoun, Crossley, Hayden, Shea, MacKinnon, Wallace, London, Manchester, Hubbard, Monadnock, North Farmhouse, and Rikert.
 - d. We need 11 more electricity monitors for other campus buildings.
4. The school provides ongoing preventative maintenance and upgrades for mechanical equipment such as air-handlers, pumps, and ventilation equipment to minimize their electrical demands.
5. The hockey rink uses an estimated 40,000 to 50,000 kWh per month (one of the largest electrical demands on campus).
6. Housekeeping staff perform some duties during late shifts, using lights and electrical systems.
7. NMH has registered to participate in a Demand Response System through ISO New England, through which we have volunteered to shed 300 kW of our demand within 30 minutes of being notified by ISO, in order to minimize the total peak demand and prevent the construction of new power plants.
8. All buildings undergo a night and weekend setback to “unoccupied” status. In Forslund, James Gym, Cutler, and Blake, air handling systems and exhaust fans are shut off at night. In Beveridge, Crossley, Overtoun, Hayden, Shea, MacKinnon, and Alumni, the systems undergo a partial setback of electrical systems.
9. Alumni Hall has 240 8-watt cold cathode light bulbs in the overhead lighting.
10. One hundred light posts are situated along campus roadways, all containing 23-watt compact fluorescent light bulbs.
11. All exit signs on campus have been, or are slated to be, refitted with LED light bulbs.

Average Daily Electricity Use, Mount Hermon



12. Shea and MacKinnon have central air conditioning, which is only used during maximum temperatures during summer sessions.
13. The upper and lower modular classrooms have external air conditioning units.
14. All new students and faculty members were given one free compact fluorescent light bulb in the fall of 2006, courtesy of the deans office.
15. Window air conditioning units are installed in offices in Schauffler, Holbrook, Cottage III, Oaknoll, plant and property, and an estimated 50 percent of faculty homes.
16. All new buildings and renovations will include energy-efficient systems.
17. Beginning in 2007-08, students will not be allowed to have refrigerators in their dorm rooms.
18. Northfield Mount Hermon School participates as a founding member of the Green Cup Challenge, an annual contest among 15 boarding schools. The goal of the Green Cup Challenge is to involve and educate the entire campus community about the impacts of our electricity consumption by competing to cut back electricity use the most (measured by a percent change from a baseline measurement).

(for numerical data, see Appendix A)

Heating

1. The steam power plant burns low-sulfur (0.5 percent sulfur) #6 fuel oil to heat the campus.
2. Norton House, Dwight's House, and all single-family homes on the faculty loop burn #2 oil for heat.
3. The Mount Hermon campus heating demands in 2006 included 331,766 gallons of low-sulfur #6 fuel oil and 57,289 gallons of #2 fuel oil.
4. NMH policy ensures a reduction in heat for all unoccupied buildings. Any buildings that are not in use for an extended period of time are maintained at 40 degrees. The METASYS energy management system has been expanded to refine heat use in unoccupied spaces on campus.
5. In Forslund, James Gym, Cutler, Blake, Beveridge, Crossley, Overtoun, Hayden, Shea, MacKinnon and Alumni, the temperatures at night are set five degrees lower than daytime temperatures.
6. The facilities personnel undertake yearly maintenance of the furnaces and boilers in faculty housing to reduce consumption.
7. Plant staff monitor the presence of open windows in dorms, to manipulate the heating in response.
8. An infrastructure upgrade included installation of super-insulated steam lines and deconstruction of the high pressure steam boiler in the powerplant.
9. Energy-efficient equipment is used as much as possible in all new construction and renovations on campus.

VISION

Advancement

An advancement campaign for "A Sustainable NMH" will provide funding for:

1. an upgraded power plant;
2. wind, solar, and geothermal technologies;
3. an energy-efficient vehicle fleet;
4. teaching equivalent workload adjustments and professional development funds to provide training in ongoing sustainable practices for Northfield Mount Hermon School's curriculum and traditions;
5. EnergyStar appliances;
6. retrofitting inefficient buildings.

Vehicle Fuel

By 2011-12:

1. NMH will cut back on total vehicle fossil fuel use by 25 percent.
2. NMH will have a no-idling policy for all vehicles on campus.
3. Most vehicular traffic will be consolidated to the outer perimeter of campus.
4. Every building will have an associated bicycle rack.
5. All diesel vehicles and equipment will run on B20 fuel, fuel containing 20 percent biodiesel.
6. All campus deliveries will be consolidated to minimize the number of trucks entering campus.

7. All faculty members either will live on campus or be provided with carpooling options.
8. NMH will determine the feasibility of commuting communities for any faculty or staff who live off-campus, in which the school provides housing clusters in prime locations, with optimal conditions for ridesharing for school faculty and/or staff.
9. All power tools used on campus will be designed for minimal noise and air pollution.

Electricity

By 2011-12:

1. A combination of small windmills and photovoltaic panels will provide at least 5 percent of our campus electricity demands, with the potential for future growth.
2. Annual campus-wide electricity demands (from the grid) will increase only 20 percent more than 2006-07 demands through the use of efficient lighting, improved personal habits, automatic computer shutdowns, a more efficient hockey rink, and the electricity provided by solar panels and wind.*
3. All community members will receive regular, immediate feedback about campus electricity consumption.
* *The Rhodes Center for the Arts will cause an increase in electricity demand.*

Heating

By 2011-12:

1. The power plant will be converted to burn #2 fuel oil, and heating needs will be cut back by 20 percent by solar water heaters and energy-efficient windows.
2. Every building will have heating zones that will be controlled by the METASYS or Automated Logic systems.
3. A priority list with cost-benefit analysis for the installation of energy-efficient windows and doors, insulation, and EnergyStar appliances in all campus buildings will be in place and publicized.
4. Faculty members will be responsible for heating needs above a certain baseline, and will receive regular feedback about their heating oil consumption.
5. New faculty will attend a yearly infrastructure orientation, with an introduction to the systems in their buildings as well as the overall infrastructure of campus.

ACTION STEPS

Vehicle Fuel

1. A rideshare SWIS folder will allow for carpooling to Northfield, Greenfield, Deerfield, Brattleboro, Keene, Swanzey, and Amherst to be consolidated among faculty, staff and students.
2. Electric and/or enclosed diesel golf carts will replace some older vehicles in plant and property, with modified structures to allow for large equipment and materials.
3. All waste vegetable oil from Alumni Hall will be used for fuel in campus vehicles and heating needs.
4. The entire NMH vehicle fleet will be updated with newer, more fuel-efficient vehicles.
5. Evaluate the necessity of jet travel to and from professional development programs.
6. A fleet of bicycles and/or electric vehicles on campus could be available for travel across campus.
7. The admission office could rely on an electric vehicle for transport on campus.
8. Travel for athletic events, outreach, and student activities will be planned with maximum vehicle efficiency as a priority.
 - a. Teams will share buses, and all opponents will be selected based on their distance from the NMH campus.
 - b. Student activities programs will only use vehicles that are just big enough to transport the number of students who are traveling.
 - c. Outreach trips will be consolidated for efficiency.
9. NMH Dean of Students Office will provide carpooling oversight for day students.

Electricity

1. "Hoggerdisk" will provide a program through which all students' computers will automatically shut down after 30 minutes of inactivity.
2. All light fixtures on campus will use compact fluorescent lightbulbs.
3. Campus policy will mandate that all light fixtures provided by students be EnergyStar rated, and that each dorm

room be limited to two or three light fixtures, depending on the size of the space.

