

**Site Hazard Assessment
Worksheet 1
Summary Score Sheet**

SITE INFORMATION

Name: Trident Metals
Address: 1851 Taylor Way
City: Tacoma **County:** Pierce **State:** WA **Zip:** 98421
Section/Township/Range: 26 / 21N / 03E
Latitude: 47.27264 **Longitude:** -122.38749
Facility Site ID Number: 5979

Site assessed/ranked for the February 2011 update.

November 1, 2010

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

General Site Description

The subject site operates on tax parcel 0321264075 and totals approximately 5.6 acres. The site is zoned “Port Maritime and Industrial” and is located in the City of Tacoma. The *Hylebos Waterway* is the property’s north border and *Cenex Ag, Inc.* provides the western border. Cenex Ag, Inc. manufactures large concrete girders, beams, and other concrete structural components. *Buffelen Woodworking* owns and operates a lumber and wood facility while serving as the subject parcel’s eastern border. *Taylor Way* provides the southern border. The surrounding area has the same zoning designation and lies in the highly industrialized *Tide Flats* section of Tacoma.

Subsurface conditions at the property likely consist mainly of gravelly silt and silty sand, to a depth of approximately thirteen feet (13’). Groundwater is likely present at approximately five feet to twenty feet below ground surface (5’ – 20’ bgs). These are typical subsurface characteristics for properties located in the Tide Flats. Groundwater is assumed to flow northerly, towards the Hylebos Waterway of Commencement Bay, Puget Sound. The Hylebos Waterway is adjacent to the subject site. The closest active groundwater drinking well is a Group A Municipal Water System (City of Tacoma) that is approximately two thousand one hundred fifty five feet (2155’) to the northwest and has a depth of approximately seven hundred eighty feet below ground surface (780’ bgs).

Site History

A joint inspection of this site was coordinated by the City of Tacoma and scheduled for December 10, 2009. The subject site is currently used as a scrap metal yard by Trident Metals, which is leasing the property from Tacoma Industrial Properties. Tacoma Industrial Properties (TIP) owns two adjacent parcels, but the scrap metal operation is confined to parcel number 0321264075. The second parcel is located immediately west of the subject parcel. TIP bought

the subject parcel from Buffelen Woodworking Company in June 2009 and Trident Metals has occupied the site since then. The Hylebos Waterway forms the northern boundary of this site. Given the location of this site, groundwater is likely present at a very shallow depth.

December 10, 2009 Inspection:

As part of the December 10, 2009 joint inspection Tacoma-Pierce County Health Department (the Health Department) staff attended a pre-inspection meeting and then proceeded with the physical inspection. Unusually cold weather had resulted in frozen soil conditions. There are two buildings on the site, and Trident Metals occupies the large building at the south end of the property near the access point off Taylor Way. Trident Metals receives scrap metal, cuts it up into smaller pieces and exports it for recycling. The scrap metal sorting and recycling operation was being conducted in the yard north of the building, in the western half. The western portion of the yard has concrete underneath a gravel and dirt layer. Where the concrete was visible, it appeared to be cracked and broken. The large building occupied by Trident Metals reportedly extended at one time to the Waterway, and the concrete slab is the remainder of that building's foundation. The eastern portion of the yard is unpaved and graveled. TIP is in the process of improving the site. Improvements include installation of two new, industrial light poles on the eastern edge of the yard, upgrading the power to the building that involved trenching to run new power lines across the southeast section of the site, and painting the building.

Health Department staff collected a soil sample from a soil stockpile that displayed staining and was located adjacent to the light pole installation. This sample was submitted for northwest total petroleum hydrocarbon identification (NWTPH-HCID), northwest total petroleum hydrocarbon identification – diesel (NWTPH-dx), Resource Conservation and Recovery Act Heavy Metals (Total RCRA 8 Metals), semi-volatile organic compounds (SVOC), and polychlorinated bi-phenyls (PCB) laboratory analyses. West and southwest from the soil stockpile, the unpaved ground was darkly stained. City of Tacoma field investigations prior to this site inspection had noted heavy oil staining in this area as well. Approximately one ounce of soil was collected from the frozen surface for field screening only. Once the sample thawed, it displayed petroleum odor and sheen.

