

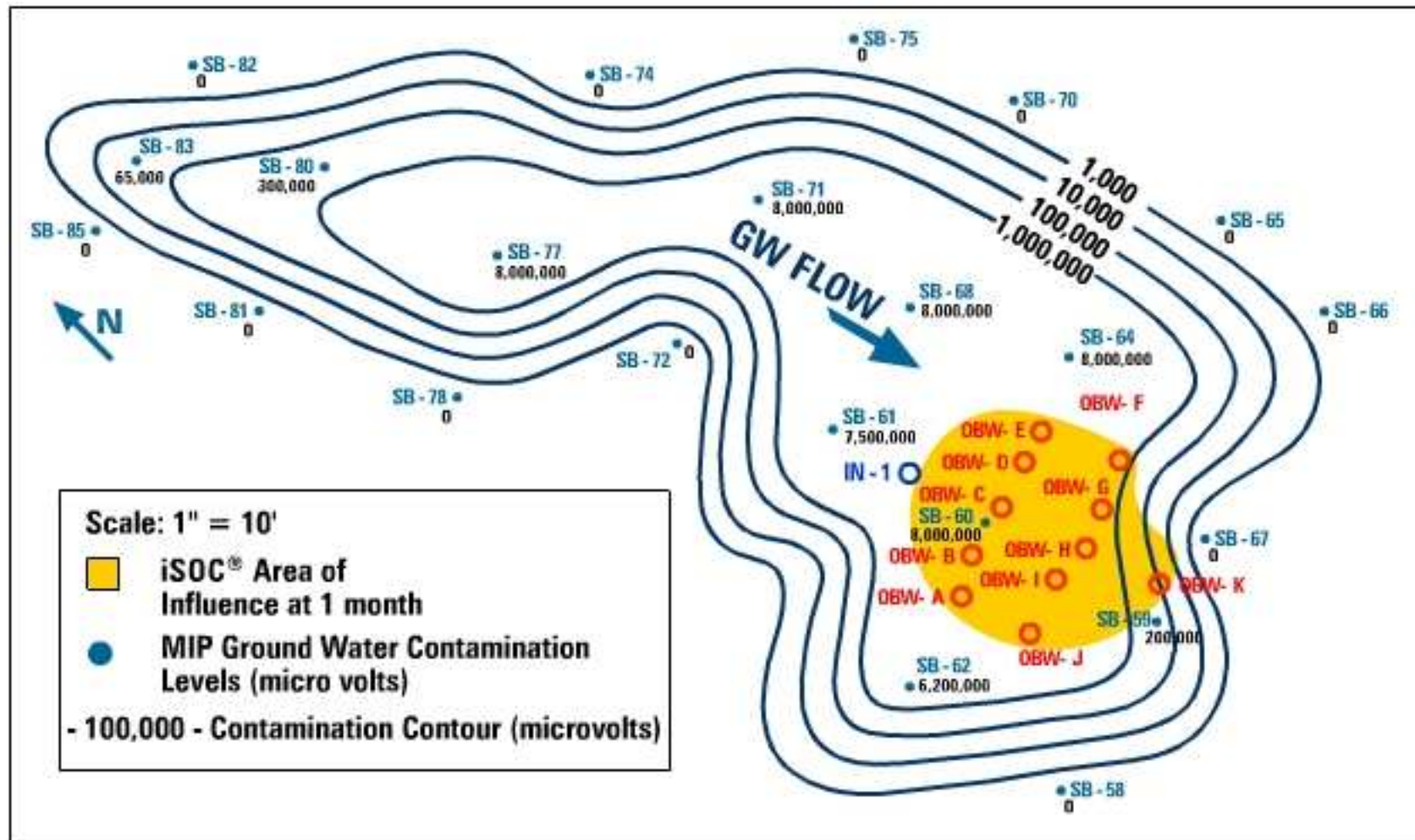
***GROUND WATER BIOREMEDIATION OF A
RAILROAD XYLENE SPILL USING ISOC
TECHNOLOGY***

CASE STUDY: GEORGIA

Site Description

- Spill of 50, 000 gallons of pure xylene during a train derailment in Georgia.
- Two separate xylene plumes in ground water—pilot test in *south* plume.
- South plume is approximately 500 feet long, 80 feet wide, traveling south at 78 ft/year.
- Most of the site is low permeability, heterogeneous layers of interbedded sands, silts and silty clay.
- Depth to bedrock approximately 7-15 feet; most ground water contamination in a narrow zone 1 to 2 feet above bedrock.

