In situ Chemical Oxidation using Unactivated Sodium Persulphate at a Former Gasoline Station

by

Neelmoy Chaitanya Biswas

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

The contamination of aquifer systems by petroleum hydrocarbons is a global problem. Underground storage tanks used for storing these hydrocarbons often leak, resulting in subsurface contamination. The hazards associated with petroleum hydrocarbon contamination are mainly attributable to the BTEX compounds, namely benzene, toluene, ethylbenzene and xylenes together with trimethylbenzenes (TMBs) and naphthalene due to their potential to impact human health and the ease with which they can enter the groundwater system.

In situ chemical oxidation (ISCO) is the delivery of strong chemical oxidants to the subsurface for the purpose of treating organic contaminants. ISCO can be an effective way to remediate organic contaminants from the soil and groundwater. Sodium persulphate is one of the newer oxidants to gain widespread use in treating petroleum hydrocarbon contamination, though without being fully understood. This investigation tested the ability of unactivated sodium persulphate in treating dissolved phase and residual BTEX contamination through bench-scale laboratory tests and a pilot-scale field study.

A degradation potential batch reactor test was carried out to assess the efficacy of unactivated sodium persulphate in oxidizing petroleum hydrocarbons present in contaminated groundwater as well as its effect on aquifer material from a field site. This test was carried out at a sodium persulphate concentration of 20 *g/L*. Results from this test did not follow the expected first-order degradation, and so subsequent experiments were carried out using a sodium persulphate concentration of 100 *g/L*. A test to determine the degree of interaction between the oxidant and aquifer material was also conducted. It was found that the degree of natural oxidant interaction for the field site in question was very low.

1000 *kg* of sodium persulphate was dissolved in nearly 10,000 *L* of water and injected into the subsurface. Electrical conductivity (EC), pH, sodium, persulphate, sulphate and BTEX were all monitored during the subsequent 152-day post-injection monitoring period.

An empirical relationship was determined between EC and the concentration of sodium in groundwater. This enabled the use of EC as a real-time tracer to track the progress of the injectate.

Field results supported predictions based on a simulation model that density-driven flow would play an important role in the delivery of the injectate. A portion of the injectate was believed to have been missed by the monitoring network. Areas that did show elevated tracer results in some cases showed a decrease in BTEX concentrations. Results were categorized in four ways. The first category had wells that showed strong evidence of injectate presence but little to no change in BTEX levels. The second category was comprised of wells that showed a reduction in BTEX levels along with the presence of injectate. BTEX levels in some wells rebounded towards the end of the study period. The third category consisted of wells that showed the presence of dilute injectate but did not show any reduction in BTEX concentrations. The fourth and final category was of wells that showed no evidence of having been affected by the injectate in any way. BTEX levels were the same as background.

The oxidation of BTEX by unactivated sodium persulphate was found to be successful, though the vagaries of oxidant delivery and field sampling made difficult the accurate determination of the degree of success.

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Dedication

To the memory of Nanaji, Hari Mohan. I wish I could have discussed this with him.

and

To the memory of Mashi, Suchitra Dhar, who passed before her time.

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Chapter 1: Introduction

Groundwater is an immensely important and conditionally renewable natural resource (Langmuir, 1997; Sra, 2010). But it is more than simply a resource; it is an important feature of the natural environment that can lead to environmental problems, as well as in some instances, offer a medium for environmental solutions (Freeze and Cherry, 1979).

Pollution of groundwater and soil is a worldwide problem that can result in the uptake and accumulation of toxic chemicals in food chains and harm the flora and fauna of affected habitats (Kunukcu, 2007). The contamination of groundwater resources by organic chemicals is a significant environmental problem, with an estimated 300,000 to 400,000 contaminated sites in the US alone (Kunukcu, 2007). The United States Environmental Protection Agency (USEPA) estimates that 35% of the gasoline and diesel underground storage tanks in the US are leaking (Pawlowski, 1998). Approximately 40% of these leaky underground storage tanks are believed to have resulted in soil and groundwater contamination (Pawlowski, 1998).

The hazards associated with petroleum hydrocarbon contamination are mainly attributable to the BTEX compounds, namely benzene, toluene, ethylbenzene and xylenes (Liang et al., 2009). The occurrence of these compounds in groundwater is of concern as exposure to these compounds can cause neurological damage. For example, benzene is considered to be a carcinogen by the US national Toxicology program and toluene, while less toxic than benzene, depresses the central nervous system (Pawlowski, 1998; Liang et al., 2009). The USEPA National Primary Drinking Water Regulations' Maximum Contaminant Levels for BTEX in drinking water are 0.005, 1.0, 0.7 and 10.0 *mg/L* respectively (Liang et al., 2008). In Canada, Health Canada's Guidelines for Canadian Drinking Water Quality has set stricter limits. The maximum acceptable concentration (MAC) for benzene in drinking water is 0.005 *mg/L*, and the aesthetic objectives (AO) are $\leq$0.024 *mg/L* for toluene, $\leq$ 0.0024 *mg/L* for ethylbenzene and $\leq$ 0.3 *mg/L* for total xylenes (Health Canada, 1988; Health Canada, 2009).

1.1 In situ *Chemical Oxidation*

In situ chemical oxidation (ISCO) can be an effective technology for the removal of organic contaminants from soil and groundwater (Tsitonaki et al., 2010). ISCO is the delivery of strong chemical oxidants to the subsurface for the purpose of treating organic contaminants (Watts and Teel, 2006). The treatment of contaminated soil and groundwater by ISCO relies on the oxidation potential of chemical reagents to destroy harmful organic compounds (Sra et al., 2010). Thus, it is important that the injected oxidant be able to react suitably with the target contaminant.

1.2 Persulphate

Persulphate is the newest form of oxidant currently being used for ISCO (Huling and Pivetz, 2006). While persulphate is being used, often extensively for industrial and environmental applications, the use of persulphate for soil and groundwater remediation has received minimal attention (Watts and Teel, 2006).

Persulphate is a sulphate peroxide with the structure: $[O_3S-O-O-SO_3]^{2-}$. On its own, the persulphate anion as seen in equation 2 has a high oxidation potential of $E^{\circ} = 2.1\ V$ (Huling and Pivetz, 2006):

$$Na_2S_2O_8 \rightarrow 2Na^+ + S_2O_8^{2-} \tag{1}$$

$$S_2O_8^{2-} + 2e^- \rightarrow 2SO_4^{2-} \tag{2}$$

When activated by heat or other means, a free radical pathway is subsequently initiated. The activation step is shown in equation 3. When activated, persulphate has an even higher one oxidation potential of $E^{\circ} = 2.6\ V$:

$$S_2O_8^{2-} \xrightarrow{h\nu} 2SO_4^{\bullet -} \tag{3}$$

Persulphate can be activated by heat, ultraviolet radiation, or metal ions like ferrous iron and other transition metal ions (Huling and Pivetz, 2006; Tsitonaki et al., 2010). The sulphate radical can initiate the formation of hydroxyl radicals and a series of radical propagation and termination chain reactions where organic compounds can be transformed (Huling and Pivetz, 2006; Tsitonaki et al., 2010). The radical-forming reactions are shown below in equations 4 and 5:

$$SO_4^{\bullet -} + H_2O \rightarrow HO^{\bullet} + SO_4^{2-} + H^+ \tag{4}$$

$$SO_4^{\bullet -} + HO^- \rightarrow HO^{\bullet} + SO_4^{2-} \tag{5}$$

Sodium persulphate is the most common and feasible form of persulphate (Huling and Pivetz, 2006). It has a high solubility (73 *g*/100 *g* of H_2O at 25°C) and relatively low cost (Huling and Pivetz, 2006). Its density in solution at the concentrations used in this study are greater than that of water; a 20 *g/L* solution of sodium persulphate has a density of 1.010 *g/mL* (FMC, 2001) and a 100 *g/L* solution of sodium persulphate has a density of 1.063 *g/mL* (FMC, 2001). This means that there will be some density-driven flow for such a solution in the subsurface.

Sodium persulphate also does not produce undesirable reaction by-products, and has a high residence time in the subsurface (Huling and Pivetz, 2006). As well, the persulphate anion is not significantly involved in sorption reactions (Huling and Pivetz, 2006). These factors taken together make sodium persulphate an attractive oxidant for *in situ* chemical oxidation.

The pH of a high persulphate concentration environment will naturally decrease due to the acidity generated through the homolytic cleavage of persulphate to form hydrogen sulphate and oxygen, as seen in equation 6 (House, 1962; Sra, 2010):

$$S_2O_8^{2-} + H_2O \rightarrow 2H^+ + 2SO_4^{2-} + \frac{1}{2}O_2 \tag{6}$$

Thus, care should be taken to use persulphate in well buffered systems.

Recent laboratory studies on sodium persulphate have found it to be able to effectively degrade BTEX compounds (Crimi and Taylor, 2007; Liang, 2008; Liang, 2009; Sra, 2010). There is, however, a paucity of peer-reviewed literature on the interaction of sodium persulphate with aquifer materials, as well as on the ability of unactivated sodium persulphate to degrade BTEX, thus making the study of these interactions at field-scale beneficial.

1.3 Objective of study

The project aims to evaluate the efficacy of unactivated sodium persulphate as an *in situ* chemical oxidant in treating a hydrocarbon source area by reducing existing residual and dissolved phase petroleum hydrocarbons in the saturated zone. Research by Sra (Sra, 2010) indicates that unactivated persulphate is effective in reducing BTEX, TMBs and naphthalene. This research aims to build on those findings through bench-scale laboratory experiments as well as a field-based pilot-scale test.

Chapter 2: Site Description

2.1 Site Background

The field site is a decommissioned retail gas station in southwestern Ontario. The site was decommissioned and pumps, distribution lines and tanks were removed by 1990. Historically, LNAPL has been identified in several monitoring wells. Product recovery activities have been undertaken since 1997 and have included the use of a vacuum truck, manual bailing and an *in situ* vacuum educator system. 35,000 *L* of liquid petroleum hydrocarbons and groundwater were removed from monitoring wells by April 2004, and a further 10,200,000 *L* of petroleum impacted groundwater were removed by the *in situ* eductor system (Chow, 2008). The instrumentation on-site is shown in plan view in Figure 1.

2.2 Target Area

The target area is approximately 8.5 metres wide, 10 metres long, and between 8.5 and 12.5 metres in depth below ground surface. The area contains three wells screened between 8.5 *m* and 10 *m* intended for injection, two fully-screened monitoring wells screened to about 10.5 *m*, and five multilevel monitoring wells. All the wells are flush-mounted. A sketch of the target area in plan view is seen in Figure 2.

Tables 1 and 2 summarize the depths and, when applicable, sampling intervals of the wells in the target area.

Well	Screened Interval
401	8.5 *m* to 10 *m*
402	8.25 *m* to 9.75 *m*
403	8.5 *m* to 10 *m*
BH5	Fully screened to 10.3 *m*
BH20	Fully screened to 10.7 *m*

Table 1 - Depths of partially and fully screened wells

Sampling Port	Screened Intervals (metres)				
	301	*302*	*501*	*502*	*503*
1	7.58 to 7.68	7.90 to 8.00	8.40 to 8.50	8.40 to 8.50	8.40 to 8.50
2	8.08 to 8.18	8.40 to 8.50	8.90 to 9.00	8.90 to 9.00	8.90 to 9.00
3	8.58 to 8.68	8.90 to 9.00	9.40 to 9.50	9.40 to 9.50	9.40 to 9.50
4	9.08 to 9.18	9.40 to 9.50	9.90 to 10.00	9.90 to 10.00	9.90 to 10.00
5	9.58 to 9.68	9.90 to 10.00	10.40 to 10.50	10.40 to 10.50	10.40 to 10.50
6	10.08 to 10.18	10.40 to 10.50	10.90 to 11.00	10.90 to 11.00	10.90 to 11.00
7 (CS)	10.58 to 10.68	10.90 to 11.00	11.40 to 11.50	11.40 to 11.50	11.40 to 11.50

Table 2 - Depths of multilevel wells. Point 7 has the centre stock slotted over the indicated interval.

2.3 Site Hydrogeology

Beneath a surficial layer of sand fill, the soil profile general consists of a native silty sand containing some small 3-4 *cm* silt/clay seams. These seams lie above the water table, with no known lenses appearing below the water table. The water table within the target area remains fairly constant about 8.4 *mbgs*. Geological maps for the area indicate an abundance of meltwater drainage channels (or spillways) which contain glaciofluvial sediments consisting of interbedded sands and silts. These sediments rest on Upper Silurian limestone Bedrock (OAEI, 1990). A cross-section for the site is seen in Figure 3. Figure 4 shows a picture of the sand with the silt/clay seam.

2.3.1 Hydraulic Conductivity, Groundwater Velocity and Direction of Flow

Falling head permeameter analyses were conducted by Chow (B.Sc., 2008), who found the average hydraulic conductivity of the fine sands to be between 10^{-3} and 10^{-5} $^{m}/_{s}$ and that of the silt/clay seam to be 10^{-7} $^{m}/_{s}$. The findings for the sands agree with previous consultants' findings (OAEI, 1991). Chow took the porosity to be 0.3, the average hydraulic conductivity to be $7.27 \times 10^{-5}\ {}^{m}\!/_{s}$ and the typical gradient to be 2.8×10^{-3} and from this calculated the average linear groundwater velocity to be $7 \times 10^{-7}\ {}^{m}\!/_{s}$ or 6 ${}^{cm}\!/_{day}$. The principal direction of groundwater flow at the site is southwest, with a slight curve due south (SLE, 2010).

2.4 Contamination

Groundwater monitoring programmes have been in place at this site since 1994 (Chow, 2008). Dissolved phase petroleum hydrocarbon contamination is present at all wells in the target area, with the maximum concentrations between 8 to 9 metres below ground surface (*mbgs*). In the soil samples, contamination peaks at the same depth (Figures 5-10), with visible black staining at 9 *mbgs* in the soil cores, shown in Figure 11. Roughly 75% of the contamination present is in the F_1 fraction, followed by F_2 and F_3 (see appendix I)

2.4.1 Estimated contaminant mass

BTEX contaminant mass was estimated to be about 41 *kg*, based on an estimated target zone volume of 21 m^3 estimated target zone volume and data collected from soil coring. Each soil sample was considered to represent a volume of aquifer material extending to half the distance between it and the next closest sample (Béland-Pelletier et al., 2010). In this way, the mass of BTEX in each representative volume unit of the soil was calculated and summed to give an estimate of total residual BTEX mass before and after the injection. It should be noted that there is a high degree of uncertainty in this calculation. The calculation is shown in Appendix C.

Chapter 3: Laboratory Studies

Laboratory studies were carried out to evaluate the efficacy of hydrocarbon oxidation using unactivated sodium persulphate with site soil and groundwater, and to quantify the degree of natural oxidant interaction between oxidant and aquifer material.

3.1 Materials

Three 4 *L* jugs of water were collected from MW 301-4 in October 2009, preserved with azide and analyzed for BTEX, TMB and naphthalene (collectively referred to as aromatic hydrocarbons) prior to use in the experiment. The results of this analysis, along with the rest of the data for the lab experiment can be seen in Appendix I. This was the water used in all the experiments with groundwater.

The only soil used in the experiment was collected from MW-302 above the water table. This soil was selected for its insignificant amounts of BTEX, TMB and naphthalene. The limited amount of this soil curtailed both the duration and number of replicates for this experiment.

Reagent grade sodium persulphate (purity $\geq 98\%$) from Sigma-Aldrich (CAS no. 775-27-71) was used for all the experiments.

3.2 Degradation Potential Batch Reactor Test (Aqueous and Solids)

This bench-scale batch test was carried out to assess the oxidation of petroleum-hydrocarbon contaminants in groundwater by unactivated persulphate as well as its effect on the aquifer material from the site. Concentrations of BTEX and persulphate were monitored at regular intervals through the test.

3.2.1 Method

As shown in Table 3, two groups of vials were sampled at each sampling episode; the first contained the contaminated groundwater from the site with unactivated persulphate, and the second contained contaminated groundwater, unactivated persulphate and aquifer material. The control vials for the first group contained contaminated groundwater from the site but with deonized water in lieu of unactivated persulphate, and similarly for the second group, the control vials contained contaminated groundwater, aquifer material and deionized water. The first group had control vials and active vials in triplicate, while the second group had control vials and active vials in duplicate. The experiment was performed with unactivated persulphate solution at 20 *g/L*, after Sra (Sra, 2010). After addition of the compounds, the samples were shaken manually and then stored undisturbed in a dark chamber until sampled.

Sampling Intervals	**Control vials: GW, DI water**	**GW, persulph. vials**	**Control: GW, soil, DI water vials**	**GW, soil, persulph. vials**
Initial	3	3	2	2
1 day	3	3	2	2
2 days	3	3	2	2
3 days	3	3	2	2
1 week	3	3	2	2
2 weeks	3	3	2	2
3 weeks	3	3	2	2
Total vials:	21	21	14	14

Table 3 - Batch reactor test design

The method used for quantifying BTEX, TMB and naphthalene is given in Appendix A.

3.2.2 Results

The results from this experiment were normalized and graphed, as shown in Figures 12-35. Each data point on the graph represents the average of the replicate samples.

The controls for this experiment, particularly for benzene, were unstable. Figures 12-35 contain a corrected active dataset in which the difference between the ideal C/C_0 value of 1 and the control was added to the active data. This presents the concentration changes in the presence of persulphate beyond what may have been due to other processes also affecting the controls. The corrected active data show that the degree of mass loss observed in this experiment was not very high.

Samples containing soil in addition to groundwater and persulphate showed greater degradation, possibly due to sorption on to the soil particles.

Benzene exhibited the most unstable control and showed the least degradation relative to its control. 1,2,4-trimethylbenzene also showed little degradation. Slight loss appeared to have occurred in all controls. As with the active vials, a greater degree of mass loss was observed in the vials containing aquifer material.

Toluene and 1,3,5-trimethylbenzene exhibited the greatest mass loss. F1 fraction hydrocarbons (nC_6 to nC_{10}) showed a much greater propensity to degradation than the F2 fraction (nC_{10} to nC_{16}).

While some degradation was evident in this experiment, the extent of observed degradation was lower than expected. For this reason, Katanchi (M.Sc, in progress) repeated this experiment with soil from a different site with persulphate at 100 *g/L*. Results from that experiment were more promising, which led to the injections in the field (discussed in Chapter 4) to be performed with persulphate at a concentration of 100 *g/L*.

The data for this experiment did not follow first-order degradation, as was expected based on the findings of Sra (Sra, 2010). This may be because of the shorter duration of this experiment or because of some systematic error during the experimental procedure. First-order degradation was also observed in the experiment later conducted by Katanchi (M.Sc, in progress).

Table 4 shows the time taken to achieve 50% degradation. Appendix I contains the data for this experiment.

Component	**Time (days) taken for 50% degradation (GW, Persulphate)**	**Time taken in days for 50% degradation (GW, Persulphate, Soil)**
Benzene	7	2
Toluene	20	14
Ethylbenzene	19	12
p,m-Xylene	>21	16
o-Xylene	>21	19
1,3,5-trimethylbenzene	18	12
1,2,4-trimethylbenzene	>21	>21
1,2,3-trimethylbenzene	>21	16
Naphthalene	>21	>21
Total BTEX	>21	16
F1 fraction	>21	15
F2 fraction	>21	>21

Table 4 – Time (in days) to achieve 50% degradation

3.3 Natural Oxidant Interaction (NOI) Test

The interaction of injected oxidants with reductive species in the subsurface like organic carbon, transition metals etc. play an important role in determining the efficacy of the oxidant (Appelo and Postma, 2007; Sra, 2010). Naturally occurring reduced components associated with aquifer materials can exert a significant oxidant interaction, thereby reducing the amount of oxidant available for the degradation of contaminants as well as reducing the overall rate of oxidation (Xu & Thomson, 2009). Quantification of this natural oxidant interaction is a requirement for site-specific assessment and the design of delivery systems

(Xu & Thomson, 2009). To this end, a test was conducted in the laboratory to quantify the degree of interaction between the aquifer material of the site and sodium persulphate.

3.3.1 Method

For each of four sampling episodes, two duplicate active vials and a control vial were sampled. The active vials contained the uncontaminated aquifer material and sodium persulphate dissolved in deionized water at 100 *g/L*. The controls contained only the sodium persulphate solution at 100 *g/L*. No significant pH change was observed. As in the previous experiment, the samples were shaken manually after the addition of all the components and stored in a dark chamber until sampled. The sampling frequency is summarized in the Table 5 below.

Sampling Interval	Active vials	Control vials
Initial	2	1
1 day	2	1
5 days	2	1
20 days	2	1

Table 5 - Sampling frequency for Natural Oxidant Interaction test

The method used for quantifying the sodium persulphate is given in Appendix A.

3.3.2 Results

The results showed that the aquifer material consumed only a very small amount of the oxidant, as seen in Figure 36 below. A loss in concentration of only 7% sodium persulphate was observed. It was thus concluded that the degree of interaction between oxidant and aquifer material over 21 days was minimal for this site.

The data for this experiment can be seen in appendix I.

Chapter 4: Field Study

With the results of the laboratory studies, several activities were carried out in the field. These are described below in chronological order.

4.1 Pre-injection

4.1.1 Soil Coring

Pre-injection soil coring was done to assess the level of residual contamination of the soil by BTEX, TMB and naphthalene, as well as to obtain a better picture of the site stratigraphy.

The pre-injection soil coring took place in the target area in November 2009. The cores were collected using a hollow-stem auger in tandem with a continuous sampler. Cores were visually inspected, photographed and then sampled roughly every 30 *cm*. Samples were collected from a freshly exposed soil surface in the continuous sampler using a 10 *mL* syringe with the tip cut off (Schumacher and Minnich, 2000; Freitas, 2009). These samples were then inserted into pre-weighed 40 *mL* volatile organic analysis (VOA) vials with 10 *mL* of methylene chloride as the solvent. These vials were capped with iChem™ brand caps with Teflon®-lined septa to prevent loss of volatile organic compounds (VOCs) through volatilization.

4.1.2 Well Installation

Six wells (401, 402, 403, 501, 502 and 503) were installed after the soil cores were taken; three of these were meant for injection and are screened from about 8.5 *mbgs* to 10 *mbgs,* and three were multilevel monitoring wells with seven points screened between 8.5 *mbgs* and 11.5 *mbgs.* See section 2.2 for complete information on screen depths. All the wells except

401 and 403 are surrounded by collapsed native sand; for 401 and 403, some silica sand was added on top of the collapsed native sandpack. See Appendix B for borehole logs.

4.1.3 Groundwater Monitoring

Pre-injection groundwater sampling consisted of sampling all the wells in the target area for aromatic hydrocarbon analysis. The samples were collected using a sampling manifold (see Figure 37) and peristaltic pump, with the manifold positioned in-line between the well and peristaltic pump. This was done to avoid aeration, agitation, exposure to the atmosphere and subsequent volatilization of the sample, as well as to avoid sorption losses in the flexible tubing in the pump head (Parker, 1994; Freitas & Barker, 2008). A minimum volume of 400 *mL* was purged from each well purged prior to sampling and the samples were collected in 40 *mL* VOA vials. The vials were filled to the brim to minimize headspace, immediately preserved with 0.4 *mL* of 10% sodium azide solution and capped with iChem™ brand caps with Teflon®-lined septa before being cooled on ice and subsequently refrigerated until analysis.

4.2 Injection

The injectate solution was made up of 1000 *kg* of sodium persulphate ($Na_2S_2O_8$) dissolved in 9850 *L* of water. The solution was mixed 200 *L* at a time in two mixing tanks (see Figure 38) at a strength of roughly 100 *g/L* and injected partly by gravity (~ 10 *L/min*) and partly under slight pressure (10 *psi* and 20 *L/min*). The injection, which was performed by Vertex Environmental Inc., took about 9 hours spread over two days to complete. Wells 402 and 403 received the injectate. Appendix D contains field notes for the injection process including time, volume and well order of injection.

4.2.1 Theoretical treatability of contaminants

As shown in Appendix E, 1000 *kg* of persulphate can theoretically treat about 21 *kg* of BTEX. BTEX contaminant mass in the 21 m^3 study area was estimated to be 41 *kg* (see section 2.4.1), thus the injection should theoretically bring about a 51% reduction in residual BTEX mass.

4.3 Post-injection

4.3.1 Soil coring

Soil coring was again conducted in November 2010 to assess the effect of the oxidant injection on residual mass. Coring was carried out close to the injection wells, as well as close to the monitoring well that had shown the best response (in terms of electrical conductivity, persulphate and other parameters further explained in Chapter 5) to the injection. The pore water was also analyzed for inorganic contaminants. As with the previous soil cores, the drilling was done with a hollow-stem auger in tandem with a continuous sampler, though some samples were collected with a hammered split-spoon sampler because of poor recovery with the continuous sampler.

Core samples for inorganic analysis were collected in much the same way as described in section 4.1.1; however some modifications were made to that method. The solvent used was 20 *mL* of deionized water in order to dissolve the pore water held in tension in the aquifer material, and the pre-weighed vials used to collect the sample were of coloured glass.

Soil core samples collected for organic analysis were collected using the method described in section 4.1.1.

4.3.2 Groundwater Monitoring

After the injection, electrical conductivity and pH were regularly monitored (about every 12 days on average). Electrical conductivity was used as a proxy for sodium to monitor the transport and dilution of the injectate (see chapter 5 for details). pH was monitored to find out whether it had declined to the point where acid-catalyzed reactions involving persulphate were possible.

4.3.2.1 Organic

Post-injection organic sampling of groundwater was carried out exactly as described in section 4.1.3.

4.3.2.2 Inorganic

Inorganic groundwater samples were collected in 20 *mL* glass vials with regular caps. The sampling manifold was not used, and the sample was collected directly from the peristaltic pump after purging at least 400 *mL* from each well. A preservative was not added. The collected samples were analyzed for sodium (conservative tracer), persulphate (active oxidizing agent) and sulphate (to determine whether oxidation had taken place). One sample was collected for sodium analysis, and another for persulphate and sulphate analysis.

Chapter 5: Field Results & Discussion

This chapter presents and discusses the results from the field experiments conducted for this study with an emphasis on the effect of unactivated sodium persulphate on five volatile constituents of gasoline, namely benzene; toluene; ethylbenzene; p,m-xylene and o-xylene. The effects of the injectate on 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, 1,2,3-trimethylbenzene, and naphthalene are also considered. Apparent reduction of these compounds assumes their degradation by the oxidant.

5.1 Groundwater results – dissolved contamination

5.1.1 Electrical conductivity

The injectate, being composed of a salt (sodium persulphate) that dissolves in water to its constituent ions (sodium and persulphate), is very electrically conductive, with an electrical conductivity (EC) of approximately 50,000 *µS/cm*. By contrast, the average background EC level for the site is roughly 1400 *µS/cm*. This difference permits the use of EC to indicate the arrival of injectate at monitoring wells, overall movement of the injectate as well as the extent of dilution of the injectate.

5.1.1.1 Field measurements

Electrical conductivity was consistently monitored over the course of the study. Measurements were taken 16 times over the 152 day post-injection monitoring period. See Figures 2 and 3 and Tables 1 and 2 in section 2.2 for plan view, cross-section and sampling point depths.

The injection wells, unsurprisingly, showed the highest electrical conductivity amongst all the wells. The conductivity in these wells peaked shortly after injection before eventually returning to background levels around 60 days after injection. At their peaks, the electrical conductivity values of the injection wells were about 37 times the background level, or 96% of the injectate's EC level.

Multilevel monitoring well 502 showed the most consistent presence of elevated EC levels, with the deepest point and shallowest points showing the highest levels. The highest level recorded was at 502-6, where the measurement was over four times the background level. 502-4 and 502-5 both recorded levels of EC twice as high as the background, and 502-2 and 502-3 both recorded values over thrice as high as the background.

Significant levels of EC were also detected at a later date at multilevel monitoring well 503. The shallower points showed the highest levels at this well; 503-2 and 503-3 at roughly thrice background levels, 503-4 at 2.5 times the background, 503-5 at twice background levels and 503-6 at 1.5 times background. 503-7 did not show any variation outside the natural range of electrical conductivity.

Multilevel monitoring wells 501 and 301 showed only slightly elevated levels of EC (around 1.5 times background at most) at the shallower depths (301-4 & 301-5, and 501-2 primarily).

Multilevel monitoring well 302 in the upgradient control area showed background levels of EC at depth, but had levels of around twice background at shallower depths. This may have been due to the injected slug migrating against the normal hydraulic gradient due to the temporary alteration of this gradient by the injection of nearly 10,000 *L* of water.

5.1.1.2 Relationship between Electrical Conductivity and Sodium

Electrical conductivity was an important parameter for this field study. A tight correlation ($R^2 = 0.83$) was found between EC and sodium, as shown in Figure 39. The equation of this regression line is:

$$\text{EC } (\mu S/cm) = 4.888 \times \text{Na } (mg/L) + 702.2 \tag{7}$$

The tight correlation between these two parameters is useful as it permits the determination of one of these parameters from the other to a reasonable degree of accuracy.

The sodium ions liberated by the dissolution of sodium persulphate are largely persistent within groundwater systems because of not being largely affected by any sorptive or transformative processes. These properties make sodium an effective tracer for sites that have a stable background sodium level (e.g. not affected by saltwater intrusions, heavy application of road salt etc.)

