Site Hazard Assessment
Worksheet 1
Summary Score Sheet

SITE INFORMATION

Name: **Smurfit Stone Container Corp**
Address: 817 E 27th St.
City: Tacoma **County:** Pierce **State:** WA **Zip:** 98421
Section/Township/Range: 03 / 20N / 03E
Latitude: 47° 14' 20.1"N **Longitude:** 122° 25' 18.8"W
Facility Site ID Number: 17167958

Site assessed/ranked for the August 22, 2007 update

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

The Smurfit Stone Container Corp. (SSCC) site consists of six (6) parcels, totaling over five (5) acres of land. The majority of the site is covered with a maintained asphalt cover. The confirmed subsurface contamination, which is the subject of this site hazard assessment (SHA), is present in shallow groundwater beneath parcel 2077290010. Specifically, petroleum hydrocarbon impacted groundwater was discovered near an underground storage tank complex (UST), which is adjacent to the boiler room (See Figure 1, Site Diagram). The contamination was discovered in April 2002 during cleaning and maintenance of a heating fuel oil tank (Tank 3). Water was observed entering the tank from a hole in the bottom of tank. The hole was easily visible due to its location directly below the tank fill port. The property was purchased by Carastaur Industries, Inc (CI) in 2002. CI is the current owner of the property and the facility is used for manufacturing paperboard.

The majority of the subject site is zoned as "Heavy Industrial". To the north, across East 26th Street, are "Tacoma Box Company", "System 99 Truck Terminal" and a City Light Sub Station. "Western Beer Distributors" and "American Neon" share a property line to the west. To the south sits vacant community land, which acts as a buffer from the "Tacoma Dome". The subject site shares a property line to the east with the "Holroyd Batch Plant", which is classified as a mining facility.

SSCC rests at sea level, approximately four thousand two hundred feet (4200') west of the Puyallup River, and eleven thousand two hundred feet (11,200') south of the Puyallup River confluence with Commencement Bay. The site sits primarily on artificial fill with a mixed Alderwood-Everett soil classification. "The Alderwood series consists of moderately deep to a cemented pan, moderately well drained soils formed in glacial till. Alderwood soils are on glacially modified foothills and valleys. The Everett series consists of very deep, somewhat excessively drained soils formed in glacial outwash or alluvium with an admixture of volcanic ash on terraces, moraines, and terrace escarpments".

The primary environmental consultant employed at this site, Maul Foster & Alongi, Inc. (MFA), describes the subsurface soil conditions as, "sand and gravel fill that extends to depths of approximately five (5) to eight (8) feet below ground surface (bgs). The fill is underlain by a laterally continuous clay unit (glacial till) that is at least seven (7) feet thick and extends to a depth of at least fifteen feet (15') bgs. The clay unit perches shallow groundwater in the fill. The groundwater table occurs at depths of approximately three (3) to four and one half (4.5) feet bgs". MFA has determined that groundwater flow is to the southwest.

After the initial discovery of the leaking underground storage tank (LUST), MFA was tasked with investigating if the release impacted subsurface soil and groundwater.

On May 31, 2002, MFA conducted a subsurface assessment near the UST complex. Two soil borings were drilled (B-1, B-2). Soil was collected from both borings and a groundwater sample was collected from B-1. The samples were analyzed for hydrocarbons by Environmental Protection Agency (EPA) Method 8015. Analysis indicated that groundwater had concentrations of diesel range hydrocarbons and residual range hydrocarbons of 520 ug/l and 3,600 ug/l, respectively. Subsurface soils did not contain hydrocarbons above the laboratory's reporting limit.

On June 6, 2002, an additional boring (B-3) was advanced, north of Tank 3 and adjacent to B1. A groundwater sample was collected and analyzed for total petroleum hydrocarbons as diesel (TPH-Dx) and total petroleum hydrocarbons as oil (TPH-O) by EPA Method 8015, and for total petroleum hydrocarbons as oil and grease (TPH-O&G) by EPA Method 1664. Analytical results confirmed concentrations of TPH-Dx and TPH-O at 1,420 ug/l and 3,440 ug/l, respectively.

On September 27, 2002, MFA submitted an "Application for Permit to Abandon UST". In order to preserve the integrity of the other two tanks and associated piping in the complex, MFA proposed to abandon Tank 3 in place.

On November 7, 2002, the Tacoma-Pierce County Health Department (TPCHD) issued a letter requiring further investigation to determine the extent of contamination.

