SHA 1 Ranking

WASHINGTON RANKING METHOD

ROUTE SCORES SUMMARY AND RANKING CALCULATION SHEET

Site name: WSU Tree Fruit Research Region: CRO

City, county: Wenatchee, Chelan

This site was ranked on August 12, 1991, based on quintile values from 259 assessed/scored sites.

Pathway	Route Score(s)	Quintile Group number(s)
SW-HH	16.1	3
Air-HH	22.1	4
GW-HH	37.1	3
Sed-HH	–	–
SW-En	27.6	3
Air-En	19.3	3
Sed-En	–	–

Priority scores:

$\frac{H^2 + 2M + L}{8}$ $\frac{16 + 6 + 3}{8} = 25/8 = 3.1 = 4$

$\frac{H^2 + 2L}{7}$ $\frac{9 + 6}{7} = 15/7 = 2.1 = 3$

Use the matrix presented to the right, along with the two priority scores, to determine the site ranking. N/A refers to where there is no applicable pathway.

Human Health \ Environment	5	4	3	2	1	N/A
5	1	1	1	1	1	1
4	1	2	2	2	3	4
3	1	2	3	4	4	5
2	2	3	4	4	5	5
1	2	3	4	5	5	5
N/A	3	4	5	5	5	5

DRAFT / (FINAL)

Matrix ("bin") Ranking: 2, or _____ No Further Action

CONFIDENCE LEVEL: The relative position of this site within this bin is:

_____ almost into the next higher bin.
_____ right in the middle, unlikely to ever change.
X almost into the next lower bin.

rev. 8/91

WORKSHEET 1
SUMMARY SCORE SHEET

Site Name: WSU Tree-Fruit Research and Extension Center

Site Location: (City, County, or Section/Township/Range)

1100 North Western Avenue
Wenatchee, Washington

Section 32 T 23 N. R. 20 E. W. M.

Site Description: (Include management areas, compounds of concern, and quantities)

Washington State University (WSU) acquired the 55-acre site in 1937. The U.S. Public Health Service in 1966 leased a test plot area from WSU to study the persistence of pesticides. These tests were continued by the United States Environmental Protection Agency from 1975 until the early 1980's. Pesticides used in research at the 2100 ft^2 (.05 acre) test plot area include carbaryl, DDT, DDE, dieldrin, disyston, endrin, furadan, guthion, paraxon, paraquat and parathion. Wastes from a laboratory sink also flowed to a drainfield from 1952 until 1979. The laboratory sink drain was connected to a septic tank in 1979 but the outlet of the tank continues to discharge to the drainfield.

Special Considerations: (Include limitations in site file data, data which cannot be accomodated in the model, but which are important in evaluating the risk associated with the site)

ROUTE SCORES:

Ground Water/Human:	37.1	Overall Rank:	_____
Surface Water/Human:	16.1		
Air/Human:	22.1		
Air/Environmental:	19.3		
Surface Water/Environmental:	27.6		

WORKSHEET 2
ROUTE DOCUMENTATION

SURFACE WATER ROUTE

List substances to be considered for scoring. Source: 1

1. P,P'-DDE
2. P,P'-DDT
3. PARATHION
4. CARBARYL
5. DIELDRIN
6. DISYSTON
7. ENDRIN
8. FURADAN
9. GUTHION
10. PAROXON
11. PARAQUAT

Explain basis for choice of substances to be used in scoring.

THE ELEVEN PESTICIDES LISTED WERE APPLIED TO SOIL AS PART OF RESEARCH. DIELDRIN, ENDRIN, PARATHION, DISYSTON, FURADAN AND DDT WERE CHOSEN FOR SCORING. THE FIRST FIVE WERE CHOSEN BASED ON TOXICITY, DDT WAS CHOSEN BASED ON CONCENTRATIONS PRESENT.

List management units to be considered in scoring: Source: 1

1. 2100 FT² SOIL TEST PLOT AREA
2. LAB DRAINFIELD

Explain basis for choice of unit used in scoring.

THE PESTICIDES WERE APPLIED TO SOIL FROM 1966 TO THE EARLY 1980's AS PART OF RESEARCH ON PESTICIDE DEGRADATION, SEE WORKSHEET 3 FOR REASON TEST PLOT WAS CHOSEN OVER LAB DRAINFIELD.

AIR ROUTE

List substances to be considered for scoring. Source: 1

1. DDE
2. DDT
3. PARATHION
4. CARBARYL
5. DIELDRIN
6. DISYSTON
7. ENDRIN
8. FURADAN
9. GUTHION
10. PAROXON
11. PARAQUAT

Explain basis for choice of substances to be used in scoring.

