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March 10, 2010

Thomas S. Burack, Chairman
Site Evaluation Committee
N.H. Department of Environmental Services
29 Hazen Drive
Concord, NH 03302

Re: Laidlaw Berlin BioPower, LLC – SEC Docket No. 2009-02

Dear Chairman Burack:

I enclose an original and eighteen (18) copies of Laidlaw's supplement to Appendix P of its Application, Landvest's Report – Biomass Supply Study, for filing in the above referenced matter. The attached Addendum does not replace the existing Appendix P, but instead supplements Landvest's original report.

Please do not hesitate to contact me if you have any questions.

Very truly yours,

Barry Needleman

Enclosure
cc: Service List

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March 10, 2010

Mr. Louis T. Bravakis
LaidLaw Biopower, LLC
PMB 148
45 State Street
Montpelier, VT 05602

Dear Mr. Bravakis,

Attached please find the ADDENDUM to the ***Biomass Supply Study for Laidlaw BioPower Plant, Berlin, N.H.;*** 12/14/2009.

We stand ready to assist Laidlaw as you move the process.

Regards,

Stephen Mongan
Exec. VP
LandVest, Inc.

Haijin Shi
Biometrician
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ADDENDUM

To: ***Biomass Supply Study for Laidlaw BioPower Plant, Berlin, N.H.***; 12/14/2009

Introduction:

Subsequent to Laidlaw Berlin BioPower, LLC ("Laidlaw") EFSEC filing on December 15th, 2009 there have been questions raised relating to the report we provided: *Biomass Supply Study for Laidlaw Biopower Plant, Berlin, NH – Research Report: Phase I, 12/14/2009*. The intention of that analysis was to provide a broad overview and estimate on the supply of biomass within 100 miles of the site of Laidlaw's proposed Berlin facility. The questions posed caused our client (Laidlaw) to ask us to provide more depth and detail to our initial review. We had initially planned on accomplishing much of this with a second phase of the report later during project development that would deal with the economics surrounding supply and demand. However, in order to make this initial report more useful as our client moves through the EFSEC process, we have provided this supplemental analysis expanding on our initial approach, which is reflective of the underlying economics - which no proper fiber supply analysis can ignore.

As suggested, our analysis of growth and available low-grade fiber concluded that there are 6,709,500 green tons at the current/historic utilization standard of 50% of the available biomass, and would be as much as 7,233,000 green tons in a more competitive environment (after the proposed Laidlaw facility comes online) – using some combination of better utilization of tops and branches and cull, and more feasibility for rail-wood and backhauls.

In this supplemental analysis we refined our basic approach and compared our findings with the estimates on removals supplied by both the US Forest Service's FIA and the recorded data from the three subject states (Maine, New Hampshire and Vermont).

Base Methodology:

The primary reason the basic methodology used in our 12/14/09 report is being supplemented is that the initial estimate was a baseline analysis without specific sensitivity to supply economics. Furthermore, this baseline approach simply used nominal circles to describe wood-sheds that we know are shaped by economic considerations. This analysis did not fully account for the Canadian influence on the study area and we have come to recognize that several facilities were omitted that draw material from the primary source of supply, i.e. the wood shed.

The first step in refining our analysis was to add the three facilities not previously accounted for to our list of the existing facilities that draw wood from the study area. We also have incorporated data from additional timber supply experts that refines our overall estimates on how much wood each competing facility procures from the study area. Good examples of the importance of this refinement are that Schiller Station's wood-shed draws a disproportionate share of its fiber needs from areas to the south of its Portsmouth location, and conversely McNeil Station draws considerably more of its fiber from our study area than our nominal circle methodology would estimate. The result of these changes is reflected on Table 1 (below), which lists the competing facilities and the consumption data necessary to run the competitive consumption model.

