

MATERIALS LICENSE

Amendment No. 05

Pursuant to the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974 (Public Law 93-438), and Title 10, Code of Federal Regulations, Chapter I, Parts 30, 31, 32, 33, 34, 35, 36, 39, 40, and 70, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, possess, and transfer byproduct, source, and special nuclear material designated below; to use such material for the purpose(s) and at the place(s) designated below; to deliver or transfer such material to persons authorized to receive it in accordance with the regulations of the applicable Part(s). This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, as amended, and is subject to all applicable rules, regulations, and orders of the Nuclear Regulatory Commission now or hereafter in effect and to any conditions specified below.

302142

Licensee

1. Novagen, Inc.
2. 601 Science Drive
Madison, WI 53711

In accordance with letter dated
December 16, 1996

3. License Number 48-26067-01 is amended in its entirety to read as follows:

4. Expiration Date December 31, 2001

5. Docket or
Reference No. 030-31338

6. Byproduct, Source, and/or
Special Nuclear Material

7. Chemical and/or Physical
Form

8. Maximum Amount that Licensee
May Possess at Any One Time
Under This License

- A. Carbon-14
 - B. Hydrogen-3
 - C. Phosphorus-32
 - D. Phosphorus-33
 - E. Sulfur-35

- A. Any
 - B. Any
 - C. Any
 - D. Any
 - E. Any

- A. 5 millicuries
 - B. 5 millicuries
 - C. 25 millicuries
 - D. 25 millicuries
 - E. 25 millicuries

9. Authorized Use:

- A. through E. To be used for research and development as defined in 10 CFR Part 30, Section 30.4.

CONDITIONS

10. Licensed material shall be used only at the licensee's facilities located at 601 Science Drive, Madison, Wisconsin.
11. Licensed material shall be used by, or under the supervision of, Robert C. Mierendorf, Ph.D., Barbara Morris, Corrine Fetherston, Robert Novy, or Thomas VanOosbree, Ph.D.
12. The Radiation Safety Officer for this license is Robert C. Mierendorf, Ph.D.
13. Survey instruments may be calibrated by the University of Wisconsin-Madison (NRC License No. 48-00983-18) or by any individual or firm authorized to provide such services under an NRC or Agreement State license, on an annual basis.

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PDR ADDCK 03031338
C PDR

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**MATERIALS LICENSE
SUPPLEMENTARY SHEET**

License Number

48-26067-01

Docket or Reference Number

030-31338

Amendment No. 05

14. The licensee is authorized to hold radioactive material with a physical half-life of less than 90 days for decay-in-storage before disposal in ordinary trash provided:
- A. Radioactive waste to be disposed of in this manner shall be held for decay a minimum of 10 half-lives.
 - B. Before disposal as ordinary trash, byproduct material shall be surveyed at the container surface with the appropriate survey meter set on its most sensitive scale and with no interposed shielding to determine that its radioactivity cannot be distinguished from background. All radiation labels shall be removed or obliterated.
 - C. A record of each disposal permitted under this License Condition shall be retained for three years. The record must include the date of disposal, the date on which the byproduct material was placed in storage, the radionuclides disposed, the survey instrument used, the background dose rate, the dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.
15. Except as specifically provided otherwise in this license, the licensee shall conduct its program in accordance with the statements, representations, and procedures contained in the documents, including any enclosures, listed below. The U.S. Nuclear Regulatory Commission's regulations shall govern unless the statements, representations, and procedures in the licensee's application and correspondence are more restrictive than the regulations.
- A. Application dated November 28, 1994; and
 - B. Letters dated September 20, 1996 and December 16, 1996.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION

Date

March 11, 1997

By

Patricia J. Reddy
Nuclear Materials Licensing Branch, Region III

COPY

BETWEEN:

License Fee Management Branch, ARM
and
Regional Licensing Sections

(FOR LFMS USE)
INFORMATION FROM LTS

Program Code: 03620
Status Code: 0
Fee Category: 3M
Exp. Date: 20011231
Fee Comments:
Decon Fin Assur Req: N

LICENSE FEE TRANSMITTAL

A. REGION

1. APPLICATION ATTACHED

Applicant/Licensee: NOVAGEN
Received Date: 961218
Docket No: 3031338
Control No.: 302142
License No.: 48-26067-01
Action Type: Amendment

2. FEE ATTACHED

Amount: *
Check No.: *

* ADOL = INFO
3 97896

3. COMMENTS

Signed
Date

D. Hersey
12/23/96

B. LICENSE FEE MANAGEMENT BRANCH (Check when milestone 03 is entered / _ /)

1. Fee Category and Amount: SM FEE NOT REQUIRED

2. Correct Fee Paid. Application may be processed for:

Amendment
Renewal
License

3. OTHER

Signed
Date

SC
12/27/96

1996 DEC 27 PM 2:04

JAN 02 1997

RECEIVED BY LFDCB

Date Dec 27 1996

Log Dec 9 III

By SC

Date Completed 12/27/96



Novagen

Novagen, Inc.

597 Science Dr.

Madison, WI 53711

Telephone (608) 238-6110

Fax (608) 238-1388

United States Nuclear Regulatory Commission
Region III
801 Warrenville Road
Lisle, IL 60532-4351

December 16, 1996

Dear NRC,

ADDITIONAL INFORMATION TO PREVIOUS CONTROL NUMBER 97896:

We recently received Amendment No. 4 for our license renewal in conjunction with our relocation to 601 Science Drive (License #48-26067-01). Here is the information for request for authorization from the NRC for the release of 597 Science Drive, Madison, WI for unrestricted use. The information is listed according to the twelve items in "Required Information for the Decommissioning and Termination of Licensed Facilities".

