



OFFICE OF THE
GENERAL COUNSEL

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 25, 2002

Denise Chancellor, Esq.
Utah Attorney General's Office
160 East 300 South, 5th Floor
P.O. Box 140873
Salt Lake City, Utah 84114-0873

In the Matter of
Private Fuel Storage, L.L.C.
(Independent Spent Fuel Storage Installation)
Docket No. 72-22-ISFSI

Dear Ms. Chancellor:

By letter dated April 17, 2002, the NRC Staff ("Staff") produced various documents to the State of Utah ("State") related, *inter alia*, to the Staff's testimony of Michael D. Waters concerning radiological dose consequences under Unified Contention Utah L/QQ, Part E. Enclosed herewith is an additional document relating to that testimony, as follows:

E-mail message from Michael Waters to Sherwin Turk, transmitting an "EXCEL" file containing data extracted from the Cobra-SFS temperature calculations performed by Thomas Michener at Pacific Northwest National Laboratories ("PNNL").

As indicated in Mr. Waters' E-mail message, the attached EXCEL file contains the specific temperatures within the horizontal cask and concrete shield, utilized in Mr. Waters' calculations. These temperatures relate to the temperature profile plot which the Staff produced on April 17, 2002, concerning Answer 20 in Mr. Waters' testimony.

Sincerely,

A handwritten signature in black ink that reads "Sherwin E. Turk".

Sherwin E. Turk
Counsel for NRC Staff

Enclosures: As stated

cc w/Encl:: Service List

From: Michael Waters
To: Turk, Sherwin
Date: 4/25/02 10:18AM
Subject: Excel File with extracted Cobra temperatures for horizontal HI-STORM.

