

WORKSHEET 1  
Summary Score Sheet

**SITE INFORMATION:**

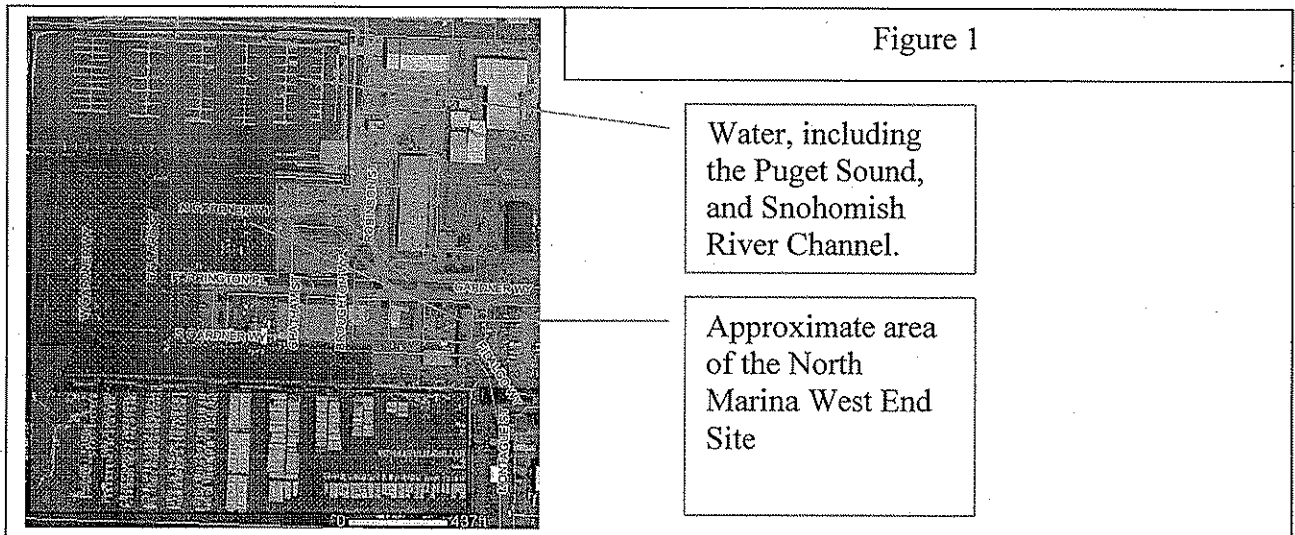
Name: North Marina West End  
Address: Between 11<sup>th</sup> and 14<sup>th</sup> Streets off Marine View Drive  
City: Everett County: Snohomish State: WA Zip: 98201  
Section/Township/Range: 18/29N/5E  
Latitude: 48° 0' 2.28" N Longitude: 122° 13' 18.73" W  
FS ID #: 3306834

*Site scored/ranked for the August 20, 2008 update.*  
August 4, 2008

**SITE DESCRIPTION:**

The North Marina West End (the site). made up of several parcels that have been lumped together. It is generally located on the western side of the City of Everett waterfront between 11<sup>th</sup> Street and 14<sup>th</sup> Street west of Marine View Drive. The Snohomish County tax parcel numbers associated with the site are 29051800208800, 29051800208900, 29051800209000/29051800209001 and 29051800302400. The site is flat and extends west into the Snohomish River channel between the Everett mainland and Jetty Island. (See figure 1)

According to the July 6, 2007 Landau Associates (Laundau) report West End Cleanup Action Plan, North Marina Redevelopment Site Everett, WA, the site historically has had commercial, industrial and marine related uses dating back to the early 1900's. The same report notes that tidelands in the area of the site were filled with material dredged from the Snohomish River to create new upland property. The report also notes that the site was filled to its current configuration between the years of 1947 and 1955. The site is approximately 65 acres.



