Confirmation Study Cost Estimates and Ranking System Documentation for the Initial Assessment Study of NSWC, White Oak Laboratory

Enclosure (2)

Confirmation Study Cost Estimates and
Ranking System Documentation for
the Initial Assessment Study of
NSWC, White Oak Laboratory

Enclosure (2)

Summary of Confirmation Study Ranking System Scores
and Cost Estimates for NSWC White Oak

Site Number	Site Name	CSRS Score	Cost Estimate
50-2	Apple Orchard Landfill	19	30K
50-3	Pistol Range Landfill	8	11K
50-4	Chemical Burial Site	11	23K
50-7	Ordnance Burn Area	18	42K
50-8	Abandoned Chemical Disposal Pit	18	25K
50-9	Industrial Wastewater Disposal from "300" Area	21	27K
50-11	Industrial Wastewater Disposal from "100" Area	12	37K

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak Lab.

Name of Site: Apple Orchard Landfill (site 2)

Prepared by: K. Adams

Date: 24 Jan 84

Years of site use: 1948 - 1983

Map Coordinates: B-4

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)

1/4 mile North of Bldg 120

Approximate size:

0.8 Acre

Shops that may have used the site:

See chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)

See chapter 8.

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	26 - 100	Maps, estimat
Distance to nearest well in aquifer of concern:	1-3 mi	Maps
Land use/zoning w/in 1 mile radius:	residential	Maps
Distance to reservation boundary:	0 to 1000 ft	Maps
Critical environments w/in 1 mile radius:	none	Maps, inspection
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	Not Used	Maps
Population served by surface water supply w/in 3 miles downstream:	0	Maps, estimat
Population served by the aquifer of concern supply w/in 3 miles of site:	1 - 50	Maps, estimat

II. PATHWAYS

Factor		
Distance to nearest surface water:	501 - 2000 ft.	Maps
Net Preciptation:	> + 20 inches	estimate
Surface erosion:	Severe	inspection
Surface permeability:	15-30% clay	inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	none	Maps
Depth to ground water:	0 - 10 ft.	Boring logs
Subsurface flows:	none	Geologic Maps
Direct acccess to ground water	Moderate risk	estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor		Measurements, Observations	Information Obtained from:
Waste types:	PCB transformer oil.		interviews
Waste quantity:	500 lb		interviews
Toxicity - Acute:		high	Sax
Chronic:		high	Sax
Persistency:	Halogenated HC.	high	Judgement.
Flammability:		none	NFPA
Reactivity:		low	NFPA
Incompatible wastes present:		no	interviews
Corrosiveness:		NA	NA
Solubility at 20°C:	Sparingly when in presence of solvents		Judgement
Bioaccumulative:		yes	Judgement
Physical State:		liquid	interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	no containment	inspection, interviews
Confidence level of information on site	high.	

NAME OF SITE Apple Orchard Landfill (Site 2)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE 1948 - 1983

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K.A

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site 26-100	2	4	8	12
B. Distance to nearest down gradient well 1-3 mi	1	10	10	30
C. Land use/zoning within 1 mile radius residential	3	3	9	9
D. Distance to reservation boundary 0-1000 ft	3	6	18	18
E. Critical environments within 1 mile radius of site none	0	10	0	30
F. Water quality of nearest surface water body fish propagation	2	6	12	18
G. Ground water use of the aquifer of concern not used	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site 0	0	6	0	18
I. Population served by ground-water supply within 3 miles of site 1-100	1	6	6	18
		Subtotals	63	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.350

II. PATHWAYS (see also table 1-11)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest down gradient surface water	500-2000 ft	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	Severe	3	8	24	24
Soil permeability	15-30% Clay	1	6	6	18
Rainfall intensity	7.19 inches	3	8	24	24
			Subtotals	88	108

Subscore = (factor score subtotal/maximum score subtotal) 0.815

2. Flooding none | 0 | 1 | 0 |

Subscore = (factor score/3) 0

3. Ground water migration

Depth to ground water	0-10 ft.	3	8	24	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% Clay	2	8	16	24
Subsurface flows	none	0	8	0	24
Direct access to ground water	moderate risk	2	8	16	24
			Subtotals	74	114

Subscore = (factor score subtotal/maximum score subtotal) 0.649

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 0.815

PCB transformer oil.

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score		Maximum Score
ATxQ =	24(2) =	48	72
CTxQ =	24(2) =	48	72
PxQxΔt=	18(2)(3) =	108	162
FxQ =	0	0	36
RxQ =	0	0	36
IxQ =	0	0	45
CxQ =	X	X	~~X~~
SxQ =	10(2) =	20	45
Bx(Δt+t) =	18(3)(3) =	162	108
PS =	9 =	9	9
Subtotal= =		395	612 -27 585

Waste Characteristics Subscore = subtotal/maximum subtotal

= 0.675

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

III. WASTE CHARACTERISTICS (see also table 1-III)

A. PCB Transformer Oil

Rating Factor	Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity 500 lb.	2	1	2	= Q
Acute Toxicity Sax 3	3	8	24	= AT
Chronic Toxicity Sax 3	3	8	24	= CT
Persistency halogenated HC	3	6	18	= P
Flammability NFPA 0	0	4	0	= F
Reactivity NFPA 0	0	4	0	= R
Incompatibility no	0	5	0	= I
Corrosiveness X	X	X	X	= C
Solubility (when dissolved by solvents)	2	5	10	= S
Bioaccumulation yes	3	6	18	= B
Physical State liquid	3	3	9	= PS
Years site was in use 35	3	1	3	= t
Years since site closed 1	3	1	3	$= \Delta t$

Weighted Factor = Factor Rating x Multiplier

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.350 = U_R

Pathways Subscore = 0.815 = U_P

Waste Characteristics Subscore = 0.675 = U_W

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 100(0.350)(0.815)(0.675) = 19.3

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

19.3 × 1 = 19.3 ≈ (19)

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information frc records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disp[illegible] practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak Lab

Name of Site: Pistol Range Landfill (Site 3)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 19 40s - 19 70s

Map Coordinates: A-9

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
North of Dahlgren Road

Approximate size:
about 40,000 sq ft.

