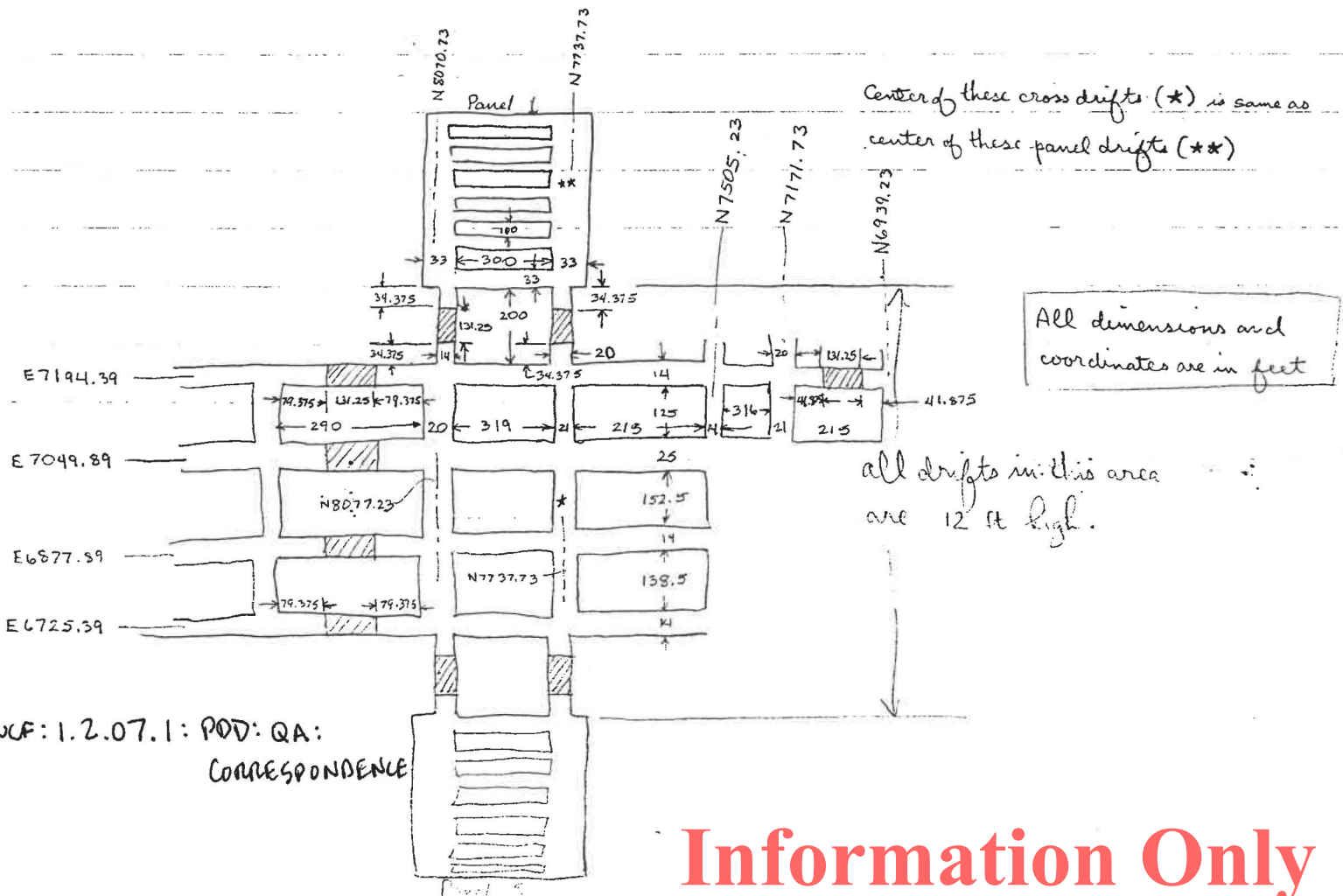


# Updated Waste Storage Volumes

J. Schreiber

- Accounts for most recent seal sizes : 131.25 ft in length (SAND90-0355, p. 53)
- Assumes seals are located centrally along the adjacent pillar (SAND90-0355, p. 51)
- All access drifts are 12 ft high ; this includes all of the North and South Equivalent Panels. (Bechtel 1986, pp 3-13 + 12-55 ; SAND90-0355, p. 51)
- Access drifts into the 8 Panels are 20 ft x 14 ft wide (intake + exhaust drifts, respectively) (Bechtel 1986 p 12-55 ; SAND90-0355, p. 51-52), even though the connecting cross drifts are 21 ft wide (extending from the 20 ft wide intake drifts) and, in the case of Panels 1 + 8, the cross drifts extending from the 14 ft wide exhaust drifts are 20 ft wide.
- Existing or planned widened areas in the access drifts (e.g., in S1600 between E140 + W30) are ignored.