- 1) Lists of radiological isotopes used with quantities and dates. Hydrogen-3, phosphorus-32, and sulfur-35 radioisotopes were used. See attached sheets.
- 2) The physical form for of all the isotopes used at 597 Science Drive was in the loose form.
- 3) There were no major radiological spills at 597 Science Drive.
- 4) There were no sealed sources used at 597 Science Drive.
- 5) Results of the final surveys are attached.
- 6) Survey instrumentation with calibration is attached. Background activity for the Beckman LS3801 Liquid Scintillation Counter is 20 dpm for Channel 1 = ^3H ; 20 dpm for channel 2 = ^{35}S ; 28 dpm for channel 3 = ^{32}P . Activity above this background would be detected. Background activity for the Mini-I Model 900 survey meter is $10\mu\text{R/hr}$ (0.5cps). Activity above the background would be detected.
- 7) Maps of the locations where wipe tests and survey meter readings were taken are attached.
- 8) Results of the final survey show no contamination and therefore no decontamination survey data is necessary.
- 9) Release criteria used as a basis for demonstrating that 597 Science Drive can be released for unrestricted free use are the wipe tests results and survey meter readings. Wipe tests showed no areas with more than 100 cpm. Decontamination must be performed if cpm is more than 1000 cpm. Survey meter readings for all areas were at background level of $10\mu\text{R/hr}$.

~~FEE NOT REQUIRED~~

Pm: 12-16-96

RECEIVED

DEC 18 1996

REGION III

302142

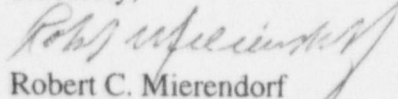
10) We did not leave any contaminated areas or materials at the site.

11) There were no remediation efforts of radioactive waste at the site. All radioactive materials have been removed prior to submittal of the final survey data.

12) Dr. Thomas R. Van Oosbree was the individual who conducted the final radiological survey. See attached sheet for his qualifications.

Please call me if I can be of further assistance.

Sincerely,



Robert C. Mierendorf
Radiation Safety Officer
Vice President and General Manager

List of Hydrogen - 3

page 1 of 1

Date Received	Lot Number	Hydrogen-3 Radioisotope	Amount
5/20/92	2901-016	CTP	1000uCi
7/22/92	2760-277	Leucine	250uCi
9/30/92	2892-127	TTP	250uCi
12/11/92	2892-157	ATP	250uCi
3/5/93	2892-217	TTP	250uCi
5/17/93	3043-090	Digoxin	250uCi
6/21/93	2892-259	TTP	250uCi
9/1/93	2867-201	CTP	250uCi
9/29/93	2892-295	TTP	250uCi
10/20/93	3107-023	TTP	250uCi
2/23/94	3107-087	TTP	250uCi
3/29/94	2950-185	Leucine	250uCi
7/6/94	3107-139	TTP	250uCi
7/6/94	3142-059	CTP	250uCi
8/18/94	B18A	Poly Adenosine	10uCi
11/7/94	3026-227	TTP	250uCi
12/30/94	3107-197	TTP	250uCi
1/10/95	3142-169	CTP	250uCi
2/25/95	3142-247	CTP	250uCi
7/5/95	3107-261	TTP	250uCi
7/18/95	3142-293	CTP	250uCi
4/4/96	3238-096	TTP	250uCi
4/18/96	3232-110	CTP	250uCi
8/2/96	3232-168	CTP	250uCi
11/7/96	3232-224	CTP	250uCi
11/7/96	3238-209	TTP	250uCi

Date Received	Lot Number	Phosphorus-32 Radioisotope	Amount
5/29/92	2821-285	dATP	500uCi
6/9/92	2821-290	dATP	250uCi
6/9/92	2822-430	ATP	250uCi
6/9/92	2821-300	dATP	250uCi
7/4/92	2821-305	dATP	250uCi
7/14/92	2821-315	dATP	250uCi
7/14/92	2822-470	dATP	250uCi
7/31/92	2821-330	dATP	250uCi
7/31/92	2822-494	ATP	250uCi
8/1/92	2821-335	dATP	250uCi
8/18/92	2821-340	dATP	250uCi
9/14/92	2821-360	dATP	250uCi
9/30/92	2821-370	dATP	250uCi
10/9/92	2822-574	ATP	250uCi
10/9/92	2821-380	dATP	250uCi
10/16/92	10921H9	Pyrophosphate	1000uCi
10/27/92	2821-390	dATP	250uCi
11/18/92	2821-405	dATP	250uCi
11/18/92	2822-261	ATP	250uCi
12/15/92	2821-425	dATP	250uCi
12/22/92	2821-430	dATP	250uCi
1/6/93	2821-440	dATP	250uCi
1/12/93	2821-445	dATP	250uCi
1/27/93	2821-455	dATP	250uCi
2/2/93	2821-460	dATP	250uCi
2/3/93	2931G6	Pyrophosphate	1000uCi
2/11/93	2821-465	dATP	500uCi
2/24/93	2821-475	dATP	250uCi
3/15/93	2821-490	dATP	250uCi
3/29/93	2822-766	ATP	250uCi
3/29/93	2821-500	dATP	250uCi
3/30/93	2821-449	dATP	100uCi
4/13/93	2821-510	ATP	250uCi
4/27/93	2821-570B	dATP	250uCi
5/6/93	2821-525	dATP	250uCi
5/17/93	2822-822	ATP	250uCi
5/19/93	2821-535	dATP	250uCi
5/25/93	2821-540	dATP	250uCi
6/9/93	2821-550	dATP	250uCi
6/22/93	2821-560	dATP	250uCi
7/2/93	2821-570C	dATP	500uCi
7/16/93	2821-580	dATP	250uCi
7/28/93	2821-585	dATP	250uCi
8/9/93	2821-595	dATP	250uCi