Shops that may have used the site:
See Chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chapter 8.

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	26-100	Maps, Estimate
Distance to nearest well in aquifer of concern:	1-3 mi	Maps
Land use/zoning w/in 1 mile radius:	Residential	Maps
Distance to reservation boundary:	0-1000 ft.	Maps
Critical environments w/in 1 mile radius:	none	Maps, inspection,
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	none	Maps
Population served by surface water supply w/in 3 miles downstream:	0	Maps, estimat
Population served by the aquifer of concern supply w/in 3 miles of site:	1-50	Maps, estimate

II. PATHWAYS

Factor		
Distance to nearest surface water:	0-500 ft.	Maps
Net Preciptation:	>+20 inches	estimate
Surface erosion:	Severe	inspection
Surface permeability:	15-30% clay	inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	none	Maps
Depth to ground water:	0-10 ft.	Boring logs
Subsurface flows:	none	Geologic Maps
Direct acccess to ground water	Moderate risk	estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	Stoddard Solvent	Interviews
Waste quantity:	8000 gal.	Interviews
Toxicity - Acute:	level 2	Sax
Chronic:	level 1	Sax
Persistency:	straight-chain HC	Judgement
Flammability:	level 2	NFPA
Reactivity:	low	NFPA
Incompatible wastes present:	no	Interviews
Corrosiveness:	no	Judgement
Solubility at 20°C:	no information	NA
Bioaccumulative:	no	Judgement
Physical State:	liquid	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	none	Interviews, site inspection
Confidence level of information on site	high	Interviews

NAME OF SITE Pistol Range Landfill (Site 3)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE Mid-40's to mid 70's

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K. Adams

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site 26-100	2	4	8	12
B. Distance to nearest down gradient well 1-3 mi	1	10	10	30
C. Land use/zoning within 1 mile radius Residential	3	3	9	9
D. Distance to reservation boundary 0-1000 ft	3	6	18	18
E. Critical environments within 1 mile radius of site none	0	10	0	30
F. Water quality of nearest surface water body fish propagation	2	6	12	18
G. Ground water use of the aquifer of concern none	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site 0	0	6	0	18
I. Population served by ground-water supply within 3 miles of site 1-50	1	6	6	18
		Subtotals	63	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.350

II. PATHWAYS (see also table 1-II)

Rating Factor		Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest down gradient surface water	0-500 ft.	3	8	24	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	Severe	3	8	24	24
Soil permeability	15-30% clay	1	6	6	18
Rainfall intensity	7.19 inches	3	8	24	24
			Subtotals	96	108

Subscore = (factor score subtotal/maximum score subtotal) 0.889

2. Flooding none | 0 | 1 | 0 |

Subscore = (factor score/3) 0

3. Ground water migration

Depth to ground water	0-10 ft.	3	8	24	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% clay	2	8	16	24
Subsurface flows	none	0	8	0	24
Direct access to ground water	moderate risk	2	8	16	24
			Subtotals	74	114

Subscore = (factor score subtotal/maximum score subtotal) 0.649

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 0.889

III. WASTE CHARACTERISTICS (see also table 1-III)

A. Stoddard Solvent

Rating Factor	Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity 8000 gal	3	1	3	= Q
Acute Toxicity Sax level 2	2	8	16	= AT
Chronic Toxicity Sax level 1	1	8	8	= CT
Persistency straight-chain HC	1	6	6	= P
Flammability NFPA level 2	2	4	8	= F
Reactivity NFPA level 0	0	4	0	= R
Incompatibility no	0	5	0	= I
Corrosiveness no	0	3	0	= C
Solubility no info.	X	5	X	= S
Bioaccumulation no	0	6	0	= B
Physical State liquid	3	3	9	= PS
Years site was in use 30 yr	3	1	3	= t
Years since site closed 8 yr	2	1	2	= Δt

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	16(3) = 48	72
CTxO =	8(3) = 24	72
PxOxΔt=	6(3)(2) = 36	162
FxQ =	8(3) = 24	36
RxQ =	0(3) = 0	36
IxQ =	0(3) = 0	45
CxQ =	0(3) = 0	27
SxQ =	X	~~45~~
Bx(Δt+t) =	0(2+3) = 0	108
PS =	9	9
Subtotal= =	141	567

Waste Characteristics Subscore = subtotal/maximum subtotal

= 0.249

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.350 = U_R

Pathways Subscore = 0.889 = U_P

Waste Characteristics Subscore = 0.249 = U_W

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 100 (0.350)(0.889)(0.249) = 7.75

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

7.75 x 1 = 7.75 ~ 8

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information from records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak Lab.

Name of Site: Chemical Burial Site (Site 4)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 19 60s - 19 70s.

Map Coordinates: A-10

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
See Chapter 8

Approximate size:
See Chapter 8

Shops that may have used the site:
See Chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chapter 8.

