Emission Unit ID: 366

300 EP-329-01-S

EP-329-01-S

This is a MINOR, ACTIVELY ventilated emission unit.

329 BUILDING

Emission Unit Information

Stack Height: 62.50 ft. 19.05 m. Stack Diameter 5.00 ft. 1.52 m.

Average Stack Effluent Temperature: 77 degrees Fahrenheit. 25 degrees Celsius.

Average Stack ExhaustVelocity: 40.00 ft/second. 12.19 m/second.

Abatement Technology ALARACT WAC 246-247-040(4)

state only enforceable: WAC 246-247-010(4), 040(5), 060(5)

Zone or Area	Abatement Technology	Required # of Units	Additional Description
	HEPA	2	In series, (System includes up to 5 banks of 2 stages of HEPA filters in series, minimum of 1 bank of 2 testable filters in use)
	Fan	2	2 in parallel, 1 Standby (3 total)

Monitoring Requirements

state enforceable: WAC 246-247-040(5), 060(5), and federally enforceable: 40 CFR 61 subpart H

Federal and State Regulatory	Monitoring and Testing Requirements	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	TOTAL ALPHA TOTAL BETA	2 week sample/year

Sampling Requirements Record Sample

Additional Requirements

Additional monitoring or sampling requirements established by this License will be listed in the Conditions and Limitations section, if applicable.

Operational Status Activities at the 329 Building support operations. This 62.5 foot tall stack exhausts filtered building air. Particulate emissions are sampled. The building contains laboratories for radioanalytical studies, environmental radionuclide studies, and radiation detection instrumentation development.

This Emission Unit has 1 active Notice(s) of Construction.

Project Title	Approval No	Date Approved	NOC_ID
Operation of Research Activities Conducted in the Chemical Sciences Laboratory (329 Building)	AIR 06-658	7/5/2006	701

Conditions (state only enforceable)

1) The total abated emission limit for this Notice of Construction is limited to 9.40E-03 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)).

2) This approval applies only to those activities described below. No additional activities or variations on the approved activities that constitute a "modification" to the emission unit, as defined in WAC 246-247-030(16), may be conducted.

Research activities conducted in the 329 Building support the Hanford environmental mission and other key DOE missions of national and international importance. Research activities are performed on both radioactive and non-radioactive samples. The following processes are allowed to be performed in the 329 Building:

- Development of special purpose radiation detection and sampling/analysis systems.
- Development of electronics and software to enhance radiation detector performance.
- Radiation detection equipment used for radioisotope quantification that may involve chemical separations.

- Solid, liquid, and gas sample (both radioactive and non-radioactive) analysis in specialized laboratories.
- Wet chemistry techniques and the operation of specialized analytical instrumentation such as mass spectrometers, organic mass spectrometers, and inductively coupled plasma spectrometers.
- Separations and analyses of radionuclides and samples containing radionuclides.
- Preparation of radioactive standards (solid, liquid, and gas).
- Characterizing chemical, radiochemical, and physical properties of samples (e.g., tank wastes, spent fuel, contaminated soils and water), as well as other gaseous materials, glass, ceramic, carbonaceous, or metallic waste forms.
- Performing research using high-level and low-level mixed tank wastes and their simulants to test radiochemical process systems such as leaching, solvent extraction, ion exchange, vitrification, fuel dissolution, decontamination, evaporation, grouting, solid waste packaging/shipment, and high-level liquid waste shipping/receiving/transportation.
- Performing research and development for processing and immobilization support including waste separation, ion exchange, sludge washing/leaching, ultra filtration, oxidation/precipitation, species separation, immobilization, and characterization.
- Using a full suite of analytical capabilities for radiochemical and inorganic chemical analyses in support of process development, specializing in the analysis of highly radioactive materials and very complex sample matrices.
- Developing methods for the separation of radioisotopes.
- Glove box work and storage of higher activity materials in shielded storage areas.
- Developing and testing radioisotope generators.
- Conducting Non-Destructive Analysis (NDA).
- Processes involving the creation of mixed activation products (MAP) and mixed fission products (MFP), separation, analysis and research.
- Developing thermal and vitrification processes to immobilize hazardous and radioactive materials into acceptable waste forms. Waste processing technology development includes design, process development, remote operations, and numerical and computational modeling.
- Providing chemical and physical separations in support of radiological and hazardous material processing and disposal requirements. These technologies include: removal and concentration of hazardous and/or radioactive components for environmental remediation; separation of hazardous and/or radioactive materials, including solid/liquid phase separations; and, recovery of specific components for recycle and reuse.
- Separations and analyses of radionuclides for environmental measurements.
- Sampling and analysis of environmental samples including soils, vegetation and water/liquids; decommissioning materials; and tank wastes.
- Performing research with supercritical fluids to understand chemistry mechanisms and processes.
- Lab setup projects involving fume hood removals/upgrades and ductwork tie-in.