8/17/93	2821-600	dATP	250uCi
8/26/93	2821-605	dATP	250uCi
9/13/93	2821-620	dATP	250uCi
9/16/93	2821-620	dATP	250uCi
9/23/93	2822-966	ATP	250uCi
9/21/93	2821-625	dATP	250uCi
10/2/93	2821-635	dATP	250uCi
10/20/93	2821-645	dATP	250uCi
10/26/93	2821-650	dATP	250uCi
10/26/93	3050-027	dCTP	250uCi
11/2/93	2821-655	dATP	250uCi
11/3/93	3051-021	ATP	250uCi
11/9/93	1093167	Pyrophosphate	1000uCi
12/7/93	2821-680	dATP	250uCi
12/9/93	3051-061	ATP	250uCi
1/11/94	2821-705	dATP	250uCi
1/17/94	3051-109	ATP	250uCi
1/21/94	2821-715	dATP	250uCi
1/26/94	2821-715	dATP	250uCi
2/4/94	2736671B	dTTP	250uCi
2/22/94	2821-735	dATP	250uCi
3/1/94	2821-740	dATP	250uCi
3/7/94	2821-745B	dATP	250uCi
3/21/94	2821-755	dATP	250uCi
3/29/94	2758-878	CTP	500uCi
4/5/94	2821-760	dATP	250uCi
4/12/94	2736-698	dTTP	250uCi
4/12/94	2821-770	dATP	250uCi
4/15/94	2821-775	dATP	250uCi
5/4/94	2821-785B	dATP	250uCi
5/16/94	2821-795B	dATP	250uCi
6/21/94	2821-810	dATP	250uCi
6/28/94	206234B	dATP	250uCi
7/5/94	2758918	ATP	250uCi
7/12/94	07074B	dATP	250uCi
7/12/94	07074B	dATP	250uCi
7/15/94	07144B	CTP	250uCi
7/26/94	07214B	ATP	250uCi
8/2/94	07284B	ATP	250uCi
8/15/94	002A08114B	ATP	250uCi
8/17/94	8114B	dATP	250uCi
9/20/94	09154B	dATP	250uCi
9/20/94	09154B	dATP	250uCi
8/24/94	002A08184B	ATP	250uCi
8/31/94	012A08254B	ATP	250uCi

9/13/94	008X09084B	CTP	250uCi
9/28/94	002A-09224B	ATP	250uCi
9/28/94	012A-09224B	dATP	250uCi
10/14/94	012A-10134B	dATP	250uCi
10/25/94	10204B	dATP	250uCi
11/2/94	008H10294B	CTP	250uCi
11/16/94	11104B	dATP	250uCi
12/12/94	12084B	dATP	250uCi
1/10/95	012A01055B	dATP	250uCi
1/27/95	008H1265B	CTP	250uCi
1/27/95	012A1265B	dATP	250uCi
3/7/95	012A03029B	dATP	250uCi
3/8/95	008H03025B	CTP	250uCi
3/24/95	008H03235B	CTP	250uCi
3/24/95	002A03235B	ATP	250uCi
3/28/95	012A03235B	dATP	250uCi
4/11/95	008H04065B	CTP	250uCi
4/15/95	135B	dATP	250uCi
4/25/95	008H04205B	CTP	250uCi
5/2/95	04275B	dATP	250uCi
5/9/95	0504B	dATP	250uCi
5/23/95	5185	dATP	250uCi
5/25/95	008H05255	CTP	250uCi
6/12/95	6085	dATP	250uCi
6/27/95	6225	dATP	250uCi
7/19/95	7135	dATP	500uCi
7/20/95	7135	dATP	250uCi
8/9/95	8035	dATP	250uCi
8/9/95	8035	dATP	250uCi
8/28/95	8245	dATP	250uCi
9/11/95	9075	dATP	250uCi
10/5/95	9285	dATP	250uCi
11/3/95	008H11025	CTP	250uCi
11/7/95	002A11025	ATP	100uCi
11/7/95	012A11025	dATP	250uCi
12/4/95	012A11305	dATP	250uCi
1/3/96	12285	dATP	250uCi
2/23/96	2156	dATP	250uCi
3/13/96	3076	dATP	250uCi
5/22/96	5166	dATP	250uCi
6/4/96	5306	dATP	250uCi
7/22/96	7186	dATP	250uCi
8/29/96	8226	dATP	250uCi
10/28/96	012A10246	dATP	250uCi
11/12/96	002A11076	ATP	250uCi

