

ENGINEERING DESIGN FILE

Project/Task WAG 7 Data Compilation
 Subtask Overburden Thickness

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TITLE: SDA Cover Thickness Data Compilation			
SUMMARY <p>The summary briefly defines the problem or activity to be addressed in the EDF, gives a summary of activities performed in addressing the problem and states the conclusions, recommendations, or results arrived at from this task.</p> <p>This report discusses the soil cover thickness at the Subsurface Disposal Area (SDA) at the Radioactive Waste Management Complex (RWMC). Buried waste is contained in pits and trenches that are covered with soil. The thickness of the soil cover is not well documented and inconsistencies exist among the documents. This report summarizes data available from three sources. No effort is made to assess the validity of the data.</p> <p>Distribution (complete package): R.M. Neupauer, MS 2107; S.O. Magnuson, MS 2107; A.J. Sondrup, MS 2107; B. Becker, MS 3920; R. Huntley, MS 3960; D.K. Jorgensen, MS 3960</p> <p>Distribution (summary page only):</p>			
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SDA Cover Thickness Data Compilation

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1.0 Introduction

Buried waste at the Subsurface Disposal Area (SDA) at the Radioactive Waste Management Complex (RWMC) is contained in pits and trenches within the surficial sediment. The pits and trenches are covered with soil. The thickness of the soil cover is not well documented and inconsistencies exist among the documents. The purpose of this EDF is to summarize soil cover thickness information into one document. No effort was made to assess the validity of the information.

2.0 Sources of SDA Cover Thickness Data

Three sources have been used to compile SDA cover thickness data. The information from these sources is summarized below. These include:

- Plessinger, 1988
- Barnes, 1989
- Bishoff, personal communication, May 2, 1995

Plessinger (1988) estimates the volume of transuranic (TRU) waste and TRU contaminated soil for eight pits and ten trenches at the SDA. In the calculations to determine these volumes, estimated soil cover thicknesses are presented. The source or justification for these soil cover thicknesses is not given. The soil cover estimated in Plessinger (1998) for selected pits and trenches at the SDA is shown in Table 1. Based on this information, the areally-averaged soil cover is 6.5 ft.

Barnes (1989) evaluates options to improve drainage at the SDA. Soil cover is discussed in detail, with references cited for all soil cover thickness values presented. Table 2 was copied directly from Barnes (1989). It presents initial soil cover thicknesses, and thicknesses of soil cover added from 1975-1979 and 1985-1987. The total thickness as of April 1989 is presented. Also, the proposed additional cover is listed; however, it is not known if the proposed addition was ever added. Soil cover thicknesses are presented for pits, trenches, Acid Pit, Pad A, Soil Vault Rows, and areas between waste.

An interview was conducted with James R. Bishoff, who has been working with RWMC Operations for approximately 15 years¹. According to the discussion, all of the SDA has a minimum of 2 ft. of soil cover. The cover over the trenches is approximately 2 to 4 ft. The pits are covered with approximately 6 to 8 ft. of soil. Pit No. 17, which is currently being filled, has approximately 8 ft. of soil cover.

1. J.R. Bishoff, personal communication with R.M. Neupauer, May 2, 1995.

Table 1: Estimated Soil Cover Thickness at SDA (Plessinger, 1988)

Pit or Trench.	Soil Cover Depth (ft)	Pit or Trench Area (ft ²)	Soil Cover Volume (ft ³)
Pit 1	6	30824	184944
Pit 2	5	99064	495320
Pit 3	5	47230	236150
Pit 4	8	104979	839832
Pit 5	7	66952	468664
Pit 6	8	54575	436600
Pit 9	5	42802	214010
Pit 10	8	112015	896120
Trench 1	5	8127	40635
Trench 5	5	7021	35105
Trench 7	5	6986	34930
Trench 9	5	6916	34580
Trench 2	5	7798	38990
Trench 3	5	7868	39340
Trench 4	5	7924	39620
Trench 6	5	7910	39550
Trench 8	5	7924	39620
Trench 10	5	7889	39445
Totals		634804	4153455