4. When allowed by building codes, all hallway, bathroom, and classroom lighting will be regulated by motion sensors.
5. Every house director will educate the dorm community about the electrical demands of drying machines, and will provide students with alternative clothes-drying methods.
6. Kiosks that display real-time electricity consumption data will be built in Schauffler, Alumni, Cutler, and/or Blake Student Center.
7. Multiple light switches will be installed in the gym and hockey rink to allow for more control of the lights and easier shut-off.
8. The tarps that serve as the walls of the hockey rink will remain raised during daylight hours when the ambient temperature is below freezing, to allow day-lighting of the rink.
9. All new washing machines installed on campus will be front-loading, EnergyStar appliances.
10. NMH will enter a partnership with ESCO, which will pay the up-front costs of converting all gym, rink, and pool lighting from the metal halide lights to T5 fluorescent lights, in return for the money saved in electricity costs.
11. Summer programs will be scheduled within certain buildings in order to consolidate cooling needs.
12. NMH policy will determine the number of window air-conditioning units allowed per office building, and will not allow more than one window unit per faculty apartment or home.
13. Housekeeping will be accomplished, when possible, during daylight hours, to reduce the need for electric lighting.
14. Eco-leaders will provide education on energy issues for all students through the student life curriculum.
15. Community members will commit to use only electricity that is absolutely necessary (including extinguishing holiday lighting on January 2).

Heating

1. Heating zones will be controlled by the METASYS or Automated Logic Systems in the five Cottages, Schauffler, Holbrook, Wallace, Rikert, plant and property, the rink, and the Rhodes Center for the Arts.
2. All faculty housing outside of the dorms will have programmable thermostats installed.
3. Plant and property will set limits on the amount of heating oil provided to faculty in campus housing (based on the average oil consumption in that house over the past ten years).
4. If a faculty house exceeds its limit, the resident will have to pay for the excess.
5. If a faculty house stays below that limit, the resultant savings will be dedicated to upgrades in the efficiency of that house.
6. All buildings on campus will be evaluated for their heating efficiency through infrared imaging, and the number of BTUs used/square foot/year will be established for each building on campus, as a standardized measure of efficiency.
5. Cogeneration from the new hockey rink compressor will provide the heat needed in the rink stands.
6. A small windmill built on campus will provide 3 percent of our annual electric demand.
7. Solar hot water panels and photovoltaic panels will be installed on the gym, the Rhodes Center, and other prime rooftops.
8. Student locker rooms in the gym will be enclosed properly to prevent nighttime freezing of pipes.
9. Tankless water heaters will be installed in the gym.
10. Buildings will be oriented appropriately and thermal mass will be installed for passive solar heating in new buildings, where appropriate.
11. NMH will work with experts at the University of Massachusetts to establish the potential for geothermal heating and cooling on campus.
12. Biogas (methane) from our farm compost will provide heating needs for a farm building.
13. Wood-burning heating systems will be evaluated for efficiency, safety, and feasibility in prime locations on campus.
14. Pellet stoves and solar mirrors will be used for clearing snow from campus pathways, and green roofs will be under consideration for use on campus.
15. Every dorm room will have a thermometer in place for immediate feedback.

WATER

PRACTICES IN PLACE

1. NMH draws an average of 58,000 gallons per day from 12 wellheads driven 24 feet deep into the Bernardston aquifer in a field 1.3 miles from campus.
2. The Bernardston wellfield is protected from contamination under NMH's Wellhead Protection Plan and the Town of Bernardston's Water Resource Protection District bylaws.
** The Massachusetts DEP has labeled our wellfield as "highly vulnerable to contamination, primarily due to its being a sand and gravel aquifer with no confining layer such as clay."*
3. As of 2005, there were no detected contaminants in the Bernardston aquifer that would pose any health risks to the consumers of this water (see Appendix B for 2006 Water Quality Data).
4. NMH spends an estimated \$5000 per year on electricity to pump water from the aquifer to our water tower. This water is being pumped during the day (between 7 am and 3 pm), but research is underway to shift this pumping time to nighttime.
5. Every five years, the inner surface of the NMH water tank is sandblasted and painted.
6. An infrastructure upgrade between 2001 and 2007 included installation of super-insulated steam lines and replacement of water lines with less permeable pipes, reducing our wastewater treatment plant's load during storm events.
7. The power plant uses, on average, 1,200 to 1,500 gallons of water per day during fall and spring, and as many as 3,000 gallons per day in the prime heating season.
8. The modular buildings contain waterless urinals, and all new buildings on campus will incorporate this technology.
9. Soap dispensers in public restrooms and soaps used on glassware in the water monitoring lab are antibacterial soaps, which may have a minute negative impact on the functioning of the wastewater treatment plant and the ecology of the Connecticut River.
10. Online maintenance request forms allow the maintenance staff to address leaking fixtures immediately.
11. The football field is watered a few times per week throughout the summer; water is treated drinking water from our water tower, and 20,000 to 40,000 gallons are used at each watering.
12. All of our athletic fields are natural soil fields, which minimize water and fertilizer demands.
13. Soil amendments (fired, unsealed clay substrate) are in place around MacLamore baseball field to trap water and re-release as needed.
14. Fire hydrants are flushed annually on campus. On June 16, 2005, this flush released 69,052 gallons.
15. The NMH wastewater treatment plant, built in 1963 and restructured in 1989, consists of a headworks (primary filtration of water), first lagoon (facultative anaerobic), second and third lagoon (settling lagoons), rapid mixer (in case of a need for polymer coagulation), clarifier, and chlorine contact chamber. Effluent is released to a point in the center of the Connecticut River.
 - a. In 1989, sludge was used for land fertilization.
 - b. In 2005, the first lagoon was pumped to remove a build-up of sludge waste (276,000 gallons, at a price of \$70,000 for pumping and removal).
16. The wastewater treatment plant treats an average of 60,000 to 100,000 gallons of water per day (depending on precipitation), and has the capacity to treat 450,000 gallons of water per day.
17. Environmental Compliance Services, Inc., monitors groundwater quality at the capped landfill, which is no longer in use, below the Piggery Fields.

VISION

1. Wellheads will be closer to campus, and all pumping will occur during the night to minimize electricity demands.
2. Aquifer water will be used only within buildings—all watering of the landscape and fire hydrants will use untreated water (from either the Connecticut River, Shadow Lake, or cisterns).
3. The wastewater treatment plant will not emit any chlorine into the Connecticut River water, and effluent nutrient levels (nitrogen and phosphorus) will be below the ambient concentrations.
4. There will be no visible signs of erosion between the westernmost portion of campus and the Connecticut River.
5. All steam and water pipes will be updated and efficient.
6. Every member of the community will be aware of the number of gallons used per minute by faucets, toilets, and showers, and will be conscientious about conserving water.

ACTION STEPS

Education

1. Install water meters on the following buildings:
 - a. Every dorm, Alumni Hall, Forslund and James Gyms, the power plant, the laundry
 - b. Blake, Beveridge, Schaufler, Holbrook, and the Rhodes Center for the Arts
 - c. Admission, North Farmhouse, Oaknoll, and all faculty housing.
2. Water meters will be a key tool for campus-wide educational programs and events focused on water use (similar to the Green Cup Challenge).
3. The student life curriculum will incorporate activities and educational programs about the source-to-sink flow of water through campus, and our impacts on the local watershed. Students will have immediate access to a system in which they can report leaks and other maintenance needs directly to plant and property.
4. Every member of the NMH community will own an identifiable, reusable NMH water bottle, which will be used in place of water in disposable bottles.
5. The NMH community will value the Connecticut River as an asset to our campus, through educational initiatives and more directed activities at the waterfront.
6. A course may be added to the NMH curriculum that studies NMH's water use, irrigation methods, and hydrological issues.

