

**242-A EVAPORATOR  
CHAPTER 11.0  
CLOSURE  
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

| <b>Modification Date</b> | <b>Modification Number</b> |
|--------------------------|----------------------------|
| 09/30/2013               |                            |
|                          |                            |

This page intentionally left blank.

1  
2  
3  
4  
5

**CHAPTER 11.0**  
**CLOSURE**

1  
2  
3  
4  
5

This page intentionally left blank.

**CHAPTER 11.0**  
**CLOSURE**

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23

**TABLE OF CONTENTS**

11.0 CLOSURE..... 5

11.1 Closure Plan ..... 5

11.2 Closure Performance Standard..... 5

11.2.1 Closure Standards for Metal Surfaces, and Concrete..... 5

11.2.2 Closure Standards for Tanks ..... 6

11.2.3 Closure Standards for Internal and/or External Piping..... 6

11.2.4 Closure Standards for Ancillary Equipment ..... 6

11.2.5 Closure Standards for Underlying Soils..... 6

11.3 Closure Activities..... 6

11.3.1 General Closure Activities ..... 7

11.3.2 Constituents of Concern for Closure for 242-A Evaporator ..... 7

11.3.3 Removing Dangerous Waste ..... 7

11.3.4 Decontaminating Structures, Equipment, and Soils..... 7

11.4 Maximum Waste Inventory..... 10

11.5 Closure of Tanks ..... 10

11.6 Schedule for Closure ..... 10

1  
2  
3  
4  
5

This page intentionally left blank.

1 **11.0 CLOSURE**

2 This chapter describes the planned activities and performance standards for closing the 242-A Evaporator.  
3 Final closure will begin when the 242-A Evaporator is no longer needed.

4 **11.1 Closure Plan**

5 The 242-A Evaporator will be clean closed with respect to dangerous waste contamination that resulted  
6 from operation as a Treatment, Storage, and Disposal (TSD) unit. To facilitate closure, the  
7 242-A Evaporator is being viewed as consisting of six components: tanks, ancillary equipment, piping,  
8 concrete floors/liners, structures, and underlying soil. Only areas that have treated, stored, or handled  
9 dangerous waste will undergo closure activities. Remedial actions with respect to contamination that was  
10 not a result of use of these areas for treatment, storage, or handling of dangerous waste are outside the  
11 scope of this closure plan.

12 Contaminated equipment, tanks, and piping removed from the 242-A Evaporator will be considered  
13 "debris" and transported to an appropriate permitted treatment, storage, or disposal unit for final  
14 disposition. Uncontaminated structures will be left for future use or disassembled, dismantled, and  
15 removed for disposal. Uncontaminated equipment and structures could include aqueous makeup, HVAC  
16 and piping, steam condensate and cooling water piping, the control room, change rooms and  
17 administrative/office areas.

18 The pipes located west and north of the 242-A Evaporator, which connect to A Farm and AW Farm, are  
19 in the same bundles with pipes used for transfers between tanks in the Double-Shell Tank (DST) System.  
20 To minimize radiation exposure during closure, these pipes will be closed at the same time the piping for  
21 the DST System is closed. Clean closure requires decontamination or removal and disposal of all  
22 dangerous waste, waste residues, contaminated equipment, soil, or other material established in  
23 accordance with the clean closure performance standards of WAC 173-303-610(2). This and future  
24 closure plan revisions will provide for compliance with these performance standards. All work will be  
25 performed as low as reasonably achievable (ALARA) with respect to worker exposure to dangerous  
26 and/or any other workplace hazards. Activities that are planned to achieve clean closure are presented in  
27 the following sections.

28 **11.2 Closure Performance Standard**

29 Clean closure, as provided for in this plan, and in accordance with WAC 173-303-610(2), will eliminate  
30 future maintenance and will be protective of human health and the environment.

31 After closure, the appearance of the land where the 242-A Evaporator is located will be consistent with  
32 the appearance and future use of the surrounding land areas. This closure plan proposes to leave clean  
33 structures and equipment in place after closure for potential future operations. This need will be  
34 evaluated at the time of closure.

35 **11.2.1 Closure Standards for Metal Surfaces, and Concrete**

36 This closure plan proposes use of a 'clean debris surface' (defined in the following paragraph) as the clean  
37 closure performance standard for the metal surfaces, and concrete that will remain after closure. This  
38 approach is consistent with Ecology guidance (Ecology 1994) for achievement of clean closure.