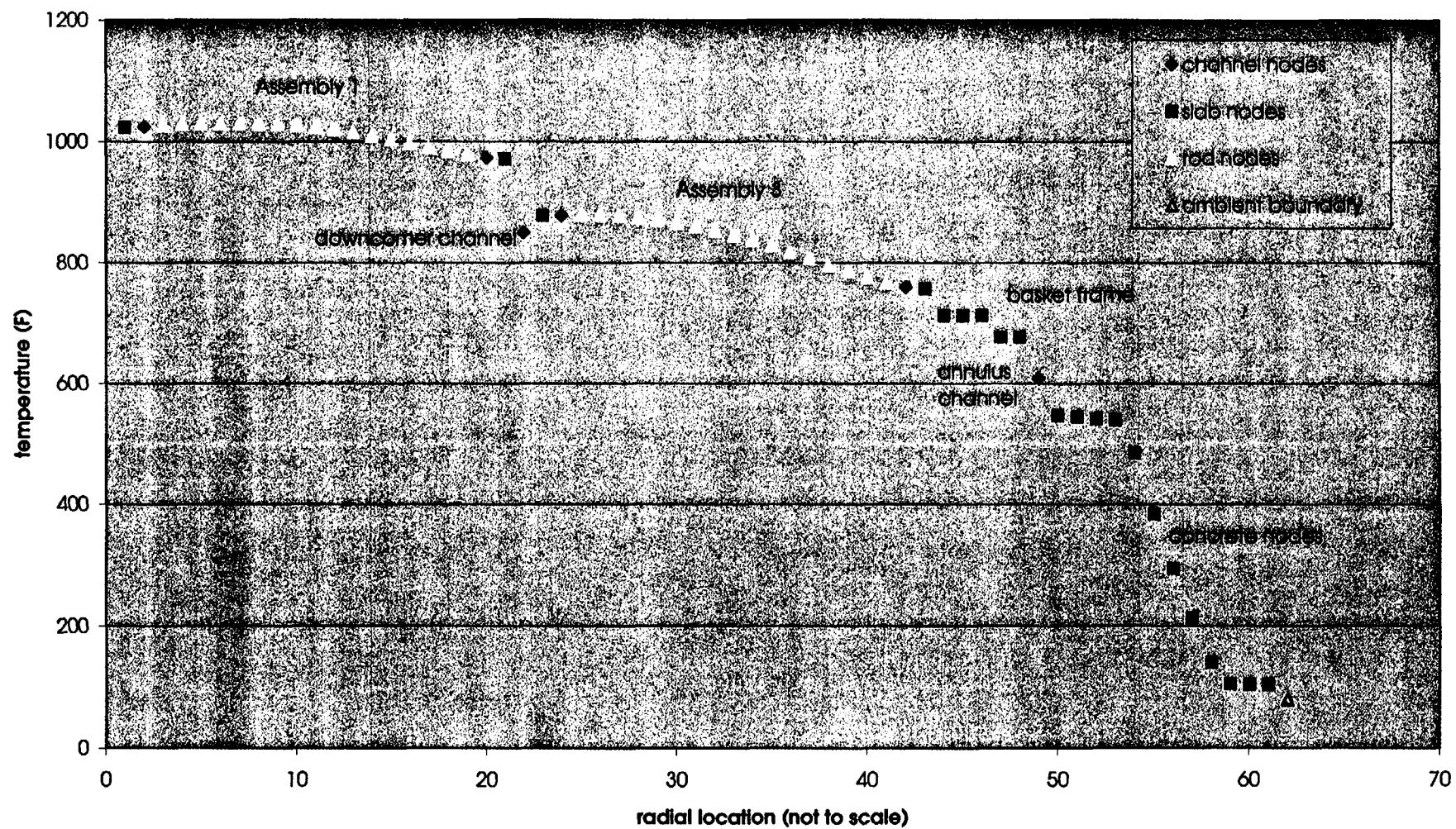
Shep,

Attached is an Excel file with data extracted from the Cobra-SFS temperature calculations performed by Tom Michner at PNNL. This file contains the exact temperatures within the horizontal cask and concrete shield. A plot of the temperature profile has already been forwarded by you to the State of Utah (i.e. the staff calculations & analyses supporting my Answer 20). The exact temperature values can be viewed electronically, within Excel, for that same temperature profile plot.

Thanks,

Mike

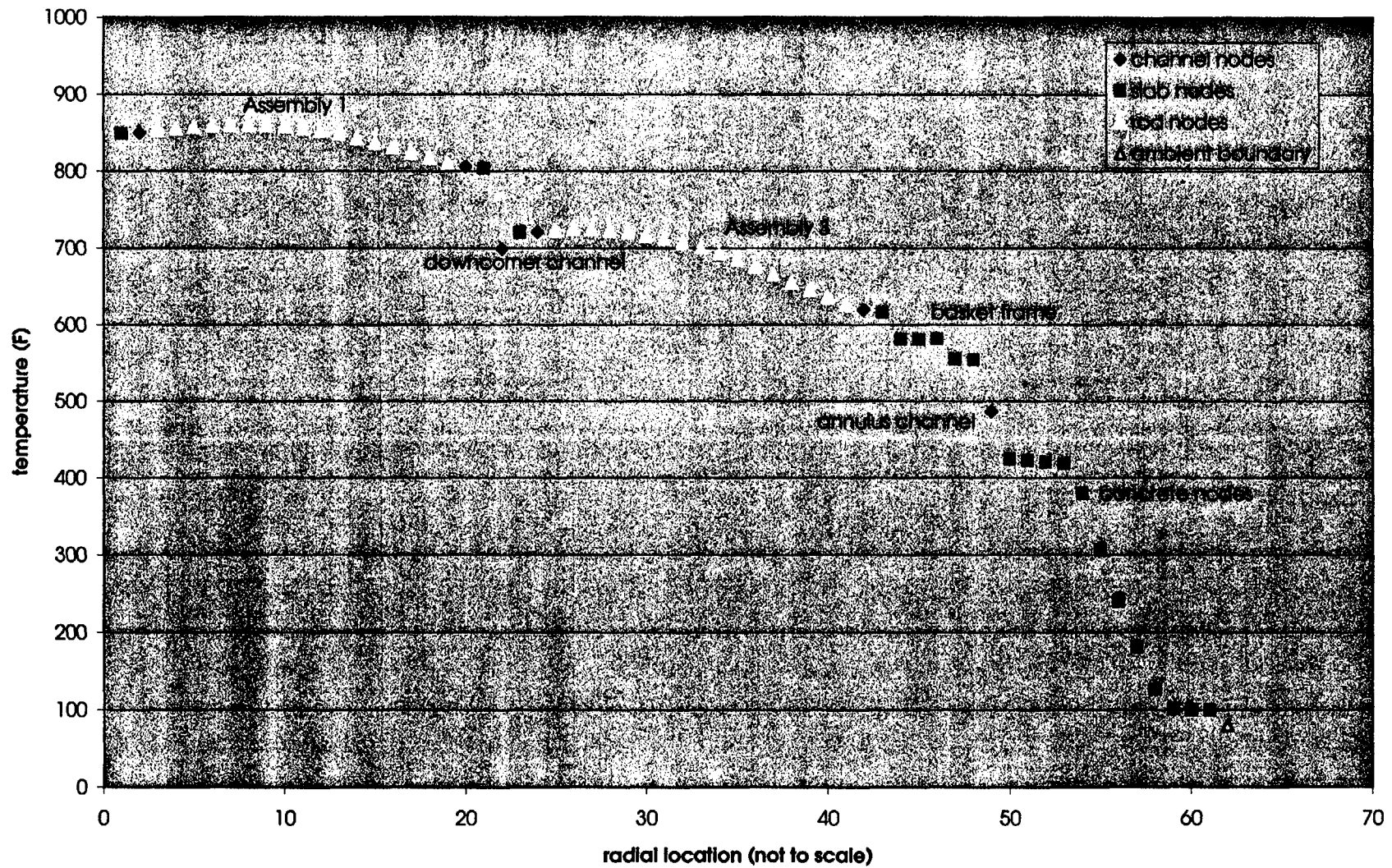
temperature profile near end of fuel (138.1 in.)