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7/29/91

J. Schreiber

Updated Waste Storage Volumes

8 Panels

- a) 7 rooms each 300' x 33' x 13'
- b) 2 drifts each (7.33' + 6.100') x 33' x 13' = 831' x 33' x 13'
- c) 1 access drift (shand) 34.375' x 14' x 12'
- d) 1 access drift (intake) 34.375' x 20' x 12'

	Floor Area				Volume			
	Each Item		Total of all parts of each item		Each Item		Total	
	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>3</sup>	m <sup>3</sup>	ft <sup>3</sup>	m <sup>3</sup>
a)	9900	919.740096	69300	6438.180672	128700	3644.37815639	900900	25510.6470947
b)	27423	2547.68006592	54846	5095.36013184	356499	10094.9274922	712998	20189.854986
c)	481.25	44.709588	481.25	44.709588	5775	163.529789068	5775	163.529789068
d)	687.5	63.87084	687.5	63.87084	8250	233.613984384	8250	233.613984384
Total 1 Panel			125314.75	11642.1212318			1627923	46097.645854
Total 8 Panels			1002518.	93136.9698544			13023384	368781.166837

7/29/91

J. Schreiber

Updated Waste Storage Volumes

NEP

- E300 ( 79.375 + 20 + 319 + 21 + 215 + 14 + 316 + 21 + 41.875 ) x 14' x 12'
- E140 ( 1047.25' ) x 25' x 12'
- W30 ( " ) x 14' x 12'
- W170 ( " ) x 14' x 12'
- S1600 ( 138.5 + 152.5 + 125.0 ) x 20' x 12'
- S1950 ( 416' ) x 21' x 12'
- S2180 ( 416' ) x 14' x 12'
- S2520 ( 416' ) x 21' x 12'

- 4 Panel exhaust drifts 34.375' x 14' x 12'
- 4 Panel intake drifts 34.375' x 20' x 12'

	Floor Area		Volume	
	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>3</sup>	m <sup>3</sup>
E300	14661.5	1362.09792096	175938	4982.0093557
E140	26181.25	2432.317716	314175	8896.44527804
W30	14661.5	1362.09792096	175938	4982.0093557
W170	14661.5	1362.09792096	175938	4982.0093557
S1600	5320	772.9532928	99840	2827.15396375
S1950	8736	811.60095744	104832	2968.51166193
S2180	5824	541.06730496	69888	1979.00277462
S2520	8736	811.60095744	104832	2968.51166193
Exhaust	481.25	44.709588	5775	163.529789069
Intake	687.5	63.87084	5250	233.613984384
<b>Total</b>	<b>102950.5</b>	<b>9564.41441952</b>	<b>1235406</b>	<b>34982.8021358</b>

**Information Only**

7/29/91

J. Schiller  
 corrections 8/12/91

Updated Waste Storage Volumes

SEP

- E300 (41.875 + 14 + 316 + 21 + 215 + 14 + ~~316~~<sup>322</sup> + 21) x 14' x 12'
- E140 ( ~~964.875~~  
958.875 ) x 25' x 12'
- W30 " x 14' x 12'
- W170 " x 14' x 12'
- S2750 (138.5 + 152.5 + 125.) x 14' x 12'
- S3080 ( 416' ) x 21' x 12'
- S3310 416' x 14' x 12'
- S3650 416' x 21' x 12'
- 4 Panel Exhaust 34.375' x 14' x 12'
- 4 Panel Intake 34.375' x 20' x 12'