Issues noted by the Health Department at the site during this site inspection included:

1. Improper handling of hazardous wastes: open buckets with used oil that could be tipped over or overflow due to rain accumulation, floor dry applied to outdoor areas, open “mixed wastes” container without any lid.
2. Petroleum staining in the area where metals and car parts were stored and machinery parts were being drained; although this portion of the yard was underlain with concrete, the concrete was cracked providing pathways for hazardous materials to seep into the ground.
3. Stained ground surface near the light pole excavation piles; stained soil in the excavation stockpiles.
4. An abundance of dirt and dust possibly containing metals, oil staining, sandblasting grit, dust from broken concrete present on the site with potential to be easily washed into the Hylebos Waterway.

5. Possible asbestos containing material (insulation present on a boiler).

Health Department Soil Sample Results:

The NWTPH-HCID analysis of the one stockpile soil sample collected by the Health Department indicated the presence of diesel and lube oil range hydrocarbons. These were further quantified as 910 mg/kg diesel and 1700 mg/kg lube oil. Carcinogenic polycyclic aromatic hydrocarbons (cPAHs) were also detected at low levels, with a sum of the Toxic Equivalency Factors (TEFs) yielding 0.09 mg/kg. Aroclor 1260 was detected at a concentration of 1.0 mg/kg. Chromium, and lead were detected at 22 and 32 mg/kg respectively. None of the detections exceeded their respective Model Toxics Control Act Method A Cleanup Levels for Unrestricted Land Use (MTCA Method A – Soil). Hexavalent chromium is not a suspected contaminant at this site, so the total chromium cleanup level (CUL) of 2000 mg/kg was applied. Barium was also detected at 180 mg/kg. Final results were received by the Health Department on December 21, 2009; preliminary results for some constituents were provided verbally on December 17, 2009.

December 14, 2009 Inspection:

Health Department staff returned to the site on December 14, 2009 to talk to Trident Metals about a report received by the Health Department that soil was being removed from the site improperly. Employees at the site were asked about the soil and they indicated that RV Construction had moved some soil around. The soil stockpiles associated with the light pole installations appeared smaller so some of the material may have been transported off-site or moved. The scrap metal material had been moved around and was better organized with a noticeable reduction in volume. There was a pile of dirt on the concrete pad that reportedly resulted from scraping up soil in the yard. Trident Metal staff including the regional manager was informed of the requirement to properly dispose of all soils removed from the property.

December 17, 2009 Inspection:

Health Department staff met with the Regional Manager for Trident Metals, on December 17, 2009. City of Tacoma Environmental Services staff was also present. The City of Tacoma was present to continue their investigation into the migration of contamination into the storm water collection system as well as into the Hylebos Waterway via surface sheet flow. At this time it was communicated that the Health Department had collected one soil sample from the stockpile and the preliminary results indicated the presence of oil and diesel range organics at concentrations below state cleanup levels, and a PCB concentration at the cleanup level. It was further communicated that one sample result was not sufficient to characterize a stockpile, and that the results indicated the need for further sampling. Trident Metals was aware of the need to characterize the soil before disposal and has contracted with Earth Solutions for this service. Further characterization would be required for the trenches excavated by RV Construction at the southwest corner of the site to provide upgraded power to the building.

No significant surface soil stains were noted during this inspection. The yard had been swept, and possibly bladed, with several piles of accumulated material resulting. Soil and gravel was stockpiled on site from these efforts and contamination of this material from the petroleum

hydrocarbon releases noted previously is considered likely. There was also a large pile of soil mixed with wood waste and small pieces of scrap metal. It was indicated that the scrap metal pieces would be removed from the pile and the soil removed from the site. A large pile of engine blocks was stored on top of the broken concrete pad and exposed to the weather. Fluids draining from the engines were present on the ground surface and displayed characteristic petroleum sheen. Absorbent booms had been placed around the pile to capture the fluids. The location of the engine blocks was about midway along the western edge of the work yard, near the large pile of soil mixed with wood waste and scrap metal.

Health Department staff communicated that an environmental site assessment was warranted to determine the impact from the site use. The sampling results from the light pole installation's excavated soils indicated the presence of subsurface contamination that, while below or at MTC A Method A - Soil CULs, warranted further delineation. It was then advised to consider engineering controls suitable to the intended use of the property while conducting upgrades to the site, such as paving the surface and installing oil/water separators.

As a result of the Health Department's multiple inspections, sampling results and information provided by other agency inspectors, the following issues were noted at the site:

1. Spills of hazardous materials to the ground and areas of stained soil consistent with petroleum hydrocarbons;
2. Improper storage of vehicle parts such as engine blocks stored outside on the ground and leaking fluids;
3. Flow of rainwater across the yard surface and carrying contamination towards the Hylebos Waterway and into the stormwater collection system;
4. Piles of soil and gravel that are suspected of being contaminated;
5. Presence of asbestos in the insulation on a scrap metal boiler.

