



Shaw Environmental, Inc.

MEMORANDUM

TO: Suzanne Dudziak, Port of Tacoma **DATE:** December 17, 2003
FROM: Brian Peters **PROJECT:** 834419
SUBJECT: Maersk Product Recovery Update

The purpose of this memorandum is to update the Port of Tacoma on ongoing product recovery activities at the Maersk Pacific site located at 1675 Lincoln Avenue, Building 600, at the Port of Tacoma (Figure 1). Shaw Environmental, Inc. (Shaw) has performed passive skimming activities since May 2002 associated with the light, non-aqueous phase liquid (free product) plume present beneath the site. The plume is comprised of diesel and heavy oil-range hydrocarbons, which likely originated from former above- and underground storage tanks and pipelines located at the site.

Passive skimming activities have been performed at the site periodically using a peristaltic pump and tubing extended into the free product to minimize the volume of water recovered. Prior to skimming activities, depth-to-free product and depth-to-water measurements were taken to accurately place pump tubing.

Depth-to-free product and depth-to-water measurements, free product thickness, and the total volume of product recovered are presented on Table 1. A total of approximately 16 gallons of free product has been recovered since skimming began in May 2002.

The thickness of free product appears to be directly associated with the groundwater elevation. During the drier months (May through October), the thickness of free product increases to thicknesses sufficient enough for recovery. During the wetter, winter months when the water table is at its highest, the measurable free product thickness decreases to essentially zero; therefore, no product is recovered. Figures 2 and 3 illustrate the relationship between depth to water and product thickness for recovery wells RW-1 and RW-2, respectively. The depth to water has been corrected to account for the density of the free product floating on top of the groundwater table (Table 1). It should be noted that the first product thickness measurements on each of the graphs represent the thickness prior to initiation of skimming activities.

Depth-to-water and depth-to-free product measurement are collected once every one to two weeks during the drier months and slightly less frequently during the winter months. If the thickness of product is sufficient for removal, skimming is performed and the product decanted into a labeled 55-gallon drum placed in a secondary containment container on site in a location approved by Maersk Pacific, LTD.

Suzanne Dudziak, Port of Tacoma
December 17, 2003
Page 2

It is Shaw's understanding that passive skimming will continue under the Port of Tacoma's direction. Based on past groundwater and free product measurements collected from the remaining groundwater wells at the site, it appears that the extent of the recoverable free product at the site is limited to the area in the immediate vicinity of the existing recovery wells and that a more aggressive recovery program is not warranted at the site at this time.

Attachments: Table 1 – Free Product Thickness and Recovered Volume
Figure 1 – Site Plan
Figure 2 – Product Thickness vs. Depth to Water – Recovery Well RW-1
Figure 3 – Product Thickness vs. Depth to Water – Recovery Well RW-2

Free Product Thickness and Recovered Volume
Port of Tacoma
Maersk Pacific Site Product Recovery

Well #	Date	DTW (feet bgs)	DTP (feet bgs)	Thickness (feet)	Volume Removed (gallons)	DTW (feet bgs)
Initial - RW-1	05/08/02	9.96	9.43	0.53	0.5	9.51
	05/16/02	10.01	9.92	0.09	0.1	9.93
	05/22/02	10.05	9.98	0.07	0.1	9.99
	05/31/02	9.27	9.22	0.05	0	9.23
	06/05/02	9.48	9.39	0.09	<0.1	9.40
	06/19/02	9.43	9.26	0.17	0.1	9.29
	06/27/02	9.80	9.72	0.08	<0.1	9.73
	07/03/02	9.60	9.53	0.07	<0.1	9.54
	07/19/02	9.33	9.23	0.10	<0.1	9.25
	08/08/02	10.40	10.26	0.14	0.1	10.28
	08/21/02	10.38	10.24	0.14	0.2	10.26
	09/04/02	10.46	10.25	0.21	0.2	10.28
	09/27/02	10.20	9.88	0.32	0.2	9.93
	10/10/02	9.55	9.36	0.19	0.1	9.39
	10/24/02	9.57	9.45	0.12	0.1	9.47
	11/14/02	10.34	10.01	0.33	0.25	10.06
	11/26/02	8.97	8.86	0.11	0	8.88
	12/11/02	8.51	8.42	0.09	0	8.43
	12/26/02	7.91	ND	0.00	0	7.91
	01/30/03	7.71	ND	0.00	0	7.71
	02/20/03	8.86	ND	0.00	0	8.86
	03/31/03	8.78	ND	0.00	0	8.78
	04/07/03	9.52	ND	0.00	0	9.52
	04/14/03	8.34	ND	0.00	0	8.34
	04/21/03	8.52	ND	0.00	0	8.52
	05/01/03	8.44	8.43	0.01	0	8.43
	05/29/03	9.15	9.00	0.15	0	9.02
	06/24/03	10.03	9.73	0.30	0.2	9.78
	07/03/03	9.88	9.78	0.10	0	9.80
	07/17/03	9.82	9.72	0.10	0	9.74
	07/23/03	10.39	10.24	0.15	0	10.26
	07/30/03	9.71	9.66	0.05	0	9.67
	08/07/03	10.01	9.93	0.08	0	9.94
	08/21/03	9.55	9.40	0.15	0	9.42
	08/28/03	9.56	9.50	0.06	0	9.51
	09/29/03	10.01	9.83	0.18	0.1	9.86
	10/08/03	9.35	9.28	0.07	0	9.29
	10/29/03	8.60	8.58	0.02	0	8.58
	11/12/03	9.02	8.96	0.06	0	8.97
	11/25/03	8.41	8.35	0.06	0	8.36

