H-AREA TANK FARM

ANCILLARY EQUIPMENT INPUTS

HTF-IP-06

Revision 0

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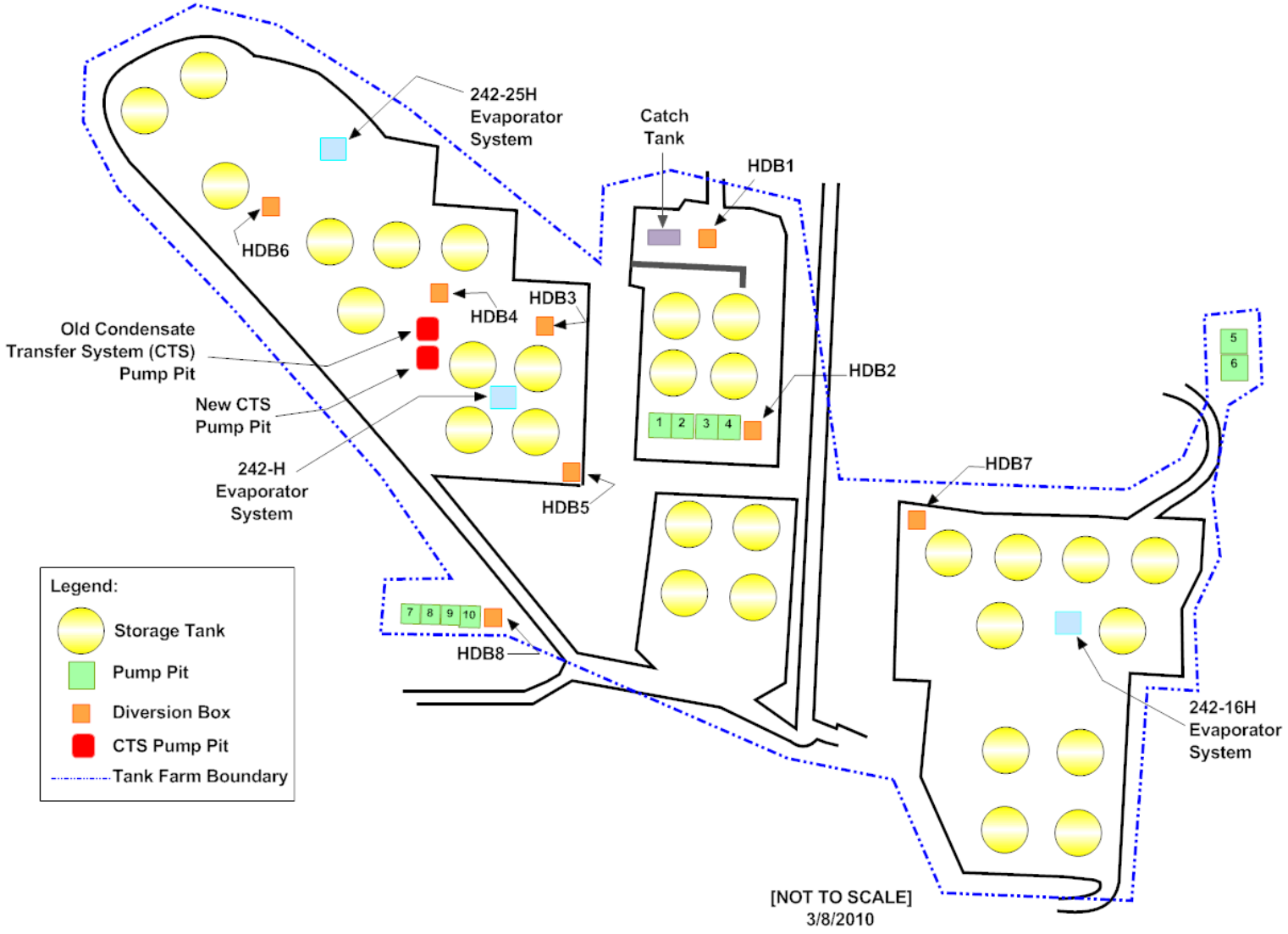
1.0 PURPOSE AND SCOPE

In order to model the potential risk associated with the H-Area Tank Farm (HTF) waste inventory expected to remain after the closure of HTF, locations with the potential for waste retention other than the waste storage tanks must be identified. The locations addressed in this package are associated with ancillary equipment throughout the HTF (i.e., transfer lines, pump pits (PPs), pump tanks, Concentrate Transfer System (CTS) PPs, a catch tank, and evaporators). Figure 1.0-1 identifies locations of the ancillary equipment relative to the waste storage tanks and relative to other tank farm components. A separate input package will be developed addressing the remaining estimated inventory upon closure of the HTF. The following HTF locations will be specifically addressed with regard to ancillary equipment modeling for the HTF Performance Assessment (PA):

- The HTF transfer line system (74,800 linear feet of transfer lines), including transfer line jackets, Leak Detection Boxes (LDBs), cleanout ports and other transfer line secondary containment systems (e.g., the Type I waste tank transfer line encasements).
- The HTF pump tanks (i.e., HPT 2-4, HPT 5-6, HPT 7-10, and CTS PT-242-3H and CTS PT 242-18H).
- The HTF PPs (i.e., HPP 1-4, HPP 5-6, HPP 7-10, and CTS PP-242-3H and CTS PP-242-18H).
- The 242-H evaporator system, including the evaporator cell and support tanks (e.g., Mercury Collection Tank, Cesium Removal Column (CRC) Pump Tank and overheads tanks).
- The 242-16H evaporator system, including the evaporator cell and support tanks (e.g., Mercury Collection Tank, CRC Pump Tank, and overheads tanks).
- The 242-25H evaporator system, including the evaporator cell and support tanks (e.g., Condenser, Mercury Collection Tank, and overheads pumps and tanks).

Figure 1.0-1: General Layout of HTF Including Locations of Ancillary Equipment



2.0 HTF ANCILLARY EQUIPMENT INITIAL CONCEPTUAL MODEL

One purpose of this input package is to synthesize the relevant background information regarding the actual HTF ancillary equipment design and present the initial conceptual design of the HTF ancillary equipment for transport modeling. Additional modeling parameters are included in other input packages (e.g., vadose zone, compiled conceptual model).

The initial conceptual design and approach used in the HTF PA modeling is an aphysical simplification of the actual infrastructure of HTF ancillary equipment design. This approach is required for analytical modeling. Certain equipment features and design elements have, by necessity, been omitted in the initial conceptual model. Some HTF ancillary equipment design features not included in the initial conceptual design may be addressed in subsequent conceptual models.

Transfer line inventory is modeled by distributing the assumed inventory uniformly throughout the HTF modeling cells. The pump tanks, evaporator pots, and CTS tanks are modeled as uniform inventories spread throughout a single modeling cell at the location of the applicable ancillary source. Other HTF ancillary equipment (i.e., diversion boxes (DB), valve boxes, the catch tank, evaporator cells, Mercury collection tanks, CRC pump tanks, condensers, and overheads tanks) are not modeled explicitly. This approach is based on the fact that these locations did not serve as primary waste containment, and therefore will not contain significant radiological inventory at closure. Additionally, ancillary equipment in the Actinide Removal Process (ARP) and Modular Caustic Solid Solvent Extraction Unit (MCU) facilities will not be modeled explicitly, as these facilities will be extensively cleaned and/or removed to support closure activities.

3.0 HTF TRANSFER LINE SYSTEM

The HTF transfer line details are provided in Table 3.0-1 based on reference drawings and data obtained from the Structural Integrity Database (M-ML-G-0005), an engineering database developed to help control and maintain the technical baseline of the Savannah River Site (SRS) facilities including HTF.

There are 74,800 linear feet of transfer line in HTF, with line segments ranging from a few feet in length to almost 3,400 feet. The HTF waste transfer lines are typically constructed of a stainless steel primary core pipe and are normally located below ground. Those lines that are above or near the surface are shielded to minimize radiation exposure to personnel. Figure 3.0-1 shows typical construction for transfer lines. All of the primary transfer lines have secondary containments of some type. The majority of primary transfer lines are surrounded by another pipe (jacket) constructed of carbon steel, stainless steel, or cement-asbestos. These jackets typically drain to LDBs, Modified LDBs (MLDBs), or to another primary or secondary containment (e.g., a waste tank). The balance of the primary transfer lines are located inside covered, concrete encasements, which perform the same secondary containment functions as the jacketed type previously described. Multiple (core) waste transfer lines may be contained in a single secondary containment jacket or concrete encasement. [W236508, W148228]

Waste transfer lines are typically sloped to be self-draining and where a pipe transitions from one size to another, the bottom of the pipe is generally aligned to prevent a situation which would prevent waste from draining to the intended tank. The line segments are supported using rod or disk type core pipe spacers, core pipe supports, jacket supports, jacket guides, or other approved methods. Typically, core pipe spacers and supports are of stainless steel welded to the core pipe and jacket, while jacket supports and guides are of stainless steel with a concrete support. [C-CH-H-8096]

Table 3.0-1: HTF Transfer Line Segment Listing

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
1	HDB-1(24)	HPP-1(2)	SS	3	Encasement	342	100
2	HDB-1(15)	HPP-1(3)	SS	3	Encasement	339	99
3	HDB-1(27)	HPP-2(2)	SS	3	Encasement	325	95
4	HDB-1(18)	HPP-2(3)	SS	3	Encasement	322	94
5	HDB-1(22)	HPP-3(2)	SS	3	Encasement	308	90
6	HDB-1(13)	HPP-3(3)	SS	3	Encasement	305	89
7	HDB-1(25)	HPP-4(2)	SS	3	Encasement	304	89
8	HDB-4(3)	HPP-1(16)	SS	3	Encasement	304	89
9	HDB-2(6)	HPP-3(23)	SS	3	Encasement	70	20
10	HPP-1(5)	HDB-2(5)	SS	3	Encasement	60	18
11	HPP-2(4)	HDB-2(4)	SS	3	Encasement	50	15
12	HPP-2(5)	HDB-2(3)	SS	3	Encasement	63	18
13	HPP-3(4)	HDB-2(8)	SS	3	Encasement	56	16
14	HPP-3(5)	HDB-2(7)	SS	3	Encasement	60	18
15	HPP-4(4)	HDB-2(2)	SS	3	Encasement	30	9
17	HDB-2(16)	Tank 13	SS	3	Encasement	173	50
18	HDB-2(15)	cut & capped	SS	3	Encasement	0	0
19	HDB-2(14)	Tank 15	SS	3	Encasement	293	85
20	HDB-2(13)	Tank 15	SS	3	Encasement	293	85
21	Tank 15 & Tank 16 Valve Box	HDB-2(12)	SS	3	Encasement	289	84
22	HDB-2(11)	Tank 16	SS	3	Encasement	293	85
23	HDB-2(10)	Tank 14	SS	3	Encasement	173	50
24	HDB-2(9)	Tank 14	SS	3	Encasement	173	50
27	Tank 13(7)	HDB-2(22)	SS	3	4	256	50

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
29	HDB-5(11)	HDB-2(20)	SS	3	4	282	82
30	HDB-5(10)	HDB-2(19)	SS	3	4	290	85
31/107	HDB-2(18)	HDB-4(13)	SS	3	10	700	204
32/106	HDB-2(17)	HDB-4(15)	SS	3	10	700	204
33E	HDB-1(11)	Tank 9	SS	3	Encasement	81	24
34E	HDB-1(12)	Tank 10	SS	3	Encasement	81	24
36E	HDB-1(14)	Tank 12	SS	3	Encasement	181	53
39E	HDB-1(17)	Tank 11	SS	3	Encasement	181	53
41E	#91	HDB-1(19)	SS	3	Encasement	50	15
42E	HDB-1(20)	Tank 9	SS	3	Encasement	81	24
43E	HDB-1(21)	Tank 10	SS	3	Encasement	81	24
45E	HDB-1(23)	Tank 12	SS	3	Encasement	181	53
48E	HDB-1(26)	Tank 11	SS	3	Encasement	181	53
100	HDB-3(3)	Tank 23 (NW)	SS	3	6	25	7
100(EVAP)	Tank 32(TP)	242-25H Evaporator (P8)	SS	2	8	423	84
101(DB3)	HDB-3(2)	Tank 21(NE)	SS	3	6	160	47
101(DB4)	HDB-4(11)	Tank 29	SS	2	3	81	16
101E	Tank 23(N)	HDB-5(7)	SS	3	10	280	82
102(DB4)	Tank 29(TJ)	HDB-4(9)	SS	3	8	103	30
102(DB6)	HDB-6(8)	Tank 35(C1)	SS	3	10	83	24
102/RCZ74	HDB-6(2)	HDB-8(21)	SS	3	6	1,176	343
103	Tank 14(2)	Tank 13(7)	SS	3	4	370	108
103(DB4)	HDB-4(6)	Tank 31(C1)	SS	3	10	190	55
103(DB6)	HDB-6(9)	Tank 36(C1)	SS	3	10	463	135
104(DB4)	HDB-4(4)	Tank 32(TJ)	SS	3	8	110	32