5.1.1.3 Relationship between Electrical Conductivity and the sum of Sulphate and Persulphate

Since there are as many moles of charge attributable to persulphate as there are to sodium, it stands to reason that EC and persulphate should also be tightly correlated. Persulphate dissociates to sulphate ions, so theoretically, the sum of the molarities of persulphate and sulphate should correlate well with electrical conductivity. As seen in Figure 40, this was not the case. The regression coefficient was 0.1.

Other pathways of reaction are likely responsible for the sum of persulphate and sulphate ions not being correlated to EC (Huang et al., 2002).

5.1.2 pH

pH was also monitored to see if it declined to the point where acid-catalyzed reactions could take place. The buffering capacity of the soil was found to be adequate, as expected. The pH in the wells after the injection varied between 5 and 7, with an average of about 6.

5.1.3 Model results

The SALTFLOW finite element model (Molson & Frind, 2002) was in used in conjunction with Katanchi (M.Sc., in prog.) to determine the effects of density on an injection of sodium persulphate at 100 *g/L*. The injection of such a solution with density 1.063 g/cm^3 was simulated alongside the injection of a solution with the same density as groundwater.

The model was constructed with the following parameters: a defined volume of injection solution containing 100 *g/L* or 0 *g/L* of sodium persulphate was designated to be the source zone as shown by the black square in Figure 42. The modelling of the flow and transport of sodium persulphate from this emplaced source was done with a flow gradient of 0.005, a porosity of 0.3 and a hydraulic conductivity of 1×10^{-5} *m/s*. This is somewhat similar to the field site. Model assumptions included: a saturated flow regime, isothermal conditions, homogeneous stratigraphy, isotropic hydraulic conductivity, uniform viscosity, and a 3-D symmetric system where chemical reactions are neglected. The model results suggested that the centre of mass of the injectate at 100 *g/L* would sink at the same rate it moved forward, i.e. after 100 days, at a distance of 3 *m* from the injection well, it would sink by 3 *m*.

5.1.4 Inorganic analyses – extent of injectate and extent of reaction

Samples were collected and analyzed for persulphate, sulphate and sodium to determine the fate and transport of the injectate. Sodium and EC levels were analyzed because of its usefulness as a non-reactive tracer (see section 5.1.1.2), and persulphate and sulphate were analyzed to gauge whether a reaction between the injectate and hydrocarbons was taking place.

Figures 43 to 63 show concentrations of these analytes over time in various wells. No lines are shown were data are lacking, whereas lines are shown to connect data points that appear to be part of a trend. Points of inflection without a data point show an interpretation of what is believed to have occurred, based on the other chemical parameters measured more frequently.

Monitoring well 502 showed the most interesting results with respect to the inorganic analytes. There was wide variation in how persulphate, sulphate and sodium manifested themselves at different depths in the same well in time. 502-2, the shallowest functioning point (502-1 was consistently dry) clearly showed the presence of the injectate with a large spike in sulphate (about 1100 *mg/L*) and a spike in sodium (about 600 *mg/L*) corresponding to a spike in EC, but showed no presence of persulphate on the days monitoring took place. 502-3, in comparison, shared the sulphate and sodium characteristics of 502-2, but showed the presence of a modest amount of persulphate, as seen in Figure 49. The high sulphate levels in both these wells could indicate both the reaction of the injectate with BTEX at the wells themselves, as well as upgradient. The injectate also seemed to have reached points 502-4 and 502-5 and possibly caused a reaction there, as they had good agreement between EC, sulphate, persulphate and sodium; however, there is a lack of data during the initial monitoring period. 502-6 has the strongest inorganic response, and thus possibly the most injectate of all the points; observations here included high EC (roughly 6000 *µS/cm*) and persulphate (about 1200 *mg/L*) with accompanying, though smaller spikes in sulphate and sodium. The relatively low level of sulphate (about 250 *mg/*L) given the high levels of EC and persulphate indicate that the injectate may not have reacted much at this well.

Monitoring well 503 presented varied results as well. 503-2 showed the presence of the injectate through high EC and sodium levels, but sulphate was not found and persulphate only was seen once at a low level. BTEX evidence (discussed in section 5.1.4) suggests that elevated persulphate and sulphate levels may simply have been missed due to infrequent sampling of this well in the first 70 days of the study. 503-3 indicated the presence of injectate but showed a fluctuation of EC and sodium values, and persulphate presence, but low sulphate levels. This could indicate that the injectate got there, but did not react. Points 503-4 to 503-7 showed diminishing EC and sodium levels and had next to no presence of sulphate and persulphate, implying the presence of a small amount of unreacted injectate which decreased with depth.

Multilevel monitoring well 302 in the upgradient control area showed slightly elevated levels of EC and sodium at shallower depths. This may have been due to the injected slug migrating against the normal hydraulic gradient due to the temporary alteration of this gradient by the injection of nearly 10,000 L of water.

The injection wells behaved differently from each other. 403 continued to show high persulphate and sodium levels and moderately high sulphate levels even after conductivity had nearly returned to background levels whereas 402 showed very little persistence and presence of any of the analytes. It may be inferred from this that the injectate lingered longer in 403, where it also seemed to react, while in 402, the injectate dissipated quickly following the injection. It must be noted, however, that there is insufficient sampling data in the period immediately following injection.

Overall, the observed levels of EC, sodium and persulphate are far lower than those present in the injectate, indicating that part of the injectate may have flowed through areas lacking in monitoring wells. This would account for the diminished levels of tracer data in the monitoring network.

Alternatively, the injectate may simply have been diluted by transport, resulting in a lower concentration, but larger slug. This larger slug would persist for longer in the monitoring causing elevated EC levels to be observed for a longer period of time.

5.1.5 Organic analyses

Groundwater samples were collected and analyzed for BTEX, TMBs and naphthalene in the dissolved phase. The observed data were corrected to account for the effect of dilution caused by the injection of 9850 L.

Figures 64 to 75 show both the measured and dilution-corrected BTEX values, along with EC. The dilution-corrected values were calculated using the level of EC to determine the percentage of injected water (versus background water) in a given sample (see Appendix F for the correction calculation). This was then applied to the background BTEX level to track the change of that level over time if only dilution were to occur. This level was then compared to the actual measured level of BTEX in the samples to determine whether there was genuine mass loss or simply a lower concentration of BTEX due to dilution. A difference between the dilution line (dotted red in Figures 64-35) and measured line (dashed red in Figures 64-75) are the result of non-dilution processes, presumably oxidation.

There was a mixed response in monitoring well 502, the first monitoring well in which the injectate was detected. At the shallowest functioning point, 502-2, there seems to be a drop in BTEX concentrations corresponding to the presence of injectate. There is apparent BTEX mass loss with respect to the dilution corrected curve as well, though BTEX levels fluctuate and seem to be rebounding at the end of the study period. At point 502-3, despite the inorganics showing injectate presence (discussed in section 5.1.3), BTEX concentrations, low to begin with, appear to be relatively unchanged. This trend is also observed at 502-4, 502-5 and 502-6, despite there being up to approximately 10% injectate at 502-6 at one point (calculated from the EC values). It should be noted that the background levels of BTEX in these wells were substantially lower (by a factor of 3 or more) than those in 502-2.

In monitoring well 503, inorganic tracers indicated the presence of injectate at 503-2, the shallowest functioning monitoring point, with high EC and sodium levels (see section 5.1.3). This monitoring point had significant apparent mass loss of BTEX (approximately 50% at the point of highest apparent reduction in mass). As with 502-2, however, BTEX levels were on the rebound at the end of the study period. 503-3 also showed increasing BTEX levels toward the end of the study period, but no loss of BTEX was observed here despite inorganics marking the presence of the injectate. As seen in Figure 73, background BTEX levels were very low at this port. Monitoring points 503-4 through 503-7 had very low BTEX levels to begin with (see Figures 74-75), and injectate presence in these wells diminished with depth. These wells were essentially unaffected by the injection.

BTEX levels in multilevel monitoring well 302 in the upgradient control area also showed little evidence of change, despite slightly elevated EC levels at shallow depths indicating the possible presence of the injectate.

The injection wells both showed significant apparent reduction in dissolved BTEX concentrations (approximately 60% at the point of highest apparent reduction in mass for well 402, and about 50% for 403). BTEX levels in well 402 seem to be rebounding at the close of the study period. Injectate was of course present in these wells.

5.1.6 Synopsis of groundwater field results

The groundwater field results can be broadly categorized in four ways:

- Category I: Wells that showed strong evidence of injectate presence (elevated EC, high sodium and the presence of persulphate), but little to no change in BTEX levels. These were: 502-3, 502-4, 502-5 and 502-6. This category consists of points directly downgradient from the injection wells.
- Category II: Wells that showed an apparent reduction in BTEX concentration, usually accompanied by the presence of injectate. BTEX levels may be rebounding towards end of study period. These wells were: 502-2, 503-2, 503-3, 402 and 403. This category has a large areal extent from the injection wells all the way to the well furthest downgradient within the study area.
- Category III: Showed presence of only minor amounts of injectate, usually indicated only by EC. Not accompanied by apparent BTEX concentration declines. Wells in this category: 503-4, 503-5, 503-6, 301-4, 301-5, 501-2, 302-3, 302-4.

- Category IV: No evidence of injectate presence. No change in any parameter, inorganic or BTEX from background levels. Wells: 302-5, 503-7, 501-3, 301-6, 301-7, BH 20

It can be inferred that insufficient sodium persulphate was injected to effect a lasting change to the BTEX levels. For example, it may be hypothesized that wells in Category I got enough injectate to drive up EC and sodium levels and have persulphate in them, but not enough injectate to measurably reduce BTEX levels even in the groundwater. Similarly for Category II, enough injectate seems to have gotten to the wells to temporarily reduce BTEX levels beyond simple dilution, but not enough to oxidize all the residuals, which led to rebounding BTEX levels later on. Categories III and IV seem to have received a little and no injectate respectively.

As well, it would seem that some of the injectate was simply not detected in the monitoring wells. This may be because of an inadequate monitoring well network in terms of both density and position relative to where the injection went (see Figure 80). Despite the homogeneity of the aquifer, there may also be preferential pathways present which resulted in the injectate being found at deeper points for MW 502, but only at shallower points at MW 503.

5.2 Soil results – residual contamination

5.2.1 Inorganic analyses

Soil cores collected at the end of the study period after the injection were analyzed to determine the levels of sodium, sulphate and persulphate contained in the porewater of the soil samples. The porewater, ordinarily held in tension in the pores, was extracted by dissolution in 20 *mL* of deionized water, which was then analyzed. Appendix G shows how the results were determined from the diluted sample.

Figures 76 to 78 show the distribution of the inorganic analytes with depth in each of the post-injection soil cores. The variability with depth is clearly seen from the graphs. BH 602 shows the presence of persulphate in the porewater, alongside elevated sodium and sulphate levels, as seen in Figure 77. This shows that the injectate reached the residual contamination present at that location.

5.2.2 Organic analyses

Soil cores from the post-injection boreholes were analyzed for residual BTEX and the concentrations were compared to pre-injection core. The post-injection cores were collected in close proximity to the pre-injection core, allowing for more reasonable comparison. Residual concentrations were then extrapolated to calculate the total amount of residual BTEX mass in the area. See Appendix C for the calculations.

As mentioned in section 4.2.1, the amount of sodium persulphate injected (1000 *kg*) can theoretically treat about 21 *kg* of BTEX. In section 2.4.1, it was noted that the target area contained approximately 41 *kg* of residual BTEX mass, as represented by xylene. Thus, a reduction of 51% in BTEX mass was theoretically possible. The total residual BTEX mass after the injection was determined to be about 25 *kg*, so about a 40% reduction seems to have taken place. While Figure 79 does show an apparent reduction in residual BTEX contamination before and after injection, it is certain that the reduction that seems to have taken place is not equal to the calculated theoretical reduction.

Estimating residual mass from the field sampling of soil has a great deal of uncertainty associated with it due to its heterogeneous nature, as seen in Figure 79. This figure suggests that that residuals are distributed in a heterogeneous fashion. This leaves considerable uncertainty that the roughly 90 subsamples analyzed provide a good representation of the mass of residuals present, adding to the degree of uncertainty. Determining the large and unknown degree of uncertainty associated with the field sampling of heterogeneously distributed BTEX residuals is very difficult, in turn making it difficult to accept the veracity and accuracy of the apparent reduction in residual BTEX concentrations.

Chapter 6: Conclusions and Recommendations

This study investigated and attempted to evaluate the efficacy of the injection of an *in situ* chemical oxidant, unactivated sodium persulphate, at 100 *g/L* in reducing residual and dissolved phase BTEX. The study looked at both oxidant transport and hydrocarbon reduction. The following conclusions, caveats and recommendations were borne of this effort.

The bench-scale studies conducted in the laboratory showed that sodium persulphate was able to oxidize BTEX at room temperature. The degree of natural oxidant interaction was minimal. A large amount of uncontaminated aquifer material should be available for these experiments and regular pH measurements should be taken to determine whether the soil has a high buffering capacity. In light of the useful correlation between electrical conductivity and sodium in the field, EC measurements should also be taken in subsequent experiments.

A large part of the 9850 *L* injectate did not appear to have been effectively delivered to the target area. This was likely due to the relatively placement of the injection wells and monitoring network as well as density effects not being fully understood at the time of injection.

Reduction in groundwater hydrocarbon concentrations was observed in areas where injectate presence was detected through analysis of sodium, persulphate and sulphate in the groundwater. In many instances, only short-term reduction of BTEX levels was observed, with the concentrations of BTEX rebounding towards the end of the study period, rather than showing long-lasting reduction. This could potentially be due to an insufficient amount of oxidant reaching the areas sampled. This rebound of BTEX towards the end of the study period may also be reduced by more frequent injections of oxidant. This will ensure that enough oxidant is available to completely oxidize both residual and dissolved phase BTEX.

Soil coring before and after injection helped determine that reduction took place in residual hydrocarbon levels as well. Estimating the amount of residual mass before and after the injection has a large amount of error associated with it, so while it can be said that a reduction in residual BTEX concentrations appears to have been observed, the calculated figure of 40% reduction may not be accurate.

As mentioned above and shown by the modeling results, density-driven flow may have had an impact on injectate delivery. This was borne out in the monitoring well most directly downgradient of the injection wells where the deepest well had the most injectate. The installation of deeper monitoring wells downgradient from the injection wells could potentially help in observing more of the injectate slug. Injecting the oxidant solution at a lower concentration of sodium persulphate with a density more similar to that of water would decrease the effect of density as well. Of course, at lower concentrations of the oxidant, multiple injections would be needed to deliver the amount of oxidant required to bring about a reduction in BTEX concentrations.

More frequent monitoring and sampling of groundwater especially at early time is highly recommended. The actual flow and transport of the injectate slug can differ from calculations based on average groundwater velocity and slug volume, and so should be observed by frequent and regular monitoring. Electrical conductivity should be monitored intensively and used as a guideline to determine when regular organic and inorganic samples should be collected.

Figures

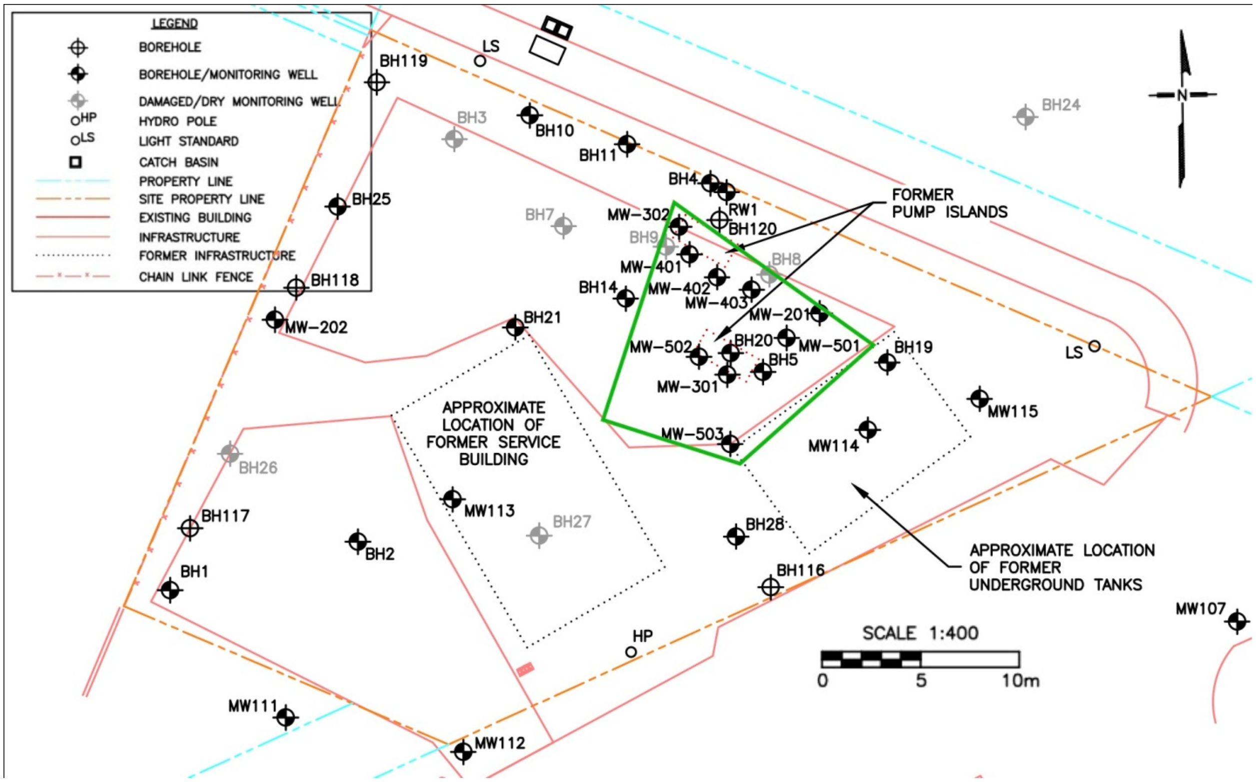

Figure 1 - Site Map (modified after SLE, 2010). Target area shown in green box.

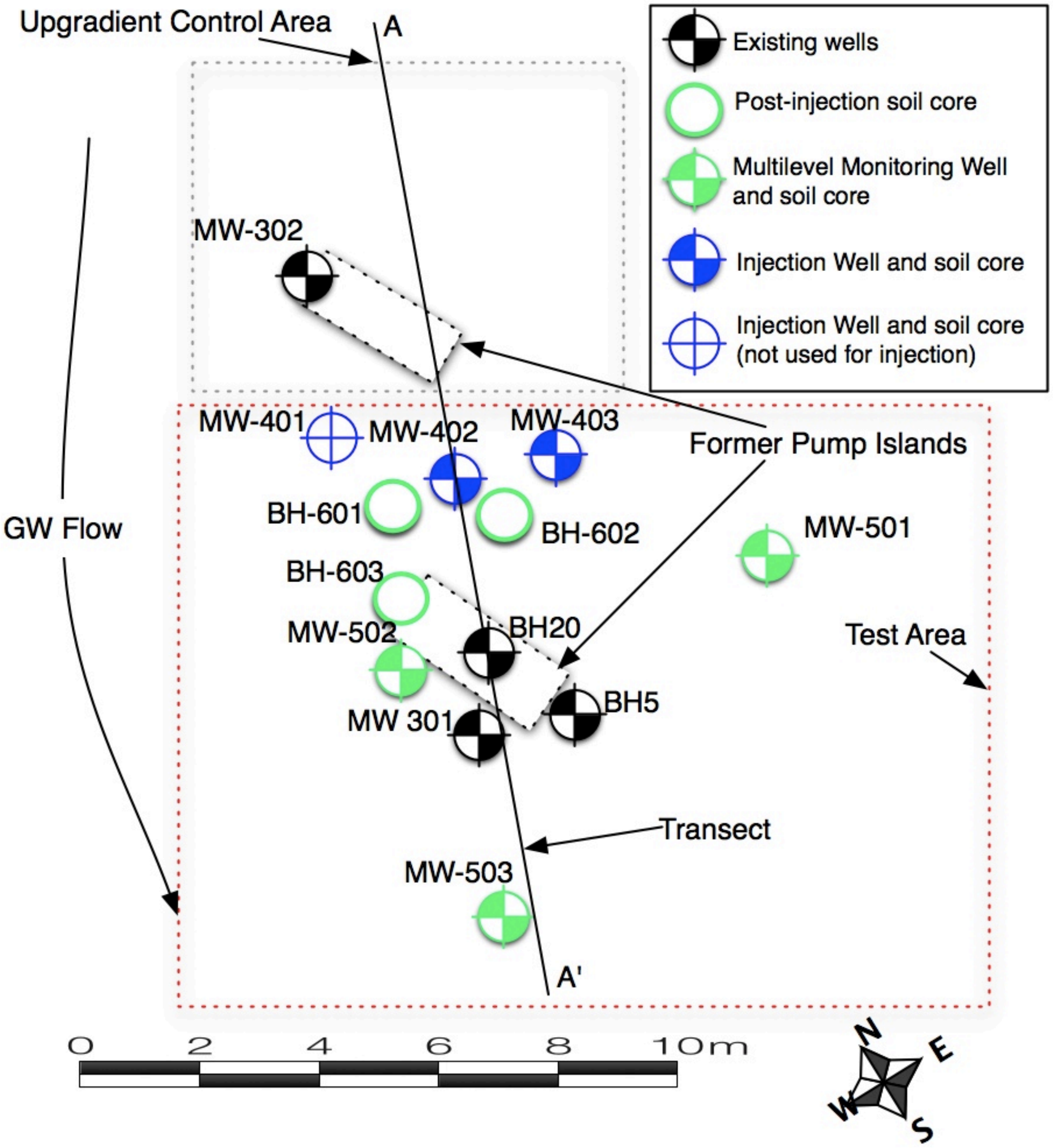

Figure 2 - Sketch of target area in plan view

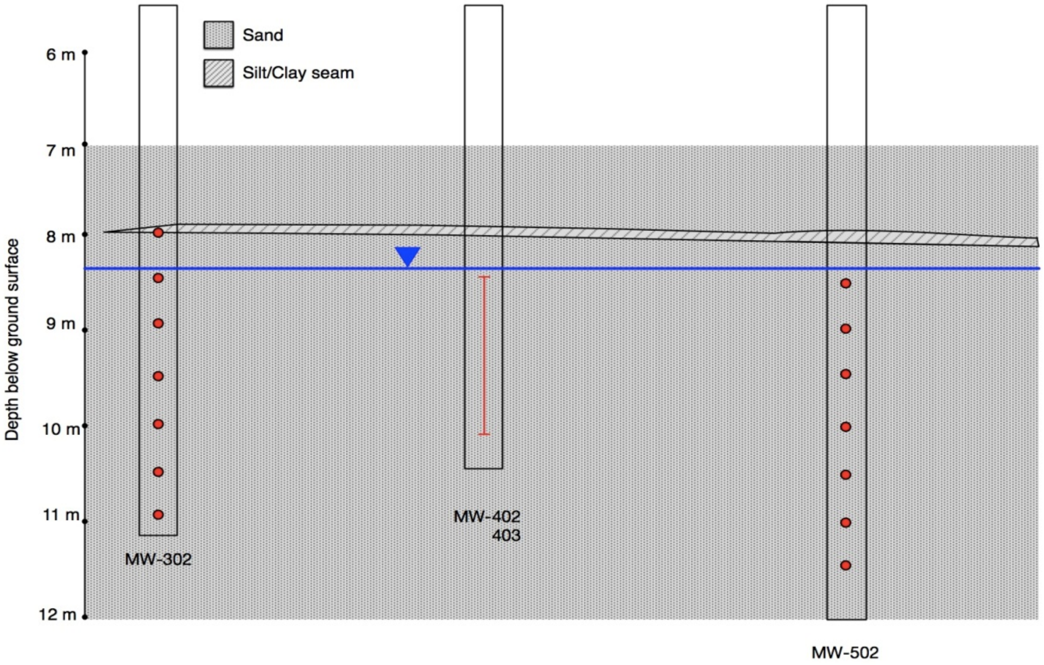

Figure 3 - Cross-section of transect A-A'

Figure 4 – Core sample showing sand with clay lens from the target area in BH-402 at 7.9 *mbgs*

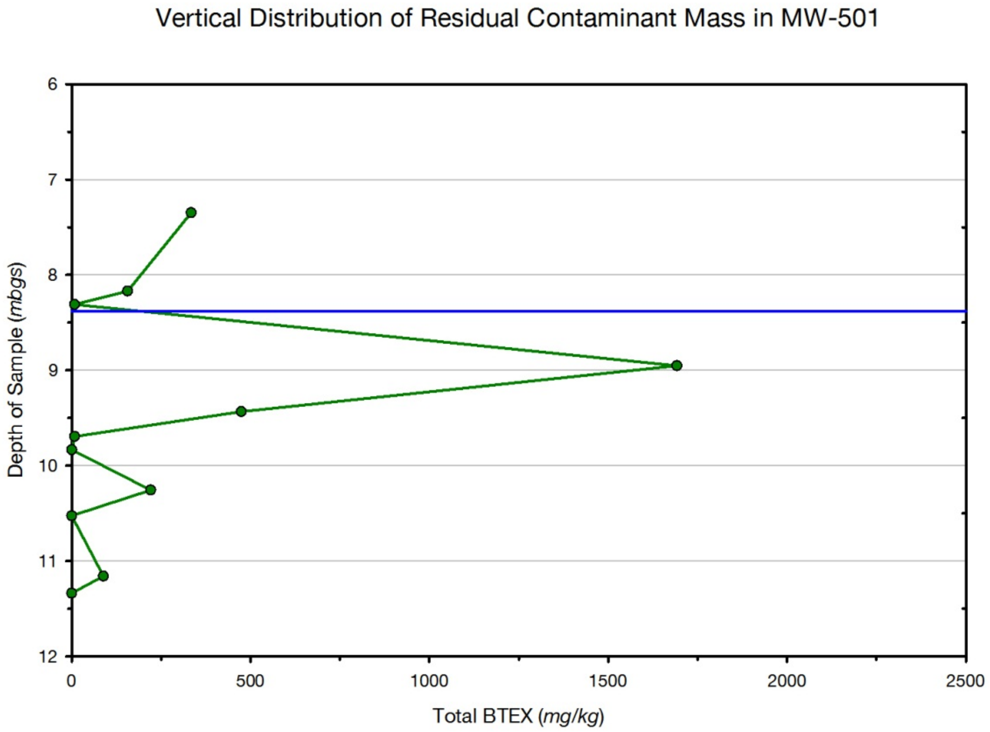

Figure 5 - Vertical distribution of contamination in soil samples from MW-501. Blue line indicates water table as on November 10, 2009.

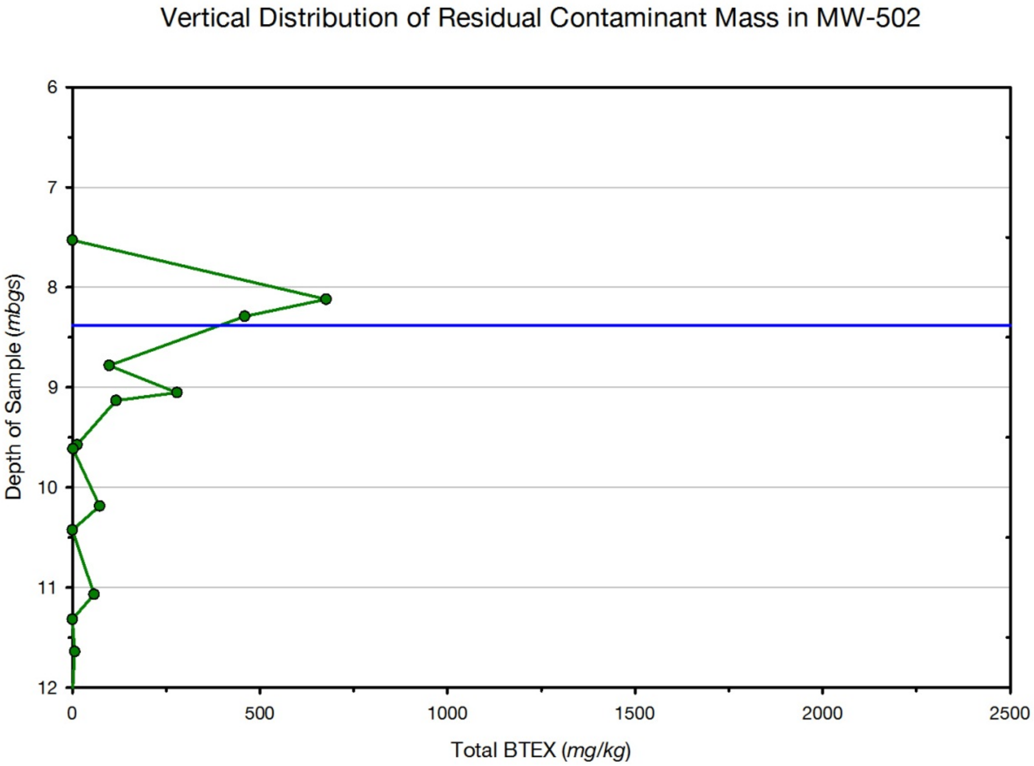

Figure 6 - Vertical distribution of contamination in soil samples from MW-502. Blue line indicates water table as on November 10, 2009.