39 Attainment of a clean debris surface can be verified visually in accordance with the standard that states,  
40 "A clean debris surface means the surface, when viewed without magnification, shall be free of all visible  
41 contaminated soil and hazardous waste except residual staining from soil and waste consisting of light  
42 shadows, slight streaks, or minor discolorations and soil and waste in cracks, crevices, and pits may be  
43 present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no  
44 more than 5% of each square inch of surface area" (40 CFR 268.45).

1 Decontamination of concrete, per the 'debris rule' is based on a physical extraction method  
2 (40 CFR 268.45, Table 1). The performance standard is based on removal of the contaminated layer of  
3 debris. The physical extraction performance standard for concrete is removal of 0.6 centimeter of the  
4 surface layer and treatment to a clean debris surface.

### 5 **11.2.2 Closure Standards for Tanks**

6 Using the 242-A Evaporator's decontamination system, the tank system could be flushed and  
7 decontaminated. The rinsate will be sampled and analyzed. Results of the analysis with less than  
8 designation limits for the constituents of concern will be accepted as indicating that the tanks are clean  
9 with respects to dangerous waste residues. An alternative to decontaminating the tanks is to remove and  
10 dispose of the tanks accordingly.

### 11 **11.2.3 Closure Standards for Internal and/or External Piping**

12 The internal and/or external piping of 242-A Evaporator will be flushed and drained as part of closure.  
13 For piping where the contaminated surfaces can be inspected, an inspection will be performed to see if the  
14 piping meets the clean debris surface standard in 40 CFR 268.45 incorporated by reference and can be  
15 declared non-dangerous in accordance with WAC 173-303-071(3)(qq). If it is not possible to inspect the  
16 contaminated surfaces or meet the clean debris surface performance standard, the particular piping of  
17 concern will be removed, designated, and disposed of accordingly.

18 The feed sampler (SAMP-F-1) located in a sample enclosure in the Hot Equipment Storage room has  
19 been isolated and blanked and will be closed during closure of the 242-A Evaporator. The feed sampler  
20 line was designed so that the piping does not contain any level/flat segments and thus facilitates active  
21 gravity drainage of liquids. The remaining portion of the feed sampler line that exists between Nozzles J  
22 and K is sloped 1° from Nozzle J to a 180° bend and sloped 1° from the 180° bend to Nozzle K.

23 Dangerous and/or mixed-waste materials generated during closure activities will be managed in  
24 accordance with WAC 173-303-610(5). Removal of any dangerous wastes or dangerous constituents  
25 during partial or final closure will be handled in accordance with applicable requirements of  
26 WAC 173-303-610(5).

### 27 **11.2.4 Closure Standards for Ancillary Equipment**

28 Ancillary equipment is defined as pumps and other miscellaneous equipment not otherwise specified in  
29 this closure plan. Ancillary equipment will be removed and disposed.

### 30 **11.2.5 Closure Standards for Underlying Soils**

31 Clean closure of soil under the 242-A Evaporator will be accomplished by determining that the coated  
32 concrete floor and stainless steel liners, kept contaminants from reaching the soil. The coated concrete  
33 and liners provided secondary containment for all the tanks, process piping, and ancillary equipment  
34 within the building. Unless inspections identify potential through-thickness cracks indicating  
35 containment failure and a subsequent potential for soil contamination from TSD unit operations, the soil  
36 will be considered clean closed. However, if inspections identify such cracks, and there have been  
37 documented spills in the vicinity, potential soil contamination will be investigated. Soils will be sampled  
38 and analyzed for constituents of concerns. If the soil analytical results determine that, the constituents of  
39 concern are at or below agreed to regulatory cleanup levels, the soil will be considered clean closed.  
40 Permit Condition II.K defines regulatory cleanup levels. Sampling and disposal objectives will be  
41 determined at the time of closure activities through the data quality objectives process. If verification  
42 sampling is required, a sampling analysis plan will be prepared before closure in a manner consistent with  
43 Ecology guidance (Ecology publication #94-111 dated 2005) for achievement of clean closure.

