The Commonwealth of Massachusetts
Executive Office of Health and Human Services
Department of Public Health
Bureau of Environmental Health
250 Washington Street, Boston, MA 02108-4619
Phone: 617-624-5757 Fax: 617-624-5777
TTY: 617-624-5286

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

JUDYANN BIGBY, M.D.
SECRETARY

JOHN AUERBACH
COMMISSIONER

October 2, 2009

Ms. Michaelann Bewsee
25 Churchill Street
Springfield, Massachusetts 01108

Dear Ms. Bewsee:

The purpose of this letter is to respond to your request for an evaluation of health and environmental concerns related to the proposed Palmer Renewable Energy Plant to be located at 1000 Page Boulevard in Springfield. The proposed 38 MW electric generating plant is a biomass facility to be located in an industrial area adjacent to an existing asphalt plant operated by Palmer Paving.

According to the June 6, 2008 MEPA certificate, the proposed plant will use a wood-fired stoker boiler to convert approximately 900 tons of per day (tpd) of wood fuel consisting of 700 tpd of recycled wood from Construction and Demolition (C&D) processors and 200 tpd of "green" wood chips into combustible gas, which would eventually generate 38 Megawatts of energy.

Although C&D waste is not considered eligible biomass fuel, it is our understanding that pre-sorted C&D waste will be re-characterized as "recycled" wood under the Massachusetts Department of Environmental Protection (MassDEP) beneficial use determination (BUD) regulation and guidance (310 CMR 19.060). Thus, approximately 230,000 tons per year (tpy) of C&D wood fuel for the proposed Palmer facility is expected to be derived from a number of existing in-state and out-of-state C&D processing facilities that physically pre-sort recycled wood from adulterated wood and non-wood materials such as plastics or inorganic materials.

The definition of C&D waste in Massachusetts is: waste resulting from construction, remodeling, repair, or demolition of buildings, pavements, roads, or other structures. The waste stream from construction, repair, and/or remodeling activities consists of a variety of building waste including asphalt roofing shingles, gypsum wallboard, and wood products including lumber, siding, laminates, flooring, and painted wood. Demolition waste from older buildings, for example, includes concrete, wood, metals, insulation, electrical materials, plumbing pipes and fixtures, and wood possibly containing lead paint. According to the 2007 Massachusetts Construction & Demolition Debris Industry Study, over 20% of the wood is considered adulterated with paint or other chemicals (e.g., chromated copper arsenate (CCA) treated wood). However, the

composition of construction and demolition debris varies significantly depending on the type of construction/demolition project.

Incineration of "green" wood and recycled C&D waste wood results in the generation of combustion-related air pollutants including carbon monoxide (CO), oxides of nitrogen (NOx), sulfur dioxide (SO_2), volatile organic compounds (VOCs), hazardous air pollutants (HAPs; e.g., acid gases, dioxins/furans), polycyclic aromatic hydrocarbons (PAHs), course particles [PM_{10}- less than 10 micrometers in diameter] and fine particles [$PM_{2.5}$ - 2.5 micrometers or less in diameter]. In addition, contaminants contained in the C&D adulterated wood that are generated from combustion include heavy metals (e.g., chromium, copper, arsenic, lead), pesticides, and wood preservatives (e.g., pentachlorophenol). According to the May 7, 2008 MEPA certificate the proposed Palmer plant exhaust from the boiler will be ducted to a scrubber, fabric filter, oxidation catalyst and Regenerative Selective Catalytic Reduction (RSCR) system and then to a 275 foot tall stack. Other equipment on site will include silos for lime, carbon and ash, and a double-walled aqueous ammonia tank for the RSCR.

According to the MEPA certificate emissions estimates from the proposed facility after controls are estimated to be: 27 tpy PM_{10}, 167 tpy CO, 0.28 tpy lead, 47 tpy SO_2, 22 tpy VOCs, 134 tpy NOx and 23.8 tpy of HAPs. In addition to stack emissions, air quality impacts from the operation of the facility also include emissions from diesel trucks delivering fuel, and emissions from equipment associated with the operation of the proposed facility. Fine particle and fugitive emissions were not included in the Environmental Notification Form (ENF) but were requested in the MEPA certificate to be included in the final air permit. Epidemiological evidence has demonstrated a relationship between exposure to fine particles at levels below the current national ambient air quality standard (NAAQS) and respiratory and cardiovascular morbidity and premature mortality in exposed populations so this type of additional information will be valuable.

In follow-up to your discussion with Margaret Round, Senior Analyst for Air Toxics in our Environmental Toxicology Program, MDPH/BEH also reviewed readily available data on the occurrence of asthma and cardiovascular conditions in Springfield residents. We reviewed these health outcomes because individuals with preexisting respiratory or cardiovascular disease are more vulnerable to exposure to air pollution.