Free Product Thickness and Recovered Volume
Port of Tacoma
Maersk Pacific Site Product Recovery

Well #	Date	DTW (feet bgs)	DTP (feet bgs)	Thickness (feet)	Volume Removed (gallons)	DTW (feet bgs)
Initial - RW-2	05/08/02	11.12	9.66	1.46	2	9.88
	05/16/02	10.68	10.05	0.63	0.5	10.14
	05/22/02	10.02	9.68	0.34	0.4	9.73
	05/31/02	9.60	9.41	0.19	0.3	9.44
	06/05/02	9.96	9.70	0.26	0.25	9.74
	06/19/02	10.23	9.54	0.69	0.5	9.64
	06/27/02	10.29	9.89	0.40	0.3	9.95
	07/03/02	10.10	9.78	0.32	0.3	9.83
	07/19/02	10.19	9.60	0.59	0.75	9.69
	08/08/02	11.06	10.29	0.77	0.75	10.41
	08/21/02	11.01	10.36	0.65	0.8	10.46
	09/04/02	10.95	10.37	0.58	0.5	10.46
	09/27/02	9.83	9.20	0.63	0.5	9.29
	10/10/02	10.00	9.70	0.30	0.25	9.75
	10/24/02	10.00	9.77	0.23	0.25	9.80
	11/14/02	9.94	9.32	0.62	0.5	9.41
	11/26/02	9.39	9.36	0.03	0	9.36
	12/11/02	8.87	8.83	0.04	0	8.84
	12/26/02	8.38	ND	0.00	0	8.38
	01/30/03	8.09	ND	0.00	0	8.09
	02/20/03	9.04	ND	0.00	0	9.04
	03/31/03	9.32	9.15	0.17	0	9.18
	04/07/03	10.15	9.71	0.44	0.25	9.78
	04/14/03	8.76	8.65	0.11	0	8.67
	04/21/03	8.88	8.70	0.18	0	8.73
	05/01/03	8.99	8.73	0.26	0	8.77
	05/29/03	10.18	9.15	1.03	0.5	9.30
	06/24/03	11.21	9.72	1.49	1.5	9.94
	07/03/03	10.38	9.87	0.51	0.3	9.95
	07/17/03	10.39	9.85	0.54	0.25	9.93
	07/23/03	10.80	10.05	0.75	0.5	10.16
	07/30/03	10.57	9.70	0.87	0.6	9.83
	08/07/03	9.68	9.15	0.53	0.3	9.23
	08/21/03	10.27	9.76	0.51	0.3	9.84
	08/28/03	10.02	9.65	0.37	0	9.71
	09/29/03	11.02	10.15	0.87	0.75	10.28
	10/08/03	10.05	9.78	0.27	0.25	9.82
	10/29/03	9.02	8.95	0.07	0	8.96
	11/12/03	9.55	9.31	0.24	0	9.35
	11/25/03	8.92	8.71	0.21	0	8.74