On January 13, 2003, MFA conducted a subsurface assessment by advancing six (6) soil borings (GP-1 – GP-6) and installed temporary well points in order to collect groundwater samples. Samples were collected at all points except GP-2 due to potential interference with organic debris. The samples were analyzed for TPH-Dx, TPH-O using Washington Department of Ecology (Ecology) Method NWTPH-Dx, and BTEX compounds (Benzene, Toluene, Ethylbenzene, Xylenes) using EPA Method 8021B. All the samples were below the laboratory's reporting limit and Model Toxic Control Act Method A Cleanup Levels (MTCA) for Groundwater with the exception of GP-1 and GP-5. Toluene was detected in GP-1 and GP-5 at concentrations of 2.22 ug/l and 0.70 ug/l respectively.

On April 9, 2003, MFA submitted a "Draft Groundwater Investigation Workplan" which proposed to install three down-gradient monitoring wells (MW1 – MW3) and to collect samples to be analyzed for TPH-Dx, TPH-O, BTEX in all three monitoring wells, and polycyclic aromatic hydrocarbons (PAHs) in MW-3.

On July 29, 2003, the TPCHD approved the workplan with the addition of one "up-gradient monitoring well".

On August 22, 2003, MFA began quarterly groundwater monitoring at all four monitoring wells. Concentrations of TPH-O were above MTCA Method A Cleanup Levels in MW1 (765 ug/l) and MW2 (512 ug/l). Groundwater monitoring continued and samples collected in November 12, 2003, had detectable concentrations of carcinogenic PAH's (cPAH's), below their MTCA cleanup levels. Monitoring continued through four quarters to April 21, 2005.

Samples collected on April 21, 2005, had concentrations above Method A Cleanup Levels for TPH-Dx (837 ug/l) and TPH-O (1370 ug/l) in MW-3.

Having achieved four clean quarters of groundwater monitoring in MW1 and MW2, MFA discontinued further monitoring of these wells. CPAH's were also not detected for four quarters. MFA discontinued sampling for this analyte.

MFA recommended that the TPCHD and Ecology issue a No Further Action (NFA) regardless of the April 21, 2005, concentrations of TPH-Dx and TPH-O in MW3. MFA stated that analytical evidence suggested that MW3 had been compromised and contaminated with surface contamination and quantitative analysis of the chromatograms indicated that the laboratory data was misread. Due to these two issues, MFA argued that the sample was not representative of "*in situ* groundwater conditions".

On May 25, 2005, the SSCC site was accepted into Ecology's Voluntary Cleanup Program (VCP).

On September 8, 2005, the TPCHD issued a letter stating that the TPCHD cannot grant a closure based on potentially flawed data from a compromised well

MFA continued monitoring the groundwater at MW3 and MW4 and collected samples on June 2, 2005. MW3 contained concentrations of TPH-Dx above MTCA Method A Cleanup Levels (510 ug/l) and MW4 did not indicate contamination. Based on these results MFA discontinued monitoring MW4.

On November 17, 2005, MFA collected one groundwater sample and a duplicate sample from MW3. Concentrations of TPH-Dx were present above the laboratory's detection limit but below MTCA Method A Cleanup Levels.

Sample results for all groundwater monitoring samples collected up to and including November 17, 2005, are presented in Table 1 and Table 2.

On September 9, 2006, Ecology placed SSCC on the Confirmed and Suspected Contaminated Sites List (CSCS) with a status of awaiting a SHA.

On October 11, 2006, Ecology issued a letter indicating that the subject site, per MFA's request, had been voluntarily removed from VCP.

On October 17, 2006, MFA collected a groundwater sample and a duplicate from MW3. Concentrations of TPH-Dx and TPH-O exceeded MTCA Method A Cleanup Levels in both samples. Concentrations of these samples are presented in Table 3.

On May 16, 2007, Ecology issued a letter notifying Carastaur Industries, Inc that the subject site would be assessed and ranked through the SHA process for the August 22, 2007, update to the Ecology Hazardous Sites List.

On June 27 2007, TPCHD staff conducted a site visit to ensure accurate representation of the current site conditions. Monitoring wells were visible and the surrounding asphalt cover was well maintained.

