



STATE OF WASHINGTON
DEPARTMENT OF HEALTH

OFFICE OF RADIATION PROTECTION
309 Bradley Blvd., Suite 201 • Richland, Washington 99352
TDD Relay Service: 1-800-833-6388

**AIR 17-601
NOC 1259**

June 5, 2017

Mr. Kevin W. Smith, Manager
United States Department of Energy
Office of River Protection
P.O. Box 450, MSIN: H6-60
Richland, Washington 99352

Re: Final Approval of Notice of Construction (NOC) 1259 for the 242-A Evaporator,
Emission Unit (EU) 296-A-22 (EU 142)

Mr. Smith:

Pursuant to Chapter 246-247 of the Washington Administrative Code (WAC), your revision is hereby approved, with an effective date of May 30, 2017, according to the enclosed EU specific license for:

**296-A-22 Operation, 242-A Evaporator (Replaces NOC 824)
(EU 142, NOC 1259)**

The conditions, controls, monitoring requirements, and limitations of this license must be observed in order for you to be in compliance with WAC 246-247. Failure to meet any provision of this license may result in the revocation of approval, the issuance of Notices of Violation, or other enforcement actions under WAC 246-247-100.

If you have any questions regarding this approval, please contact Ernest McCormick at ernest.mccormick@doh.wa.gov or, by phone, at (509) 946-0624.

Sincerely,

John Martell, Manager
Radioactive Air Emissions Section

Enclosure: Conditions and Limitations for EU 142 (NOC 1259)

cc: (see next page)



Mr. Kevin W. Smith

June 5, 2017

Page 2 of 2

AIR 17-601

cc: Ruth Allen, WRPS
Matthew Barnett, PNNL
Lilyann Bauder, Ecology
Shawna Berven, WDOH
Lucinda Borneman, WRPS
Lee Bostic, BNI
Dennis Bowser, USDOE-ORP
Frank Carleo, CHPRC
Cliff Clark, USDOE-RL
Jack Donnelly, WRPS
Dennis Faulk, EPA
Eric Faust, USDOE-RL
Gary Fritz, MSA
Philip Gent, Ecology
Robert Haggard, BNI
Daniel Heuston, Ecology
Jessica Joyner, WRPS
Reed Kaldor, MSA
Paul Karschnia, CHPRC
Jim McAuley, EPA
Ernest McCormick, WDOH
Bryan Trimberger, USDOE-ORP
Randy Utley, WDOH
Jeff Voogd, WRPS
Environmental Portal
RAES Tracking: Line 17-75; EU 142; NOC 1259

Emission Unit ID: 142

200E P-242A-002

296-A-22

This is a MINOR, ACTIVELY ventilated emission unit.

242-A Evaporator

Emission Unit Information

Stack Height: 111.45 ft. 33.97 m. Stack Diameter 0.48 ft. 0.15 m.

Average Stack Effluent Temperature: 120 degrees Fahrenheit. 49 degrees Celsius.

Average Stack Exhaust Velocity: 48.00 ft/second. 14.63 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
	Heater	1	
	HEPA	2	In series
	Fan	1	Fan operates during 242-A processing.
	Prefilter	1	
	Deentrainer	1	

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)	During campaigns: 40 CFR 60, Appendix A, Method 2; 40 CFR 61, Appendix B, Method 114; During non-campaigns: 40 CFR 61, Appendix B, Method 114(3).	Campaign: TOTAL ALPHA, TOTAL BETA, 137Cs, 90Sr, 239Pu, 238Pu, and 241Am. Non-Campaign: Total Alpha, Total Beta.	One week sample per quarter, and continuous sampling during campaign.

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 This emission unit is a Vessel Vent exhauster that is used to ventilate the process equipment including the evaporator vessel, C-100 tank and associated piping. The emission unit is a building/facility exhauster ventilation system that operates intermittently.

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

Project Title	Approval #	Date Approved	NOC_ID
296-A-22 Operation, 242-A Evaporator (Replaces NOC 824)	AIR 17-601	5/30/2017	1259

Conditions (state only enforceable: WAC 246-247-040(5), 060(5) if not specified)

- 1) The total abated emission limit for this Notice of Construction is limited to 5.00E-07 mrem/year to the Maximally Exposed Individual (WAC 246-247-040(5)). The total limit on the Potential-To-Emit for this Notice of Construction is limited to 1.00E-03 mrem/year to the Maximally Exposed Individual (WAC 246-247-030(21)).
- 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.

The 242-A Evaporator facility is used to reduce the volume of waste solutions that do not self-boil, and thus reduce the number of underground double-shell tanks required for waste storage. The 242-A Evaporator employs

a conventional forced-circulation, vacuum evaporation system to concentrate radioactive waste solutions. Principal process components of the evaporator system are located in the 242-A Building. They include the reboiler, vapor-liquid separator, recirculation pump and pipe loop, slurry product pump, condensers, and vessel ventilation system.

The evaporator system receives a mixed blend feed from the feed tank. The feed consists of unprocessed and processed waste and recycled liquid that are removed from storage tanks after solids have settled. The feed is pumped into the recirculation line and blended with the main product slurry stream, which flows to the reboiler via the recirculation pump. The mixture is heated in the reboiler. The vapor liquid separator is maintained at a reduced pressure. Under this reduced pressure, a fraction of the water in the heated slurry flashes to steam and is drawn through two wire mesh deentrainer pads into a vapor line that leads to the primary condenser. As evaporation takes place in the separator vessel, the slurry becomes concentrated. When the process solution has been concentrated to the parameters specified by the campaigns process memo, a fraction is withdrawn from the upper recirculation line, upstream of the feed addition point, and is either gravity drained or pumped by the slurry pump to underground storage tanks.

Vapors removed from the vapor-liquid separator via the vapor line are condensed and routed to the condensate collection tank. The process condensate is discharged to the Liquid Effluent Retention Facility (LERF). Steam condensate is continuously monitored for excessive radiation, pH, and conductivity, and then discharged from the building to the 200 Area Treated Effluent Disposal Facility (TEDF). Upon detection of radioactive contamination, the radiation monitor will automatically divert the steam condensate stream to the feed tank. Cooling water from the condensers, which is also continuously monitored for excessive radiation, pH, and conductivity, is also discharged to the 200 Area TEDF. This used cooling water stream cannot be diverted, thus, if contamination is detected, an evaporator shutdown is required. Non-condensable vapors from the evaporator are filtered and discharged to the atmosphere via the vessel vent system. This system consists of a deentrainment pad, prefilter, heater, high-efficiency filter assembly, and vessel vent exhauster.

3) **The Annual Possession Quantity is limited to the following radionuclides (Curies/year):**

Am - 241	3.50E+04	C - 14	1.80E+05	Cm - 244	4.50E+02
Co - 60	4.20E+04	Cs - 134	5.20E+05	Cs - 137	5.20E+07
Eu - 154	1.70E+05	Eu - 155	2.40E+05	I - 129	9.10E+01
Nb - 94	3.40E+03	Pu - 238	4.50E+01	Pu - 239/240	5.60E+03
Pu - 241	5.20E+05	Ra - 226	1.10E+03	Ru - 106	1.80E+06
Se - 79	2.70E+03	Sr - 90	7.70E+06	Tc - 99	7.00E+04