## **Background**

A number of different reports have been prepared regarding property at the site and in the near vicinity. Work includes phase I and Phase II Environmental Site Assessments (Landau 2001 and 2004), the Data Gaps Investigation Report (Landau 2005), and the Supplemental Data Gaps Investigation Report (Landau 2006).

According to the July 6, 2007 Landau report, the site has been organized into 13 subareas (Areas A-M.) This Site Hazard Assessment includes review of the aforementioned parcels, for subareas D and H to be identified as the west end.

Within the D and H investigation area Landau confirms that the following contaminants are present in soils above their respective Model Toxics Cleanup Act (MTCA) Method A/Method B soil clean up levels:

Arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and Carcinogenic Polyaromatic Hydrocarbons (cPAHs).

Landau also confirmed the following contaminants to be above their respective MTCA Method A/Method B ground water cleanup levels:

Arsenic, copper, zinc, lead, diesel-range petroleum hydrocarbons, oil range hydrocarbons, and cPAHs.

It is unclear what, over the course of time, caused the contamination at the site. Landau points to general industrial use, spills, leaks and poor containment throughout the history of the site.

The site is currently undergoing a formal clean up. Potentially liable parties have been identified. The next steps of the process, as outlined in a January 4, 2008, letter from Ecology's Tim Nord to the Port of Everett's Jerry Heller are: Remedial Investigation and Feasibility Study, an Interim Action if found to be necessary, and a Clean up Action Plan. Of course, subsequent to these actions the clean up will occur in conjunction, where possible, the redevelopment of the property.

## **Surface Water and Groundwater Features**

The site is surrounded on the north, west and south sides by waters of the Puget Sound and the Snohomish River channel which drains to Port Gardner Bay. The site is an artificial rectangular shaped peninsula created by fill. The long side of the rectangle exists on an east/west plane while the short side of the rectangle exists on the north/south plane. From anywhere in the D and H portions of the site, the surface water features are less than 500 feet away.

According to Ecology well logs from resource protection well constructed within the site boundary, groundwater exists at approximately 12-25 feet below ground surface.

## Ground and Surface Water Uses

Ecology well logs did not indicate any domestic drinking water wells within two miles of the site. Review of the Washington State Water Rights Application and Tracking System (WRATS) revealed no groundwater use for irrigation within two miles of the site. The City of Everett supplies the site, the surrounding businesses and residential properties to the west with public water. The City of Everett's water source is piped from Lake Chaplain.

## Summary/Recommendations

Contamination of soils and groundwater is well documented. MTCA clean up levels for both soils and groundwater have been exceeded for a number of different compounds and elements. For this reason, the Health District recommends that the site be scored and ranked under the Washington Ranking Method.

**SPECIAL CONSIDERATIONS (include limitations in site file data or data which cannot be accommodated in the model, but which are important in evaluating the risk associated with the site, or any other factor(s) over-riding a decision of no further action for the site):**

None.

## ROUTE SCORES:

Surface Water/Human Health: 19.4  
Air/Human Health: 10.5  
Groundwater/Human Health: 39.5

Surface Water/Environmental.: 54.0  
Air/Environmental: NS

**OVERALL RANK: 2**

WORKSHEET 2  
Route Documentation

1. SURFACE WATER ROUTE

- a. List those substances to be considered for scoring:

Source: 1

**Arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs.**

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

**Analytical results from soil sampling indicate the presence of arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs (score as benzo(a) pyrene) at concentrations which exceed current Method B cleanup levels.**

- c. List those management units to be considered for scoring:

Source 1

**Subsurface soils, surface soils, ground water**

- d. Explain basis for choice of unit to be used in scoring:

**Discharges caused soil contamination Spills occurred in the surface with unknown run-on and run-off controls.**

2. AIR ROUTE

- a. List those substances to be considered for scoring:

Source: 1

**Arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs**

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

**Analytical results from soil sampling indicate the presence of arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs (score as benzo(a) pyrene) at concentrations which exceed current Method B cleanup levels.**

