RADIOLOGICAL CONTAMINATION SURVEY FORM

Facility: Section 12 Mine

Release Survey Performed By: Sam Paterniti

Date: 07/09/2021

Survey Description: Hoist House Drum 1

RWP: n/a

Instrument Make/Model:	Ludlum Model 19		Ludlum Model 2360 with Ludlum Model 43-93				Ludlum Model 2929 with Ludlum Model 43-10-1			
Instrument Serial No.:	144026		347133/PR399491				152268/PR156426			
Calibration Due Date:	12/16/2021		5/27/2022				7/1/2022			
Survey Background:	gamma (µR/hr):	30	alpha (cpm):	1	beta (cpm):	457	alpha (cpm):	1	beta (cpm):	66
Calibration Background: (1)	gamma (µR/hr):	NA	alpha (cpm):	10	beta (cpm):	289	alpha (cpm):	4	beta (cpm):	64
Calibration Source: (1)	Cs-137 (µCi)	NA	Th-230 (epm)	1481	Tc-99 (epm)	5002	Th-230 (epm)	2443	Tc-99 (epm)	5259
Total Efficiency: (2)	n/a		(cpm/epm)	0.10	(cpm/epm)	0.06	(cpm/epm)	0.16	(cpm/epm)	0.07

#	Description/Location	Exposure Rate		Total Alpha		Total Beta		Removable Alpha		Removable Beta	
		Gross Gamma (µR/hr)	Net Gamma (µR/hr)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)
1	Top Surface of Motor	35	5	29	290	438	0	7	38	71	70
2	Wire (Top of Spool)	32	2	12	114	519	988	5	25	71	70
3	Casing (Bottom of Interior)	32	2	14	135	471	223	5	25	61	0
4	Drum Shaft (Interior)	33	3	18	176	449	0	3	13	72	84
5	Wire (Bottom of Spool)	30	0	12	114	582	1991	3	13	60	0
6	Casing (Exterior, Top)	28	0	14	135	345	0	3	13	58	0
7											
8											
9											
10											

Comments: Survey backgrounds taken on site. For source information see function check forms.