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	26-1000	Maps, Estimate
Distance to nearest well in aquifer of concern:	1-3 mi	Maps
Land use/zoning w/in 1 mile radius:	Residential	Maps
Distance to reservation boundary:	0 — 1000 ft	Maps
Critical environments w/in 1 mile radius:	None	Maps, Inspection
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	None	Maps
Population served by surface water supply w/in 3 miles downstream:	0	Maps, Estimat
Population served by the aquifer of concern supply w/in 3 miles of site:	1-50	Maps, Estimat

II. PATHWAYS

Factor		
Distance to nearest surface water:	800 ft	Maps
Net Preciptation:	> + 20 inches	Estimate
Surface erosion:	Severe	Inspection
Surface permeability:	15-30% Clay	Inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	none	Maps
Depth to ground water:	11-50 ft.	Boring Logs
Subsurface flows:	none	Geologic Maps
Direct acccess to ground water	Moderate Risk	Estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor		Measurements, Observations	Information Obtained from:
Waste types:	TNT		Interviews
Waste quantity:		825 lb	Interviews
Toxicity - Acute:		Level 3	Sax
Chronic:		Level 3	Sax
Persistency:	Degredation products	hazardous	Judgement
Flammability:		Level 4	NFPA
Reactivity:		Level 4	NFPA
Incompatible wastes present:		Unknown	Interviews
Corrosiveness:		No information	N.A.
Solubility at 20°C:		very low	Judgement
Bioaccumulative:		no	Judgement
Physical State:	Solid, unstabilized		Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	None	Interviews, Site Inspection
Confidence level of information on site	High	Judgement.

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	Sulfuric Acid	Interviews
Waste quantity:	500 lb	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 2	Sax
Persistency:	Slowly Neutralized	Judgement
Flammability:	Level 0	NFPA
Reactivity:	Level 2	NFPA
Incompatible wastes present:	unknown	N.A.
Corrosiveness:	pH 1-3	Judgement
Solubility at 20°C:		
Bioaccumulative:	no	Judgement
Physical State:	liquid	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment		
Confidence level of information on site		

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types: Trichloroethylene		Interviews
Waste quantity:	730 lb.	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Chlorinated Hydrocarbon	Judgement
Flammability:	Level 1	NFPA
Reactivity:	Level 0	NFPA
Incompatible wastes present:	no	Interviews
Corrosiveness:	No information	
Solubility at 20°C:	Slight	CRC Handbo
Bioaccumulative:	no	Judgement
Physical State:	liquid	Judgement

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment		
Confidence level of information on site		

NAME OF SITE Chemical Burial Site (Site 4)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE '55-'72

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K.A.

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site 26-100	2	4	8	12
B. Distance to nearest down gradient well 1-3 mi.	1	10	10	30
C. Land use/zoning within 1 mile radius residential	3	3	9	9
D. Distance to reservation boundary 0-1000 ft.	3	6	18	18
E. Critical environments within 1 mile radius of site none	0	10	0	30
F. Water quality of nearest surface water body fish propagation	2	6	12	18
G. Ground water use of the aquifer of concern none	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site 0	0	6	0	18
I. Population served by ground-water supply within 3 miles of site 1-50	1	6	6	18
		Subtotals	63	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.350

II. PATHWAYS (see also table 1-11)

Rating Factor		Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest down gradient surface water	800 ft	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	severe	3	8	24	24
Soil permeability	15-30% clay	1	6	6	18
Rainfall intensity	7 inches	3	8	24	24
			Subtotals	88	108

Subscore = (factor score subtotal/maximum score subtotal) 0.8148

2. Flooding — none | 0 | 1 | | |

Subscore = (factor score/3) 0

3. Ground water migration

Depth to ground water	11-50 ft.	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% clay	2	8	16	24
Subsurface flows	none	0	8	0	24
Direct access to ground water	moderate risk.	2	8	16	24
			Subtotals	66	114

Subscore = (factor score subtotal/maximum score subtotal) 0.5789

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 0.8148

III. WASTE CHARACTERISTICS (see also table 1-III)

A. TNT

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	825 lb	2	1	2	= Q
Acute Toxicity	level 3	3	8	24	= AT
Chronic Toxicity	level 3	3	8	24	= CT
Persistency	deg. prod. Haz.	3	6	18	= P
Flammability	Level 4	3	4	12	= F
Reactivity	level 4	3	4	12	= R
Incompatibility	unk.	1	5	5	= I
Corrosiveness	no info.	X	3	X	= C
Solubility	Insoluble	0	5	0	= S
Bioaccumulation	no	0	6	0	= B
Physical State	Solid, unstabilized	1	3	3	= PS
Years site was in use	17	3	1	3	= t
Years since site closed	10	2	1	2	$= \Delta t$

Weighted Factor = Factor Rating x Multiplier

TNT

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24(2) = 48	72
CTxQ =	24(2) = 48	72
PxQxΔt=	18(2)(2) = 72	162
FxQ =	12(2) = 24	36
RxQ =	12(2) = 24	36
IxQ =	5(2) = 10	45
CxQ =	X X	~~X~~
SxQ =	0(2) = 0	45
Bx(Δt+t) =	0(2+3) = 0	108
PS =	3	9
Subtotal= =	229	~~612~~ 585

Waste Characteristics Subscore = subtotal/maximum subtotal

for TNT = 0.39145

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

III. WASTE CHARACTERISTICS (see also table 1-III)

A. Sulfuric Acid

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	5001b.	2	1	2	= Q
Acute Toxicity	Sax lev 3	3	8	24	= AT
Chronic Toxicity	Sax lev 2	2	8	16	= CT
Persistency	slowly neutr.	2	6	12	= P
Flammability	NFPA lev. 0	0	4	0	= F
Reactivity	NFPA lev 2	2	4	8	= R
Incompatibility	unknown	1	5	5	= I
Corrosiveness	pH 1-3	3	3	9	= C
Solubility	Soluble	3	5	15	= S
Bioaccumulation	NO	0	6	0	= B
Physical State	liquid	3	3	9	= PS
Years site was in use	17	3	1	3	= t
Years since site closed	10	2	1	2	$= \Delta t$

Weighted Factor = Factor Rating x Multiplier

Sulfuric Acid.