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
104 (DB6)	HDB-6(10)	Tank 37(C1)	SS	3	10	575	168
105(DB4)	HDB-4(8)	Tank 30(C1)	SS	3	10	84	25
105/HHP14	HDB-8(20)	HDB-6(1)	SS	3	6	1,176	343
108	HDB-4(12)	HDB-5(9)	SS	3	10	460	134
109	HDB-4(10)	Tank 29(C1)	SS	3	8	103	30
110	Tank 31(TJ)	HDB-4(5)	SS	3	8	190	55
111	Tank 32(C1)	HDB-4(3)	SS	3	8	110	32
112	Tank 30(TJ)	HDB-4(7)	SS	3	8	84	25
140	244-H (RBOF)	HDB-3 (1)	SS	3	6	852	249
151	Tank 35(TJ)	HDB-6(5)	SS	3	10	81	24
201	Tank 36(TJ)	HDB-6(6)	SS	3	10	463	135
251	Tank 37(TJ)	HDB-6(7)	SS	3	10	575	168
451	Tank 13(TP)	242-H Evaporator	SS	3	6	427	125
452	242-H Evaporator vent	Tank 13	SS	3	6	427	125
475	242-25H Evaporator (P4)	Tank 29(C2)	SS	3	8	239	70
476	242-25H Evaporator (P5)	Tank 30(C2)	SS	3	8	188	55
477	242-25H Evaporator (P6)	capped/not installed	SS	3	8	116	34
479	242-25H Evaporator (P18)	Tank 37(C2)	SS	3	8	251	73
501	242-H Evaporator	HCTS(2)	SS	3	8	282	82
504	HCTS (27)	Tank 29	SS	3	4	90	26
505	HCTS (21)	Tank 32 cut & capped	SS	2	3	90	18
506	Tank 31(C2)	Tank 32 cut & capped	SS	2	3	289	57
507	Tank 31(C2)	Tank 30 cut & capped	SS	2	3	165	33
508	Tank 30 cut & capped	Tank 29(C2)	SS	2	3	73	14
509	Tank 29 cut & capped	HCTS (24)	SS	2	8	253	50

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
535	242-25H Cell(P12)	Tank 32(C2)	SS	2	8	456	90
552	242-25H Hg Tank overheads	Tank 32	SS	2	8	463	92
665	Tank 12(7) TJ	Line 930 at HDB-2	CS	3	4	80	23
671	Tank 11(6)	Tank 11(7)	SS	3	4	16	5
703A	ITP filter cell #1	#1554A	SS	3	6	34	10
705A	ITP filter cell #1	Tank 48(E2)	SS	6	10	57	31
910	#2225	#911	SS	3	4	130	38
911	Tank 10(2) TJ	#41E to HDB-1(19)	CS	3	8	212	62
930	Tank 11(7)	HDB-2(29)	CS	3	4	140	41
1051	HDB-4(2)	HDB-6(13)	SS	3	6	641	187
1052	HDB-6(11) sump	Tank 35(C2)	SS	2	4	58	11
1100	221H HHW HDR#1	HPP-6(1)	SS	3	10	750	219
1101	221H LHW HDR#4	HPP-5(1)	SS	3	10	771	225
1102	221H LHW HDR#3	HPP-5(2)	SS	3	10	760	222
1103	221H HHW HDR#2	HPP-6(2)	SS	3	10	760	222
1103A	ITP filter cell #2	#703A	SS	3	6	31	9
1104	221H LDB#4	#1000 at HPP-6	CS	1.5	N/A	752	119
1105A	ITP filter cell #2	Tank 48(E2)	SS	6	10	72	40
1151A	Tank 48(G)	ITP filter cell #2	SS	6	10	135	75
1152A	Tank 48(H)	ITP filter cell #1	SS	6	10	165	91
1251A	Tank 49 transfer valve box drain	#8318 to #8415 to drain cell	CS	3	Encasement	108	32
1252A	Tank 49 transfer valve box	#1660	SS	3	6	10	3
1253A	Tank 49 transfer valve box	Late Wash facility	SS	3	6	893	260
1451A	#1661	Tank 49	SS	3	6	13	4

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
1501	Tank 39(TJ)	Tank 43(C1)	SS	3	6	350	102
1501A	Tank 22 valve box	Tank 22 side port	SS	3	4	53	15
1502A	Tank 22 valve box	#5811	SS	3	4	17	5
1503A	HDB-5(3)	Tank 22 valve box	SS	3	4	205	60
1528	Tank 38(TJ)	Tank 43(R)	SS	3	6	586	171
1552A	ITP building	cut & capped	SS	3	6	22	6
1554A	ITP hold tanks	Tank 48	SS	3	6	78	23
1555A	#1552A	#1566A	SS	3	6	16	5
1555A (cut)	ITP building	cut & capped	SS	3	6	19	6
1566A	ITP wash valve	Tank 48(B3)	SS	3	6	65	19
1576	Tank 41(TJ)	Tank 43	SS	3	6	314	92
1596	#16102	Tank 43	SS	3	6	338	99
1626	Tank 43(TJ)	HDB-7(10)	SS	3	10	815	238
1628	Tank 43 (R) pump	242-16H Evaporator (N12)	SS	1	6	104	11
1651	242-16H Evaporator (N10)	Tank 43(C3)	SS	2	6	79	16
1653	242-16H Evaporator (N9)	Tank 41(C3)	SS	2	6	164	32
1654	242-16H Evaporator (N8)	Tank 40(C3)	SS	2	6	92	18
1660	#1252A	#3056	SS	3	10	404	118
1661	#1701A	#1451A	SS	3	6	292	85
1662	#16053 at Tank 51	Tank 43	SS	3	10	451	132
1663	Tank 50(TJ)	Tank 43 cut & capped	SS	3	10	620	181
1701A	Tank 48(B5) TTP	#1661	SS	3	6	58	17
1825	Tank 24(TJ)	HDB-5(8)	SS	3	10	396	116
1905A/SSP2	Tank 50 (B5) TTP	Low point drain tank	SS	4	6	3,371	1264

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
2225	Tank 9(3) TJ	#910	SS	3	4	5	1
2701	242-16H Evaporator (N4)	Tank 39(C3)	SS	2	6	114	23
2702	242-16H Evaporator (N3)	Tank 38(C3)	SS	2	6	206	41
2703	242-16H Evaporator bottom line clean out drain	Tank 38	SS	1.5	3	93	15
2708	242-16H Evaporator (N2)	Tank 42(C3)	SS	2	6	77	15
2722	Tank 42(C1) valve box	Tank 43	SS	3	8	381	111
3051	HDB-7(11)	Tank 43(C1)	SS	3	10	815	238
3052	HDB-7(12)	Tank 41(C1)	SS	3	10	515	150
3053	HDB-7(13)	Tank 40 valve box	SS	3	10	377	110
3054	HDB-7(14)	Tank 39(C1)	SS	3	6	238	69
3055	HDB-7(15) drain	Tank 38	SS	1.5	4	51	8
3056	#1660	HDB-7(20)	SS	3	12	394	115
3057	HDB-7(19)	Tank 48(C1)	SS	3	12	404	118
3059	Tank 50(C1) TJ	HDB-7(21)	SS	3	12	855	249
3060	#16052	HDB-7(22)	SS	3	12	975	284
3062	HDB-8(3)	HDB-7(23)	SS	3	6	1,152	336
3063	HDB-8(2)	HDB-7(24)	SS	3	6	1,154	337
3068	HDB-2(31)	HDB-7(5)	SS	3	10	472	138
3069	HDB-2(30)	HDB-7(6)	SS	3	10	472	138
3070	HDB-7(3)	HDB-8(1)	SS	3	10	1,173	342
3071	HDB-8(4)	HDB-7(4)	SS	3	10	1,173	342
3083	HDB-7(17)	Tank 38(C1)	SS	3	6	64	19
3084	Tank 42(C1) valve box	HDB-7(18)	SS	3	8	285	83
3094	HPP-6(6)	HDB-7(1)	SS	3	10	857	250

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
3095	HPP-6(7)	HDB-7(2)	SS	3	10	857	250
3096/RCZ73	HDB-8(15)	HDB-7(9)	SS	3	8	1,206	352
3097	HPP-5(6)	HDB-7(7)	SS	3	10	816	238
3098	HPP-5(7)	HDB-7(8)	SS	3	10	816	238
3102	HDB-7(25)	HDB-8(16)	SS	3	8	1,180	344
3378	242-16H Evaporator overheads drain	Tank 43	SS	2	4	100	20
3934	242-16H (N6)	Tank 50	SS	2	6	342	68
3958	242-16H CRC feed pumps	Tank 42(M)	SS	1.5	6	86	14
3964	Tank 42(M)	242-16H OH receiver	SS	1.5	6	86	14
5811	#1502A	Tank 22(S)	SS	3	4	5	1
6386	ETF WC Tk2	Tank 50 VB	SS	2	6	1,286	255
8352	LDB drain cell (2)	Tank 48	SS	2	4	46	9
12261	Tank 15(7) TJ	916 valve box at Tank 16	SS	3	4	119	35
13568	916 valve box Tank 16	#21 to HDB-2(12)	SS	3	4	296	86
14101	#3084 at Tank 42 valve box	#2722 at Tank 42 valve box	SS	3	4	5	1
15912	#16053	Tank 51 drain valve box	SS	3	4	27	8
15913	#3060	Tank 51 drain valve box	SS	3	4	4	1
15914	Tank 51 drain valve box	#16055	SS	3	4	2	1
15961	Tank 51(B5) TTP	Tank 51 transfer valve box	SS	3	4	25	7
16051	Tank 51 transfer valve box	Tank 51(C1) jet	SS	3	4	45	13
16052	Tank 51 transfer valve box	#3060	SS	3	4	43	13
16054	Tank 51 transfer valve box	DWPF LPPP sludge tank	SS	3	10	1,131	330

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
16055	Tank 51 transfer valve box	Tank 51(C1) jet	SS	3	6	35	10
16101	Tank 40 transfer valve box	Tank 40(C1)	SS	3	4	28	8
16102	Tank 40 transfer valve box	#1596	SS	3	6	54	16
16103	Tank 40 transfer valve box	Tank 40(C1)	SS	3	6	62	18
16104	Tank 40 transfer valve box	DWPF LPPP sludge tank	SS	3	10	1,360	397
16262	Tank 40(V2)	Tank 40 transfer valve box	SS	3	4	41	12
16312	Tank 40(B5)	Tank 40 transfer valve box	SS	3	4	22	6
16460	Tank 40(C1)	Tank 40 transfer valve box	SS	3	4	36	11
16462	#16102	Tank 40 drain valve box	SS	3	4	11	3
16463	Tank 40 drain valve box	#16101	SS	3	4	25	7
210001	Tank 21(S)	Tank 21 valve box	SS	3	4	22	6
210002	Tank 21 valve box	Tank 21(SW) spare inlet	SS	3	4	71	21
210003	Tank 21 valve box	HDB-5(6)	SS	3	4	89	26
HHP16	HPP-9(5)	HDB-8(13)	SS	3	Encasement	30	9
HHP17	HDB-8(4)	HPP-9(3)	SS	3	Encasement	30	9
PSP11	HPP-7(5)	HDB-8(3)	SS	3	Encasement	50	15
PSP12	HDB-8(16)	HPP-7(4)	SS	3	Encasement	50	15
RCZ20	Auxiliary pump pit	HDB-8(8)	SS	3	6	2,350	685
RCZ36	LW hold tank	HDB-8(7)	SS	3	6	2,350	685
RCZ75	HDB-5(1)	HDB-8(17)	SS	3	6	311	91
RCZ76	HDB-8(18)	HDB-5(2)	SS	3	6	311	91
RCZ92	ETF valve pit	HDB-8(6)	SS	3	8	1,260	386