Floor Area

Volume

	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>3</sup>	m <sup>3</sup>
E300	<del>13508.25</del> <del>13424.25</del> 24121.875	<del>1254.95749008</del> <del>1247.15363472</del> 2240.995518	<del>162099</del> <del>161091</del> 289462.5	<del>4590.13251572</del> <del>4561.58913435</del> 8196.66520664
E140	<del>23971.875</del> 13508.25	<del>2227.060062</del> 1254.95749008	<del>287462.5</del> 162099	<del>8145.69488278</del> 4590.13251572
W30	<del>13424.25</del> 13508.25	<del>1247.15363472</del> 1254.95749008	<del>161091</del> 162099	<del>4561.58913435</del> 4590.13251572
W170	<del>13424.25</del> 8736	<del>1247.15363472</del> 811.60095744	<del>161091</del> 104832	<del>4561.58913435</del> 2968.51166193
S2750	5824	541.06730496	69888	1979.00777462
S3080	8736	811.60095744	104832	2968.51166193
S3310	5824	541.06730496	69888	1979.00777462
S3650	8736	811.60095744	104832	2968.51166193
Exhaust	481.25	44.709588	5775	163.529789069
Intake	687.5	63.87084	8250	233.613984284
Total	94533.375	8782.43791896	1134460.5	32122.6442224
	94935.375	8819.78494164	1139224.5	32259.2454003

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J. Schneider

### Update Waste Storage Volumes

	Floor Area		Volume	
	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>3</sup>	m <sup>3</sup>
8 Panels	1 002 518	93 136.969 854 4	13 023 384	368 781.166 837
NEP	102 950.5	9 564.414 419 52	1 235 406	34 982.802 120 8
	94 935.375	8 819.784 941 03	1 139 224.5	32 259.245 400 3
SEP	<del>94 533.375</del>	<del>8 782.437 918 96</del>	<del>1 134 400.5</del>	<del>32 122.644 932 4</del>
Total	<del>1 200 001.875</del>	<del>111 483.822 193</del>	<del>15 393 190.5</del>	<del>435 886.613 950</del>
	1 200 403.875	111 521.169 215	15 398 014.5	436 023.214 418

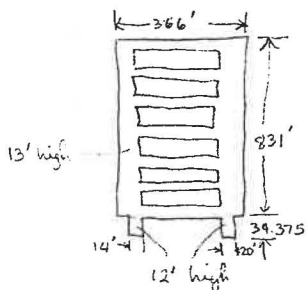
### Number of Equivalent Panels

$$= \frac{\text{Total Volume}}{\text{1 Panel Volume}} = \frac{15\ 398\ 014.5}{1\ 627\ 923} = \frac{9\ 458\ 687\ 235\ 21}{9\ 455\ 723\ 950\ 09} \text{ Panels}$$

### Number of Equivalent Rooms

$$= \frac{\text{Total Volume}}{\text{1 Room Volume}} = \frac{15\ 398\ 014.5}{128\ 700} = \frac{119\ 642\ 692\ 308}{119\ 605\ 209\ 79} \text{ Rooms}$$

### Enclosed Area + Volume of 1 Panel



865.375

$$\text{Area} = 366' \times (831' + 34.375) = 316\ 727.25 \text{ ft}^2 = 29\ 424.924\ 375\ 8 \text{ m}^2$$

$$\text{Volume} = \text{Area} \times 13' = 4\ 117\ 454.25 \text{ ft}^3 = 116\ 593.320\ 347 \text{ m}^3$$

$$\text{Equivalent Cylinder Radius } \pi r^2 = A$$

$$r = 317.517\ 582\ 031 \text{ ft} = 96.779\ 359\ 003 \text{ m}$$

### Excavated Vol of 1 equivalent panel

$$V = \frac{436\ 023.214\ 418}{9\ 458\ 687\ 235\ 21} = 46\ 097.645\ 854\ 6 \text{ m}^3$$

