DMC
Leading. Health. Care.
Detroit Medical Center

March 20, 2019

Anthony Tedeschi, MD
Chief Executive Officer

Detroit Market Office
3990 John R
Detroit, MI 48201-2018

UNITES STATES NUCLEAR REGULATORY COMMISSION
Region III, Materials Licensing Section
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Re: Amendment to License No. 21-04172-02

1. Please remove 10 CFR 35.500 from the license. All sources were removed from this location on 06/22/2016. Please find the enclosed low-level radioactive waste manifest for your review.

2. Please remove Phosphorus-32 from the license. All waste was decayed to background and was disposed on 02/21/2011.

Thank you for your cooperation with this matter. If you have any question please contact our physicist, Michelle Kritzman, at (734) 662-3197 or by email at mkritzman@mpcphysics.com

Sincerely,

Anthony Tedeschi, MD
Chief Executive Officer
Detroit Medical Center

RECEIVED APR 11 2019

NRC FORM 540 (8-2010)

U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code)
(865) 220-8529

ORGANIZATION
Bionomics, Inc.

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?
[X] YES
[ ] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST
1

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?
[X] YES
[ ] NO
If "Yes", provide Manifest Number >>>>

EPA MANIFEST NUMBER
914743662 JVK

5. SHIPPER - NAME AND FACILITY
VHS Harper-Hutzel Hospital
Nuclear Medicine, 3990 John R Street
Detroit, MI 48201

SHIPMENT ID NUMBER
0615/VHS9

USER FORMAT NUMBER

SHIPMENT NUMBER
0615/VHS9

COLLECTOR
PROCESSOR
X GENERATOR TYPE (Specify) M

CONTACT
Renee Hagerty

TELEPHONE NUMBER (Include Area Code)
(313) 745-2722

6. CARRIER - Name and Address

Truck #:

Trailer #:

Bionomics, Inc
1350 Bear Creek Road
Oak Ridge, TN 37830

EPA I.D. NUMBER
TND982115433

SHIPPING DATE
06/22/2016

CONTACT
John McCormick

TELEPHONE NUMBER (Include Area Code)
865-220-8501

SIGNATURE - Authorized carrier acknowledging waste receipt
John McCormick

DATE
6-22-16

7. FORM 540 AND 540A PAGE 1 OF 1 PAGE(S)
FORM 541 AND 541A 1 PAGE(S)
FORM 542 AND 542A NONE PAGE(S)
ADDITIONAL INFORMATION NONE PAGE(S)

8. MANIFEST NUMBER
(Use this number on all continuation pages)
0615/VHS9

9. CONSIGNEE - Name and Facility Address
Perma-Fix of Florida
Operated By Perma-Fix
1940 NW 67th Place
Gainesville, FL 32653

CONTACT
Raymond White

TELEPHONE NUMBER (Include Area Code)
(352) 373-6066

SIGNATURE - Authorized consignee acknowledging waste receipt

DATE

10. CERTIFICATION

This is to certify that the below-named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. This also certifies that the materials are classified, packaged, marked, and labeled and in proper condition for transportation and disposal in accordance with the requirements of 10 CFR Parts 20 and 61 or equivalent state regulations.

AUTHORIZED SIGNATURE
[signature]

TITLE
RSO

DATE
6/22/16

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (for hauling proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM		15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY MBq	mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
UN3321, WASTE RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), 7, (5 1) 1 - 5 GAL PLASTIC PAIL	NA	NA	SOLID/OXIDES	TH-232 ; U-238		1.500E-03	(4.054E-05)	LSA II	0.71 ft³ 10.00 lb	VHS-02 (16-001653)

FOR CONSIGNEE USE ONLY

20. Generator Certification Statement

A) Radioactive Materials. Certification: I hereby certify that the shipment of the listed radioactive waste has been prepared in accordance with the applicable waste management procedures which have been approved by the Nuclear Regulatory Commission or an Agreement State regulatory agency and that the current version of the NRC Manifest Instructions (NUREG/BR-0204) was used to complete this manifest.

B) Hazardous Materials. Certification: I hereby certify that the Index # 1 (line #1) does not contain a hazardous waste as defined in 40 CFR 261.

C) Data. Certification: I hereby certify that all data entered in the LOW-LEVEL RADIOACTIVE WASTE MANIFEST on this and any continuation sheet is complete and accurate to the best of my knowledge and belief. All applicable governmental laws, rules, regulations and conditions for packaging and transportation are complied with.

D) WITNESS'S SIGNATURE: Certification: I certify that this material does not exceed the activity limit for Type A quantities as defined in 49 CFR 173.435.