Written correspondence was sent to Trident Metal's regional manager, indicating the issues noted above along with the need to assess the site conditions and remediate any contamination. Copies were provided to the site owner and his representative, along with the business owner and the City of Tacoma.

TIP Sampling Results:

Two sets of sampling results were provided by TIP to the Health Department. The first set consisted of Sample #1 and #2, collected on 12/16/09, from the soil stockpile associated with the light pole installation. The NWTPH-dx analysis results were non-detect (ND) except for Bunker C oil concentrations of 1400 and 800 mg/kg, respectively. Sample #1 was also analyzed for; benzene, toluene, ethylbenzene, and xylenes compounds (BTEX compounds), and none were detected. A second set of three samples was collected from the mixed soil/wood waste/scrap metal pile in the Trident Metal's work yard. The samples were analyzed by NWTPH-dx, and by 8260 for BTEX compounds. The results show the presence of Bunker C oil in Sample #4 at 1100 mg/kg and Sample #5 at 14,000 mg/kg. BTEX compounds were not detected.

Health Department Recommendation:

On January 13, 2010 the Health Department recommended that the subject site be placed on the Washington State Department of Ecology's Confirmed or Suspected Contaminated Sites List (CSCSL) with a status of awaiting a Site Hazard Assessment.

At this point in time, significant contamination of soils or groundwater at the site has not been verified. Trident Metals has been operating for approximately one year atop a structurally compromised concrete surface and releasing hazardous materials in the process. Some of the released materials may have infiltrated the cracks in the concrete and impacted the subsurface soils. Pre-existing subsurface contamination, unrelated to the Trident Metals business operation, may also be present.

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):

The scope of this Site Hazard Assessment did not include a hydrogeologic survey of the subject site and surrounding area. The groundwater contamination documented or inferred at the subject site is therefore considered to have the potential to impact any well located within the prescribed 2-mile radius and all such wells were used in the scoring process.

ROUTE SCORES:

Surface Water/Human Health: <u>44</u>	Surface Water/Environ. <u>72</u>
Air/Human Health: <u>14.6</u>	Air/ Environmental: <u>16.5</u>
Ground Water/Human Health: <u>59.9</u>	

OVERALL RANK: 1

Worksheet 2--Route Documentation

1. SURFACE WATER ROUTE:

- a. List those substances to be considered for scoring: Source: 1,2,3

Metals, PCBs, cPAHs, TPH, BTEX Compounds

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

Arsenic, benzo[a]pyrene, PCBs, and TPH-dx will be used to score this site due to available analytical data, geographic location (ASARCO Smelter Plume), and that constituents are available to the Surface Water route due to less than perfect containment.

- c. List those management units to be considered for scoring: Source: 1,2,3

Spills, Discharges, and Contaminated Soil

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

Spills, Discharges, and Contaminated Soil Contamination will be the management unit used for scoring due to multiple current and historical surface releases.

2. AIR ROUTE:

- a. List those substances to be considered for scoring: Source: 1,2,3

Metals, PCBs, cPAHs, TPH, BTEX Compounds

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

Arsenic, benzo[a]pyrene, PCBs, and TPH-dx will be used to score this site due to available analytical data, geographic location (ASARCO Smelter Plume), and that constituents are available to the Air route due to less than perfect containment.

- c. List those management units to be considered for scoring: Source: 1,2,3

Spills, Discharges, and Contaminated Soil

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

Spills, Discharges, and Contaminated Soil Contamination will be the management unit used for scoring due to multiple current and historical surface releases.

3. GROUND WATER ROUTE:

- a. List those substances to be considered for scoring: Source: 1,2,3

Metals, PCBs, cPAHs, TPH, BTEX Compounds

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

Arsenic, benzo[a]pyrene, PCBs, and TPH-dx will be used to score this site due to available analytical data, geographic location (ASARCO Smelter Plume), and that constituents are available to the Groundwater route due to less than perfect containment.

c. List those management units to be considered for scoring: **Source: 1,2,3**

Spills, Discharges, and Contaminated Soil

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

Spills, Discharge, Contaminated Soil will be the management unit used for scoring due to contaminated soil verified through sampling and analysis.