Radius Height = 3.9624

$$r = 60.852\ 460\ 473 \text{ m}$$



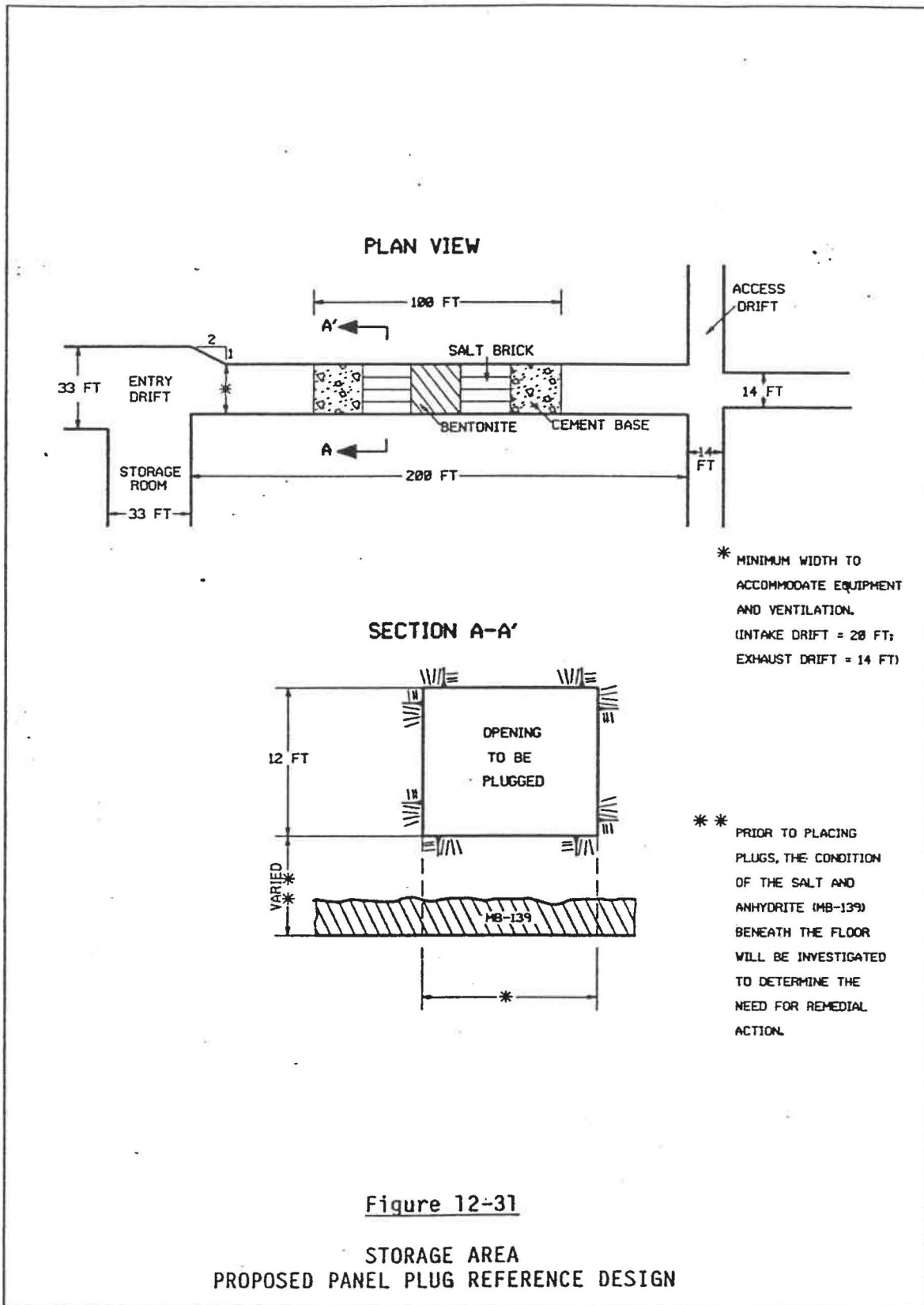


Table 3-1

FACILITY LEVEL CONFIGURATIONS  
NOMINAL EXCAVATED DIMENSIONS OF MAJOR DRIFTS AND ROOMS

Drift or Room				Width (ft)	Height (ft)
E0	From	N35	To N1420	25	12
E140	From	N140	To N1420	14	8
E140	From	N140	To S2210	25	12
E140	From	S2210	To S3264 (Exploratory Drift)	25	8
E300	From	S90	To S1980	14	12
W30	From	S90	To S700	20	12
W30	From	S700	To S1950	14	12
W170	From	N140	To S1300	14	12
N140	From	E0	To E140	12	12/19
N140	From	E0	To W170	12	12/19
N460	From	E0	To E140 (Conference Room)	20	8
N780	From	E0	To E140	12	12
N1100	From	E0	To E1546	14	9
N1100	From	E0	To W667	20	12
N1100	From	W667	To W1800 (Room G Entry Drift)	20	9
N1100	From	W1800	To W2990 (Room G)	20	10
N1420	From	E140	To E1546	14	12
N1420	From	E140	To W647	20	12
S90	From	E0	To E140	12	12
S90	From	E140	To E300	14	12
S400	From	E60	To E140	20	12
S400	From	E140	To E300	14/18	12/17
S400	From	E300	To E500	20	12
S700	From	W170	To W30	20/25	12
S700	From	W30	To E140	20	12
S700	From	E140	To E300	20/35	12
S1000	From	W170	To W30	20	12
S1000	From	W30	To E140	25	12
S1000	From	E140	To E300	20	12
S1300	From	W170	To W30	20	12
S1300	From	W30	To E140	20	12
S1300	From	E140	To E300	20	12
S1600	From	W170	To W30	20	12
S1600	From	W30	To E140	20	12
S1600	From	E140	To E300	20	12
S1600	From	E300	To E520	14	12
S1950	From	W30	To E140	14	12
S1950	From	E140	To E300	20	12
S2180	From	E140	To E300	14	12