Richard W. Farrell — [signature] — 6/22/16
Print Name — Signature — Date

NRC Form 540 (8-2010)

Mailed Date: 06/22/2016 11:49

NRC FORM 541 (9-2010) — U.S. NUCLEAR REGULATORY COMMISSION

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

NUMBER OF PACKAGES/DISPOSAL CONTAINERS		NET WASTE VOLUME	NET WASTE WEIGHT	SPECIAL NUCLEAR MATERIAL (grams) U-233	U-235	Pu	TOTAL
1	m³	0.0230 kg	4.54	NP	NP	NP	NP
	ft³	0.7063 lb	10.00				

ACTIVITY (MBq/mCi) ALL UNITS IN (MBq/mCi)

	ALL NUCLIDES	TRITIUM	C-14	Tc-99	I-129		SOURCE
MBq	1.500E-03	NP	NP	NP	NP	kg	2.8692E-04
mCi	4.0541E-05	NP	NP	NP	NP	lb	6.3256E-04

2. MANIFEST NUMBER: 3516VH53

3. PAGE 1 OF 1 PAGE(S)

4. SHIPPER NAME: VHS Harper Hutzel Hospital

SHIPMENT ID NUMBER: 0516VH53

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. CONTAINER IDENTIFICATION NUMBER / TRANSPORT PERMIT NUMBER	6. CONTAINER DESCRIPTION (See Note 1)	7. VOLUME m³ / ft³	8. WASTE AND CONTAINER WEIGHT kg / lb	9. SURFACE RADIATION LEVEL mSv/hr / mrem/hr	10. SURFACE CONTAMINATION Bq/100 cm² / dpm/100 cm² ALPHA	BETA-GAMMA	11. WASTE DESCRIPTOR (See Note 2)	12. APPROXIMATE WASTE VOLUME(S) IN CONTAINER m³ / ft³	13. SOLIDIFICATION OR STABILIZATION MEDIA (See Note 3)	14. CHEMICAL FORM / CHELATING AGENT	WEIGHT % CHELATING AGENT IF > 0.1%	15. RADIOLOGICAL DESCRIPTION: RADIONUCLIDES	MBq	mCi	16. WASTE CLASSIFICATION AS - Class A Stable, AU - Class A Unstable, B - Class B, C - Class C
* - Irradiated Components															
19-002458 (VHS-53)	3	0.0200	4.54	< 0.005	< 0.000000334	< 0.0000167	29	0.0200	100	SOLID OXIDES / NP	NP	Th-232	1.5000E-03 [2.4503E-04 kg]	2.7027E-05	AU
		0.7063	10.00	< 0.5	< 20	< 1000		0.7063				U-238	5.0000E-04 [4.0318E-05 kg]	1.3514E-05	
Origin: MI VHS Harper-Hutzel Hospital Nuclear Medicine, 3990 John R Street Detroit, MI 48201												Sub Total	1.5000E-03 [2.8613E-04 kg]	4.0541E-05	
Package Total													1.5000E-03 [2.8692E-04 kg]	4.0541E-05	
Shipment Total		0.0200	4.54										1.5000E-03 [2.8692E-04 kg]	4.0541E-05	
		0.7063	10.00												

NOTE 1: Container Description Codes. For containers that are not ... the numerical code must be followed by "-CP."

[illegible]

NOTE 2: Waste Descriptor Codes (Choose up to three which predominate by volume.)

[illegible]

NOTE 3: Sorption, Solidification and Stabilization Media Codes. (Choose up to three which predominate by volume.)

[illegible]

 * - Indicates Cross Contamination

FORM 540 — Bionomics, Inc.

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

SHIPPING PAPER

1. EMERGENCY TELEPHONE NUMBER (Include Area Code)
(865) 220-8530

ORGANIZATION
Bionomics, Inc

2. IS THIS AN "EXCLUSIVE USE" SHIPMENT?
[ ] YES
[X] NO

3. TOTAL NUMBER OF PACKAGES IDENTIFIED ON THIS MANIFEST
2

4. DOES EPA REGULATED WASTE REQUIRING A MANIFEST ACCOMPANY THIS SHIPMENT?
[ ] YES
[X] NO
If "Yes", provide Manifest Number(s):

EPA MANIFEST NUMBER
NA

5. SHIPPER - NAME AND FACILITY
Bionomics, Inc. for VHS Harper-Hutzel Hospital
Nuclear Medicine, 3990 John R Street
Detroit, MI 48201