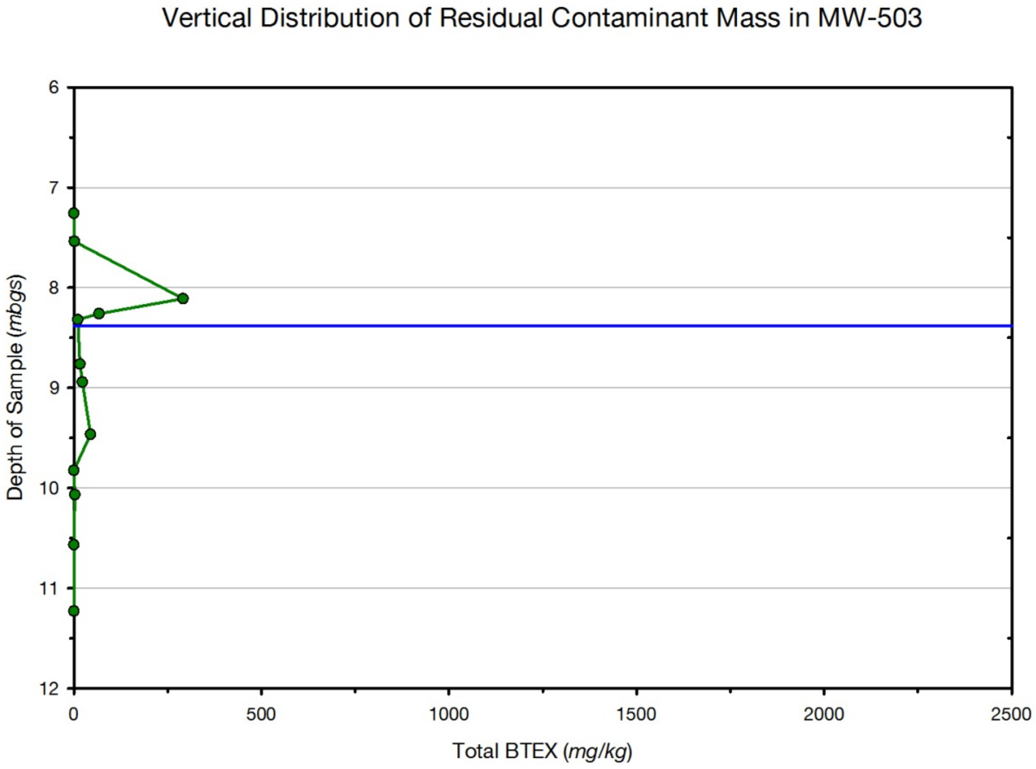

Figure 7 – Vertical distribution of contamination in soil samples from MW-503. Blue line indicates water table as on November 10, 2009.

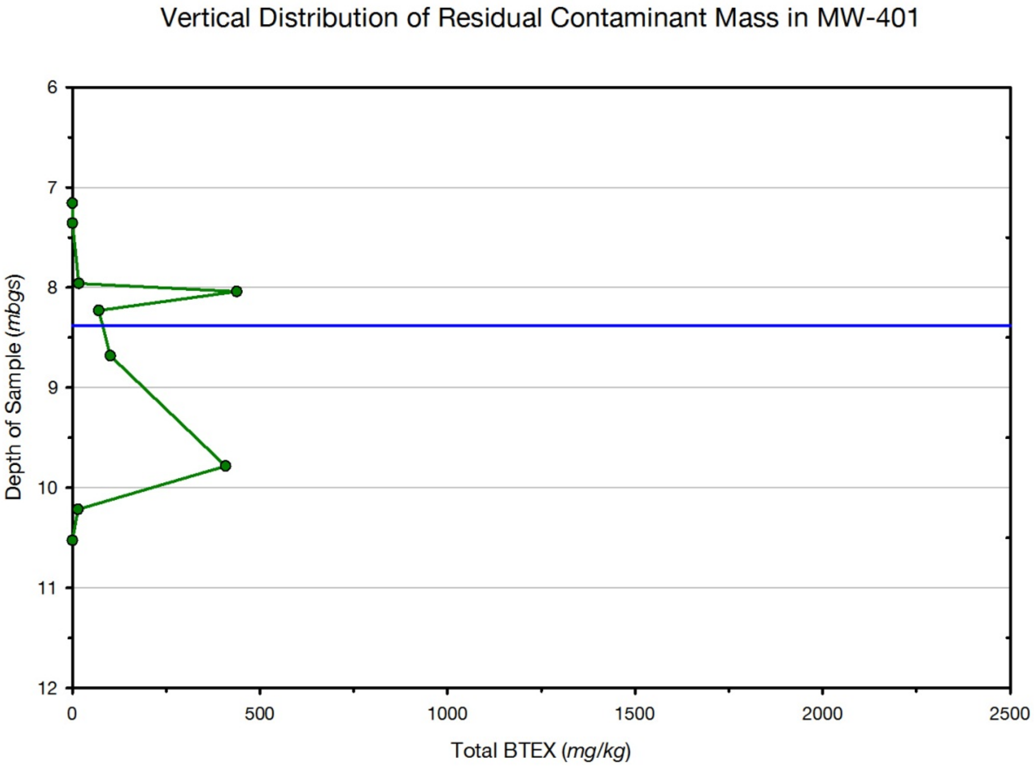

Figure 8 - Vertical distribution of contamination in soil samples from MW-401. Blue line indicates water table as on November 10, 2009.

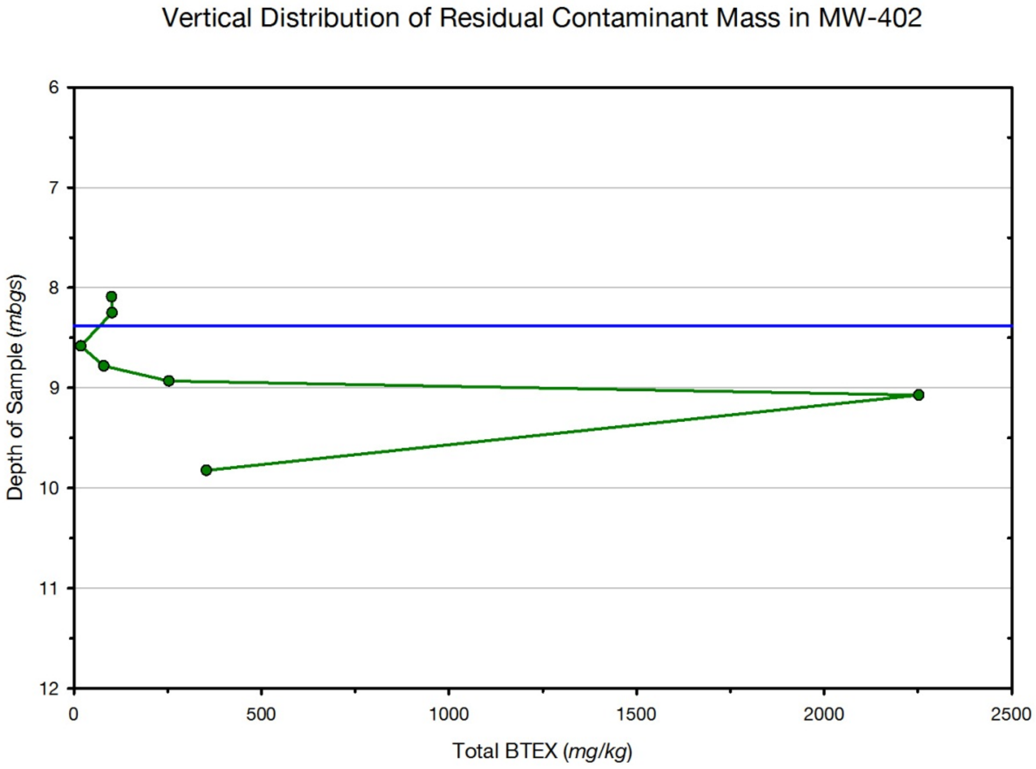

Figure 9 - Vertical distribution of contamination in soil samples from MW-402. Blue line indicates water table as on November 10, 2009.

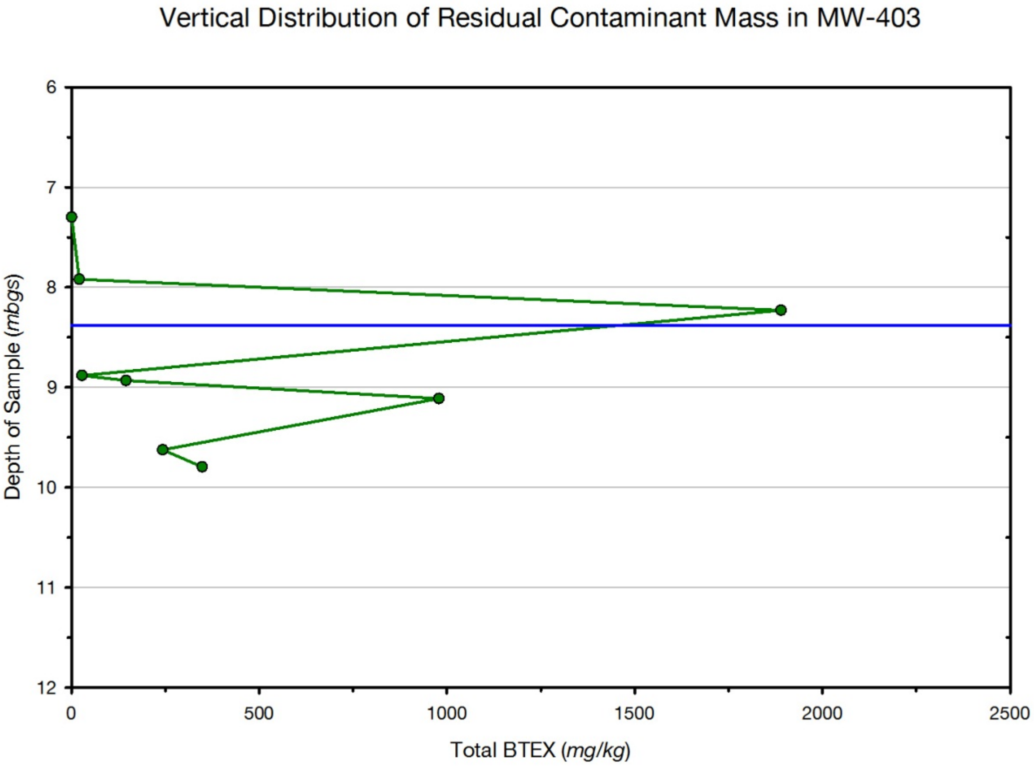

Figure 10 - Vertical distribution of contamination in soil samples from MW-403. Blue line indicates water table as on November 10, 2009.

Figure 11 - Staining at approximately 9 *mbgs* at MW-402

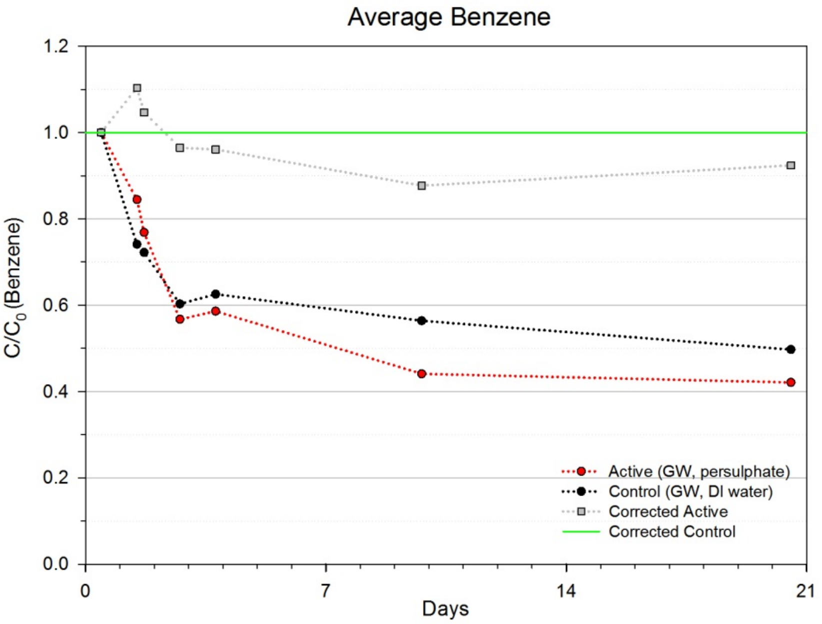

Figure 12 - Groundwater, Persulphate - Average Benzene

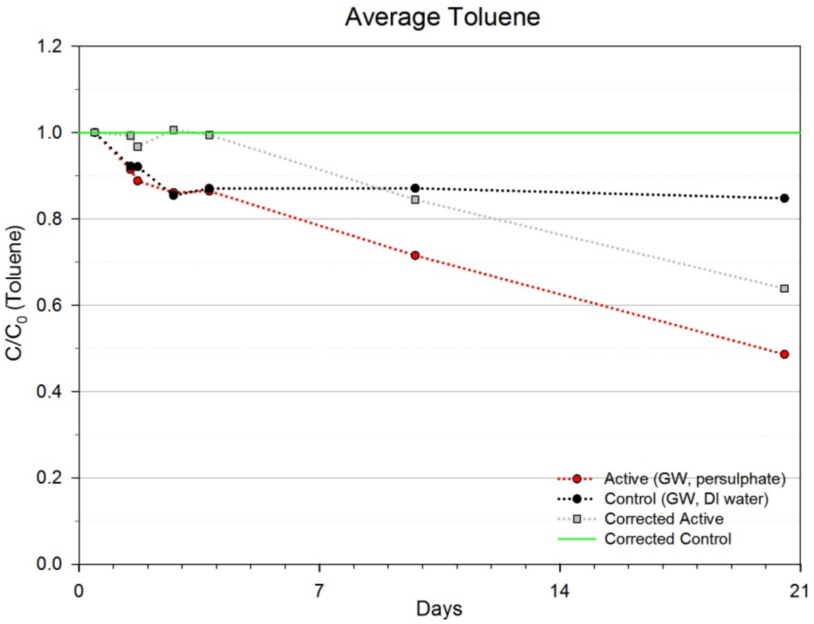

Figure 13 - Groundwater, Persulphate - Average Toluene

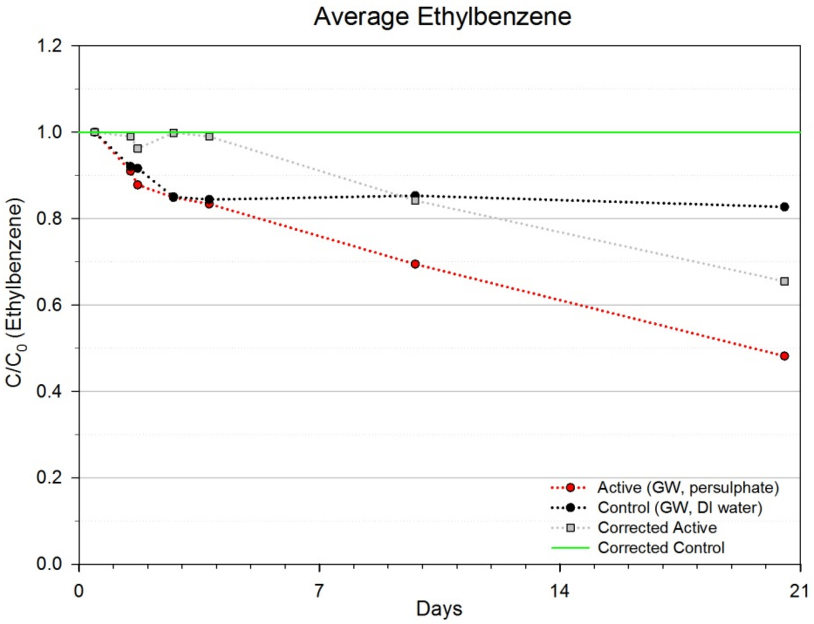

Figure 14 - Groundwater, Persulphate - Average Ethylbenzene

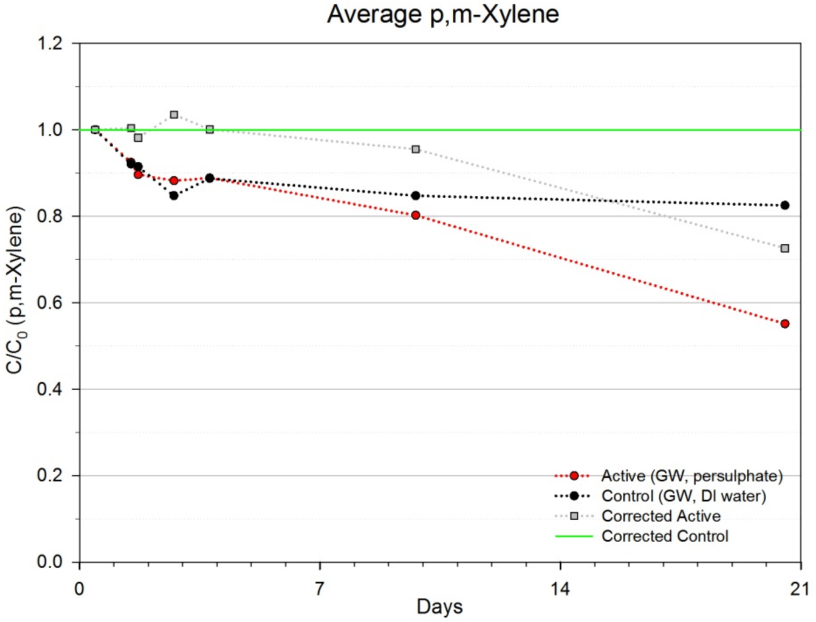

Figure 15 - Groundwater, Persulphate - Average p,m-Xylene

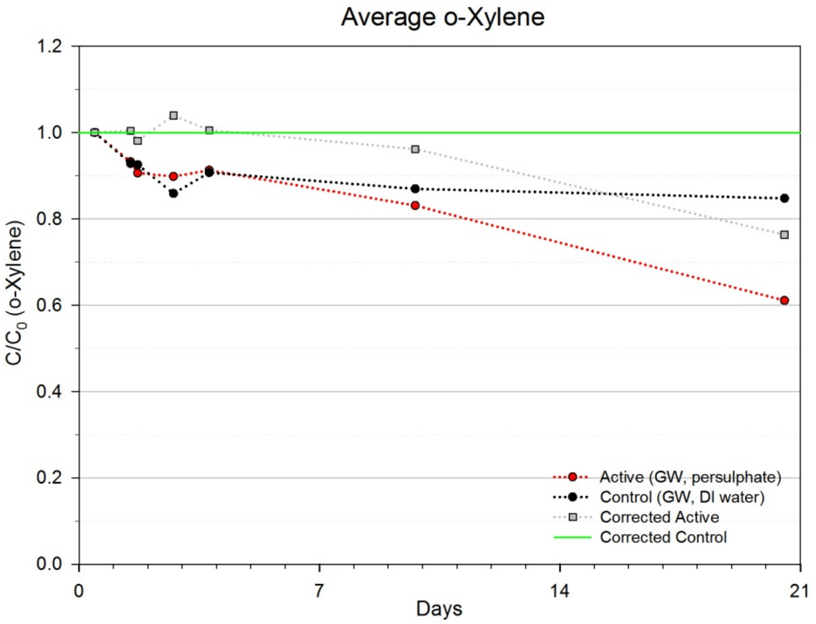

Figure 16 - Groundwater, Persulphate - Average o-Xylene

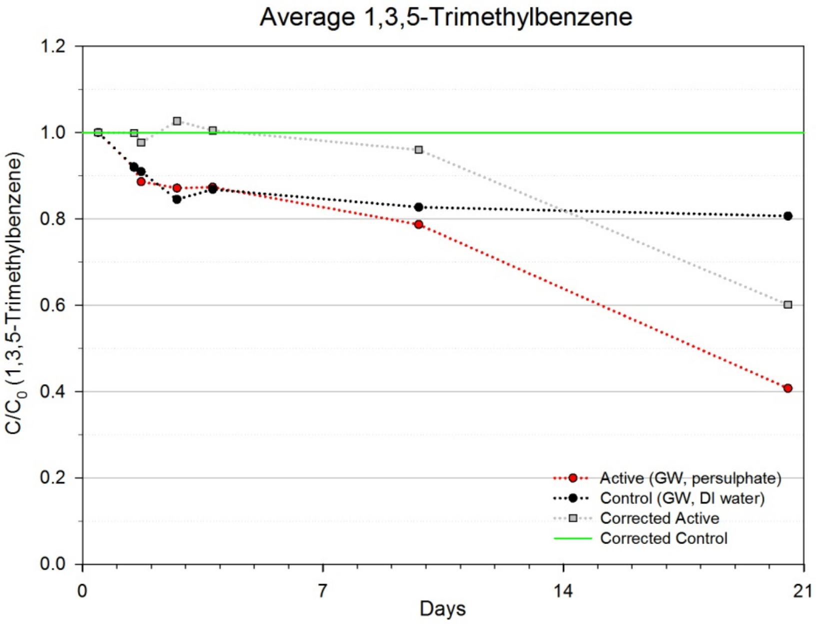

Figure 17 - Groundwater, Persulphate - Average 1,3,5-Trimethylbenzene

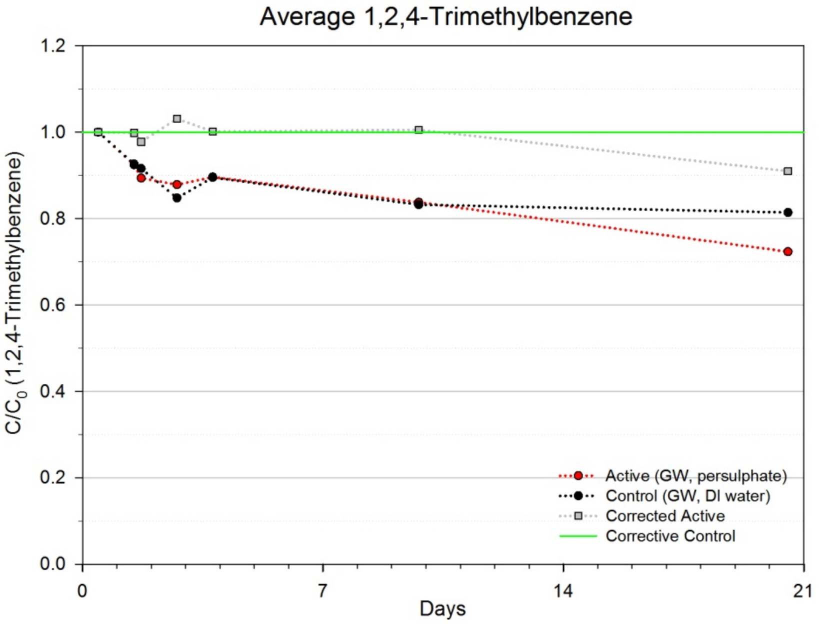

Figure 18 - Groundwater, Persulphate - Average 1,2,4-Trimethylbenzene

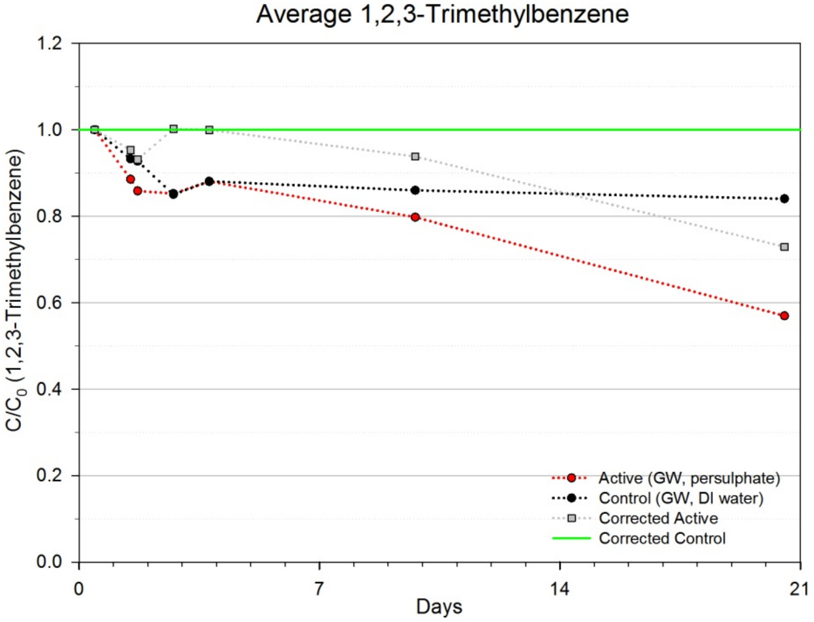

Figure 19 - Groundwater, Persulphate - Average 1,2,3-Trimethylbenzene

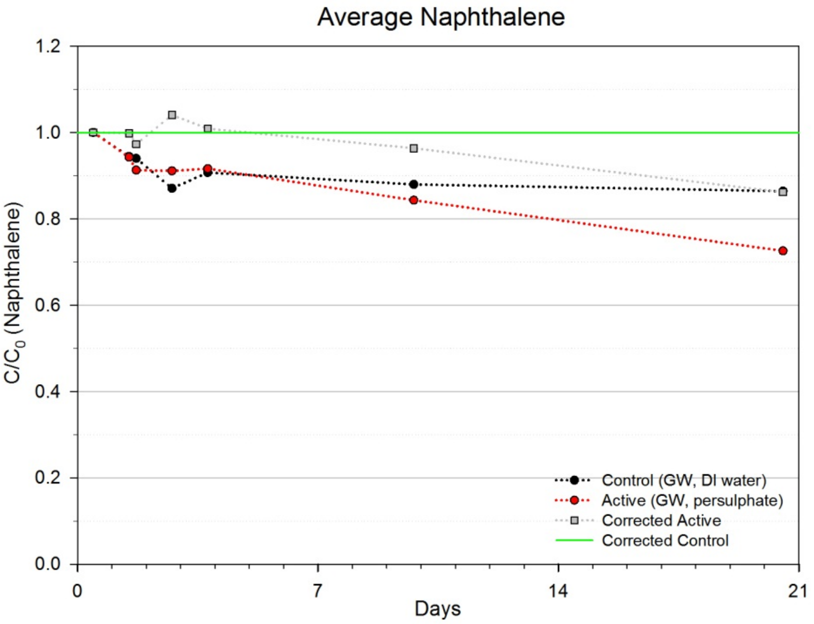

Figure 20 - Groundwater, Persulphate - Average Naphthalene

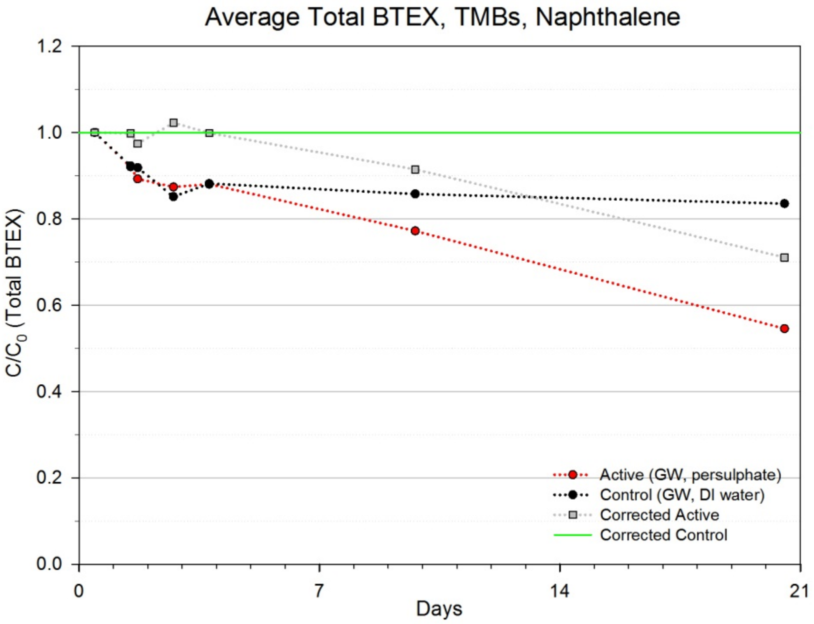

Figure 21 - Groundwater, Persulphate - Total of Averages of BTEX, TMBs, Naphthalene