radial location	nodes temperature in	along	1/8th upper	section region	line (138.1 channel	of in.) noc slab	nodes	symmetry: rod nodes	ambient bol
slab	1			1023.26			1023.26		
assembly	1	channel	1	1024.0935	1024.0935				
assembly	1	rod	1	1026.1				1026.1	
assembly	1	rod	3	1028				1028	
assembly	1	rod	6	1029.3				1029.3	
assembly	1	rod	10	1029.5				1029.5	
assembly	1	rod	15	1029.9				1029.9	
assembly	1	rod	21	1029				1029	
assembly	1	rod	28	1028				1028	
assembly	1	rod	36	1026				1026	
assembly	1	rod	45	1022.8				1022.8	
assembly	1	rod	55	1019.4				1019.4	
assembly	1	rod	66	1014.9				1014.9	
assembly	1	rod	78	1009.1				1009.1	
assembly	1	rod	91	1003.3				1003.3	
assembly	1	rod	105	996.5				996.5	
assembly	1	rod	120	990.3				990.3	
assembly	1	rod	136	983.9				983.9	
assembly	1	rod	153	977.7				977.7	
assembly	1	channel	171	972.9634	972.9634				
slab	5			970.9471			970.9471		
assembly	5	channel	4	849.4797	849.4797				
slab	16			877.2882			877.2882		
assembly	3	channel	1	877.6281	877.6281				
assembly	3	rod	1	878.5				878.5	
assembly	3	rod	3	878.4				878.4	
assembly	3	rod	6	876.9				876.9	
assembly	3	rod	10	873.5				873.5	
assembly	3	rod	15	869.9				869.9	
assembly	3	rod	21	864.6				864.6	
assembly	3	rod	28	859.2				859.2	
assembly	3	rod	36	852.4				852.4	
assembly	3	rod	45	844.5				844.5	
assembly	3	rod	55	836.6				836.6	
assembly	3	rod	66	827.3				827.3	
assembly	3	rod	78	816.9				816.9	
assembly	3	rod	91	806.7				806.7	
assembly	3	rod	105	795.7				795.7	
assembly	3	rod	120	785.7				785.7	
assembly	3	rod	136	775.6				775.6	
assembly	3	rod	153	766.1				766.1	
assembly	3	channel	171	759.4725	759.4725				
slab	20			756.6319			756.6319		
slab	47			711.939			711.939		
slab	48			711.9549			711.9549		
slab	49			712.2289			712.2289		
slab	53			676.7341			676.7341		
slab	81			676.0009			676.0009		
assembly	6	channel	4	608.0906	608.0906				
slab	85			546.0303			546.0303		

slab	89		544.4127	544.4127
slab	93		540.7019	540.7019
slab	97		538.6216	538.6216
slab	109		484.6028	484.6028
slab	113		383.7496	383.7496
slab	117		294.2628	294.2628
slab	121		213.7404	213.7404
slab	125		140.4697	140.4697
slab	129		105.4709	105.4709
slab	101		104.2733	104.2733
slab	105		103.7632	103.7632
ambient			80	