### 44 **11.3 Closure Activities**

45 At the time of closure, the closure plan will be modified as necessary to reflect current regulations and  
46 information. If it is determined that clean closure is not possible, the closure plan will be modified to  
47 address required postclosure activities.



### 11.3.1 General Closure Activities

Closure of the 242-A Evaporator will include removal of accumulated liquid waste (i.e., liquid remaining from evaporator campaigns) by transferring the waste to the DST System and/or Liquid Effluent Retention Facility (LERF). After the waste has been removed, clean closure of the tanks, process equipment, the piping, concrete/liners, and the structures will be accomplished by decontaminating the components, if required and demonstrating that clean closure performance standards are met in accordance with WAC 173-303-610. Clean closure of the soil will be accomplished by demonstrating that the concrete and liners kept the contaminants from reaching the soil. If it is determined that soil contamination is possible, investigation and cleanup of the soils will also be managed in accordance with WAC 173-303-610(2)(b).

Equipment or materials (personnel protective equipment, steam cleaners, etc.) used in performing closure activities will be decontaminated or disposed at a permitted TSD facility as appropriate.

### 11.3.2 Constituents of Concern for Closure for 242-A Evaporator

Based on process knowledge and the risk to human health and the environment, the constituents of concern for closure will be selected from the list of dangerous waste numbers in Chapter 1.0 through the data quality objective process.

### 11.3.3 Removing Dangerous Waste

All of the waste inventory at the 242-A Evaporator will be processed before closure. Any residue remaining in piping and equipment will be removed to an appropriate TSD unit.

### 11.3.4 Decontaminating Structures, Equipment, and Soils

Before closure activities begin, all waste inventories will be removed. To facilitate closure, tanks, internal and/or external piping, ancillary equipment, concrete floors/liners, structures, and soil directly beneath the structure will be decontaminated, as necessary, to demonstrate that the clean closure performance standards are met.

Removal and disposal of most of the components will be determined at the time of closure. Clean closure of the soil will be accomplished by demonstrating that the concrete/liners kept contaminants from reaching the soil.

#### 11.3.4.1 Tanks

In accordance with WAC 173-303-640(8) at closure all pumpable waste will be removed from the interior of the tanks, including the internal components such as the process condensate agitator. Both interior and exterior tanks surfaces will be decontaminated by flushing or spraying with steam, a water-soluble cleaner, or other approved method, or removed as debris and disposed appropriately.

If the tanks are decontaminated, the tanks will be inspected visually for compliance with the clean debris surface standard (40 CFR 268.45, Table 1, Extraction Technologies). If any areas are found not to meet the clean debris surface performance standard, these areas will be decontaminated in-place. Per the debris rule, only removal of contaminants from the surface layer is necessary for metal surfaces. Contamination will be removed as specified in 40 CFR 268.45, Table 1, Extraction Technologies and/or other Ecology approved methods.

If the decontamination option is used, the outside of the tanks also will be inspected for compliance to the clean debris surface standard. Any areas found not to meet this performance standard will be decontaminated in-place. Contamination will be removed from the surface layer using any of the methods described for internal tank decontamination as specified in *Alternate Treatment Standards for Hazardous Debris* (40 CFR 268.45, Table 1, Extraction Technologies and/or other Ecology approved methods).. Before using decontamination solutions on the outside of the tanks, the floor will be inspected for cracks or other openings that could provide a pathway to soil.

1 This inspection will be performed as described in Section 11.2.1 of this chapter in conjunction with  
2 mapping of potential through-thickness cracks. Any such cracks will be mapped. The cracks will be  
3 sealed before beginning treatment or other engineered containment devices (e.g., collection basins) will  
4 be used to collect and contain solutions.

5 Decontamination waste will be generated as a result of decontamination activities. Decontamination  
6 waste may include but not be limited to the following: contaminated rags, and decontamination residue  
7 (liquids and solvents used in the decontamination process). This waste will be collected, designated, and  
8 managed in accordance with WAC 173-303. If it is not possible to meet the closure by removal or  
9 decontamination (clean closure) performance standard, contaminated portions of the tanks could be  
10 removed, designated, and disposed of in accordance with 40 CFR 268, incorporated by reference by  
11 WAC 173-303-140 as appropriate. The inspections for a clean debris surface will be documented on an  
12 inspection record.