Worksheet 4 - Surface 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-bw)	Val.	Carcinogenicity		Val.	
							WOE	PF*		
1	Arsenic	10	8	763 (rat)	5	0.001	5	A	1.75	6
2	benzo[a]pyrene	0.2	10	50(rat)	10	--	ND	B2	12	7
3	PCBs	0.5	10	1315(rat)	3	--	ND	B2	7.7	6
4	TPH-diesel	160	4	490 (rat)	5	0.004	3	--	--	ND
5										
6										

*Potency Factor

Source: 3

Highest Value: 10
(Max=10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max=12)

1.2 Environmental Toxicity

Substance	<input type="checkbox"/> Freshwater <input checked="" type="checkbox"/> Marine Acute Water Quality Criteria		Non-human Mammalian Acute Toxicity (mg/kg)	
	Value	Value	Value	Value
1	Arsenic	69	6	
2	benzo[a]pyrene	300	4	
3	PCBs	10	8	
4	TPH-Diesel	2350	2	
5				
6				

Source: 2

Value: 8
(Max 10)

1.3 Substance Quantity

Substance Quantity: >82,500 – 420,000 ft ²
Explain Basis: Conservative estimated based on the areal extent of non maintained engineered cover.

Source: 2

Value: 9
(Max 10)

Worksheet 4 (cont'd)

2.0 MIGRATION POTENTIAL		SOURCE	VALUE
2.1	Containment Spills, Discharge, and Contaminated Soil Explain Basis: No run-on run-off control , located outside	2	10 (Max = 10)
2.2	Surface Soil Permeability: adjacent to surface water	2	7 (Max = 7)
2.3	Total Annual Precipitation: 38.95 inches	9,11	3 (Max = 5)
2.4	Max. 2-Yr/24-hour Precipitation: > 2-4	2	3 (Max = 5)
2.5	Flood Plain: FEMA Zone A, 100 year flood plain	11	2 (Max = 2)
2.6	Terrain Slope: Adjacent to Surface Water, ~ 13%	11	5 (Max = 5)

3.0 TARGETS		SOURCE	VALUE
3.1	Distance to Surface Water: adjacent to Hylebos Waterway, which drains into Puget Sound.	11	10 (Max = 10)
3.2	Population served within 2 miles (See WARM Scoring Manual regarding direction): $\sqrt{\text{pop.}} = \sqrt{0} = 0$	11	0 (Max = 75)
3.3	Area irrigated within 2 miles: (0.75) $\sqrt{\text{no. acres}} =$ (Refer to note in 3.2.) : (0.75) $\sqrt{0} = 0$	11	12 (Max = 30)
3.4	Distance to nearest fishery resource: < 1,000 ft	11	12 (Max = 12)
3.5	Distance to, and name(s) of, nearest sensitive environment(s) < 1,000 ft	11	12 (Max = 12)

4.0 RELEASE		Source	Value
Explain basis for scoring a release to surface water: No confirmed release		1	0 (Max = 5)

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/m ³)	Val	Acute Toxicity (mg/m ³)	Val	Chronic Toxicity (mg/kg/day)	Val	Carcinogenicity		Val
							WOE	PF*	
1 Arsenic	0.00023	10	--	ND	--	ND	A	50	9
2 benzo[a]pyrene	0.0006	10	--	ND	--	ND	B2	--	ND
3 PCBs	--	ND	--	ND	--	ND	B2	--	ND
4 TPH-Diesel	166.5	4	--	ND	--	ND	--	--	ND
5									

*Potency Factor

Source: 3

Highest Value: 10
(Max=10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max=12)

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: Gravelly sand
1= 0 = 1	Erodibility: 22
2= 5.6E-09 = 1	Climatic Factor: 1-10
3= 7.7E-05 = 2	Particulate Mobility Potential: 0
4= 8.2E-02 = 3	
5=	

Source: 3
 Value: 3
 (Max = 4)

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

Final Matrix Value: 18
(Max = 24)

Worksheet 5 (cont'd)

1.5 Environmental Toxicity Mobility

Substance	Non-Human Mammalia Inhal. Toxicity (mg/m ³)	Acute Value	Mobility (mmHg)	Value
1 Arsenic	N/A	--	--	--
2 benzo[a]pyrene	N/A	--	--	--
3 PCBs	N/A	--	--	--
4 TPH-Diesel	N/A	--	--	--
5				

Highest Environmental Toxicity/Mobility Matrix Value (From Table A-7) equals

Final Matrix Value: N/A
 (Max= 4)

1.6 Substance Quantity: >67,500 – 340,000		
Explain basis: Conservative estimate based on the areal extent of non maintained engineered cover.	Source: <u>11</u>	Value: <u>7</u> (Max=10)

1.0 MIGRATION POTENTIAL

2.1 Containment: Spills, Discharge, and Contaminated Soil. No cover, spills directly to ground, no vapor collection system.	Source: <u>1,2</u>	Value: <u>10</u> (Max=10)
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2.0 TARGETS

