

Permit Package LAW-016 Description

LAW-016, Rev. 0, "Miscellaneous Treatment Unit Subsystem for LAW Facility LMP System at El. 3 ft"

The Low-Activity Waste (LAW) Facility permit package LAW-016 addresses installation of the two LAW melters at the 3 ft elevation of the LAW Facility.

In the LMP system, LAW melter feed, consisting of LAW waste concentrate mixed with glass former chemicals, is transferred as a slurry by air displacement pumps from the Melter 1 Feed Vessel (LFP-VSL-00002) to LAW melter 1 (LMP-MLTR-00001) through feed nozzles in the melter lid. The process is the same for slurry transferred from the Melter 2 Feed Vessel (LFP-VSL-00004) to LAW melter 2 (LMP-MLTR-00002). In the melter, water and waste feed volatile constituents evaporate, leaving behind a layer of material known as the "cold cap". New slurry is added at about the same rate as the cold cap dissolves in the glass melt pool maintaining the quantity of cold cap material at a steady level. Waste feed components that remain in the cold cap undergo chemical reactions, are converted to their respective oxides, and dissolve in the melt pool. Bubblers inject air into the molten glass for agitation. As the slurry is fed, molten glass is formed that accumulates in the glass tank. When the melt level rises to a predetermined upper limit, an air lift mechanism is actuated and glass is discharged to a container. The evaporated water and waste feed volatile constituents are treated by the primary and secondary offgas treatment systems, monitored, and released to the atmosphere.

Permit package LAW-016, Rev. 0, includes:

- An assessment report signed by an independent qualified registered professional engineer (IQRPE) certifying certain portions of the permit package
- Melter assembly mechanical drawings
- An engineering specification for the LAW melters
- A specification change notice – update seismic clamp installation
- A mechanical data sheet for each LAW melter
- A corrosion evaluation for the LAW melters

The following components of this package are already included in the Dangerous Waste Permit and in the Administrative Record, or they are provided with other permit packages, as listed in the Table of Contents:

- A general arrangement plan for the 3-ft elevation of the LAW Facility
- Two process flow diagrams for the LMP system
- Twenty-seven piping and instrumentation diagrams
- Engineering specifications for:
 - Pressure vessel design and fabrication
 - Seismic qualification criteria for pressure vessels
 - Pressure vessel fatigue analysis
 - Positive material identification for shop fabrication
- A document describing secondary containment design
- A document describing the LAW offgas system bypass analysis
- A document describing the installation of tank systems and miscellaneous treatment unit systems
- A system design description for the LAW melter
- A material and energy balance (Flowsheet Bases and Assumptions)
- A document describing the control of toxic vapors and emissions from WTP tank systems and miscellaneous treatment unit systems
- A document describing the control of hydrogen accumulation in tank systems and miscellaneous treatment unit systems