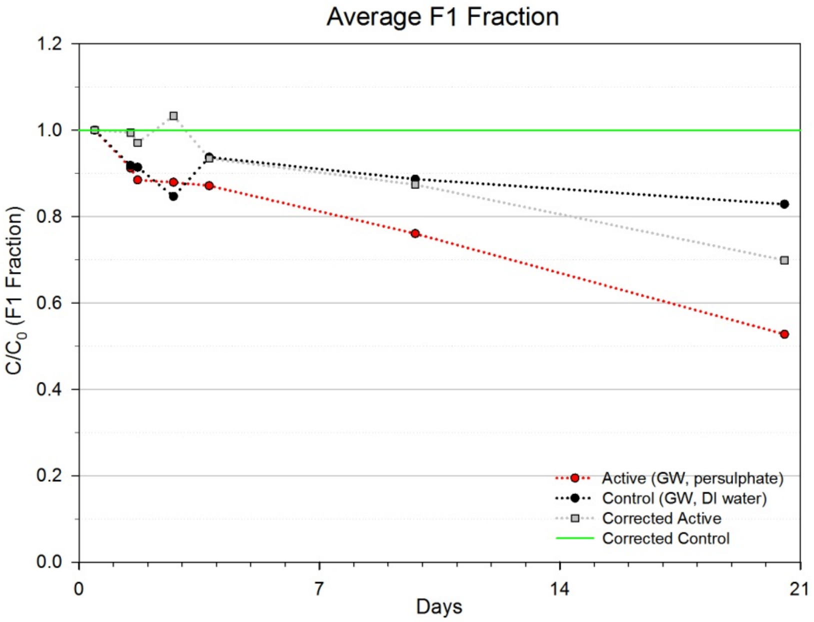

Figure 22 - Groundwater, Persulphate - Average F1 Fraction

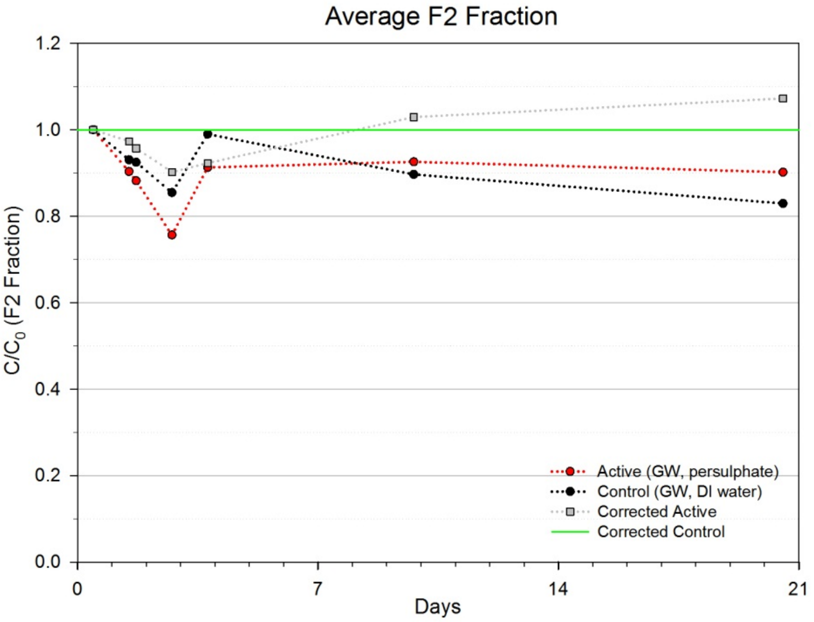

Figure 23 - Groundwater, Persulphate - Average F2 Fraction

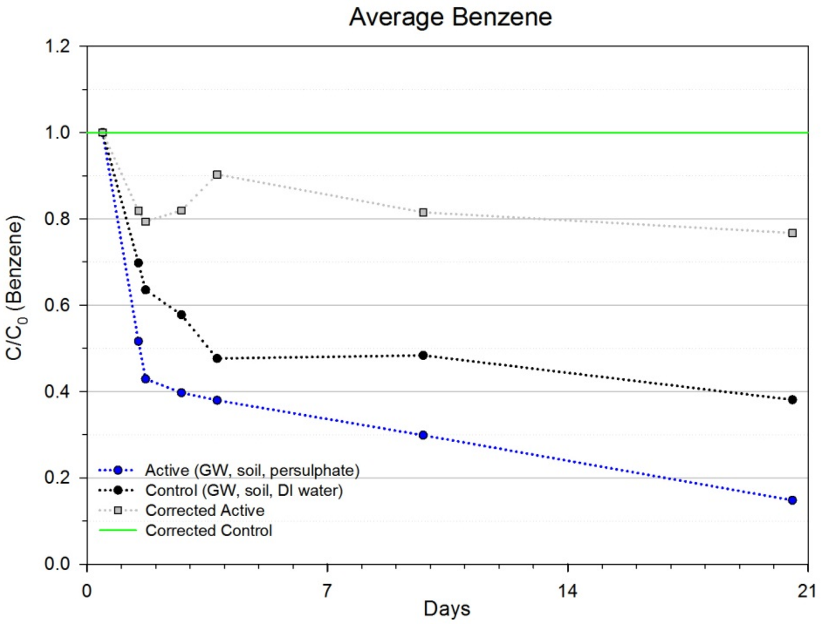

Figure 24 - Groundwater, Soil, Persulphate - Average Benzene

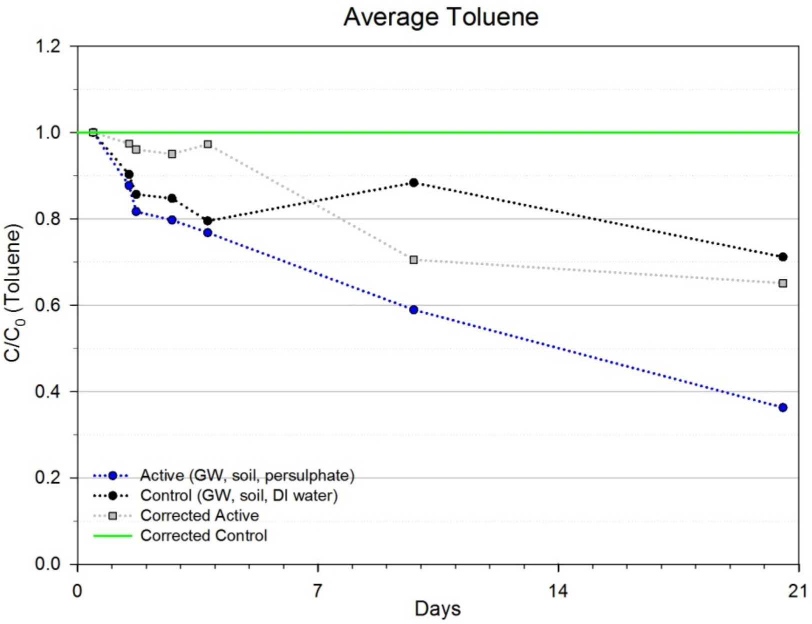

Figure 25 - Groundwater, Soil, Persulphate - Average Toluene

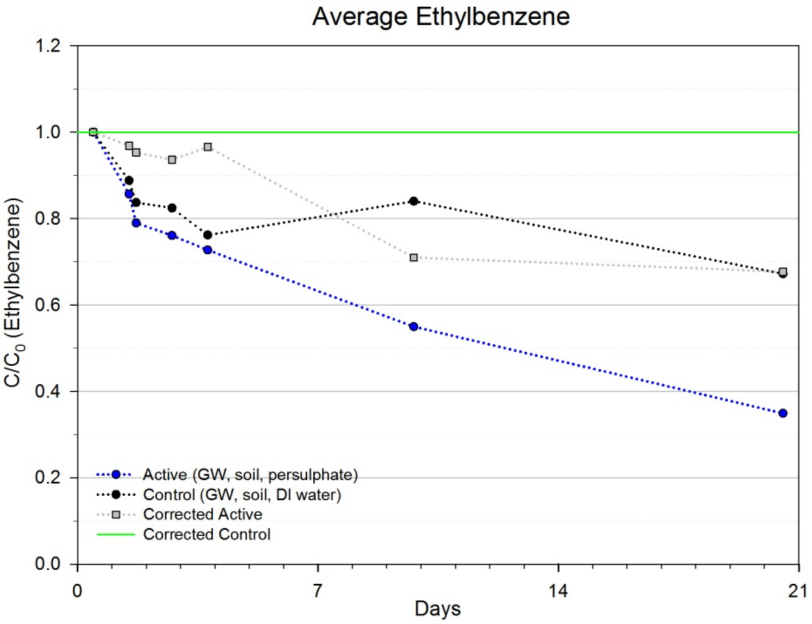

Figure 26 - Groundwater, Soil, Persulphate - Average Ethylbenzene

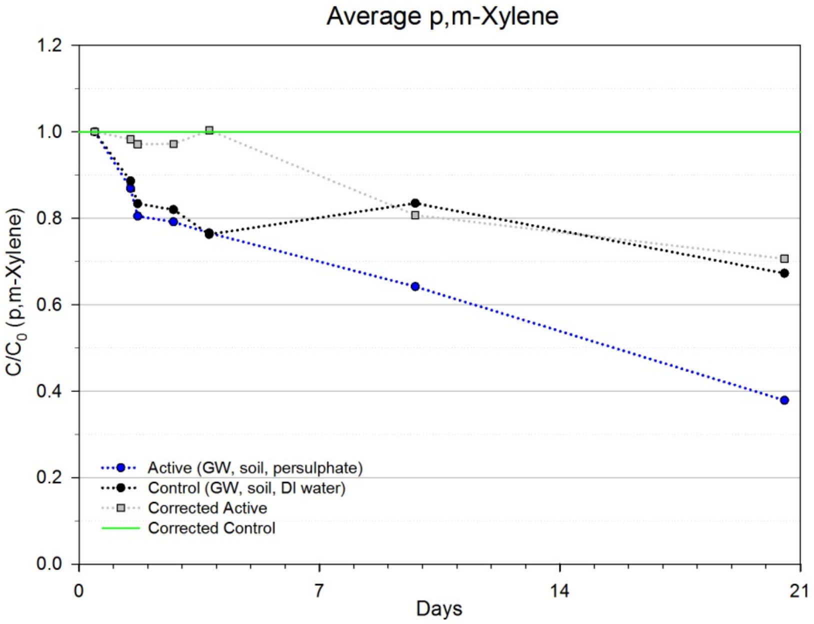

Figure 27 - Groundwater, Soil, Persulphate - Average p,m-Xylene

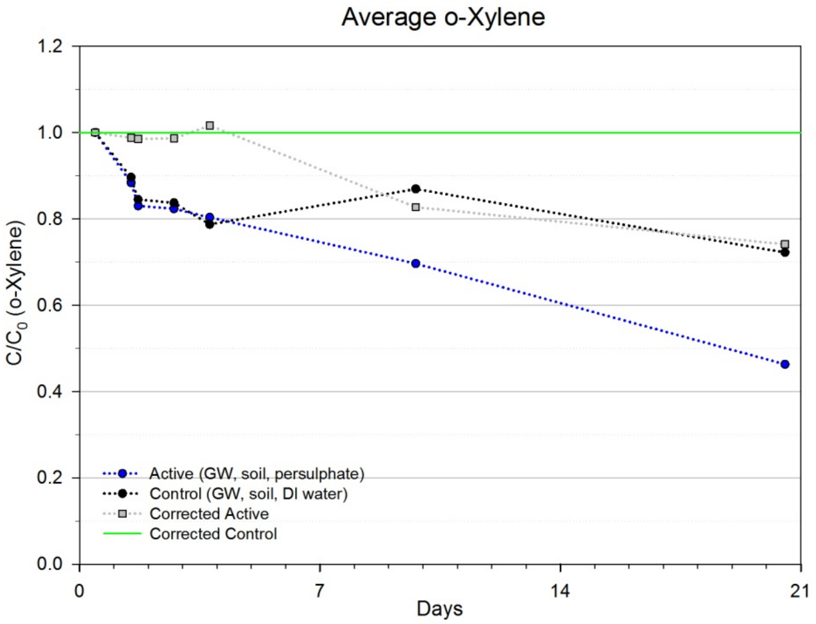

Figure 28 - Groundwater, Soil, Persulphate - Average o-Xylene

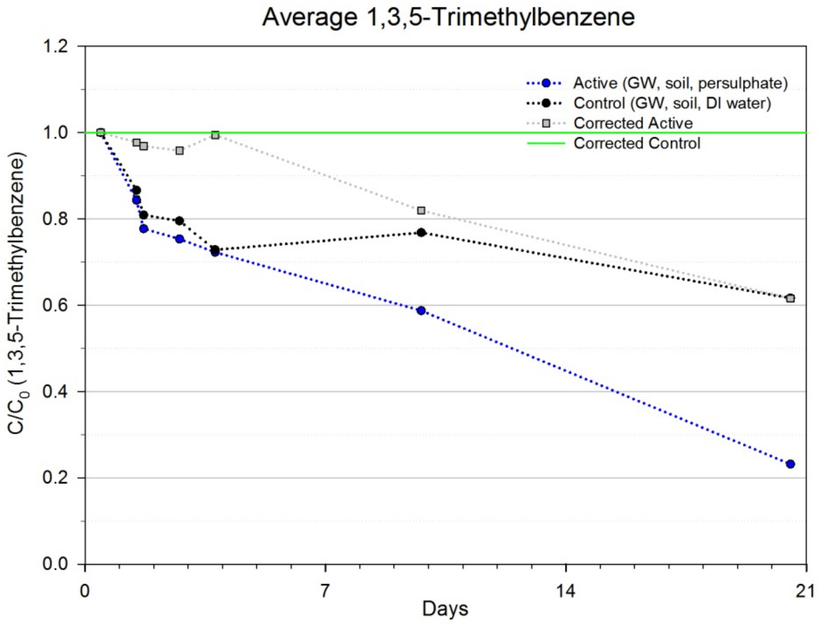

Figure 29 - Groundwater, Soil, Persulphate - Average 1,3,5-Trimethylbenzene

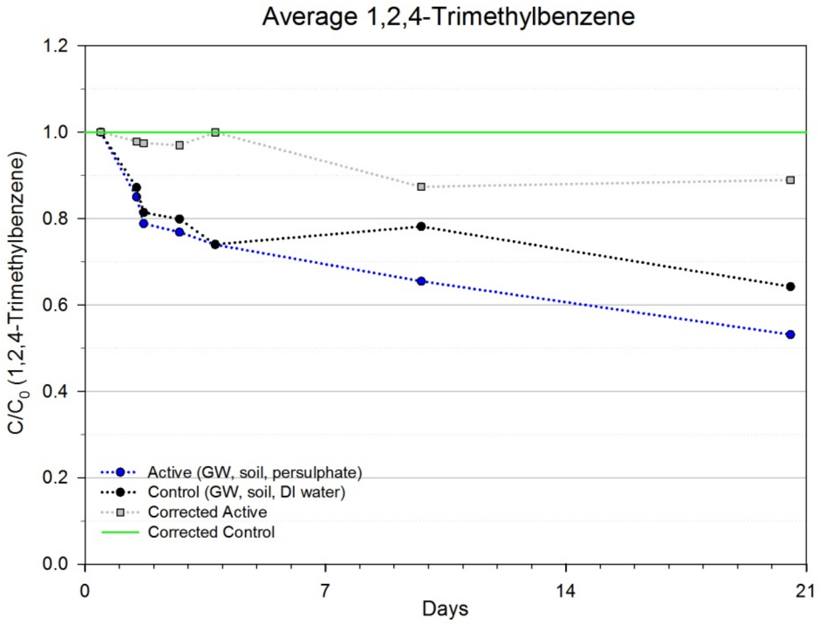

Figure 30 - Groundwater, Soil, Persulphate - Average 1,2,4-Trimethylbenzene

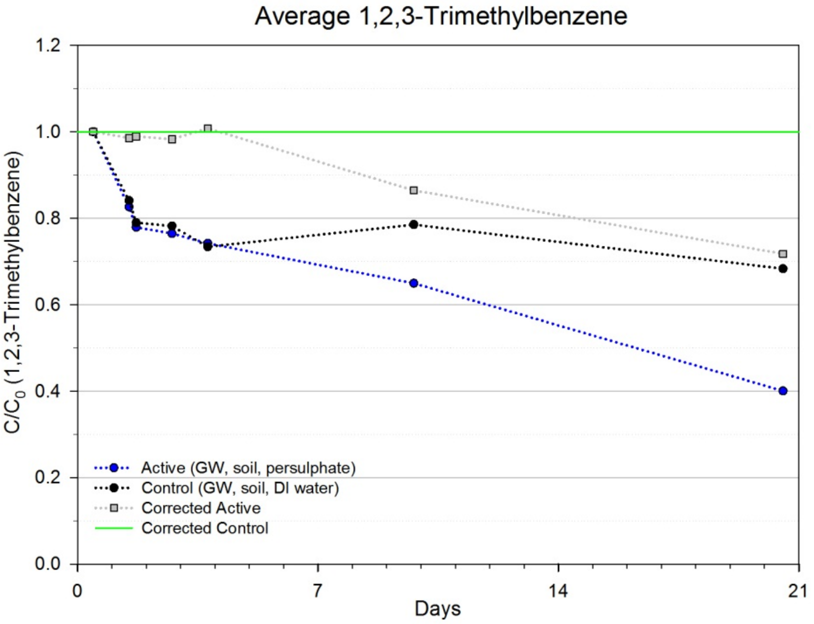

Figure 31 - Groundwater, Soil, Persulphate - Average 1,2,3-Trimethylbenzene

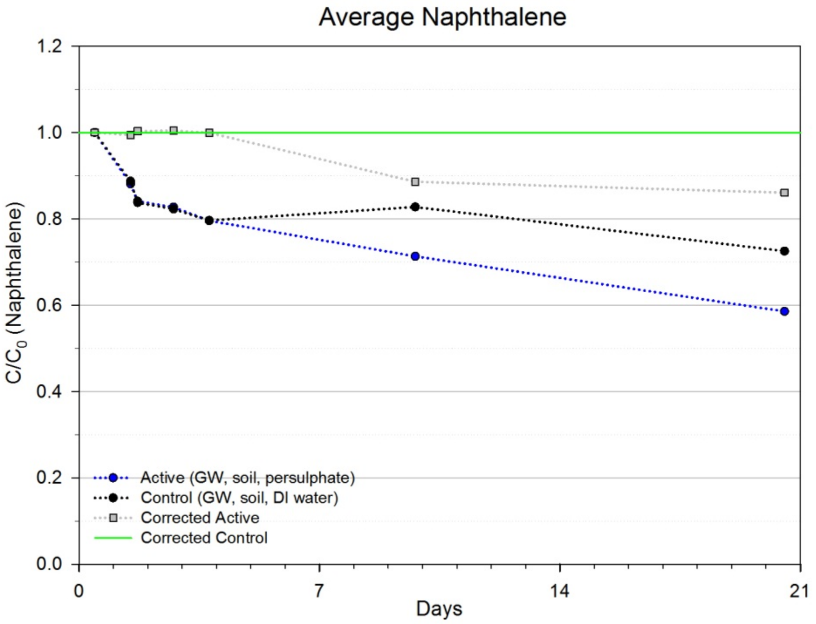

Figure 32 - Groundwater, Soil, Persulphate - Average Naphthalene

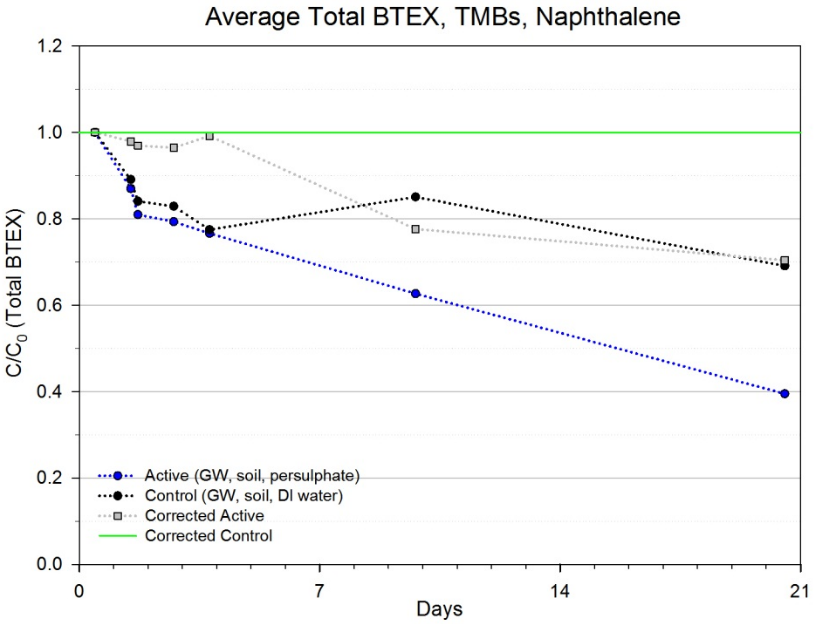

Figure 33 - Groundwater, Soil, Persulphate - Average Total BTEX, TMBs, Naphthalene

