



Mechanical Data Sheet: VESSEL

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RPP-WTP PDC

Plant Item No:
24590-BOF-MV-DEP-VSL-00005A
24590-BOF-MV-DEP-VSL-00005B
1

Data Sheet No:
24590-BOF-MVD-DEP-00006

Rev:
1

River Protection Project
Waste Treatment and Immobilization Plant

Project:	RPP-WTP	P&ID:	24590-BOF-M6-DEP-00006001, -00006002 (Ref. 1, 22) 1
Project No:	24590	Process Data:	24590-BOF-MVC-DEP-00008 (Ref. 2) 1
Project Site:	Hanford	Vessel Drawing:	24590-BOF-MV-DEP-00008001, -00008002, -00009001, -00009002 (Ref. 16, 17, 20, 21)

Description: Process Condensate Lag Storage Vessel

Reference Data

Charge Vessels (Tag Numbers)	None
Eductors (Tag Numbers)	24590-BOF-MP-DEP-EDUC-00010 through -00017 (Ref. 1,14, 22) 1
Nozzle (Tag Numbers)	None
RFDs/Pumps (Tag Numbers)	None

Design Data

Quality Level	CM	Fabrication Specs	24590-BOF-3PS-MVSC-T0003 (Ref. 4)		
Seismic Category	SC-IV	Design Code	ASME VIII Div 1		
Service/Contents	Process Radioactive Condensate	Code Stamp	Yes (Note 29) 1		
Specific Gravity of Fluid	0.99/1.05 (Min/Max) (Ref. 2) 1	NB Registration	Yes		
Maximum Operating Volume	gal	108,208 (Ref. 3)	Weights (lbs)	<u>Empty</u>	<u>Operating</u>
Batch Volume	gal	95,228 (Ref. 3) 1	Actual	*	*
Total Volume	gal	127,260 (Ref. 3)	Not to exceed wet weight (lbs)	1,285,000	
Area Classification	R2/C1 (Ref. 8) (Note 12)	Not to exceed size (Notes 1 and 2)	27' Diameter x 46' High		

General Data

Inside Diameter	feet	25 (Ref. 3)		Wind Design	ASCE 7 - 1998
Length/Height (TL - TL) 1	feet	29.5 (Ref. 3)		Snow Design	ASCE 7 - 1998
	<u>Vessel Operating</u>	<u>Vessel Design</u>	<u>Coil/Jacket Design</u>	Seismic Design	24590-BOF-3PS-MVSC-T0003 (Ref. 4)
Internal Pressure (psig)	-1.16/0 (Min/Max) (Ref. 23) 1	15 (Ref. 6) 1	N/A	Postweld Heat Treat	Per Code
External Pressure (psig)	0 (Outdoor Environment Ref. 8) 1	15 (Ref. 6)	N/A	Corrosion/Erosion Allowance (inch) (Ref. 19)	0.04
Temperature (°F)	40/125 (Min/Max) (Ref. 2) 1	155 (Note 9) (Ref. 6)	N/A	Head Type (Top and Bottom)	100%-6% Flanged & Dished
Min Design Metal Temp. (°F)	-23 (Ref. 10)		Maximum Circulating Pump Discharge Pressure (psig)	142.48 (Ref. 13)	

Materials of Construction (Ref. 19)

Component	Material	Minimum Thickness/Size	Containment
Top Head	SA 240 316 (Note 7)	*	Auxiliary 1
Shell	SA 240 316 (Note 7)	*	Primary
Bottom Head	SA 240 316 (Note 7)	*	Primary
External Support such as Lifting Lugs and Vessel Skirt 1	SA 240 304 (Note 7) 1	*	N/A
Jacket/Coils/Half-Pipe Jacket	SA 240 316 (Note 7)	*	N/A
Internals	SA 240 316 / SA 312 TP316 (Note 7)	*	Thermocouples Primary
Wash Ring Pipe	SA 312 TP316 Seamless (Note 7) 1	*	N/A
Internals - Piping	SA 312 TP316 Seamless (Note 7)	*	(Note 8)
Forgings/Bar Stock	SA 182 F316 (Note 7)	*	N/A
Gaskets	EPDM	N/A	N/A
Bolting	SA-193 Gr. B8M / SA-194 Gr. 8M	N/A	N/A

Vessel Connections (Ref. 1, 16, 17, 20, 21, 22)

See Note 28

Miscellaneous Data

Orientation	Vertical	Support Type (Note 3)	Skirt
Insulation Function (Note 4)	Freeze Protection	Insulation Material	By Buyer
Insulation Thickness (inch)	3 (Ref. 1)	Internal Finish	Welds descaled as laid
		External Finish	Welds descaled as laid
DEP-VSL-00005A Wash Ring Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	42.16, 105 (Ref. 7)		
DEP-VSL-00005B Wash Ring Available Pressure at Design Flow (Pressure [psig], Flow [gpm])	42.11, 105 (Ref. 7)		

Remarks

* To be determined/confirmed by the vendor

Note 1 - Not to exceed size diameter includes allowance for side nozzle protrusion in addition to the vessel ID.