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24(2) = 48	72
CTxQ =	16(2) = 32	72
PxQxΔt=	12(2)(2) = 48	162
FxQ =	0 = 0	36
RxQ =	8(2) = 16	36
IxQ =	5(2) = 10	45
CxQ =	9(2) = 18	27
SxQ =	15(2) = 30	45
Bx(Δt+t) =	0 = 0	108
PS =	9 = 9	9
Subtotal= =	211	612

Waste Characteristics Subscore = subtotal/maximum subtotal

for Sulfuric Acid= 0.34477

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

III. WASTE CHARACTERISTICS (see also table 1-III)

A. TCE

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	730 lb	2	1	2	= Q
Acute Toxicity	Saxlev. 3	3	8	24	= AT
Chronic Toxicity	Saxlev. 3	3	8	24	= CT
Persistency	chlor. Hc.	3	6	18	= P
Flammability	NFPA lev 1	1	4	4	= F
Reactivity	NFPA Lev 0	0	4	0	= R
Incompatibility	no	0	5	0	= I
Corrosiveness	X	X	3	X	= C
Solubility	slightly	2	5	10	= S
Bioaccumulation	no	0	6	0	= B
Physical State	liquid	3	3	9	= PS
Years site was in use	17	3	1	3	= t
Years since site closed	10	2	1	2	$= \Delta t$

Weighted Factor = Factor Rating x Multiplier

density - 1.46

TCE

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24(2) = 48	72
CTxQ =	24(2) = 48	72
PxQxΔt=	18(2)(2) = 72	162
FxQ =	4(2) = 8	36
RxQ =	0 = 0	36
IxQ =	0 = 0	45
CxQ =	X = X	~~X~~
SxQ =	10(2) = 20	45
Bx(Δt+t) =	0 = 0	108
PS =	= 9	9
Subtotal= =	205	612 − 27 = 585

Waste Characteristics Subscore = subtotal/maximum subtotal

for TCE = 0.3504

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.3500 = U_R

Pathways Subscore = 0.8148 = U_P

Waste Characteristics Subscore = 0.3915 = U_W TNT

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 100(0.3500)(0.8148)(0.3915) = 11.16

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

11.16 x 1 = 11.16 = ~~11~~

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria	Suspected Criteria
• At least 2 verbal reports from interviews or written information from records.	• One or no verbal reports or conflicting verbal reports, and no written information fro records.
• Knowledge of types and quantities of wastes generated by shops and other areas on base.	• Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposa practices indicate that these wastes were disposed of at the site.
• Based on the above, a determination of the types and quantities of waste disposed of at the site.	

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak Lab.

Name of Site: Ordnance Burn Area (Site 7)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 1948 - 1968

Map Coordinates: B-11

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
Immediately West of Bldg 501

Approximate size: 1/4 Acre

Shops that may have used the site:
See Chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chapter 8

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:		
Distance to nearest well in aquifer of concern:		
Land use/zoning w/in 1 mile radius:		
Distance to reservation boundary:		
Critical environments w/in 1 mile radius:		
Water quality of nearest surface water body:		
Ground water use of the aquifer of concern:		
Population served by surface water supply w/in 3 miles downstream:		
Population served by the aquifer of concern supply w/in 3 miles of site:		

II. PATHWAYS

Factor		
Distance to nearest surface water:		
Net Preciptation:		
Surface erosion:		
Surface permeability:		
1 yr-24 hr rainfall (or mean annual number of thunderstorms):		
In which floodplain:		
Depth to ground water:		
Subsurface flows:		
Direct acccess to ground water		
Lab evidence of contaminant migration - (attach results):	yes	Hoffsommer, 1978

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	TNT	Interviews
Waste quantity:	>1000 lb	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Degredation Products Hazardous	Judgement
Flammability:	Level 4	NFPA
Reactivity:	Level 4	NFPA
Incompatible wastes present:	no	Interviews
Corrosiveness:	no information	N.A.
Solubility at 20°C:	very low	CRC Handbook
Bioaccumulative:	no	Judgement
Physical State:	Slurry	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	none	Inspection
Confidence level of information on site	high.	

NAME OF SITE Ordnance Burn Area (Site 7)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE 1948-1968

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K.A.

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site (greater than 100)	3	4	12	12
B. Distance to nearest down gradient well (1-3 miles)	1	10	10	30
C. Land use/zoning within 1 mile radius (Residential)	3	3	9	9
D. Distance to reservation boundary (600 ft)	3	6	18	18
E. Critical environments within 1 mile radius of site (not critical)	0	10	0	30
F. Water quality of nearest surface water body (fish prop.)	2	6	12	18
G. Ground water use of the aquifer of concern (not used)	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site (0)	0	6	0	18
I. Population served by ground-water supply within 3 miles of site (1-50)	1	6	6	18
		Subtotals	67	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.372

II. PATHWAYS (see also table 1-11)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.

Subscore 1

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest down gradient surface water		8		24
Net precipitation		6		18
Surface erosion		8		24
Soil permeability		6		18
Rainfall intensity		8		24

Subtotals _____ 108

Subscore = (factor score subtotal/maximum score subtotal) _____

2. Flooding | | 1 | | |

Subscore = (factor score/3) _____

3. Ground water migration

Depth to ground water		8		24
Net precipitation		6		18
Soil permeability		8		24
Subsurface flows		8		24
Direct access to ground water		8		24

Subtotals _____ 114

Subscore = (factor score subtotal/maximum score subtotal) _____

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 1.00

III. WASTE CHARACTERISTICS (see also table 1-III)

A. TNT

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor
Waste Quantity	>1000 lb	3	1	3 = Q
Acute Toxicity	Sax 3	3	8	24 = AT
Chronic Toxicity	Sax 3	3	8	24 = CT
Persistency	deg prod haz	3	6	18 = P
Flammability	NFPA 4	3	4	12 = F
Reactivity	NFPA 4	3	4	12 = R
Incompatibility	no	0	5	0 = I
Corrosiveness	no info	X	3	X = C
Solubility	insoluble	0	5	0 = S
Bioaccumulation	no	0	6	0 = B
Physical State	slurry	2	3	6 = PS
Years site was in use	20	3	1	3 = t
Years since site closed	16	1	1	1 = Δt

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24 (3) = 72	72
CTxQ =	24 (3) = 72	72
PxQxΔt=	18 (3) (1) = 54	162
FxQ =	12 (3) = 36	36
RxQ =	12 (3) = 36	36
IxQ =	(0) (3) = 0	45
CxQ =	X = X	~~X~~
SxQ =	0 (3) = 0	45
Bx(Δt+t) =	0 (1+3) = 0	108
PS =	= 6	9
Subtotal= =	276	612 − 27 = 585

Waste Characteristics Subscore = subtotal/maximum subtotal

= 0.472

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.372 = U_R

Pathways Subscore = 1.00 = U_P

Waste Characteristics Subscore = 0.472 = U_W

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 17.6 ≈ 18

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

18 x 1 = 18

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information from records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposal practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak Lab.