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
RCZ94	ETF conc diversion box	HDB-8(5)	SS	4	10	150	56
RCZ117	HDB-8(1)	HPP-7(3)	SS	3	Encasement	50	15
RCZ120	HPP-8(5)	HDB-8(14)	SS	3	Encasement	50	15
RCZ121	HDB-8(6)	HPP-8(2)	SS	3	Encasement	40	12
RCZ122	HDB-8(2)	HPP-8(3)	SS	3	Encasement	40	12
RCZ123	HDB-8(11)	HPP-8(4)	SS	3	Encasement	40	12
RCZ125	HPP-9(2)	HDB-8(7)	SS	3	Encasement	30	9
RCZ126	HPP-9(4)	HDB-8(10)	SS	3	Encasement	30	9
RCZ128	HDB-8(8)	HPP-10(3)	SS	3	Encasement	20	6
RCZ129	HPP-10(5)	HDB-8(9)	SS	3	Encasement	20	6
RCZ130	HDB-8(5)	HPP-10(4)	SS	3	Encasement	20	6
RCZ131	HDB-8(12)	HPP-10(2)	SS	3	Encasement	20	6
RCZ135	HPP-7(2)	HDB-8(15)	SS	3	Encasement	50	15
HB-241942-WTS-L-13052	Tank 42 riser B3 WTS-P-5	Tank 42 transfer valve box	SS	3	4	41	12
HB-241951-WTS-L-15910	Tank 51 riser C1	Transfer valve box WTS-V-78	SS	3	4	26	8
HB-241951-WTS-L-16011	Tank 51 riser V1	Valve box WTS-V-8 line used for flushing	SS	3	4	35	10
HB-241951-WTS-L-16053	Tank 51 valve box WTS-V-76 tie-in	#15912	SS	3	4	23	7
HI-241278-WTS-L-1459	ARP Filtrate line at tie-in to S-512000-RCZ37	Line WTE-L-1459 (at MCU wall/seal plate)	SS	3	4	42	12
HI-241278-WTS-L-1657	Line from seal plate at line WTE-L-1657	tie-in at RCZ38 alias 1253A	SS	3	4	42	12

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
HI-241278-WTS-L-1755	Line from seal plate at line WTE-L-1755	Tie-in at SDP1	SS	3	4	40	12
HI-241949-WTS-L-651A	Tank 49 riser B5 WTS-P-3	Tank 49 VBX (above ground)	SS	3	6	56	16
HI-241949-WTS-L-656A	Tank 49 riser B3 WTS-P-4	Tank 49 VBX (above ground)	SS	3	6	47	14
HI-241950-LD-L-8424	Drain line from Tank 50 valve box	Tank 50	CS	3	N/A	21	6
HL-241000-WTS-L-3	Tie-in line HL-241000-WTS-L-49E	HPP-2(2) via encasement	SS	3	N/A	43	13
HL-241000-WTS-L-33E	HDB-1(11)	Tank 9	SS	3	N/A	142	41
HL-241000-WTS-L-34E	HDB-1(12)	Tank 10	SS	3	N/A	132	39
HL-241000-WTS-L-35E	HDB-1(13)	HPP-3(3)	SS	3	N/A	356	104
HL-241000-WTS-L-36E	HDB-1(14)	Tank 12	SS	3	N/A	230	67
HL-241000-WTS-L-41E	#911	HDB-1(19)	SS	3	N/A	69	20
HL-241000-WTS-L-42E	HDB-1(20)	Tank 9	SS	3	N/A	124	36
HL-241000-WTS-L-43E	HDB-1(21)	Tank 10	SS	3	N/A	116	34
HL-241000-WTS-L-44E	HDB-1(22)	Tie-in with HL-241035-WTS-L-5	SS	3	N/A	318	93

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
HL-241000-WTS-L-45E	HDB-1(23)	Tank 12	SS	3	N/A	215	63
HL-241000-WTS-L-48E	HDB-1(26)	Tank 11	SS	3	N/A	215	63
HL-241000-WTS-L-49E	HDB-1(27)	Tie-in with HL-241000-WTS-L-3	SS	3	N/A	319	93
HL-241-035-WTS-L-16	HDB-2(1)	HPP-4(5)	SS	3	N/A	18	5
HL-241-035-WTS-L-17	HDB-2(16)	Tank 13	SS	3	N/A	177	52
HL-241-035-WTS-L-18-102	HDB-2(15)	Line #102 at Tank 13 cut & capped at HDB-5	SS	3	N/A	171	50
HL-241-035-WTS-L-19	HDB-2(14)	Tank 15	SS	3	N/A	351	102
HL-241-035-WTS-L-2	HDB-1(15)	HPP-1(3)	SS	3	N/A	388	113
HL-241-035-WTS-L-20	HDB-2(13)	Tank 15	SS	3	N/A	355	104
HL-241-035-WTS-L-22	HDB-2(11)	Tank16	SS	3	N/A	359	105
HL-241-035-WTS-L-23	HDB-2(10)	Tank 14	SS	3	N/A	185	54
HL-241-035-WTS-L-24	HDB-2(9)	Tank 14	SS	3	N/A	187	55
HL-241035-WTS-L-3071	HDB-2(28)	cut & capped at HDB-2	SS	3	10	8	2

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
HL-241035-WTS-L-33	HDB-2 overflow to encasement	Tie-in with #68E	SS	3	N/A	140	41
HL-241035-WTS-L-4	HDB-1(18)	HPP-2(3)	SS	3	N/A	367	107
HL-241035-WTS-L-5	Tie-in line HL-241000-WTS-L-44E	HPP-3(2) via encasement	SS	3	N/A	29	8
HL-241035-WTS-L-6	HDB-1(13)	HPP-3(3)	SS	3	N/A	358	104
HL-241035-WTS-L-7	HDB-1(25)	HPP-4(2)	SS	3	N/A	329	96
HL-241035-WTS-L-8	HDB-1(16)	HPP-4(3)	SS	3	N/A	340	99
HL-241035-WTS-L-8E	HDB-1 Encasement drain	Catch tank	SS	3	N/A	399	116
HL-241035-WTS-L-9-HPP1	HPP-1(4)	HDB-2(6) cut & capped	SS	3	N/A	87	25
HL-241035-WTS-L-HP68E	Encasement line #33	Line #8E tie-in	SS	3	N/A	60	18
HL-241035-WTS-L-IAL-25	HDB-2(24)	cut & capped near HDB-8	SS	3	4	660	193
HL-241035-WTS-L-IAL-26	HDB-2(23)	cut & capped near HDB-8	SS	3	4	660	193
HL-241052-WTS-L-21	HDB-5(4)	Tank 21 south riser	SS	1.5	3	94	15
HL-241911-WTS-PSP-5362	Tank 11 annulus transfer line south riser, including new spool piece	Tank 11 Riser 6	SS	3	4	25	7

Table 3.0-1: HTF Transfer Line Segment Listing (Continued)

Line No.	From (a)	To	Core Material (b)	Core Diameter (inches)	Jacket Diameter (inches)	Line Length (ft)	Surface Area (ft^2)
HL-241916-WTS-L-20E	Tank 16(TJ)	Tank 13(5)	SS	3	4	200	58
HM-242016-WEE-L-3932	Evaporator (N5)	Tank 48	SS	2	4	200	40
HM-242016-WEE-L-3933	Evaporator (N11)	Tank 49	SS	2	4	185	37
HM-242016-WEE-L-3935	Evaporator (N7)	Tank 51	SS	2	3	359	71
Total (Carbon Steel)						1,313	283
Total (Stainless Steel)						73,487	21,240
Grand Total (Carbon Steel and Stainless Steel)						74,800	21,523

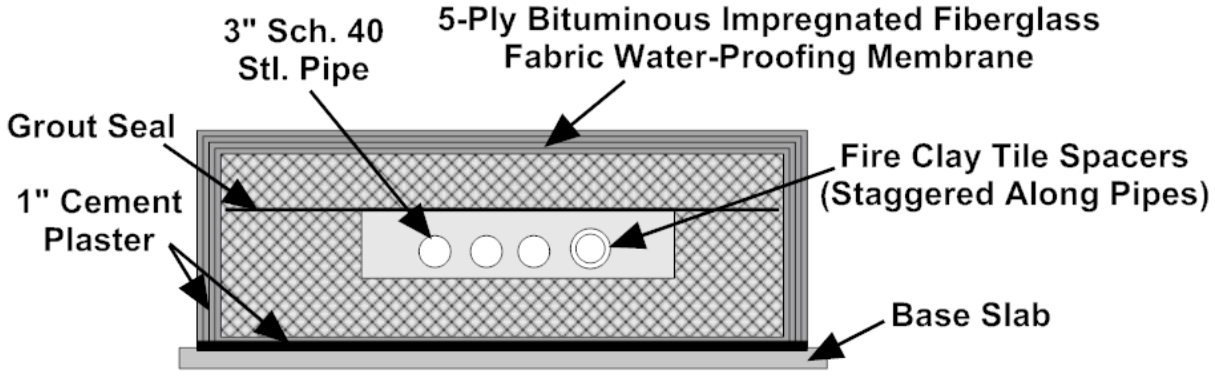
a. Number in "( )" is riser or nozzle identifier.
b. SS = Stainless Steel, CS = Carbon Steel.

Figure 3.0-1: HTF Transfer Line Construction at Tank 30H

The following types of transfer lines exist in the HTF (it should be noted that designation of transfer line type and waste tank type are not related):

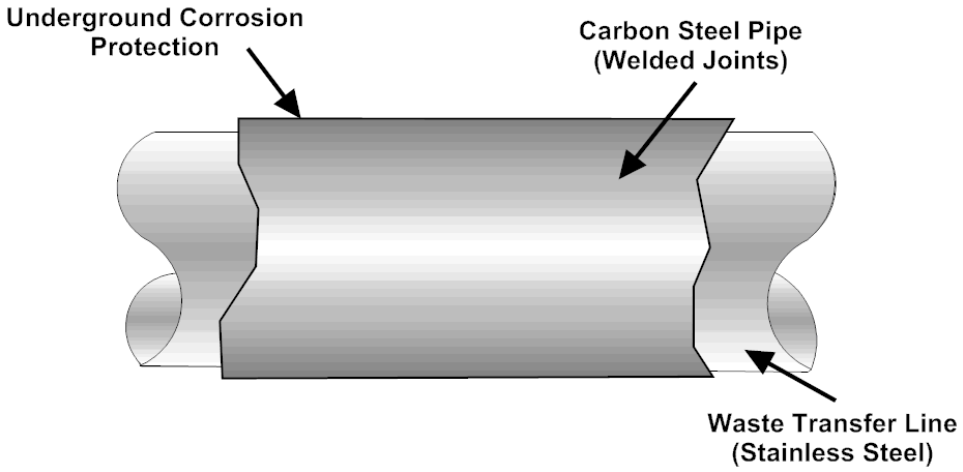
Type I transfer line - The core pipe is constructed of stainless steel, which is enclosed in a covered reinforced concrete encasement below ground (e.g., transfer lines from HDB-1 to Tanks 9 through 12) as shown in Figure 3.0-2. Core pipe leakage into the encasement and in-leakage of ground water into the encasement will gravity drain to the catch tank. The catch tank is described later in this package.