3) The PTE for this project as determined under WAC 246-247-030(21)(a-e) [as specified in the application] is 4.34E-02 mrem/year. Approved are the associated potential release rates (Curies/year) of:

Alpha - 0	5.60E-06	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Alpha release rate based on Am-241.			
B/G - 0	9.20E-03	Liquid/Particulate Solid	WAC 246-247-030(21)(a)
Beta/Gamma release rate based on Sr-90 and Cs-137.			

The radioactive isotopes identified for this emission unit are (no quantities specified):

Ac - 225	Ac - 227	Ac - 228	Ag - 108 m	Ag - 108
Ag - 109 m	Ag - 110 m	Ag - 110	Ag - 111	Al - 26
Am - 241	Am - 242 m	Am - 242	Am - 243	Am - 245
Ar - 37	Ar - 39	Ar - 41	Ar - 42	As - 74
As - 76	At - 217	Au - 195	Au - 198	Ba - 131
Ba - 133	Ba - 133 m	Ba - 137 m	Ba - 139	Ba - 140
Ba - 141	Ba - 142	Be - 10	Be - 7	Bi - 207

Bi - 210	Bi - 211	Bi - 212	Bi - 213	Bi - 214
Bk - 249	Bk - 250	Br - 82	Br - 83	Br - 84
Br - 85	C - 11	C - 14	C - 15	Ca - 41
Ca - 45	Ca - 47	Cd - 109	Cd - 113 m	Cd - 113
Cd - 115 m	Cd - 115	Ce - 139	Ce - 141	Ce - 142
Ce - 143	Ce - 144	Cf - 249	Cf - 250	Cf - 251
Cf - 252	Cl - 36	Cm - 241	Cm - 242	Cm - 243
Cm - 244	Cm - 245	Cm - 246	Cm - 247	Cm - 248
Co - 56	Co - 57	Co - 58	Co - 60	Cr - 51
Cs - 131	Cs - 134	Cs - 134 m	Cs - 135	Cs - 136
Cs - 137	Cs - 138	Cs - 139	Cu - 64	Es - 254
Eu - 150	Eu - 152	Eu - 152 m	Eu - 154	Eu - 155
Eu - 156	Eu - 157	F - 18	Fe - 55	Fe - 59
Fr - 221	Fr - 223	Ga - 67	Ga - 72	Gd - 148
Gd - 149	Gd - 151	Gd - 152	Gd - 153	Ge - 68
H - 3	Hf - 175	Hf - 178	Hf - 178 m	Hf - 181
Hf - 182	Hg - 203	Ho - 166	Ho - 166 m	I - 122
I - 123	I - 125	I - 129	I - 130	I - 131
I - 132	I - 133	I - 134	I - 135	In - 106
In - 113 m	In - 114 m	In - 114	In - 115	In - 115 m
Ir - 192	K - 40	K - 42	Kr - 81	Kr - 83 m
Kr - 85	Kr - 85 m	Kr - 87	Kr - 88	Kr - 89
Kr - 90	La - 138	La - 140	La - 141	La - 142
Lu - 177	Mn - 52	Mn - 54	Mn - 56	Mo - 93
Mo - 99	N - 13	Na - 22	Na - 24	Nb - 91
Nb - 91 m	Nb - 92	Nb - 93 m	Nb - 94	Nb - 95
Nb - 95 m	Nb - 97	Nb - 97 m	Nd - 144	Nd - 147
Ni - 56	Ni - 59	Ni - 63	Ni - 65	Np - 235
Np - 236	Np - 237	Np - 238	Np - 239	Np - 240
Np - 240 m	O - 15	P - 32	P - 33	Pa - 231
Pa - 233	Pa - 234	Pa - 234 m	Pb - 209	Pb - 210
Pb - 211	Pb - 212	Pb - 214	Pd - 107	Pd - 109
Pm - 145	Pm - 146	Pm - 147	Pm - 148 m	Pm - 148
Pm - 149	Pm - 151	Po - 208	Po - 209	Po - 210
Po - 211	Po - 212	Po - 213	Po - 214	Po - 215
Po - 216	Po - 218	Pr - 143	Pr - 144	Pr - 144 m
Pu - 234	Pu - 236	Pu - 237	Pu - 238	Pu - 239
Pu - 240	Pu - 241	Pu - 242	Pu - 243	Pu - 244
Ra - 223	Ra - 224	Ra - 225	Ra - 226	Ra - 228
Rb - 86	Rb - 87	Rb - 88	Rb - 89	Rb - 90
Rb - 90 m	Re - 186	Re - 187	Re - 188	Rh - 102
Rh - 103 m	Rh - 105	Rh - 105 m	Rh - 106	Rn - 219
Rn - 220	Rn - 222	Ru - 103	Ru - 105	Ru - 106
Ru - 97	S - 35	Sb - 124	Sb - 125	Sb - 126
Sb - 126 m	Sb - 127	Sc - 46	Sc - 47	Se - 75
Se - 79	Sm - 145	Sm - 146	Sm - 147	Sm - 151
Sm - 153	Sm - 157	Sn - 113	Sn - 119 m	Sn - 121 m
Sn - 123	Sn - 125	Sn - 126	Sr - 85	Sr - 89
Sr - 90	Sr - 91	Sr - 92	Ta - 179	Ta - 182