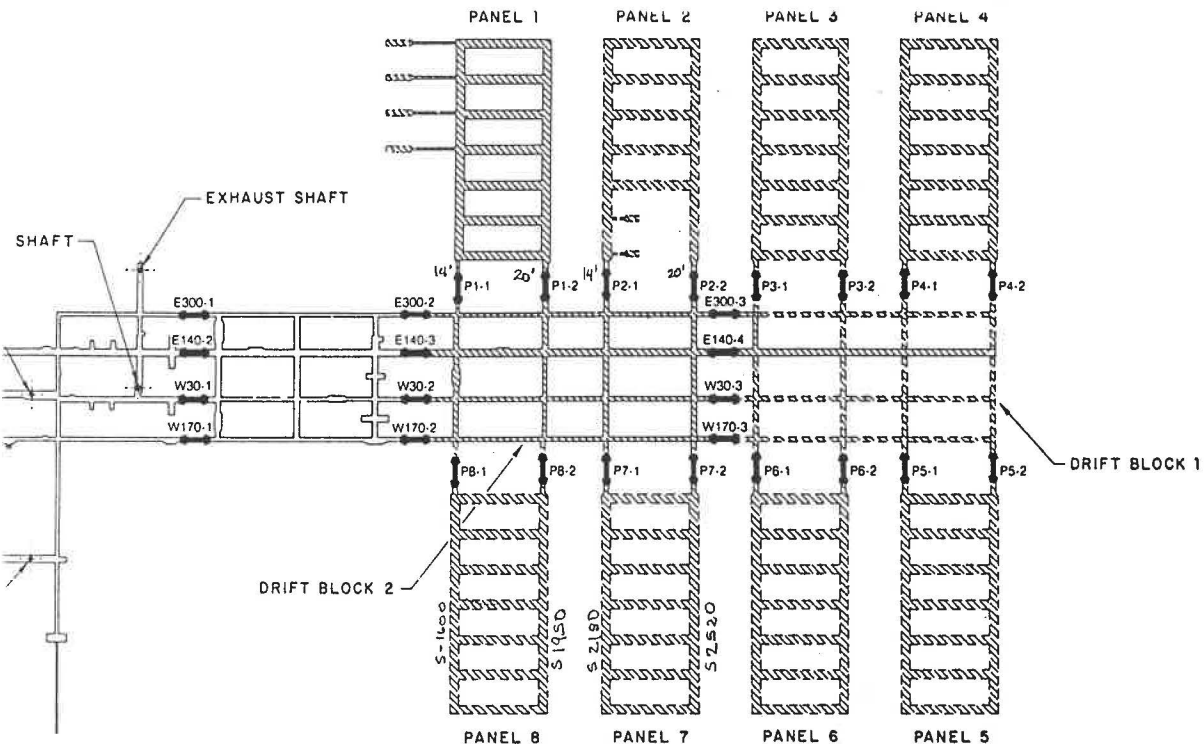
Table 3-1 (continued)

FACILITY LEVEL CONFIGURATIONS  
NOMINAL EXCAVATED DIMENSIONS OF MAJOR DRIFTS AND ROOMS

Page 2 of 2

<u>Drift or Room</u>	<u>Width (ft)</u>	<u>Height (ft)</u>
Test Rooms 1, 2, 3 & 4 (300 feet long)	33	13
Experimental Rooms A1, A2, A3, B & D (306 feet long)	18	18
Alcove I1 (43 feet long)	24	12
Alcoves I2, I3, I4, I5, I6 & I7 (33 feet long)	33	12
Rooms C1 & C2 (98 and 102 feet long)	18	18
Room J (98 feet long)	33	12
Rooms L1 & L2 (98 feet long)	33	12
Room H Entry	12	10
Room H (outside radius = 54 feet)	36	10