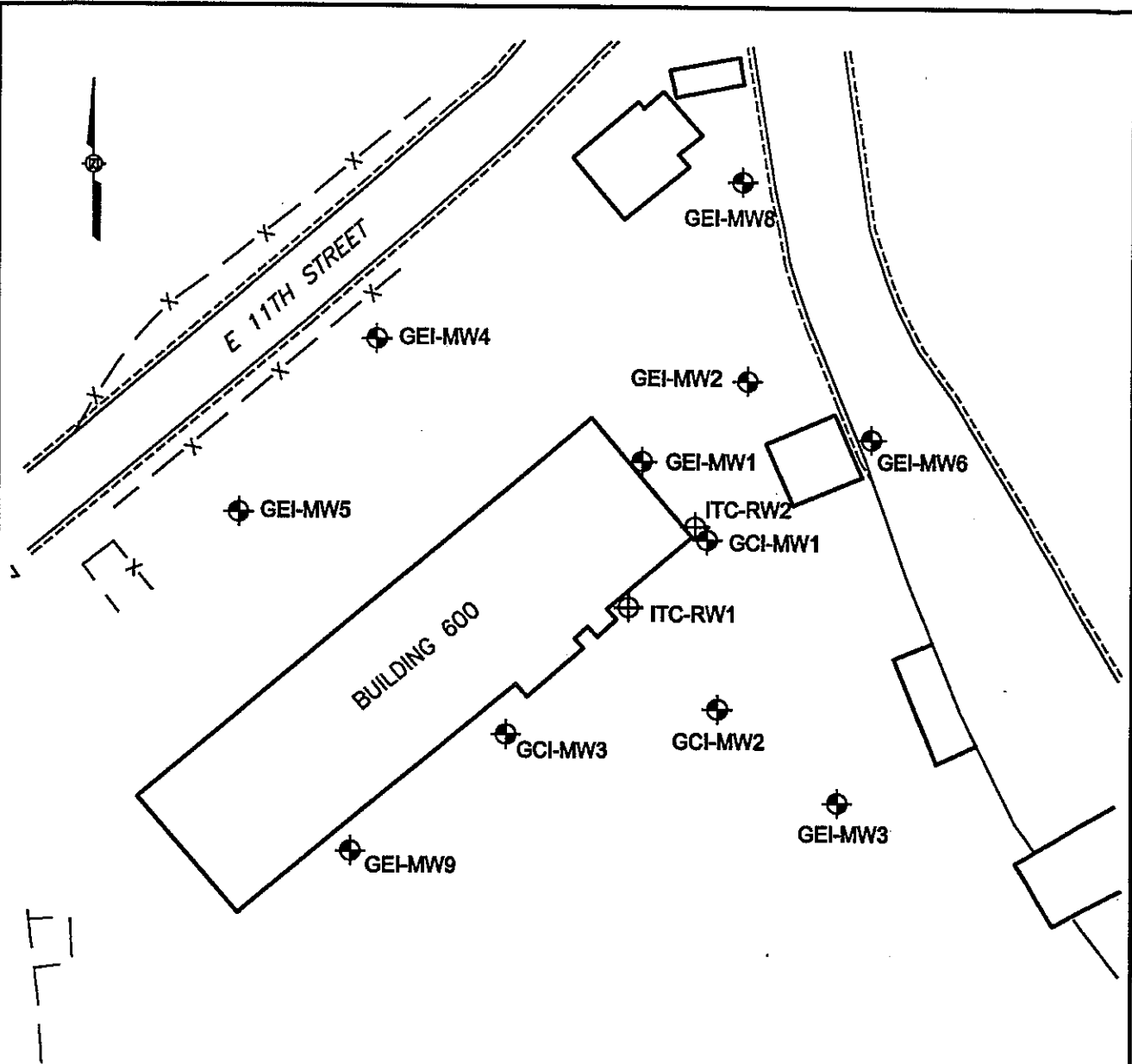
NOTE: DTW - depth to water (feet below ground surface).
DTP - depth to product (feet below ground surface).

Total Volume Recovered RW-1 (approximate)
Total Volume Recovered RW-2 (approximate)

2.15 gallons
14.35 gallons

OFFICE: BOTHELL
 DRAWN BY: MPerdacio 1/9/03
 CHECKED BY:
 APPROVED BY:
 DRAWING NUMBER: 834419

R:\Project\New\NorthPac\834419\Drawings\834419-22.dwg Thu, 09/Jan/03 01:46pm mperdacio
 Bolidesk Project: N:\SDBK\PROJ\834419.dwg
 Director: 100 Location: 03 Pathcode: 1



LEGEND:

- Product Recovery Well
- Monitoring Well
- Existing Fence
- Bridges Line

NOTE: LOCATIONS ARE APPROXIMATE.



SOURCE: GEO ENGINEERS

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 Shaw Environmental, Inc.