THE ELEVEN PESTICIDES LISTED WERE APPLIED TO SOIL AS PART OF RESEARCH, DIELDRIN, ENDRIN, PARATHION, DISYSTON, FURADAN AND DDT WERE CHOSEN FOR SCORING. THE FIRST FIVE CHOSEN WERE BASED ON TOXICITY. DDT WAS CHOSEN BASED ON CONCENTRATION PRESENT.

List management units to be considered in scoring: Source: 1

1. 2100 FT² SOIL TEST PLOT AREA
2. LAB DRAINFIELD

Explain basis for choice of unit used in scoring.

THE PESTICIDES WERE APPLIED TO SOIL IN THE TEST PLOT AREA FROM 1966 TO THE EARLY 1980'S AS PART OF RESEARCH ON PESTICIDE DEGRADATION, SEE WORKSHEET 3 FOR REASON TEST PLOT WAS CHOSEN OVER LAB DRAINFIELD.

GROUND WATER ROUTE

List substances to be considered for scoring. Source: 1

1. DDE
2. DDT
3. PARATHION
4. CARBARYL
5. DIELDRIN
6. DISYSTON
7. ENDRIN
8. FURADAN
9. GUTHION
10. PARAXON
11. PARAQUAT

Explain basis for choice of substances to be used in scoring.

THE 11 PESTICIDES LISTED WERE APPLIED TO SOIL AS PART OF RESEARCH. DIELDRIN, ENDRIN, PARATHION, DISYSTON, FURADAN AND DDT WERE CHOSEN FOR SCORING. THE FIRST FIVE CHOSEN WERE BASED ON TOXICITY. DDT WAS CHOSEN BASED ON CONCENTRATIONS PRESENT.

List management units to be considered in scoring: Source: 1

1. 2100 FT^2 SOIL TEST PLOT AREA
2. LAB DRAINFIELD

Explain basis for choice of unit used in scoring.

THE PESTICIDES WERE APPLIED TO SOIL IN THE TEST PLOT AREA FROM 1966 TO THE EARLY 1980's AS PART OF RESEARCH ON PESTICIDE DEGRADATION. SEE WORKSHEET 3 FOR REASON TEST PLOT WAS CHOSEN OVER DRAINFIELD.

WORKSHEET 3
SUBSTANCE CHARACTERISTIC WORKSHEET
FOR MULTIPLE UNIT/SUBSTANCE SITES

	Combination 1	Combination 2	Combination 3
Unit: Substance:	TEST PLOT DIELDRIN, ENDRIN, ETC.	LAB DRAINFIELD UNKNOWN (POSSIBLY SAME SUBSTANCES)	
AIR ROUTE			
Human Toxicity/Mobility Value:	12	12	
Environmental Toxicity/ Mobility Value:	10	10	
Containment Value:	10	0	
Air Human Subscore:	120	0	
Air Environmental Score:	100	0	
SURFACE WATER ROUTE			
Human Toxicity Value:	12	12	
Environmental Toxicity Value:	10	10	
Containment Value:	10	0	
Surface Water Human Subscore:	120	0	
Surface Water Environmental Subscore:	100	0	
GROUND WATER ROUTE			
Human Toxicity/Mobility Value:	12/0	12/0	
Containment Value:	10	10	
Ground Water Subscore:	120	120	

WORKSHEET 4
SURFACE WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std. (µg/l)	Value	Chronic Toxicity mg/kg/day	Value	Acute Toxicity mg/kg-bw	Value	Carcinogencity Potency WOE	Factor	Value
1. DIELDRIN	1. ND = X	—	1. .00005	8	1 38.3 (LD_{50})	10	B2 = .8	16	9
2. ENDRIN	2. X		2. .0003	5	2 3 (LD_{50})	10	≥ X	—	—
3. PARATHION	3.		3.		3		3.		
4. DISYSTON	4.		4.		4		4.		
5. FURADAN	5.		5.		5		5.		
6. DDT	6.		6.		6		6. B2	.34	5

BOTH RfD ORAL

Source: 3
Highest Value: 10
+2 Bonus Points?: 2
Value: 12

1.2 Environmental Toxicity

Source: 5 Value: 10

Substance	Acute Criteria (µg/L)	Non-human mammalian acute toxicity (mg/kg)	Value
1. DIELDRIN	2.5		8
2. ENDRIN	.18		10
3. PARATHION			
4. DISYSTON			
5. FURADAN			
6. DDT			