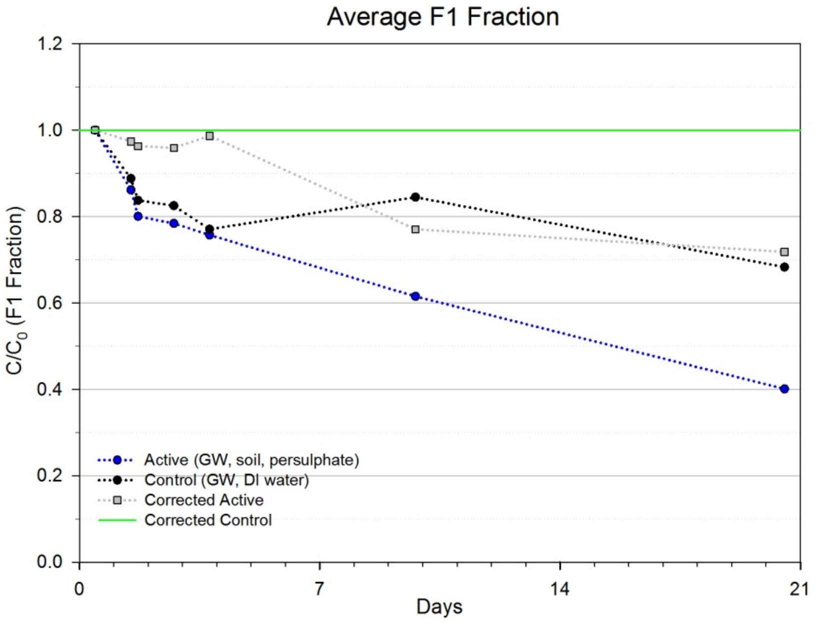

Figure 34 - Groundwater, Soil, Persulphate - Average F1 Fraction

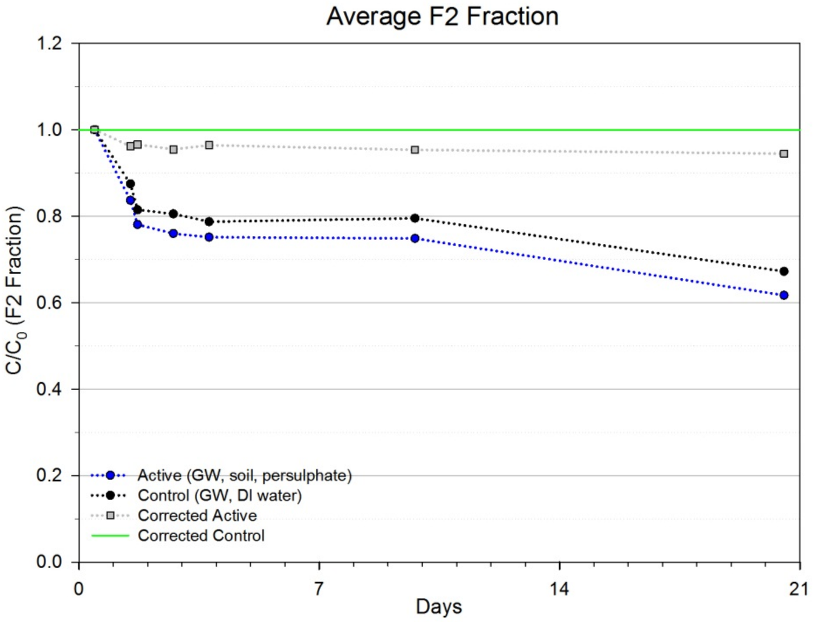

Figure 35 - Groundwater, Soil, Persulphate – Average F2 Fraction

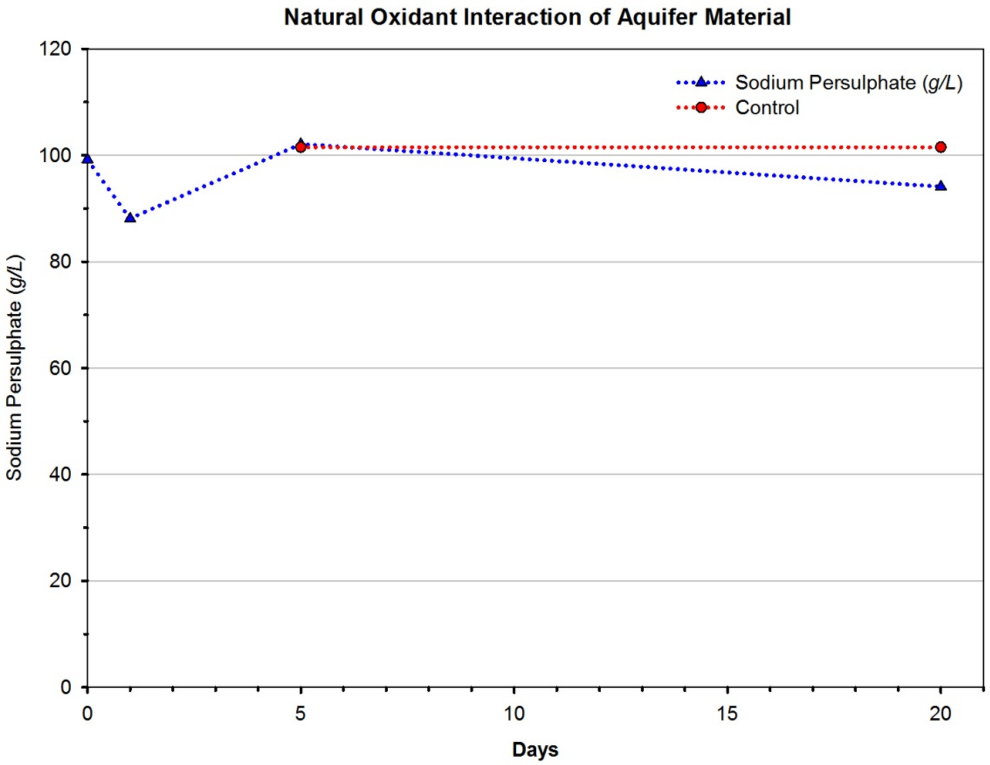

Figure 36 - Natural Oxidant Interaction Experiment

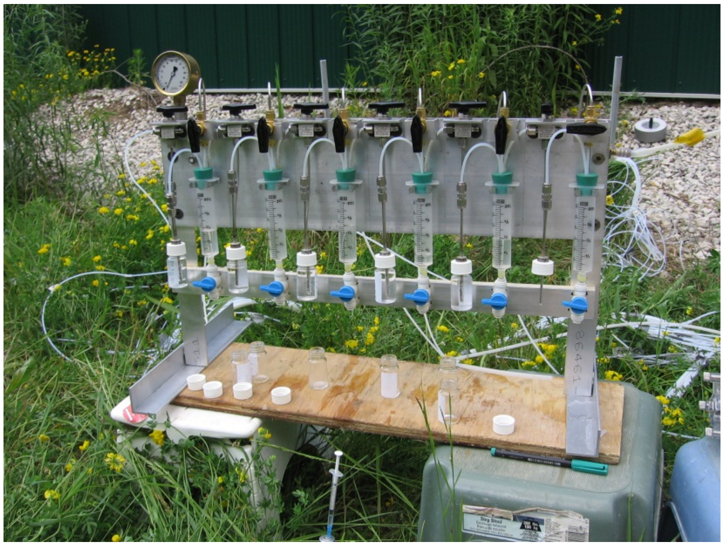

Figure 37 - Sampling manifold for volatile sampling. Photo: J.G. Freitas

Figure 38 - Mixing tanks for oxidant solution

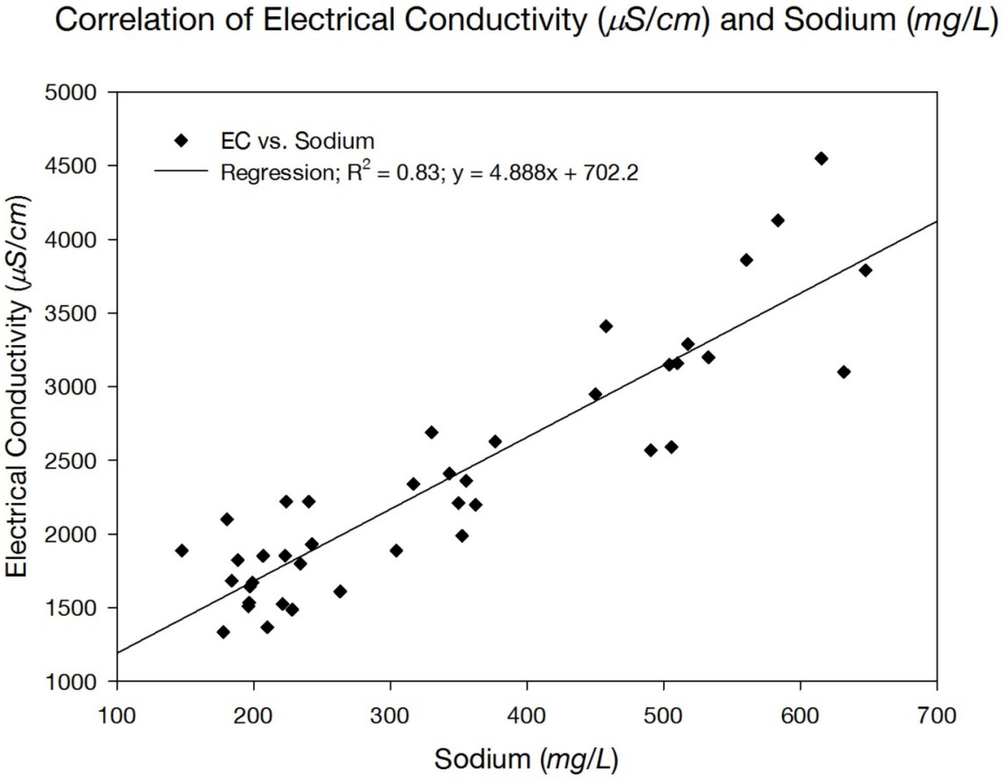

Figure 39 - Electrical conductivity vs. sodium concentration

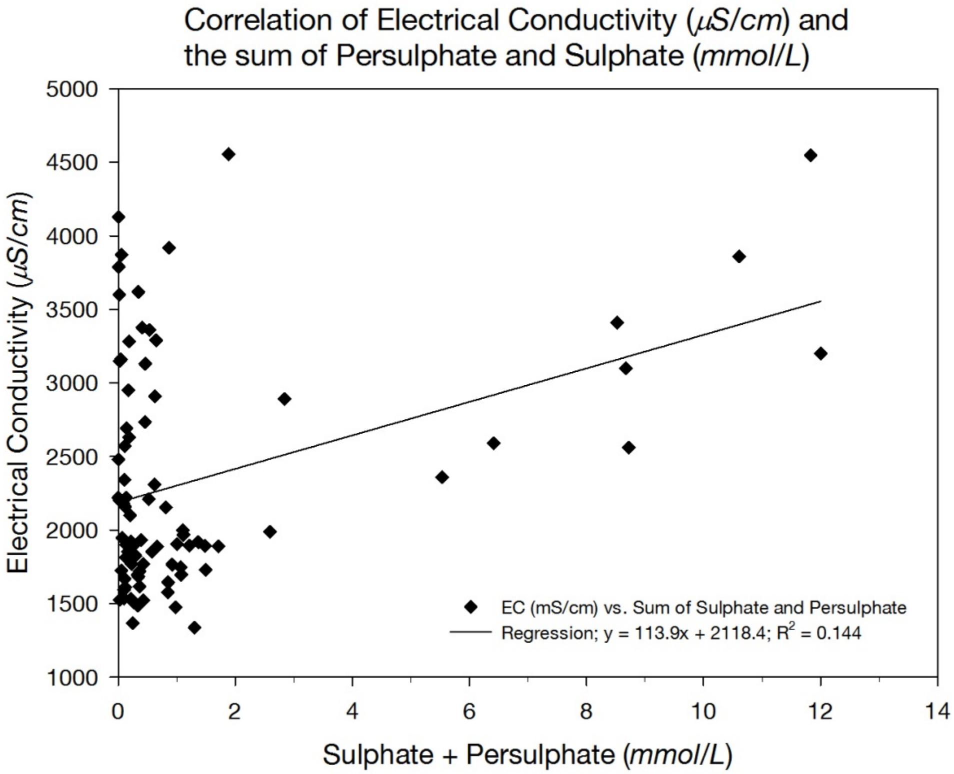

Figure 40 - Electrical conductivity vs. sum of sulphate and persulphate

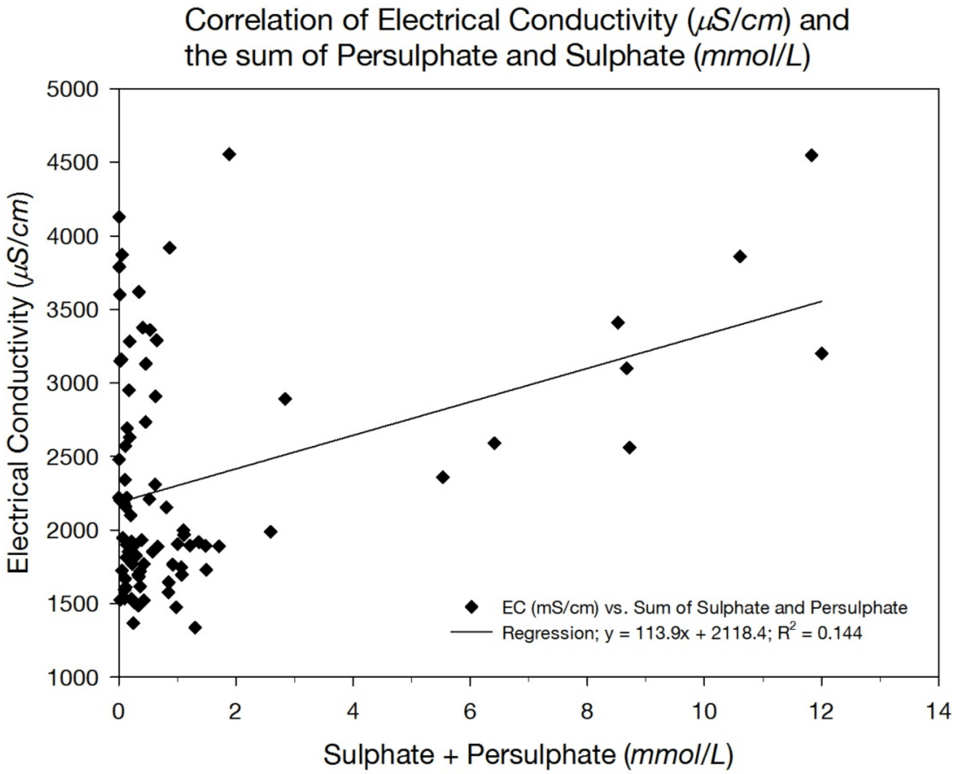

Figure 41 - Electrical Conductvity vs. sum of sulphate vs. persulphate

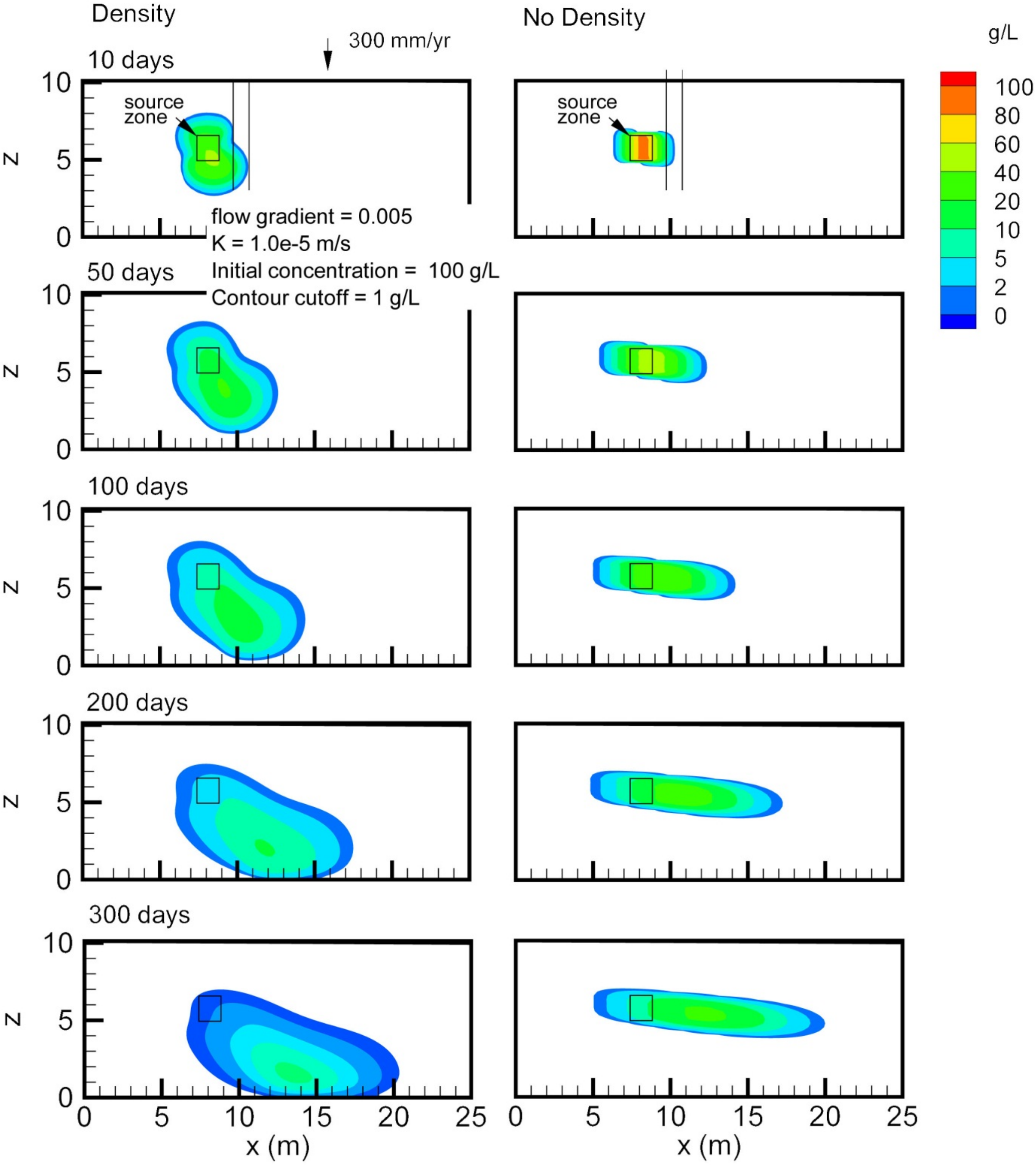

Figure 42 - SALTFLOW model by Dr. John Molson

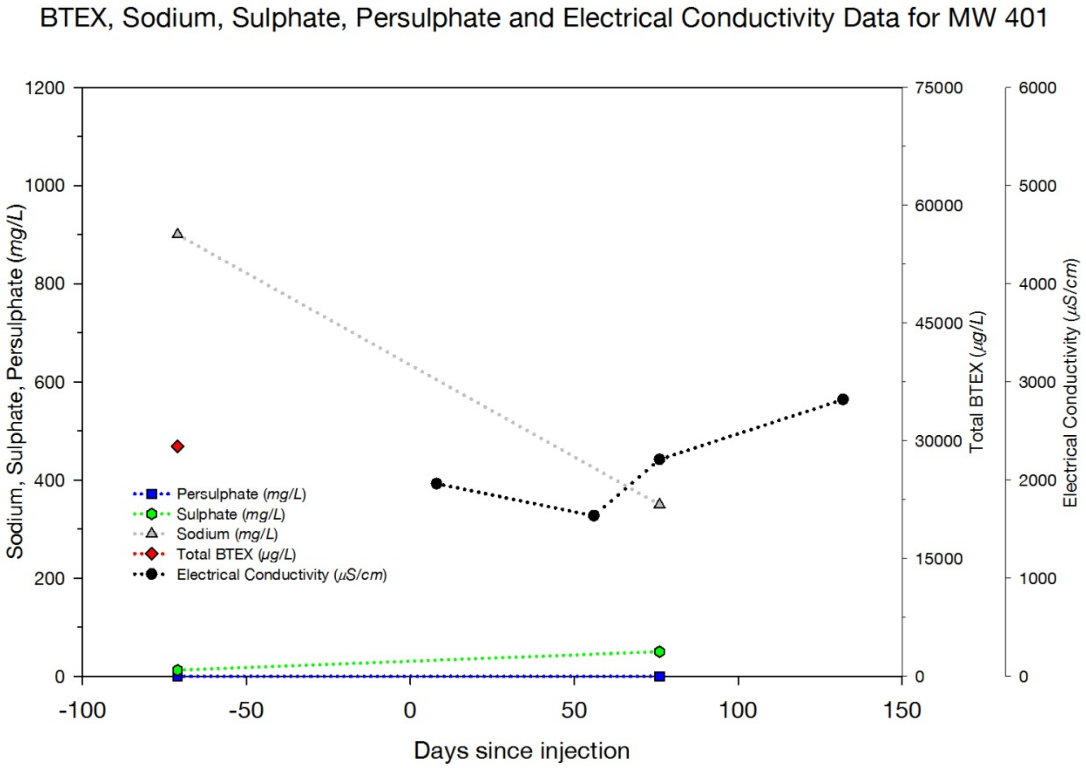

Figure 43 - Inorganic and Organic Analyses, MW 401

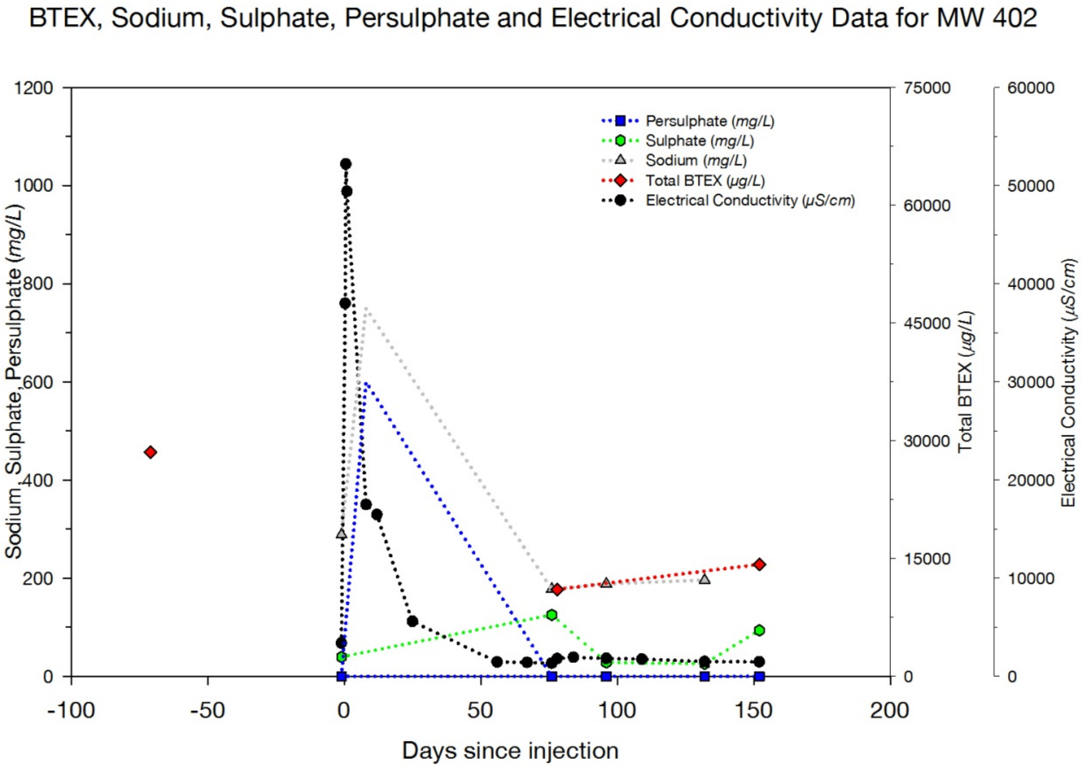

Figure 44 - Inorganic and Organic Analyses, MW 402

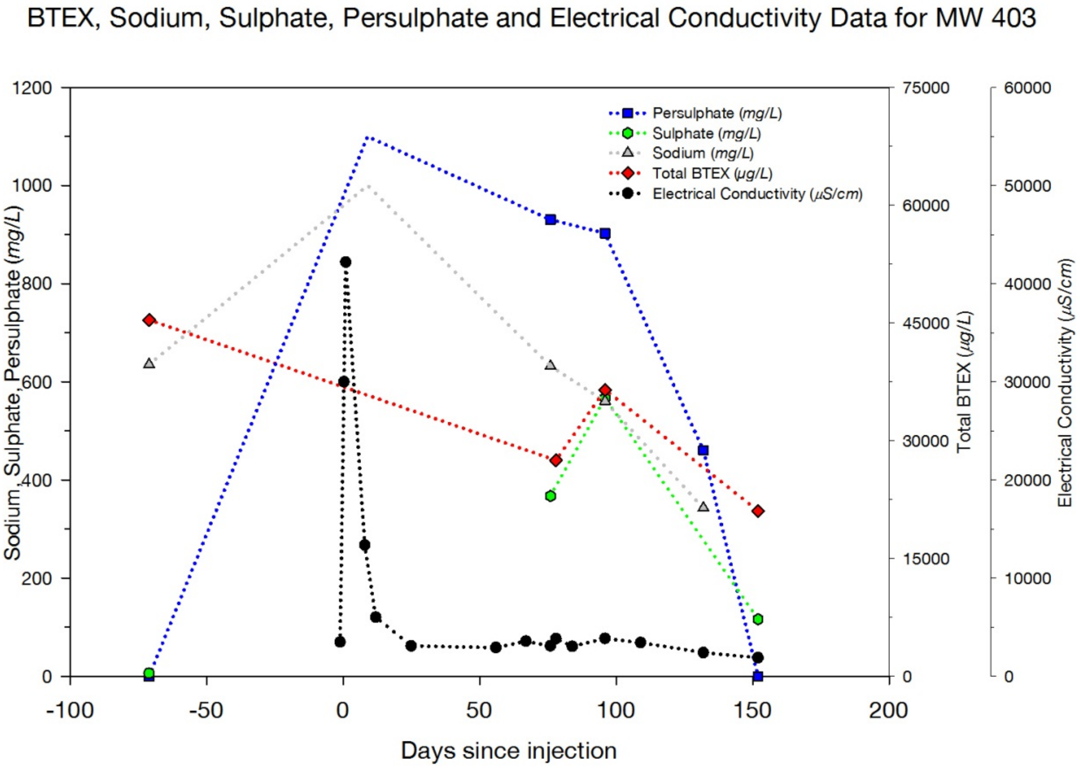

Figure 45 - Inorganic and Organic Analyses, MW 403

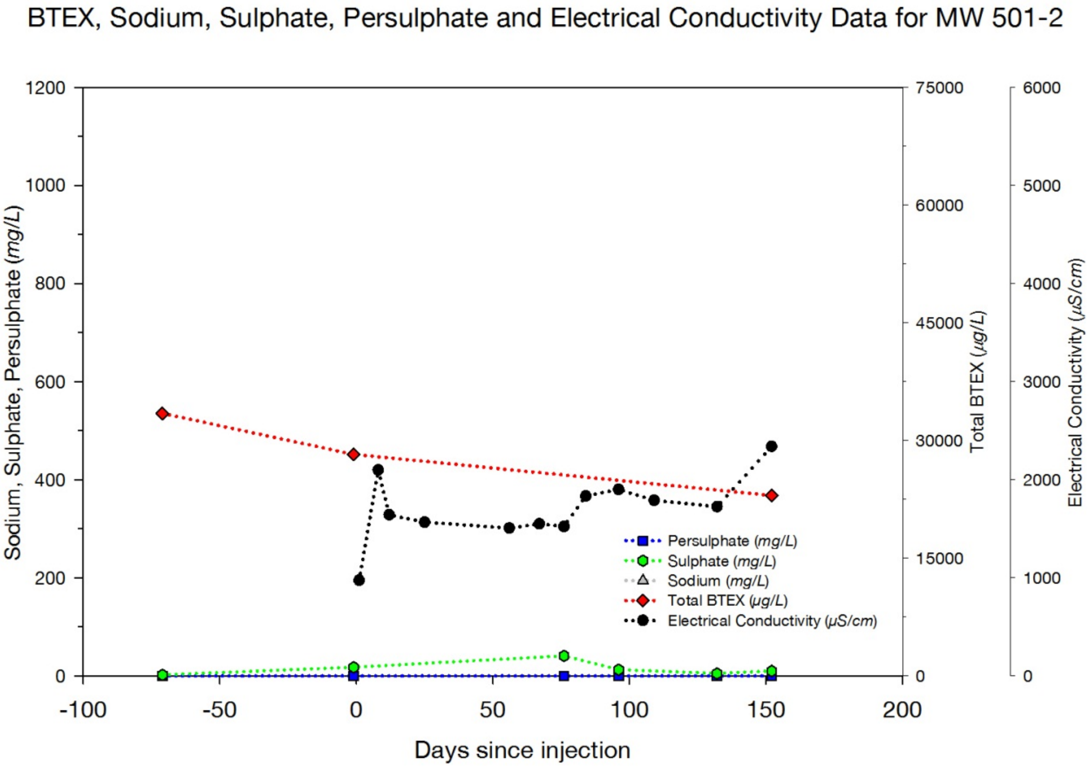

Figure 46 - Inorganic and Organic Analyses, MW 501-2

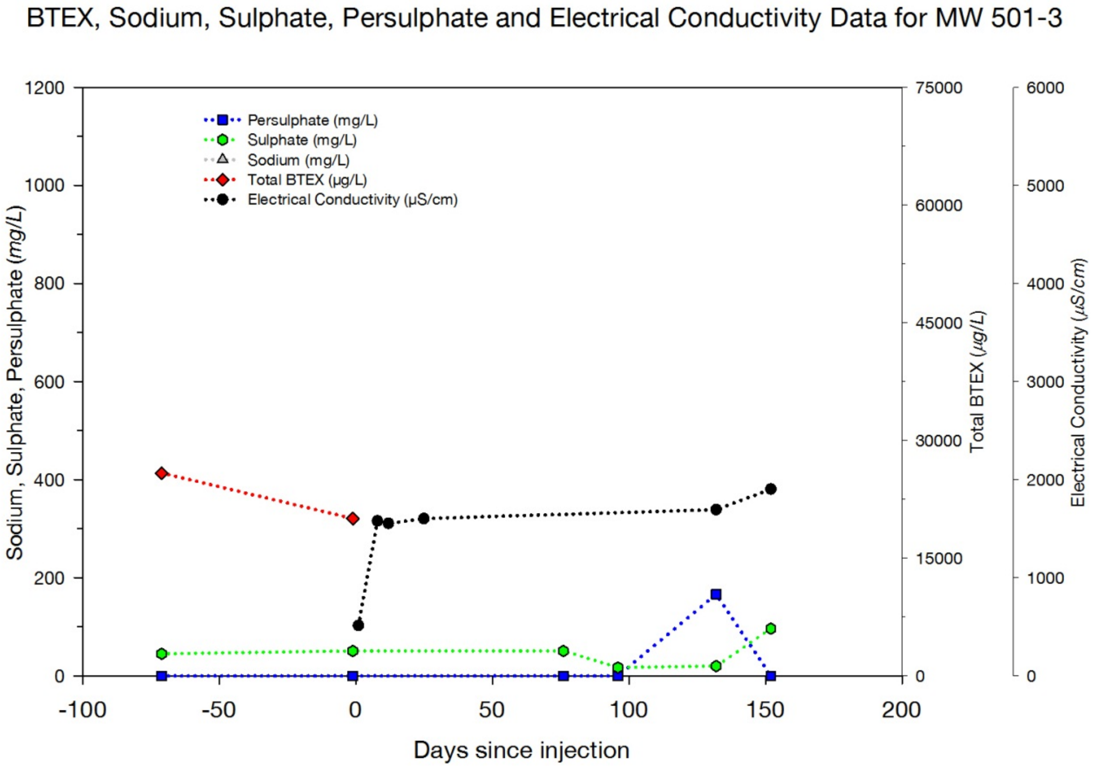

Figure 47 - Inorganic and Organic Analyses, MW 501-3

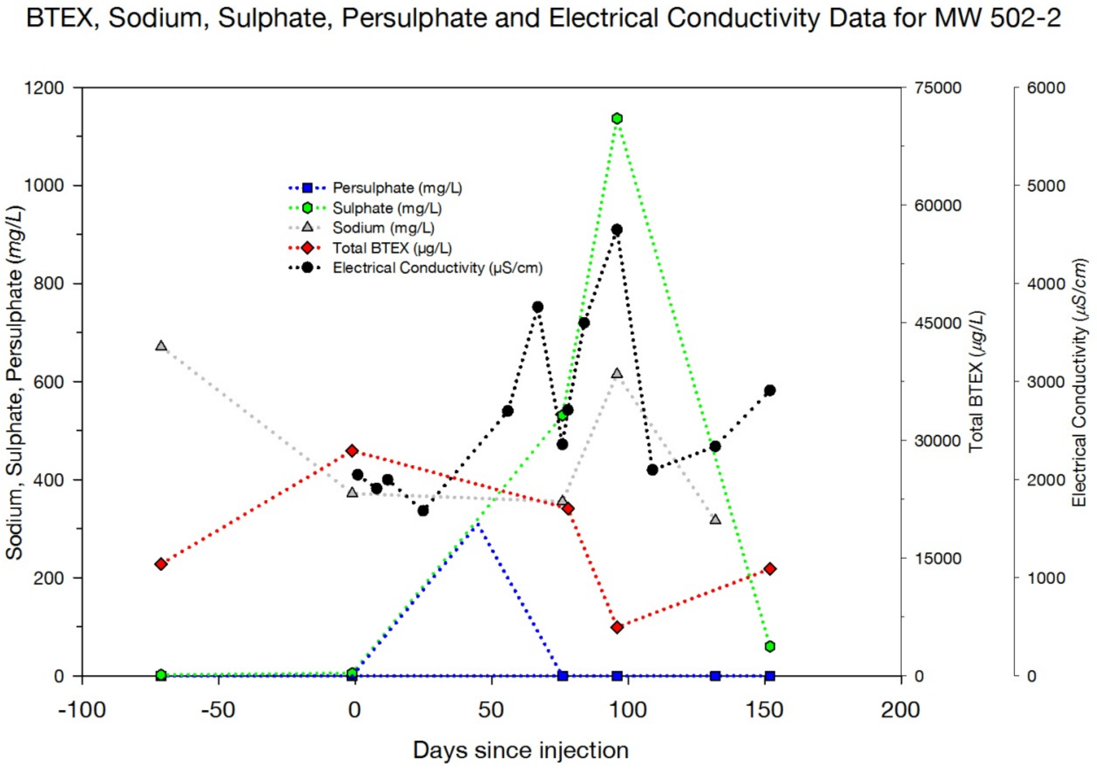

Figure 48 - Inorganic and Organic Analyses, MW 502-2

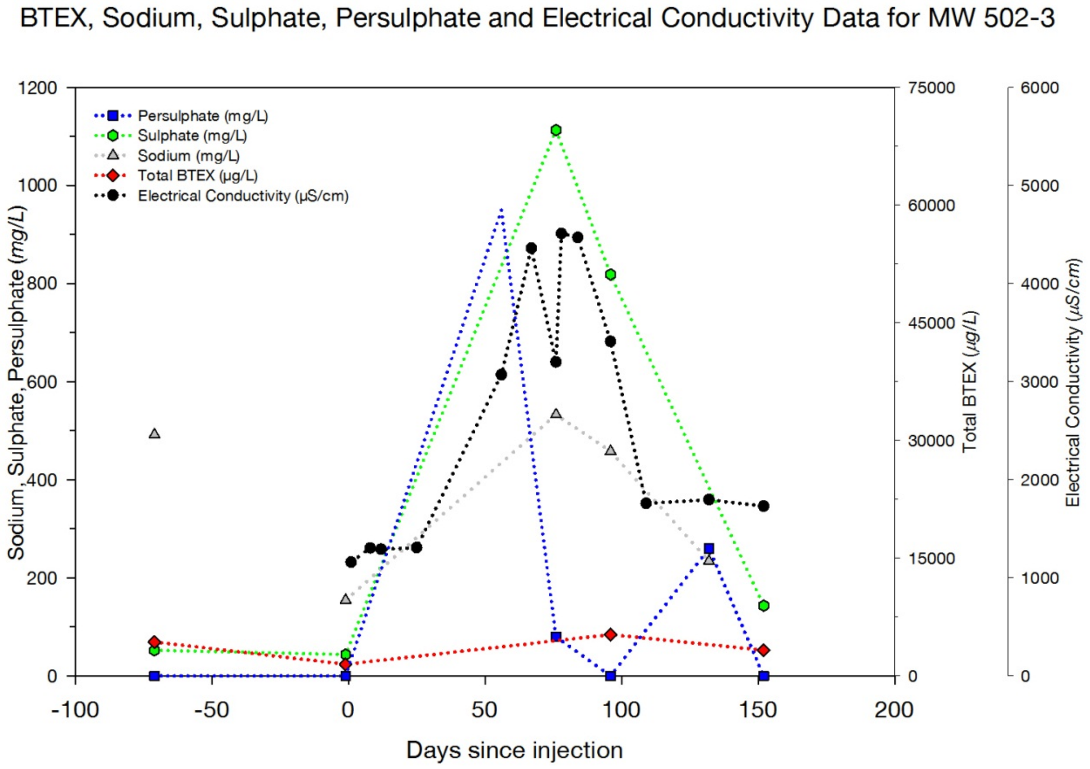

Figure 49 - Inorganic and Organic Analyses, MW 502-3

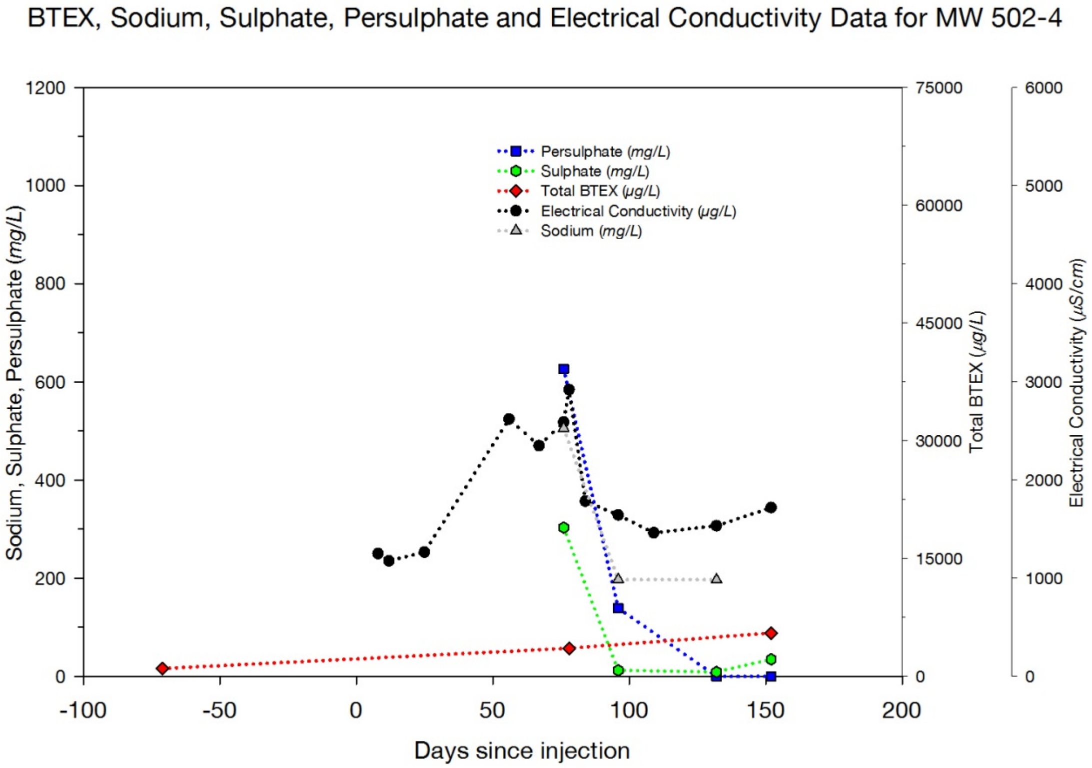

Figure 50 - Inorganic and Organic Analyses, MW 502-4

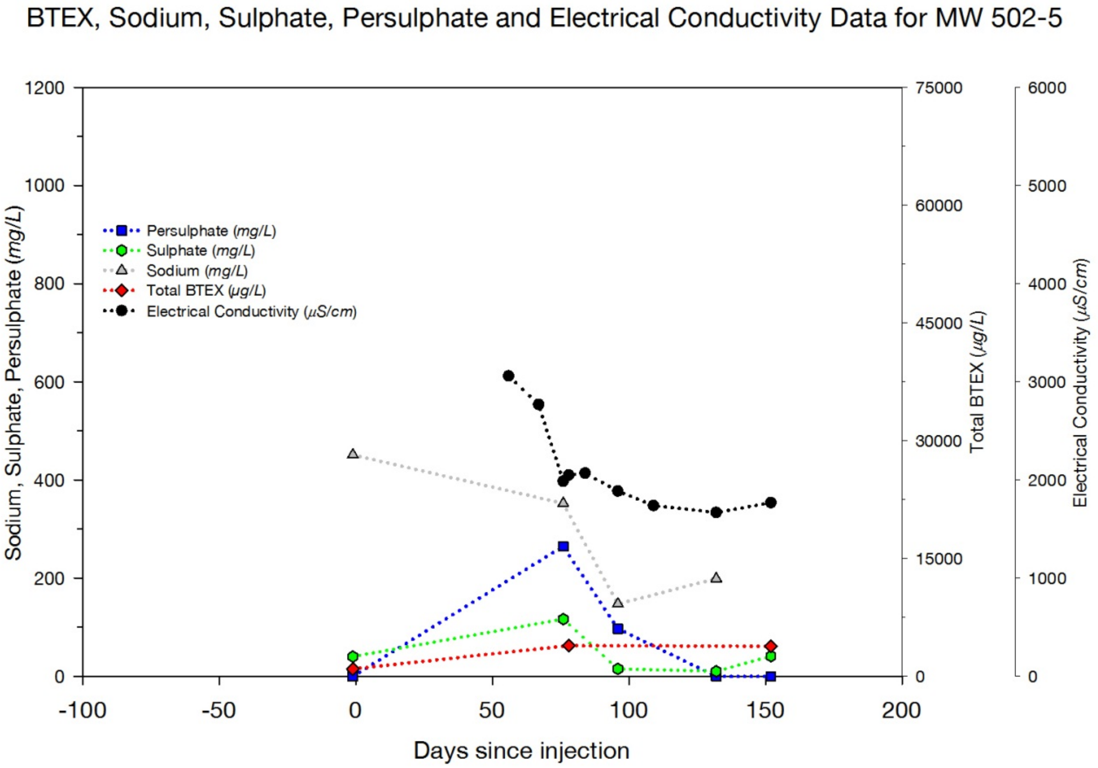