Technician Signature/Date: Sam Paterniti 7/11/21

Reviewer Signature/Date: 7/12/21

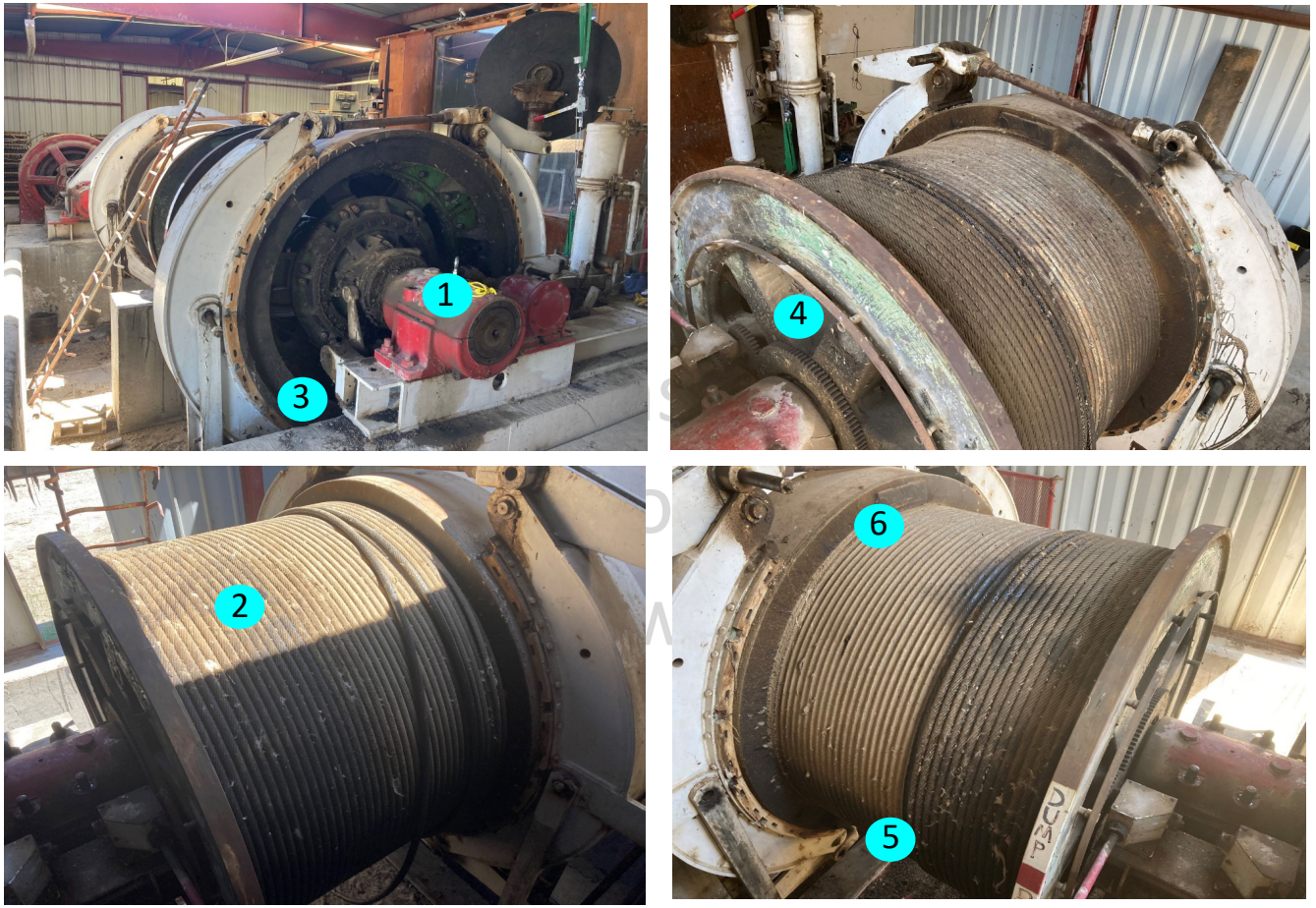
Notes:

(1) This data is taken from the respective instrument calibration sheet. Instrument efficiency does not change as long as equipment function checks indicate normal operation.

(2) The instrument total efficiency is calculated per NUREG 1575; Total Efficiency = Instrument Efficiency × Source Efficiency. There is no instrument efficiency calculated for the Ludlum Model 19.

EDF-5 RADIOLOGICAL CONTAMINATION SURVEY FORM (Supplement)

Facility: ___Drum 1 in Hoist House and Mechanical Shop_____ Date: _____07/09/2021____



RADIOLOGICAL CONTAMINATION SURVEY FORM

Facility: Section 12 Mine

Release Survey Performed By: Sam Paterniti

Date: 07/09/2021

Survey Description: Hoist House Drum 2

RWP:

Instrument Make/Model:	*Ludlum Model 19*		*Ludlum Model 2360 with Ludlum Model 43-93*				*Ludlum Model 2929 with Ludlum Model 43-10-1*			
Instrument Serial No.:	**144026**		**347133/PR399491**				**152268/PR156426**			
Calibration Due Date:	**12/16/2021**		**5/27/2022**				**7/1/2022**			
Survey Background:	*gamma (μR/hr):*	**30**	*alpha (cpm):*	**1**	*beta (cpm):*	**457**	*alpha (cpm):*	**1**	*beta (cpm):*	**66**
Calibration Background: (1)	*gamma (μR/hr):*	**NA**	*alpha (cpm):*	**10**	*beta (cpm):*	**289**	*alpha (cpm):*	**4**	*beta (cpm):*	**64**
Calibration Source: (1)	*Cs-137 (μCi)*	**NA**	*Th-230 (epm)*	**1481**	*Tc-99 (epm)*	**5002**	*Th-230 (epm)*	**2443**	*Tc-99 (epm)*	**5259**
Total Efficiency: (2)	*n/a*		(cpm/epm)	***0.10***	(cpm/epm)	***0.06***	(cpm/epm)	***0.16***	(cpm/epm)	***0.07***