Site Map



Pilot Test Description

- Pilot test consisted of 1 iSOC[®] injection well and 11 down-gradient monitor wells.
- Two rows of monitor wells (5 wells per line, spaced 5 feet apart) at 10 feet, 20 feet down gradient of injection well; a third monitor well placed 30 feet down gradient of injection well.
- BTEX and heterotrophic bacteria plate counts sampled in monitor wells.
- Water quality sampled in April, May and September 2004.

Bioremediation Results

- iSOC[®] area of influence created in all 11 monitor wells down gradient of injection well within one month of pilot startup.
- Within this area of influence, all 11 wells showed large increases in heterotrophic bacteria; most wells had decreases in background xylene concentrations.
- Four months after pilot startup, xylene reduced in total of 9 of 11 wells.
- Within 20 feet of injection well, xylene reduced an average of 57% in 9 of 10 wells.
- Within 20 feet of injection well, largest reduction was 93%, smallest reduction 7.7%
- In monitor well OBW-H (well with highest xylene concentration 82,000ppb), reduction was 61% in four months

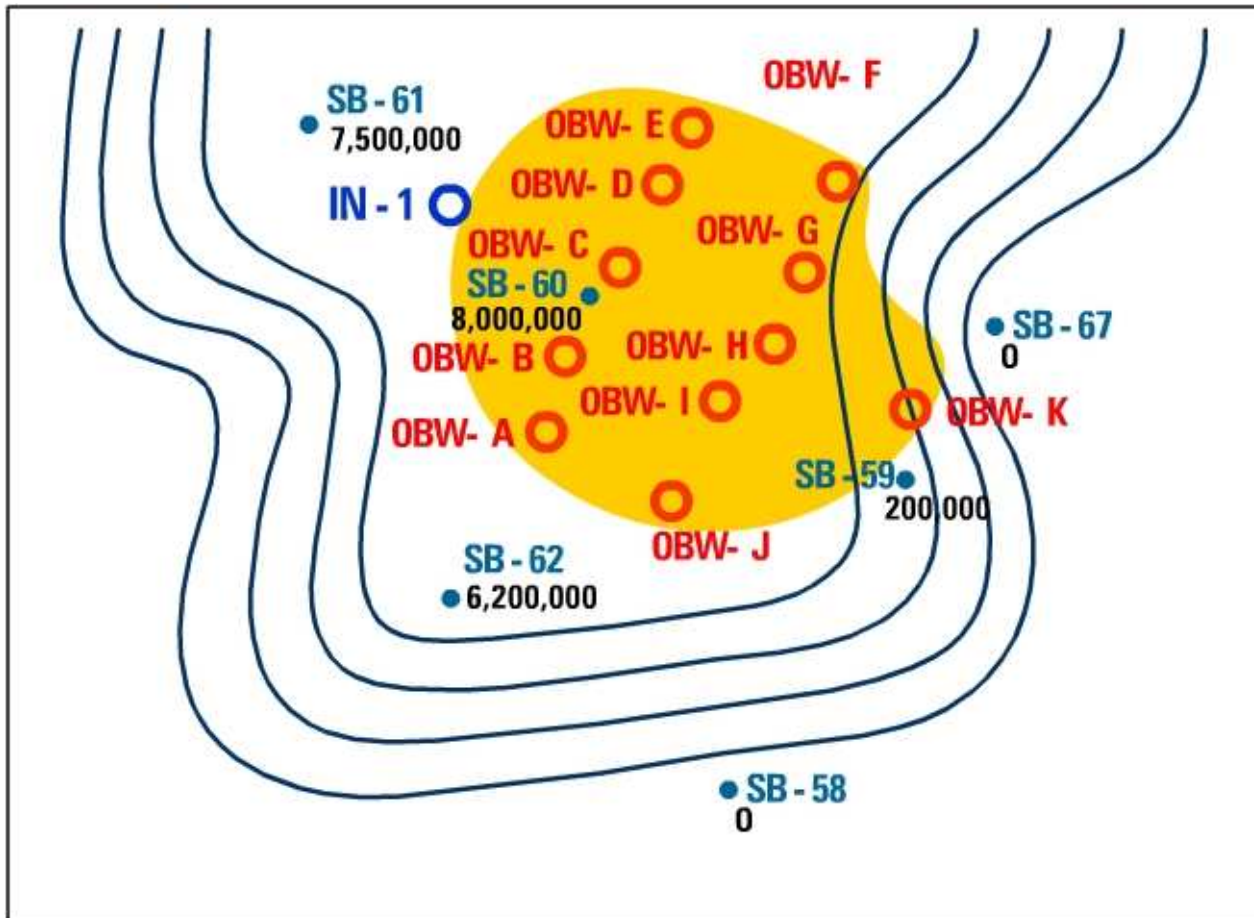
iSOC[®] Pilot Test (Xylene and Heterotrophic Bacteria Plate Count)