Figure 51 - Inorganic and Organic Analyses, MW 502-5

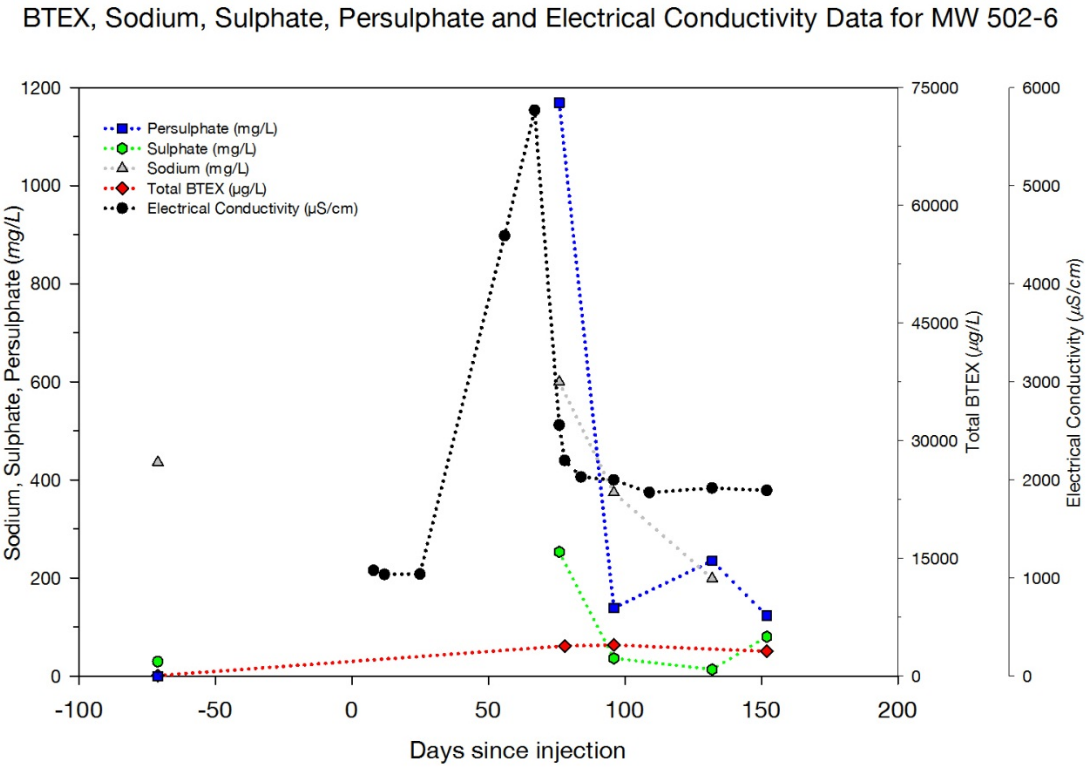

Figure 52 - Inorganic and Organic Analyses, MW 502-6

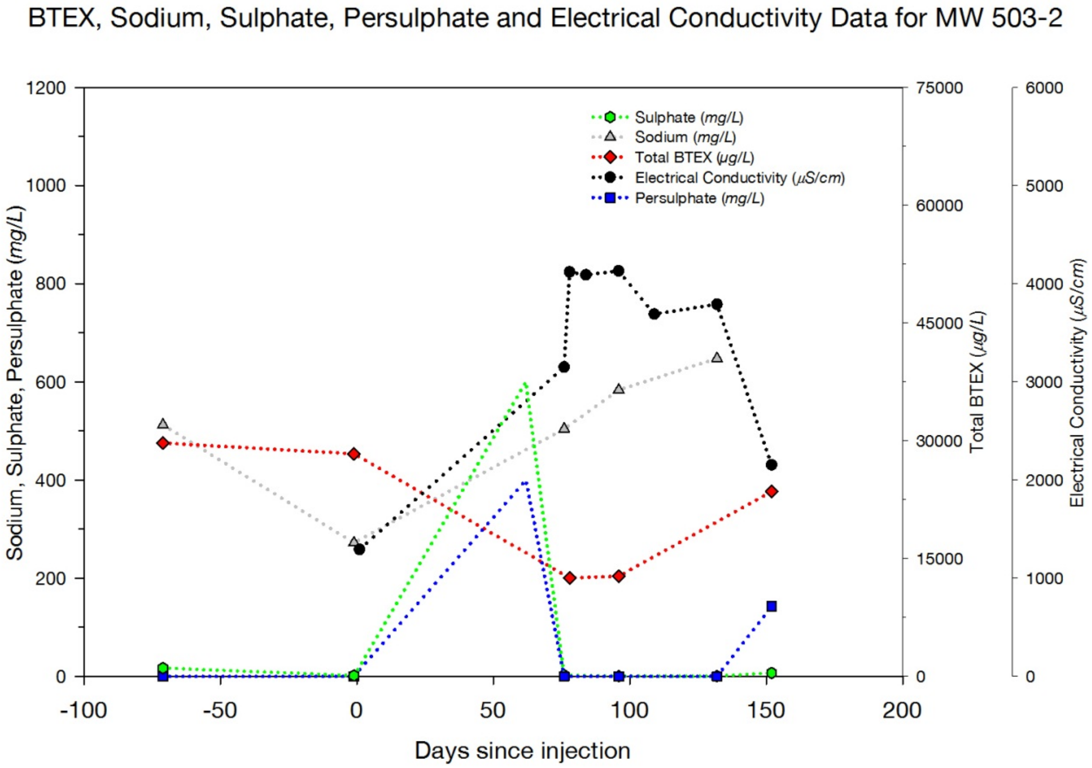

Figure 53 - Inorganic and Organic Analyses, MW 503-2

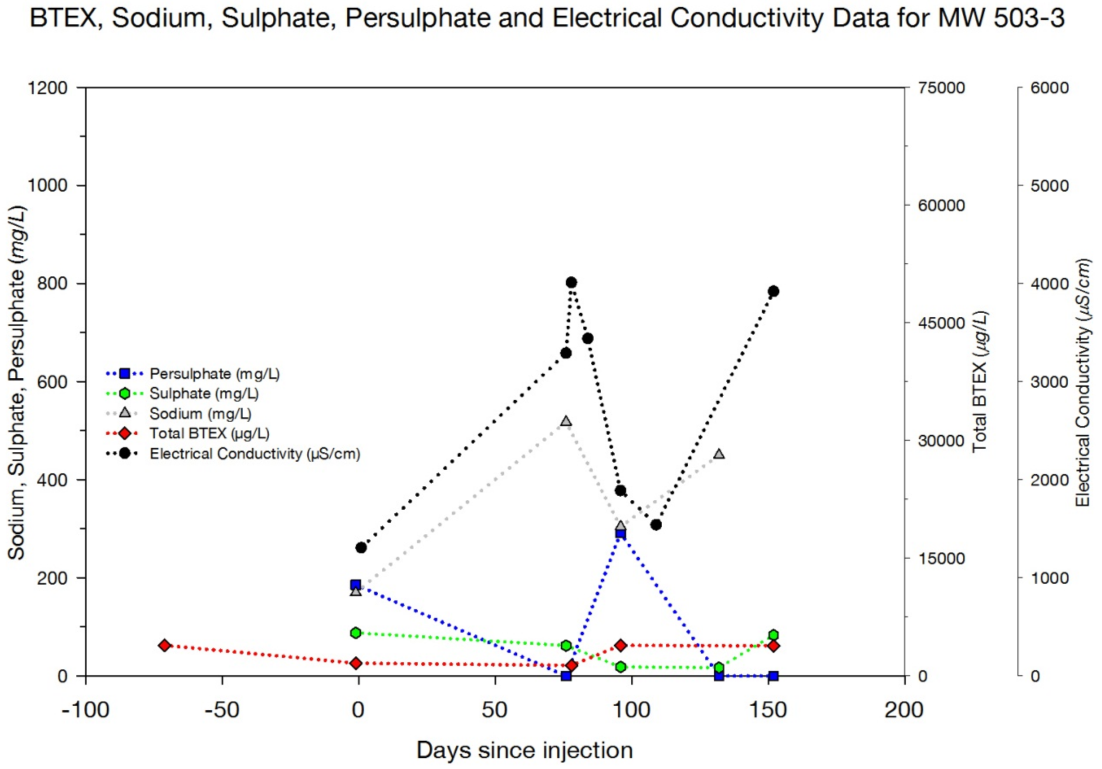

Figure 54 - Inorganic and Organic Analyses, MW 503-3

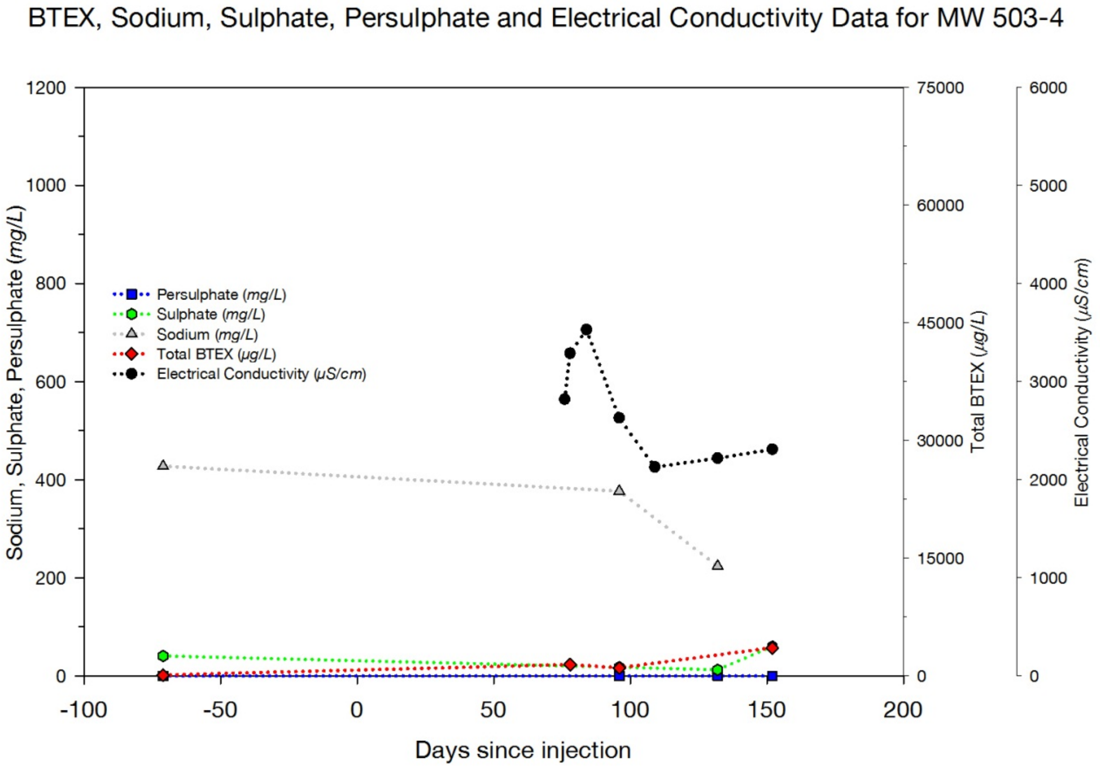

Figure 55 - Inorganic and Organic Analyses, MW 503-4

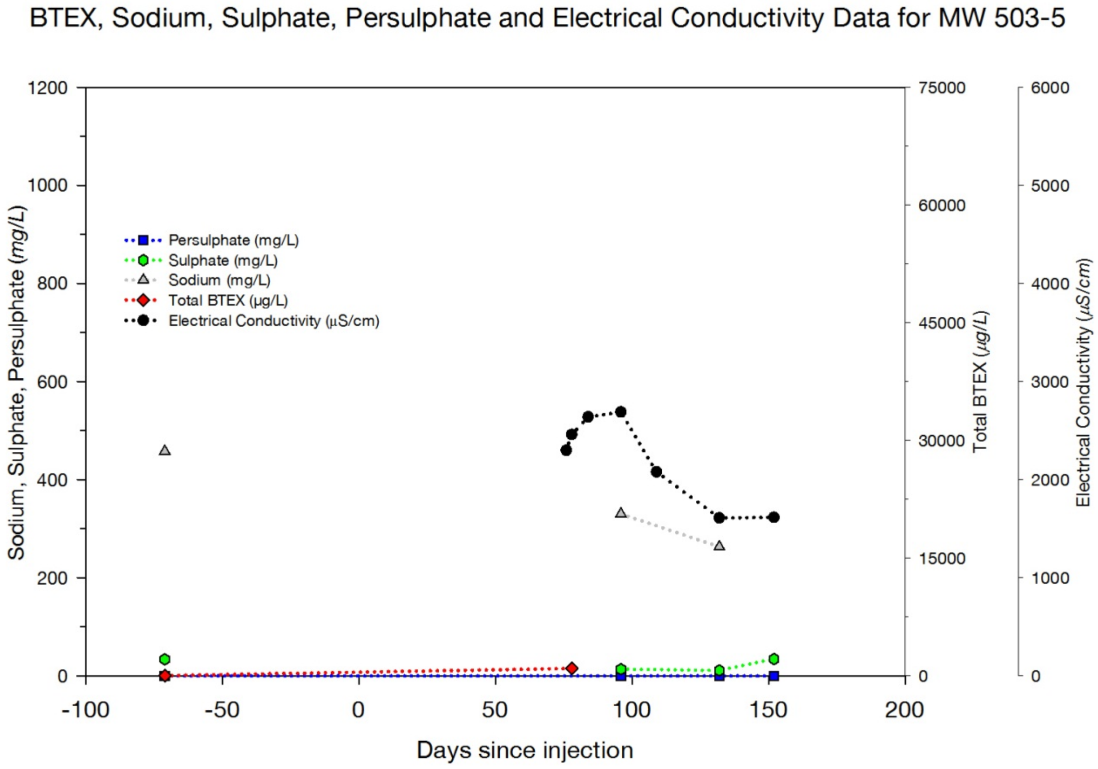

Figure 56 - Inorganic and Organic Analyses, MW 503-5

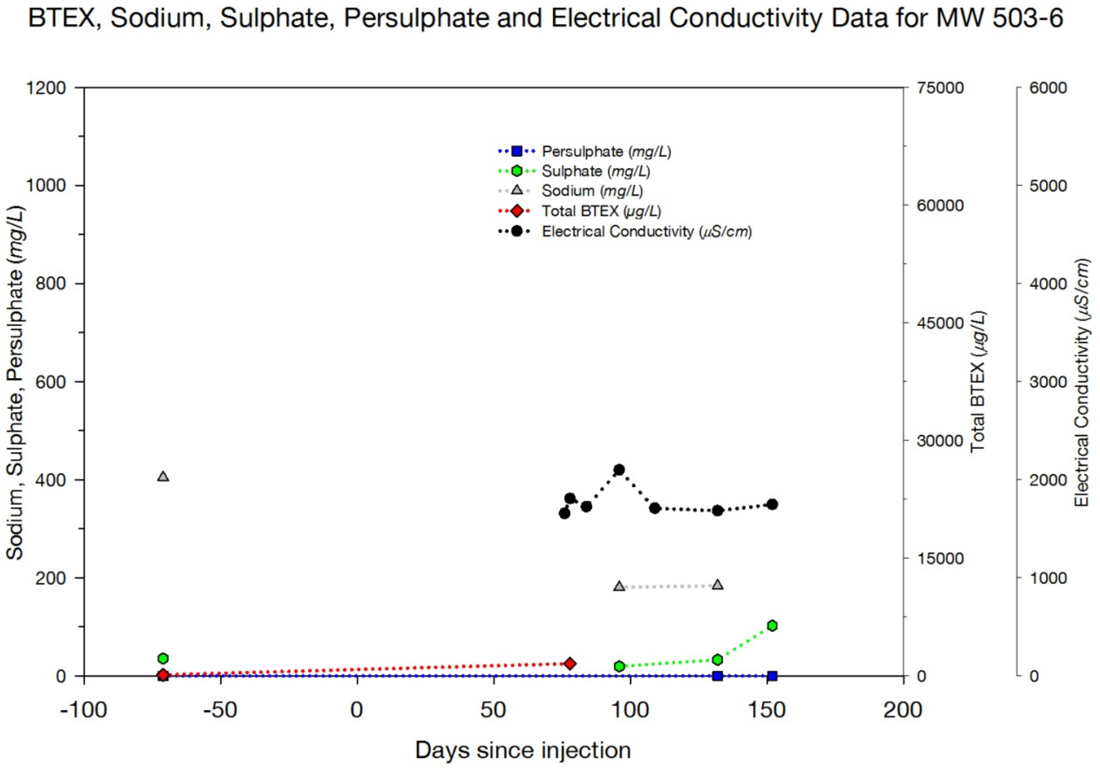

Figure 57 - Inorganic and Organic Analyses, MW 503-6

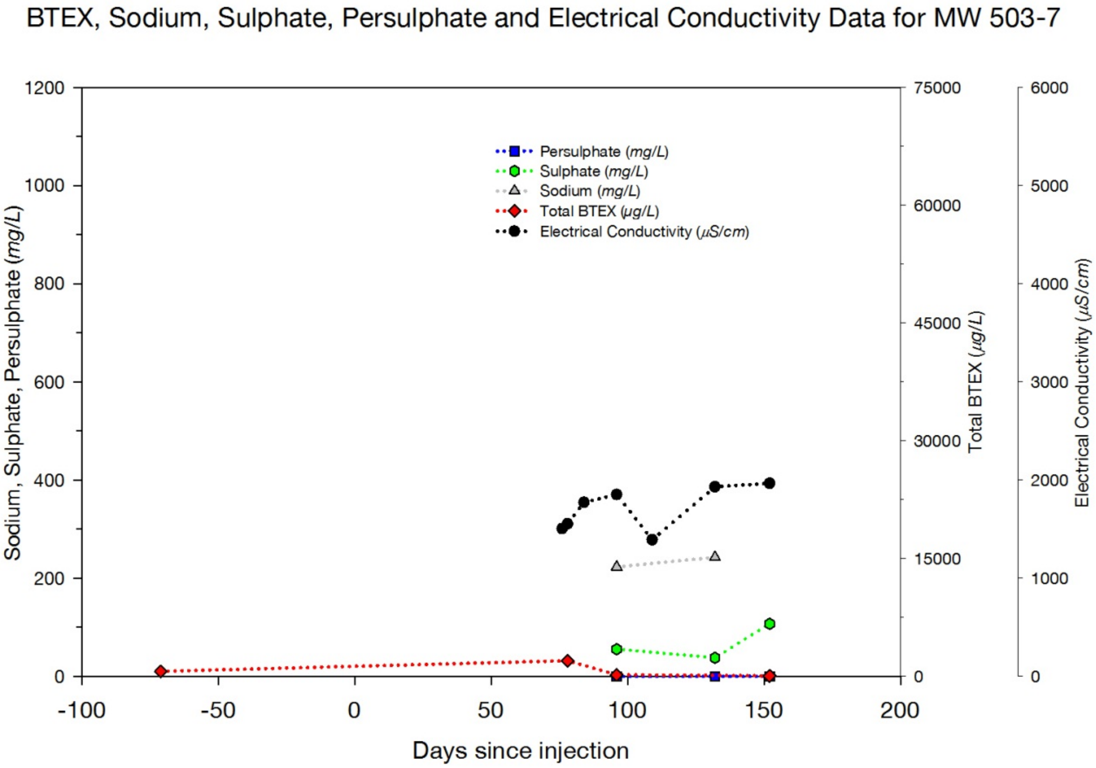

Figure 58 - Inorganic and Organic Analyses, MW 503-7

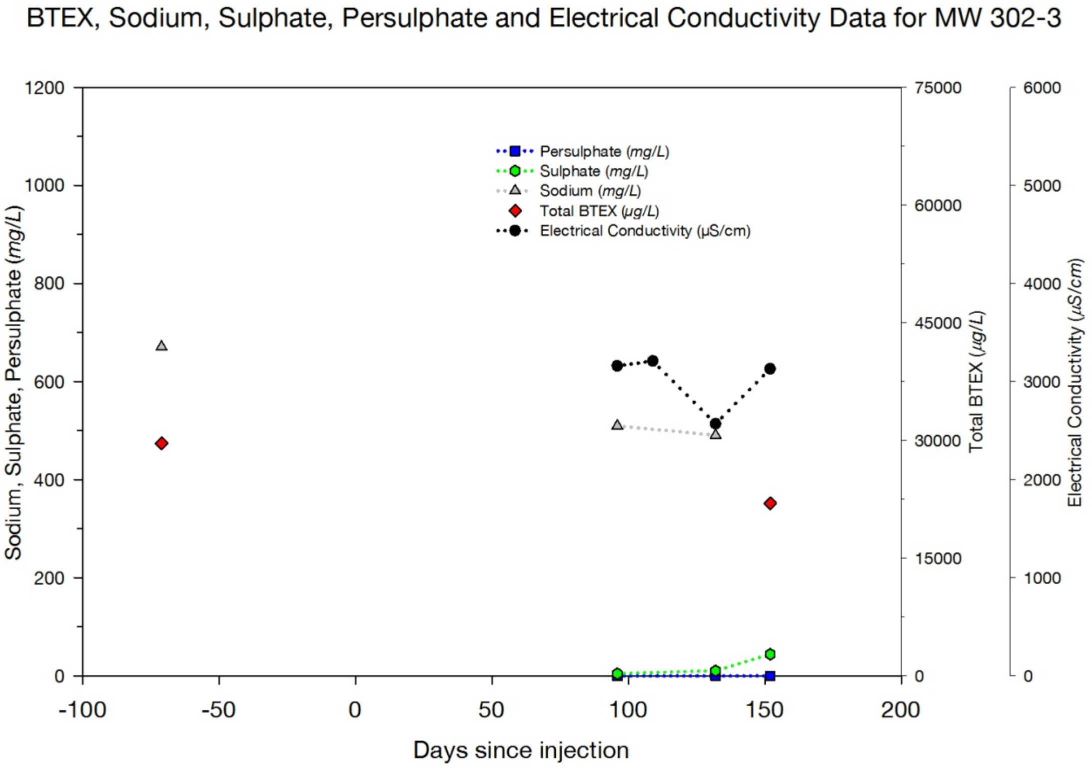

Figure 59 - Inorganic and Organic Analyses, MW 302-3

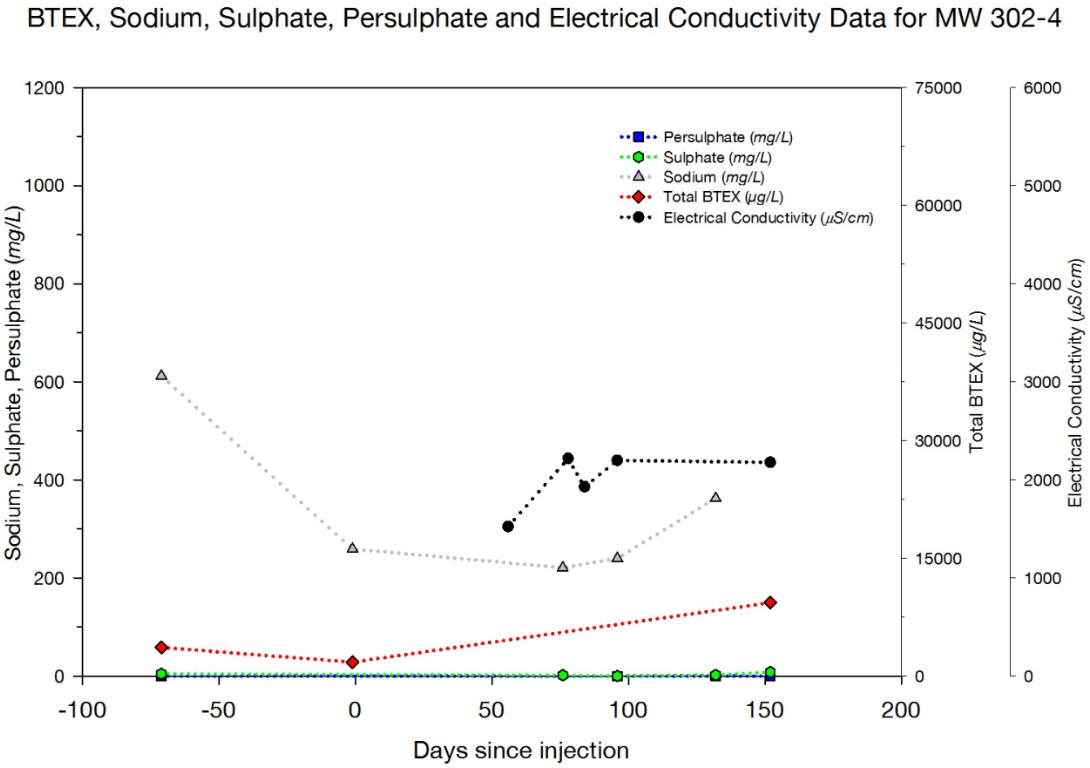

Figure 60 - Inorganic and Organic Analyses, MW 302-4

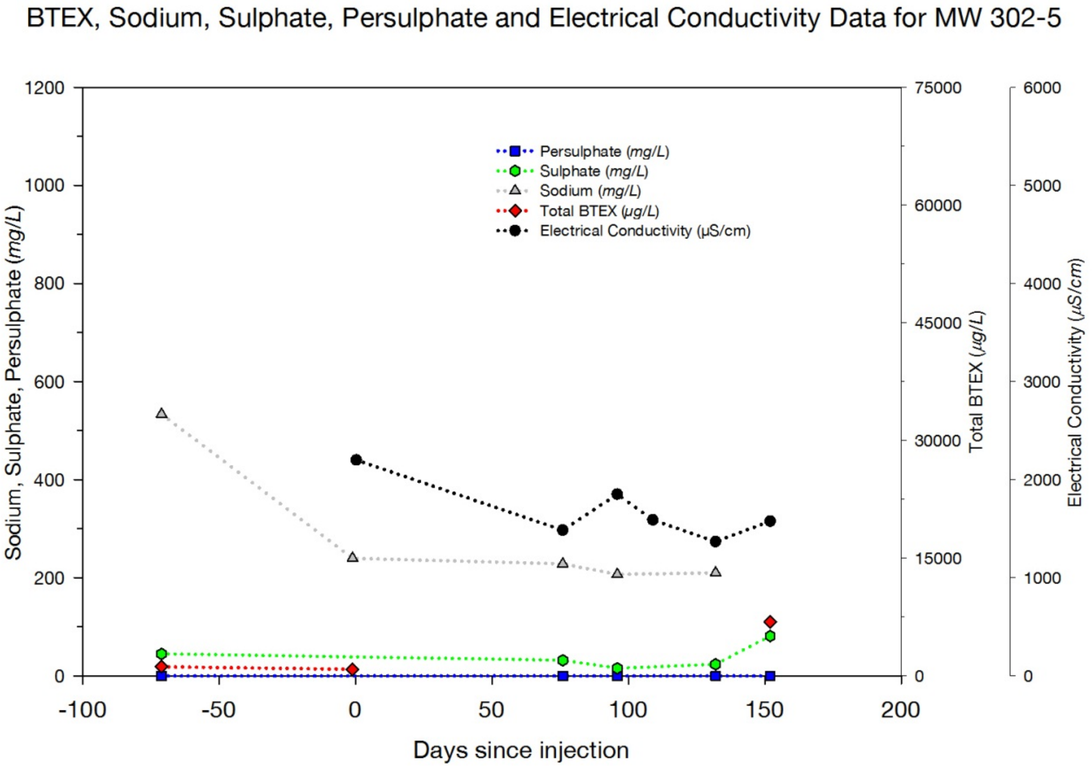

Figure 61 - Inorganic and Organic Analyses, MW 302-5

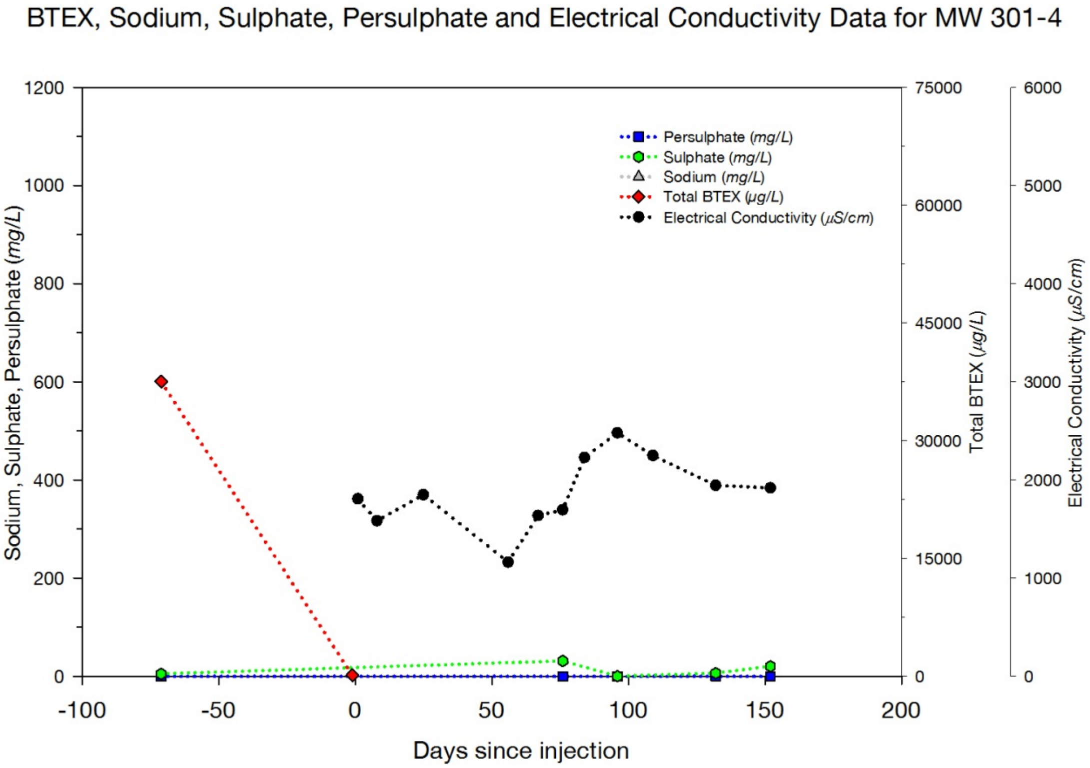

Figure 62 - Inorganic and Organic Analyses, MW 301-4

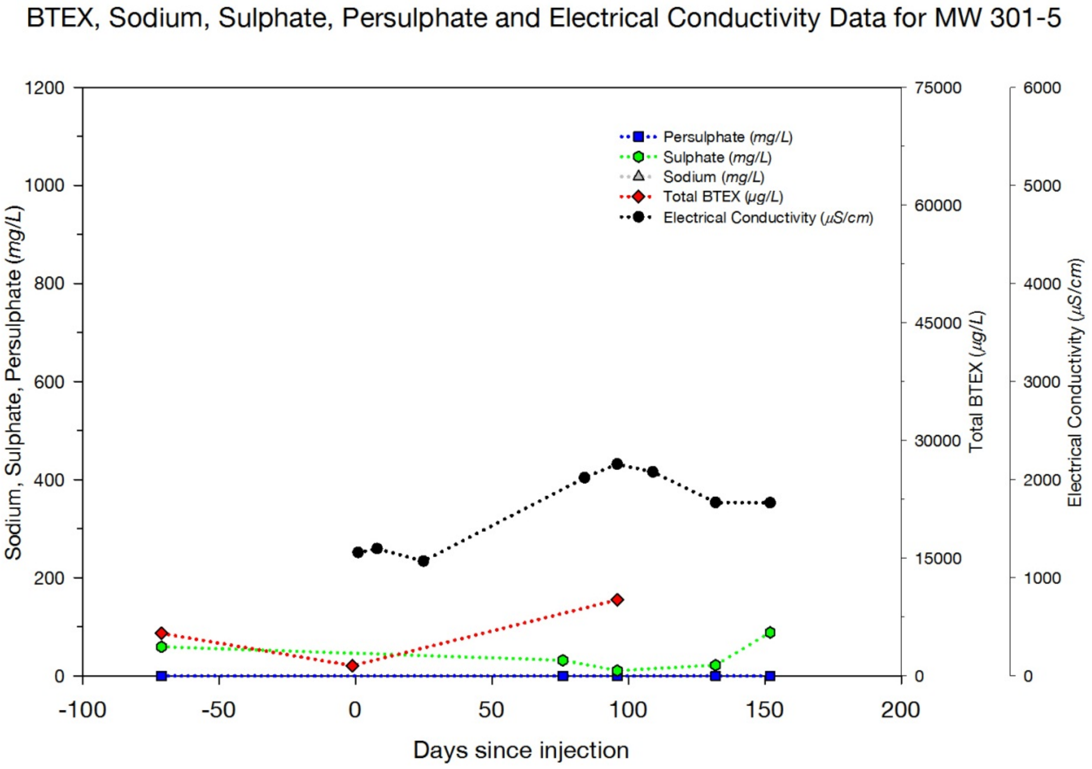

Figure 63 - Inorganic and Organic Analyses, MW 301-5

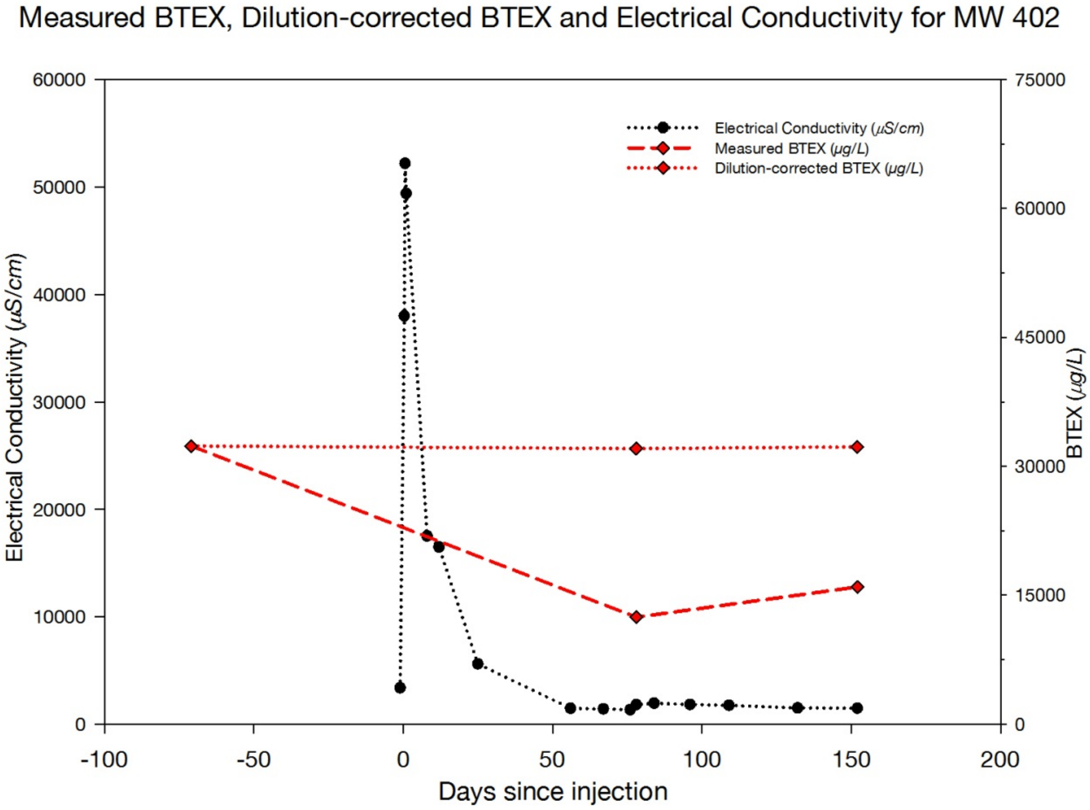

Figure 64 - Measured and Dilution-corrected BTEX with EC, MW 402

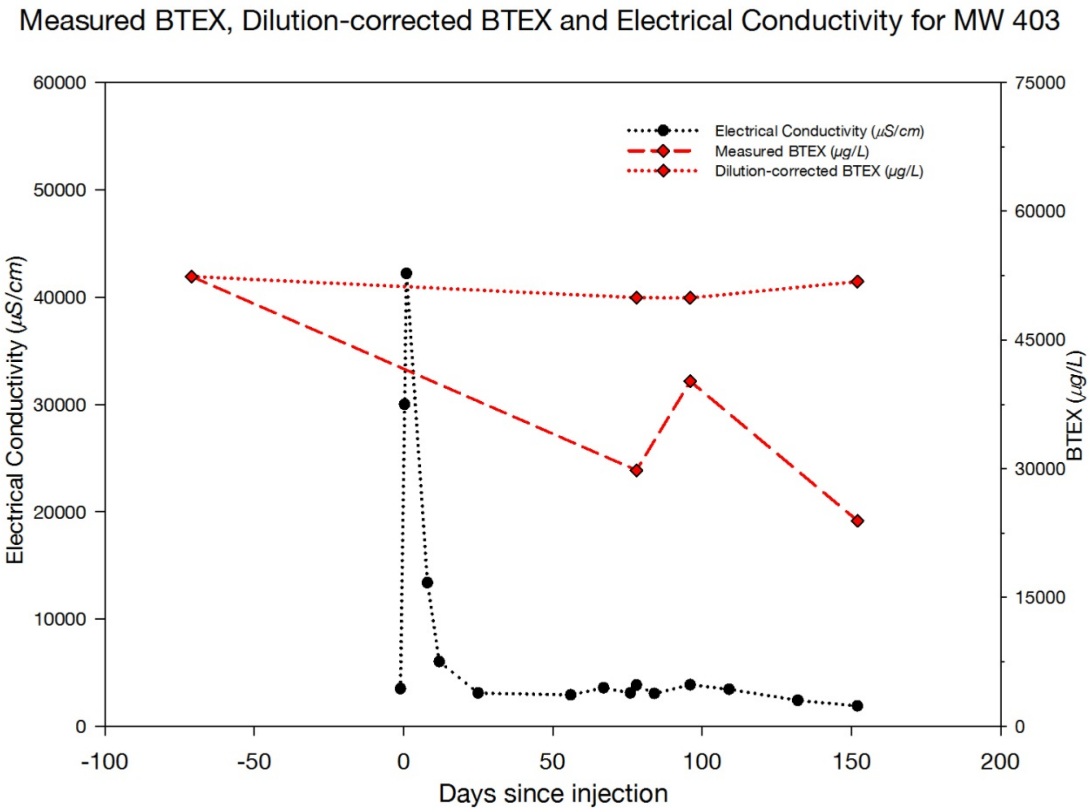

Figure 65 - Measured and Dilution-corrected BTEX with EC, MW 403

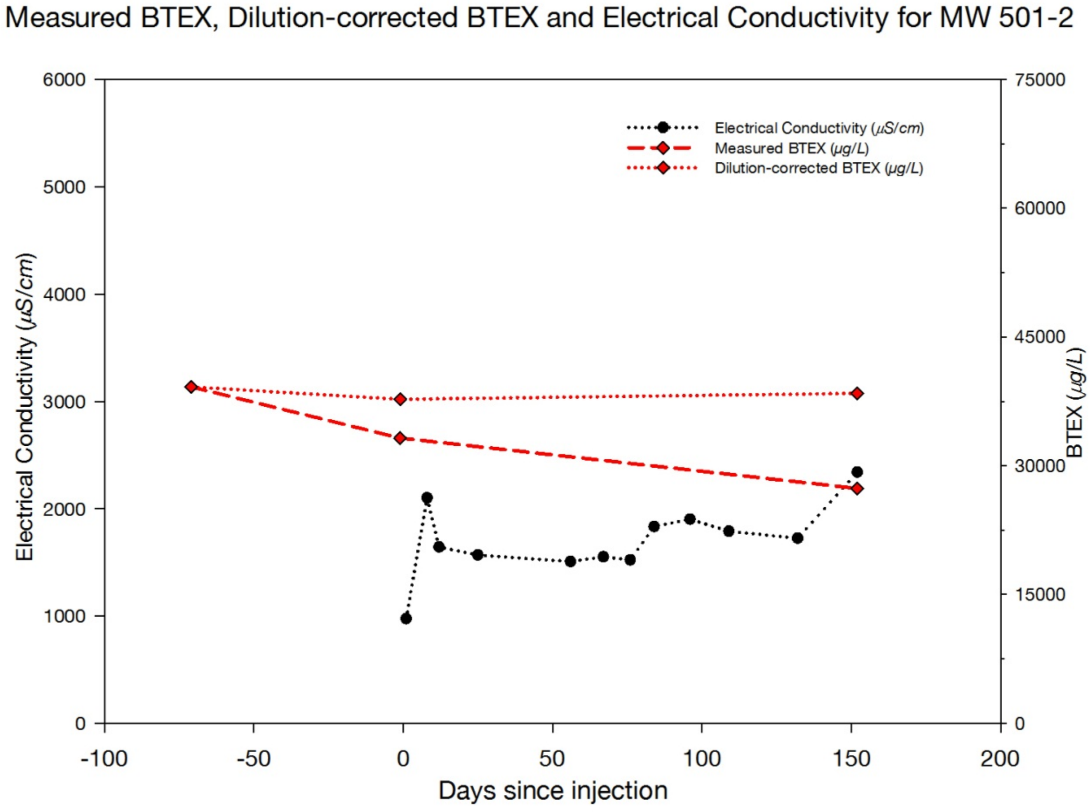

Figure 66 - Measured and Dilution-corrected BTEX with EC, MW 501-2

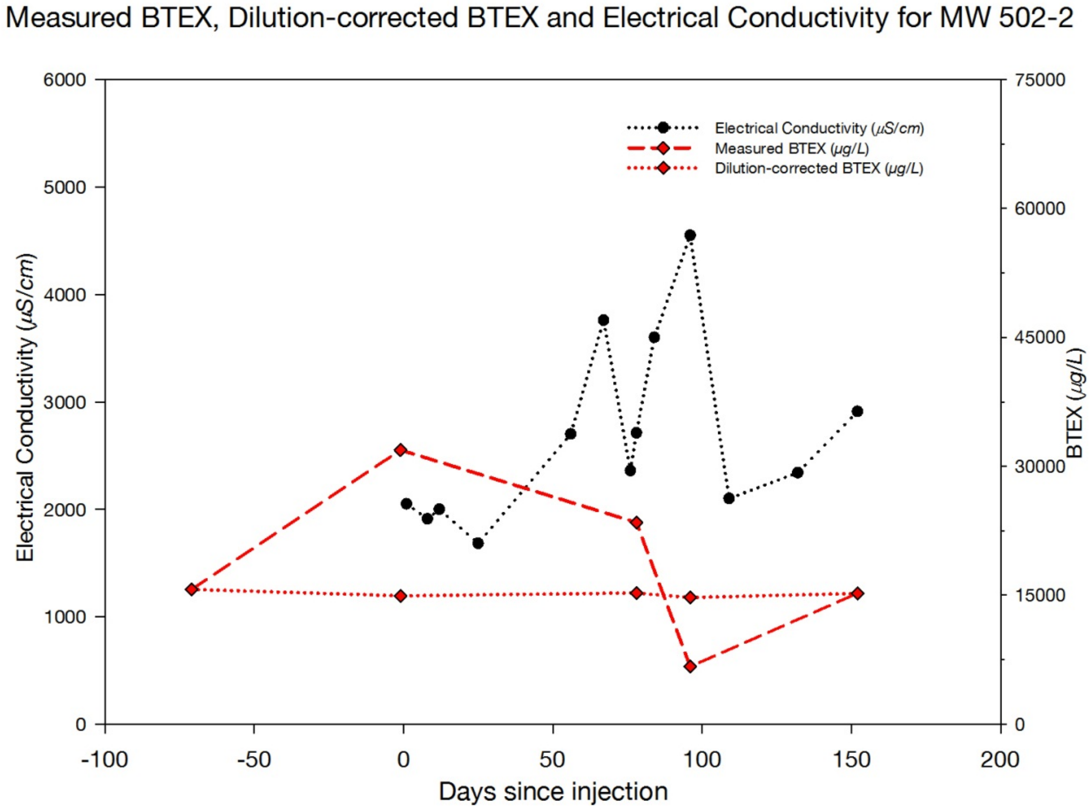

Figure 67 - Measured and Dilution-corrected BTEX with EC, MW 502-2

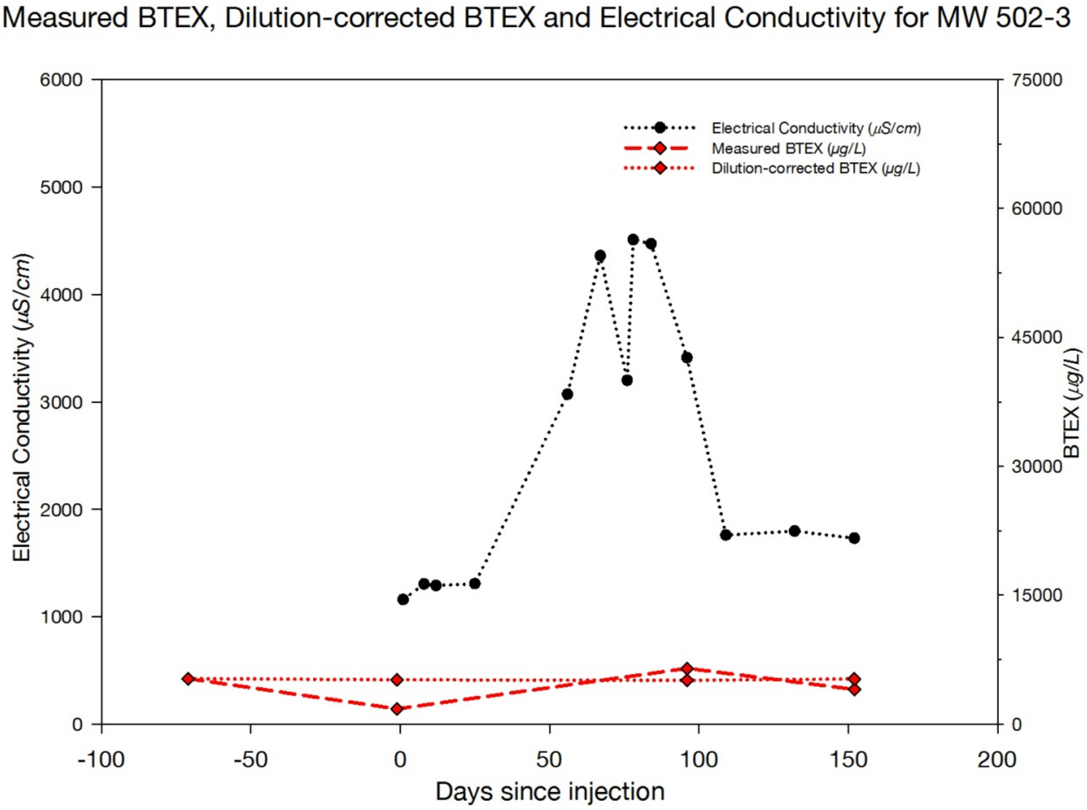