3.1 Nearest Population: > 1,000 ft – 2000 ft	Source: <u>2,11</u>	Value: <u>8</u> (Max=10)
Distance to, and name(s) of, nearest sensitive environment(s): 0 ft to Hylebos Creek, Critical Habitat	Source: <u>2,11</u>	Value: <u>7</u> (Max=7)
3.2 Population within 0.5 miles: $\sqrt{\text{pop.}} = \sqrt{102} = 10.09$	Source: <u>2,11</u>	Value: <u>10</u> (Max=75)

3.0 RELEASE

Explain basis for scoring a release to air: No confirmed release.	Source: <u>1,2</u>	Value: <u>0</u> (Max.=5)
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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		Val	
							WOE	PF*		
1	Arsenic	10	8	763 (rat)	5	0.001	5	A	1.75	6
2	benzo[a]pyrene	0.2	10	50(rat)	10	--	ND	B2	12	7
3	PCBs	0.5	10	1315(rat)	3	--	ND	B2	7.7	6
4	TPH-diesel	160	4	490 (rat)	5	0.004	3	--	--	ND
5										
6										

***Potency Factor**

Source: 2,3

Highest Value: 10
(Max=10)

Plus 2 Bonus Points? 2

Final Toxicity Value: 12
(Max=12)

1.2 Mobility (Use numbers to refer to above listed substances)	
Cations/Anions:	OR Solubility (mg/l):
1= Arsenic = 3 (K > 1.0)	1=
2=	2= benzo[a]pyrene = 0.0012 = 0
3=	3= PCBs = 0.003 = 0
4=	4= TPH-Diesel = 30 = 1
5=	5=
6=	6=
Source: <u>2,3</u> Value: <u>1</u> (Max=3)	
1.3 Substance Quantity: 13,163 cubic yards	
Explain basis: Estimated volume based on three foot depth and areal extent of potential contaminated soil.	Source: <u>1,2</u> Value: <u>5</u> (Max=10)

2.0 MIGRATION POTENTIAL

2.1	Containment Spills, Discharges, and Contaminated Soil Explain basis:	Source: <u>1,2</u>	Value: 10 (Max = 10)
2.2	Net precipitation: (Nov. – Apr.) <u>22.9</u> inches (29.3'' – 6.4'')	Source: <u>2,9</u>	Value: 3 (Max = 5)
2.3	Subsurface hydraulic conductivity: Sandy Silt	Source: <u>1,2</u>	Value: 3 (Max = 4)
2.4	Vertical depth to ground water: <u>0-25</u> feet	Source: <u>1,2,7</u>	Value: 8 (Max = 8)

3.0 TARGETS

3.1	Ground water usage: Aquifer Recharge Area, public supply; no alternate unthreatened sources available with minimal hook ups.	Source: <u>2,11</u>	Value: 9 (Max = 10)
3.2	Distance to nearest drinking water well: <u>2155'</u> feet. (City of Tacoma Well)	Source: <u>2,7,11</u>	Value: 5 (Max = 5)
3.3	Population served within 2 miles: $\sqrt{\text{pop.}} = \sqrt{359811} = \geq 100$	Source: <u>2,8,11</u>	Value: 100 (Max = 100)
3.4	Area irrigated by (groundwater) wells within 2 miles: $(0.75) \sqrt{345} \text{ No. acres} = 0 = 0$	Source: <u>2,6</u>	Value: 0 (Max = 50)

4.0 RELEASE

	Explain basis for scoring a release to ground water: No release confirmed.	Source: <u>1,2</u>	Value: 0 (Max = 5)
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Sources Used in Scoring

1. Tacoma-Pierce County Health Department Site Hazard Assessment File/Ecology TCP File
2. Washington State Department of Ecology, WARM Scoring Manual, April 1992.
3. Washington State Department of Ecology, Toxicology Database for Use in Washington Ranking Method Scoring, January 1992.
4. U.S. Department of Interior Geological Survey Topographical Map
5. Soil Survey of Pierce County, U.S.D.A. Soil Conservation Service
6. Water Rights Information System (WRIS), Ecology
7. Department of Ecology/Tacoma-Pierce County Health Department Well Logs
8. Washington State Department of Health Public Water Supply System
9. Washington Climate for Pierce County, National Weather Service Forecast Office
10. Department of Fish and Wildlife, Catalog of Washington Streams and Salmon
11. Pierce County Geographic Information System Countyview Database