1.3 Substance Quantity

PAGE 3 Source: 1 Value: 6

Explain basis: CONTAMINATED SOIL 2100 FT^2

2.0 MIGRATION POTENTIAL

2.1 Containment

Source: 1 Value: 10

Explain basis: EITHER E. WASTE PILE OUTSIDE NO CONTROL
OR F. CONTAMINATED SOIL NO CONTROL. EITHER CASE, VALUE = 10

2.2 Surface Soil Permeability: HIGH, SANDY LOAM

PAGE 7 Source: 1 Value: 1

2.3 Total Annual Precipitation: 8.8 INCHES

Source: 2 Value: 1

2.4 Maximum 2-Year 24-Hr Precipitation: 1.0 TO 1.5 INCHES

Source: 7 Value: 2

2.5 Flood Plain: 1, TEST PLOT AREA NOT IN FLOODWAY 2, LAB DRAINFIELD IN 100 YEAR FLOODWAY

PAGE 9 SOURCE 1 (1.0) Source: 1,6 Value: 2.2

2.6 Terrain Slope: TO COLUMBIA RIVER SLOPE = $\frac{194}{(1.6)5280}$ = 2.3 %

Source: 1 Value: 3

THIS WOULD GIVE VALUE = 2. HOWEVER THE STORM DRAIN SYSTEM MEANS FLOW IS PIPED, GIVING VALUE = 3 ACCORDING TO TABLE SW-12

3.0 TARGETS

3.1 Distance to Surface Water: COLUMBIA RIVER 8450 FEET — Source: 1 Value: 2

3.2 Population Served within 2 miles: PUBLIC & DOMESTIC 6 → √6 — Source: 9,10 Value: 2

3.3 Area Irrigated by Sources within 2 miles: .75 √76 — Source: 10 Value: 6

3.4 Distance to Fishery Resource: COLUMBIA RIVER - 8450 FEET — Source: 1,4 Value: 3

3.5 Distance to Sensitive Environment: 3,700 FEET PA DATA COLL. FORM P.5 — Source: 1,4 Value: 6

List: LEWIS AND CLARK PARK 0.7 MILE E. OF SITE
COLUMBIA RIVER 1.6 MILE EAST OF SITE

4.0 RELEASE

Explain basis: NONE DOCUMENTED — Source: ___ Value: 0

WORKSHEET 5
AIR ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction - please review before scoring

1.2 Human Toxicity

Substance	Air Std. µg/m³	Value	Chronic Toxicity mg/kg/day	Value	Acute Toxicity ~~mg/kg-bw~~ mg/m³	Value	Carcinogencity WOE	Potency Factor	Value
1. DIELDRIN	1. .04	9	1. .005	8	1. 13	10	1 B2	16	9
2. ENDRIN	2. .3	9	2. .025	5	2. X		2. D		—
3. PARATHION	3. BOTH WA.		3.		3.		3.		
4. DISYSTON	4.		4.		4.		4.		
5. FURADAN	5. ASIL		5.		5.		5.		
6. DDT	6.		6. .05	5	6.		6. B2	.34	5

Source: 3
Highest Value: 10
+2 Bonus Points?: 2
Toxicity Value: 12

1.3 Mobility

1.3.1 Gaseous Mobility

Vapor Pressure: _____ Source: ____
Value: _____

1.3.2 Particulate Mobility

Soil Type: COARSE TEXTURED SANDY LOAM PAGE 7 Source: 1
Erodibility: 86 TONS/ACRE/YEAR
Climatic Factor: 10 - 30
Particulate Mobility Potential Value: 2

1.4 Final Human Health Toxicity/Mobility Matrix:

MOBILITY POTENTIAL - 2
TOXICITY - 12

Value: 12

1.5 Environmental Toxicity/Mobility

Substance	Non-human mammalian Acute Toxicity	Value	Mobility	Value
1. DIELDRIN	13	10	2	10
2. ENDRIN				
3. PARATHION				
4. DISYSTON				
5. FURADAN				
6. DDT				

Environmental Toxicity Mobility Matrix: MOBILITY POTENTIAL - 2
ENVIRONMENTAL TOXICITY 10
Source: 1,3 Value: 10

1.6 Substance Quantity: SURFACE SOIL CONTAMINATION 2100 FT²

PAGE 3 Source: 1 Value: 4

WORKSHEET 5 (CONTINUED)
AIR ROUTE

2.0 MIGRATION POTENTIAL

2.1 Containment: EITHER C. WASTE PILE OUTDOORS, UNCOVERED Source: 1 Value: 10
or E. SOIL CONTAMINATION, NO COVER. IN EITHER CASE VALUE = 10

3.0 TARGETS

3.1 Nearest Population: 45 FEET, PA DATA COLLECTION FORM PAGE 5 Source: 1 Value: 10

3.2 Nearest Sensitive Environment: 3,700 FEET PA DATA COLL. FORM P.5 Source: 1,4 Value: 3
List: LEWIS AND CLARK PARK .7 MILE E. OF SITE