Name of Site: Abandoned Chemical Disposal Pit (Site 8)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 1961 - 1971

Map Coordinates: E-7

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
End of perimeter road south side of NSWC boundary.

Approximate size: 100 sq ft.

Shops that may have used the site:
See Chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chapter 8

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	26-100	Maps, Estima
Distance to nearest well in aquifer of concern:	3000 ft - 1 mile	Maps
Land use/zoning w/in 1 mile radius:	Residential	Maps
Distance to reservation boundary:	50 ft.	Maps, Interview
Critical environments w/in 1 mile radius:	none	Maps, Inspection
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	Not used	Maps
Population served by surface water supply w/in 3 miles downstream:	none	Maps, Estima.
Population served by the aquifer of concern supply w/in 3 miles of site:	1-50	Maps, Estimat

II. PATHWAYS

Factor		
Distance to nearest surface water:	900 ft.	Maps
Net Preciptation:	>+20 inches	Estimate
Surface erosion:	severe	Inspection
Surface permeability:	15-30% Clay	Inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	None	Maps
Depth to ground water:	11-50 ft.	Boring Logs
Subsurface flows:	none	Geologic Maps
Direct acccess to ground water	Moderate Risk	Estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	Mercury	Interviews
Waste quantity:	180 lb	Interviews, Estimat
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Heavy metal	Judgement
Flammability:	Level 0	NFPA
Reactivity:	Level 0	NFPA
Incompatible wastes present:	unknown	Interviews
Corrosiveness:	No information	N.A.
Solubility at 20°C:	Soluble	CRC Handbook
Bioaccumulative:	yes	Judgement
Physical State:	liquid	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	none	Inspection
Confidence level of information on site	high	Judgement

NAME OF SITE Abandoned Chemical Disposal Pit (Site 8)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE 1951 - 1971

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K. A.

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site (26-100)	2	4	8	12
B. Distance to nearest down gradient well (3000 ft - 1 mi)	2	10	20	30
C. Land use/zoning within 1 mile radius (residential)	3	3	9	9
D. Distance to reservation boundary (50 ft.)	3	6	18	18
E. Critical environments within 1 mile radius of site (not critical)	0	10	0	30
F. Water quality of nearest surface water body (fish prop.)	2	6	16	18
G. Ground water use of the aquifer of concern (not used)	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site (zero)	0	6	0	18
I. Population served by ground-water supply within 3 miles of site (1-50)	1	6	6	18
		Subtotals	77	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.428

II. PATHWAYS (see also table 1-11)

Rating Factor		Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.					
				Subscore	
B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.					
1. Surface water migration					
Distance to nearest down gradient surface water	900 ft.	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	Severe	3	8	24	24
Soil permeability	15-30% clay	1	6	6	18
Rainfall intensity	7.19 in.	3	8	24	24
			Subtotals	88	108
			Subscore = (factor score subtotal/maximum score subtotal)		0.815
2. Flooding	not in a floodplain	0	1	0	
			Subscore = (factor score/3)		0
3. Ground water migration					
Depth to ground water	11-50 ft	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% clay	2	8	16	24
Subsurface flows	site bottom >5 ft above	0	8	0	24
Direct access to ground water	moderate risk	2	8	16	24
			Subtotals	66	114
			Subscore = (factor score subtotal/maximum score subtotal)		0.579
C. Highest pathway subscore.					
Enter the highest subscore value from A, B-1, B-2 or B-3 above.					
			Pathways Subscore		0.815

III. WASTE CHARACTERISTICS (see also table 1-III)

A. Mercury, ions in aqeous solution with low pH.

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	180 lb	2	1	2	= Q
Acute Toxicity	Sax 3	3	8	24	= AT
Chronic Toxicity	Sax 3	3	8	24	= CT
Persistency	heavy metal	3	6	18	= P
Flammability	NFPA 0	0	4	0	= F
Reactivity	NFPA 0	0	4	0	= R
Incompatibility	unk.	1	5	5	= I
Corrosiveness	no info	X	X	X	= C
Solubility	soluble	3	5	15	= S
Bioaccumulation	yes	3	6	18	= B
Physical State	liquid	3	3	9	= PS
Years site was in use	20 yr	3	1	3	= t
Years since site closed	13 yr	2	1	2	= Δt

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24(2) = 48	72
CTxQ =	24(2) = 48	72
PxQxΔt=	18(2)(2) = 72	162
FxQ =	0(2) = 0	36
RxQ =	0(2) = 0	36
IxQ =	5(2) = 10	45
CxQ =	X = X	~~X~~
SxQ =	15(2) = 30	45
Bx(Δt+t) =	18(2+3) = 90	108
PS =	= 9	9
Subtotal= =	307	612 −27 585

Waste Characteristics Subscore = subtotal/maximum subtotal

= 0.525

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.428 = U_R

Pathways Subscore = 0.815 = U_P

Waste Characteristics Subscore = 0.525 = U_W

Enter the above subscores in the equation:

$$\text{Site Subscore} = U_{site} = 100\ (U_R)(U_P)(U_W)$$

$$= 18.3$$

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

18.3 x 1 = 18.3 ≈ (18)