As part of this review, MDPH/BEH evaluated pediatric asthma for Springfield school children for schools. MDPH/BEH has been conducting statewide pediatric asthma surveillance since the 2003-2004 school year. Pediatric asthma data are reported by school nurses at schools with at least some of grades K-8. An earlier study carried out by MDPH/BEH in the Merrimack Valley region of the state demonstrated 96 percent agreement between doctor diagnosed asthma and school based asthma numbers, so the data are adequate for evaluation/comparison.

Figure 1 shows the participating schools in Springfield and surrounding communities, as well as the location of the proposed transfer station. Table 1 shows the pediatric asthma data for school years for the last three school years (i.e., 2004-2005, 2005-2006 and 2006-2007). The pediatric asthma prevalence for the schools in Springfield located closest to the proposed site (Samuel Bowles Elementary School, Mary O. Pottenger Elementary School, and the Van Sickle Middle School) is statistically significantly higher than statewide prevalence for each of the three school years. It should be noted that the Samuel Bowles School is less than one mile to the west of the proposed site and the closest school to the proposed site.

MDPH/BEH also evaluated asthma and cardiovascular hospitalization data available for Springfield residents. Hospitalization data are housed in the Massachusetts Division of Health

Care Finance and Policy and are readily available through MassCHIP (Massachusetts Community Health Information Profile), a computerized database accessible to the general public and researchers. These data include all Springfield hospitalizations regardless of age and are available on MassCHIP by community and not at smaller geographical levels (e.g., zip code).

Table 2 shows asthma hospitalization data for Springfield residents as compared to statewide rates. During the years 2004 through 2006 the rates of asthma-related hospitalizations for Springfield residents were statistically significantly higher than the statewide rates for each of the three years. Specifically, the age-adjusted rates were over twice the statewide rates. However, as shown in Table 3, the age-adjusted rates for Springfield residents hospitalized for myocardial infarction are about the same as the statewide rate.

It is important to note that asthma is a multifactorial lung disease that is often associated with familial, allergenic, socioeconomic, psychological, and environmental factors. Studies have shown disparities in hospitalization rates for asthma by race/ethnicity and income. Hospitalization counts are based on the number of episodes (event based) rather than the number of patients (person based). As a result, the number of hospitalizations could indicate admissions for different individuals or re-admissions for the same person. Hospitalizations for asthma does not reflect the prevalence of the disease in the population but other conditions such as uncontrolled asthma conditions, limited access health care services, and/or inadequate medical treatment practices.

You also specifically requested information on blood lead levels in Springfield residents. The Massachusetts Lead Poisoning Prevention and Control Act requires all children up to age 3 years (up to 4 years old for those children in high risk communities and up to age 6 for a child entering kindergarten who has never been screened before) to have a blood test for lead. The Centers for Disease Control and Prevention (CDC) currently considers a blood lead level (BLL) of 10 micrograms per deciliter (µg/dL) or greater to be a "level of concern" that should be followed by public health officials. Table 4 shows the prevalence of BLL for children tested in Springfield for 2006, 2007 and 2008. The prevalence rate for children with BLL greater than 10 µg/dL is 15.5 per 1000, 15.8 per 1000, and 9.5 per 1000 for 2006, 2007, and 2008, respectively. These rates are about twice the statewide rates of BLL greater than 10 µg/dL (i.e., 8.5 per 1000 in 2006, 6.7 per 1000 in 2007 and 5.0 per 1000 in 2008.)

It is our understanding that the Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) determines whether or not to consider the Environmental Justice policy for specific MEPA projects. It is our further understanding that EOEEA did not require this project to meet Environmental Justice criteria.

In summary, the data reviewed by MDPH/BEH indicates that respiratory disease among the pediatric population attending school in relatively close proximity to the proposed facility is significantly higher than the statewide rates. In addition, Springfield residents in general have higher rates of respiratory disease but not myocardial infarction. Finally, the prevalence of blood lead levels in children tested in Springfield is about twice the statewide rates. Although site-specific data are limited at this stage of the proposed project, we do believe as stated that some additional information on the potential increase in emissions from the operation of this facility, including mobile sources and respiratory irritants (e.g., fine particles, acid gases (HF, HCL), lead, aldehydes) may be helpful in ensuring that the facility will not impact or exacerbate existing health conditions of nearby residents. In this regard, mitigation of emissions (e.g., diesel retrofit control technology on trucks associated with facility operations) should also be considered.

We hope this information is helpful to you. If you have any questions, please feel free to contact us at 617-624-5757.