#	Description/Location	Exposure Rate		Total Alpha		Total Beta		Removable Alpha		Removable Beta	
		Gross Gamma (μR/hr)	Net Gamma (μR/hr)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)
1	**Top Surface of Motor**	**20**	0	**18**	176	**463**	96	**3**	13	**65**	0
2	**Wire (Top of Spool)**	**24**	0	**18**	176	**386**	0	**7**	38	**69**	42
3	**Casing (Bottom of Interior)**	**24**	0	**13**	124	**570**	1800	**4**	19	**72**	84
4	**Drum Shaft (Interior)**	**24**	0	**28**	279	**438**	0	**6**	31	**70**	56
5	**Wire (Bottom of Spool)**	**22**	0	**8**	72	**405**	0	**2**	6	**55**	0
6	**Casing (Exterior, Top)**	**18**	0	**3**	21	**364**	0	**2**	6	**53**	0
7											
8											
9											
10											

Comments: Survey backgrounds taken on site. For source information see function check forms.

Technician Signature/Date: Sam Paterniti July 11, 2021

Reviewer Signature/Date: July 12, 2021

Notes:

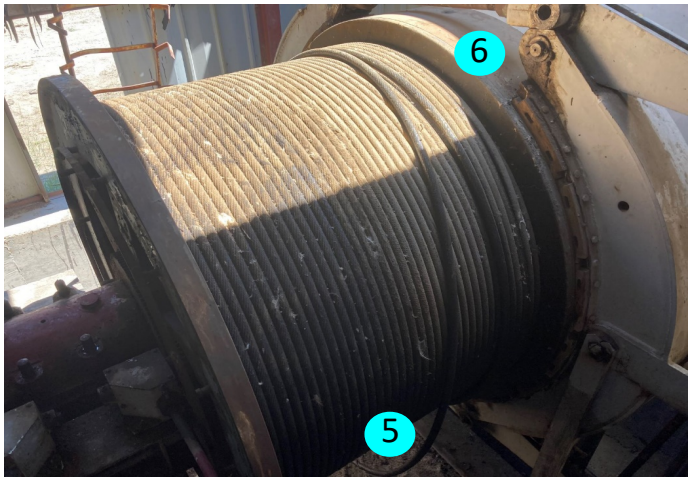
(1) This data is taken from the respective instrument calibration sheet. Instrument efficiency does not change as long as equipment function checks indicate normal operation.

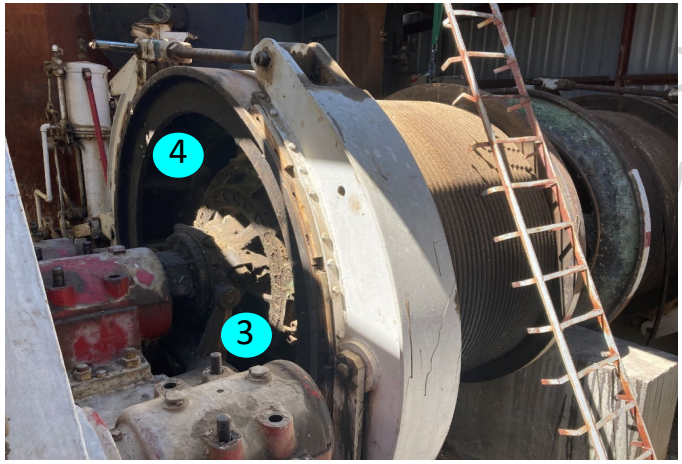
(2) The instrument total efficiency is calculated per NUREG 1575; Total Efficiency = Instrument Efficiency × Source Efficiency. There is no instrument efficiency calculated for the Ludlum Model 19.