Figure 3.0-2: Type I Line Encasement (Sealed Concrete Trench)



Type II Transfer Line - The core pipe is stainless steel inside a carbon steel jacket (Figure 3.0-3). Pipe joints are typically welded and leak tested. Most jackets are encased in insulation. The portion of the carbon steel pipe in contact with the soil is protected against corrosion with polyethylene film wrap or bituminous coating. Type II transfer lines are the most common type of transfer lines in use.

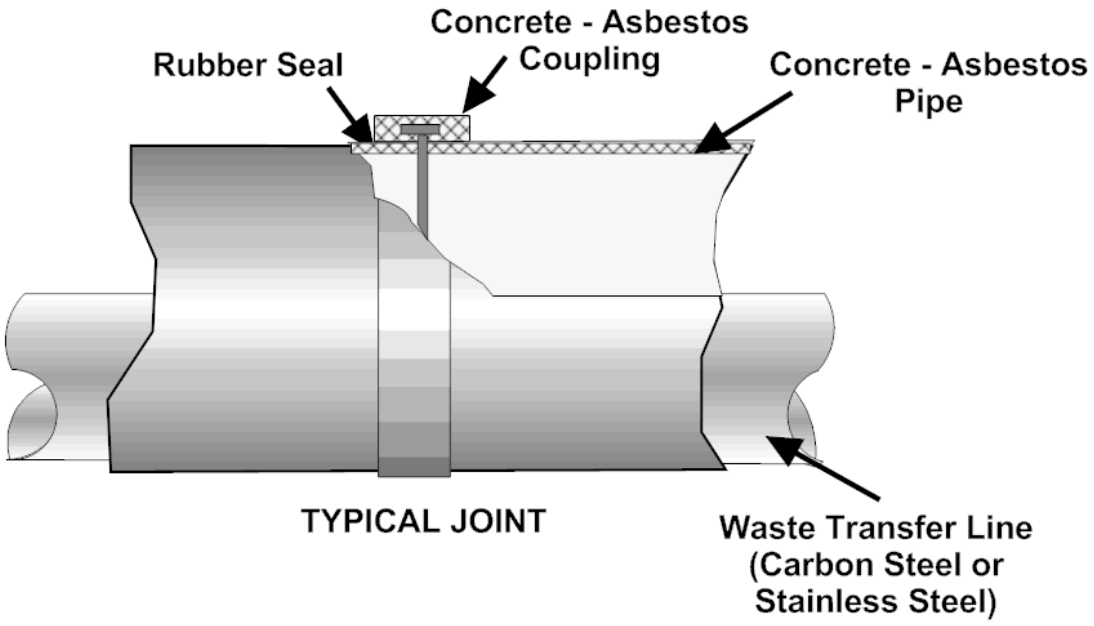
Figure 3.0-3: Type II Line Carbon Steel Jacket



Type IIA Transfer Line - Type IIA lines are similar to Type II except that both core pipe and jacket are of carbon steel. In HTF, there are very few lines of this type, and they are all associated with Tanks 10 through 12 only.

Type III Transfer Line - The core pipe is stainless steel within a cement-asbestos secondary containment with rubber seals in the joints between the sections of cement-asbestos (Figure 3.0-4). Very few of these lines exist in HTF, and the few that do are associated with HDB-3.

Figure 3.0-4: Type III or Type IIIA Line Concrete Asbestos Jacket



Type IV Transfer Line - Type IV lines are similar to Type II except that both the core pipe and jacket are stainless steel. This type of line in HTF is commonly found in use in conjunction with the evaporator systems, especially within the confines of the evaporator cells.

Type VI Transfer Line - Type VI transfer lines are designed to transfer evaporator overheads to and from the CRC. These lines do not have secondary containment. There are a few of these lines in HTF associated with the CRCs in the evaporator systems.

4.0 HTF PUMP PITS AND PUMP TANKS

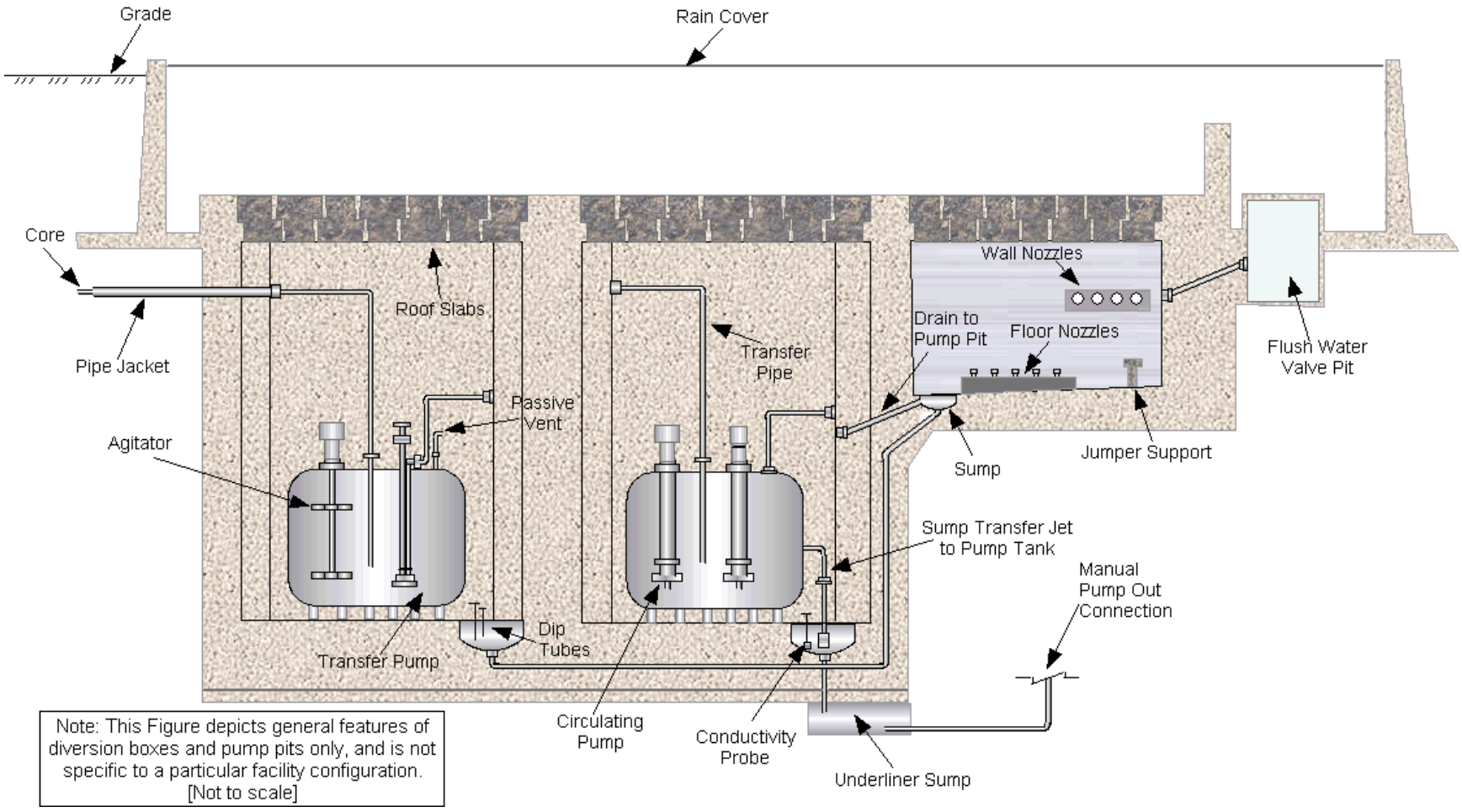
The HTF has 12 PPs (HPP-1 through HPP-10) and the CTSs, old and new. Table 4.0-1 provides a summary of the size and location of the PPs. The PPs are shielded reinforced concrete structures located below grade at the low points of transfer lines and are usually lined with stainless steel. The PP walls are 2 to 3 feet thick (2 feet - 1 inch minimum), with sloped floors that are approximately 3 feet thick (2 feet - 9 inch minimum), and concrete slab cell covers that are 2 to 4 feet thick. All PPs house a pump tank (with the exception of HPP-1) and provide secondary containment for the pump tanks. The CTS was used to facilitate transfers of the concentrate from the 1H Evaporator to selected waste tanks. A second CTS pit was needed to replace the original CTS pit to accommodate additional waste tanks. See Figure 1.01 for locations of the PPs and CTS pits relative to other tank farm components. HPP-1 through HPP-4 and HPP-7 through HPP-10 respectively are co-located with a DB. See Figure 4.0-1 for a typical DB and PP layout. [W163386, W163527]

Table 4.0-1: HTF Pump Pit Sizes and Elevations

Pump Pit	Interior Dimension of Floor Area (ft)	Northern Location [a]	Eastern Location [a]	Minimum Elevation of PP Bottom (ft above MSL)	Minimum Elevation of PP Top (ft above MSL)	References
HPP-1	15 X 15	71477	62007.5	246.9 [b]	282.33	W163386 W163527
HPP-2	15 X 15	71477	62025.5			
HPP-3	15 X 15	71477	62043.5			
HPP-4	15 X 15	71477	62061.5			
HPP-5	18 X 15	71659.5	62950	272.88 [b]	306.5	W714951 W714352
HPP-6	18 X 15	71680.5	62950			
HPP-7	18 X 18	71141.5	61579.5	250 [c]	294	W778702 W778815
HPP-8	18 X 18	71141.5	61601.0			
HPP-9	18 X 18	71141.5	61622.5			
HPP-10	18 X 18	71141.5	61644.0			
CTS (OLD) (242-3H)	14 X 14	71585.8	61549.5	297.18	323	W238758 W238746
CTS (NEW) (242-18H)	14 X 14	71585.83	61506.5	295.625	325	W702909 W702913

a Approximate to centerline of PP
b Bottom of structural slab
c Bottom of concrete below sump
MSL = Mean Sea Level

Figure 4.0-1: Typical Diversion Box and Pump Pit Layout



4.1 HPP-1 Through HPP-4/HPT-2 Through HPT-4

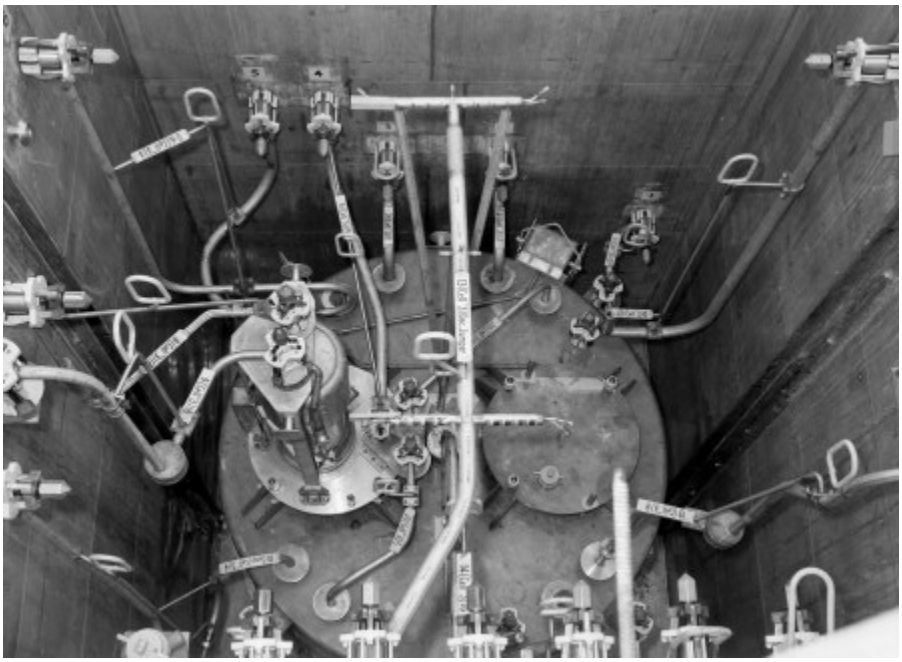
The walls of HPP-1 through HPP-4 are 2 feet - 6 inches to 3 feet - 9 inches thick with sloped floors that are approximately 3 feet thick (2 feet – 9 inch minimum). The cells are 15 feet square. [W163386] The cell covers consist of 12 concrete slabs that are approximately 1 foot - 4 inch thick (four across and three high for each PP). [W163613]. Sheets of 16 gage stainless steel cover the walls and 11 gage stainless steel sheets cover the floor and sump of the individual cells. [W163510] Figure 4.1-1 is a photograph of a typical PP during construction.