Figure 1 (Site Diagram)

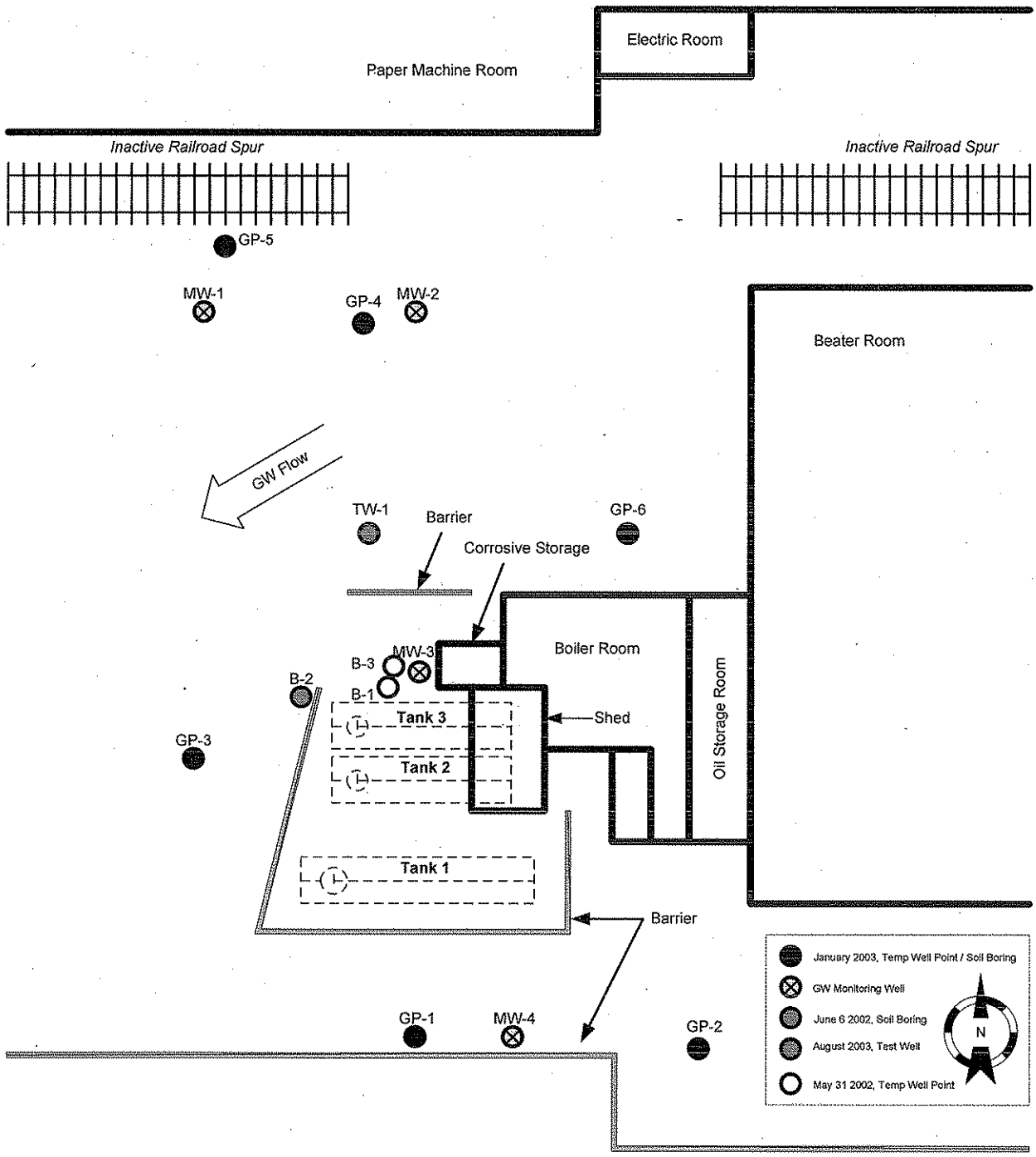

Table 1

Maul, Foster, Alongi 8.21.03 – 3.17.04 Groundwater Sample Results (ug/l)							
Sample ID	**Date**	**Benzene**	**Toluene**	**EthlyBenz.**	**Xylenes**	**TPH-Dx**	**TPH-O**
TW-1	8.21.03	1.74	ND	0.594	1.28	ND	ND
MW-1	8.22.03	ND	ND	ND	ND	387	765
	11.12.03	ND	0.547	ND	ND	ND	ND
	3.17.04	ND	ND	ND	ND	ND	ND
	7.29.04	NA	NA	NA	NA	ND	ND
	1.6.05	NA	NA	NA	NA	ND	ND
	4.21.05	NA	NA	NA	NA	ND	ND
MW-2	8.22.03	ND	ND	ND	ND	497	512
	11.12.03	ND	ND	ND	ND	286	ND
	3.17.04	ND	ND	ND	ND	ND	ND
	7.29.04	NA	NA	NA	NA	ND	ND
	1.6.05	NA	NA	NA	NA	ND	ND
	4.21.05	NA	NA	NA	NA	ND	ND
MW-3	8.22.03	ND	ND	ND	ND	ND	ND
	11.12.03	ND	ND	ND	ND	ND	ND
	3.17.04	ND	ND	ND	ND	ND	ND
	7.29.04	NA	NA	NA	NA	ND	ND
	1.6.05	NA	NA	NA	NA	ND	ND
	4.21.05	NA	NA	NA	NA	**837**	**1370**
	6.2.05	NA	NA	NA	NA	**510**	ND
	11.17.05	NA	NA	NA	NA	267	ND
	11.17.05	NA	NA	NA	NA	361	ND
MW-4	8.22.03	ND	2.2	ND	ND	ND	ND
	11.12.03	ND	3.82	ND	ND	ND	ND
	3.17.04	ND	0.541	ND	ND	ND	ND
	7.29.04	NA	NA	NA	NA	ND	ND
	1.6.05	NA	NA	NA	NA	ND	ND
	4.21.05	NA	NA	NA	NA	ND	ND
	6.2.05	NA	NA	NA	NA	ND	ND
MTCA Method A Cleanup Levels for Groundwater		**5**	**1000**	**700**	**1000**	**500**	**500**

Table 2 (cPAHs)

Maul, Foster, Alongi 8.21.03 - 3.17.04 Groundwater Sample Results (ug/l)									
Sample ID	Date	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Chrysene	Dibenzo(a,h)anthracene	Indeno(1,2,3-cd)pyrene	Total Toxic Equivalency Concentration
TW-1	8.21.03	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	8.22.03	NA	NA	NA	NA	NA	NA	NA	NA
	11.12.03	0.348	0.347	0.261	0.247	0.441	0.136	0.246	**0.516**
	3.17.04	ND	ND	0.022	0.0141	ND	0.0147	0.0143	0.011