EDF-5 RADIOLOGICAL CONTAMINATION SURVEY FORM (Supplement)

Facility: Drum 2 in Hoist House

Date: 07/09/2021





RADIOLOGICAL CONTAMINATION SURVEY FORM

Facility: Section 12 Mine

Release Survey Performed By: Sam Paterniti

Date: 07/09/2021

Survey Description: Bull Motor and Gear

RWP:

Instrument Make/Model:	Ludlum Model 19		Ludlum Model 2360 with Ludlum Model 43-93				Ludlum Model 2929 with Ludlum Model 43-10-1			
Instrument Serial No.:	144026		347133/PR399491				152268/PR156426			
Calibration Due Date:	12/16/2021		5/27/2022				7/1/2022			
Survey Background:	gamma (µR/hr):	30	alpha (cpm):	1	beta (cpm):	457	alpha (cpm):	1	beta (cpm):	66
Calibration Background: (1)	gamma (µR/hr):	NA	alpha (cpm):	10	beta (cpm):	289	alpha (cpm):	4	beta (cpm):	64
Calibration Source: (1)	Cs-137 (µCi)	NA	Th-230 (epm)	1481	Tc-99 (epm)	5002	Th-230 (epm)	2443	Tc-99 (epm)	5259
Total Efficiency: (2)	n/a		(cpm/epm)	0.10	(cpm/epm)	0.06	(cpm/epm)	0.16	(cpm/epm)	0.07

#	Description/Location	Exposure Rate		Total Alpha		Total Beta		Removable Alpha		Removable Beta	
		Gross Gamma (µR/hr)	Net Gamma (µR/hr)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Surface Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)	Gross (cpm)	Activity (dpm/100 cm²)
1	Exterior Gear	18	0	7	62	411	0	7	38	74	112
2	Casing (Top)	25	0	3	21	339	0	6	31	70	56
3	Interior Gear	25	0	9	83	582	1991	3	13	73	98
4	Steel Lower Support Arm	25	0	8	72	411	0	5	25	69	42
5	Motor Cap	28	0	6	52	445	0	3	13	65	0
6	Casing (Exterior, bottom)	28	0	11	104	323	0	4	19	89	321
7											
8											
9											
10											

Comments: Survey backgrounds taken on site. For source information see function check forms.

Technician Signature/Date: Sam Paterniti July 11, 2021

Reviewer Signature/Date: July 12, 2021

Notes:

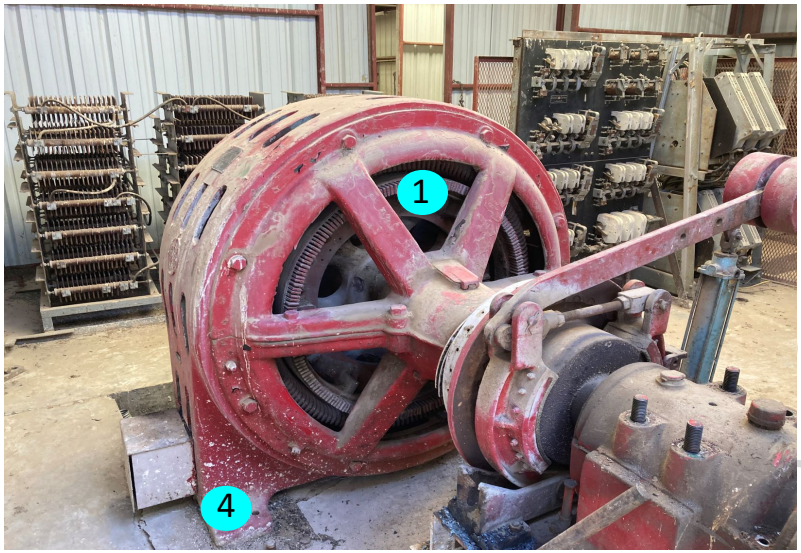
(1) This data is taken from the respective instrument calibration sheet. Instrument efficiency does not change as long as equipment function checks indicate normal operation.

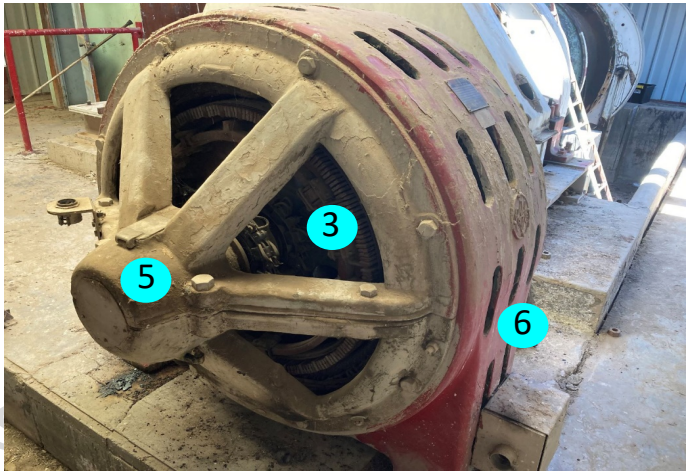
(2) The instrument total efficiency is calculated per NUREG 1575; Total Efficiency = Instrument Efficiency × Source Efficiency. There is no instrument efficiency calculated for the Ludlum Model 19.