DRIFT DIMENSIONS AT PROPOSED SEAL LOCATIONS

SEAL NUMBER	NOMINAL WIDTH (ft)	NOMINAL HEIGHT (ft)	*SECTION TYPE
E300-1	14	12	C-C
E300-2	14	12	C-C
E300-3	14	12	C-C
E140-1	14	18	B-B
E140-2	25	12	A-A
E140-3	25	12	A-A
E140-4	25	12	A-A
DRIFT SEALS			
E0-1	25	12	A-A
W30-1	20	12	D-D
W30-2	14	12	C-C
W30-3	14	12	C-C
W170-1	14	12	C-C
W170-2	14	12	C-C
W170-3	14	12	C-C
P1-1	14	12	C-C
P1-2	20	12	D-D
P2-1	14	12	C-C
P2-2	20	12	D-D
P3-1	14	12	C-C
P3-2	20	12	D-D
P4-1	14	12	C-C
P4-2	20	12	D-D
PANEL SEALS			
P5-1	14	12	C-C
P5-2	20	12	D-D
P6-1	14	12	C-C
P6-2	20	12	D-D
P7-1	14	12	C-C
P7-2	20	12	D-D
P8-1	14	12	C-C
P8-2	20	12	D-D

\*REFER TO TRI-46-3, 2 OF 2 FOR SECTION DETAILS

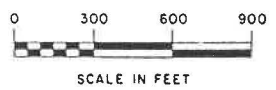
Note that seals are approximately centered with respect to adjacent pillars.

**LEGEND**

- EXISTING EXCAVATION
- PLANNED EXCAVATION
- DRIFT SEALS
- WASTE DISPOSAL AREAS

**NOTES**

- DRIFT BLOCK 1 CONSISTS OF THE INTERSECTING DRIFTS BOUNDED BY THE FOLLOWING SEALS: P3-1, P3-2, P4-1, P4-2, P5-1, P5-2, P6-1, P6-2, W170-3, W30-3, E140-4, AND E300-3.
  - DRIFT BLOCK 2 CONSISTS OF THE INTERSECTING DRIFTS BOUNDED BY THE FOLLOWING SEALS: P1-1, P1-2, P2-1, P2-2, P7-1, P7-2, P8-1, P8-2, W170-2, W30-2, E140-3, AND E300-2.
  - IN EACH WASTE DISPOSAL AREA, WASTE EMPLACEMENT, BACKFILLING, AND SEALING WILL BE COMPLETED BEFORE PROCEEDING WITH THOSE OPERATIONS IN THE NEXT AREA. THE WASTE DISPOSAL AREAS ARE PANELS 1 THROUGH 8, DRIFT BLOCK 1, AND DRIFT BLOCK 2. PANEL 1 WILL BE THE FIRST AREA TO BE COMPLETED, FOLLOWED BY PANEL 2, AND CONTINUING IN NUMERICAL SEQUENCE THROUGH PANEL 8. AFTER THE EIGHT PANELS ARE FINISHED, THE DRIFT BLOCKS WILL BE COMPLETED; FIRST BLOCK 1 FOLLOWED BY BLOCK 2.
- THE SEALS WILL BE CONSTRUCTED BETWEEN EACH WASTE DISPOSAL AREA AND OPEN ACCESS DRIFTS. FOR EXAMPLE, SEALS P1-1 AND P1-2 WILL BE BUILT FOLLOWING WASTE EMPLACEMENT AND BACKFILLING IN PANEL 1, AND SEALS E300-3, E140-4, W30-3, AND W170-3 WILL BE BUILT FOLLOWING WASTE EMPLACEMENT AND BACKFILLING IN DRIFT BLOCK 1.