Table 1. Initial low-grade wood assignment

Plant Name	Type	Consumption (Green Ton)	Radius	Acres in the Study Area	Acres of Each Facility	Geographical Analysis	Wood Assigned
Androscoggin Mill	Pulp	2,000,000	125	8,810,983	16,679,231	52.83%	1,056,521
Madison Paper Industries	Pulp	400,000	50	1,364,917	4,111,343	33.20%	132,795
Masonite Corp.	Pulp	100,000	50	1,692,342	2,698,907	62.70%	62,705[1]
Newpage Corp.	Pulp	2,200,000	125	9,800,165	16,864,509	58.11%	1,278,446
Sappi Fine Paper	Pulp	2,300,000	125	6,359,931	17,042,103	37.32%	858,335
Bridgewater Power	Power plant	229,000	75	7,053,629	8,377,035	84.20%	192,823
Whitefield Power and Light	Power plant	187,000	50	4,077,687	4,077,687	100.00%	187,000
Pine Tree Power	Power plant	230,000	75	8,109,391	8,418,486	96.33%	221,555
Hemphill Power	Power plant	208,000	75	6,048,745	8,464,339	71.46%	148,640
PSNH Schiller Station	Power plant	450,000	75	3,536,302	4,336,563	81.55%	183,479
Finch, Pruyn, & Co., Inc.	Pulp	638,000	100	3,006,480	12,165,734	24.71%	157,667
International Paper Co.	Pulp	750,000	100	4,532,595	11,899,043	38.09%	71,423
Joseph C. McNeil Station	Power plant	380,000	75	2,915,249	5,798,031	50.28%	250,000
Ryegate Power Station	Power plant	260,000	75	6,934,641	7,804,296	88.86%	231,027
Pine Tree -Tamworth	Power plant	300,000	75	7,802,191	8,014,101	97.36%	292,067
Alexandria - Power	Power plant	200,000	75	6,843,218	8,365,359	81.80%	163,608
Boralex - Livermore Falls	Power plant	320,000[2]	75	4,571,587	7,885,834	57.97%	185,511
New England Wood Pellet Pellets	Pellet plant	150,000	50	1,829,104	3,605,944	50.72%	50,000
Boralex – Stratton Power Plant	Power plant	500,000	75	3,505,722	7,384,441	47.47%	200,000
SAPPI – Westbrook Power Plant	Power plant	360,000[3]	75	4,174,855	5,221,232	79.96%	287,853
Total		12,162,000					6,211,456

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[1] Currently closed. The assigned consumption is adjusted for Joseph C. McNeil Station, New England Wood Pellet, International Paper (Ticonderoga), and PSNH based on our interviews.

[2] After 20% C&D deduction

[3] After 20% C&D deduction

The second area of refinement was to use modeling to account for competitive factors which actually shape supply zones. A basic problem with nominal circles is accounting for areas where there would be a greater allocation of supply than can feasibly be drawn from these areas. We know there is a limit (available growth) to what can be drawn from an area, and also know that in such cases the competing facilities will instead draw their necessary fiber elsewhere. We identify this refinement as a competitive consumption analysis.

The competitive consumption model uses GIS mapping to define highly competitive areas where demand exceeds supply capacity. Then we use a redistribution protocol based on the proximity of the competing facility to other fiber within the study area versus other fiber outside the study area. This is a complex process that is described in more detail in Appendix I, attached.

The result from adding new competing facilities, utilizing more targeted expert analysis and rerunning our model with the above described refinements is an estimate of low-grade consumption by existing facilities in our defined study area (within 100 miles of Berlin) of 5,873,370 green tons per year[4].

In our initial analysis, we made a base assumption that the difference between supply and demand from Canada would not be significant. However, while we know Canadian users have not traditionally drawn much wood from this area, we do know that Domtar in Windsor, Quebec recently has procured fiber from the study area. We are told Kruger also draws (mostly) bark on backhauls. On the other side of the equation we have been told that Western Maine contractors often backhaul sawmill residue in from Canada. Given all this, the best way to refine our analysis to account for Canadian impacts is to use published data from the three states to subtract imports from exports.

Based on additional information from procurement experts, there is almost no low grade wood export to Canada from Vermont. According to the report of the Northeast Foresters Association, the net export of low-grade wood from New Hampshire to Canada is approximately 205,500 green tons in 2005[5]. We also obtained the 2001-2008 export/import of low-grade wood from Maine Forest Service, where the net eight-year average <u>import</u> is 130,200 green tons. The sum of this supplemental analysis is an estimated draw from Canadian facilities of 75,300 green tons per year, which is right in line with our estimate recorded in our 2008 study for the North Country Council.