List of Sulfur-35

page 1 of 2

Date Received	Lot Number	Sulfur-35 Radioisotope	Amount
6/3/92	3039-117	UTP	1000uCi
7/7/92	2689-054	Methionine	1000uCi
8/15/92	3039-133	UTP	1000uCi
8/25/92	2689-056	Methionine	1000uCi
10/7/92	2689-058	Methionine	1000uCi
11/17/92	2689-060	Methionine	1000uCi
12/2/92	39H9212	UTP	1000uCi
1/27/93	39H9301	UTP	1000uCi
2/3/93	2976-163	Methionine	1000uCi
3/30/93	2794-240	Methionine	1000uCi
4/30/93	2952-217	Methionine	1000uCi
5/6/93	39H9305	UTP	1000uCi
8/3/93	2689-072	Methionine	1000uCi
8/9/93	2927-203	Methionine	1000uCi
9/8/93	2794-299	Methionine	1000uCi
9/8/93	39H9309	UTP	1000uCi
9/29/93	3111-014	Methionine	1000uCi
10/27/93	2927-234	Methionine	1000uCi
12/7/93	112293MA	Methionine	1000uCi
1/11/94	010394MA	Methionine	1000uCi
2/10/94	0214994MA	Methionine	1000uCi
3/1/94	3459403	Methionine	1000uCi
3/29/94	032894CT	dATP	1000uCi
3/31/94	032894MA	Cysteine	1000uCi
5/23/94	050994MA	Methionine	1000uCi
6/6/94	053094MA	Methionine	1000uCi
6/15/94	053094MA	Methionine	1000uCi
7/15/94	071194MA	Methionine	1000uCi
7/26/94	071199MA	Methionine	1000uCi
8/17/94	080194MA	Methionine	1000uCi
8/25/94	B9433	Methionine	1000uCi
9/13/94	9436	Methionine	1000uCi
9/22/94	9437	Methionine	1000uCi
10/5/94	100394MA	Methionine	1000uCi
11/4/94	102494MA	Methionine	1000uCi
11/21/94	111494MA	Methionine	1000uCi
12/5/94	111494MA	Methionine	1000uCi
12/30/94	122694MA	Methionine	1000uCi
1/10/95	122694MA	Methionine	1000uCi
1/20/95	39H9501	UTP	250uCi
2/22/95	020695MA	Methionine	1000uCi
3/24/95	032095MA	Methionine	1000uCi
4/28/95	041795MA	Methionine	1000uCi
5/23/95	052295MA	Methionine	1000uCi

List of Sulfur -35

page 2 of 2

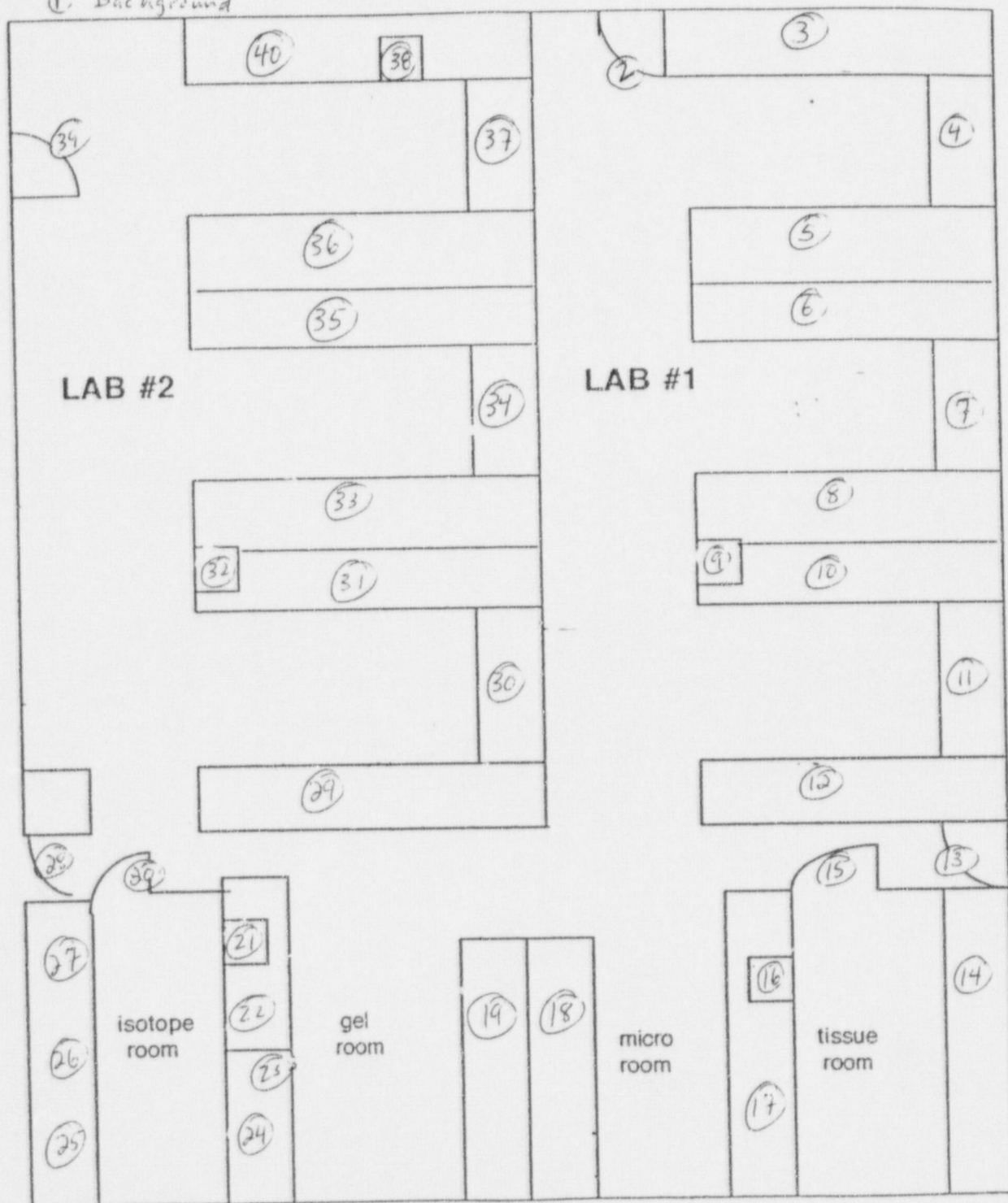
6/15/95	061295MA	Methionine	1000uCi
7/20/95	070395MA	Methionine	1000uCi
8/17/95	B9532	Methionine	1000uCi
7/5/95	070395MA	Methionine	1000uCi
9/6/95	B9534	Methionine	1000uCi
9/29/95	092595MA	Methionine	1000uCi
12/14/95	112795MA	Methionine	1000uCi
2/20/96	021996MA	Methionine	1000uCi
3/11/96	021996MA	Methionine	1000uCi
3/27/96	031996MB	Methionine	1000uCi
4/29/96	042296MB	Methionine	1000uCi
5/14/96	051396MB	Methionine	1000uCi
5/22/96	051396MB	Methionine	1000uCi
6/13/96	060396MB	Methionine	1000uCi
8/2/96	071596MB	Methionine	1000uCi
9/12/96	082696MB	Methionine	1000uCi
9/24/96	091696MB	Methionine	1000uCi
10/23/96	100796MB	Methionine	1000uCi
11/15/96	102896MB	Methionine	1000uCi



Wipe test map for 597 Science Drive Laboratory

Surveyor's Name: Tom Van Osbrece
Date: 12/12/96

① Background



Please attach cpm data.