Table 2: Estimated Soil Cover Thickness at SDA (Barnes, 1989)

	<u>Initial Thickness</u>	<u>Additions</u>		<u>Total</u>	<u>Proposed Addition</u>
		<u>1975-9</u>	<u>1985-7</u>		
Pit 1	1.5-2	1.5-2	-	3-4	0-1
Pit 2	2-3	1.5-2	-	3.5-5	0-1
Pit 3	2-3	2-3	-	4-6	2-3
Pit 4	3	3-5	0-1	6-9	0-1
Pit 5	3	1-3	0-1	4-7	0-1
Pit 6	3	3-5	0-2	6-9	0-1
Pit 7	3	-	0-1	3-4	0-1
Pit 8	3	-	1-3	4-6	0-1
Pit 9	3	2-3	0-1	5-7	0-1
Pit 10	3	3-5	-	6-8	0-1
Pit 11	3	-	2-4	5-7	0-1
Pit 12	3	-	3-5	6-8	0-1
Pit 13	3	-	1-3	4-6	0-1
Pits 14-16	3	-	-	3	0-1
Trenches					
1,5,7,9	1.5-2	1-3	-	2.5-5	0-2
2,3,4,6,8,10,11,13,15	1.5-2	-	0.5-4	2-6	0-1
12,14	1.5-2	-	0-1	1.5-3	0-1
16,19,23,26,28,31,34,36	2-3	-	0.5-3	2.5-6	0-1
17,58	2-3	-	1-4	3-7	0-1
18,38	2-3	-	0-1	2-4	0-1
20,25,27,30,33,35,37,39	2-3	-	1-2	3-5	0-1
21,22,24,29,32	2-3	-	-	2-3	2-3
40,42,45,47,49,51,53,55	3	-	0-2	3-5	0-1
41,43,46,48,50,52,54,56,57	3	-	0-1	3-4	0-1
Acid Pit	2-3	-	2-4	4-7	0-1
Pad A	3	-	-	-	-
Soil Vault Rows	3	-	0-1	3-4	0-1
Areas Between Waste	-	-	0-5	0-5	0-2

Basis: (Barnes, 1989)

- a. Initial Thickness - Blanchfield, 1985; Bradley, 1981; EG&G, 1985; Niccum, 1972.
- b. 1975-8 Addition - Dolenc, 1977; Drawings 156168, 158246-7, 196261
- c. 1985-7 Addition - Truitt, 1984; comparison of 1980 and 1987 aerial survey contour maps
- d. Proposed Addition - Mark up of Drawing 356697
- e. Does not include soil added in 1970-3, 1980-1, or subsidence maintenance, or soil removed by erosion, animal burrowing, etc.

3.0 References

1. Barnes, C.M., 1989, **Evaluation of Cover and Drainage Improvements for Interim Stabilization of the Subsurface Disposal Area at the INEL RWMC**, Engineering Design File, EDF Serial No. BWP-SC-03, March 15, 1989.
2. Blanchfield, L.A., 1985, **Strategy for Stabilization of the SDA at the INEL**, EGG-WM-7062.
3. Bradley, S.A., 1981, **Stabilization and Closure Plan for the INEL Subsurface Disposal Area**, WM-F1-81-002.
4. Dolenc, M.R., 1977, **Moisture Exclusion Studies for Stored Transuranic Waste 1975-1976**, WMP 77-2.
5. EG&G, 1985, **A History of the RWMC at the INEL**, WM-F1-81-003, Rev 3.
6. Niccum, M.R., 1972, **Final Protection of the NRTS Burial Ground, A Proposed Method Compatible with the Local Environment**, CI-1239.
7. Plessinger, M.P., 1988, **Volume of Transuranic (TRU) Waste and TRU Contaminated Soil Subject to BWP Retrieval Operations**, Engineering Design File, Project File No. 3X2RE2145, EDF Serial No. BWP-4, March 30, 1988.
8. Truitt, D.J., 1984, **SDA Maintenance Plan - Contour Design and Work Schedule**, EDF-RWMC-187.