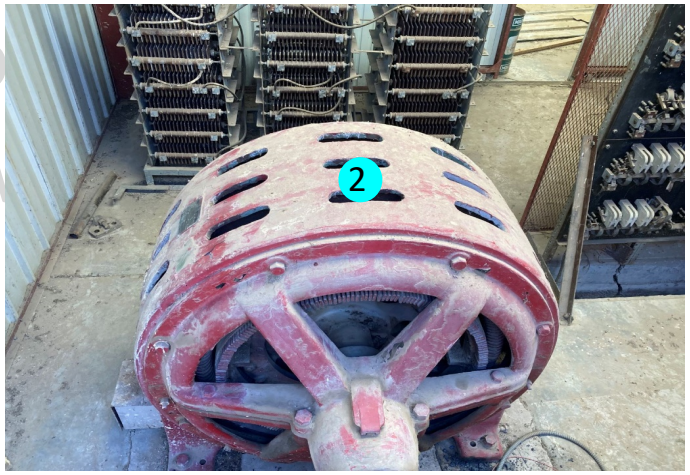
EDF-5 RADIOLOGICAL CONTAMINATION SURVEY FORM (Supplement)

Facility: Bull Drum in Hoist

Date: 07/09/2021

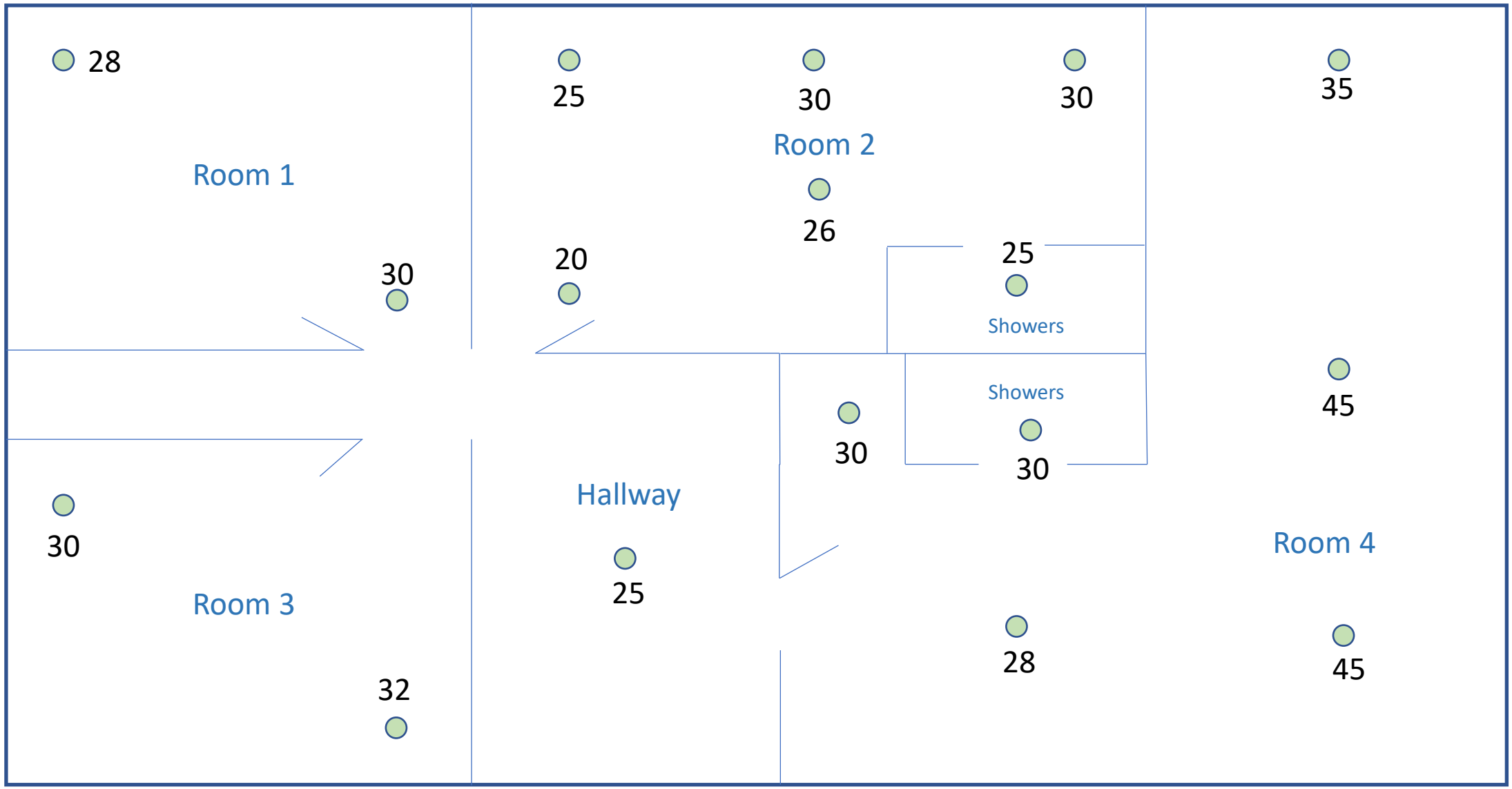






Administrative Building

All measurement are in micro roentgen per hour (µR/hr) collected with a Ludlum Model 19.