Figure 4.1-1: Construction of Typical HTF PP

All the PPs (except for HPP-1) contain a stainless steel pump tank. The PP tank vessels are 12 feet in diameter and 8 feet - 6 inches high. [D116850] The PP provides secondary containment for the pump tank. The PPs have sumps that with a conductivity probe, dip tube, and a transfer pump/jet for level detection and transfer. Additionally, most PP locations have a flush water connection for flushing lines and vessels within the PP. The pump tanks are all approximately 7,200 gallon stainless steel tanks equipped with dip tube level detection for monitoring level. [PV179667]

HPP-1 does not contain a pump tank and is used only for storage of old jumpers (rainwater that collects in the sump is pumped to HPT-3). HPP-2, HPP-3, and HPP-4 each contain a pump tank, HPT-2, HPT-3, and HPT-4, respectively. Figure 4.1-2 shows the interior of HPP-3.

Figure 4.1-2: Interior View of HPP-3



4.2 HPP-5 and HPP-6/HPT-5 and HPT-6

The walls of HPP-5 and HPP-6 are 2 feet – 6 inches to 3 feet thick with sloped floors that are approximately 3 feet thick (2 feet - 9 inch minimum). The cells are 18 feet x 15 feet and cell covers are concrete slabs 4 feet - 3 inch thick. [W714951] Sheets of 11 gage stainless steel cover the walls and 0.375 inch thick sheets of stainless steel cover the floor and sump. [W714953] The PP tank vessels have sloped bottoms and are 12 feet in diameter, each with a capacity of 7,200 gallons. [PV179667]

4.3 HPP-7 through HPP-10/HPT-7 through HPT-10

HPP-7 through HPP-10 are 18 feet square with a height of 38 feet - 8 inches with walls 3 feet to 3 feet – 6 inches thick and sloped floors approximately 3 feet thick. The cell covers are concrete slabs that are 4 feet - 3 inch thick. [W778815] Sheets of 0.25 inch thick stainless steel cover the walls and 0.375 inch thick stainless steel sheets cover the floor and sump. [W778850] The tank vessels have sloped bottoms and are 12 feet in diameter, each with an approximate operating capacity of 6,000 gallons. [W752789]

4.4 CTS Pump Pit Building 242-3H (Old)

242-3H PP (Figure 4.4-1) is a 14 foot square cell with walls that are 1 foot – 8 inches to 2 feet thick reinforced concrete and sloped floors that are approximately 2 feet thick. The cell covers are reinforced concrete slabs with minimum thickness of 3 feet. [W238758] Sheets of stainless steel cover the walls, floor, gutter, and sump. [W238862] The PP tank vessel has a sloped

bottom and is 8 feet in diameter with a capacity of approximately 3,000 gallons. [D139006] This PP was retired from service in 1979 and replaced with a new CTS PP to accommodate additional waste tanks.

Figure 4.4-1: Construction of HTF CTS Pump Pit Building 242-3H (Old)

4.5 CTS Pump Pit Building 242-18H (New)

242-18H PP (Figure 4.5-1) is a 14 foot square cell with walls of reinforced concrete that are minimum 2 feet thick and sloped floors approximately 2 feet. [W702913] The cell covers are reinforced concrete slabs approximately 3 feet thick. [W702914] Sheets of 11 gage stainless steel cover the walls and 0.375 inch thick stainless steel sheets cover the floor, gutter, and sump. [W702915] The PP tank vessel has a sloped bottom and is 8 feet in diameter with a capacity of approximately 3,000 gallons. [D139006]

Figure 4.5-1: HTF CTS Pump Pit and Pump Tank

5.0 CATCH TANK

There is a single catch tank in HTF designed to collect drainage from HDB-1 and the Type I tank transfer line encasements. These transfer lines run primarily from Tanks 9 through 16 to HDB-1 and HDB-2. The transfer line encasement slopes towards the catch tank to collect leakage from the transfer line core pipe and in-leakage from ground water. The catch tank is located west of HDB-1. No significant contamination has been collected in this tank and is not modeled as a source for contamination in the HTF PA; however, its description is provided for completeness.

The catch tank is a dished head stainless steel tank with a straight shell length of 30 feet, 8 feet in diameter, and a capacity of approximately 11,700 gallons. [D129961] It is located in an underground reinforced concrete cell with walls that are 2 feet - 8 inches thick, with a 2 feet - 11 inches thick cover, and a floor that is 3 feet - 10 inches thick. The floor of the catch tank is sloped to drain liquid into a sump and the bottom elevation of the floor, which is approximately at 241 feet above MSL and rests on a 4 inch base slab. [W149426]

6.0 EVAPORATOR SYSTEMS

There are three evaporator systems in the HTF, the 242-H evaporator system (1H Evaporator), the 242-16H evaporator system (2H Evaporator), and the 242-25H evaporator system (3H Evaporator). The evaporators are used to reduce the amount of liquid volume of radioactive waste resulting from nuclear processes. The evaporator systems are principally comprised of the evaporator, the overheads system, and the condenser. The 242-H evaporator system also includes the CTS, which was used to distribute evaporator bottoms throughout HTF (see Figure 1.0-1 for evaporator system locations within HTF). Table 6.0-1 provides evaporator system locations and elevations.

Table 6.0-1: Evaporator System Locations and Elevations

Evaporator System	North Location	East Location	Reference	Elevation of Cell Bottom (ft above MSL)	Top Elevation (ft above MSL)	Reference
242-H	71521	61716	W231132	314.5	348.5	W231299
242-16H	71173	62695	W702194	333.72 [a]	374.78 [b]	W702199
242-25H	71913	61398	W835332	295	345 [c]	SE5-2-2004313

Note Location is centerline of evaporator.
a Top of evaporator sump floor
b Top of cell covers over condenser (N71191, E62691)
c. Top of cell covers – does not include enclosure building.

6.1 242-H Evaporator System

The 242-H evaporator cell is a cuboid with a 16 feet x 15 feet base and a height of 25 feet. The cell includes a floor sump measuring 2 feet x 2 feet x 2 feet - 6 inches deep. The cell covers are 1 foot thick reinforced concrete. The cell provided containment for the evaporator and served as shielding for personnel protection. [W231299] Figure 6.1-1 is a sketch of 242-H Evaporator.

6.1.1 242-H Evaporator Vessel/Pot

The evaporator pot, located inside the 242-H evaporator cell, is a stainless steel cylindrical vessel with a conical bottom. The cylindrical portion is 8 feet in diameter and the overall height of the vessel is 15 feet. The evaporator was used to concentrate liquid in order to reduce waste volumes. [W703006] Figure 6.1-2 is a view of the top of the evaporator.

6.1.2 242-H Evaporator Overheads System

The receiver cell is a cuboid with a 15 feet x 8 feet - 10 inch base and a height of 16 feet - 6 inches. The receiver cell includes a floor sump, with the sump having a 1 foot - 6 inch square base x 1 foot - 6 inch depth. The receiver cell provided containment for the two overheads vessels. The overheads vessels functioned as receipt tanks for liquids condensed from evaporator vapors via the 242-H condenser. [W231299]

Figure 6.1-1: 242-H Evaporator Detail Sketch

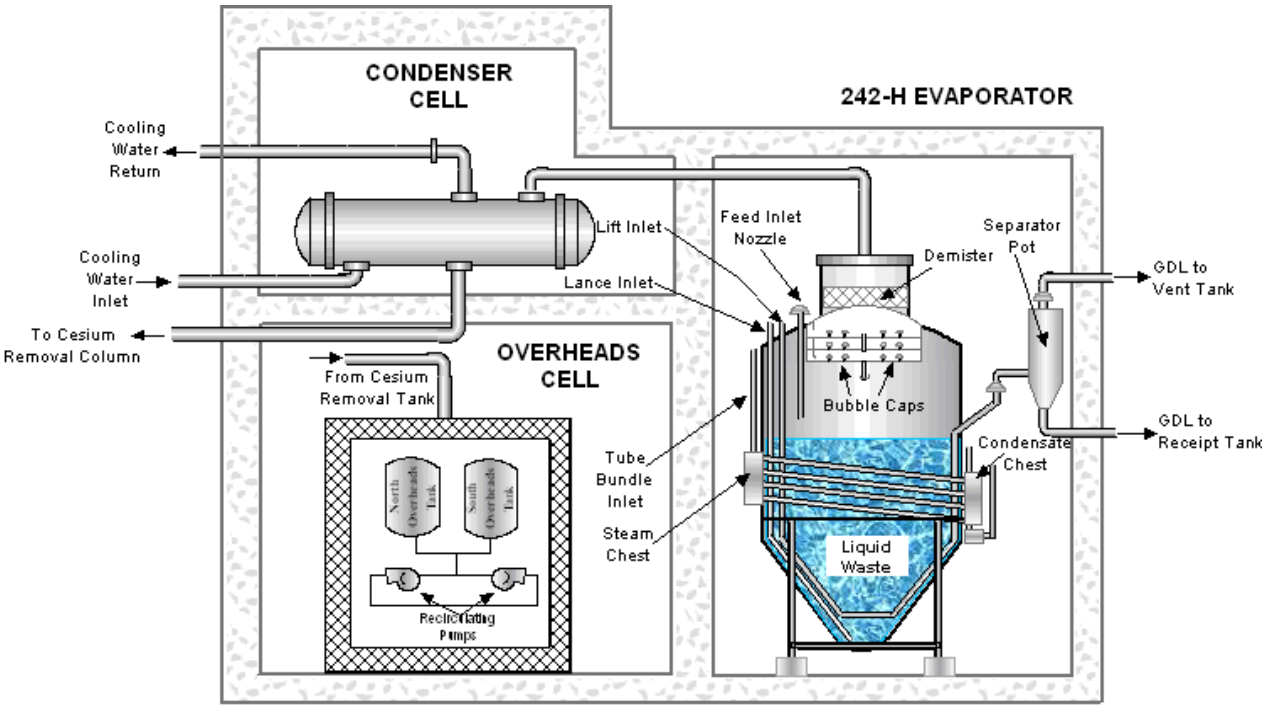
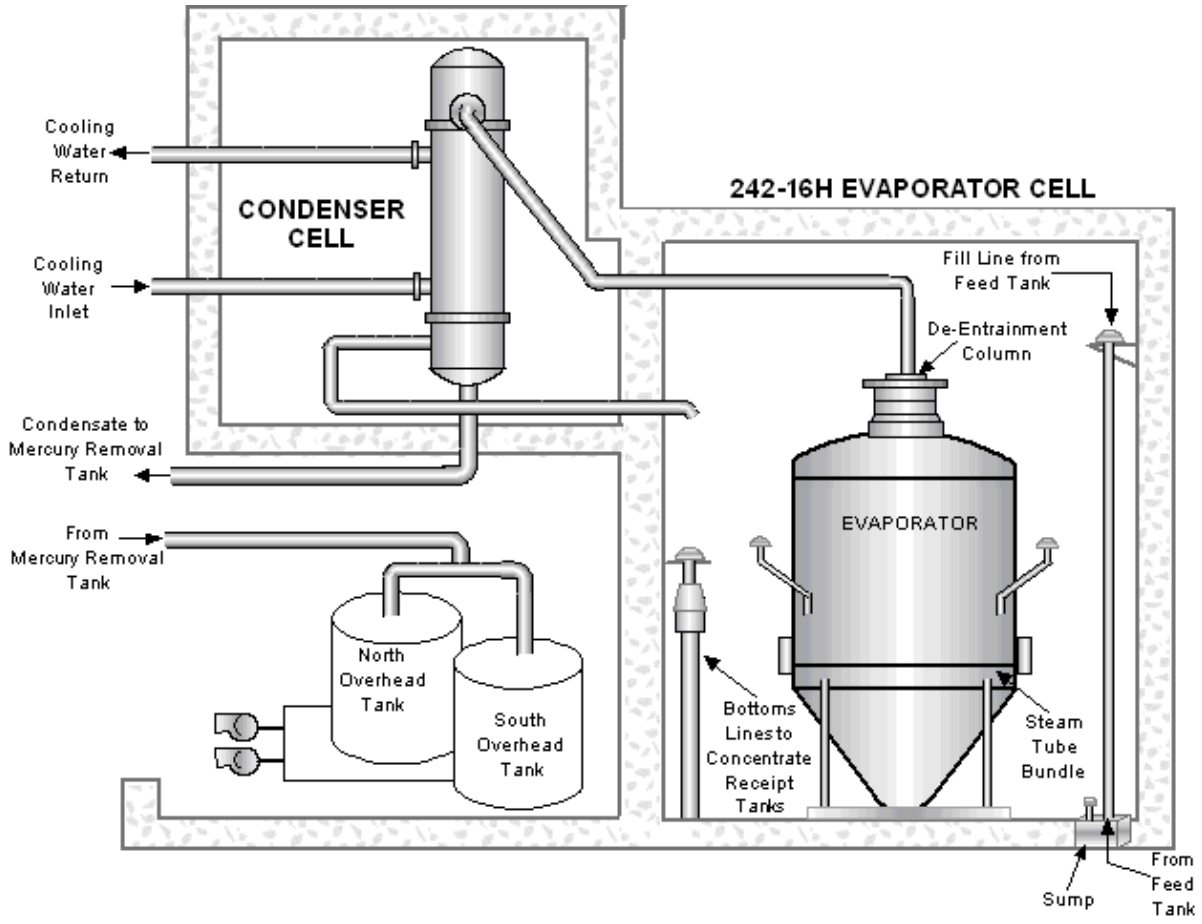