Water Source

1. NMH will install pumps from the Connecticut River to use river water instead of treated aquifer water to water all athletic fields. This may be supplemented with gray water from campus systems.
2. NMH will reestablish dry fire hydrants in Shadow Lake (which were in place until 1999, but have been out of service due to a lack of maintenance).
3. NMH will identify an aquifer closer to campus to cut back on pumping costs.
4. NMH will renegotiate with Crumpin Fox and other local water users in order to ensure the preservation of the future integrity of the Bernardston Aquifer.
5. All runoff from athletic fields and from impermeable surfaces on campus should be trapped in cisterns and used as gray water.
6. Research into NMH's historical use of wind power for the extraction of water from wells on the Beveridge Bowl will determine the efficiency of reestablishing this practice.
7. Snow cleared from the hockey rink will be used as recaptured water for the rink surface.

Water Use

1. NMH will provide financial incentives for the purchase of water-saving laundry machines in faculty residences.
2. All new laundry machines, showerheads, and toilets installed on campus will be water-saving models, and a timeline will be set for the phase-out of existing inefficient models in dorms and faculty apartments.
3. Sensor faucets will be installed in all nonresidential buildings on campus.
4. Timers and water-use charts will be installed in all public showers, in order to educate the community about water waste.
5. All public showers will contain soap dispensers with low-phosphate shampoos.
6. All bottled water dispensers will be replaced with water fountains, and every member of the NMH community will be provided with a reusable water bottle.
7. Solar water heaters will be used in combination with demand water heaters where available; most importantly, the gym facilities.
8. The hockey rink and pool systems will be combined eventually to minimize water and energy waste.
9. Install stop-flow showerheads in the gym, all dorms, and all campus houses.
10. The community will adhere to a suggested limit of two showers per person per day.
11. Where possible, dual-flush toilets will be installed.

Landscape

1. Soil amendments must be installed around all new impermeable surfaces on campus.
2. Landscaping will be designed to mitigate any directional water flow on campus, and therefore minimize erosion.
3. In the zones on campus with minimal water retention, xeriscaping will be used.

4. One artificial turf playing field on campus will decrease water needs and upkeep.
5. All cement and hardtop surfaces will be porous, allowing for better drainage of water and minimizing direct water flow.

Wastewater Treatment

1. The wastewater treatment plant will be converted from a chlorine disinfectant system to ultraviolet radiation disinfectant.

CHEMICALS

PRACTICES IN PLACE

1. The most widely used cleaning product on campus is H2Orange, a sustainable citrus-based cleaning product. Deep cleaning requires less sustainable products, but as these products are being used up, the director of facilities is identifying and purchasing more powerful sustainable products. (see Appendix C for a list of cleaning products used on campus)
2. NMH has a policy of integrated pest management, in which the following steps are taken in order to minimize pest populations:
 - a. an action threshold (the point at which pest populations or environmental conditions demand pest control actions) is identified;
 - b. pest populations on campus are monitored through daily observations of the plant facilities staff and house staff;
 - c. preventative steps are taken to minimize pest invasion;
 - d. once the action threshold is reached, facilities staff control pest populations with the most sustainable products available (cedar and spearmint oils, dusts, and gels);
 - e. if sustainable products are not successful at controlling the pests, facilities staff resort to the use of products such as Roundup (see Appendix D for the Integrated Pest Management Plan and a list of pesticides used on campus);
 - f. the NMH farm uses certified organic fungicides and pesticides.
3. No refrigeration systems on campus use CFC systems.
4. The hockey rink refrigeration system uses 3,000 pounds of ammonia, which is cycled in a closed loop and never replaced as long as the system is functioning.
5. The wastewater treatment plant and pool systems use liquid chlorine to disinfect the water.
6. During routine vehicle maintenance at plant and property, waste oil is collected, and removed by SafetyKleen.
7. Fuel tanks at plant and property are on metal stands and contained by a low cement wall, the base of which is lined with sand, to absorb any small spills and avoid contamination of the surrounding areas.
8. Chlorine bleach is used for routine sanitation and cleaning on campus, especially in the dairy facilities on the farm. It is diluted, and disposed of through the water system.
9. Medications prescribed at the infirmary do not take into account the impacts on the Connecticut River ecosystem.
10. Efforts are under way to identify and safely remove all mercury-containing lab equipment from the science department.
11. The sites of the former Silliman and Recitation halls have been partially remediated during the construction of the Rhodes Center for the Arts (asbestos and other chemicals have established these sites as brownfields).
12. The chapel's windows are most likely leaded glass, and lead flashing remains throughout campus buildings. As old systems are replaced, the lead flashing has been replaced with copper structures or rubber membranes.
13. The hockey rink mechanical room has some remaining mercury switches; these are being replaced with environmentally sound switches as systems are upgraded.
14. The unused landfill at the base of campus is in the process of being capped, and water quality is monitored around the site.

VISION

1. All cleaning products will be environmentally friendly products.
2. Heavy metals and toxic chemicals will be minimized, if not eliminated completely, in the science department, art department, mechanical rooms, and throughout the rest of the campus.
3. The remaining footprints of Silliman and Recitation halls will be excavated and remediated.
4. All lead building materials will be replaced with updated technologies.
5. All asbestos will be removed from campus buildings.
6. All carpet installation and interior decorating will use fixatives and other products that prevent hazardous off-gassing.
7. The historic landfill will be capped and remediated.

ACTION STEPS

1. The science department will commit to microlabs, in which the quantities of chemicals used will be minimized.
2. All new NMH community members will receive an orientation on what can and cannot be poured down the sink drains (especially science and arts faculty).
3. Plant and property will diversify its use of green cleaning products.
4. Alumni Hall dishwasher soaps will be certified green.
5. Mercury thermostats will be removed safely from all campus buildings.
6. An evaluation of the use of chlorine as a disinfectant in the pool will determine whether ozone, or other disinfecting agents, might be most sustainable, economically and environmentally.
7. The coolant system in the hockey rink will be evaluated, in order to determine whether the ammonia system is the most sustainable option (economically and sustainably).
8. No paints and finishes used on campus will release volatile organic compounds.

CONSUMPTION AND WASTE

PRACTICES IN PLACE

Minimizing Rubbish, Promoting Recycling

1. NMH pays Waste Management \$80 per ton to remove our rubbish, both for the transport of the rubbish and for the disposal.
2. For recycled products (commingled glass, plastic, tin, paper, and cardboard), NMH is charged \$125 per haul for bottles and cans for the removal, not the disposal.
3. During FY 2006, NMH recycled 1,500 cubic yards of materials, saving the school \$16,000 in disposal fees.
4. There are recycling bins in key locations in every building; this translates most commonly to one set of recycling bins (paper, cans, and trash) per floor.
5. Clear trash liners are used to collect rubbish and recycling, to determine the level of crossover (contamination) between the two categories of waste.
6. The director of institutional services is working on a pilot program that would establish new recycling receptacles with restrictive tops in freshman housing.
7. Large-roll toilet paper rolls minimize the stub waste generated.
8. Microfiber cloths are used by the housekeeping staff in place of paper towels to minimize the waste generated in cleaning.
9. The community has been encouraged to maintain records electronically instead of paper records.