Sincerely,

Suzanne K. Condon, Associate Commissioner
Director, Bureau of Environmental Health

cc: Martha J. Steele, Deputy Director, MDPH/BEH
Meg Blanchet, Assistant Director, Environmental Toxicology Program, MDPH/BEH
Margaret Round, Environmental Toxicology Program, MDPH/BEH

Table 1: Pediatric Asthma Rates By School in Springfield, Massachusetts

School	2004-2005 Prevalence		2005-2006 Prevalence		2006-2007 Prevalence	
Alfred G Zanetti	11.9	8.6-15.3	6.2	3.8-8.7	4.75	2.55-6.95
Alice B Beal	10.2	6.8-13.6	11.3	7.6-15	11.94	8.33-15.55
Arthur T Talmadge	11.3	7.7-14.8	13	9.3-16.7	18.75*	14.24-23.26
Boland	18.2*	14.6-21.8	22.5*	18.8-26.2	24.28*	20.59-27.97
Brightwood	17.6*	13.7-21.5	21.9*	17.8-26	19.46*	15.61-23.31
Chestnut Accelerated	13.4*	11.5-15.3	18.2*	16.1-20.4	20.69*	18.35-23.03
Curtis Blake Day	6.3	0.9-11.6	13.2	5.6-20.8	N/A	N/A-N/A
Daniel B Brunton	20.6*	17-24.1	18.1*	15-21.3	16.73*	13.63-19.83
Dryden Memorial	18*	13.2-22.9	20.2*	15.5-25	9.84	6.18-13.5
Elias Brookings	20.2*	16.7-23.7	18.6*	15.1-22.2	20.21*	16.64-23.78
Forest Park	15.5*	13.1-17.8	15.7*	13.5-18	14.6*	12.45-16.75
Frank H Freedman	21.6*	16.2-27	21.9*	16.4-27.4	19*	13.83-24.17
Frederick Harris	16.8*	13.8-19.8	16.2*	13.1-19.2	17.75*	14.61-20.89
Gerena	20.9*	17.7-24.2	42.6*	38.8-46.5	20.67*	17.56-23.78
Glenwood	18.6*	14.7-22.6	18.6*	14.6-22.5	20.12*	15.88-24.36
Glickman	18.1*	13.4-22.8	16*	11.8-20.2	17.59*	13.21-21.97
Hiram L Dorman	16.9*	12.4-21.3	17.4*	12.5-22.2	15.79*	11.06-20.52
Holy Cross	N/A	N/A-N/A	6.1	3.7-8.5	3.34	1.55-5.13
Holy Name	N/A	N/A-N/A	8.1	4.3-11.9	6.09	2.75-9.43
Homer Street	22.7*	18.6-26.7	3.8	1.8-5.8	2.45	0.77-4.13
Hughes Academy Charter	N/A	N/A-N/A	N/A	N/A-N/A	12.22	7.44-17
John F Kennedy	13.1*	10.6-15.5	13.3	10.7-15.9	17.37*	14.38-20.36
John J Duggan	14.3*	12-16.7	16.7*	14-19.5	14.01*	11.57-16.45
Kathleen Thornton	N/A	N/A-N/A	20.8	4.6-37.1	20	2.47-37.53
Kensington Avenue	18.2*	14.4-22.1	19.9*	15.9-23.9	19.29*	15.08-23.5
Liberty	9.6	6.2-13.1	13.4	9.4-17.5	19.03*	14.5-23.56
Lincoln	19.2*	15.2-23.2	25.4*	20.9-29.9	27.78*	23.26-32.3
M Marcus Kiley	16*	13.8-18.3	14.9*	12.6-17.1	17.15*	14.74-19.56
Margaret C Ells	10.8	7.1-14.4	12.6	6.7-18.6	10.34	4.8-15.88
Martin Luther King Jr. Charter	N/A	N/A-N/A	N/A	N/A-N/A	16.11	10.74-21.48
Mary M Lynch	13.3	9.3-17.2	20.8*	16.1-25.5	20.2*	15.63-24.77
Mary M Walsh	25.6*	21.6-29.7	28.8*	24.6-33.1	17.42*	13.79-21.05
Mary O Pottenger	**20.9***	**17.2-24.7**	**20.8***	**16.9-24.8**	**19.37***	**15.56-23.18**

