

1 Supplemental Information for:  
2 An Evaluation of Compound-Specific Isotope Analyses for Assessing the Biodegradation of  
3 MTBE at Port Hueneme, CA  
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8 Contents: 5 pages (including this cover page), 2 tables, 1 figure  
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9 **TABLE S1.** MTBE- $\delta^{13}\text{C}$  results from first phase of field sampling (July 2002). Triplicate field  
10 samples are: 7S, 8S, 8D and 12D, 13S, 13D; Samples 30S and 30D are diluted samples from 2D  
11 and 9S respectively. Samples with DO < 2mg/L are considered “source zone” samples (up  
12 gradient of the biobarrier). Method error from field triplicate samples is 0.4‰ for  $\delta^{13}\text{C}$ .

Sample #	MTBE ( $\mu\text{g/L}$ )	$\delta^{13}\text{C}(\pm 0.2\text{‰})$	D.O.	Location	Depth
1S	110	n.d.	<1	1- Source Zone	S
1D	130	n.d.	<1	1- Source Zone	D
2S	1620	n.d.	<1	1- Source Zone	S
2D	360	n.d.	<1	1- Source Zone	D
3S	3460	n.d.	<1	1- Source Zone	S
3D	270	-29.9	<1	1- Source Zone	D
4S	140	n.d.	<1	1- Source Zone	S
4D	30	n.d.	<1	1- Source Zone	D
5S	690	-30.6	<1	1- Source Zone	S
6S	700	n.d.	<1	1- Source Zone	S
6D	290	n.d.	<1	1- Source Zone	D
7D	380	-29.6	<1	1- Source Zone	D
7S	3080	-30.2	<1	1- Source Zone	S
8S	4910	-29.2	<1	1- Source Zone	S
8D	n.a.	-30.3	<1	1- Source Zone	S
9S	2670	-29.4	<1	1- Source Zone	S
9D	280	-29.7	<1	1- Source Zone	D
10D	70	-29.1	<1	1- Source Zone	D
30S	40	n.d.	<2	1- Source Zone	D
30D	270	n.d.	<1	1- Source Zone	S
10S	110	-28.2	15.3	1- Treatment Zone	S
25S	50	-28.4	>20	1- Treatment Zone	S
26S	30	-28.7	>20	1- Treatment Zone	S
26D	30	-28.6	>20	1- Treatment Zone	D
27S	390	-29.5	10.5	1- Treatment Zone	S
31S	570	-28.2	>20	1- Treatment Zone	S
32S	30	-27.0	>20	1- Treatment Zone	S
33S	180	-27.0	>20	1- Treatment Zone	S
41S	100	-26.4	>20	1- Treatment Zone	S
42S	720	-28.4	11.0	1- Treatment Zone	S
44S	220	-29.2	15.3	1- Treatment Zone	S
45S	610	-28.2	15.3	1- Treatment Zone	S
12S	60	-28.3	<1	2	S
12D	70	-29.0	<1	2	D
13S	60	-29.0	<1	2	D
13D	n.a.	-28.7	<1	2	D
14S	150	-27.8	<1	2	S
14D	150	-28.3	<1	2	D
15S	750	-28.7	<1	2	S

15D	710	-28.8	<1	2	D
16S	40	-28.6	<1	2	S
16D	190	-28.8	<1	2	D
36S	300	-28.9	<1	2	S
36D	200	-28.9	<1	2	D
17S	70	-28.6	<1	3	S
17D	760	-28.8	<1	3	D
18S	380	-29.0	<1	3	S
18D	360	-29.1	<1	3	D
19S	80	-29.0	<1	3	S
19D	20	-29.5	<1	3	D

Notes:

n.d. = not detected by the GC-IRMS

n.a. = concentration not analyzed for this triplicate

S = sample collected from 2.5 to 3 m bgs

D = sample collected from 5.5 to 6 m bgs

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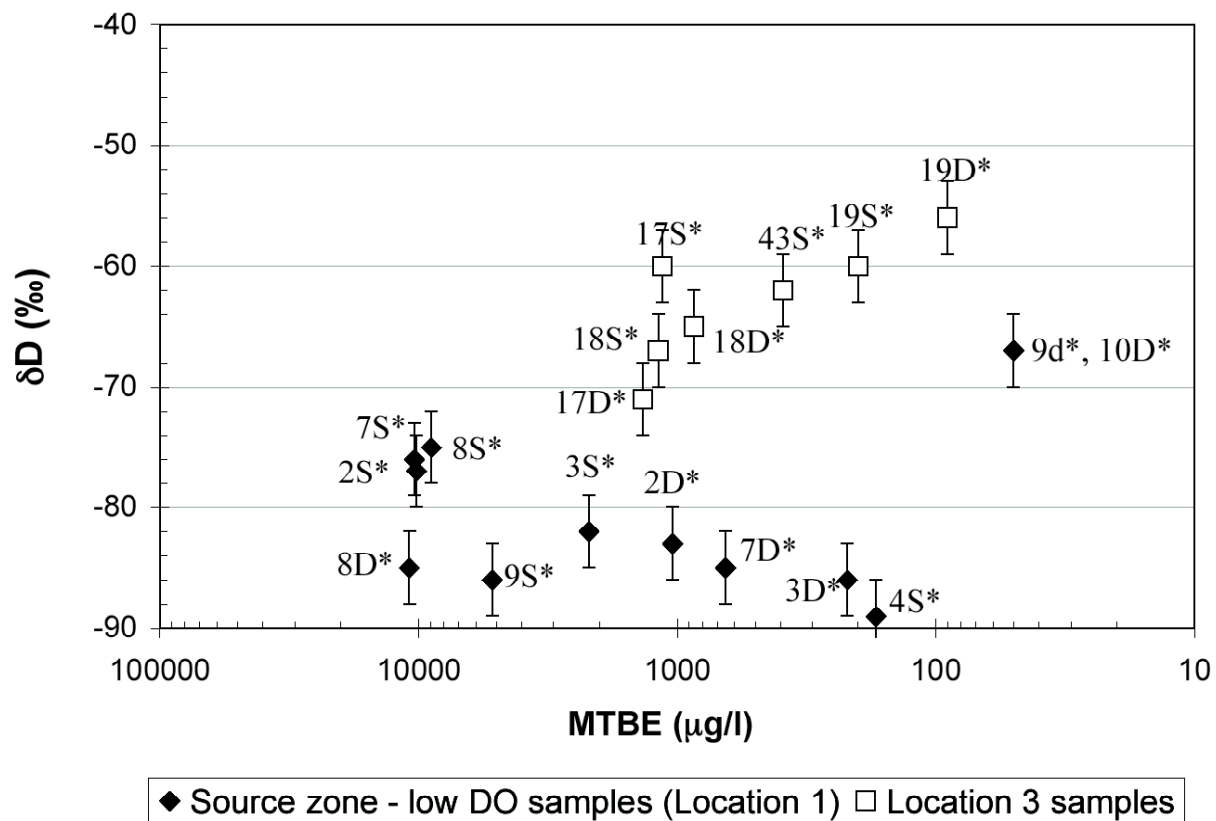
**TABLE S2.** MTBE- $\delta^{13}\text{C}$  and MTBE- $\delta\text{D}$  results from the second phase of field sampling (November 2002). Triplicate field samples are: 7S\*, 8S\*, 8D\*. Samples with DO < 2 mg/L are considered "source zone" samples (up-gradient of the biobarrier). Samples are denoted with an asterisk to reflect the collection of samples as close as possible to direct-push locations used in the first-phase of the field sampling. Method errors from field triplicate samples are 0.03‰ for  $\delta^{13}\text{C}$  and 6‰ for  $\delta\text{D}$ .

Sample #	MTBE ( $\mu\text{g/L}$ )	$\delta\text{D}$	$\delta^{13}\text{C}$	D.O. (mg/l)	Location	Depth
2S*	10,190	-77	-28.1	<1	1- Source Zone	S
2D*	1,040	-83	-28.5	<1	1- Source Zone	D
3S*	2,190	-82	-28.3	<1	1- Source Zone	S
3D*	220	-86	-28.7	1.4	1- Source Zone	D
4S*	170	-89	-28.2	<1	1- Source Zone	S
7S*	10,370	-76	-27.9	<1	1- Source Zone	S
7D*	650	-85	-28.4	<1	1- Source Zone	D
8S*	8,910	-75	-28.0	<1	1- Source Zone	S
8D*	10,870	-85	-28.0	<1	1- Source Zone	S
9S*	5,200	-86	-27.9	<1	1- Source Zone	S
10D*	50	-67	-28.0	<1	1- Source Zone	D
5S*	460	-74	-27.5	18.7	1- Treatment Zone	S
9D*	50	-67	-28.0	6.4	1- Treatment Zone	D
10S*	220	-74	-27.4	>20	1- Treatment Zone	S
25S*	110	-61	-27.4	>20	1- Treatment Zone	S
26S*	100	-78	-28.1	>20	1- Treatment Zone	S
31D*	70	-29	-26.1	>20	1- Treatment Zone	D
33S*	400	-72	-27.7	6.7	1- Treatment Zone	S
34S*	1,280	-56	-27.4	8.4	1- Treatment Zone	S
35S*	710	-71	-27.6	8.2	1- Treatment Zone	S
41S*	220	-63	-27.3	>20	1- Treatment Zone	S
43S*	390	-62	-27.5	>20	1- Treatment Zone	S
17S*	1,140	-60	-27.9	<1	3	S
17D*	1,360	-71	-27.7	<1	3	D
18S*	1,180	-67	-27.8	<1	3	S
18D*	860	-65	-27.7	<1	3	D
19S*	200	-60	-27.8	<1	3	S
19D*	90	-56	-27.9	<1	3	D

Notes:

S =sample collected from 2.5 to 3 m bgs

D =sample collected from 5.5 to 6 m bgs



**FIGURE S1.** Leading-edge MTBE-plume  $\delta D$  results (Location 3) from Phase 2 sampling, compared with source zone sample results (Location 1). Error bars correspond to the laboratory analytical uncertainty. Method error (not shown) from field triplicate samples was 6‰ for  $\delta D$ . Samples denoted with an asterisk reflect their collection as close as possible to Phase 1 locations shown in Figure 4c.