	7.29.04	ND	ND	ND	ND	ND	ND	ND	0
	1.6.05	ND	ND	ND	ND	ND	ND	ND	0
	4.21.05	ND	ND	ND	ND	ND	ND	ND	0
MW-2	8.22.03	NA	NA	NA	NA	NA	NA	NA	NA
	11.12.03	0.158	0.108	0.0677	0.0751	0.139	ND	0.0939	**0.149**
	3.17.04	ND	ND	ND	ND	ND	ND	ND	0
	7.29.04	ND	ND	ND	ND	ND	ND	ND	0
	1.6.05	ND	ND	ND	ND	ND	ND	ND	0
	4.21.05	ND	ND	ND	ND	ND	ND	ND	0
MW-3	8.22.03	0.0217	ND	ND	ND	0.0136	ND	ND	0.002
	11.12.03	ND	ND	ND	ND	ND	ND	ND	0
	3.17.04	ND	ND	ND	ND	ND	ND	ND	0
	7.29.04	ND	ND	ND	ND	ND	ND	ND	0
	1.6.05	ND	ND	ND	ND	ND	ND	ND	0
	4.21.05	ND	ND	ND	ND	ND	ND	ND	0
MW-4	8.22.03	NA	NA	NA	NA	NA	NA	NA	NA
	11.12.03	0.452	0.554	0.388	0.404	0.636	0.179	0.354	**0.792**
	3.17.04	ND	ND	ND	ND	ND	ND	ND	0
	7.29.04	ND	ND	ND	ND	ND	ND	ND	0
	1.6.05	ND	ND	ND	ND	ND	ND	ND	0
	4.21.05	ND	ND	ND	ND	ND	ND	ND	0

MTCA Method A Cleanup Levels for Groundwater	0.1

Table 3

Maul, Foster, Alongi 8.21.03 - 3.17.04 Groundwater Sample Results (ug/l)							
Sample ID	Date	Benzene	Toluene	EthlyBenz.	Xylenes	TPH-Dx	TPH-O
MW-3	8.22.03	ND	ND	ND	ND	ND	ND
	11.12.03	ND	ND	ND	ND	ND	ND
	3.17.04	ND	ND	ND	ND	ND	ND
	7.29.04	NA	NA	NA	NA	ND	ND
	1.6.05	NA	NA	NA	NA	ND	ND
	4.21.05	NA	NA	NA	NA	**837**	**1370**
	6.2.05	NA	NA	NA	NA	**510**	ND
	11.17.05	NA	NA	NA	NA	267	ND
	11.17.05	NA	NA	NA	NA	361	ND
	10.17.06	NA	NA	NA	NA	**513**	**686**
	10.17.06	NA	NA	NA	NA	**581**	**921**
MTCA Method A Cleanup Levels for Groundwater		**5**	**1000**	**700**	**1000**	**500**	**500**

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):

Due to the significant contamination documented on-site being primarily subsurface, the surface water and air routes are not applicable for WARM scoring for this site. Thus, only the groundwater route will be scored.