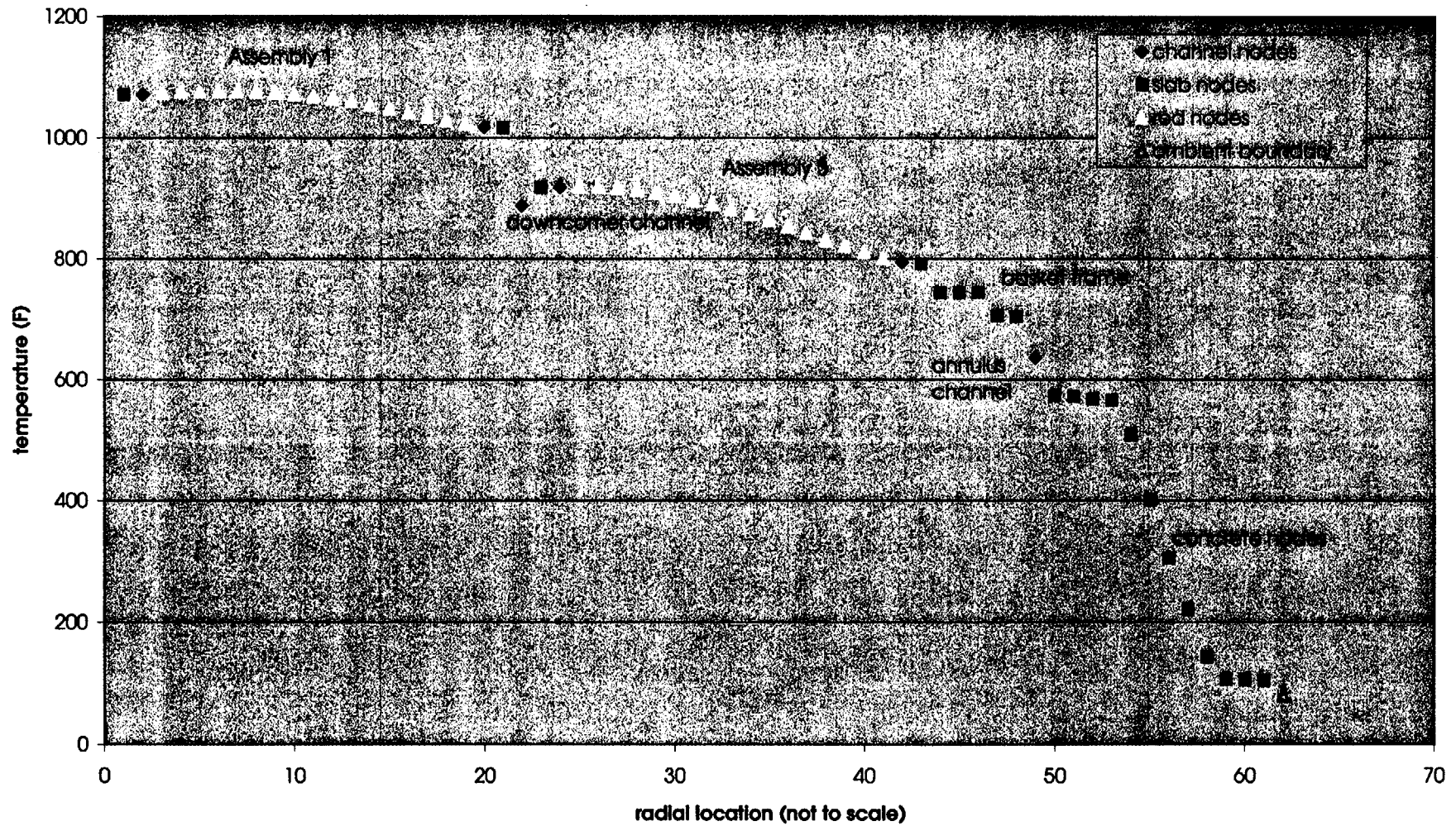
temperature profile near beginning of fuel (43.6 in.)



radial location	nodes temperature	along in	1/8th lower	section region	line (43.6 channel	of in.) noc slab	nodes	symmetry: rod nodes	ambient bol
slab		1		849.0301			849.0301		
assembly		1 channel		850.0976	850.0976				
assembly		1 rod	1	852.7				852.7	
assembly		1 rod	3	855.4				855.4	
assembly		1 rod	6	857.5				857.5	
assembly		1 rod	10	858.6				858.6	
assembly		1 rod	15	859.8				859.8	
assembly		1 rod	21	859.6				859.6	
assembly		1 rod	28	859.5				859.5	
assembly		1 rod	36	858				858	
assembly		1 rod	45	855.3				855.3	
assembly		1 rod	55	852.4				852.4	
assembly		1 rod	66	848.2				848.2	
assembly		1 rod	78	842.6				842.6	
assembly		1 rod	91	836.9				836.9	
assembly		1 rod	105	830.2				830.2	
assembly		1 rod	120	824				824	
assembly		1 rod	136	817.3				817.3	
assembly		1 rod	153	810.9				810.9	
assembly		1 channel	171	806.0871	806.0871				
slab		5		804.0523			804.0523		
assembly		5 channel	4	698.7913	698.7913				
slab		16		720.1869			720.1869		
assembly		3 channel	1	720.8961	720.8961				
assembly		3 rod	1	722.6				722.6	
assembly		3 rod	3	723.8				723.8	
assembly		3 rod	6	723.7				723.7	
assembly		3 rod	10	721.8				721.8	
assembly		3 rod	15	719.7				719.7	
assembly		3 rod	21	715.8				715.8	
assembly		3 rod	28	711.9				711.9	
assembly		3 rod	36	706.5				706.5	
assembly		3 rod	45	699.7				699.7	
assembly		3 rod	55	692.9				692.9	
assembly		3 rod	66	684.5				684.5	
assembly		3 rod	78	674.7				674.7	
assembly		3 rod	91	665.3				665.3	
assembly		3 rod	105	654.7				654.7	
assembly		3 rod	120	645.1				645.1	
assembly		3 rod	136	635.1				635.1	
assembly		3 rod	153	625.5				625.5	
assembly		3 channel	171	618.9908	618.9908				
slab		20		616.2125			616.2125		
slab		47		580.7476			580.7476		
slab		48		580.7757			580.7757		
slab		49		581.2583			581.2583		
slab		53		554.6391			554.6391		
slab		81		554.1163			554.1163		
assembly		6 channel	4	486.1086	486.1086				
slab		85		423.9684			423.9684		