- c. List those management units to be considered for scoring:

Source: 1

**Subsurface soils, surface soils, ground water**

- d. Explain basis for choice of unit to be used in scoring:

**Spills/discharges caused soil contamination Spills occurred in surface with no cover and no vapor collection.**

### 3. GROUNDWATER ROUTE

- a. List those substances to be considered for scoring:

Source: 1

**Arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs**

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

**Analytical results from soil sampling indicate the presence of arsenic, copper, mercury, diesel range petroleum hydrocarbons, oil range petroleum hydrocarbons, naphthalenes, and cPAHs (score as benzo(a) pyrene) at concentrations which exceed current Method B cleanup levels.**

- c. List those management units to be considered for scoring:

Source: 1

**Subsurface soils, surface soils, ground water**

- d. Explain basis for choice of unit to be used in scoring:

**Spills/discharges caused soil contamination Documented impacts to groundwater.**

WORKSHEET 4  
Surface Water Route

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.1 Human Toxicity</b>										
Substance		Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	10	8	763	5	.001	5	A	1.75	7
2	Mercury	2	8	ND	x	.0003	5	ND	ND	x
3	TPH Diesel	500	5	490	5	.0004	3	ND	ND	X
4	TPH Oil	ND	x	ND	x	2	1	ND	ND	X
5	Benzo[a]pyrene	5	10	50	10	ND	x	B2	12	7

*\*Potency Factor*

Source: 1, 2

**Highest Value: 10**

(Max = 10)

**Plus 2 Bonus Points? 2**

**Final Toxicity Value: 12**

(Max = 12)

<b>1.2 Environmental Toxicity ( ) Freshwater (x) Marine</b>					
Substance		Acute Water Quality Criteria		Non-Human Mammalian Acute Toxicity	
		(µg/L)	Value	(mg/kg)	Value
1	Arsenic	69	6		
2	Mercury	2.1	8		
3	TPH Diesel	2350	2		
4	TPH Oil	ND	-	ND	-
5	Benzo[a]pyrene	300	4		

Source: 1, 2

**Highest Value: 8**

(Max = 10)

<b>1.3 Substance Quantity (aerial extent)</b>	
Explain Basis: approximately 20,000yd <sup>3</sup> (Landau, 2007)	Source: <u>1, 3</u> <b>Value: <u>5</u></b> (Max = 10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> Management unit scored as a spills/discharges/contaminated soil occur in the surface and in the subsurface. <b>Explain basis:</b> Spill occurred in the surface with unknown run on and runoff controls .	1, 3	<b>10</b> (Max = 10)
2.2	<b>Surface Soil Permeability:</b> Snohomish Silt Till – well graded sands, silt loam	11	<b>3</b> (Max = 7)
2.3	<b>Total Annual Precipitation:</b> average annual precipitation for Mt. Vernon WSO AP, WA = 32.30 in	3	<b>3</b> (Max = 5)
2.4	<b>Max 2yr/24hr Precipitation:</b> 1.5 inches to 2.0 inches	4	<b>2</b> (Max = 5)
2.5	<b>Flood Plain:</b> not in a flood plain	13	<b>0</b> (Max = 2)
2.6	<b>Terrain Slope:</b> = 0-2% to Puget Sound	13	<b>1</b> (Max = 5)

## 3.0 TARGETS

		Source	Value
3.1	<b>Distance to Surface Water:</b> < 500 feet Puget Sound / Snohomish River	13	<b>10</b> (Max = 10)
3.2	<b>Population Served within 2 miles (see WARM Scoring Manual Regarding Direction ):</b> $\sqrt{0} = 0$	6, 7	<b>0</b> (Max = 75)
3.3	<b>Area Irrigated by surface water within 2 miles :</b> $(0.75) * \sqrt{\# \text{ acres}} = 0.75 * \sqrt{0} = 0$	6	<b>0</b> (Max = 30)
3.4	<b>Distance to Nearest Fishery Resource:</b> <500 feet to the Puget Sound/Snohomish river	13	<b>12</b> (Max = 12)
3.5	<b>Distance to, and Name(s) of, Nearest Sensitive Environment(s):</b> wetland > 500 feet to the Puget Sound and Snohomish River	13	<b>12</b> (Max = 12)