Figure 6.1-2: Top View of the 242-H Evaporator Vessel

6.2 242-16H Evaporator System

The 242-16H evaporator facilities are arranged into three cells and a gang valve house. The evaporator cell contains the evaporator; the condenser cell contains the condenser; and a diked overheads cell contains overheads system components other than the condenser as shown in Figure 6.2-1.

Figure 6.2-1: 242-16H Evaporator System Schematic



6.2.1 242-16H Evaporator Building

The evaporator cell is 16 feet x 16 feet and approximately 25 feet high. The walls are constructed of concrete that is 3 feet - 6 inches thick and lined with 11 gage stainless steel. The floor is lined with 0.375 inch stainless steel plate. The roof consists of 1 foot thick concrete slab sections covered with a sloped galvanized steel rain cover with access ports. The evaporator cell is stainless steel lined for collecting leakage from equipment inside the evaporator or condenser cells, leakage from the lift/lance/evaporator cell sump gang valve vent header, and liquid from cell spray operations. An evaporator underliner sump collects any leakage through the concrete or stainless steel liner. [W702199, W702678]

The condenser cell is 10 feet - 6 inches x 9 feet - 8 inches x 15 feet - 6 inches high with 2 feet thick concrete walls. The roof is composed of 1 foot thick concrete slab sections and a sloped, galvanized steel rain cover with access ports. The condenser cell contains a 1 foot high stainless steel liner pan on a sloped floor. The condenser cell has an opening to the evaporator cell for the de-entrainment column piping and permits airflow to the evaporator cell. [W702199, W702678, W702679]

The overheads cell is 15 feet x 21 feet x 21 feet high, constructed of concrete and contains the following primary equipment: two overheads tanks, mercury removal tank, CRC feed tank, two CRC pumps, and two overheads pumps. This cell has a 14 inch high concrete curb and a sloped floor which are lined with 11 gage stainless steel. [W702199, W702678, W702679]

6.2.2 242-16H Evaporator Vessel/Pot

The 242-16H evaporator vessel is 8 feet in diameter and a height of 19 feet from the top of the demister to the bottom of the conical shaped lower section. The vessel is constructed of 0.5 inch stainless steel. There are multiple evaporator vessel service/equipment lines installed in, or penetrating the vessel, including the feed inlet nozzle, steam tube bundle, warming coil, lift lines, de-entrainment column, lance lines, and the seal pot. Figure 6.2-2 provides a top view of the 242-16H evaporator vessel. [W449644]

Figure 6.2-2: Top View of the 242-16H Evaporator Vessel

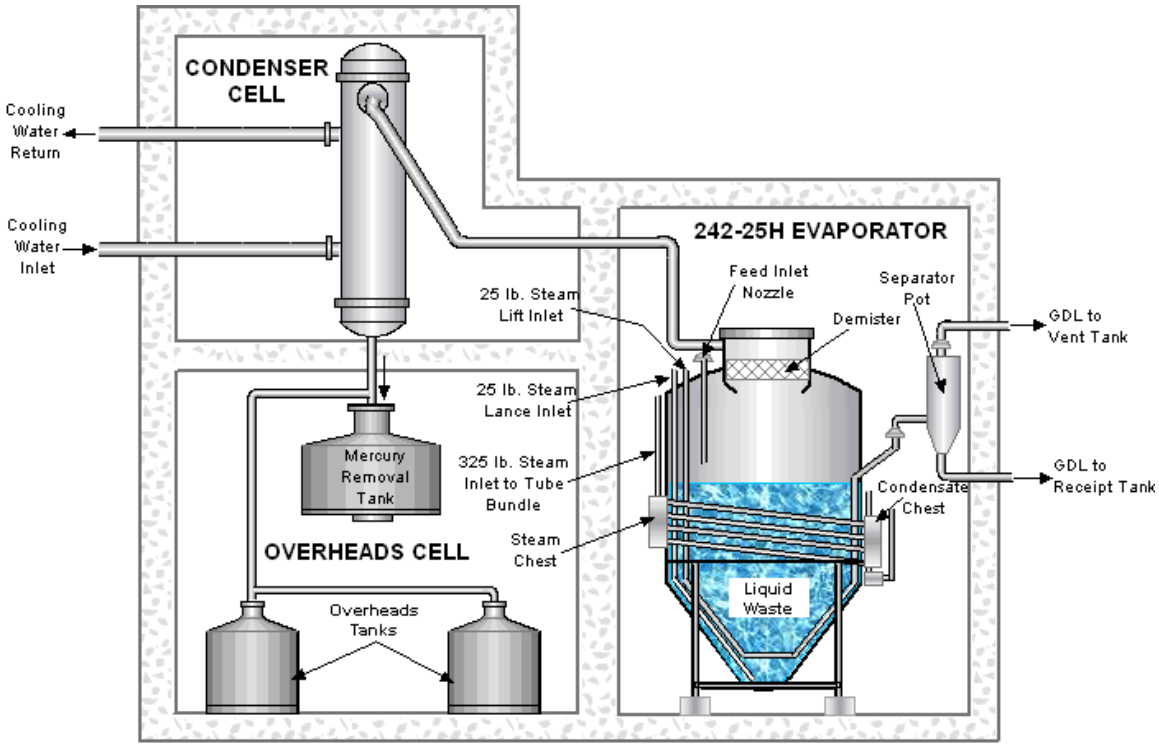
6.2.3 242-16H Evaporator Overhead System

The 242-16H overheads system includes the condenser, mercury removal tank; CRC feed tank, two CRC pumps, two overheads tanks, and two overhead pumps. The condenser is a vertical, single-pass, counter-flow tube and shell type heat exchanger located in the condenser cell. The mercury removal tank receives condensed overheads from the condenser. When full, the stainless steel tank overflows to the CRC feed tank, permitting the heavier mercury to settle out and remain in the tank. The tank vents to the condenser cell, which vents and drains to the evaporator cell. The path from the evaporator vessel to the stainless steel overheads tanks travels through a stainless steel CRC feed tank. [W702199]

6.3 242-25H Evaporator System

The 3H Evaporator system is located within building 242-25H. The 242-25H evaporator facility includes the evaporator cell which houses the evaporator vessel (pot), the condenser cell and condenser, and an overheads cell which contains the overheads system (that includes the mercury removal tank, mercury removal station, two overheads tanks and two overhead pumps). Figure 6.3-1 shows the 3H evaporator system configuration. [SE5-2-2004260, W835332, W2010385]

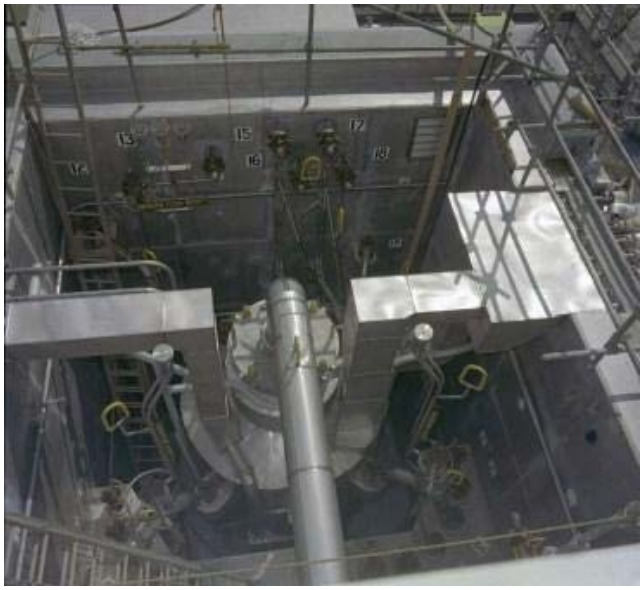
Figure 6.3-1: 242-25H Evaporator System Schematic



6.3.1 242-25H Evaporator Building

The evaporator cell is 27 feet - 6 inches x 20 feet x 32 feet - 9 inches high with 3 feet - 6 inch thick concrete walls and 3 feet - 6 inch thick roof composed of concrete slab sections. The evaporator cell floor and sump are lined with 0.375 inch thick stainless steel and the walls are lined with 11 gage stainless steel. [W835332, W835333, W838269] Figure 6.3-2 provides a top view of the evaporator vessel and the evaporator cell.

Figure 6.3-2: Top View of the 242-25H Evaporator Vessel and Cell



The condenser cell is 10 feet - 9 inches x 19 feet x 18 feet high with concrete walls that are a minimum of 2 feet thick and a roof composed of 2 feet thick concrete slabs. The condenser cell contains a 0.25 inch thick stainless steel liner pan on a sloped floor and 6 inches high 11 gage stainless steel wall liner. The condenser cell has an opening to the evaporator cell for the routing of the de-entrainment column piping and to provide airflow to the evaporator cell. [W835332, W835333, W838269]

The overhead cell is below grade and is 25 feet x 24 feet x 23 feet in height. This cell contains a mercury removal tank, two overheads tanks, an overheads tank sample system, and two overheads pumps. The overhead cell contains a 0.25 inch thick stainless steel liner pan on a sloped floor and 14 inches high, 11 gage stainless steel wall liner. [SE5-2-2004260, W835335, W838269]

6.3.2 242-25H Evaporator Vessel/Pot

The 242-25H evaporator vessel has a capacity of approximately 19,000 gallons. The insulated vessel is 14 feet in diameter and 26 feet - 6.375 inches in height to the top of the demister from the conical shaped bottom. The vessel shell is constructed of 0.5625 inch thick stainless steel and the cone is comprised of 0.4038 inch thick stainless steel. There are multiple evaporator vessel service/equipment lines installed in, or penetrating, the vessel, including the feed inlet nozzle, steam tube bundle, warming coil, lift lines, de-entrainment column, lance lines, and the seal pot. [AA98142C Sheets 31 and 40] Figure 6.3-3 provides a view of the bottom of the 242-25H evaporator vessel.