slab	89	422.8091	422.8091
slab	93	420.124	420.124
slab	97	418.6092	418.6092
slab	109	379.3752	379.3752
slab	113	305.7836	305.7836
slab	117	240.1786	240.1786
slab	121	180.9082	180.9082
slab	125	126.8242	126.8242
slab	129	100.9582	100.9582
slab	101	100.0731	100.0731
slab	105	99.6959	99.6959
ambient		80	

profile at location of peak clad temperature (101.8 in.)



radial location	nodes temperature(1 at	along	1/8th axial	section peak	line (101.8 channel	of in.) noc slab	nodes	symmetry: rod nodes	ambient bol
slab	1			1070.3844			1070.3844		
assembly	1 channel		1	1071.1494	1071.1494				
assembly	1 rod		1	1073				1073	
assembly	1 rod		3	1074.7				1074.7	
assembly	1 rod		6	1075.7				1075.7	
assembly	1 rod		10	1075.7				1075.7	
assembly	1 rod		15	1075.8				1075.8	
assembly	1 rod		21	1074.7				1074.7	
assembly	1 rod		28	1073.5				1073.5	
assembly	1 rod		36	1071.3				1071.3	
assembly	1 rod		45	1067.9				1067.9	
assembly	1 rod		55	1064.4				1064.4	
assembly	1 rod		66	1059.7				1059.7	
assembly	1 rod		78	1053.9				1053.9	
assembly	1 rod		91	1048				1048	
assembly	1 rod		105	1041.1				1041.1	
assembly	1 rod		120	1034.9				1034.9	
assembly	1 rod		136	1028.4				1028.4	
assembly	1 rod		153	1022.4				1022.4	
assembly	1 channel		171	1017.5735	1017.5735				
slab	5			1015.5549			1015.5549		
assembly	5 channel		4	888.101	888.101				
slab	16			917.9418			917.9418		
assembly	3 channel		1	918.1753	918.1753				
assembly	3 rod		1	918.8				918.8	
assembly	3 rod		3	918.4				918.4	
assembly	3 rod		6	916.4				916.4	
assembly	3 rod		10	912.7				912.7	
assembly	3 rod		15	908.6				908.6	
assembly	3 rod		21	902.8				902.8	
assembly	3 rod		28	896.9				896.9	
assembly	3 rod		36	889.7				889.7	
assembly	3 rod		45	881.4				881.4	
assembly	3 rod		55	873.2				873.2	
assembly	3 rod		66	863.5				863.5	
assembly	3 rod		78	852.7				852.7	
assembly	3 rod		91	842.3				842.3	
assembly	3 rod		105	831				831	
assembly	3 rod		120	820.7				820.7	
assembly	3 rod		136	810.5				810.5	
assembly	3 rod		153	801				801	
assembly	3 channel		171	794.264	794.264				
slab	20			791.3885			791.3885		
slab	47			743.5195			743.5195		
slab	48			743.5329			743.5329		
slab	49			743.7632			743.7632		
slab	53			705.36			705.36		
slab	81			704.5619			704.5619		
assembly	6 channel		4	635.877	635.877				
slab	85			573.1376			573.1376		

slab	89	571.3788	571.3788
slab	93	567.3813	567.3813
slab	97	565.154	565.154
slab	109	507.2787	507.2787
slab	113	399.794	399.794
slab	117	304.9477	304.9477
slab	121	220.0181	220.0181
slab	125	143.0098	143.0098
slab	129	106.2866	106.2866
slab	101	105.03	105.03
slab	105	104.4952	104.4952
ambient		80	

inary