Administrative Building

Room 1

Room 2

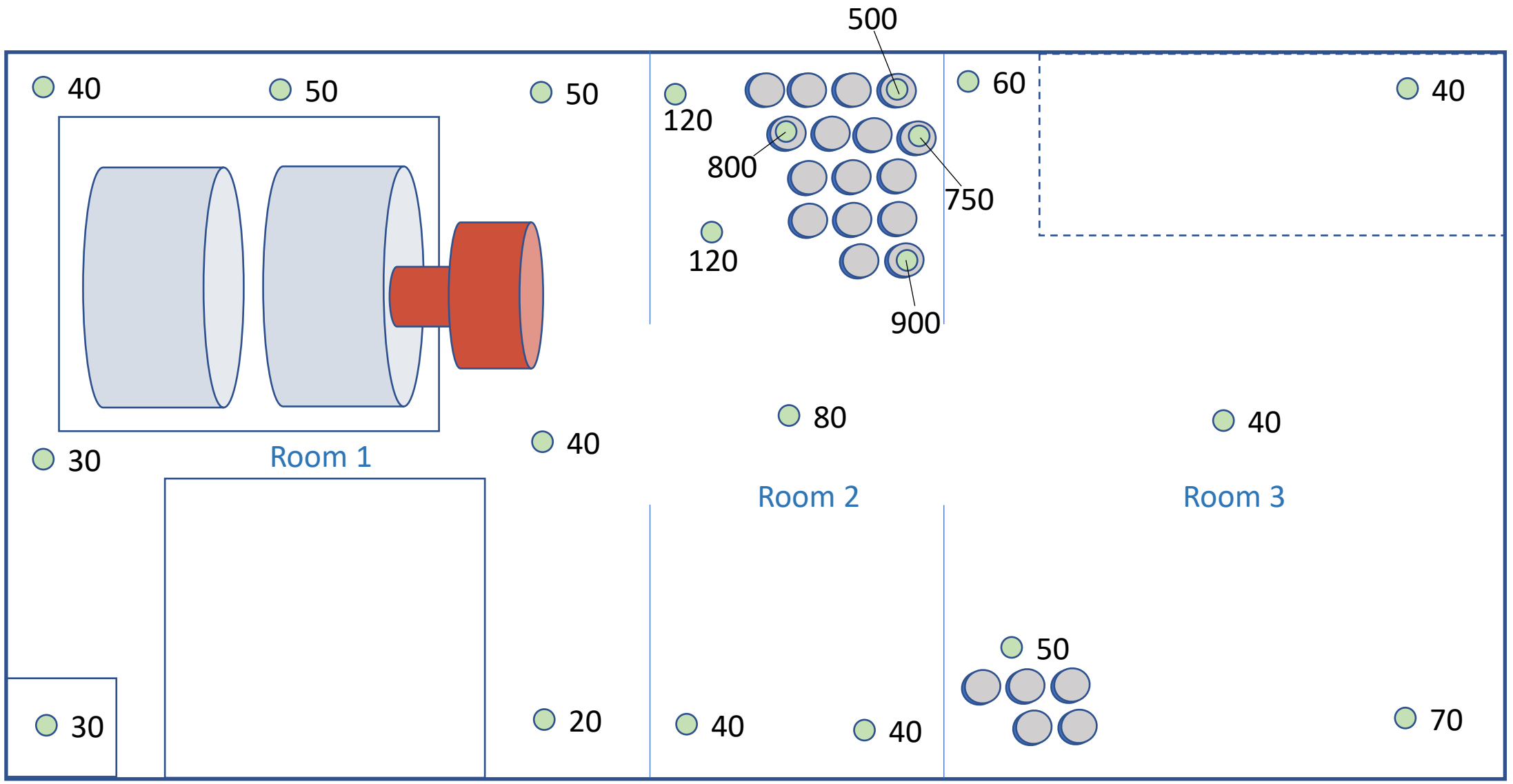
Room 3

Hallway

Room 4

Hoist House and Mechanical Shop

All measurement are in micro roentgen per hour (µR/hr) collected with a Ludlum Model 19.



Hoist House and Mechanical Building

Room 1 (Looking South)

Room 1 (Looking North)

Room 2 (Looking North)

Room 3 (Looking South)

Room 3 (Looking North)

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

Single-Channel Function Check Log

METER	
Manufacturer:	Ludlum
Model:	Model 19
Serial No.:	144026
Cal. Due Date:	16-Dec-21

DETECTOR	
Manufacturer:	
Model:	
Serial No.:	
Cal. Due Date:	

Comments:
Function checked at ERG/Sam P office.
Scaler Count Time: n/a
Distance To Source: ERG Cal jig, approx 5-in.

Source: Cs-137 Serial No.: 5309-04 Activity: Emission Rate: 5.7 uCi cpm/emissions Source Date: Jig 6, SP