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information fror records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposa practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC White Oak

Name of Site: Wastewater Disposal from "300" Area (Site 9)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 1953 - 1975

Map Coordinates: B-10, C-10

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
300 Area

Approximate size: 13 Acres

Shops that may have used the site:
Ordnance testing

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chap 8

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	> 100	Maps, Estima
Distance to nearest well in aquifer of concern:	3000 ft to 1 mi.	Maps,
Land use/zoning w/in 1 mile radius:	Residential	Maps,
Distance to reservation boundary:	0 - 1000 ft	Maps
Critical environments w/in 1 mile radius:	none	Maps, Inspection
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	not used	Maps
Population served by surface water supply w/in 3 miles downstream:	none	Maps, Estima...
Population served by the aquifer of concern supply w/in 3 miles of site:	1 - 50	Maps, Estima

II. PATHWAYS

Factor		
Distance to nearest surface water:	0 - 500 ft.	Maps
Net Preciptation:	> + 20 inches	Estimate
Surface erosion:	Severe	Inspection
Surface permeability:	15-30% Clay	Inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	none	Maps
Depth to ground water:	0 - 10 ft	Boring logs
Subsurface flows:	none	Maps
Direct acccess to ground water	Moderate Risk	Estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	TNT	Interviews
Waste quantity:	7200 lb	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Degradation Products Hazardous	Judgement
Flammability:	Level 4	NFPA
Reactivity:	Level 4	NFPA
Incompatible wastes present:	no	Interviews
Corrosiveness:	no information	N.A.
Solubility at 20°C:	very low	CRC Handbook
Bioaccumulative:	no	Judgement
Physical State:	Slurry	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	none	Inspection
Confidence level of information on site	high	

NAME OF SITE Wastewater Disposal from "300" Area (Site 9)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE 1953 - 1975

OWNER/OPERATOR NOL / NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K.A.

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site (>100)	3	4	12	12
B. Distance to nearest down gradient well (3000ft to 1mi)	2	10	20	30
C. Land use/zoning within 1 mile radius (residential)	3	3	9	9
D. Distance to reservation boundary (0 - 1000 ft.)	3	6	18	18
E. Critical environments within 1 mile radius of site (not critical)	0	10	0	30
F. Water quality of nearest surface water body (fish prop)	2	6	12	18
G. Ground water use of the aquifer of concern (not used)	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site (zero)	0	6	0	18
I. Population served by ground-water supply within 3 miles of site (1-60)	1	6	6	18
Subtotals			77	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.428

II. PATHWAYS (see also table 1-11)

Rating Factor		Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.					
				Subscore	
B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.					
1. Surface water migration					
Distance to nearest down gradient surface water	0-500 ft	3	8	24	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	Severe	3	8	24	24
Soil permeability	15-30% Clay	1	6	6	18
Rainfall intensity	7.19 in	3	8	24	24
				Subtotals 96	108
				Subscore = (factor score subtotal/maximum score subtotal)	0.889
2. Flooding	not in floodplain	0	1		
				Subscore = (factor score/3)	0
3. Ground water migration					
Depth to ground water	0-10 ft	3	8	24	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% Clay	2	8	16	24
Subsurface flows	none	0	8	0	24
Direct access to ground water	moderate risk	2	8	16	24
				Subtotals 74	114
				Subscore = (factor score subtotal/maximum score subtotal)	0.649
C. Highest pathway subscore.					
Enter the highest subscore value from A, B-1, B-2 or B-3 above.					
				Pathways Subscore	0.889

FIGURE 2 (Continued)

III. WASTE CHARACTERISTICS (see also table 1-III)

A. TNT

Rating Factor	Factor Rating (0-3)	Multiplier	Weighted Factor
Waste Quantity 7200lb	3	1	3 = Q
Acute Toxicity Sax 3	3	8	24 = AT
Chronic Toxicity Sax 3	3	8	24 = CT
Persistency Deg prod Haz	3	6	18 = P
Flammability NFPA 4	3	4	12 = F
Reactivity NFPA 4	3	4	12 = R
Incompatibility no	0	5	0 = I
Corrosiveness no info	X	X	X = C
Solubility insoluble	0	5	0 = S
Bioaccumulation no	0	6	0 = B
Physical State slurry	2	3	6 = PS
Years site was in use 22	3	1	3 = t
Years since site closed 9	2	1	2 = Δt

Weighted Factor = Factor Rating x Multiplier

FIGURE 2 (Continued)

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24 (3) = 72	72
CTxQ =	24 (3) = 72	72
PxQxΔt=	18 (3) (2) = 108	162
FxQ =	12 (3) = 24	36
RxQ =	12 (3) = 24	36
IxQ =	0 (3) = 0	45
CxQ =	X X	~~27~~
SxQ =	0 (3) = 0	45
Bx(Δt+t) =	0 (2+3) = 0	108
PS =	6	9
Subtotal= =	330	~~612~~ - 27 = 585

Waste Characteristics Subscore = subtotal/maximum subtotal

= 0.564

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

FIGURE 2 (Continued)

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.428 = U_R

Pathways Subscore = 0.889 = U_P

Waste Characteristics Subscore = 0.564 = U_W

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 21.4

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

21.4 x 1 = 21.4 ≃ (21)

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information fro records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposa practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.

WORKSHEET FOR RANKING DISPOSAL SITES

Name of Base: NSWC, White Oak Lab.