Note 2 - Not to exceed size height includes allowance for top manway and bottom skirt height dimension, from Top of Concrete (TOC) to bottom of vessel, in addition to total vessel height.

Note 3 - Skirt must be designed with 25'-0" Internal Diameter Ring Beam attachment (provided by BUYER) in consideration.

Note 4 - Insulation (by BUYER) is required on both the shell and top/bottom head of the vessel.

Note 5 - The contents of this document are Dangerous Waste Permit affecting.

Note 6 - Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

Note 7 - Max. Carbon content 0.030%

Note 8 - Nozzle necks below the high operating liquid level are Primary, others Auxiliary.

Note 9 - Vessel design temperature is determined by adding 25 °F to the max vessel operating temperature and rounding up to the nearest 5 °F.

Note 10 - Deleted

Note 11 - Deleted

Note 12 - This equipment is located in R2 radiation area (radiological buffer area) which is designed to have a target radiation level of less than 0.250 mrem/hr. The average contact dose rate for this equipment is 3.1E-04 Rad/hr. (Ref. 8, 10, and 11)

Note 13 - Deleted △₁

Note 14 - Deleted

Note 15 - Deleted

Note 16 - Vessel is not Black Cell/Hard-to-Reach.

Note 17 - Deleted

Note 18 - Deleted

Note 19 - Deleted

Note 20 - Deleted

Note 21 - Seller to provide access platform and ladders.

Note 22 - Vessel Discharge Outlet nozzle (N80 for DEP-VSL-00005A and N84 for DEP-VSL-00005B) to be flush with vessel bottom / center wear plate, centered on vessel, and fitted with a vortex breaker. △₁ △₁

Note 23 - All internal supports and welds that interact with the primary confinement barrier (vessel) shall maintain equal quality level and seismic category as the vessel.

Note 24 - Deleted

Note 25 - Deleted

Note 26 - Deleted

Note 27 - Deleted






Note 28 - Refer to 24590-BOF-MV-DEP-00008001, -00008002, -00009001, -00009002 for vessel details including dimension, nozzle schedule table and locations/orientations.

Note 29 - Include a statement on the Manufacturer's Data Report that over-pressure protection is provided by the system design per ASME Section VIII, Division 1, UG-140(a). △₁

Equipment Cyclic Data Sheet (ECDS)














Component Plant Item Number	DEP-VSL-00005A & DEP-VSL-00005B			
Component Description	Process Condensate Lag Storage Vessel			
The information below is provisional and envelopes operational duty for fatigue assessment. It is not to be used as operational data.				
Materials of Construction	See Materials of Construction section above for details.			
Design Life	40 years			
Component Function and Life Cycle Description	DEP-VSL-00005A/B receive process condensate from DEP-VSL-00004A/B, and secondary steam blowdown from HPS-HX-00011. DEP-VSL-00005A/B allow for lag storage and characterization before sending to the LERF/ETF. Content agitation and mixing are maintained via educators and recirculation system.			
Load Type	Min	Max	Number of Cycles	Comment
Design Pressure (psig)	-15 (Ref. 6)	15 (Ref. 6)	10 (Ref. 23)	
Operating Pressure (psig)	See Comment	See Comment	0 (Ref. 23)	-1.16/0 (Min/Max) (Ref. 23). Range of pressure variations < 20% of design pressure.
Operating Temperature (°F)	See Comment	See Comment	88 (Ref. 23)	40/125 (Min/Max) (Ref. 2). Number of Cycles include 10% increase to account for commissioning duty.
Contents Specific Gravity	See Comment	See Comment	N/A	0.99/1.05 (Min/Max) (Ref. 2). Specific gravity is based on temperature and pressure.
Contents Level (inch)	0.0 (Ref. 3)	373.6 (Ref. 3)	14,600 (Ref. 23)	
Localized Features				
Internals	N/A			
Nozzles	N/A			
Supports	N/A			