Minimizing Food Waste

1. In the dining hall, dining services director Rich Messer has eliminated the use of trays, dramatically reducing the amount of food that individuals waste.
2. The NMH Task Force for Sustainability spent two days weighing food waste in the dining hall in 2005-06. The gathered data was translated into an eye-opening announcement at an all-school meeting.
3. Kitchen waste was composted on the NMH farm until the spring of 2006.

Recycling of Large Items

1. Broken or defunct computer monitors and printers are sold when possible. Items that cannot be sold are picked up by a hazardous-waste disposal company hired by the school. This company pays NMH for the plastics they retrieve from NMH.
2. Laser-printer toner cartridges are recycled by a contracted company.
3. There is not a program in place for recycling printer-ink cartridges in homes and dorms on campus.
4. Old furniture is removed from campus by the Institution Recycling Network (www.ir-network.com). Reusable furniture is distributed for international relief. Over the last three years, NMH has donated:
 - a. mattresses—1 ton;
 - b. mixed electronics—22 tons;
 - c. surplus furniture—7 tons;
 - d. universal waste—1 ton.
5. Products that can be reused that are left in dorms at the end of the year are brought to the Salvation Army or other similar programs by house directors and the housekeeping staff.
6. We have a 20 cubic-yard open-top dumpster that receives metal scrap waste, pipes, shelving, old bikes, mowers, etc., for a local salvage yard at no cost.

Disposing of Hazardous Waste

1. The science department makes every effort to keep chemicals from going down the drains. Students are asked to put the products from their labs in waste beakers, which are then collected by a lab technician. The contents of these waste beakers are capped and stored for disposal by a registered hauler contracted by the school. We do these disposals every few years. The most toxic chemicals we use are compounds of lead, zinc, and silver. Substances such as sodium chloride (salt) we allow down the drains with lots of dilution.

2. The art department recycles chemicals where possible, and disposes of hazardous chemicals in accordance with NMH school practices (see Appendix E for a list of chemicals).
3. There is not a program in place on campus for the disposal of batteries, compact fluorescent light bulbs, or other hazardous waste.
4. Mike Henderson (director of institutional services) and Emil Rende (bookstore manager) are working together to create a battery and compact fluorescent lightbulb drop-off point in the bookstore.

Use of Recycled/Green Products

1. The hand soap used by NMH right now is SBS AeroGreen. This is not Green Seal Certified, but is in use at NMH because it contains an antimicrobial agent (preventing its certification). SBS also makes AeroBlue and AeroRose, which may obtain Green Seal certification.
2. NMH currently uses the following recycled paper products:
 - a. Kimberly Clark Brown Roll Towels (100 percent recycled, 60 percent post-consumer content, made from recycled corrugated cardboard)
 - b. Kimberly Clark Jumbo Tissue (20 percent post-consumer recycled content)
 - c. Scott Canada Kitchen Roll Towels (100 percent recycled, 80 percent post-consumer content)
 - d. Cascades Jumbo Tissue (100 percent recycled, 60 percent post-consumer content)
 - e. Cascades Brown Roll Towels (100 percent recycled, 80 percent post-consumer content)
3. The trash liners used on campus are Covalence Liners (33 x 40 and 40 x 48), and are 100 percent virgin material.
4. Recycled liners require more thickness to achieve the same strength as the bags made with virgin resin, resulting in more plastics entering the landfill. NMH has chosen, in this case, to reduce instead of recycle.
5. See the purchasing breakdown in Appendix F.

VISION

By 2011-12:

1. NMH will cut down on its rubbish production by 50 percent below 2007 levels, by diverting waste to recycling.
3. All paper products used on campus will have at least 30 percent recycled content. All bathroom tissue (paper towels, tissues, and toilet tissue) will have 100 percent recycled content.
4. Classrooms will use one-fifth of the paper used in 2006-07.
5. All brochures and NMH advertising materials will be printed on 100 percent recycled paper.
6. A full composting program will be in place, composting kitchen waste, waste from the Alumni Hall dish room, and organic material from dorm kitchens and faculty apartments.
7. All hazardous waste will be collected on campus, and NMH will be working with Eaglebrook, Bement, and Deerfield on a regular program for removal of the waste.
8. NMH will work with Eaglebrook, Bement, and Deerfield to identify a company that will regularly pick up and recycle technology waste from the entire community (including computers, cell phones, etc.) on a regular basis.
9. A program will be in place for recycling printer cartridges in all dorms and faculty apartments on campus.
10. Dining services will cut back on the annual number of meals using paper plates, cups, and utensils by 75 percent.
11. Appropriate support for community engagement in our campus-wide recycling program will be established.

ACTION STEPS

Education

1. Label recycling bins more clearly, and place them in key locations throughout campus.
2. Educate the community about the printers' default settings (with a default of double-sided printing), and about how to select the correct printer.
3. Create clearer, consistent signage in the recycling shed area.
4. Provide more schoolwide education about recycling, including a swis folder with updates on the school's recycling practices, as well as updates on how much we have recycled month by month.
5. Create a dorm-versus-dorm contest to see which dorm can be most consistent about recycling.
6. Recycling procedures and the global impacts of recycling should be included in the fall orientation and registration program as well as the orientation program for new faculty.

7. At orientation, every member of the NMH community should take an oath or sign a contract to be a committed, responsible global citizen.
8. Students should create a catchy phrase or theme for the recycling program at NMH.
9. Individual recycling contracts should be a part of the hiring process, and the orientation process in the dorms.
10. House directors should be notified when a dorm is not successfully recycling, so that the problem can be immediately addressed with the entire dorm.
11. Alumni involved in global programs who can demonstrate the importance of consuming and recycling should be invited to speak at NMH and share their message with our community.
12. In the long run, NMH should invest in recycling centers outside each dorm, to which individuals must bring their sorted trash, recyclables, etc.

Reducing Consumption

1. Individual food container use should be monitored and limited, especially at the Beveridge breakfast program, and disposable plates, cups, and utensils will be eliminated whenever possible.
2. Every dorm should use a grease-pencil sign-in sheet in place of a binder with paper.
3. The advancement office should shift towards using e-mail in place of sending paper mailings.
4. The reunion program should focus on modeling sustainable practices, minimizing paper waste and food waste.
5. The communications office should use 100-percent recycled paper in all mailings and brochures, if possible.
6. All offices should be supplied with energy-efficient light bulbs.
7. All toilet paper on campus should be recycled paper.
8. Paper used in printing on campus should all have some recycled content.
9. Students' use of printers can be monitored, and charged to their account, using a keycard or password.
10. All student papers should be submitted by e-mail, graded on the computer, and returned electronically. Faculty can commit to this initiative or some variation thereof.
11. Faculty should move towards paperless classrooms if computers are provided for all students in the classroom buildings.
12. Grades and progress reports should be accessible to parents through the school's website; grades should only be mailed to those parents without access to the Internet.
13. All mailings sent from NMH should be consolidated, to use double sides of paper and to minimize the number of envelopes sent to NMH families.
14. Coffee should be brewed multiple cups at a time, where possible, eliminating the need for individual coffee pods (K-cups).
15. Those who work in offices on campus and drink coffee should bring their own mugs to work, to eliminate the need for disposable coffee cups.
16. Every student should have the opportunity, during freshman orientation, to use clay from the Connecticut River to produce their own bowl and mug. These dishes would serve as their in-dorm dishes, allowing the Alumni Hall dishes to stay in Alumni Hall.
17. The default settings on all printers should be double-sided.
18. Paper towels should be replaced with longer-lasting, more sustainable alternatives.
19. Lotion soap should be used in place of antibacterial soap in all bathroom soap dispensers.
20. Food consumption may be limited to certain areas, in order to extend the life cycle of carpeting and other products.