Name of Site: Industrial Wastewater Disposal from "900" Area. (Site 11)

Prepared by: K. Adams

Date: 2 Feb 84

Years of site use: 19 52 - 19 72

Map Coordinates: C-3

Location: (NE x 1 from building Y, x 1 SW of intersection of A&B, etc.)
underneath buildings 1, 2, 3, 4, 20, 24, 30, and 101

Approximate size: 16 acres

Shops that may have used the site:
See Chapter 5

Description of site: (including basic hydrogeology and biology of site)
(Include sketch of site on back)
See Chapter 8

Comments:

I. RECEPTORS

Factor	Measurement, Observation	Information Obtained from:
Working population w/in 1000 ft:	> 100	Maps, Estimat
Distance to nearest well in aquifer of concern:	1-3 miles	Maps
Land use/zoning w/in 1 mile radius:	Residential	Maps
Distance to reservation boundary:	1-1000 ft.	Maps
Critical environments w/in 1 mile radius:	none	Maps, Inspection
Water quality of nearest surface water body:	Fish Propagation	Interviews
Ground water use of the aquifer of concern:	not used	Maps
Population served by surface water supply w/in 3 miles downstream:	none	Maps, Estima...
Population served by the aquifer of concern supply w/in 3 miles of site:	1-50	Maps, Estimat

II. PATHWAYS

Factor		
Distance to nearest surface water:	4200 ft.	Maps
Net Preciptation:	> +20 Inches	Estimate
Surface erosion:	Severe	Inspection
Surface permeability:	15-30% Clay	Inspection
1 yr-24 hr rainfall (or mean annual number of thunderstorms):	7.19 inches	NOAA
In which floodplain:	none	Maps
Depth to ground water:	11-50 ft.	Boring Logs
Subsurface flows:	none	Maps
Direct acccess to ground water	Moderate Risk	Estimate
Lab evidence of contaminant migration - (attach results):	none	

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	Chromium Compounds	Interviews
Waste quantity:	100-1000 lb.	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Heavy Metal	Judgement
Flammability:	Level 0	NFPA
Reactivity:	Level 0	NFPA
Incompatible wastes present:	unknown	Interviews
Corrosiveness:	No Information	N.A.
Solubility at 20°C:	No Information	N.A.
Bioaccumulative:	No Information	N.A.
Physical State:	Liquid	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment	none	Interviews
Confidence level of information on site	high	

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	Sulfuric Acid	Interviews
Waste quantity:	100 - 1000 lb.	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 2	Sax
Persistency:	Slowly Neutralized	Judgement
Flammability:	Level 0	NFPA
Reactivity:	Level 2	NFPA
Incompatible wastes present:	unknown	Interviews
Corrosiveness:	pH 1-3	Judgement
Solubility at 20°C:	Soluble	CRC Handbook
Bioaccumulative:	no	Judgement
Physical State:	liquid	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment		
Confidence level of information on site		

III. WASTE CHARACTERISTICS *

Factor	Measurements, Observations	Information Obtained from:
Waste types:	TNT	Interviews
Waste quantity:	100 – 1000 lb.	Interviews
Toxicity - Acute:	Level 3	Sax
Chronic:	Level 3	Sax
Persistency:	Degradation Products Hazardous	Judgement
Flammability:	Level 4	NFPA
Reactivity:	Level 4	NFPA
Incompatible wastes present:	Unknown	Interviews
Corrosiveness:	No Information	N.A.
Solubility at 20°C:	Low Solubility	CRC Handbook
Bioaccumulative:	no	Judgement
Physical State:	slurry	Interviews

* NOTE: May be more than one of these pages per site

IV. WASTE MANAGEMENT

Factor	Measurement, Observement	Information Obtained from:
Site containment		
Confidence level of information on site		

NAME OF SITE Industrial Wastewater (from "100" Area Disposal (Sites 11)

LOCATION NSWC White Oak

DATE OF OPERATION OR OCCURRENCE 1952 - 1972

OWNER/OPERATOR NSWC

COMMENTS/DESCRIPTION

SITE RATED BY K.A

I. RECEPTORS (see also table 1-1)

Rating Factor	Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score
A. Population within 1,000 feet of site (>100)	3	4	12	12
B. Distance to nearest down gradient well (1-3 mi)	1	10	10	30
C. Land use/zoning within 1 mile radius (residential)	3	3	9	9
D. Distance to reservation boundary (1-1000 ft)	3	6	18	18
E. Critical environments within 1 mile radius of site (not critical)	0	10	0	30
F. Water quality of nearest surface water body (fish prop)	2	6	12	18
G. Ground water use of the aquifer of concern (not used)	0	9	0	27
H. Population served by surface water supply within 3 miles dowstream of site (zero)	0	6	0	18
I. Population served by ground-water supply within 3 miles of site (1-50)	1	6	6	18
		Subtotals	67	180

Receptors subscore = (factor score subtotal/maximum score subtotal) 0.372

II. PATHWAYS (see also table 1-11)

Rating Factor		Factor Rating (0-3)	Multiplier	Factor Score	Maximum Possible Score

A. If there is documented laboratory evidence of migration of hazardous contaminants away from the site in question, assign maximum factor subscore of 1 point for direct evidence. If direct evidence exists then proceed to C. If no evidence exists, proceed to B.

Subscore _____

B. Rate the migration potential for 3 potential pathways: surface water migration, flooding, and ground water migration. Select the highest rating, and proceed to C.

1. Surface water migration

Distance to nearest down gradient surface water	4200 ft	1	8	8	24
Net precipitation	>+20 inches	3	6	18	18
Surface erosion	Severe	3	8	24	24
Soil permeability	15-30% clay	1	6	6	18
Rainfall intensity	7.19 in.	3	8	24	24
			Subtotals	80	108

Subscore = (factor score subtotal/maximum score subtotal) 0.741

2. Flooding — no floodplain | 0 | 1 | | |

Subscore = (factor score/3) 0

3. Ground water migration

Depth to ground water	11-50 ft	2	8	16	24
Net precipitation	>+20 inches	3	6	18	18
Soil permeability	15-30% clay	2	8	16	24
Subsurface flows	none	0	8	0	24
Direct access to ground water	moderate risk	2	8	16	24
			Subtotals	66	114

Subscore = (factor score subtotal/maximum score subtotal) 0.579

C. Highest pathway subscore.

Enter the highest subscore value from A, B-1, B-2 or B-3 above.