Revision History

Rev.	Description	Originator	Checker	MET Reviewed	Approver	Date
0	Issued for Procurement (to reuse HLP-VSL-00027A/B). EIE, 24590-BOF-EIE-MS-16-0060 is incorporated.	Jung Shin	Ryan Rickenbach	Steven Vail	Youssef Mohammad-Zadeh	6/30/2017
1	Revised Batch Volume, Vessel Maximum Operating Temperature, Material for External Supports & Wash Ring Pipe, Notes 12 & 22, and reference #s 1, 2, 4, 6, 8, 10, 11, 16, 17, 18, 20, 21 & 22; Incorporated 24590-WTP-SDDR-MS-17-00121 rev.NA, 24590-BOF-EIE-PR-17-0006 rev.0, 24590-BOF-EIE-PR-17-0011 rev.0, and 24590-WTP-EIE-ENG-17-0018 rev.0; Added Note 29, ECDS section, and reference # 23.	Kar Wei (Sengwai) Chin 	Ryan Rickenbach 	Debbie Adler 		

Attachment A – References for Mechanical Datasheet 24590-BOF-MVD-DEP-00006, Rev. 1

(For internal reference; except for Ref. 4, 14, 16, 17, 20, 21)

1. 24590-BOF-M6-DEP-00006001, Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System **Process Condensate** Lag Storage Vessel DEP-VSL-00005A 
2. 24590-BOF-MVC-DEP-00008, Rev 0 - Process Data for the Process Condensate Lag Storage Vessels (DEP-VSL-00005A/B), Transfer Pumps (DEP-PMP-00005A/B), and Recirculation Pumps (DEP-PMP-00015A/B/C) 
3. 24590-BOF-MVC-DEP-00004, Rev B - Process Condensate Lag Storage Vessel (DEP-VSL-00005A/B) - Vessel Sizing, Vessel Overflow Sizing, and Wash Ring Sizing
4. 24590-BOF-3PS-MVSC-T0003, Rev 1 - Engineering Specification for DFLAW EMF Lag Storage and Overhead Sampling Vessels 
5. 24590-BOF-M6C-DEP-00009, Rev B - Design Pressure and Temperature Calculation for the EMF DEP/DVP/AFR/NLD/SHR/SNR Systems
6. 24590-WTP-3DG-M40T-00001, Rev 1 - Design Parameters and Test Pressures for Equipment and Piping 
7. 24590-BOF-M6C-PSW-00008, Rev B - EMF Process Service Water (PSW) Line Sizing (PIPE-FLO)
8. 24590-BOF-P1-25-00001, Rev 1 – Balance of Facilities LAW Effluent Process BLDG & LAW Effluent Drain Tank BLDG General Arrangement Plan at Elev. 0'-0" 
9. Deleted.
10. 24590-WTP-DB-ENG-01-001, Rev 6 – Basis of Design 
11. 24590-WTP-Z0C-W13T-00010, Rev. H – Contact Dose Rates to Equipment From Beta and Gamma Emitters 
12. Deleted.
13. 24590-BOF-MPC-DEP-00008, Rev A - DEP Process Condensate Lag Storage Vessel Recirculation Pump (DEP-PMP-00015A/B/C) Sizing and Line Sizing
14. 24590-BOF-MPD-DEP-00019, Rev 0 - 24590-BOF-MP-DEP-EDUC-00010, -00011, -00012, -00013, -00014, -00015, -00016, -00017 - Mixing Eductors for Atmospheric Vessels DEP-VSL-00005A/B
15. Deleted.
16. 24590-BOF-MV-DEP-00008001, Rev 2 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005A 
17. 24590-BOF-MV-DEP-00009001, Rev 2 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005B 
18. Deleted. 
19. 24590-BOF-N1D-DEP-00005, Rev 0 - DEP-VSL-00005A/B - Process Condensate Lag Storage Vessel A & B
20. 24590-BOF-MV-DEP-00008002, Rev 1 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005A 
21. 24590-BOF-MV-DEP-00009002, Rev 1 - **Design Proposal Drawing** Equipment Assembly Process Condensate Lag Storage Vessel DEP-VSL-00005B 
22. 24590-BOF-M6-DEP-00006002, Rev 2 - P&ID - BOF/EMF Direct Feed LAW EMF Process System **Process Condensate** Lag Storage Vessel DEP-VSL-00005B 
23. **24590-BOF-MVC-M80T-00001, Rev A - DFLAW EMF Vessel Cyclic Datasheet Inputs and Fatigue Evaluation** 