From: Nowak, Tillerson, Torres  
SAND 90-0355 May 1990

SNL APPROVALS		
ORG	DATE	APPROVALS
6346	11-28-89	[Signature]
6346	11/28/89	[Signature]

Sandia National Laboratories	
DR. W. DUNAS	TITLE
CHK. DL. PULLIAM	<b>DRIFT AND PANEL SEALS GENERAL ARRANGEMENT</b>
ENG. R. JONES	
APV. [Signature]	
SIZE <b>D</b>	DWG NUMBER <b>TRI-46-3</b>
SCALE 1"=300'	SHEET 1 OF 2

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Fig. 8. Drift and Panel General Arrangement

7/29/91

Seals  
100

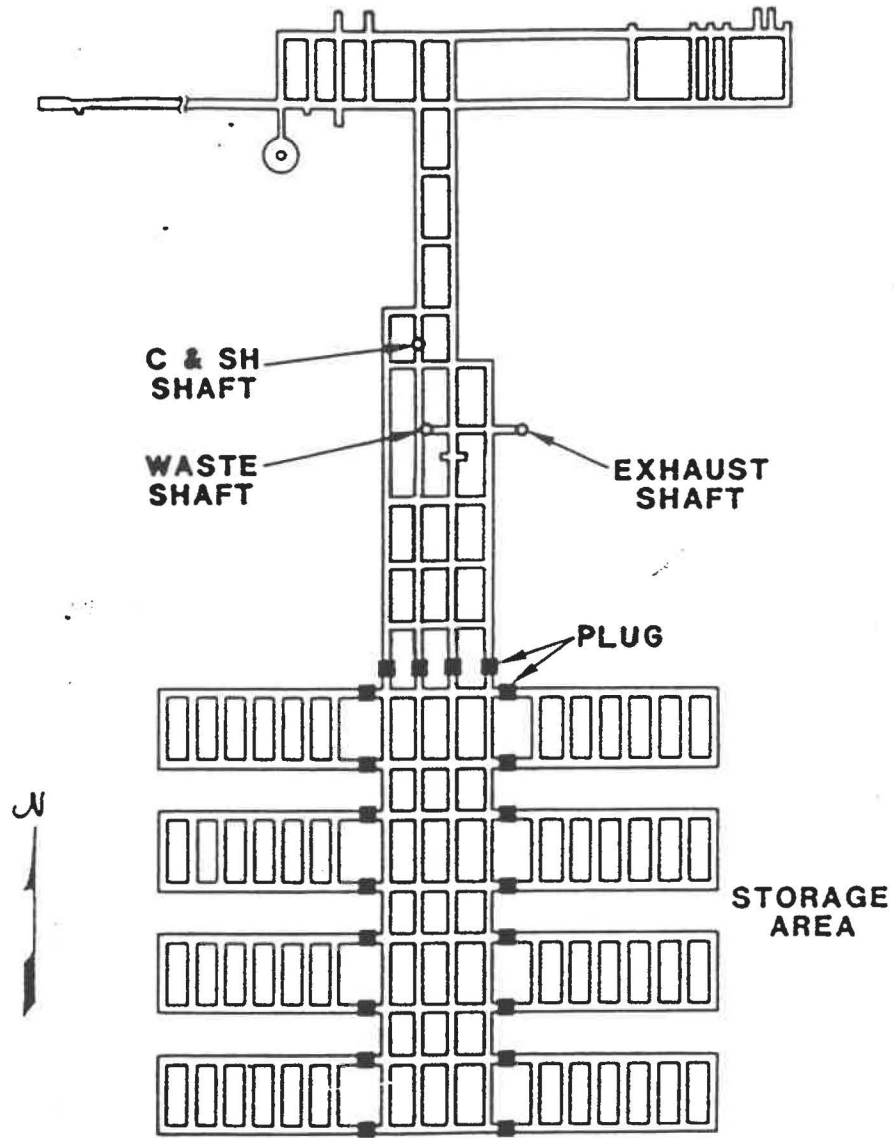


Figure 12-30

STORAGE AREA  
PLUG LOCATIONS

5/12/91

J. C. Miller

## Total Disposal Region - Excluding Seals

	Enclosed Area		Enclosed Volume	
	ft <sup>2</sup>	m <sup>2</sup>	ft <sup>3</sup>	m <sup>3</sup>
8 Panels	2533818.	235399.395007	32939634	932746.562776
NEP	577820.1875	53681.2519921	6933842.25	196344.547296
SEP	532369.78125	49458.7710823	6388437.375	180900.40111
Total	3644007.96875	338539.418081	46261913.6249	1309991.51117