SHIPMENT ID NUMBER
0819/VHSA

COLLECTOR

PROCESSOR

USER PERMIT NUMBER

SHIPMENT NUMBER
0819/VHSA

X GENERATOR TYPE (Specify) M

CONTACT
Renee Hagarty

TELEPHONE NUMBER (Include Area Code)
(313) 745-3727

6. CARRIER - Name and Address
Bionomics, Inc
1550 Bear Creek Road
Oak Ridge, TN 37830

Truck #:

Trailer #:

EPA ID. NUMBER
TNDA82118433

SHIPPING DATE
06/22/2016

CONTACT
John McCormick

TELEPHONE NUMBER (Include Area Code)
865-220-8501

SIGNATURE - Authorized carrier acknowledging waste receipt — **DATE** 6-22-16

7. FORM 540 AND 540A — PAGE 1 OF 1 PAGE(S)
FORM 541 AND 541A — 1 PAGE(S)
FORM 542 AND 542A — NONE PAGE(S)
ADDITIONAL INFORMATION — NONE PAGE(S)

8. MANIFEST NUMBER
(Use this number on all continuation pages)
0819/VHSA

9. CONSIGNEE - Name and Facility Address
Bionomics, Inc
Operated By Bionomics, Inc
1550 Bear Creek Road
Oak Ridge, TN 37830

CONTACT
John McCormick

TELEPHONE NUMBER (Include Area Code)
(865) 220-8501

SIGNATURE - Authorized consignee acknowledging waste receipt

DATE

10. CERTIFICATION
This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation. I also certify that the materials are contained, packaged, marked, and labeled and in proper condition for transportation and disposal in accordance with the requirements of 10 CFR Parts 20 and 61 or equivalent state regulations.

AUTHORIZED SIGNATURE — **TITLE** Technician — **DATE** 6-22-16

11. U.S. DEPARTMENT OF TRANSPORTATION DESCRIPTION (Including proper shipping name, hazard class, UN ID number, and any additional information)	12. DOT LABEL "RADIOACTIVE"	13. TRANSPORT INDEX	14. PHYSICAL AND CHEMICAL FORM	15. INDIVIDUAL RADIONUCLIDES	16. TOTAL PACKAGE ACTIVITY MBq	16. TOTAL PACKAGE ACTIVITY mCi	17. LSA/SCO CLASS	18. TOTAL WEIGHT OR VOLUME (Use appropriate units)	19. IDENTIFICATION NUMBER OF PACKAGE
UN2915, RADIOACTIVE MATERIAL, TYPE A PACKAGE, 7 1 - 10 GAL METAL DRUM	Yellow II	1.0	SOLID OXIDES	BA-133 ; CO-57 ; CS-137 , EU-152 , GD-153 ; I-129 , NA-22	1.8503E+01	(4.4633E-01)	NA	1.36 ft³ 50.00 lb	VHS-01 (16-001937)
Non-Radioactive per DOT 1 - PLASTIC BOX	NA	NA	SOLID OXIDES	GD-153	1.3320E+00	(3.6000E-02)	NA	1.41 ft³ 62.00 lb	VHS-03 (16-001972)

FOR CONSIGNEE USE ONLY

___ Record Waste Description Inadequate
___ Contamination or Leakage Detected
___ Unexpected Exposure Rates Detected
___ Labels, Markings, etc. Inadequate
___ Container Integrity Inadequate
___ Other
___ No Violations Detected on this Shipment

21. TERMS AND CONDITIONS

A. HAZARDOUS MATERIALS. Generator represents it warrants that Waste Material ___ is [X] is not hazardous waste as defined in 40 CFR 261. Where the material is a hazardous waste, the shipment is also accompanied by a separate and completed Hazardous waste manifest, along with the appropriate land disposal of radioactive waste and/or stabilization as required by 40 CFR 268.

B. TITLE. Upon acceptance of the disposal site by Energy Solutions, Inc. and all appropriate regulatory authorities, title to the Waste Material which conforms to Generator's representations herein shall thereupon transfer from Generator and be vested in Energy Solutions, Inc.

C. WASTE MATERIAL. Generator represents and warrants that all data set forth in the LLW (LOW LEVEL RADIOACTIVE WASTE MANIFEST) are true and correct in all respects and in accordance with all applicable governmental laws, rules, and regulations and Commission of Utah, Inc.'s tariffs, if any.

D. INDEMNIFICATION. Generator agrees to indemnify Energy Solutions, Inc. its officers, employees, and agents against all losses and liability whatsoever of such losses or liability results from the failure of the Waste Material to conform in all material respects to the data supplied on the UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST on the shipment bill of lading and/or the applicable regulations of the Department of Transportation or any governmental agency having jurisdiction over such matters.