Soil data collected thus far may not be indicative of potential subsurface soil contamination. Soil samples were not obtained from directly below the tank. The tank was abandoned in place and initial site characterization borings were collected from locations north (B-1 & B-3) and west (B-2) of the release.

Groundwater data collected thus far may not be indicative of potential contamination. If the direction of groundwater flow, as interpreted by MFA, is correct then the groundwater monitoring wells are not down-gradient of the release.

ROUTE SCORES:

Surface Water/Human Health: **NS**

Surface Water/Environ. **NS**

Air/Human Health: **NS**

Air/ Environmental: **NS**

Ground Water/Human Health: **20.1**

OVERALL RANK: 5

Worksheet 2--Route Documentation

1. SURFACE WATER ROUTE: *Not Scored*

2. AIR ROUTE: *Not Scored*

3. GROUND WATER ROUTE:

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

TPH-Diesel
TPH-Oil

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

TPH-Diesel and TPH-Oil will be scored due to concentrations detected in groundwater above current MTCA Method A Cleanup Levels, and because it was available to the groundwater route through less than perfect containment.

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

Contaminated soil and groundwater, capped, with no liner or leachate collection system.

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

Contaminated groundwater verified by laboratory results.

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	Carcino-genicity WOE PF*	Val
1	TPH-Diesel	160	4	490 (rat)	5	0.004	3	NA	--
2	TPH-Oil	NA	--	NA	--	2.0	1	NA	--
3									
4									
5									
6									

***Potency Factor**

Source: 2, 3

Highest Value: 5 (Max=10)

Plus 2 Bonus Points? 0

Final Toxicity Value: 5 (Max=12)

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

Cations/Anions:	OR	Solubility (mg/1):
1=		1= TPH-Diesel = 30 mg/l = 1
2=		2= TPH-Oil = <10 mg/l = 0
3=		3=
4=		4=
5=		5=
6=		6=
		Source: 2, 3
		Value: 1 (Max=3)

1.3 Substance Quantity: 10,000 Gallons

Explain basis: Based on default of the one filled volume of the unit.

Source: 1, 2

Value: 5 (Max=10)

Worksheet 6 (cont'd)

2.0 MIGRATION POTENTIAL

2.1	**Containment:** Landfill **Explain basis:** Contaminated groundwater with maintained engineered cover (0), no liner (3); no leachate collection system (2).	**Source:** 1, 2	**Value:** 5 (Max = 10)
2.2	**Net precipitation:** (Nov. – Apr.)19.1 inches (25.5'' – 6.4'') **inches**	**Source:** 2, 9	**Value:** 2 (Max = 5)
2.3	**Subsurface hydraulic conductivity:** Clay, low permeability till	**Source:** 1, 2	**Value:** 1 (Max = 4)
2.4	**Vertical depth to ground water:** 0 **feet**	**Source:** 1,2,7	**Value:** 8 (Max = 8)

3.0 TARGETS

3.1	**Ground water usage:** Federally designated sole source aquifer	**Source:** 2, 11	**Value:** 10 (Max = 10)
3.2	**Distance to nearest drinking water well:** 3,391 **feet,** Tacoma (Star) Ice	**Source:** 2,7,11	**Value:** 2 (Max = 5)
3.3	**Population served within 2 miles:** √ **pop.** = √ 305,336 = 553	**Source:** 2,8,11	**Value:** 100 (Max = 100)
3.4	**Area irrigated by (groundwater) wells within 2 miles:** **(0.75)** √ 46 **No. acres** = 5.08	**Source:** 2, 6	**Value:** 5 (Max = 50)

4.0 RELEASE

Explain basis for scoring a release to ground water: Analytical evidence of a release from groundwater monitoring wells at the site.	**Source:** 1, 2	**Value:** 5 (Max = 5)

Smurfit Stone Container Corp
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. Water Rights Application Tracking System (WRATS), Ecology

5. Washington State Department of Health Public Water Supply System

6. Washington Climate for Pierce County, National Weather Service Forecast Office

7. Pierce County Geographic Information System Countyview Database