NOTE: For use as needed. Acceptable upper/lower net counts, detector total effiiciecy, and detector MDA calculated on ERG Form ITC.201.B .

Acceptable Upper Net Counts:	NA
Acceptable Lower Net Counts:	NA

Total Efficiency (E_t):	NA
MDA (dpm/100-cm²):	NA

Date	Time	Battery	High Voltage	Threshhold	Source Counts	BKG Counts	Net Counts	Initials	Note(s):
7/09/21	0715	ok	NA	NA	400	12	388	SP	
7/09/21	1817	ok	NA	NA	400	12	388	SP	

Reviewed by: C. Fair Review Date: July 12, 2021

ERG Form ITC.201.A

Dual-Channel Function Check Log

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

METER	
Manufacturer:	2360 Ludlum
Model:	2360
Serial No.:	347133
Cal. Due Date:	27-May-22

DETECTOR	
Manufacturer:	Ludlum
Model:	43-93
Serial No.:	PR399491
Cal. Due Date:	27-May-22

Comments:	
Function checked at ERG/Sam P office.	
Scaler Count Time(s):	1-min.
Distance To Source:	Contact

Alpha Source: Th-230 Serial No.: 7132-10 Emission Rate: 7550 dpm / 3830 cpm cpm/emissions Source Date: 06/15/11