## 4.0 RELEASE

<b>Explain Basis:</b> No documented release	<b>Source:</b> 1, 3 <b>Value:</b> <b>0</b> (Max = 5)
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## WORKSHEET 5

### Air Route

#### 1.0 SUBSTANCE CHARACTERISTICS

##### 1.1 Introduction

##### 1.2 Human Toxicity

	Substance	Air Standard ( $\mu\text{g}/\text{m}^3$ )	Value	Acute Toxicity ( $\text{mg}/\text{m}^3$ )	Value	Chronic Toxicity ( $\text{mg}/\text{kg}/\text{day}$ )	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	.00023	10	ND	X	ND	X	A	50	9
2	Mercury	.3	10	ND	X	$8.5 \times 10^{-5}$	8	ND	ND	X
3	TPH Diesel	166.5	4	ND	X	ND	X	ND	ND	X
4	Benzo[a]pyrene	0.0006	10	ND	X	ND	X	B2	ND	X

\* Potency Factor

Source: 1, 3

**Highest Value: 10**

(Max = 10)

**Plus 2 Bonus Points? 2**

**Final Toxicity Value: 12**

(Max = 12)

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

1.3.1 Gaseous Mobility		1.3.2 Particulate Mobility		
Vapor Pressure(s) (mmHg)		Soil Type	Erodibility	Climatic Factor
1		Silty clay loam	38	1-10
2		"	"	"
3	$8.2\text{E}+01 = 3$			
4				

Source: 2

**Value: 3**

(Max = 4)

Compare  $4/3 = 6$  vs  $12/1 = 6$

Source: 1, 3

**Value: 1**

(Max = 4)

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

**Final Matrix Value: 6**

(Max = 24)



1.5 Environmental Toxicity/Mobility						
	Substance	Non-human Mammalian Inhalation Toxicity (mg/m <sup>3</sup> )	Acute Value	Mobility (mmHg)	Value	Matrix Value
1	Arsenic	ND	--	ND	--	--
2	Mercury	--	--			
3	TPH Diesel	--	--			
4	TPH Oil	--	--			
5	Benzo[a]pyrene	--	--			

Highest Environmental Toxicity/Mobility Matrix Value (from Table A-7) = **Final Matrix Value: NS**  
(Max = 24)

1.6 Substance Quantity (aerial extent)	
<b>Explain Basis:</b> North Marina West End is approximately 7.8-39 acres. Entire site is 65 acres and the west end is between 0 and ½ that size.	Source: 1, 3 <b>Value: 8</b> (Max = 10)

## 2.0 MIGRATION POTENTIAL

		Source	Value
2.1	<b>Containment:</b> Spill occurred in surface with no cover and no vapor collection	1, 3	<b>10</b> (Max = 10)

## 3.0 TARGETS

		Source	Value
3.1	<b>Nearest Population:</b> less than 1000 feet to various marina facilities and the City of Everett boat launch park.	3, 13	<b>10</b> (Max = 10)
3.2	<b>Distance to [and name(s) of] nearest sensitive environment(s) [fisheries excluded]:</b> N/A since not scoring environmental route	13	<b>NA</b> (Max = 7)
3.3	<b>Population served within 0.5 miles:</b> 2004 us census data pop/sq mile = $\sqrt{\text{pop.}} = \sqrt{244} = 15.6$ estimated by GIS parcel based population estimates	13	<b>15.6</b> (Max = 75)

## 4.0 RELEASE

<b>Explain Basis for scoring a release to air:</b> Not documented	Source: 1, 3 <b>Value: 0</b> (Max = 5)
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**WORKSHEET 6**  
Groundwater Route