Any area showing more than 1000 cpm, must be cleaned until wipe tests show levels of 1000 cpm or less.

Close Out Survey for 597 Science Drive

Wipe Test Record

Surveyor's Name: Tom Van Oosthert

Survey Date: 12/12/96

3H

35S

32P

Area Wiped (refer to map)	Channel 1	Channel 2	Channel 3
1. Background	12 cpm = 20 dpm	20 dpm	28 dpm
2. Lab 1 door to front office	16 " = 27 "	20 "	22 "
3. Lab 1 counter top	12 " = 28 "	17 "	18 "
4. Lab 1 counter top	16 " = 27 "	22 "	27 "
5. Lab 1 counter top	13 " = 22 "	18 "	24 "
6. Lab 1 counter top	18 7 cpm = 12 "	9 "	14 "
7. Lab 1 counter top	21 cpm = 35 "	33 "	35 "
8. Lab 1 counter top	19 " = 32 "	26 "	32 "
9. Lab 1 sink	8 " = 13 "	13 "	13 "
10. Lab 1 counter top	12 " = 20 "	19 "	25 "
11. Lab 1 counter top	8 " = 13 "	14 "	23 "
12. Lab 1 counter top	15 " = 25 "	18 "	19 "
13. Door entrance	12 " = 20 "	23 "	27 "
14. Tissue room counter top	11 " = 18 "	18 "	27 "
15. Tissue room door	6 " = 10 "	13 "	15 "
16. Tissue room sink	14 " = 23 "	18 "	21 "
17. Tissue room counter top	15 " = 25 "	27 "	34 "
18. Micro room counter top	10 " = 17 "	16 "	22 "
19. Gel room counter top	13 " = 22 "	25 "	29 "
20. Isotope room door	6 " = 10 "	10 "	13 "
21. Isotope room sink	22 " = 37 "	37 "	38 "
22. Isotope room counter top	22 " = 37 "	31 "	34 "
23. Isotope room sink in the hood	9 " = 15 "	16 "	18 "
24. Isotope room counter top in hood	8 " = 13 "	18 "	19 "
25. Isotope room counter top	13 " = 22 "	21 "	25 "
26. Isotope room counter top	9 " = 15 "	16 "	23 "
27. Isotope room counter top	22 " = 37 "	33 "	35 "
28. Lab 2 door to corridor	11 " = 18 "	18 "	20 "
29. Lab 2 counter top	88 " = 145 "	95 "	97 "
30. Lab 2 counter top	9 " = 15 "	14 "	18 "
31. Lab 2 counter top	12 " = 20 "	20 "	25 "
32. Lab 2 sink	13 " = 22 "	23 "	29 "
33. Lab 2 counter top	12 " = 20 "	17 "	20 "
34. Lab 2 counter top	33 " = 55 "	41 "	51 "
35. Lab 2 counter top	86 " = 143 "	93 "	98 "
36. Lab 2 counter top	14 " = 23 "	21 "	23 "
37. Lab 2 counter top	12 " = 20 "	18 "	20 "
38. Lab 2 sink	17 " = 28 "	28 "	34 "
39. Lab 2 door to corridor	8 " = 13 "	13 "	19 "
40. Lab 2 counter top	21 " = 35 "	27 "	29 "

USER: 1 ID: PRESET TIME: 1.00 THU 12 DEC 1996 12:14
 SAMPLE REPEAT: 1 CYCLE REPEAT: 1 SCR:N RS232:N
 H#: 1 AOC:N OCF:N RCM:N
 CHANNEL 1-LL: 0 UL: 400 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 CHANNEL 2-LL: 0 UL: 670 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 CHANNEL 3-LL: 0 UL: 1000 2SIGMA: 2.00 BKG SUB: 0.00 BKG 2SIG: 0.00 LSR: 0
 DATA CALC: CPM, UNKNOWN REPLICATES: 1 NORM FACTOR: 0 1.00000
 HALF LIFE(DAYS): N

SAM	POS	CH	CPM	2SIG%	TIME	EL TIME	AVG H#	ERR
1	**	1	12.00	57.74	1.00	1.51	114.0	
①	background	2	20.00	44.72				
		3	28.00	37.80				
2	**	2	16.00	50.00	1.00	3.18	95.0	
②		2	20.00	44.72				
		3	22.00	42.64				
3	**	3	12.00	57.74	1.00	4.85	95.0	
③		2	17.00	48.51				
		3	18.00	47.14				
4	**	4	16.00	50.00	1.00	6.53	95.0	
④		2	22.00	42.64				
		3	27.00	38.49				
5	**	5	13.00	55.47	1.00	8.18	103.0	
⑤		2	18.00	47.14				
		3	24.00	40.82				
6	**	6	7.00	75.59	1.00	9.86	98.0	
⑥		2	9.00	66.67				
		3	14.00	53.45				
7	**	7	21.00	43.64	1.00	11.58	104.0	
⑦		2	33.00	34.82				
		3	35.00	33.81				
8	**	8	19.00	45.88	1.00	13.26	97.0	
⑧		2	26.00	39.22				
		3	32.00	35.36				
9	**	9	8.00	70.71	1.00	14.92	110.0	
⑨		2	13.00	55.47				
		3	13.00	55.47				
10	**	10	12.00	57.74	1.00	16.58	108.0	
⑩		2	19.00	45.88				
		3	25.00	40.00				
11	**	11	8.00	70.71	1.00	18.25	115.0	
⑪		2	14.00	53.45				
		3	23.00	41.70				
12	**	12	15.00	51.64	1.00	19.91	106.0	
⑫		2	18.00	47.14				
		3	19.00	45.88				
13	**	13	12.00	57.74	1.00	21.57	115.0	
⑬		2	23.00	41.70				
		3	27.00	38.49				
14	**	14	11.00	60.30	1.00	23.23	111.0	
⑭		2	18.00	47.14				
		3	27.00	38.49				

