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Formal Letter
United States
Department of
Agriculture

Forest
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One Gifford Pinchot Dr.
Madison, WI 53705-2398

File Code: 4700

Date: February 21, 1995

Mr. Greg Adams
Cannon Structures, Inc.
Trestlewood Division
P.O. Box 1728
Provo, UT 84603-1728

Dear Greg:

Attached are the data generated by Ms. Kolby Hirth, a chemist in my group. The first page gives the moisture content of all the samples. The samples were very odorous and contained an unknown amount of organic volatile compounds in addition to the moisture. Therefore, the "moisture" content or %H₂O includes both water and volatile organic compounds. The second page lists the results for the ash determination. This test was conducted on oven-dry samples.

The charge we agreed upon totals \$70/sample, which includes \$20 for sample preparation and moisture determination, and \$50 for the ash test. The total for 10 samples is \$700.

Let me know if we can be of further assistance. If you have questions concerning these results, call me at 608-231-9475.

Sincerely yours,

Roger Pettersen

ROGER C. PETERSEN, Project Leader
Analytical Chemistry & Microscopy Laboratory





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One Gifford Pinchot Dr.
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Date: February 23, 1995

Mr. Greg Adams
Cannon Structures, Inc.
Trestlewood Division
P.O. Box 1728
Provo, UT 84603-1728

Dear Greg:

I'm sorry, but there is an error on the moisture contents of the wood samples, and I am sending a corrected set of results for moisture content. You should discard the original set of results for moisture content. This does not affect the ash results I sent to you. I am sorry for this inconvenience.

I am also sending you the ash results based on ashing the samples as received and correcting for moisture content. You will notice that the agreement between the two sets of ash determinations is very good.

I hope that this is clear. Please call me at 608-231-9475, if you have questions.

Sincerely yours,

Roger Pettersen

ROGER C. PETTERSEN, Project Leader
Analytical Chemistry & Microscopy Laboratory

Enclosures



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Salt Lake Trestle Analysis

Sample Description and Preparation:

Samples were taken from a trestle from Salt Lake, Utah.

They were labeled as follows:

TAH: Trestlewood Piling, above mud, Heartwood
 TBS: Trestlewood Piling, below mud, Sapwood
 IMH: Inside Pile (2-6), mud, Heartwood
 IMS: Inside Pile (2-6), mud, Sapwood
 IWH: Inside Pile (2-6), water, Heartwood
 IWS: Inside Pile (2-6), water, Sapwood
 OMH: Outside Pile (1-7), mud, Heartwood
 OMS: Outside Pile (1-7), mud, Sapwood
 OWH: Outside Pile (1-7), water, Heartwood
 OWS: Outside Pile (1-7), water, Sapwood

Assay request was moisture content of wood as received and %ash.

The samples were very wet, discolored and very odorous. The odor was similar to turpentine and rot.

The size of the samples ranged from ~3" x 4" x 2" to ~2" x 2" x 2".

I felt the sample blocks as received were too large for a good moisture assay (not enough surface area).

So, the samples were cut with a bandsaw into roughly cube shape ~1/2" x 1/2" x 1/2".

The samples were not ground because too much moisture would've been lost during grinding;
 the request was for moisture content as received.

The samples were then weighed for both the moisture assay and the ash determination;

the moisture numbers will be used to determine dry weight for the ash calculations.

MOISTURE

Samples were heated at 100 C for 1 week.

(* Volatiles other than H2O also evaporated.)

