

CSID 12071

**WORKSHEET 1
SUMMARY SCORE SHEET**

Note: This document currently has no provision for sediment route scoring.

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

All Fab (Former)/Paine Field, Everett, Snohomish Co., 22/28N/4E

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

In about 1965 All Fab leased land and buildings from Snohomish County Airport for aerospace parts manufacturing. Building C-29 was used by All Fab for storage of equipment and some chemicals. It was constructed around 1945 by the military. There had been other industries that used C-29. In 1980 All Fab constructed building C-19 and used as main building for operations. In 1994 Snohomish County Airport hired Landau Associates Inc. to conduct an Environmental Assessment of the All Fab lease area. The investigation centered at the former vapor degreaser sump at C-19. The sump served as a dip tank and lost about 1000 gallons of solvent per year during operation. The estimate may not be accurate. Shallow groundwater underlying the sump was sampled and trichloroethylene (TCE), 1,1,1-trichloroethane, and vinyl chloride, exceeded Model Toxics Control Act (MTCA) cleanup levels. TCE was found in soil that exceeded MTCA cleanup levels. A subsequent study (July 1994) by Landau Associates confirmed the presence of TCE both soil and groundwater. Cis and Trans 1,2-Dichloroethene were found in groundwater. Chromium was found in one soil sample. These were all found in levels that exceeded MTCA cleanup levels. During demolition of the building at C-29 in 1996 a yellow-greenish stain was observed in the soil. Soil and groundwater was sampled out of a test pit by Landau Associates, Inc. Data indicated the presence of chromium, TCE, and vinyl chloride at levels which exceeded MTCA cleanup levels.

ROUTE SCORES:

Surface Water/Human Health: 17.2

Surface Water/Environ.: 12.4

Air/Human Health: 21

Air/Environmental: NS

Ground Water/Human Health: 31.6

OVERALL RANK: 4

Rev. 4/3/92

WORKSHEET 2
ROUTE DOCUMENTATION

1. SURFACE WATER ROUTE

List those substances to be considered for scoring: Source: 2.5

Trichloroethylene (TCE), chromium

Explain basis for choice of substance(s) to be used in scoring.

TCE and chromium will be used in scoring the surface water route, as their measured concentrations exceed MTCA cleanup levels and are available due to less than perfect containment.

List those management units to be considered for scoring: Source: 2.5

Contaminated surface soil

Explain basis for choice of unit to be used in scoring. Source: 2.5

Contaminated surface soil will be used in scoring as the measured concentration of TCE and chromium was from this management unit. No containment was observed of this unit allowing contaminants to be available to the ground water pathway.

2. AIR ROUTE

List those substances to be considered for scoring: Source: 2.5

TCE and chromium

Explain basis for choice of substance(s) to be used in scoring.

TCE and chromium will be used in scoring the air route, as their measured concentrations exceed MTCA cleanup levels and are available due to less than perfect containment.

List those management units to be considered for scoring: Source: 2.5

Contaminated surface soil

Explain basis for choice of unit to be used in scoring. Source: 2.5

Contaminated surface soil will be used in scoring as the measured

concentration of TCE and chromium was from this management unit. No containment was observed of this unit allowing contaminants to be available to the ground water pathway.

3. GROUND WATER ROUTE

List substances to be considered for scoring: Source: 2.5

Trichloroethylene (TCE), Cis-1,2-Dichloroethene, Trans-1,2-Dichloroethene, Chromium

Explain basis for choice of substance(s) to be used in scoring.

TPH Diesel will be used in scoring the ground water route, as it's measured concentration exceeded MTCA cleanup levels and is available due to less than perfect containment.

List management units to be considered in scoring: Source: 2.5

Contaminated subsurface soil

Explain basis for choice of unit used in scoring. Source: 2.5

Contaminated subsurface soil will be used in scoring as the measured concentration of TPH Diesel was from this management unit. No containment was observed of this unit allowing contaminants to be available to the ground water pathway.