Pathways Subscore 0.741

III. WASTE CHARACTERISTICS (see also table 1-III)

A. Chromium Compounds

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	100 - 1000lb	2	1	2	= Q
Acute Toxicity	Sax 3	3	8	24	= AT
Chronic Toxicity	Sax 3	3	8	24	= CT
Persistency	heavy metal	3	6	18	= P
Flammability	NFPA 0	0	4	0	= F
Reactivity	NFPA 0	0	4	0	= R
Incompatibility	unk	1	5	5	= I
Corrosiveness	no info	X	X	X	= C
Solubility	no info	X	X	X	= S
Bioaccumulation	no info	X	X	X	= B
Physical State	liquid	3	3	9	= PS
Years site was in use	20	3	1	3	= t
Years since site closed	12	2	1	2	= Δt

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24 (2) = 48	72
CTxQ =	24(2) = 48	72
PxQxΔt=	18 (2)(2) = 72	162
FxQ =	0(2) = 0	36
RxQ =	0(2) = 0	36
IxQ =	5(2) = 10	45
CxQ =	X = X	~~20~~
SxQ =	X = X	~~45~~
Bx(Δt+t) =	X = X	~~108~~
PS =	= 9	9
Subtotal =	= 187	~~612~~ 432

Waste Characteristics Subscore = subtotal/maximum subtotal

for Chromium Compounds = 0.433

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

III. WASTE CHARACTERISTICS (see also table 1-III)

A. Sulfuric Acid

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	100 - 1000 lb	2	1	2	= Q
Acute Toxicity	Sax 3	3	8	24	= AT
Chronic Toxicity	Sax 2	2	8	24	= CT
Persistency	slowly neutr.	2	6	12	= P
Flammability	NFPA 0	0	4	0	= F
Reactivity	NFPA 2	2	4	8	= R
Incompatibility	unk	1	5	5	= I
Corrosiveness	pH 1-3	3	3	9	= C
Solubility	Soluble	3	5	15	= S
Bioaccumulation	no	0	6	0	= B
Physical State	liquid	3	3	9	= PS
Years site was in use	20	3	1	3	= t
Years since site closed	12	2	1	2	$= \Delta t$

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24 (2) = 48	72
CTxQ =	24 (2) = 48	72
PxQxΔt=	12 (2)(2) = 48	162
FxQ =	0(2) = 0	36
RxQ =	8 (2) = 16	36
IxQ =	5(2) = 10	45
CxQ =	9(2) = 18	27
SxQ =	15(2) = 30	45
Bx(Δt+t) =	0(2+3) = 0	108
PS =	= 9	9
Subtotal =	= 227	612

Waste Characteristics Subscore = subtotal/maximum subtotal

for Sulfuric Acid = 0.371

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

III. WASTE CHARACTERISTICS (see also table 1-III)

A. TNT

Rating Factor		Factor Rating (0-3)	Multiplier	Weighted Factor	
Waste Quantity	100-1000 lb	2	1	2	= Q
Acute Toxicity	Sax 3	3	8	24	= AT
Chronic Toxicity	Sax 3	3	8	24	= CT
Persistency	degprod haz	3	6	18	= P
Flammability	NFPA 4	3	4	12	= F
Reactivity	NFPA 4	3	4	12	= R
Incompatibility	unk	1	5	5	= I
Corrosiveness	no info	X	X	X	= C
Solubility	insoluble	0	5	0	= S
Bioaccumulation	no	0	6	0	= B
Physical State	slurry	2	3	6	= PS
Years site was in use	20	3	1	3	= t
Years since site closed	12	2	1	2	= Δt

Weighted Factor = Factor Rating x Multiplier

III. WASTE CHARACTERISTICS (continued)

B. Take the weighted factors and multiply together as indicated below, then add the results together, and add PS from figure 2-IIIA.

	Score	Maximum Score
ATxQ =	24 (2) = 48	72
CTxQ =	24 (2) = 48	72
PxQxΔt=	18 (2) (2) = 72	162
FxQ =	12 (2) = 24	36
RxQ =	12 (2) = 24	36
IxQ =	5 (2) = 10	45
CxQ =	X = X	~~X~~
SxQ =	0 (2) = 0	45
Bx(Δt+t) =	0 (2+3) = 0	108
PS =	= 6	9
Subtotal =	232	~~585~~

Waste Characteristics Subscore = subtotal/maximum subtotal

for TNT = 0.397

General Note:

If data are not available or are known to be incomplete under items I-A through I, II-B-1 or II-B-3, or III-A, then leave blank for calculation of factor score and maximum subscore (i.e. for calculation of the subscore divide the factor score by the maximum subscore minus the unknown item's maximum score).

IV. WASTE MANAGEMENT AND FINAL SCORE (see also table 1-IV)

A. Receptors Subscore = 0.372 = U_R

Pathways Subscore = 0.741 = U_P

Waste Characteristics Subscore = 0.433 = U_W

Enter the above subscores in the equation:

Site Subscore = U_{site} = 100 $(U_R)(U_P)(U_W)$

= 11.9

B. Apply factor for waste containment from waste management (table 1-IV)

Site Subscore x Waste Management = Final Score

11.9 x 1 = 11.9 ≈ (12)

Note: If Final Scores are tied for sites on one base, rate the sites according to the confidence level of the information.

Confirmed Criteria

- At least 2 verbal reports from interviews or written information from records.
- Knowledge of types and quantities of wastes generated by shops and other areas on base.
- Based on the above, a determination of the types and quantities of waste disposed of at the site.

Suspected Criteria

- One or no verbal reports or conflicting verbal reports, and no written information fro records.
- Logic based on a knowledge of types and quantities of wastes generated at the base, and a history of past waste disposa practices indicate that these wastes were disposed of at the site.

Confirmed sites would be above suspected sites in the ranking.