Form 540 (10-96)

Modified Date: 05/22/2015 11:43

FORM 541 — Bionomics, Inc.

UNIFORM LOW-LEVEL RADIOACTIVE WASTE MANIFEST

CONTAINER AND WASTE DESCRIPTION

Additional Nuclear Regulatory Commission (NRC) Requirements for Control, Transfer and Disposal of Radioactive Waste

1. MANIFEST TOTALS

Number of Packages/Disposal Containers	Net Waste Volume		Net Waste Weight	U-233	U-235	Pu	Total
2	m³	0.0785 kg	38.29	NP	NP	NP	NP
	ft³	2.7725 lbs	8.04				

Activity (in MBq/mCi as units indicated)

	All Nuclides	Tritium	C-14	Tc-99	I-129	Source
MBq	1.7845E+01	NP	NP	NP	1.1655E-02	NP
mCi	4.8230E-01	NP	NP	NP	3.1500E-04	NP

2. MANIFEST NUMBER: GEN/VGA

3. PAGE 1 OF 1 PAGE(S)

4. SHIPPER NAME: Bionomics Inc. for VHS Harper-Hutzel Hospital

SHIPMENT ID NUMBER: GEN/VGA

DISPOSAL CONTAINER DESCRIPTION / WASTE DESCRIPTION FOR EACH WASTE TYPE IN CONTAINER

5. Container Identification Number	6. Container Description (See Note 1 & 1A)	7. Volume m³ / ft³	8. Waste and Container Weight kg / lbs	9. Surface Radiation Level mSv/hr / mrem/hr	10. Surface Contamination MBq/100 cm² / dpm/100 cm² Alpha	Beta-Gamma	11. Waste Descriptor (See Note 2 & Note 2A)	12. Approximate Waste Volume(s) in Container m³ / ft³	13. Solidification or Stabilization Media (See Note 3)	14. Chemical Form or Chelating Agent	Weight % Chelating Agent if > 0.1%	15. Radionuclides	MBq	mCi	16. Waste Classification
15-001457 (VHS-01) Orgn. MI VHS Harper-Hutzel Hospital Nuclear Medicine, 3990 John R Street, Detroit, MI 48201	4	0.0385 / 1.3600	22.61 / 0.83 [illegible]	0.015 / 1.5	< 0.000000334 / < 20	< 0.0000167 / < 1000	H 28	0.0385 / 1.3600	100	SOLID OXIDES / NP	NP	BA-133	1.1[illegible]E+00	3.[illegible]E-02	AU
												CO-57	3.[illegible]E-03	[illegible]	
												CS-137	2.[illegible]E+00	7.[illegible]E-02	
												EU-152	[illegible]	[illegible]	
												GD-153	1.2472E+01	3.3[illegible]E-01	
												I-129	1.1655E-02	3.1500E-04	
												NA-22	[illegible]	[illegible]	
												Sub Total	1.[illegible]E+01	4.[illegible]E-01	
Package Total													1.[illegible]E+01	4.[illegible]E-01	
15-001522 (VHS-02) Orgn. MI VHS Harper-Hutzel Hospital Nuclear Medicine, 3990 John R Street, Detroit, MI 48201	19 Plastic Box	0.0400 / 1.4125	17.22 / 0.83 [illegible]	0.0012 / 0.012	< 0.000000334 / < 20	< 0.0000167 / < 1000	H 38	0.0400 / 1.4125	100	SOLID OXIDES / NP	NP	GD-153	1.3320E+00	3.6000E-02	AU
												Sub Total	1.3320E+00	3.6000E-02	
Package Total													1.3320E+00	3.6000E-02	
Shipment Total		0.0785 / 2.7725	39.80 [illegible] / 0.06 [illegible]										1.7845E+01	4.8230E-01	

* - Indicates Cross Contamination

NOTE 1: Container Description Codes [illegible]

NOTE 1A: Bulk Packaging Description Codes [illegible]

NOTE 2: Waste Descriptor Codes [illegible]

NOTE 2A: Specific Waste Descriptors [illegible]

NOTE 3: Solidification and Stabilization Media Codes [illegible]