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FIGURE 1
 SITE PLAN
 MAERSK PACIFIC LTD.
 1675 LINCOLN AVENUE
 TACOMA, WASHINGTON

Figure 2
Product Thickness vs. Depth to Water
Recovery Well RW-1
Maersk Pacific Site - Building 600
Port of Tacoma, Tacoma WA

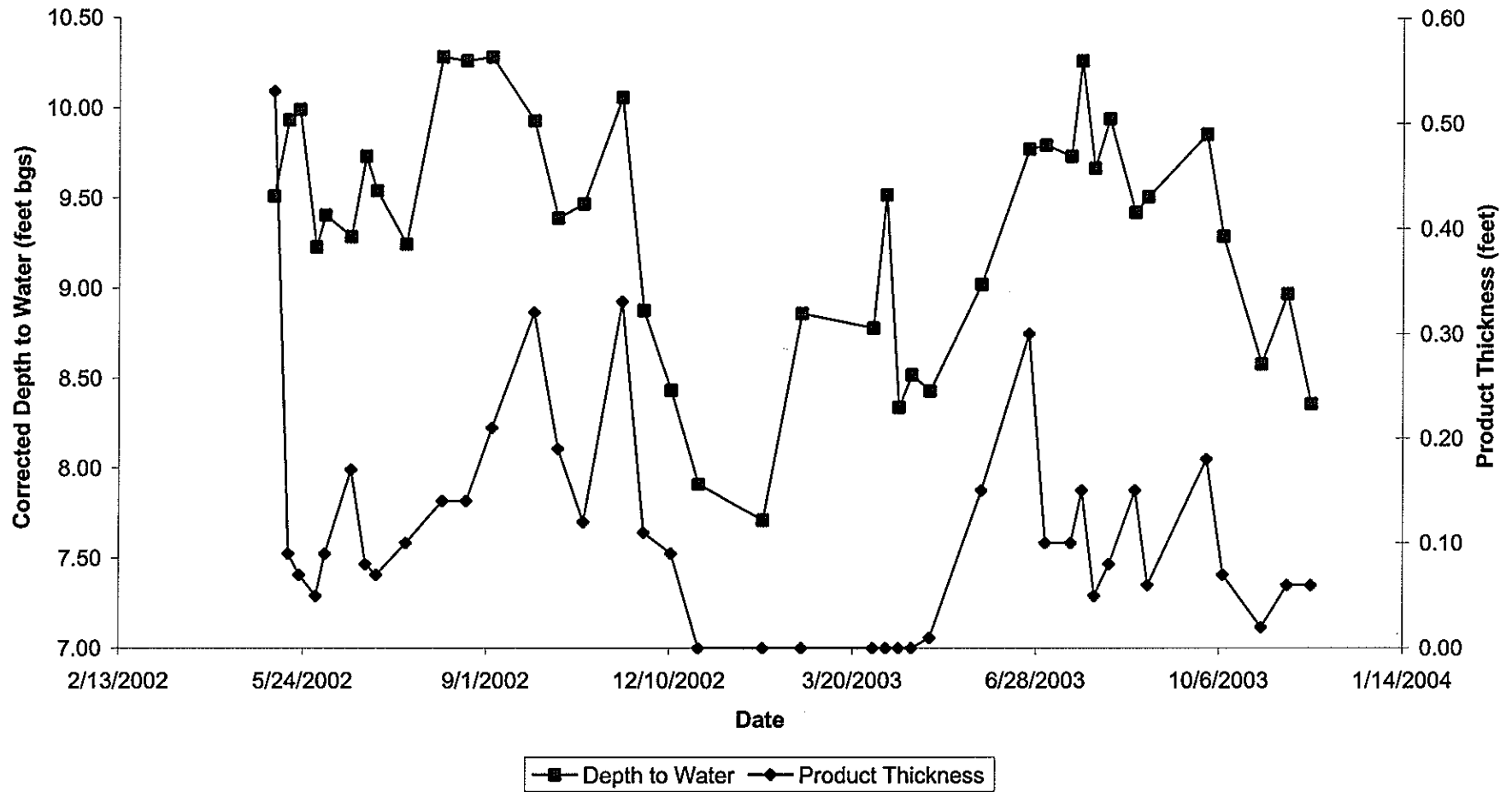


Figure 3
Product Thickness vs. Depth to Water
Recovery Well RW-2
Maersk Pacific Site - Building 600
Port of Tacoma, Tacoma WA