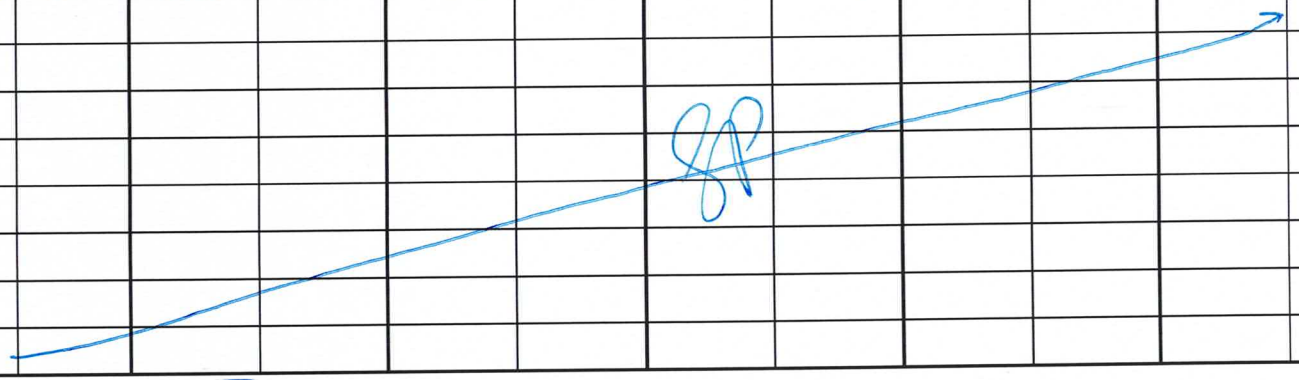
Beta Source: Tc-99 Serial No.: 93TC4700530 Emission Rate: 29000 dpm / 18100 cpm/emissions Source Date: 01/29/93

NOTE: For use as needed. Acceptable upper/lower net counts, detector total efficiecy, and detector MDA calculated on ERG Form ITC.202.B.

	α Alpha	β Beta
Total Efficiency (E_t):	0.10	0.06
MDA (dpm/100-cm²):		

	Alpha	Beta
Acceptable Upper Net Counts:	NA	NA
Acceptable Lower Net Counts:	NA	NA

Date	Time	Battery	High Voltage	Alpha Counts		Beta Counts		BKG Counts		Net Counts		Initials
				α Alpha	α Beta	β Alpha	β Beta	Alpha	Beta	α Alpha	β Beta	
7/9/21	0720	ok	625	1483	520	8	4930	7	320	1476	4610	SP
7/9/21	1022	ok	625	1434	503	6	5008	5	294	1429	4714	SP



Reviewed by: C. Fan

Review Date: July 12, 2021

ERG Form ITC.202.A

Dual-Channel Function Check Log

Environmental Restoration Group, Inc.
8809 Washington St. NE, Suite 150
Albuquerque, NM 87113
(505) 298-4224

METER	
Manufacturer:	Ludlum
Model:	2929
Serial No.:	152263
Cal. Due Date:	1-July-22

DETECTOR	
Manufacturer:	Ludlum
Model:	43-10-1
Serial No.:	PR 156426
Cal. Due Date:	1-July-22

Comments:	
Function checked at ERG/Sam P office.	
Scaler Count Time(s):	1-min
Distance To Source:	In-tray

Alpha Source: Th-230 Serial No.: 7132-10 Emission Rate: 7550 dpm / 3830 cpm cpm/emissions Source Date: 06/15/11

Beta Source: Tc-99 Serial No.: 93TC4700530 Emission Rate: 29000 dpm / 18,100 cpm/emissions Source Date: 01/28/93

NOTE: For use as needed. Acceptable upper/lower net counts, detector total efficiency, and detector MDA calculated on ERG Form ITC.202.B.

	α Alpha	β Beta
Total Efficiency (E_t):	0.16	0.07
MDA (dpm/100-cm²):		

	Alpha	Beta
Acceptable Upper Net Counts:		NA
Acceptable Lower Net Counts:		NA

Date	Time	Battery	High Voltage	Alpha Counts		Beta Counts		BKG Counts		Net Counts		Initials
				α Alpha	α Beta	β Alpha	β Beta	Alpha	Beta	α Alpha	β Beta	
7/9/21	0715	ok	950	2565	230	2	5230	5	61	2563 SP	5259	SP
7/9/21	1015	ok	950	2504	251	3	5168	2	67	2502	5101	SP

2560

Reviewed by: [signature]

Review Date: July 12, 2021

ERG Form ITC.202.A