Figure 6.3-3: View of the Bottom of the 242-25H Evaporator Vessel

6.3.3 242-25H Evaporator Overhead System

The 242-25H overheads system includes the condenser, mercury removal tank, two overheads tanks, and two overhead pumps. The condenser is a vertical, single-pass, counter-flow tube and shell type heat exchanger located in the condenser cell. The mercury removal tank receives condensed overheads from the condenser. A drain valve leads from the bottom of the tank to the mercury collection station located in the overheads receiver cell. The overheads are pumped to the Effluent Treatment Project (ETP) by one of the two recirculation pumps. The tank vents to the condenser cell, which vents and drains to the evaporator cell. Figure 6.3-4 provides a view of the Overheads System Condenser. [W835333]

Figure 6.3-4: 242-25H Evaporator Overheads System Condenser

7.0 DIVERSION BOXES, VALVE BOXES, ETC.

The HTF contains a total of eight DBs (see Figure 1.0-1 DB locations). Two of the DBs are incorporated with the design and construction of multiple PPs. HDB-2 is incorporated with HPP-1 through HPP-4 and HDB-8 is incorporated with HPP-7 through HPP-10. [W163527, W778815]

Diversion boxes are shielded reinforced concrete structures that provide a central location for waste transfer lines. The DBs contain transfer line nozzles to which jumpers are connected in order to direct waste transfers to desired waste tanks and pump tanks. This reduces the number of transfer lines necessary to perform diverse transfers amongst tanks and other facilities. Each of the DBs are associated with, and provide connections to a group of tanks that are categorized as shown in Table 7.0-1 (see Figure 1.0-1 for locations). Figure 7.0-1 shows the interior of HDB-1 and Figure 7.0-2 shows HDB-3 during the concrete cell and transfer pipe construction phase. [W147544, S5-2-1341]

Table 7.0-1: Diversion Boxes and Associated Service

Diversion Box	Associated Service
HDB-1	Type I Tanks 9 – 12
HDB-2	Type I Tanks 9-12, Type II Tanks 13-16
HDB-3	Type IV Tanks 29 – 32
HDB-4	Type III Tank 29-32
HDB-5	Type IV Tanks 21-24
HDB-6	Type IIIA Tanks 35-37
HDB-7	Type IIIA Tanks 38-43, Tanks 48-51
HDB-8	Transfers to/from HDB-5, HDB-6, HDB-7 or transfers from FTF and the Defense Waste Processing Facility (DWPF).

Figure 7.0-1: Interior of HDB-1

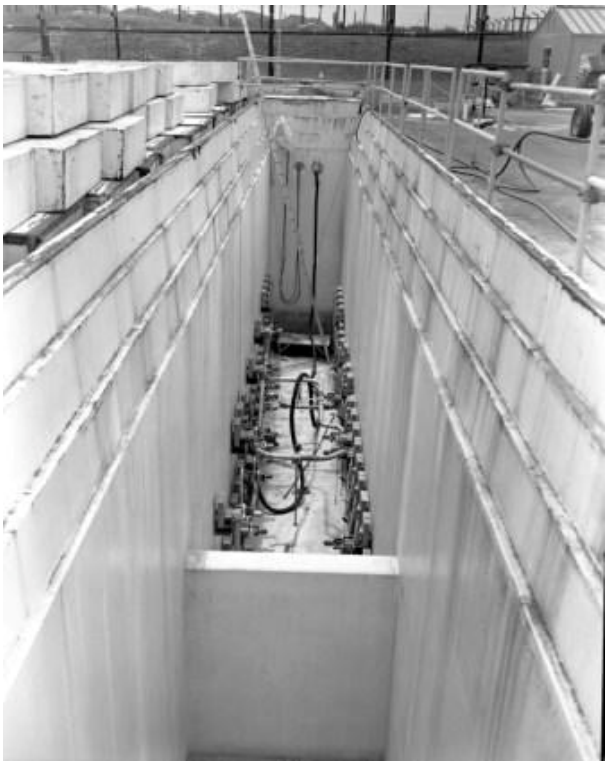


Figure 7.0-2: HDB-3 During Construction

HDB-1 is 78 feet long x 7 feet wide x 21 feet high with reinforced concrete walls that are a minimum of 1 foot - 6 inches thick and taper to accommodate the two layers of concrete slab that form a roof of approximately 2 feet - 8 inches thick. The sloped, reinforced concrete floor is a minimum of 2 feet - 6 inches thick. [W158080]

HDB-2 is a 26 feet long x 15 feet wide rectangle that is incorporated with HPP-1 through HPP-4. HDB-2 walls area reinforced concrete a (minimum) of 3 feet thick with a sloped floor of reinforced concrete approximately 4 feet - 6 inches thick. The DB covers are concrete slabs and the walls and floor are lined with stainless steel. [W163386]

HDB-3 is a square with outside dimensions of 6 feet - 8 inches. The concrete walls and floor are 10 inches thick and the concrete slabs that comprise the roof are 8 inches thick. [S5-2-1341]

HDB-4 is an octagon with a 10 feet x 7 feet inside diameter. It is comprised of reinforced concrete walls (minimum) 18 inches thick and a sloped, reinforced concrete floor that is approximately 2 feet - 6 inches thick. The cover is a reinforced concrete plug with 7 feet - 8 inches inside diameter and 3 feet thick. Stainless steel plate covers the walls, floor, and sump. [W236630]

HDB-5 is an octagon with an inside diameter of 10 feet x 7 feet. It is comprised of reinforced concrete walls that are (minimum) 18 inches thick and a sloped, reinforced concrete floor that is approximately 2 feet - 4 inches thick. The cover is a reinforced concrete plug with an inside diameter of 7 feet - 8 inches with a thickness of 3 feet. Stainless steel plate covers the walls, floor, and sump. [S5-2-4262]

HDB-6 is a 15 foot square with walls and floor that are comprised of reinforced concrete; the walls are (minimum) 18 inches thick and sloped floor approximately 2 feet - 11 inches thick. The cover for the DB is comprised of reinforced concrete slabs that are 3 feet thick. Stainless steel sheets cover the wall, floor and sump. [W700547]

HDB-7 is a 25 foot long x 19 foot wide rectangle with walls and floor that are comprised of reinforced concrete; the walls are (minimum) 2 feet - 6 inches thick and the (sloped) floor is approximately 3 feet - 4 inches thick. The cover for the DB is comprised of reinforced concrete slabs that are 3 feet thick. Stainless steel covers the walls, floor and sump. [W703874]

HDB-8 is a 20 feet long x 24 feet wide rectangle that is incorporated with HPP-7 through HPP-10. The HDB-8 walls are reinforced concrete with a minimum thickness of 3 feet. The floor is reinforced concrete that is 3 feet thick. The DB cover is comprised of reinforced concrete slabs approximately 4 feet - 3 inches thick. The walls, floor, and sump are lined with stainless steel. [W778815, W778818]

8.0 TRANSFER VALVE BOXES

Valve boxes provide passive containment for valve manifolds which allow waste to be transferred to one of several different locations using common transfer lines. Valve boxes house permanently installed valve manifolds within a heavily shielded concrete box. The valves are manual ball valves installed within removable jumpers with flush water connections. The valve boxes serve specific transfers that are conducted as needed to support facility operations. Valve boxes are generally located adjacent to the tanks they provide transfer isolation capability for - depending on the type of transfer being performed. [W2017867]

The valve boxes are constructed of stainless steel and provide secondary containment for the valve manifolds they house. All valve boxes contain conductivity probes which actuate control room alarms if leakage is detected. Leakage that collects in the valve box will generally drain to the associated waste tank, DB or LDB. Valve boxes do not have forced ventilation and are passively ventilated primarily via atmospheric breathing. The valve boxes associated with HTF are further described below. [W2017867]

Valve Box 15/16 - Valve box for Tanks 15 and 16 contains a transfer line connection to HDB-2. Valve Box 15/16 design is shown on drawing S5-2-11980.

Tanks 21 and 22 Valve Boxes - Valve box design details for Tanks 21 and 22 are shown on drawings P-PM-H-7723 and P-PM-H-7726, respectively.

Tank 40 Valve Box and Tank 40 Drain Valve Box - Valve box and drain valve box design details for Tank 40 are shown on drawings W802781 and D199324, respectively.

Tank 42 Valve Box - Valve box design for Tank 42 is shown on drawing W740180.

Tank 49 Valve Box - Valve box design for Tank 49 is shown on drawing D189542.

Tank 50 Valve Box - Valve box design for Tank 50 is shown on drawing P-PJ-H-7973.

Tank 51 Valve Box and Tank 51 Drain Valve Box - The valve box for Tank 51 is used for transfers in and out of the tank. The design of the Tank 51 valve box and the Tank 51 drain valve box are shown on drawings W800445 and W807558, respectively.

241-96H Valve Box - The 241-96H valve box allows transfers in and out of the Building 241-96H MST strike tanks. This valve box design is shown on drawing C-CM-H-7026.

9.0 LEAK DETECTION BOXES

The LDBs are the primary means of detecting leaks from the waste transfer piping. The LDBs are situated at the low point of a transfer line, near a waste tank or DB where a transfer pipe penetrates the containment wall. Figures 9.0-1 and Figure 9.0-2 show where the LDBs are located in relation to other ancillary equipment.

The LDBs are horizontal, carbon steel cylinders, with capped ends. They are located below grade level in proximity to a waste tank or DB that transfer lines penetrate. Each LDB is coated with protective coatings to protect it from corrosion. The components of a typical LDB include a conductivity probe, a set of dip tubes, an overflow line, and a drain line. The overflow plug is normally removed but is installed during pressure testing to ensure a pressure seal is maintained within the transfer piping and LDB. To support LDB conductivity probe operability, the drain plug must be installed and must prevent waste from draining past the probe undetected. The conductivity probe will annunciate a control room alarm if liquid is detected. Figure 9.0-3 shows a typical LDB. [W715343]