USER: 1 ID: PRESET TIME: 1.00 THU 12 DEC 1996 13:00
 SAMPLE REPEAT: 1 CYCLE REPEAT: 1 SURIN RS232IN
 H#: 1 AUCIN UCFIN RUMIN
 CHANNEL 1-LL: 0 UL: 400 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 CHANNEL 2-LL: 0 UL: 670 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 CHANNEL 3-LL: 0 UL: 1000 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 DATA CALC: CPM, UNKNOWN REPLICATES: 1 NORM FACTOR: Q 1.00000
 HALF LIFE(DAYS): N

SAM	POS	CH	CPM	ZSIG%	TIME	EL TIME	AVG H#	ERR
1	**	1	6.00	81.65	1.00	1.51	109.0	
15		2	13.00	55.47				
		3	15.00	51.64				
2	**	2	14.00	53.45	1.00	3.17	108.0	
16		2	18.00	47.14				
		3	21.00	43.64				
3	**	3	15.00	51.64	1.00	4.83	106.0	
17		2	27.00	38.49				
		3	34.00	34.30				
4	**	4	10.00	63.25	1.00	6.50	118.0	
18		2	16.00	50.00				
		3	22.00	42.64				
5	**	5	13.00	55.47	1.00	8.16	108.0	
19		2	25.00	40.00				
		3	29.00	37.14				
6	**	6	6.00	81.65	1.00	9.83	125.0	
20		2	10.00	63.25				
		3	13.00	55.47				
7	**	7	22.00	42.64	1.00	11.49	113.0	
21		2	37.00	32.88				
		3	38.00	32.44				
8	**	8	22.00	42.64	1.00	13.16	103.0	
22		2	31.00	35.92				
		3	34.00	34.30				
9	**	9	9.00	66.67	1.00	14.83	119.0	
23		2	16.00	50.00				
		3	18.00	47.14				
10	**	10	8.00	70.71	1.00	16.49	102.0	
24		2	18.00	47.14				
		3	19.00	45.88				
11	**	11	13.00	55.47	1.00	18.16	109.0	
25		2	21.00	43.64				
		3	25.00	40.00				
12	**	12	9.00	66.67	1.00	19.82	103.0	
26		2	16.00	50.00				
		3	23.00	41.70				
13	**	13	22.00	42.64	1.00	21.49	109.0	
27		2	33.00	34.82				
		3	35.00	33.81				
14	**	14	11.00	60.30	1.00	23.16	110.0	
28		2	18.00	47.14				
		3	20.00	44.72				