Figure 68 - Measured and Dilution-corrected BTEX with EC, MW 502-3

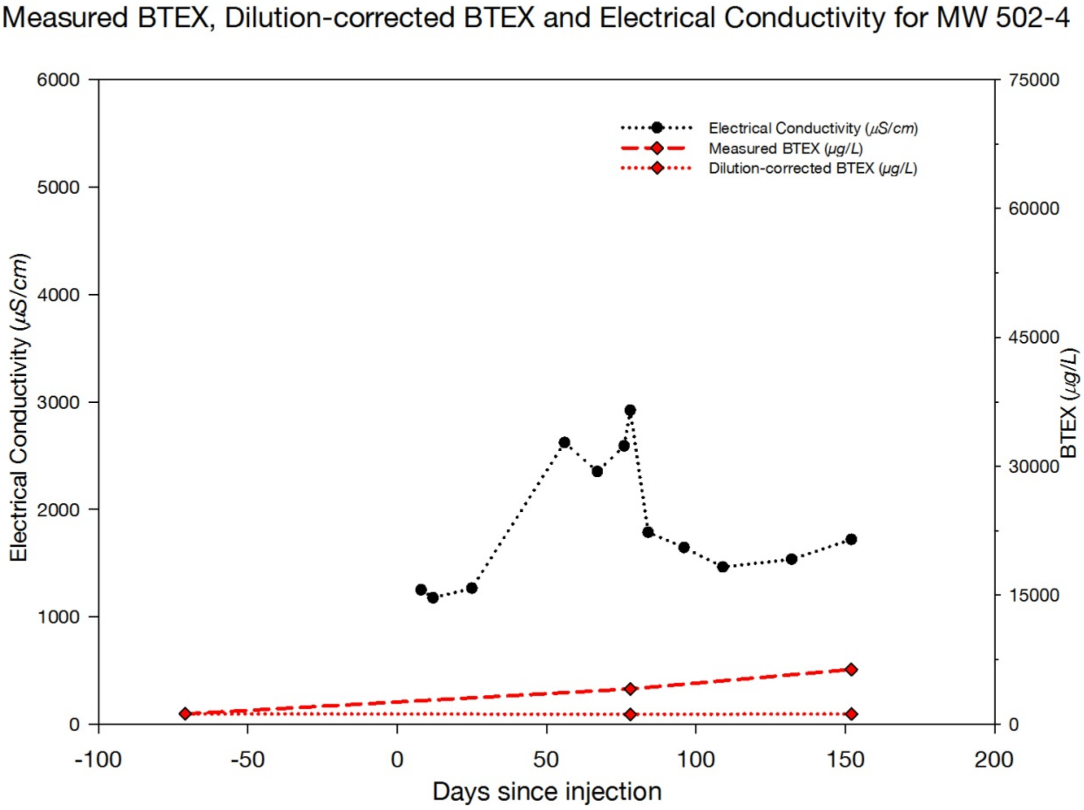

Figure 69 - Measured and Dilution-corrected BTEX with EC, MW 502-4

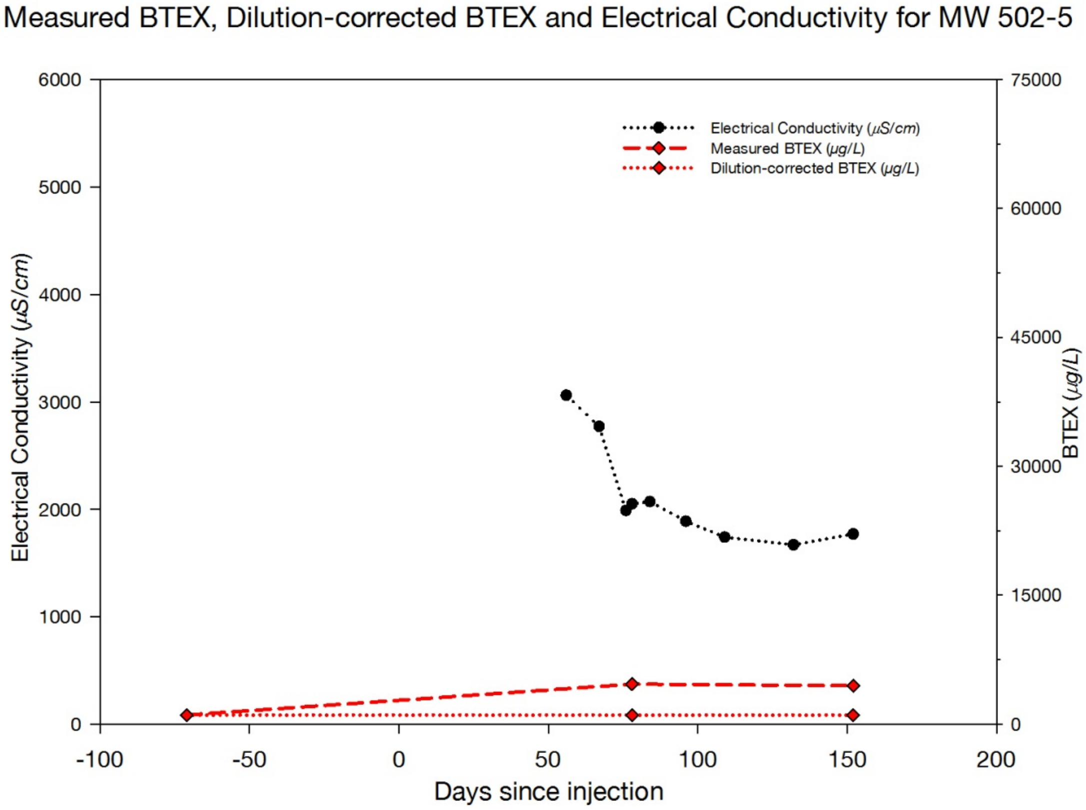

Figure 70 - Measured and Dilution-corrected BTEX with EC, MW 502-5

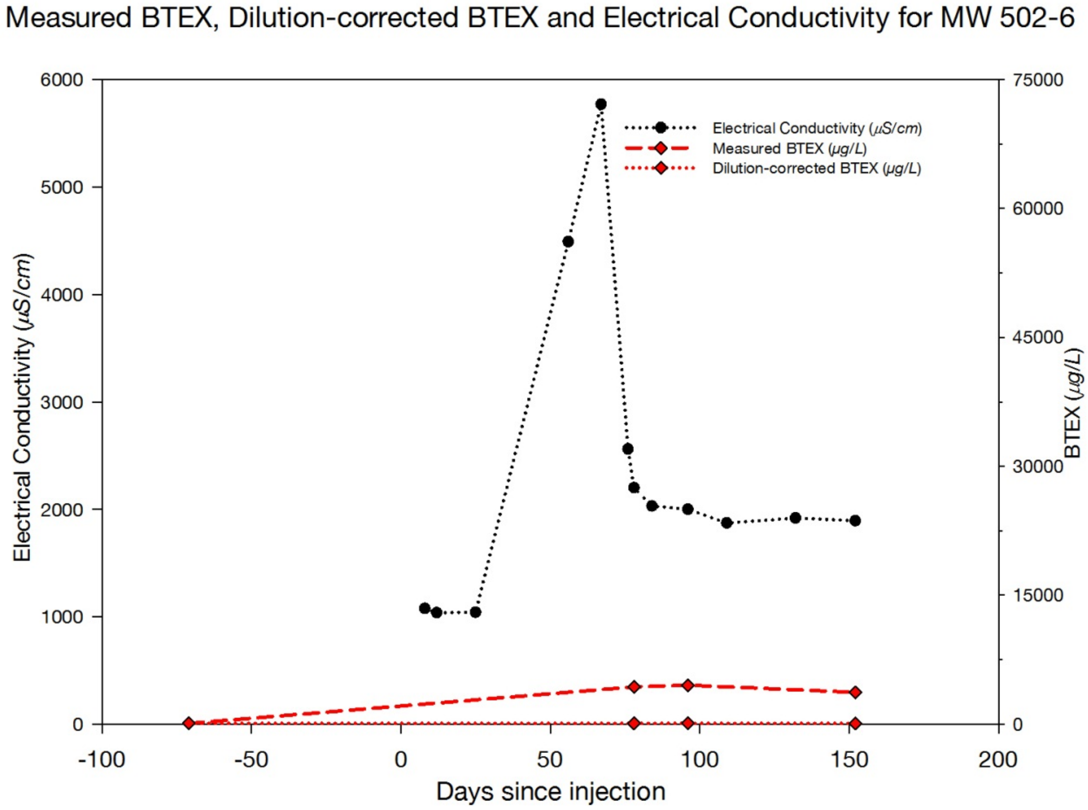

Figure 71 - Measured and Dilution-corrected BTEX with EC, MW 502-6

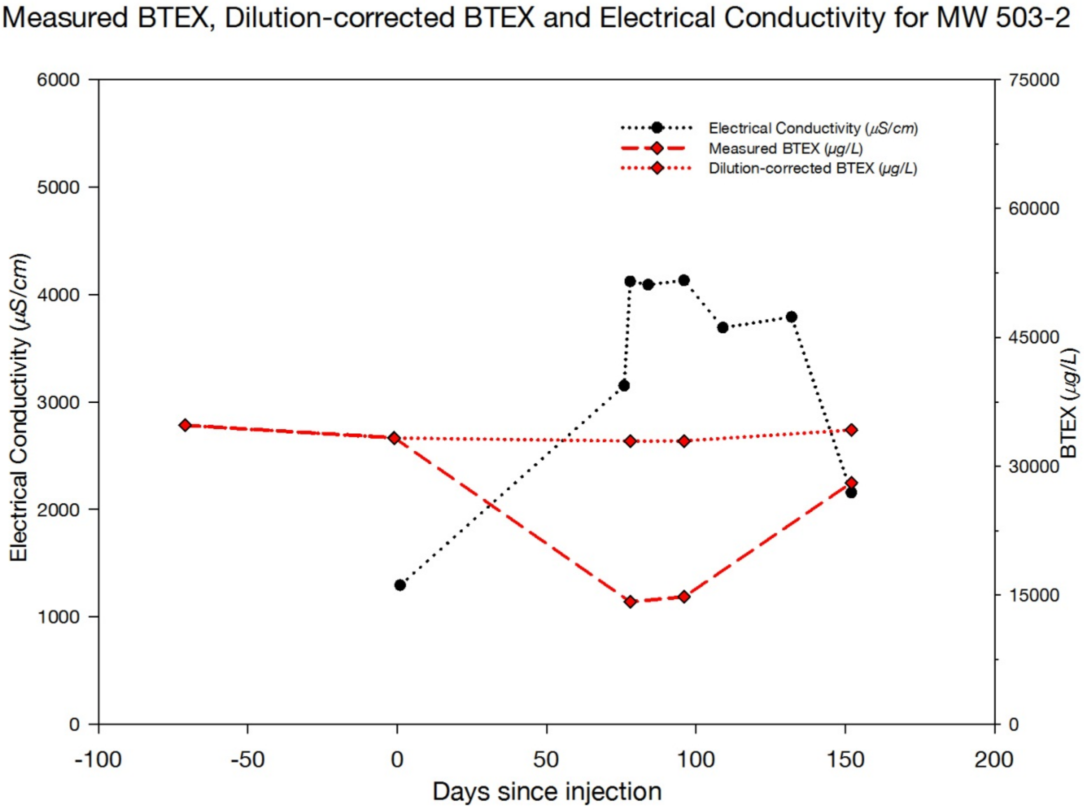

Figure 72 - Measured and Dilution-corrected BTEX with EC, MW 503-2

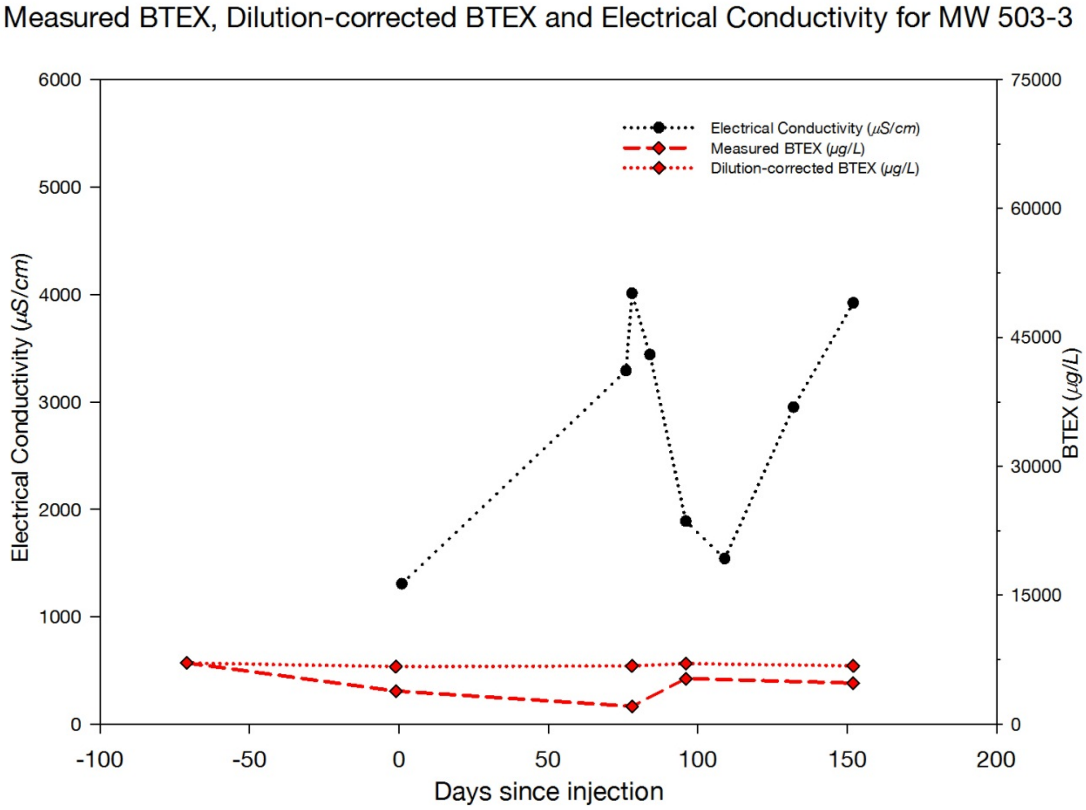

Figure 73 - Measured and Dilution-corrected BTEX with EC, MW 503-3

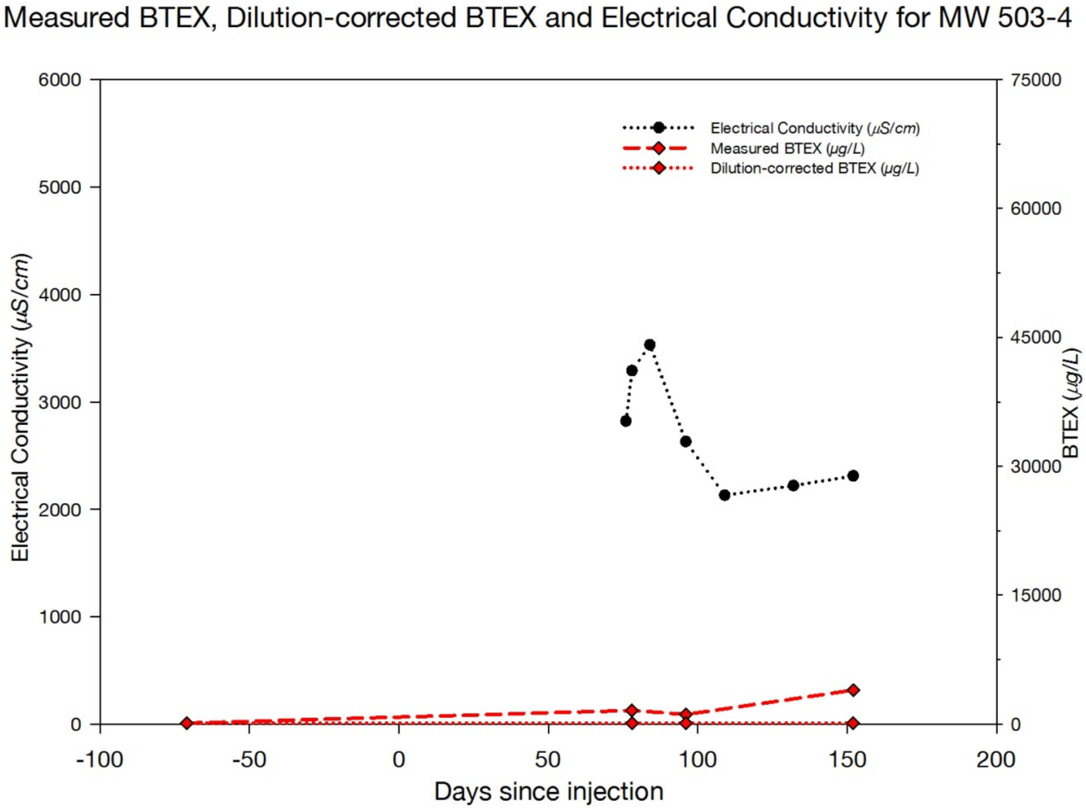

Figure 74 - Measured and Dilution-corrected BTEX with EC, MW 503-4

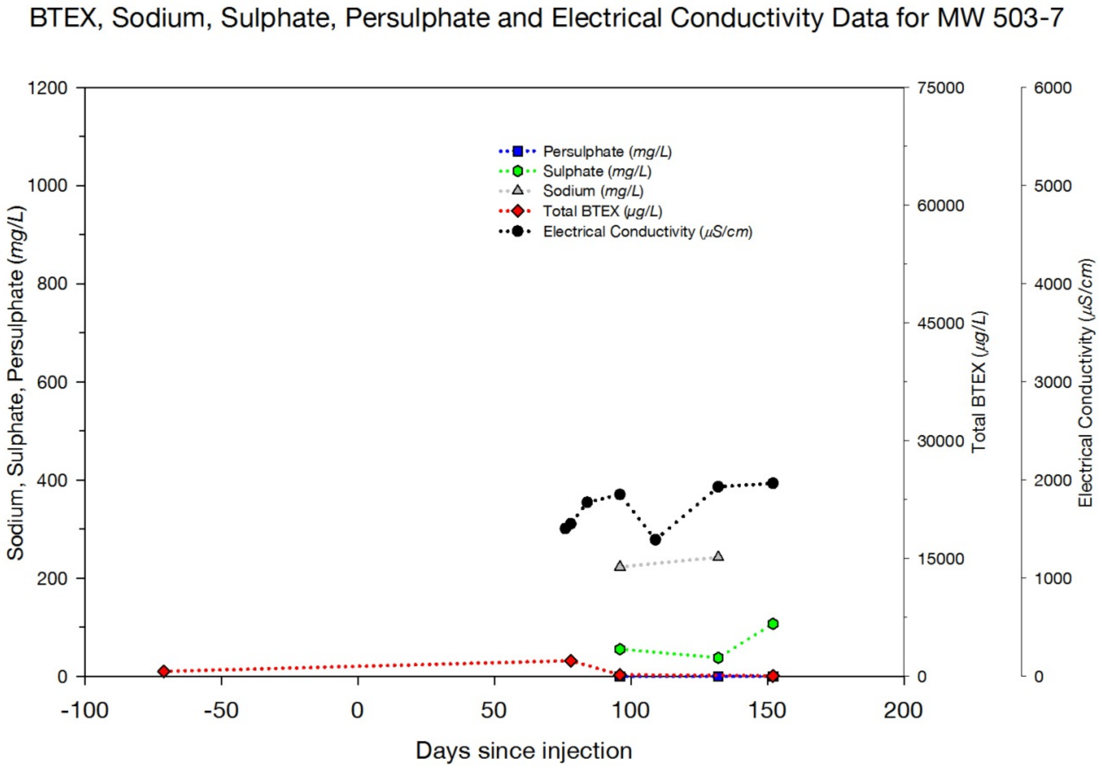

Figure 75 - Measured and Dilution-corrected BTEX with EC, MW 503-7

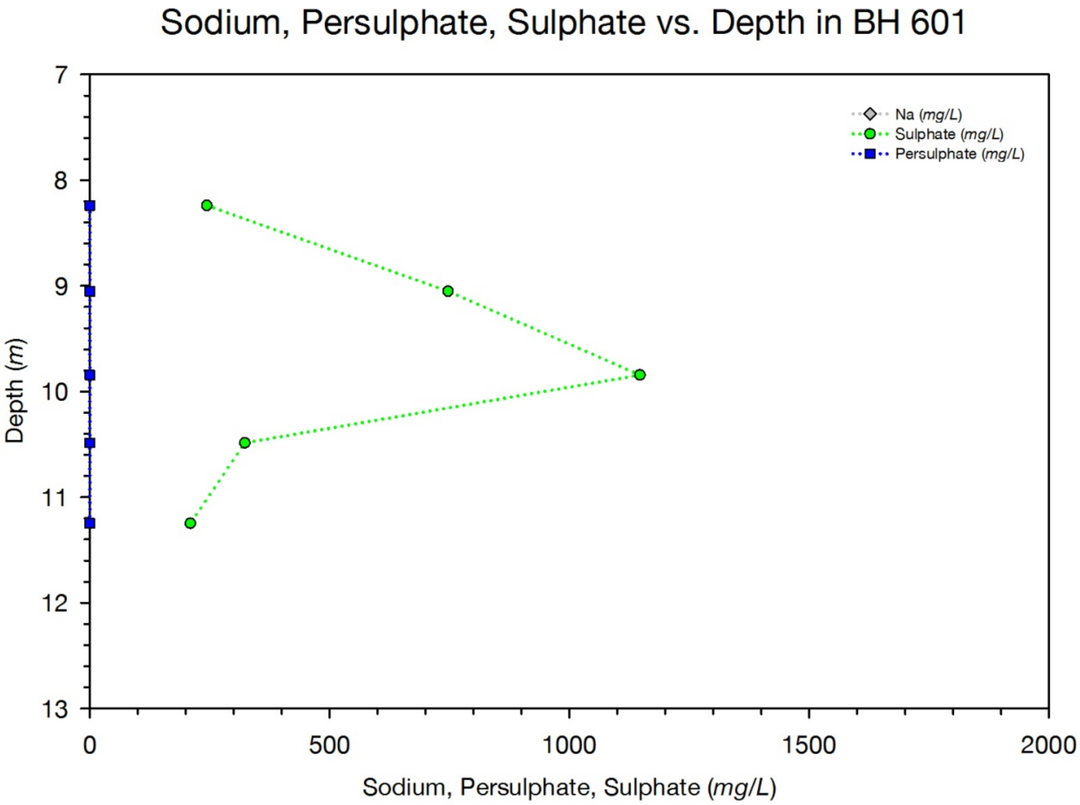

Figure 76 - Inorganic Analytes vs. Depth in BH 601 soil core

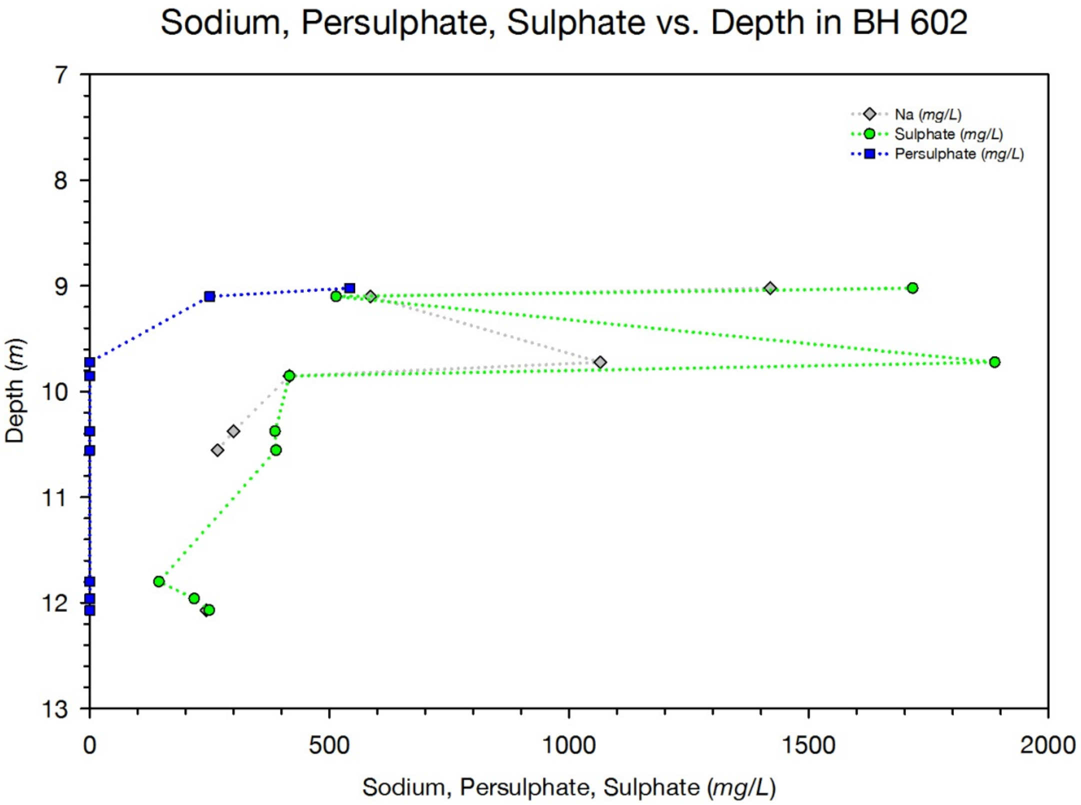

Figure 77 - Inorganic Analytes vs. Depth in BH 602 soil core

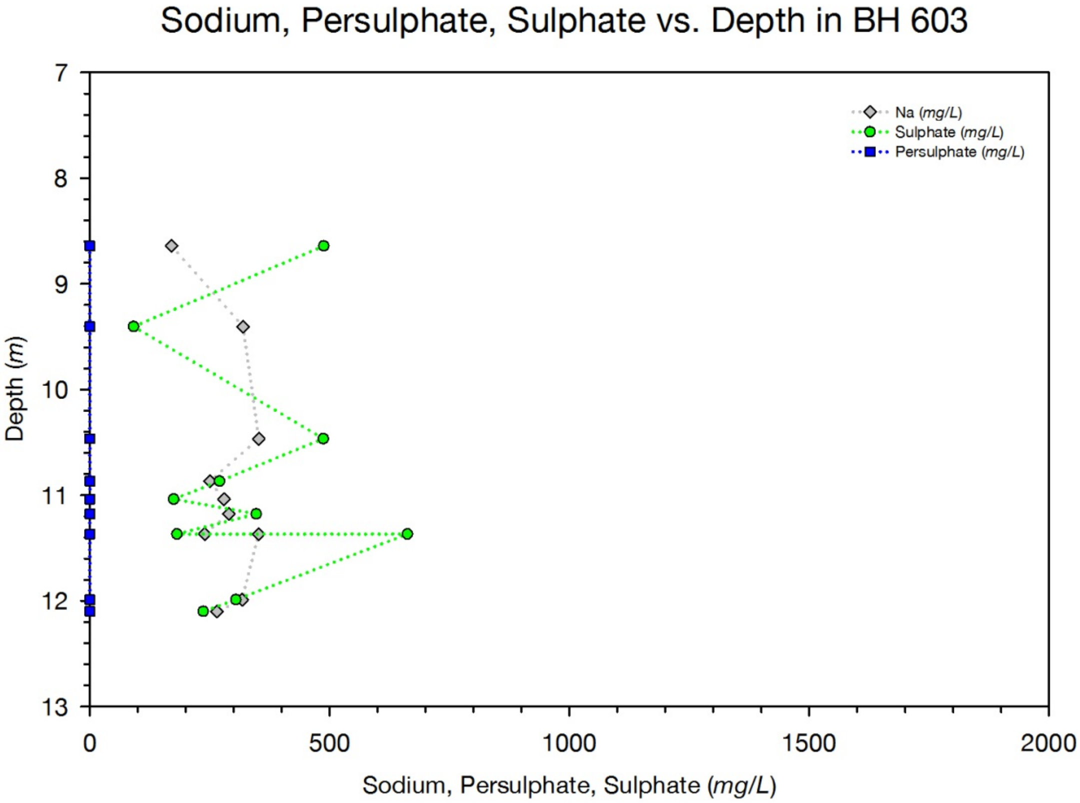

Figure 78 - Inorganic Analytes vs. Depth in BH 603 soil core

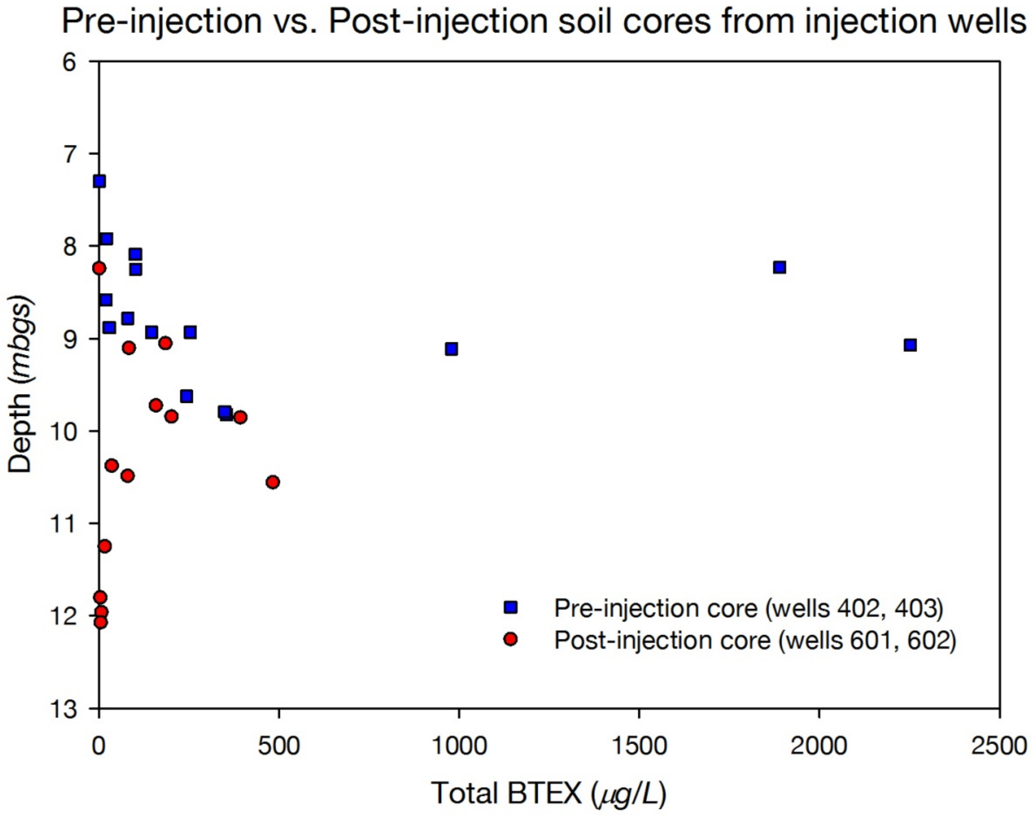

Figure 79 - Comparison of BTEX levels in pre-injection and post-injection soil cores from the injection wells

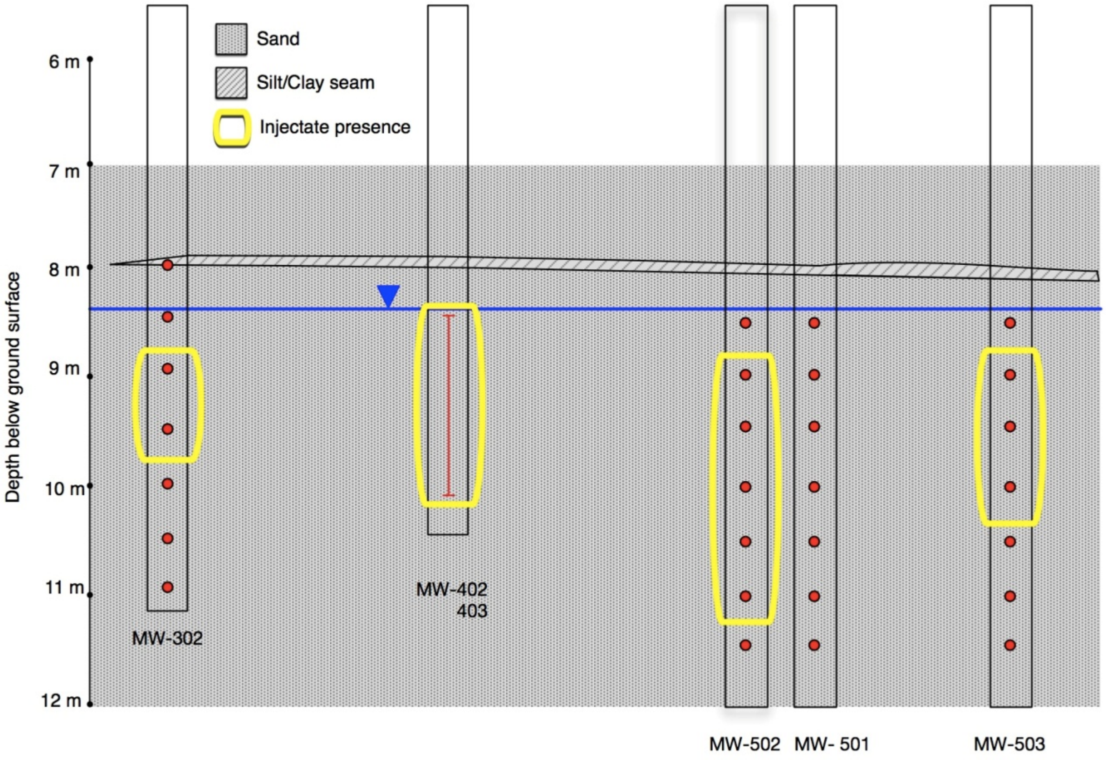

Figure 80 - Cross-section showing injectate presence

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Appendix A: Analytical Methods

Soil and groundwater sample analysis for organic contaminants (hydrocarbons) and persulphate was done in the Organic Geochemistry Laboratory in the Department of Earth and Environmental Sciences at the University of Waterloo. Sodium analysis was performed by the Blowes Group Trace Metal Analysis Laboratory in the Department of Earth and Environmental Sciences.