So, adjusted for the Canadian study area impacts, our estimate is that current consumption of low-grade wood fiber by competing facilities in our study area is <u>5,948,670</u> green tons.

<u>State and FIA Removals Data:</u>

Removals data is available from the FIA online database, and their estimate is from five-year permanent plots and the projected tree size from models. The FIA estimate of total low-grade removals from our study area is 6,127,362[6] green tons. The three states also make estimates of removals. New Hampshire has a requirement to report the harvest by law and makes available the sum of the "Report of Cut" volumes. Maine and Vermont create annual reports based on information voluntarily reported by wood products users and buyers. The sum of low grade removals from our study area based on estimates from the three states is 5,182,552[7]. Our estimate of 5,948,670 green tons per

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[4] See detailed information in Appendix I.

[5] No recent report available yet.

[6] It is the sum of 15% of sawtimber, all pulpwood and 50% of tops and branches from the FIA removals. See Appendix II.

[7] It is the sum or 15% of sawtimber, all pulpwood and biomass from the state harvesting data. See Appendix II.

year of removals is near the upper end of the range and relatively close to the FIA estimate, and for that reason we believe this alternative approach strongly supports our conclusion.

Conclusion:

Based on a supplemental refinement to our modeling, as described in this addendum, we conclude that the consumption of low-grade fiber within 100 miles/three hour drive of Berlin (the study area) is approximately 5,948,670 tons per year.

As discussed in our 12/14/09 report, our estimate of the available and sustainable low-grade fiber within the study area is between 6,709,500 and 7,233,000 tons per year, depending on utilization standards. As demonstrated through this refined analysis, it is our estimate that the range of low-grade fiber available within our study area, above and beyond current consumption, is from 760,830 to 1,284,330 green tons per year.

Furthermore, it is also our conclusion that when the Laidlaw facility comes on line it will represent a significant new market for biomass, drawing on a consistent basis from the available supply, allowing suppliers to invest in equipment and manpower to respond to this new market. Hence utilization of available biomass will increase. **Therefore, because this study is to estimate the sustainable availability of low-grade fiber to the proposed Laidlaw BioPower plant, it is our best estimate that producers will supply over one million tons per year in excess of current consumption.**

Appendix I

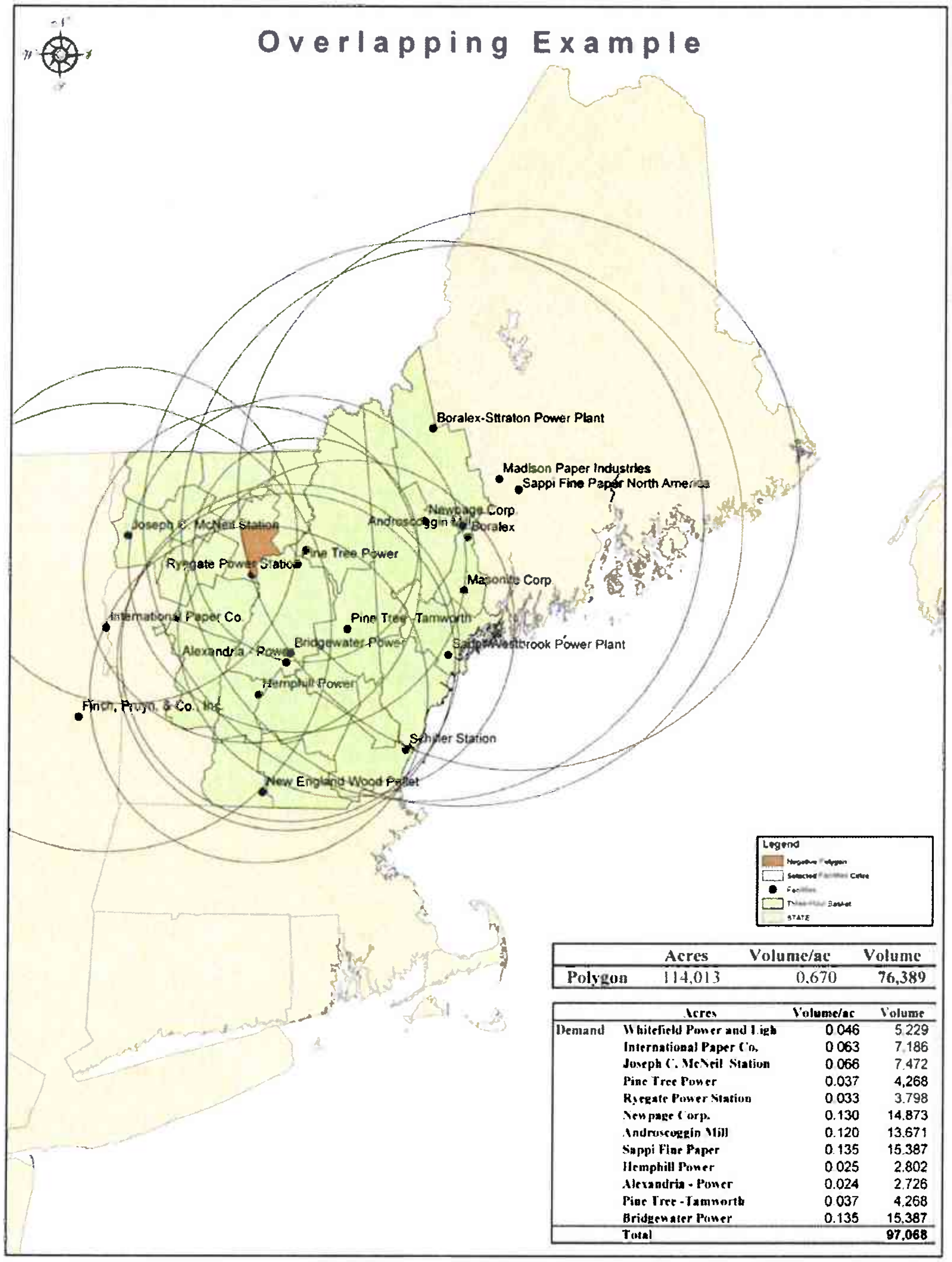
Competitive Consumption:

Our baseline methodology assigned volumes to facilities based on their total consumption, refined by the percentage of their wood-shed that overlapped into our study area (Table 1). However, this methodology presents a modeling problem when enough wood-sheds overlap in certain areas (mapped polygons) such that the draw from those areas would exceed the capacity and growth level for this area. In reviewing the baseline analysis, this approach would assign more volume than could be produced. In actual procurement conditions, this competition for fiber would cause these wood-baskets to change shape in order to procure the required fiber. By ignoring this dynamic, our 12/14/09 studywould incorrectly predict that **ALL** of the required fiber would be attained within our study area. In fact and in practice we know that is not true. What is true is that economics will determine where those facilities go to attain fiber that cannot be attained in these areas where competition is so acute.

To supplement this baseline approach, we have utilized a competitive consumption analysis that will estimate how much of the wood competing facilities require but would not be available from assigned polygons from inside our study area. *(Figure 1 is an example of how the baseline methodology portrays such modeling anomalies. In this example, there are 12 facilities competing for a total assigned volume of 97,068 green tons of low-grade wood from this polygon, while there is only 76,389 green tons available.)* In order to estimate how these facilities get the deficit volume that would have been predicted to come from the assigned area, we used the following method:

The first step was to determine which polygons would not have enough low-grade wood to support the prorated volumes required by the assigned facilities. Once we had identified these polygons, the next step was to analyze how much low-grade wood these facilities would get from within our study area. In order to accomplish these analyses, we first assigned the volume of low-grade wood volume to each polygon using the acreage of each polygon and the average available low-grade wood (i.e., 0.67 tons/ac). Second, we marked the polygon with the facility's name if the facility's concentric circle overlapped this polygon. Third, for each facility, we got the average low-grade wood demand per acre (Table 1). Fourth, we went through each polygon to get the total volume assigned to these 20 facilities. We approached the initial analysis of this data from two angles, though in both cases the first thing we did was to find the difference between the available volume and the total volume of each polygon.