Overall enclosed disposal region, including seals between panels

$$\text{N-S length} = \overset{\text{NEP}}{1047.25 \text{ ft}} + \overset{\text{seal}}{131.25} + \overset{\text{SEP}}{964.875} = 2143.375 \text{ ft}$$

$$= 2064 \text{ ft} + \overset{\text{NEP N-S drifts}}{79.375}$$

$$\text{E-W Width} = 1031 + 483 + 1031 = 2545 \text{ ft}$$

$$\text{Area} = 5454889.375 \text{ ft}^2 = 506775.805801 \text{ m}^2$$

$$\text{Vol} = \text{Area} \times 13 \text{ ft} = 70913561.875 \text{ ft}^3 = 2008048.45291 \text{ m}^3$$

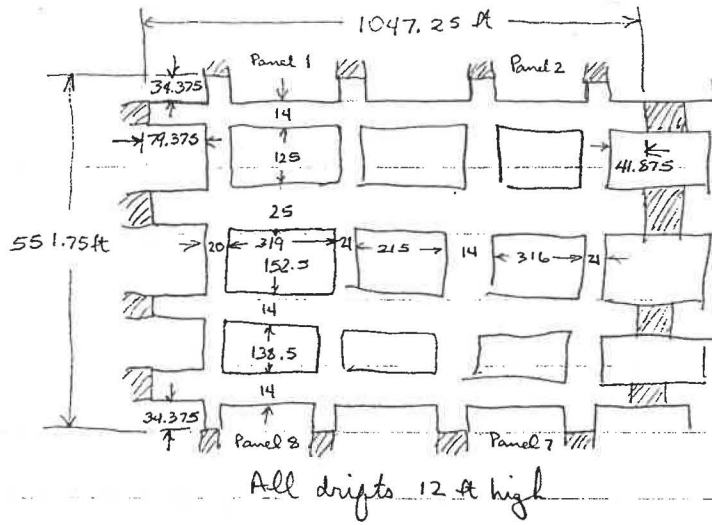
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Enclosed Areas + Volumes - Excluding Seals

NEP



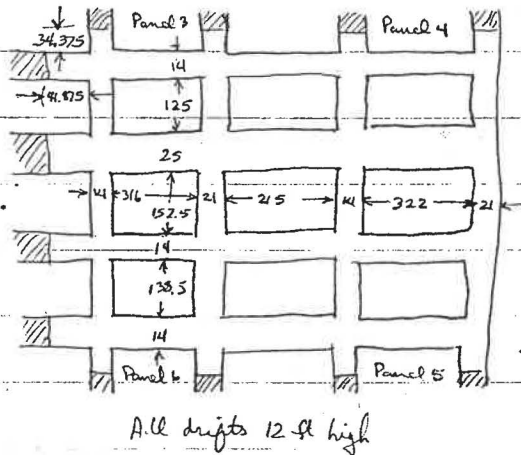
Total Length =  
 $79.375 + 20 + 319 + 21 + 215$   
 $+ 14 + 316 + 21 + 41.875$   
 $= 1047.25 \text{ ft}$

Total Width =  
 $34.375 + 14 + 125 + 25$   
 $+ 152.5 + 14 + 138.5 + 14 + 34.375$   
 $= 551.75 \text{ ft}$

Enclosed Area =  $(1047.25)(551.75) = 577,820,187.5 \text{ ft}^2 = 53,681,251,992.1 \text{ m}^2$

Enclosed Volume =  $(1047.25)(551.75)(12) = 6,933,842,250 \text{ ft}^3 = 196,344,547,286 \text{ m}^3$

SEP



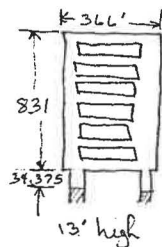
Total Length  
 $= 41.875 + 14 + 316 + 21 + 215 + 14 + 322 + 21$   
 $= 964.875 \text{ ft}$

Total Width  
 $= 34.375 + 14 + 125 + 25 + 152.5$   
 $+ 14 + 138.5 + 14 + 34.375$   
 $= 551.75 \text{ ft}$

Enclosed Area =  $(964.875)(551.75) = 532,369,781.25 \text{ ft}^2 = 49,458,771,082.3 \text{ m}^2$

Enclosed Volume =  $(964.875)(551.75)(12) = 6,388,437,375 \text{ ft}^3 = 180,900,401,111 \text{ m}^3$

Each Panel



Area =  $366' (831 + 34.375) = 316,727.25 \text{ ft}^2 = 29,424,924,375.8 \text{ m}^2$   
 Vol = Area  $\times 13' = 4,117,454.25 \text{ ft}^3 = 116,593,320,347 \text{ m}^3$

**Information Only**