29 → 40

PAGE: 1

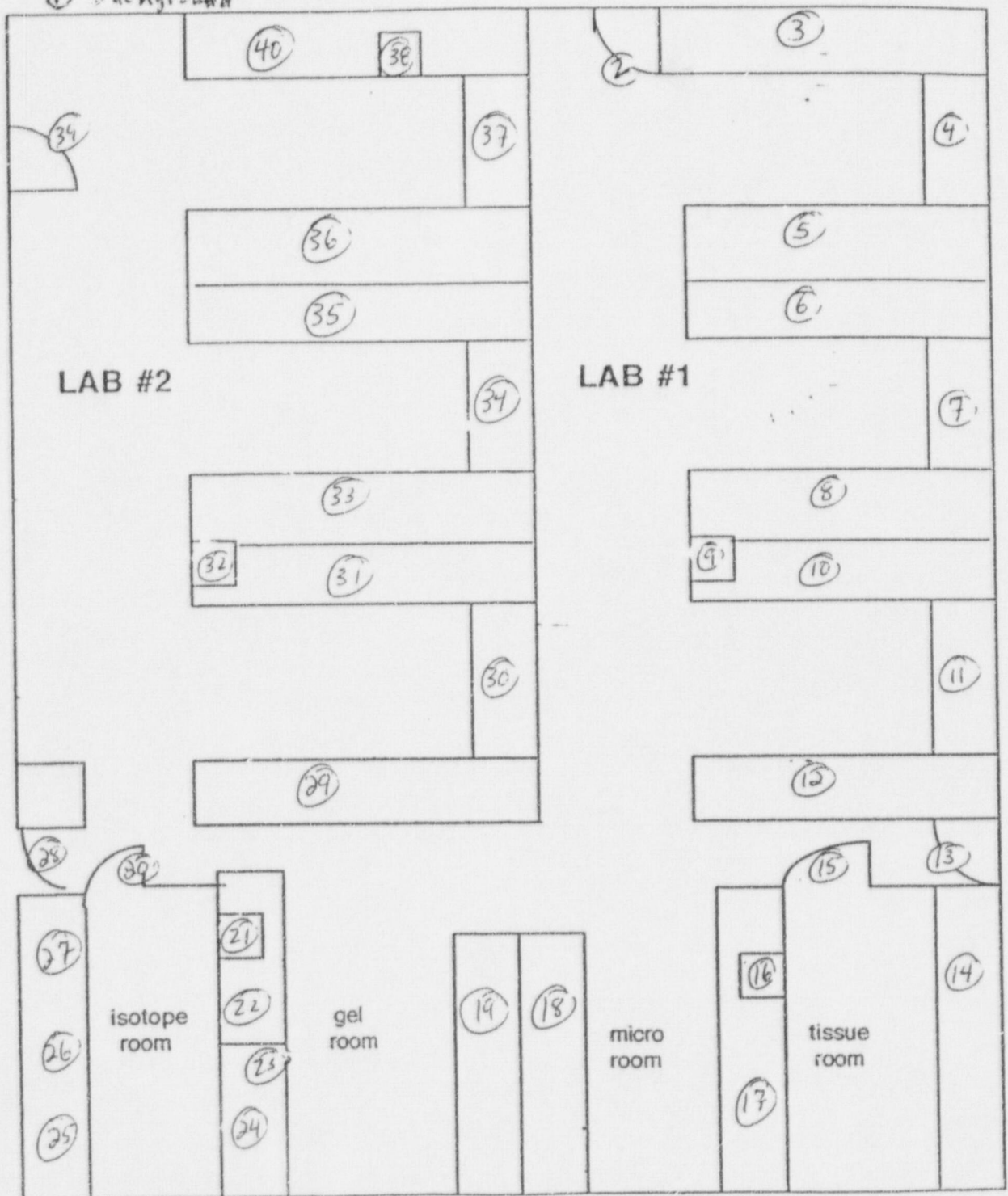
USER: 1 ID: PRESET TIME: 1.00 THU 12 DEC 1996 13:32
 SAMPLE REPEAT: 1 CYCLE REPEAT: 1 DCR:N RS232:N
 R#: 1 ACC:N QCF:N RCM:N
 CHANNEL 1-LL: 0 UL: 400 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 CHANNEL 2-LL: 0 UL: 670 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 CHANNEL 3-LL: 0 UL: 1000 ZSIGMA: 2.00 BRG SUB: 0.00 BRG ZSIG: 0.00 LSK: 0
 DATA CALC: CPM, UNKNOWN REPLICATES: 1 NORM FACTOR: 0 1.00000
 HALF LIFE(DAYS): N

SAM	POS	CH	CPM	ZSIG	TIME	EL TIME	AVG R#	ERR
1	KK= 1	1	88.00	21.32	1.00	1.54	117.0	
2		2	95.00	20.52				
3		3	97.00	20.31				
2	KK= 2	1	9.00	66.67	1.00	3.20	111.0	
3		2	14.00	53.45				
4		3	18.00	47.14				
3	KK= 3	1	12.00	57.74	1.00	4.88	118.0	
4		2	20.00	44.72				
5		3	25.00	40.00				
4	KK= 4	1	13.00	55.47	1.00	6.54	128.0	
5		2	23.00	41.70				
6		3	29.00	37.14				
5	KK= 5	1	12.00	57.74	1.00	8.26	113.0	
6		2	17.00	48.51				
7		3	20.00	44.72				
6	KK= 6	1	33.00	34.82	1.00	9.99	125.0	
7		2	41.00	31.23				
8		3	51.00	28.01				
7	KK= 7	1	66.00	21.37	1.00	11.74	113.0	
8		2	53.00	20.74				
9		3	58.00	20.20				
8	KK= 8	1	14.00	53.45	1.00	13.46	110.0	
9		2	21.00	43.64				
10		3	23.00	41.70				
9	KK= 9	1	12.00	57.74	1.00	15.14	126.0	
10		2	18.00	47.14				
11		3	20.00	44.72				
10	KK= 10	1	17.00	48.51	1.00	16.61	121.0	
11		2	26.00	37.60				
12		3	34.00	34.30				
11	KK= 11	1	6.00	70.71	1.00	18.47	105.0	
12		2	13.00	55.47				
13		3	19.00	45.86				
12	KK= 12	1	21.00	43.64	1.00	20.14	126.0	
13		2	27.00	38.49				
14		3	29.00	37.14				

Map for 597 Science Drive Laboratory

 Surveyor's Name: Tom Van Osbree
 Date: 12/12/96

① Background



Please attach cpm data.

Any area showing more than 1000 cpm, must be cleaned until wipe tests show levels of 1000 cpm or less.

Close Out Survey for 597 Science Drive
Series 900 Mini-Monitor Radiation Survey

Surveyor's Name: *Tom Van Cestert*

Survey Date: *12/13/96*

Area Wiped (refer to map)	Counts per second
1. Background	<i>0.5</i>
2. Lab 1 door to front office	<i>0.5</i>
3. Lab 1 counter top	<i>0.5</i>
4. Lab 1 counter top	<i>0.5</i>
5. Lab 1 counter top	<i>0.5</i>
6. Lab 1 counter top	<i>0.5</i>
7. Lab 1 counter top	<i>0.5</i>
8. Lab 1 counter top	<i>0.5</i>
9. Lab 1 sink	<i>0.5</i>
10. Lab 1 counter top	<i>0.5</i>
11. Lab 1 counter top	<i>0.5</i>
12. Lab 1 counter top	<i>0.5</i>
13. Door entrance	<i>0.5</i>
14. Tissue room counter top	<i>0.5</i>
15. Tissue room door	<i>0.5</i>
16. Tissue room sink	<i>0.5</i>
17. Tissue room counter top	<i>0.5</i>
18. Micro room counter top	<i>0.5</i>
19. Gel room counter top	<i>0.5</i>
20. Isotope room door	<i>0.5</i>
21. Isotope room sink	<i>0.5</i>
22. Isotope room counter top	<i>0.5</i>
23. Isotope room sink in the hood	<i>0.5</i>
24. Isotope room counter top in hood	<i>0.5</i>
25. Isotope room counter top	<i>0.5</i>
26. Isotope room counter top	<i>0.5</i>
27. Isotope room counter top	<i>0.5</i>
28. Lab 2 door to corridor	<i>0.5</i>
29. Lab 2 counter top	<i>0.5</i>
30. Lab 2 counter top	<i>0.5</i>
31. Lab 2 counter top	<i>0.5</i>
32. Lab 2 sink	<i>0.5</i>
33. Lab 2 counter top	<i>0.5</i>
34. Lab 2 counter top	<i>0.5</i>
35. Lab 2 counter top	<i>0.5</i>
36. Lab 2 counter top	<i>0.5</i>
37. Lab 2 counter top	<i>0.5</i>
38. Lab 2 sink	<i>0.5</i>
39. Lab 2 door to corridor	<i>0.5</i>
40. Lab 2 counter top	<i>0.5</i>