In the first step of this evaluation, we determined the sum of all negative values (i.e., 494,531 tons) from over-assigned polygons. For the second step (which was from the perspective of the Laidlaw facility), we assumed there would be zero wood available from any of the over-assigned polygons and only the volume in excess of what the competing facilities used in the remaining polygons. In this second step our positive value was 992,575 tons, and is (preliminarily) the unassigned volume still available in the wood basket after satisfying competing facilities in all but the negative value polygons. In the third step of the modeling, we determined how much of the negative value would be found within our study area so we could deduct that from the positive value. The following method was used to do this analysis:



	Acres	Volume/ac	Volume
Polygon	114,013	0.670	76,389

	Acres	Volume/ac	Volume
Demand	Whitefield Power and Ligh	0.046	5,229
	International Paper Co.	0.063	7,186
	Joseph C. McNeil Station	0.066	7,472
	Pine Tree Power	0.037	4,268
	Ryegate Power Station	0.033	3,798
	Newpage Corp.	0.130	14,873
	Androscoggin Mill	0.120	13,671
	Sappi Fine Paper	0.135	15,387
	Hemphill Power	0.025	2,802
	Alexandria - Power	0.024	2,726
	Pine Tree -Tamworth	0.037	4,268
	Bridgewater Power	0.135	15,387
	Total		97,068

Figure 1. Example of overlapping polygon.

Assignment of deficit volume:

After we defined each polygon that had more demand assigned to it than growth (at .67 tons/ac) could support, we identified which facilities were slated to acquire wood from that polygon and assigned them a prorated share. This process created deficits for the subject facilities and to determine how much of that deficit would come from our study area and how much from elsewhere in the subject facilities' wood-basket we developed a protocol.

The basic idea is that the facility has to compete harder for wood if the overlapped polygon does not have enough, and the implied assumption is that the percentage of the facility's wood-basket in our study area (PFW) is the probability that the facility can procure wood from our wood basket. In order to get some wood from other areas in our wood basket, their procurement probability has to be higher than their PFW, or it would seek the last incremental volume from outside the study area. Because not all of the competing facilities assigned wood needs to come from the study area, we have developed a stochastic function to simulate what would happen. The stochastic function will create a random number between 0 and 1. If this random number is higher than the PFW, this facility will get PFW percent of deficit volume from within our wood basket; if not, the facility gets that volume elsewhere. Additionally, and for those facilities with PFW>90%, they will get PFW percent of deficit volume from our wood basket whether the random number is greater than the PFW or not.

We ran this model 1,000 times and found that our study area could supply 156,445 of the total deficit required. Therefore the analysis of low-grade wood demand indicates that the required volume from Table 1 of 6,211,456 green tons needs to be reduced by 338,086 green tons (494,531 tons minus 156,445 tons). The adjusted consumption figure without accounting for Canadian import/export is 5,873,370 green tons (Table 2). On the other hand, the same result can be obtained by the examination of the low-grade wood supply. Because the total positive value is 992,575 and the deficit supply from the study area is 156,445, there is 836,130 green tons (992,575 tons minus 156,445 tons) available in the study area after the low-grade wood assignment. Therefore, the adjusted consumption of the existing facilities is again 5,873,370 green tons (6,709,500 tons minus 836,130 tons).

Table 2. Low-grade wood assignment

Demand	**Tons**	**Supply**	**Tons**
a. Initial assignment (Table 1)	6,211,456	e. FIA net growth	6,709,500
b. Total deficit	494,531	f. Total remaining	992,575
c. Deficit supplied from the study area	156,445	h. Total available low-grade wood (f-c)	836,130
d. Consumption of existing facilities [a-(b-c)]	5,873,370[8]	i. Consumption of existing facilities (e-h)	5,873,370

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[8] Without Canadian import/export

Appendix II

Table 3. FIA removal and state harvesting data.

	Sawtimber	Pulpwood	Roundwood[9]	Tops and Branches[10]	Low-grade Wood
Total Removal	4,852,630	4,101,167	8,953,796	2,596,601	6,127,362[11]
Removals from Harvesting Data	2,947,202	3,344,093	6,172917[12]	1,396,397[13]	5,182,552[14]

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[9] Roundwood includes sawtimber and pulpwood.

[10] Tops and branches is estimated by roundwood * 0.29.

[11] It is the sum of 15% of sawtimber, all pulpwood and 50% of tops and branches from the FIA removals.

[12] This is the simple mean from 2001 to 2007 and we assume that the whole tree chips do not include any poor quality roundwood.

[13] Whole tee chips

[14] It is the sum or 15% of sawtimber, all pulpwood and biomass from the state harvesting data.