3.3 Population within 1/2 mile: 718, PA DATA COLLECTION FORM PAGE 5 Source: 1 Value: 27

4.0 RELEASE: NONE DOCUMENTED Source: 1 Value: 0

WORKSHEET 6
GROUND WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std. (µg/l)	Value		Chronic Toxicity mg/kg/day	Value		Acute Toxicity mg/kg-bw	Value		Carcinogencity Potency WOE	Factor	Value
1. DIELDRIN	1. ND = X	=		1. .00005	8		1. 38.3 (LD_{50})	10		1 B2	16	9
2. ENDRIN	2. X	=		2. .0003	5		2. 3 (LD_{50})	10		2 X		
3. PARATHION	3.			3.			3.			3.		
4. DISYSTON	4.			4.			4.			4.		
5. FURADAN	5.			5.			5.			5.		
6. DDT	6.			6.			6.			6. B2	.24	5

Source: 3
Highest Value: 10
+2 Bonus Points?: 2
Value: 12

1.2 Mobility

Substance: SOLUBILITIES DIELDRIN 0.186 (20°C), ENDRIN 0.26 (25°C), DDT 0.0031 (25°C) ALL IN mg/l. PARATHION, DISYSTRON AND FURADAN "NEARLY INSOLUBLE IN WATER." Source: 3,8 Value: 0

1.3 Substance Quantity

Source: 1 Value: 3

Explain basis: $(2100\ FT^2\ AREA)(3FT\ DEEP)\left(\frac{1\ YD^3}{27\ FT^3}\right) = 233\ YD^3$

2.0 MIGRATION POTENTIAL

2.1 Containment

Source: 1 Value: 10

Explain basis: E.I. CONTAMINATED SOIL

2.2 Net Precipitation: 3.0 INCHES

Source: 2 Value: 1

2.3 Subsurface Hydraulic Conductivity: PAGE 8 - 17' CLAY LAYER 1 MILE FROM SITE

Source: 1 Value: 2

2.4 Vertical Depth to Ground Water: 150 FEET PAGE 8

Source: 1 Value: 3

3.0 TARGETS

3.1 Ground Water Usage: PUBLIC SUPPLY, ALTERNATE SOURCES AVAILABLE

Source: 9 Value: 4

3.2 Distance to Nearest Drinking Water Well: 7000 FEET DATA FORM PAGE 6

Source: 1 Value: 1

3.3 Population Served with 2 miles: PUBLIC 7225 + DOMESTIC 30 → $\sqrt{7255}$

Source: 9,10 Value: 85

3.4 Area Irrigated by Wells within 2 miles: .75 $\sqrt{303}$

Source: 10 Value: 13

4.0 RELEASE

Explain basis: NONE DOCUMENTED

Source: ___ Value: 0

WORKSHEET 7
SOURCES USED IN SCORING

1. FINAL PRELIMINARY ASSESSMENT WSU TREE FRUIT RESEARCH UNIT WENATCHEE WASHINGTON, PRC ENVIRONMENTAL MANAGEMENT, INC. FOR US EPA, 1990
2. WASHINGTON CLIMATE FOR THESE COUNTIES CHELAN DOUGLAS OKANOGAN, COOPERATIVE EXTENSION SERVICE, WASHINGTON STATE UNIVERSITY.
3. WASHINGTON DEPARTMENT OF HEALTH GUIDE TO PHYSICO-CHEMICAL, TOXICOLOGICAL AND REGULATORY VALUES FOR PRIORITY POLLUTANTS, MONA KIMBELL, MEGAN DAVIS ET AL, DRAFT, 1990.
4. CHELAN COUNTY WASHINGTON MAP, PRODUCED BY CHELAN COUNTY PUBLIC WORKS, ALEX E. ALEXANDER, CARTOGRAPHER.
5. QUALITY CRITERIA FOR WATER, 1986, USEPA.
6. FLOOD BOUNDARY AND FLOODWAY MAP CHELAN COUNTY WASHINGTON UNINCORPORATED AREA PANEL NO. 530015 0625 A, FEMA FEDERAL INSURANCE ADMINISTRATION.
7. ISO PLUVIALS OF 2 YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH + NOAA ATLAS 2, VOLUME IX.
8. FARM CHEMICALS HANDBOOK '90, MEISTER PUBLISHING CO., 1990
9. STATE OF WASHINGTON PUBLIC WATER SUPPLY SYSTEM LISTING, DEPARTMENT OF HEALTH, 11/8/89.
10. RECORDED WATER RIGHTS OF THE DEPARTMENT OF ECOLOGY REGION 4, 9/16/90.