Figure 9.0-1: West Hill LDB and MLDB Locations

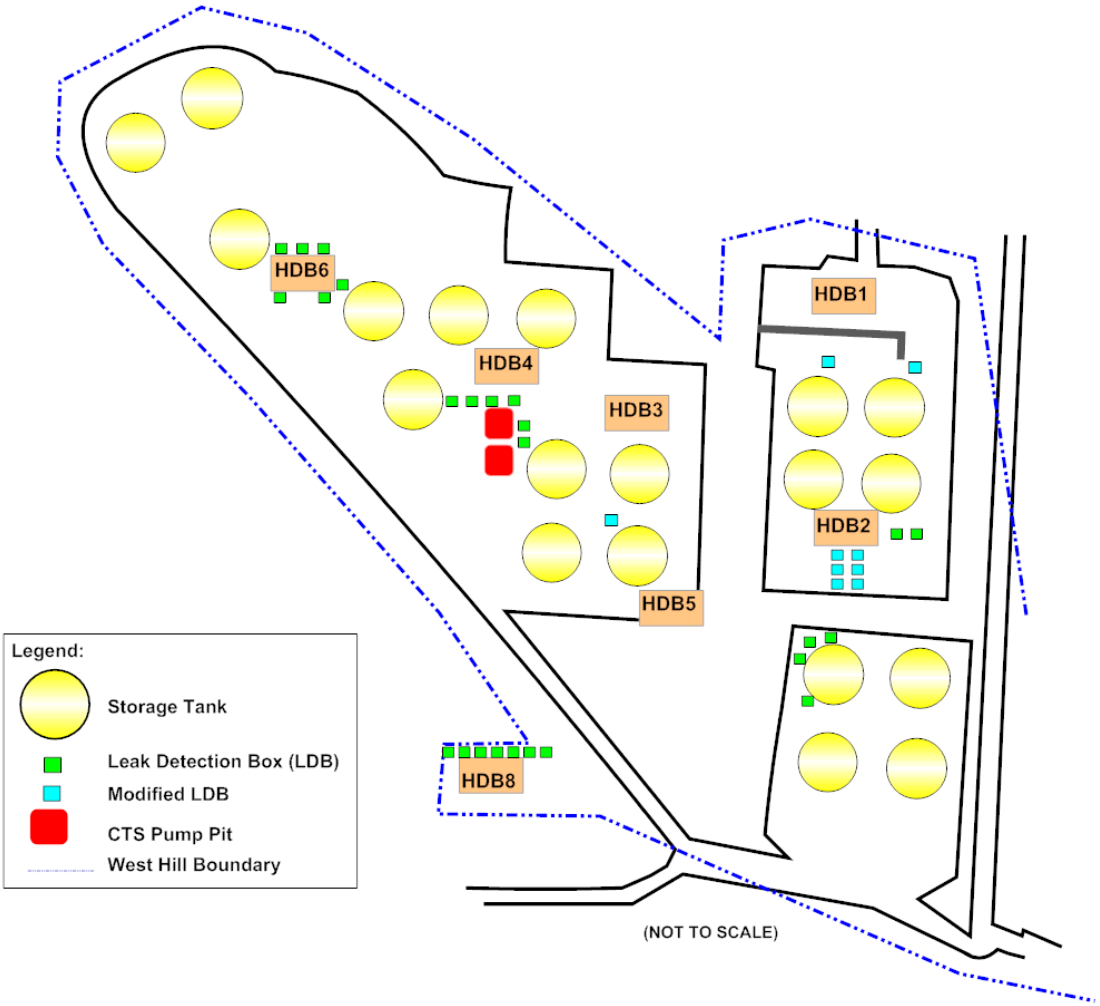


Figure 9.0-2: East Hill LDB Locations

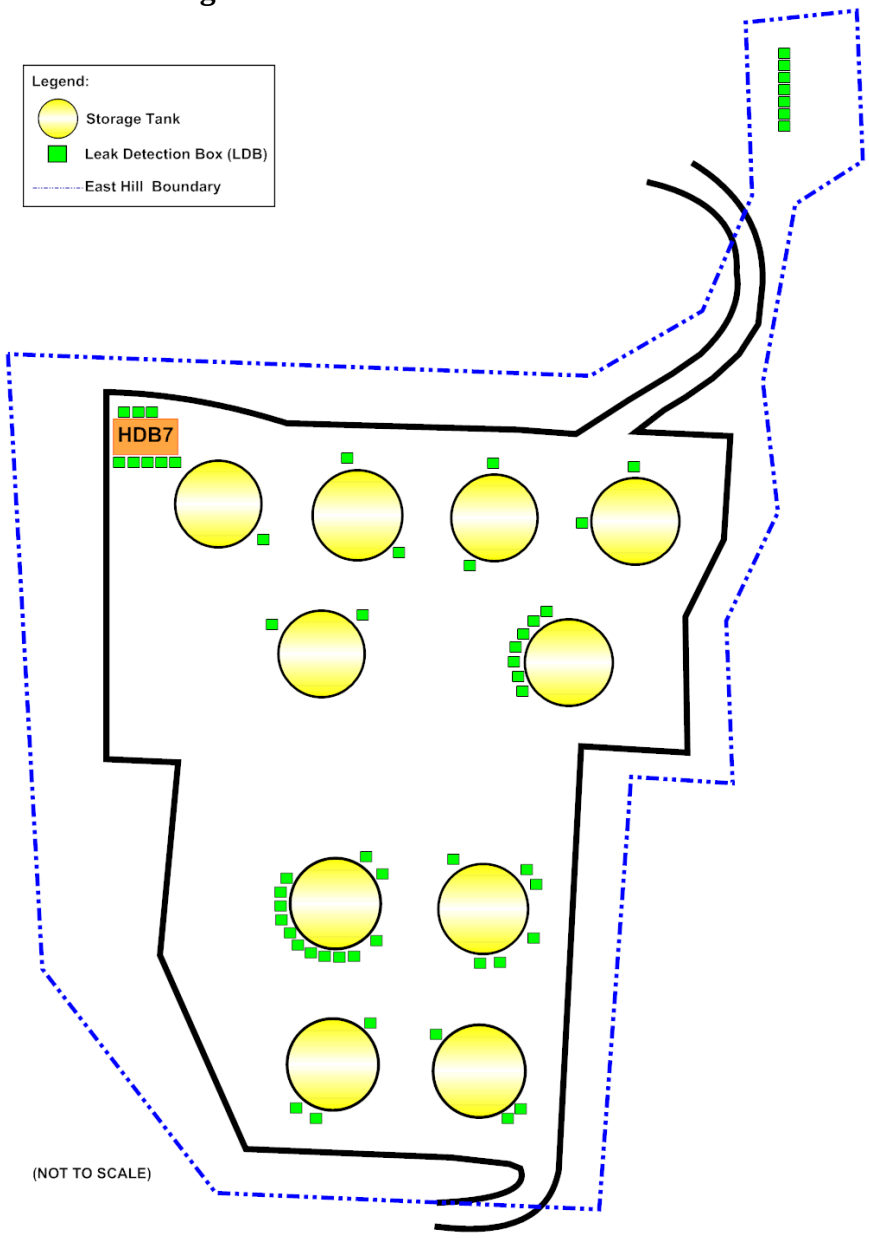
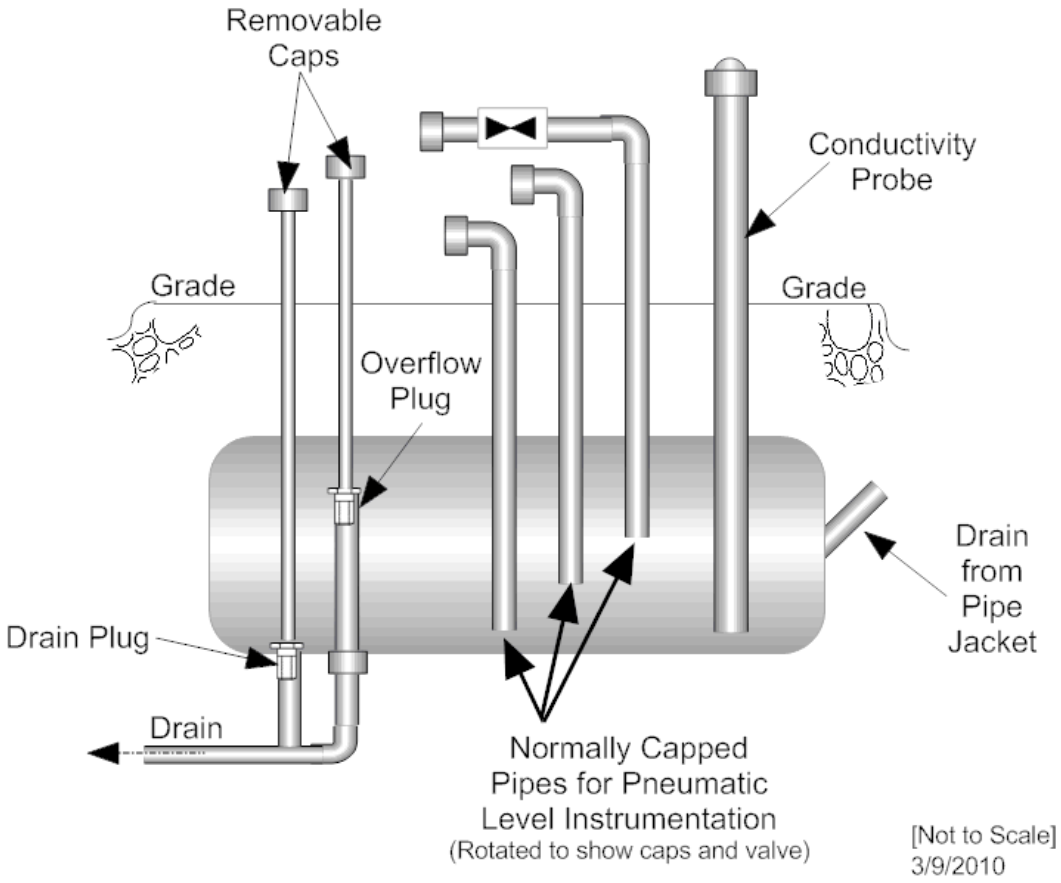
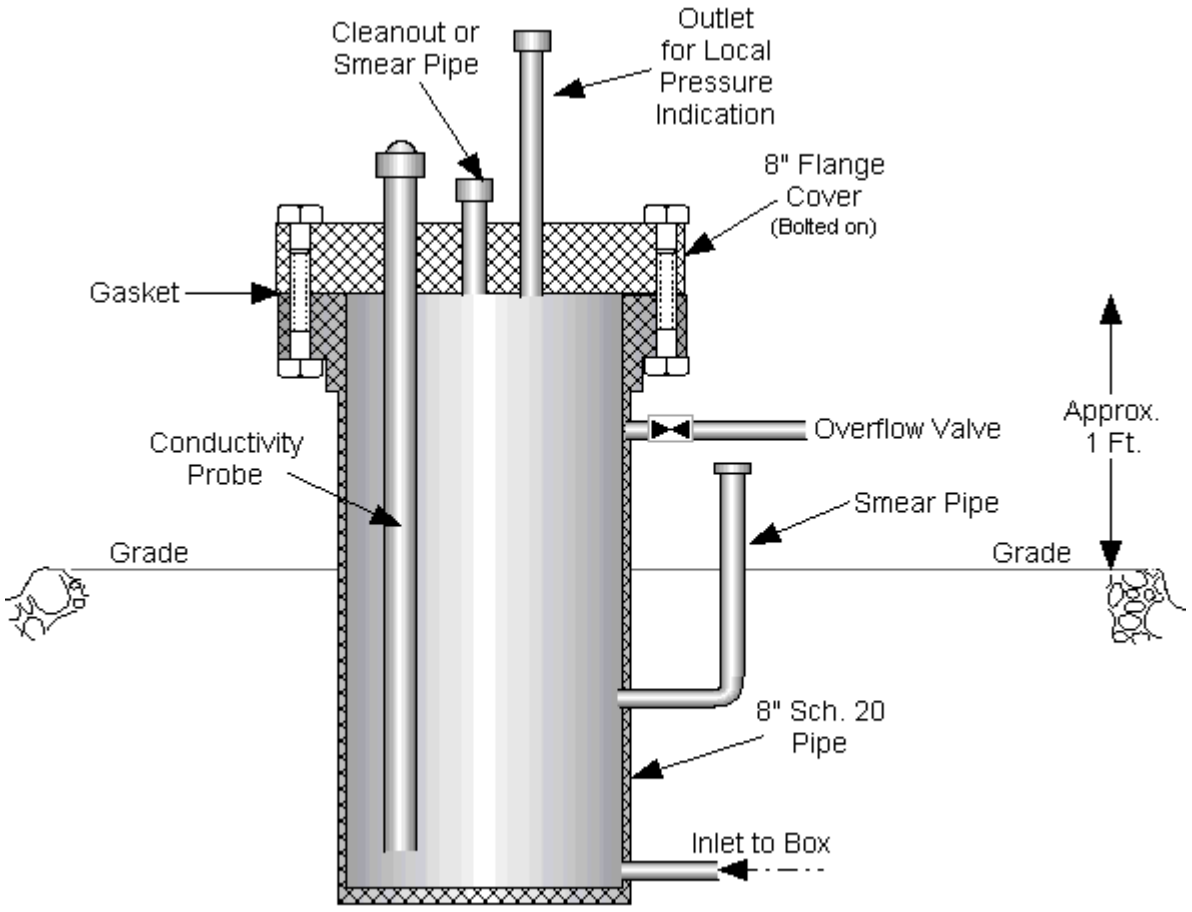


Figure 9.0-3: Typical Leak Detection Box



The MLDBs are used in place of LDBs in areas where the LDB cannot be gravity drained. Part of the MLDB extends above the ground. Each MLDB is coated with protective coating to protect it from corrosion. The MLDB consists of a vertical pipe flanged at the top with three 1 inch to 1.5 inch pipe extending out of the top flange. MLDBs have a level conductivity probe located near the bottom of the MLDB. In addition to a conductivity probe, MLDBs also include an overflow line that is routed a DB or PP, and an above ground pressure gauge to monitor for potential over-pressurization. A cleanout/smear pipe provides a means to sample, smear, or measure the contamination level of the MLDB. The cleanout/smear pipe also can be used to empty the MLDB, using a portable pump. Figure 9.0-4 shows a typical MLDB. [W702976]

Figure 9.0-4: Typical Modified Leak Detection Box



[Not to Scale]

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