Ta - 183	Tb - 160	Tc - 101	Tc - 95 m	Tc - 97
Tc - 97 m	Tc - 98	Tc - 99	Tc - 99 m	Te - 121 m
Te - 121	Te - 123	Te - 123 m	Te - 125 m	Te - 127 m
Te - 127	Te - 129 m	Te - 129	Te - 131	Te - 131 m
Te - 132	Te - 133	Te - 133 m	Te - 134	Th - 227
Th - 228	Th - 229	Th - 230	Th - 231	Th - 232
Th - 233	Th - 234	Ti - 44	Tl - 204	Tl - 207
Tl - 208	Tl - 209	Tm - 170	Tm - 171	U - 232
U - 233	U - 234	U - 235	U - 236	U - 237
U - 238	U - 239	U - 240	V - 48	V - 49
W - 181	W - 185	W - 187	W - 188	Xe - 122
Xe - 123	Xe - 125	Xe - 127	Xe - 131 m	Xe - 133
Xe - 133 m	Xe - 135	Xe - 135 m	Xe - 137	Xe - 138
Y - 88	Y - 90	Y - 90 m	Y - 91	Y - 91 m
Y - 92	Y - 93	Yb - 164	Yb - 175	Yb - 177
Zn - 65	Zn - 69	Zn - 69 m	Zr - 88	Zr - 89
Zr - 93	Zr - 95			

The potential release rates described in this Condition were used to determine control technologies and monitoring requirements for this approval. DOE must notifiy the Department of a "modification" to the emission unit, as defined in WAC 246-247-030(16). DOE must notify the Department of any changes to a NESHAP major emission unit when a specific isotope is newly identified as contributing greater than 10% of the potential TEDE to the MEI, or greater than 25% of the TEDE to the MEI after controls. (WAC 246-247-110(9)) DOE must notify the Department of any changes to potential release rates as required by state or federal regulations including changes that would constitute a significant modification to the Air Operating Permit under WAC 173-401-725(4). Notice will be provided according to the particular regulation under which notification is required. If the applicable regulation(s) does not address manner and type of notification, DOE will provide the Department with advance written notice by letter or electronic mail but not solely by copies of documents.

4) The emission unit monitoring system shall have the following activities performed:

a. A functional/calibration check of monitoring system instrumentation shall be performed annually.