Serial No.	Isotope	Activity	Date of Measurement	Calibration Activity	Model	Comments
M-032	129I	2.00E-07		2.00E-07	Rod	
Tube	129I	1.15E-07		1.15E-07	Micromedic	
F-092	129I				Rod	
2580383AS1	133Ba	2.62E-04	3/29/1983	2.98E-05	NES-358	
022582-027	133Ba	1.00E-07	2/25/1982	1.06E-08	NES-138A	
Unk	137Cs	1.74E-04	12/12/1974	6.72E-05	NES-356	
125	137Cs	1.00E-05	5/1/2010	8.72E-06	Button	
162068	137Cs	1.00E-06		1.00E-06	Rod	
658-194	137Cs	1.00E-06		1.00E-06	Rod	
053183-003	137Cs	9.90E-07	5/31/1983	4.65E-07	NES-139A	
	137Cs	1.12E-07	10/5/1976	4.51E-08	Rod	
92280	137Cs	1.04E-07	9/22/1980	4.59E-08	NES-139S	
184010	137Cs	1.00E-07	4/1/1966	3.16E-08	Rod	
184642	137Cs	1.00E-07	4/1/1971	3.55E-08	Rod	
Y-76	137Cs			1.00E-06	Rod	
Red	152Eu	5.00E-07		5.00E-07	Mallinckrodt	X2 sources.
923	153Gd	2.50E-01	3/7/2007	1.80E-05	NES8412	Line
924	153Gd	2.50E-01	3/7/2007	1.80E-05	NES8412	Line
77050A5	153Gd	2.00E-02	11/1/2004	1.23E-07	NES8426-28	Line
77050A6	153Gd	2.00E-02	11/1/2004	1.23E-07	NES8426-28	Line
77050A7	153Gd	2.00E-02	11/1/2004	1.23E-07	NES8426-28	Line
77050A8	153Gd	2.00E-02	11/1/2004	1.23E-07	NES8426-28	Line
77051B5	153Gd	2.00E-02	5/1/2004	7.25E-08	NES8426-28	Line
77051B6	153Gd	2.00E-02	5/1/2004	7.25E-08	NES8426-28	Line
77051B7	153Gd	2.00E-02	5/1/2004	7.25E-08	NES8426-28	Line
77051B8	153Gd	2.00E-02	5/1/2004	7.25E-08	NES8426-28	Line
77052C5	153Gd	2.00E-02	11/1/2003	4.29E-08	NES8426-28	Line
77052C6	153Gd	2.00E-02	11/1/2003	4.29E-08	NES8426-28	Line
77052C7	153Gd	2.00E-02	11/1/2003	4.29E-08	NES8426-28	Line
77052C8	153Gd	2.00E-02	11/1/2003	4.29E-08	NES8426-28	Line
77053D5	153Gd	2.00E-02	5/1/2003	2.53E-08	NES8426-28	Line
77053D6	153Gd	2.00E-02	5/1/2003	2.53E-08	NES8426-28	Line
77053D7	153Gd	2.00E-02	5/1/2003	2.53E-08	NES8426-28	Line
77053D8	153Gd	2.00E-02	5/1/2003	2.53E-08	NES8426-28	Line
77054[illegible]E5	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line
77054[illegible]E6	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line
77054[illegible]E7	153Gd	2.00E-02	11/1/2002	1.50E-08	NES8426-28	Line
77054[illegible]E8	153Gd	2.00E-02	11/1/2002	1.50E-08	NES8426-28	Line
77055F5	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line
77055F6	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line

77055F7	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line
77055F8	153Gd	2.00E-02	5/1/2002	8.86E-09	NES8426-28	Line
77056G5	153Gd	2.00E-02	11/1/2001	5.26E-09	NES8426-28	Line
77056G6	153Gd	2.00E-02	11/1/2001	5.26E-09	NES8426-28	Line
77056G7	153Gd	2.00E-02	11/1/2001	5.26E-09	NES8426-28	Line
77056G8	153Gd	2.00E-02	11/1/2001	5.26E-09	NES8426-28	Line
NEZ081	22Na	1.00E-04	4/28/1986	3.47E-08	Vial	
Nitrate - 8170	232Th				Mallinckrodt	56.7g
Thorotrast ThO2	232Th				Vial - Fellows	
Acetate - 8632	238U				Mallinckrodt	9.5g
C00226	238U				Nitrate - Bakers	100g
319-047-09	57Co	4.90E-03	8/12/1997	1.27E-10	NES-206	
1231-46-1	57Co	1.00E-04	6/1/2007	2.52E-08	Button	
1231-50-6	57Co	5.00E-05	6/1/2007	1.26E-08	Button	
~~[illegible]~~	~~57Co~~	~~5.00E-06~~	~~5/1/2011~~	~~4.93E-08~~	~~Button~~	
Yellow	57Co	5.00E-06	6/1/2009	8.21E-09	Button	
				0.000148		

Th232 = 0.0000062 mCi

U238 = 0.000035 mCi

Perma Fix Drum # VHS-02

Did Not Take

129I/Am241 (mock I-125) 0.072µCi no date Tube source.