#### 13 **11.3.4.2 Internal and/or External Piping and Ancillary Equipment**

14 The internal piping and ancillary equipment for the 242A Evaporator will be flushed and drained as part  
15 of closure. For piping where the contaminated surfaces can be inspected, an inspection will be performed  
16 to see if the piping meets the clean debris surface standard in 40 CFR 268.45 and can be declared  
17 non-dangerous. If it is not possible to meet the clean debris surface standard or the piping cannot be  
18 inspected, portions of the internal piping will be removed, designated, and disposed of accordingly.

19 External piping (transfer lines) and ancillary equipment between 242A and LERF consists of below grade  
20 and above grade piping. Below grade piping will be dispositioned at closure either by removal,  
21 designation and disposal in accordance with WAC 173-303-610(5) and 40 CFR 268 or closed in  
22 accordance with another Ecology approved process. For above grade piping, it will be dispositioned  
23 consistent with the provisions for internal piping.

24 Rinsate from the external piping and internal piping will be processed through ETF. Details regarding the  
25 process for rinsing any internal and external piping and ancillary equipment will be provided in the  
26 closure plan in accordance with WAC 173-303-610(3)(a)(v) upon modification as stated in Section 11.6  
27 Dangerous and/or mixed-waste generated during closure activities will be managed in accordance with  
28 WAC 173-303-610(5). Removal of any dangerous wastes or dangerous constituents during partial or  
29 final closure will be handled in accordance with applicable requirements of WAC 173-303-610(5).

30 If the performance standards are not met, the interior surfaces will be cleaned using an appropriate  
31 decontamination method and the method repeated until the surfaces meet the clean closure performance  
32 standard.

33 The 207-A pump pit, located east of the 242-A Evaporator, will be closed using the performance  
34 standards for pipes and concrete (e.g., WAC 173-303-610(5) and 40 CFR 268 debris rule standards  
35 Table 1, Extraction technologies.). A visual inspection will be performed. If the interior surfaces meet  
36 the performance standards (clean debris surface), the 207-A pump pit will be considered clean closed.

37 If the performance standards are not met for any components described above, the interior surfaces will  
38 be cleaned using an Ecology approved decontamination method and the method repeated until the  
39 surfaces meet the clean closure (clean debris surface) performance standard; or a decision will be made to  
40 remove, designate and dispose of piping and equipment in accordance with WAC 173-303.

#### 41 **11.3.4.3 Concrete/Liner**

42 The coated concrete floor and the pump room sump liner provide secondary containment for all the tanks,  
43 process piping, and ancillary equipment. All concrete and liners will be inspected visually and surveyed  
44 radiologically before any decontamination. The purpose of the inspection will be twofold: to identify  
45 and map any cracks in the concrete that might have allowed contaminants a pathway to the soil below and  
46 to identify areas that potentially are contaminated with dangerous waste or dangerous waste residues. The  
47 inspection standard will be a clean debris surface as defined in Section 11.2 .1.

1 The inspection of the concrete for a clean debris surface will be documented on an inspection record.  
2 Those areas already meeting the standard will be clean closed as is.

3 Those potentially contaminated areas will undergo decontamination to meet the clean closure standard of  
4 a clean debris surface. The concrete will be washed down; the rinsate collected, designated, and disposed  
5 of accordingly. The concrete will be re-inspected for a clean debris surface. Concrete surfaces indicated  
6 by visual examination, as potentially still being contaminated will have the surface layer removed to a  
7 depth of 0.6 centimeter by scabbing or other approved methods. This will not threaten the environment,  
8 even if potential through-thickness cracks had been found during the inspection, because concrete  
9 decontamination (scabbing) will not employ liquid solutions that could enter cracks and because scabbing  
10 residues will be vacuumed away from cracks as any residue is generated.

11 Achievement of a clean debris surface will be documented on an inspection record. Decontamination  
12 residues will be collected, designated, and managed as appropriate.

#### 13 **11.3.4.4 Structures**

14 If contaminated with either dangerous or mixed waste constituents, structures will be decontaminated  
15 and/or disassembled, if necessary, packaged, and disposed in accordance with existing land disposal  
16 restrictions (WAC 173-303-140).