$$0.5 \text{ cps} = 10 \mu\text{R/hr}$$

University of Wisconsin - Madison
Department of Medical Physics
Accredited Dosimetry Calibration Laboratory

Radiation Safety Survey Meter Calibration Report

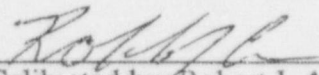
Customer: Keith Yaeger, Novagen, Inc., Madison, WI 53711

Calibration Date: September 27, 1996Due for Recalibration by: September 27, 1997Survey Meter Readout Device DescriptionMini-I
Model 900Serial Number : 036774
Type : Scaler/Ratemeter
Scales : 500K(log)Survey Meter Probe DescriptionMini-I
Model EP15Serial Number : Unknown
Type : GM
Buildup Cap : None
Orientation : Window toward beamIRRADIATION CONDITIONSIsotope : Cs-137Temperature : 18.2 °CPressure : 732.3 TorrAir Density Correction Applied? : NoRadiation Source : J.L. Shepherd Model 78-2MDual-Source Irradiator, s/n 5069USNRC License Number : 48-09843-18Calibration Uncertainty : +/- 10%

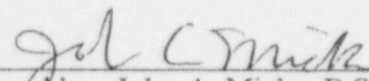
<u>Scale</u>	<u>Known X Rate (mR/hr)</u>	<u>Final Rdg. (CPS)</u>	<u>CF (mR/hr per CPS)</u>
500K(log)	0.38	20	N/A
	0.91	50	N/A
	1.81	100	N/A
	3.15	200	N/A
	5.91	400	N/A

Comments: The calibration reference point was the window surface. The CF is reported as N/A because the units of the meter reading and the stated exposure rate have different units. AC power was used.

Recorded in data book: UW ADCL SM-03Page: 124



Calibrated by: Robert J. Aus, B.S.
Research Assistant, UW-ADCL



Reviewed by: John A. Micka, B.S.
Associate Director, UW-ADCL

Beckman LS 5801 Liquid Scintillation Counter

CALIBRATION SUCCESSFUL

THU 05 DEC 1996 14:23

Calibrated Dec 5, 1996 by Tamara Costello

Qualifications for Thomas R. Van Oosbree, Ph. D:

9/92- present: Manufacturing Manager, Senior Scientist, Protein Biochemistry, Novagen, Inc., Madison, WI. Authorized user for radioisotopes at Novagen. Trains personnel in the handling of radioisotopes. Supervises recordkeeping and training for Novagen.

6/84-8/92: Senior Scientist, Protein Biochemistry Group Leader, Promega Corporation (2800 Woods Hollow Road, Madison, WI 53711). Used up to 1mCi ^{32}P labeled inorganic phosphate, ATP, CTP, and dATP, up to 1mCi ^3H CTP and ATP, up to 1mCi ^{35}S methionine at a time for development and quality control of molecular biology reagents. Trained personnel in the handling of radioisotopes; supervised record keeping, isotope disposal, and wipe testing for company. Passed radiation safety exam and attended seminar on use and handling of radioisotopes.

9/83-5/84: Postdoctoral Fellow, McArdle Laboratory for Cancer Research, University of Wisconsin, Madison, WI. Used up to 1mCi ^{125}I for labeling proteins.

7/77-8/83: Graduate student, McArdle Laboratory for Cancer Research, University of Wisconsin, Madison, WI. Used up to 1mCi ^3H CTP, dTTP, dexamethasone, and estradiol, up to 1mCi ^{32}P dCTP at a time for research in cell and molecular biology of steroid hormone action. Attended semester course on the use and handling of radioisotopes. Passed radiation safety exam.

9/75- 6/77: Research assistant, Department of Zoology, University of Iowa, Iowa City, Iowa. Used up to 1mCi of ^3H and ^{14}C amino acids for *in vivo* and *in vitro* protein synthesis studies. Passed radiation safety exam.

MAR 21 1997

Robert C. Mierendorf, Ph.D.
Vice President and General Manager
Novagen, Inc.
601 Science Drive
Madison, WI 53711

Dear Dr. Mierendorf:

Enclosed is Amendment No. 05 to your NRC Material License No. 48-26067-01 in accordance with your request.

Please review the enclosed document carefully and be sure that you understand all conditions. If there are any errors or questions, please notify the U.S. Nuclear Regulatory Commission, Region III office so that we can provide appropriate corrections and answers.

Sincerely,

Original Signed By
Patricia J. Pelke
Nuclear Materials Licensing Branch

License No. 48-26067-01
Docket No. 030-31338

Enclosure: Amendment No. 05

DOCUMENT NAME: M:\03031338.CL7

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NAME	PJPelke:brt								
DATE	03/ 11 /97								

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