Reuse

1. Market pads of paper in the NMH bookstore, produced by students from reused single-sided paper printouts, using binding glue and cardboard covers.
2. Provide compost bins and compost removal for every dorm and faculty house on campus on a regular basis, and raise pigs on the farm, fed by composted waste.
3. Use fallen trees, used paper, and other materials found on campus for campus improvement projects (outdoor furniture, signs, etc.).
4. Store items discarded by students at the end of every school year for a tag sale every fall (lamps, furniture, books, clothing, etc.).
5. A policy must be drafted in which we commit to deconstructing old buildings instead of demolishing them, and reusing building materials.
6. An NMH employee should be licensed to pump Freon from waste appliances for reuse.
7. We should have central plastic bag stations for depositing and reusing grocery bags/newspaper bags.

8. NMH should commit to using rechargeable batteries wherever possible.

Recycle

1. All bins at the plant and property recycling center must have clear, visible signage.
2. Cans and bottles that have a deposit in Massachusetts should be collected separately and returned; funds from their return can translate into sustainability programs on campus.
3. Eco-leaders can initiate and monitor recycling programs in the dorms, and can coordinate a house contest to see which dorm can be the most efficient at recycling.
4. Unify the recycling containers on campus into one common design (with unique identifying features for paper, bottle, and trash bins), and add recycling bins in every high-traffic area as determined by student eco-leaders.
5. Provide a visible, unified approach to recycling printer cartridges, computers and computer components, different kinds of plastics, compact discs, etc.
6. In the long run, house a recycling center with a can crusher, etc., here on campus.

ECOLOGICAL IMPACT

PRACTICES IN PLACE

1. During the summer months, grass on the athletic fields is kept at 4 inches (maximizing root depth) for water and fertilizer retention, aeration of the soil, and less mowing. During the fall and spring months, fields are trimmed to 2 inches.
2. The runoff from the track is diverted to the orchard for watering.
3. Grub populations are controlled during the summer months.
4. No toxic chemicals are used for pest control.
5. Landscaping is designed to maximize the views of the Connecticut River Valley.
6. There is not currently a forest land management policy in place.
7. Trees on campus are maintained through grooming, trimming, and planting.
8. The orchard has been retired, but arsenic and lead remain in the soil.
9. Some fields are kept in a natural tall-grass state for habitat.
10. Trail management is undertaken with the goal of minimizing ecological impact.
11. Green cleaning products, such as H2Orange and microfiber cloths, are used throughout campus for cleaning needs. (Appendix C)
12. Environmentally sound brewery byproducts are used in conjunction with salt for winter de-icing of pathways and roads.
13. Pests are managed with the most environmentally friendly products available.
14. Roundup is applied once per summer to minimize weed invasion. This application will be complemented this summer by a prescribed burn around appropriate structures to minimize the need for pest control throughout the year.

VISION

1. Use more local species for ground cover.
2. More trees will be strategically placed in the central campus, creating shade, habitat, and water and soil retention, while maintaining views and supporting the campus-wide master plan.
3. The core of the campus will be used predominantly by pedestrian traffic.
4. With a strong forest management program, our forest wood will be used for lumber, and waste wood will be sold for energy production.
5. Campus landscaping will shift from maintenance and upkeep to a planned productive landscape strategy where possible (using interplanting and other self-maintaining strategies to create ecological niches on campus).
6. Northfield Mount Hermon School will become a groundbreaking leader among its peers in the field of environmentally friendly landscaping.

ACTION STEPS

1. Gully erosion on the downward slope of the Piggery Fields must be rectified through appropriate landscaping.
2. Standing water and direct runoff around the new construction must be diverted into landscaping designed for maximum water absorption and soil maintenance.
3. Guidelines for faculty chemical use and landscaping will be provided in the faculty and staff handbook.
4. More environmentally friendly pest management products will be identified and used on campus.
5. The campus master plan will include a vision of sustainable landscaping, incorporating native species, vegetative stratification, vegetation for run-off management, and productive plant species (fruit, wood, etc.) whenever possible.
 - a. Elm and maple trees will be restored to the central campus.
 - b. Outdoor spaces will be redesigned where appropriate, with patios and sitting areas to encourage and enhance the community's ability to enjoy the outdoors.
6. NMH will commit to a set of sustainable building practices for all new construction and renovation.
7. NMH will institute a forest management plan.
8. Sheep raised on the NMH farm will be made available on a rotating basis to maintain grass-length on faculty lawns throughout the summer months.

Curriculum

PRACTICES IN PLACE

Extrinsic

1. NMH offers a number of courses whose central theme is living sustainably.
 - English
 - Freshman Humanities through an environmental lens
 - Turtle Island (historical, literary, and ethical perspectives on the North American landscape, with a three-week study/travel component)
 - History and religious studies
 - History of the Connecticut River Valley
 - Humans on the Edge (humans' response to environmental catastrophe, with a study, travel, and service component)
 - Environmental History and Ethics
 - Use and Abuse of Power
 - International Studies in New Zealand (three-week study, travel, and service component)
 - Global Futures: Global Warming
 - Science
 - Environmental Studies and AP Environmental Science
 - Ecology of Costa Rica (with a three-week study/travel component)
 - Biology (with lab experience on the NMH farm)
 - Physics courses at the 100 and 200 levels focus on energy, with some discussion of sustainable energy sources
 - Geology
 - Genetics and Ethics
 - Outdoor Education courses
2. Many courses, while not focused on sustainability, incorporate sustainable themes into their course content.
 - Economics
 - Anthropology
 - Ceramics
 - Senior English
 - Botany
 - Geology
 - Chemistry
 - Physics
 - French

Intrinsic

1. In campus buildings, the message of saving energy and recycling materials is advertised.
2. The Wipe-A-Tear student group, which is raising money to help Rwandan children, has undertaken an active recycling initiative in which they recycle bottles with a deposit to raise money.
3. A student eco-leader position will begin in 2007-08 as a work job for six to ten students. These students will take on a leadership role in implementing sustainable practices on campus.
4. Grant money is available to students and faculty for developing environmental education and activism.
5. The Green Cup Challenge has incorporated a student-life-curriculum component, in which the student community engages in issues related to sustainable energy and shares ideas with peer schools.
6. Institutional actions and publicity
 - a. When possible, all materials used in the art curriculum are nontoxic. Water-based paints are used when possible, and paper products are recycled after use. No incandescent light bulbs are used in the art buildings.
 - b. Many of our students are involved in some form of weekly outreach program through NMH Outreach.
 - c. Some students, faculty, and staff volunteer locally in big projects, such as the Connecticut River cleanup every fall.
 - d. Every member of the school community pitches in to accomplish important projects on campus and in local communities on our annual day of service.
 - e. As part of the school's work program, every student is required to work four hours each week, thereby contributing to the functioning of the NMH campus.