**WORKSHEET 4
SURFACE WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard (ug/l)	Val.	Acute Toxicity		Chronic Toxicity		Carcinogenicity		
			(mg/kg-bw)	Val.	(mg/kg/day)	Val.	WOE	PF	Val.
Chromium	100	6	X	X	0.005	3	X	X	X
Trichloroethylene	5	8	2402	3	X	ND	B2	0.011	4

Source: 1,2,5,6

Highest Value: 8

2 Bonus Points? 2

Final Toxicity Value 10

1.2 Environmental Toxicity

Substance	(X) Freshwater () Marine Acute Criteria (ug/l)	Val.	Non-human Mammalian Acute Toxicity		Source: <u>1,2,5,6</u> Value: <u>2</u>
			(mg/kg)	Val.	
Chromium	1700	2	X	ND	
Trichloroethylene	45000	2	2402	3	

1.3 Substance quantity

Explain basis: Unknown quantity - Default value

Source: 1,2,3,5 Value: 1

**WORKSHEET 4 (CONTINUED)
SURFACE WATER ROUTE**

2.0 MIGRATION POTENTIAL

2.1	Containment Explain basis:	Spill and contaminated soil	Source: <u>1,2,4</u>	Value: <u>10</u>
2.2	Surface Soil Permeability:	Weathered till, clay sand mixture	Source: <u>5,11</u>	Value: <u>5</u>
2.3	Total Annual Precipitation	40 inches	Source: <u>4,7</u>	Value: <u>3</u>
2.4	Max. 2-Yr/24-hour Precipitation	1.5 inches	Source: <u>5</u>	Value: <u>2</u>
2.5	Flood Plain:	Not in floodplain	Source: <u>3,4,5</u>	Value: <u>0</u>
2.6	Terrain Slope:	< 2%	Source: <u>3,4,5,8</u>	Value: <u>1</u>

3.0 TARGETS

3.1	Distance to Surface Water:	4700 feet to Big Gulch	Source: <u>4,15</u>	Value: <u>4</u>
3.2	Population Served within 2 miles:	0	Source: <u>5,9</u>	Value: <u>0</u>
3.3	Area Irrigated within 2 miles:	0	Source: <u>5,9</u>	Value: <u>0</u>
3.4	Distance to Nearest Fishery Resource:	over 10,000 feet	Source: <u>4,15</u>	Value: <u>0</u>
3.5	Distance to, and Name (s) of, nearest Sensitive Environment (s)	Approx. 4700 feet to wetlands.	Source: <u>4,15</u>	Value: <u>6</u>

4.0 RELEASE

Explain basis for scoring a release to surface water:

No release of any hazardous substance was documented.

Source: 3,4,5 Value: 0

**WORKSHEET 5
AIR ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction (WARM Scoring Manual) - Please review before scoring.

1.2 Human Toxicity

Substance	Air Standard (ug/m3)	Val.	Acute Toxicity (mg/kg)	Val.	Chronic Toxicity (mg/kg/day)	Val.	Carcinogenicity		
							WOE	PF	Val.
Chromium	8.30E-05	10	X	ND	5.70E-05	10	A	41	9
Trichloroethylene	0.8	10	15583	3	X	ND	B2	0.017	4

Source: 1,2,5,6
 Highest Value: 10
 2 Bonus Points? 2
Final Toxicity Value 12

1.3 Mobility (Use numbers to refer to above listed substances)

1.3.1 Gaseous Mobility

Vapor Pressure (s):
 1) 1.1E+03=4

Source: 1,2,4,5,6 Value: 4

1.3.2 Particulate Mobility

Soil type: Sandy Clay
 Erodibility: 56 tons/acre/yr
 Climactic Factor: 1-10

Source: 1,2,4,5,6 Value: 1

1.4 Highest Human Health Toxicity/Mobility Matrix Value (from Table A-7)

equals **Final Matrix Value:** 24

1.5 Environmental Toxicity/Mobility

Source: 1,2,4,5,6

Non-human Mammalian

Substance	Inhal. Toxicity (ug/m3)	Value	Mobility	Value	Matrix Value
Chromium	-	ND		1	ND
Trichloroethylene	-	ND		4	ND