17 Closure steps could include the following activities.

- 18 • Containerize (as necessary and practicable) and remove any remaining waste.
- 19 • Review operating records for spillage incidents and visually inspect area surfaces for evidence of  
20 contamination or for cracks that could harbor contamination or allow the escape of  
21 decontamination solutions. Inspect storage area surfaces for visible evidence of contamination  
22 (e.g., discoloration, material degradation, wetness, and odor). If contamination is evident, the  
23 affected area(s) will be decontaminated.
- 24 • Decontaminate walls and floors to minimize the potential for loose contamination and to facilitate  
25 any required radiation surveys and/or chemical field screening. Wash down could be by water  
26 rinse or high-pressure, low-volume steam cleaning coupled with a detergent wash. After  
27 decontamination, the building walls and floor will be compared to closure performance standards.
- 28 • Collect rinsate and manage as dangerous waste for appropriate disposal.
- 29 • Secure (lock) personnel entries into building and post doors with appropriate warning signs.

30 Clean closure of structures will occur in accordance with WAC 173-303-610. Remediation of soil  
31 contamination beneath or around containment buildings will be performed in conjunction soil closure  
32 requirements.

#### 33 **11.3.4.5 Underlying Soils**

34 Clean closure of soil under the 242-A Evaporator will be accomplished by demonstrating that the coated  
35 concrete floor and stainless steel liners kept contaminants from reaching the soil. The coated concrete  
36 floor provided secondary containment for all the tanks, process piping, and ancillary equipment. Unless  
37 inspections identify potential through-thickness cracks indicating containment failure and a subsequent  
38 potential for soil contamination from TSD unit operations, the soil will be considered clean closed.  
39 However, if inspections identify such cracks, and there have been documented spills in the vicinity,  
40 potential soil contamination will be investigated.

41 Where it is possible to inspect visually directly beneath the tanks, a visual inspection will be performed.  
42 Where it is not possible to inspect visually beneath the tanks, an evaluation of the tank integrity will be  
43 made. The condition of the tank will be evaluated to determine if there was any potential for leakage. If  
44 no cracks, severe corrosion, or evidence of leaks is observed, it will be reasoned that mixed or dangerous  
45 waste solutions could not have penetrated to the soil directly below the tank.

1 **11.4 Maximum Waste Inventory**

2 The 242-A Evaporator is used to treat mixed waste from the DST System by removing water and most  
3 volatile organics. Two waste streams leave the 242-A Evaporator following the treatment process.  
4 The first waste stream, the concentrated slurry (in which approximately half the water content is removed  
5 and a portion of the volatile organics), is pumped back into the DST System. The second waste stream,  
6 process condensate (containing a portion of the volatile organics removed from the mixed waste during  
7 the evaporation process), is routed through condensate filters before being transferred to LERF. The  
8 242-A Evaporator is used to treat up to 870,642 liters of mixed waste per day.

9 The condensate collection tank (TK-C-100) receives process condensate and potentially contaminated  
10 drainage from the vessel vent system. The maximum design capacity for the C-100 tank is 67,380 liters.

11 Vapor-liquid separator, C-A-1, is located in the evaporator room and is used to separate vapor from the  
12 boiling slurry solution and deentrain liquid from the vapor before it enters the condensers in the condenser  
13 room. The maximum design capacity of C-A-1 is 103,217 liters.

14 **11.5 Closure of Tanks**

15 Clean closure of 242-A Evaporator will consist of the removal and disposal of all dangerous waste and  
16 the decontamination and/or removal and disposal of contaminated equipment, including tanks.

17 **11.6 Schedule for Closure**

18 Closure of 242-A Evaporator is not anticipated to occur within the next 15 to 20 years. The actual year of  
19 closure will depend on the time required for current waste to be processed and what role the  
20 242-A Evaporator will play in processing additional waste generated during future activities in the  
21 200 Areas. Other factors affecting the year of closure include changes in operational requirements,  
22 lifetime extension upgrades, and unforeseen factors. When a definite closure date is established, a revised  
23 closure plan will be submitted to Ecology. The activities required to complete closure are planned to be  
24 accomplished within 180 days in accordance with WAC 173-303-640(4)(c). Should a modified schedule  
25 be necessary, a revised schedule will be presented and agreed to before closure in accordance with  
26 WAC 173-303-640(4)(b).

27