Well Number	Sample Date	Xylene (µg/L)	Heterotrophic Bacteria Plate Count (CFU/mL)	Xylene % Reduction
OBW-A	4/29/04	34,000	>300	93.0
	5/27/04	-	20,000	
	8/20/04	2,500	12,400	
OBW-B	4/29/04	41,000	>300	-
	5/27/04	-	32,000	
	8/20/04	43,000	430,000	
OBW-C	4/29/04	12,000	>300	87.5
	5/27/04	-	36,000	
	8/20/04	1,500	116,000	
OBW-D	4/29/04	54,000	>300	37.0
	5/27/04	-	26,000	
	8/20/04	34,000	3,200,000	
OBW-E	4/29/04	13,000	>300	7.7
	5/27/04	-	75,000	
	8/20/04	12,000	44,000	

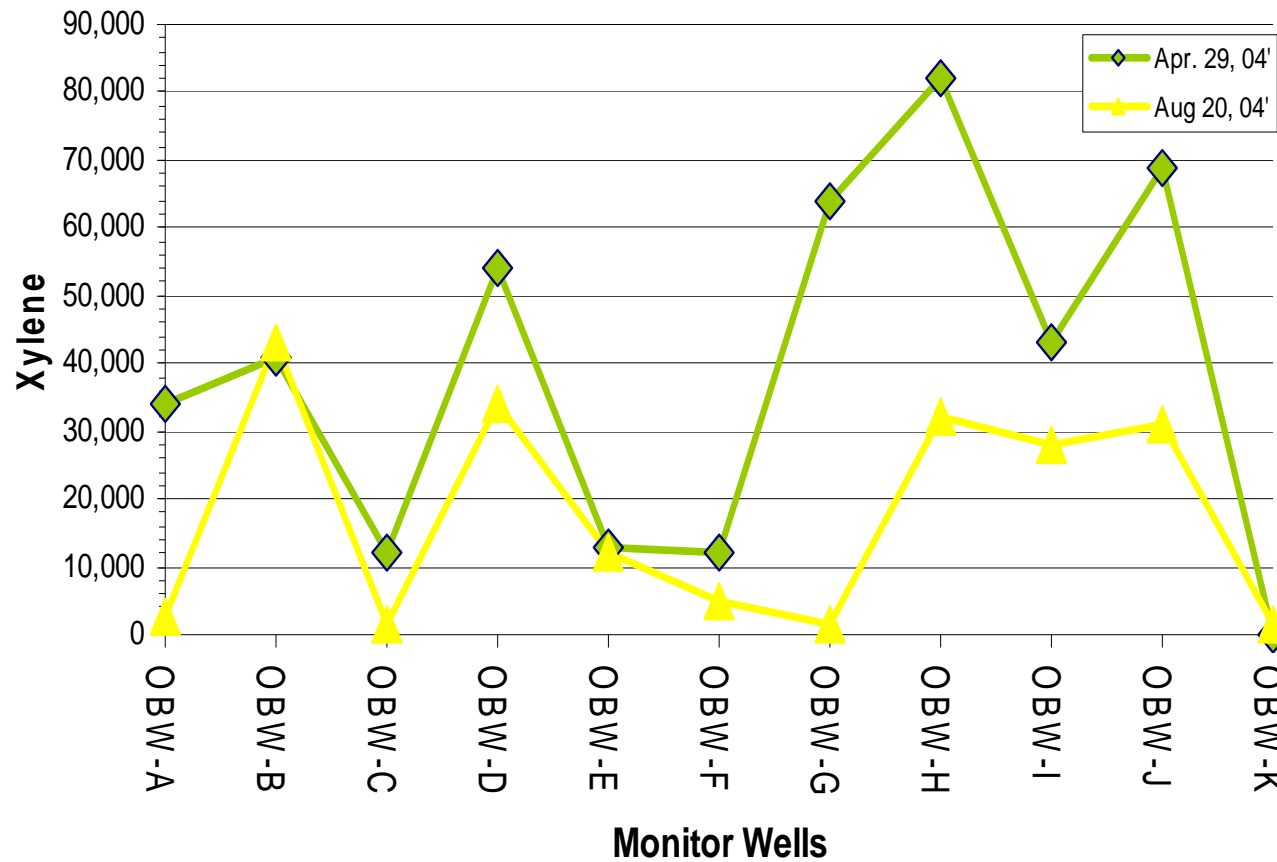
iSOC[®] Pilot Test (Xylene and Heterotrophic Bacteria Plate Count)