**1.0 SUBSTANCE CHARACTERISTICS**

<b>1.2 Human Toxicity</b>										
Substance		Drinking Water Standard (µg/L)	Value	Acute Toxicity (mg/ kg-bw)	Value	Chronic Toxicity (mg/kg/day)	Value	Carcinogenicity		Value
								WOE	PF*	
1	Arsenic	10	8	763	5	.001	5	A	1.75	7
2	Mercury	2	8	ND	x	.0003	5	ND	ND	x
3	TPH Diesel	500	5	490	5	.0004	3	ND	ND	X
4	TPH Oil	ND	x	ND	x	2	1	ND	ND	X
5	Benzo[a]pyrene	5	10	50	10	ND	x	B2	12	7

\* Potency Factor

Source: 1, 2

**Highest Value: 10**  
(Max = 10)

**Plus 2 Bonus Points? 2**  
**Final Toxicity Value: 12**  
(Max = 12)

<b>1.2 Mobility (use numbers to refer to above listed substances)</b>	
Cations/Anions [Coefficient of Aqueous Migration (K)]	OR Solubility (mg/L)
1 = > 1.0 = 3	
2 = > 1.0 = 3	
	3 = 3.0E+01 = 1
	4 = 0
	5 = 1.2E-03 = 0

Source: 1, 3

**Value: 3**  
(Max = 3)

<b>1.3 Substance Quantity (volume):</b>	
Explain basis: 5,000-50,000 cubic yards	Source: 1, 3, 8 <b>Value: 5</b> (Max=10)

## MIGRATION POTENTIAL

		Source	Value
2.1	Containment (explain basis): Spills to surface with unknown level of soil contamination	1, 3	<b>10</b> (Max = 10)
2.2	Net precipitation: $22.8'' - 5.9'' = 16.9''$	4	<b>2</b> (Max = 5)
2.3	Subsurface hydraulic conductivity: sandy slit $>10^{-5}$ to $10^{-3}$ (cm/sec)	3, 11	<b>3</b> (Max = 4)
2.4	Vertical depth to groundwater: 0-25 feet as per well logs	3, 5	<b>8</b> (Max = 8)

## 2.0 TARGETS

		Source	Value
3.1	Groundwater usage: Groundwater not usable	3, 6	<b>1</b> (Max = 10)
3.2	Distance to nearest drinking water well: <u>&gt;10,000</u> feet	3, 5, 13	<b>0</b> (Max = 5)
3.3	Population served within 2 miles: $\sqrt{\text{pop.}} = \sqrt{0}$	3, 7	<b>0</b> (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: $(0.75) * \sqrt{\# \text{ acres}} = 0.75 * \sqrt{0} = 0$	3, 6	<b>0</b> (Max = 50)

## 3.0 RELEASE

		Source	Value
	Explain basis for scoring a release to groundwater: Documented impacts to groundwater - (Landau, 2007)	1, 3, 13	<b>5</b> (Max = 5)

## SOURCES USED IN SCORING

1. Washington State Department of Ecology File on North Marina West End.
2. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992
3. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
4. Washington Climate – Net Rainfall Table
5. Washington State Department of Ecology, Online Water Well Log database
6. Washington State Department of Ecology, Water Rights Application System (WRATS) printouts
7. Washington State Department of Health, Office of Drinking Water Sentry website printout for public water supplies
8. Western Regional Climate Center's Historical Climate Information
9. Thomas Guide, Snohomish County, 2008
10. Department Of The Interior, US Geologic Survey, Geologic Map of the Everett 7.5 Minute Quad, James P. Minard, 1985
11. Soil Conservation Service, Soil Survey of Snohomish County Area, July 1983.
12. Snohomish County Assessors/Treasurers On-line information page @ <http://198.238.192.103/propsys/Asr-Tr-PropInq/PrpInq01-Entry.asp>
13. Snohomish County GIS mapping information