VISION

1. Our curriculum will promote awareness, visible progress, and on-going regeneration.
2. The entire community will be aware of energy and sustainability issues.
3. The NMH community will take ownership of sustainability; students, faculty, and staff will all learn from each other.
4. Regular all-school programming will address issues of sustainability in our world today.
5. Specific annual professional development funds will be provided for individual faculty members to develop the concept of sustainability within their course curriculum.
6. NMH will be a model for other schools to emulate, allowing NMH to have a wider impact on the local and global community.

ACTION STEPS

1. Incorporate sustainability themes into all NMH publications.
2. Develop sustainability components for the student, faculty and staff orientation.
 - a. Deliver a message of sustainability during NMH On Stage.
 - b. Provide every new resident with a buildings orientation, so that they will understand the energy and heat management systems, sources of energy, sources of water, wastewater treatment, etc.
3. Provide every new member of the NMH community with a compact fluorescent lightbulb.
4. Print an *NMH Little Green Book*, with sustainable principles and practices, as a handbook for the NMH community.
5. Clearly define the role of the work job in sustaining our community early in the school year.
6. Three student life curricula and two faculty meetings per year will address issues of sustainability on campus and in the surrounding communities.
7. NMH students will work with students from Gill and Northfield Elementary schools to teach our local community members about environmental themes.
8. Each department will commit to writing detailed sustainability action steps at the opening meeting of the year.
9. To encourage more faculty members to incorporate sustainability into the curriculum, an "Environmental Week" can be scheduled around Earth Day, during which teachers and students can take on leadership roles, bringing sustainability and current events into every course across the curriculum. Some ideas include:
 - a. The math department uses word problems that focus on sustainability issues, or holds a contest in which students are challenged to come up with the best problems or projects analyzing an environmental issue in a mathematical way.
 - b. The language department incorporates vocabulary focused on current events and environmental issues and gives students the tools for a crosscultural discussion on an important international issue. Upper-level courses read articles and literature on sustainability or look at the cultural perspectives around pertinent environmental issues.
 - c. The religious studies department includes sustainable practices, environmental ethics and justice, religious stories and practices celebrating the earth, and connections between religious traditions and sustainability.
 - d. Look at how the environment shapes human culture and vice versa, especially in Humanities II travel courses.
 - e. The art department includes the local landscape, and the use of sustainable, local materials.
 - f. Through reading literature and personal writing, the English department examines:
 - i. how people relate to their environments,
 - ii. how people make connections between people and place, and
 - iii. how authors use language to express differing perspectives on the land.
 - f. The history department looks at how environmental history has shaped human history and vice versa.
 - g. The science department develops course material such as the studies of energy in physics, the studies of biogeochemical cycles, and the studies of ecology with a place-based lens, exploring the environmental impacts of the NMH community on the surrounding ecosystems.

Food

PRACTICES IN PLACE

1. NMH dining services has committed to the following goals:
 - a. reducing the energy used to get products to our community;
 - b. raising awareness of the importance of local, sustainable agriculture and business;
 - c. striving to identify who is responsible for our food, where it comes from, how our land is used, and how corporate farming has had an impact on local agriculture.
 - d. becoming 100 percent trans-fat free by modifying the menu and changing purchasing practices to ensure trans-fat free food for our community;
 - e. purchasing only fair-trade coffee.
2. Ten percent of our annual food budget is purchased locally. This has involved:
 - a. developing business relationships,
 - b. creating systems of accounting, and
 - c. overcoming delivery challenges.
3. Dining Services has developed an herb garden outside Alumni Hall to promote use of fresh herbs and spices and so students can see the garden as part of the food production process.
4. Used Frialator oil from Alumni Hall is processed into fuel that was used for a student's car and an NMH tractor.
5. Awareness of food waste is encouraged in our dining facilities by monitoring food and beverage waste at the dishroom drop-off area. This is monitored several times per year, and the results are posted to the NMH community.
6. NMH uses these farm products in the dining hall: maple syrup, fresh-pressed apple cider, squash, asparagus, raspberries and jams, and dairy products (cheese, milk, cream, and yogurt).
7. Estimates of the food waste generated by our dining hall are:
 - a. pre-consumer waste, controlled by our kitchen staff: 8 percent;
 - b. post-consumer waste, including all liquids and solids deposited at the dishwashing room: 18 percent.

VISION

1. The NMH farm will double the current amount of produce provided to the dining hall each year. (Appendix G)
2. NMH farm operations will be expanded to include rolling greenhouses, turkeys, and sheep.
3. The NMH community will recognize the importance of being self-sufficient, and most community members will select locally grown products when given the option in the dining hall because of their appreciation for and understanding of sustainable agriculture.
4. Twenty-five percent of the annual dining services budget will be dedicated to purchasing locally-grown foods.
5. We will cut pre-consumer and post-consumer waste estimates by 50 percent.

ACTION STEPS

1. Educational programs and improved signage in the dining hall will raise consciousness and awareness about where our food comes from (e.g.: "These oranges have traveled 1,350 miles from Vero Beach, FL, to be a part of your breakfast fare this morning."), and how much CO₂ is generated by its production and transportation.
2. Menus will be based on seasonal fare. The dining services recipe database will be expanded to take full advantage of products that are available during each season.
3. Community garden plots will be available for NMH faculty and staff at the NMH farm.
4. The NMH farm "kitchen building" will be heated using methane from compost pile or Frialator oil.
5. Four times per year, special meals made from sustainable, local, and NMH farm products will support local agriculture and raise awareness.
6. Farm visibility will be increased through better signage, both at the farm and where items are served in Alumni Hall.
7. Light-block milk bottles will be used with farm milk to preserve freshness and quality.
8. The NMH farm will undertake large-scale yogurt production to better utilize farm dairy products.
9. Student eco-leaders will take on an educational role in the dining hall, educating the community about food waste, monitoring the dining room, analyzing energy use, and increasing recycling awareness for dining services.

Appendix A

Average Total Electrical Demand Per Day for the Mount Hermon Campus

	2003-04	2004-05	2005-06	2006-07
September	8708.8	8889.4	11496.0	10198.2
October	10061.2	9888.8	12434.5	11226.4
November	10425.5	10666.1	13155.5	12457.2
December	10134.1	10473.0	12378.5	11920.8
January	10996.5	11728.6	14030.6	13534.8
February	11703.0	12525.8	13151.5	12993.0
March	8006.7	9422.7	10235.8	9844.3
April	9472.1	10112.1	10966.1	10822.6
May	8839.1	9782.7	10987.8	
June	6136.2	7464.8	7981.7	
July	5293.3	7066.7	9194.1	
August	6094.3	7895.7	7966.1	

Appendix B

2006 Water Quality Data Mount Hermon Water Supply

Contaminant	Unit	Maximum Contaminant Level	Level Detected	Date	Typical Source of Contaminant
Asbestos	MFL	7	Below detectable limits	3/30/1999	Decay of asbestos Cement water mains, erosion of natural deposits
Coliform Bacteria	Colonies/100 ml	0	none	monthly	Human and animal fecal waste
Barium	ppm	2	0.013	5/5/2005	Erosion of natural deposits
Sodium	ppm	none	6.4	12/6/2005	Road salt, naturally present
Sulfate	ppm	none	6.1	11/27/2005	Natural sources
Nitrate	ppm	10	0.72	4/11/2006	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
Nitrate	ppm	1	Below detectable limits	5/17/2005	Runoff from fertilizer use, leaching from septic tanks, sewage, erosion of natural deposits
Chloroform	ppb	n/a	0	8/23/2006	By-product of drinking water chlorination
Bromodichloro Methane	ppb	n/a	0	8/23/2006	By-product of drinking water chlorination
Chlorodibromo Methane	ppb	n/a	0	8/23/2006	By-product of drinking water chlorination
Gross Alpha Radionclides	Picocuries/ L	15	Below detectable limits	12/09/03	Erosion of natural deposits

Contaminant	Action Level	Range Detected	90th percentile	# of sites sampled/ #of sites exceeding AL	Typical Source of Contaminant
Lead	15 ppb	0.0058	10/0		Corrosion of household plumbing systems, erosion of natural deposits
Copper	1.3 ppm	0.098	10/0		Corrosion of household plumbing systems, erosion of natural deposits

The table above includes the contaminants detected in the Mount Hermon drinking water in 2006, unless otherwise noted, and their most likely source. All levels are below allowable limits.

