

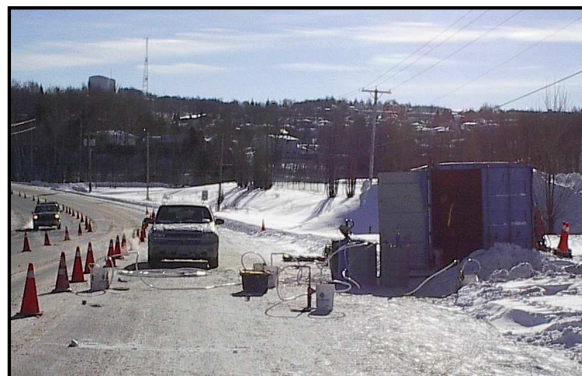
ISCO CASE STUDY

PETROLEUM HYDROCARBONS AT A FORMER RETAIL FUEL OUTLET, ELLIOT LAKE, ONTARIO

Case Study #12

A Fenton's based ISCO (in situ chemical oxidation) process was selected to address petroleum hydrocarbon contamination from underground storage tanks (USTs) at a former retail fuel outlet in Elliot Lake, Ontario. The source area was previously excavated up to the property boundary (west of Highway 108). The remaining dissolved-phase plume outside of the property boundary migrated approximately 35 metres down gradient and was estimated to be about 65 metres in width. The petroleum contamination was migrating beneath Highway 108, through a recreational pathway and into a marshland located beside Horne Lake. Site soils consisted mainly of large boulders with coarse sand lenses and gravel, overlying native organic-rich soil.

Following a Bench Scale Application (BSA), a 10-day Pilot Scale Application (PSA) was performed, focusing on one of the existing monitoring wells with the highest total petroleum hydrocarbon (TPH) and benzene, toluene, ethylbenzene and xylene (BTEX) concentrations. The PSA was performed in January, with an average daytime temperature of -30 °C. All four application wells were installed in the southbound lane of Highway 108 and traffic was managed effectively, resulting in minimal disruption and inconvenience to businesses and residents of Elliot Lake.



Groundwater sampling approximately two weeks following the PSA indicated average reductions of 79 % for VOCs and 83 % for TPH. A summary of reductions for monitoring wells MW-1 through MW-4 and application wells AW-1 through AW-4 are shown in the table below.

Well	VOCs (ppb)			TPH (ppb)		
	Before PSA	After PSA	Reductions (%)	Before PSA	After PSA	Reductions (%)
MW-1	3,275	786	76%	10,000	190	98%
MW-2	6,614	2,600	61%	11,430	3,840	66%
MW-3	2,656	900	66%	7,250	1,597	78%
MW-4	3,630	559	85%	7,430	2,520	66%
AW-1	18,778	1,952	90%	27,060	2,950	89%
AW-2	2,419	360	85%	6,440	1,695	74%
AW-3	459	873	-90%	1,587	727	54%
AW-4	8,915	1,570	82%	16,910	1,259	93%
Total	46,746	9,600	79%	88,107	14,778	83%