Table 1: Pediatric Asthma Rates By School in Springfield, Massachusetts

School	2004-2005 Prevalence		2005-2006 Prevalence		2006-2007 Prevalence	
Mill Pond	N/A	N/A-N/A	35.7	10.6-60.8	N/A	N/A-N/A
Milton Bradley	15.2*	12.4-18.1	23.2*	19.7-26.6	26.22*	22.69-29.75
Mount Carmel	N/A	N/A-N/A	5.1	1.1-9.1	7.48	2.5-12.46
Our Lady of Hope	11.1	7.8-14.4	9.1	6-12.2	3.21	1.15-5.27
Our Lady Sacred Heart	N/A	N/A-N/A	N/A	N/A-N/A	3.44	1.44-5.44
Pioneer Valley Christian	N/A	N/A-N/A	7.9	3.4-12.4	6.33	2.53-10.13
Pioneer Valley Montessori	N/A	N/A-N/A	11.9	2.1-21.7	7.69	0.45-14.93
Rebecca M Johnson	18.9*	15.9-21.9	24.9*	21.4-28.4	25.04*	21.52-28.56
Sabis International Charter	13.8*	11.7-15.9	N/A	N/A-N/A	18.07*	15.74-20.4
Samuel Bowles	**18.2***	**14.2-22.1**	**19***	**14.8-23.3**	**16.1***	**12.09-20.11**
Sumner Avenue	19.7*	16.1-23.4	16.4*	12.8-19.9	16.49*	13.1-19.88
The Macduffie School	11.7	3.5-19.8	12.7	4.5-20.9	15.09	5.45-24.73
Thomas M Balliet	23.2*	17.8-28.6	20.6*	15.4-25.8	21.07*	16.12-26.02
Van Sickle	**13***	**10.9-15**	**15.5***	**13.4-17.6**	**18.15***	**15.91-20.39**
Warner	14.6*	10.3-18.8	15.4*	10.8-19.9	20.77*	15.84-25.7
Washington	15.6*	11.6-19.5	19.5*	14.7-24.4	19.08*	14.66-23.5
White Street	19.4*	15.7-23	18*	14.2-21.8	15.45*	11.83-19.07
William N Deberry	21.3*	16.5-26.2	19.3*	14.7-23.9	16.16*	11.97-20.35
State Totals	**10.0**	**9.9-10.1**	**10.6**	**10.5-10.7**	**10.8**	**10.7-10.9**

* Statistically significant determined by comparing school prevalence with overall state prevalence for given year.
N/A - Not reported

Table 2: Asthma-related Hospitalizations: Age-Adjusted Rate Per 100,000 (with 95% C.I.): Springfield

		2004	2005	2006
Springfield	Total Population	1602.68 (1538.49-1666.88) *	1703.66 (1637.93-1769.38) *	1877.29 (1808.36-1946.21) *
Statewide	Total Population	773.25 (766.56-779.93)	814.46 (807.60-821.32)	862.74 (855.68-869.79)

* Statistically significantly higher

1. Parentheses are 95 percent confidence intervals
2. Age adjustment is used to compare risks of two or more populations at one point in time or one population at two or more points in time. Age-adjusted rates are computed by the direct method by applying age-specific rates in a population of interest to a standardized age distribution, in order to eliminate differences in observed rates that result from age differences in population composition. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

Table 3: Acute Myocardial Infarction Hospitalizations: Age-Adjusted Rate Per 100,000 (with 95% C.I.): Springfield

		2004	2005	2006
Springfield	Total Population	248.70 (223.09-274.31)	207.32 (183.89 – 230.75)	184.95 (162.88 – 207.02)
Statewide	Total Population	231.97 (228.2-235.52)	214.49 (211.08-217.89)	204.77 (201.46-208.08)

** Statistically significantly higher

1. Parentheses are 95 percent confidence intervals
2. Age adjustment is used to compare risks of two or more populations at one point in time or one population at two or more points in time. Age-adjusted rates are computed by the direct method by applying age-specific rates in a population of interest to a standardized age distribution, in order to eliminate differences in observed rates that result from age differences in population composition. Age-adjusted rates should be viewed as relative indexes rather than actual measures of risk.

Table 4: Prevalence and Rate Per 1,000 of Blood Lead Levels in Springfield

	2006		2007		2008	
Springfield	**Prevalence**	**Rate per 1,000**	**Prevalence**	**Rate per 1,000**	**Prevalence**	**Rate per 1,000**
<10 µg/dL	7,884	979.9	7,698	979.3	8,087	986.2
10 – 14 µg/dL	125	15.5	124	15.8	78	9.5
15 + µg/dL	37	4.6	39	5.0	35	4.3
Total	**8,046**		**7,861**		**8,200**	
Statewide	**Prevalence**	**Rate per 1,000**	**Prevalence**	**Rate per 1,000**	**Prevalence**	**Rate per 1,000**
<10 µg/dL	220,595	988.8	223,268	990.9	223,537	993.0
10 – 14 µg/dL	1,889	8.5	1,516	6.7	1,129	5.0
15 + µg/dL	609	2.7	540	2.4	445	2.0
Total	**223,093**		**225,324**		**225,111**	

1. Age of children when tested ranges from 9 to 71 months
2. Prevalence is the number of children with blood lead level screened
3. Rate per 1,000 is the (number of children with blood lead levels screened/number of children screened) X 1000