Appendix C

NMH Cleaning Products

H2 Orange
Triad
Quik Fill 520 (window cleaner)
Allstar Classic Shine (furniture polish)
Allstar Gum Off
Allstar Sud-n-Kleen
Netcare Vandalism Mark Remover
Defoamer
Old English Scratch Remover
Old English Lemon Oil
Goo Gone
Eco-Lyzer
Vanish
X-14
MSR Mildew Remover
Clairidge White Board Cleaner
One Up Stainless Steel Cleaner
S C Johnson's Stride
Johnson's #52/neutral cleaner

Appendix D

PEST MANAGEMENT (IPM) PLAN

(complying with the Act to Protect Children and Families From Harmful Pesticides)

INDOOR PLAN

1). General School Information

School Name: Northfield Mount Hermon School
Address: One Lamplighter Way
City/Town/Zip Code: Mount Hermon, MA 01354
Telephone Number: (413) 498-3000
E-Mail Address: mike_henderson@nmhschool.org
Plan Prepared By: Mike Henderson
Submittal Date: 6-19-06

2). School IPM Coordinator, Leader, or Supervisor

Name: Mike Henderson
Title: Manager of Institutional Services
Telephone Number: (413) 498-3261
E-Mail Address: mike_henderson@nmhschool.org

3). School IPM Committee or Team

Name: Mike Henderson, Manager of Institutional Services
Name: Janet Ball, Custodial Lead
Name: Paul Bartlett, Safety / Support
Name: Judy McWilliams, Day Care Director
Name: Randy Miller, Hermon Dining Service
Name: Dave Pomerantz, Project Manager, Plant Facilities

4). School IPM Policy

Structural and landscape pests can pose significant problems for people and property. Pesticides can pose risks to people, property, and the environment. It is therefore the policy of NMH to incorporate Integrated Pest Management (IPM) procedures for control of structural and landscape pests. The objective of this program is to provide necessary pest control while minimizing pesticide use.

5). School Pest Problem(s) Description

Historically NMH has observed the following indoor pests. Bees (hornets, yellow jackets), ants (black, brown, carpenter, flying), mice, termites, chipmunks, squirrels, skunks, bats, beetles, spiders, silverfish, cockroaches, fleas, and bedbugs.

The school historically contracts Waltham Chemical to properly identify and treat the problem pest in accordance with state and local laws and regulations. The school continues to contract Waltham to work with the school to identify pests, make suggestions on possible prevention and remove them when necessary in accordance with the Act Protecting Children and Families From Harmful Pesticides.

NMH currently has subterranean termite bait traps at Holbrook Hall, Kenarden, Meany Gym, Weston Dorm, McMillian House and Sawyer House, Cottage B, Wilson Dorm, Hermon Music, and Hayden Dorm. Craig Burke from Waltham Chemical is monitoring these traps.

6). School IPM Information Flow and Training

Mike Henderson will meet with Waltham Chemical on a monthly basis to discuss pest activity. Staff, faculty, and students will be communicated to about IPM policies and procedures to be used to achieve the desired pest management objectives.

Training will be held annually for maintenance, housekeeping, and kitchen staff.

7). School Chemical Pesticide Applied

Waltham Chemical is our licensed pesticide contractor, Kraig Kearns License# 25999, Robert Knowlton Ma Lic# 07301 and Craig Burke License# 12373 have historically monitored and controlled indoor pests. All applications will

be made in accordance with the Act Protecting Children and Families From Harmful Pesticides.

MATERIALS IN COMMON USE	EPA REG. #
Avert Cockroach Gel Bait	499-410
Borid	9444-129
MaxForce Roach Killer Gel	64248-5
Recruit IVAG	62719-453
Recruit IV	62719-454
Timbor (dry only)	64405-8
Advance Dual Choice Ant Bait Stations	499-459
Delta Dust	432-772
Maxforce FC Ant Bait Stations	64248-10
Maxforce FC Large roach Bait stations	64248-12
Maxforce FC Roach Killer Bait Stations	64248-11
Max Force Ant Killer Gel	64248-21
Uncle Alberts Ant Bait	733340-1
Pre-Empt Cockroach Gel Bait	3125-525
Contra Rodenticide	12455-61
Talon Weatherblox	10182-339
Poison Free Wasp & Hornet Killer (mint oil)	exempt
Poison Free Contact (mint Oil)	exempt
Phantom Termiticide-Insecticide	241-392
Termidor SC Termicide/Insecticide	432-901
Recruit* IIIAG	62719-454
EnviroCon	9804-3
Suspend SC Insecticide	432-763
Precor IGR	2724-352

Anticipated emergency problems: Stinging Pests

An available general use pesticide would be used in the event of an emergency pesticide application. Application will be made in accordance with the Act Protecting Children and Families From Harmful Pesticides.

8). School Non-Chemical Actions

Whenever possible NMH will use non-chemical means to control pests using, but not limited to, inspection, sanitation, structural and mechanical integrity, and tolerance.

9). School IPM Program Evaluation

The School IPM Plan will be evaluated every three months or annually at a minimum. Pest problems will be monitored on a continual basis until a safe, acceptable level has been reached. Actions taken will be documented, evaluated, and modified as needed.

10). School IPM Plan Location

A copy of out indoor and outdoor IPM plans, and pesticide use reports will be kept on file in the physical plant work control office on the Mount Hermon campus.

OUTDOOR PLAN

2). School IPM Coordinator, Leader, or Supervisor

Name: Mike Henderson, Manager of Institutional Services

Telephone Number: (413) 498-3261

E-Mail Address: mike_henderson@nmhschool.org

3). School IPM Committee or Team

Name: Mike Henderson, Manager of Institutional Services

Name: Chris Taylor, Grounds

Name: Rick Kidder, Athletic Maintenance

Name: Judy McWilliams, Day Care Director

Name: Richard Odman, Director Farm Program

4). School IPM Policy

Structural and landscape pests can pose significant problems for people and property. Pesticides can pose risks to people, property, and the environment. It is therefore the policy of NMH to incorporate Integrated Pest Management (IPM) procedures for control of structural and landscape pests. The objective of this program is to provide necessary pest control while minimizing pesticide use.

5). School Pest Problem(s) Description

White grubs, clover, crabgrass, knotweed, dandelions, and invasive grasses/weeds, small animals, rodents, ants, termites. When identification of pest is unknown or questionable, we seek help through the UMass Extension.

Pests have been observed on athletic turf, ornamental lawn areas and campus infrastructure.