Sample #	Empty crucible	Sample only Before heat	Sample only after heat	Sample only after heat	Loss	% H2O *	Avg.	S.D.	R.S.D.	
TAH - 1	42.11858	51.92015	9.80157	48.7508	6.6322	3.16935	32.3	32.3	N.A.	N.A.
TAH - 2	---	---	---	---	---	---	---	---	---	---
TBS - 1	43.5150	51.4158	7.90080	50.6443	7.1293	0.77150	9.8	9.8	N.A.	N.A.
TBS - 2	---	---	---	---	---	---	---	---	---	---
IMH - 1	53.32053	76.70965	23.38912	64.8728	11.5523	11.83685	50.6	50.2	0.59	1.2
IMH - 2	47.27333	71.83795	24.56462	59.6125	12.3392	12.22545	49.8			
IMS - 1	41.96142	75.74600	33.78458	58.7308	16.7694	17.01520	50.4	50.6	0.30	0.6
IMS - 2	55.11786	88.91417	33.79631	71.7505	16.6326	17.16367	50.8			
IWH - 1	43.00874	65.74455	22.73581	58.3858	15.3771	7.35875	32.4	31.8	0.81	2.6
IWH - 2	41.54886	66.35000	24.80114	58.6073	17.0584	7.74270	31.2			
IWS - 1	52.45482	83.88305	31.42823	75.0835	22.6287	8.79955	28.0	29.2	1.69	5.8
IWS - 2	40.14755	65.93324	25.78569	58.0958	17.9483	7.83744	30.4			
OMH - 1	51.33592	79.16315	27.82723	63.8823	12.5464	15.28085	54.9	54.8	0.21	0.4
OMH - 2	49.03483	73.42225	24.38742	60.1012	11.0664	13.32105	54.6			
OMS - 1	51.74282	82.03245	30.28963	66.2102	14.4674	15.82225	52.2	51.9	0.46	0.9
OMS - 2	49.31944	77.16245	27.84301	62.8008	13.4814	14.36165	51.6			
OWH - 1	52.37253	69.56440	17.19187	63.1482	10.7757	6.41620	37.3	37.6	0.39	1.0
OWH - 2	38.06007	54.93595	16.87588	48.5454	10.4853	6.39055	37.9			
OWS - 1	51.80273	82.68925	30.88652	67.5157	15.7130	15.17355	49.1	48.6	0.81	1.7
OWS - 2	50.93765	75.56305	24.62540	63.7480	12.8104	11.81505	48.0			

Salt Lake Trestle Analysis

ASH Samples were heated to 575 degrees C for ~50 hours.

Crucible #	Sample #	Empty crucible	Crucible & sample before heat	Sample before heat	% H ₂ O	Dry sample corrected for H ₂ O	Crucible & sample after heat	Sample after heat	% Ash	Avg.	S.D.	R.S.D.
1	TAH - 1	25.63285	39.20409	13.57124	32.3	9.18296	28.83861	3.20576	34.9	35.1	0.25	0.7
3	TAH - 2	23.92438	33.90300	9.97862		6.75202	26.30524	2.38086	35.3			
2	TBS - 1	22.61168	29.05974	6.44806	9.8	5.81842	23.91273	1.30105	22.4	22.6	0.30	1.3
7	TBS - 2	26.45607	31.55132	5.09525		4.59771	27.50368	1.04761	22.8			
6	IMH - 1	27.60514	46.46425	18.85911	50.2	9.39402	30.54782	2.94268	31.3	32.0	0.96	3.0
8	IMH - 2	21.63421	34.20640	12.57219		6.26240	23.68096	2.04675	32.7			
10	IMS - 1	23.64787	40.23232	16.58445	50.6	8.19691	26.37859	2.73072	33.3	32.9	0.64	1.9
12	IMS - 2	21.64305	39.79635	18.15330		8.97232	24.55087	2.90782	32.4			
4	IWH - 1	24.82565	37.34610	12.52045	31.8	8.53986	26.49128	1.66563	19.5	20.3	1.10	5.4
14	IWH - 2	22.92745	35.70905	12.78160		8.71798	24.76315	1.83570	21.1			
23	IWS - 1	23.09606	35.66675	12.57069	29.2	8.90046	24.69850	1.60244	18.0	17.7	0.42	2.4
24	IWS - 2	22.45189	37.93098	15.47909		10.95971	24.36017	1.90828	17.4			
25	OMH - 1	23.95663	39.84580	15.88917	54.8	7.18700	25.19416	1.23753	17.2	17.2	0.06	0.4
27	OMH - 2	24.62423	39.63920	15.01497		6.79158	25.78788	1.16365	17.1			
33	OMS - 1	24.36165	40.06630	15.70465	51.9	7.55258	25.81189	1.45024	19.2	19.5	0.37	1.9
35	OMS - 2	22.9541	39.81680	16.86270		8.10950	24.55326	1.59916	19.7			
29	OWH - 1	22.78318	31.71165	8.92847	37.6	5.57185	23.20817	0.42499	7.6	7.8	0.19	2.5
I	OWH - 2	23.91825	36.25445	12.33620		7.69846	24.52660	0.60835	7.9			
II	OWS - 1	22.95765	36.64845	13.69080	48.6	7.04351	24.11785	1.16020	16.5	16.2	0.38	2.4
III	OWS - 2	22.73934	41.65325	18.91391		9.73065	24.28958	1.55024	15.9			

Samples were not only very wet, but were strongly odorous also. The odor was due to volatile components other than H₂O. These volatile components also evaporated in the 105 degree oven, possibly giving artificially high results for %H₂O. High %H₂O values throw off the ash values because the %H₂O is used to calculate dry weight.

The ash determination will be repeated starting from oven-dried wood.