Well Number	Sample Date	Xylene (µg/L)	Heterotrophic Bacteria Plate Count (CFU/mL)	Xylene % Reduction
OBW-F	4/29/04	12,000	>300	58.3
	5/27/04	-	42,000	
	9/2/04	5,000	-	
OBW-G	4/29/04	6,400	>300	78.1
	5/27/04	-	1,000	
	9/2/04	1,400	-	
OBW-H	4/29/04	82,000	>300	61.0
	5/27/04	-	17,000	
	9/2/04	32,000	-	
OBW-I	4/29/04	43,000	>300	34.9
	5/27/04	-	60,000	
	9/2/04	28,000	-	
OBW-J	4/29/04	69,000	>300	55.1
	5/27/04	-	1,000	
	9/2/04	31,000	-	
OBW-K	4/29/04	150	>300	-
	5/27/04	-	18,000	
	9/2/04	1,400	-	

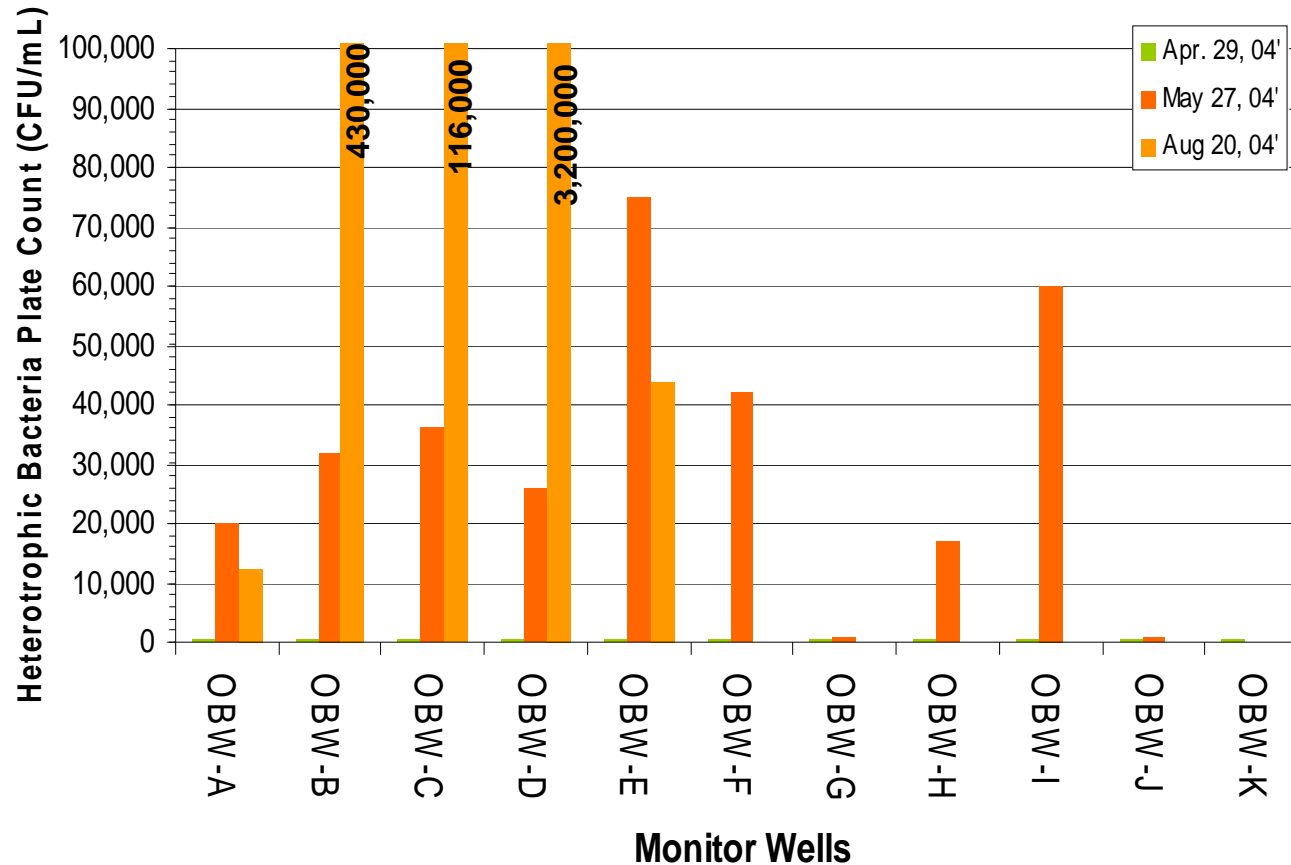
Enlarged Site Map



Xylene Plot



Heterotrophic Bacteria Plate Count (CFU/mL)



April 29, 04' – All monitor well concentrations are >300 CFU/mL

Xylene Percentage Reduction