Turf pests are kept to a minimum using IPM. Sharp mower blades, height of cut, fertilization, over seeding, aerating, topdressing, and watering when possible help to minimize the need to use pesticides. Turf pests are treated with pesticides when quantity jeopardizes the safety of the athletic turf, esthetic value of campus lawns and integrity of the infrastructure. If pesticide treatments are necessary, unless it's an emergency, they will be made when school is out of session. All applications will be made in accordance with the Act Protecting Children and Families From Harmful Pesticides.

Historically NMH has needed to treat athletic fields with white grubs control (Merit) every other year to keep the population below the threshold that can jeopardize the safety of the turf. Herbicides are applied if the quantity of weeds jeopardizes the safety of the field or play of the sport. We applied Drive to a new athletic field in 2000; this was the first time since 1997 we used weed control on the athletic turf. We use Round Up while school is out to control unwanted vegetation that compromises the infrastructure integrity and esthetic value of the school property. Small animals and rodents that pose health and safety issues or compromise the quality of life of the NMH residents or cause damage to the schools buildings or grounds are trapped by a licensed trapper and removed.

6). School IPM Information Flow and Training

Staff, faculty, and students will be communicated to about IPM policies and procedures to be used to achieve the desired pest management objectives.

Training will be held annually for grounds maintenance staff.

7). School Chemical Pesticide Applied

MATERIALS IN COMMON USE	EPA REG. #
Drive 75 wp	7969-130
Round UP	524-475
Merit	3125-474-961
Trimec	2217-543
Borid	9444-129
Recruit IV AG Termite Bait	62719-454
Recruit IV Termite Bait	62719-453
Timbor (dry only)	64405-8
Delta Dust	432-772
Maxforce Carpenter Ant Bait Gel	432-1264
Contra Rodenticide	12455-79
Talon Weatherblox	100-1055
Poison Free Wasp & Hornet Killer (mint oil)	exempt
Poison Free Contact (mint oil)	exempt
Phantom Termicide-Insecticide	241-392
Termidor SC Termiticide/Insecticide	7969-210
Golden Malrin	2724-274
Multicide Wasp & Hornet	1021-1649-72113
Fert. With Confront Herbicide	62719-262-961
Fert. With Millennium	228-343-9198

NMH Employees names and license numbers:

Michael Henderson, License #22650

Chris Taylor, License # 28594

Waltham Chemical names and license numbers:

Kraig Kearns, License# 25999

Robert Knowlton, Ma Lic# 07301

Craig Burke, License# 12373

All outdoor applications will be made in accordance with the Act Protecting Children and Families From Harmful Pesticides.

Anticipated emergency problems: Stinging pests

NMH will try to control these pests using non-chemical means such as CO₂, high-pressure water, and possibly steam. If chemical control were necessary, the school would use an available general-use pesticide formulated for the specific pest. All chemical control will be used in accordance with the Act Protecting Children and Families From Harmful Pesticides.

8). School Non-Chemical Actions

Whenever possible NMH will use non-chemical means to control pests using, but not limited to, inspection, sanitation, structural and mechanical integrity, and tolerance.

9). School IPM Program Evaluation

The School IPM Plan will be evaluated every three months or annually at a minimum. Pest problems will be monitored on a continual basis until a safe, acceptable level has been reached. Actions taken will be documented, evaluated, and modified as needed.

10). School IPM Plan Location

A copy of out indoor and outdoor IPM plans, and pesticide use reports will be kept on file in the physical plant work control office on the Mount Hermon campus.

Appendix E

VISUAL ARTS STUDIO USE

Solvent waste, oils, chemicals, and printer ink cartridges in all areas are disposed of in accordance with current school practices. Metal, plastic, and clean paper/cardboard waste is recycled.

Drawing/Painting Chemicals:

- Mineral Spirits
- Turpentine
- Linseed Oil
- Stand Oil
- Varnish
- Spray Fixative

Ceramics Studio Chemicals—Possible Materials in Wet Glazes:

- | | |
|-----------------------|---------------------------|
| • Silica | • Flourspar |
| • Flint | • Pearl Ash |
| • Quartz | • Borax |
| • Clay | • Alumina |
| • Feldspar | • Sodium Oxide |
| • Calcium Carbonate | • Potassium Oxide |
| • Whiting | • Calcium Oxide |
| • Magnesium Carbonate | • Magnesium Oxide |
| • Dolomite | • Strontium Oxide |
| • Barium | • Lithium Oxide |
| • Talc | • Iron Oxide |
| • Strontium Carbonate | • Cobalt |
| • Calcium Borate | • Copper Oxide |
| • Colemanite | • Chromium Oxide |
| • Gerstley Borate | • Nickel Oxide |
| • Zinc Oxide | • Vanadium Oxide |
| • Spodumene | • Rutile |
| • Lithium Carbonate | • Free Silica (clay dust) |

Printmaking:

- No toxic solvents used
- Disposal of oil-based rags only

Photography Darkroom Chemicals:

- Kodak—*Fixer, Dektol, D-76, Selectol-Soft, Selenium Toner*
- Sprint—*Stop Bath and Wetting Agent & Stabilize*
- Photographer's Formulary—*Iron Blue Toner, Sepia Sulfide Toner, Copper Toner, Nelson's Gold Toner*

Appendix F

PURCHASING PRACTICES

WAREHOUSE PRODUCTS ISSUED 1/1/2006 to 11/30/2006

ITEM:	Unit: 10 RM=CS	QTY:	COST: PER UNIT
COPY PAPER:			
Xerox 8.5 x 11	RM	20360	\$2.68
Xerox 8.5 x 11 - 3-Hole Punch	RM	940	\$2.83
Xerox Legal	RM	278	\$3.29
Xerxo 11 x 17	RM	79	\$5.90
Xerox 8.5 x 11 Blue	RM	361	\$3.80
Xerox 8.5 x 11 Pink	RM	227	\$3.74
Xerox 8.5 x 11 Green	RM	279	\$3.71
Xerox 8.5 x 11 Yellow	RM	423	\$3.86
Xerox 8.5 x 11 Goldenrod	RM	164	\$3.70
Xerox Recycled 30 percent	RM	170	\$3.16
Riso 8.5 x 11	RM	849	\$2.73
Riso 8.5 x 11 Canary	RM	101	\$3.80
Riso 8.5 x 11 Blue	RM	91	\$3.85
Riso 8.5 x 11 Pink	RM	34	\$3.89
Riso 8.5 x 11 Green	RM	79	\$3.89
Riso 8.5 x 11 Goldenrod	RM	56	\$3.70
TOTAL		24491	
COMMONLY USED ITEMS:			
Toilet Tissue	RL	10704	\$0.41
Toilet Tissue	CS	988	\$39.00
Paper Towel	RL	27475	\$0.66
Paper Towel	CS	840	\$51.09
Hot Cups 8 oz	SL	1955	\$2.28
Trash Bags 33.5 x 40	CS	769	\$20.72
Trash Bags 40 x 46	CS	752	\$23.09
Facial Tissue	BX	2028	\$0.98
Letterhead White Recycled	RM	200	\$14.95
Letterhead Envelopes	BX	300	\$29.69
Sealing Tape	RL	416	\$1.29
Mildew Remover	EA	828	\$6.13
Mildew X-14	EA	348	\$4.93
Dry Board Markers	BX	915	\$11.50
Dust Masks	EA	420	\$0.60
Bulb 60 Watt	EA	2304	\$0.34
Bulb F32T8	EA	2054	\$1.33
Battery D	EA	728	\$0.73
Battery AA	EA	3249	\$0.38
Battery AAA	EA	1696	\$0.37
Battery 9V	EA	643	\$1.18