1.4 Highest Environmental Toxicity/Mobility Matrix Value (from Table A-7) equals **Final Matrix Value** 0

**WORKSHEET 5 (CONTINUED)
AIR ROUTE**

1.6 Substance Quantity: Source: 1,2,3,5 Value: 1
Explain basis: Unknown quantity - default value

2.0 MIGRATION POTENTIAL

2.1 Containment: Source: 3,4,5 Value: 10
Surface spill no containment or vapor collection

3.0 TARGETS

3.1 Nearest Population: Source: 4,8,14 Value: 8
1200 feet to nearest residence

3.2 Distance to, and Name (s) of, Nearest Sensitive Source: 4,15 Value: 5
Environment (s)
Wetlands about 2600 feet

3.3 Population within 0.5 miles: Source: 4,14 Value: 13
sq root of 174 = 13.2

4.0 RELEASE

Explain basis for scoring a release to air: Source: 1,2,3,4 Value: 0
Confirmed release not documented

**WORKSHEET 6
GROUND WATER ROUTE**

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Standard (ug/l)	Val.	Acute Toxicity (mg/kg-bw)	Val.	Chronic Toxicity (mg/kg/day)	Val.	Carcinogenicity		
							WOE	PF	Val.
Chromium	100	6	X	X	0.005	3	X	X	ND
Trichloroethylene	5	8	2402	3	X	ND	B2	0.011	4
Cis-1,2-dichloroethylene	70	6	X	ND	0.01	3	X	X	ND
Tran-1,2-dichloroethylene	100	6	7902	1	0.02	1	X	X	ND

Source: 1,2,4,5,6
 Highest Value: 8
 2 Bonus Points? 2
Final Toxicity Value: 10

1.2 Mobility (Use numbers to refer to above listed substances)
 Cations/Anions K value for chromium is less than 0.1

Source: 1,3,4,5 Value: 3

OR
 Solubility (mg/l) 1.10E+03

1.3 Substance Quantity
 Explain basis:
 Unknown quantity - Default value

Source: 1,2,3,5 Value: 1

2.0 MIGRATION POTENTIAL

2.1 Containment
 Explain basis: Discharge and contaminated soil

Source: 1,2,5,6 Value: 10

2.2 Net Precipitation: 19.6 inches

Source: 5,7 Value: 2

2.3 Subsurface Hydraulic Conductivity: Till

Source: 2,5,13 Value: 1

2.4 Vertical Depth to Ground Water: 25 feet

Source: 4,12 Value: 8

**WORKSHEET 6
GROUND WATER ROUTE**

3.0 TARGETS

3.1 Ground Water Usage: Ground water not used but usable	Source: <u>5,9,10,12</u> Value: <u>2</u>
3.2 Distance to Nearest Drinking Water Well: 9600 feet	Source: <u>5,10</u> Value: <u>1</u>
3.3 Population Served within 2 Miles: sq. root of 11 = 3	Source: <u>5,9,10,12</u> Value: <u>3</u>
3.4 Area Irrigated by (Groundwater) Wells within 2 miles: 0	Source: <u>5,9</u> Value: <u>0</u>

4.0 RELEASE

Explain basis for scoring a release to ground water: Source: 1,2,5 Value: 5
Confirmed release documented from analytical evidence

Sources Used in Scoring

1. Landau Associates, Inc., Former All Fab, Inc., Building C-19, Everett, WA, April 1994.
2. Landau Associates, Inc., Former All Fab, Inc. Chemical Storage Building, Everett, WA, July, 1996.
3. Washington Department of Ecology, Initial Investigation, All Fab/UNC Aerostructures, Everett, WA, June, 1994.
4. Snohomish Health District, Site Visit, All Fab/UNC Aerostructures, Everett, WA, November 4, 1996.
5. Washington Department of Ecology, WARM Scoring Manual, April, 1992.
January 1992.
6. Washington Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring,
7. National Weather Service, Washington Climate Data, Snohomish County
8. U.S.G.S. Topo. Map, East Edmonds Quad., 7.5 Min. Series, Photorev. 1981.
9. Washington Department of Ecology, Water Rights Information System (WRIS), November 4, 1992.
10. Washington Department of Health, Public Water System List, April 26, 1993.
11. Soil Conservation Service, Soil Survey of Snohomish County Area, July 1983.
12. Washington Department of Ecology, Well Logs
13. U.S. Dept. of Interior, Groundwater Resources of Snohomish County, 1952.

**PATHWAY SCORING FORMULAE WITH WEIGHTING AND
NORMALIZATION FACTORS**

Air Route - Human Health Pathway

$$\text{AIR} = (\text{SUB} \times 60/329) \times \{ \text{REL} + (\text{TAR} \times 35/85) \} / 24 = \quad \underline{\mathbf{21.03}}$$

where

AIR =	Pathway score for Air-Human Health =	
SUB =	(Human Toxicity Value + 5) X (Containment +1) + Substance Quantity =	<u>320</u>
REL =	Release to Air =	<u>0</u>
TAR =	Nearest population + Population within 1/2 mile =	<u>21</u>

Air Route - Environmental Pathway

$$\text{AIR} = (\text{SUB} \times 60/329) \times \{ \text{REL} + (\text{TAR} \times 35/85) \} / 24 = \quad \underline{\mathbf{10.64}}$$

where

AIR =	Pathway score for Air-Environmental =	
SUB =	(Env. Toxicity Value + 5) X (Containment +1) + Substance Quantity =	<u>56</u>
REL =	Release to Air =	<u>0</u>
TAR =	Nearest Sensitive Environment =	<u>5</u>

Surface Water Route - Human Health Pathway

$$\text{SW} = (\text{SUB} \times 40/175) \times \{ (\text{MIG} \times 25/24) + \text{REL} + (\text{TAR} \times 30/115) \} / 24 = \quad \underline{\mathbf{17.15}}$$

where

SW =	Pathway Score for Surface Water-Human Health =	
SUB =	(Human Toxicity + 3) X (Containment + 1) + Substance Quantity =	<u>144</u>
MIG =	Soil Permability + Annual Precip. + Rainfall Frequency + Floodplain + Slope =	<u>11</u>
REL =	Release to the Surface Water =	<u>0</u>
TAR =	Distance to Surface Water + Population Served by Surface Water + Area Irrigated =	<u>4</u>

Table 2 (Continued)

Surface Water Route - Environmental Pathway

$$SW = (SUB \times 40/175) \times \{(MIG \times 25/24)\} + REL + (TAR \times 30/115) / 24 = \underline{12.37}$$

where

SW =	Pathway Score for Surface Water-Environmental =	
SUB =	(Env. Toxicity + 3) X (Containment + 1) + Substance Quantity =	
	<u>56</u>	
MIG =	Soil Permeability + Annual Precip. + Rainfall Frequency +	
	Floodplain + Slope =	<u>11</u>
REL =	Release to the Surface Water =	<u>0</u>
TAR =	Distance to Nearest Surface Water + Distance to Fisheries	
	Resource + Distance to Sensitive Environment =	<u>10</u>

Ground Water Route - Human Health Pathway

$$GW = (SUB \times 40/208) \times \{(MIG \times 25/17) + REL + (TAR \times 30/165)\} / 24 = \underline{31.58}$$

GW =	Pathway Score For Ground Water-Human Health =	
SUB =	(Human Toxicity + Mobility + 3) X (Containment + 1) +	
	Substance Quantity =	<u>177</u>
MIG =	Depth to Aquifer + Net Precipitation + Hydraulic Conductivity =	
	<u>11</u>	
REL =	Release to the Ground Water =	<u>5</u>
TAR =	Aquifer Use + Well Distance + Population Served +	
	Area Irrigated =	<u>6</u>