Hydrocarbon (groundwater)

Aqueous hydrocarbon samples and standards were equilibrated to room temperature prior to extraction. To extract a sample or standard, the Teflon® screw cap of the vial was quickly removed and 5.0 *mL* of sample was removed with a glass syringe. Immediately following this, 2.0 *mL* of methylene chloride (the extracting agent) containing the internal standards m-fluorotoluene and fluorobiphenyl was added. The vial is then quickly resealed and mixed at 350 *rpm* on a platform shaker for 20 minutes. After shaking, the vial was inverted and the phases were allowed to separate for 30 minutes. Approximately 1.0 *mL* of the methylene chloride phase was removed from the inverted vial with a gas tight glass syringe, through the Teflon® septum. The solvent was added to a Teflon® sealed auto-sampler vial for injection into the Gas Chromatograph. Samples were analyzed with a HP 5890 capillary gas chromatograph, a HP7673A auto-sampler, and a flame ionization detector. 3 μL of methylene chloride was injected in splitless mode onto a 0.25 *mm* x 30 *m* long DB5 capillary column with a stationary phase film thickness of 0.25 μm. The chromatographic run time was 10 minutes. Data integration was completed with a HP 3396A integrator.

Calibrations were made in internal standard mode and standards were run in triplicate at five or more different concentrations covering the expected sample range. Preparation of standards consisted of mixing DI water with concentrated stock standards of methanol. Then they were extracted and analyzed by gas chromatography in the same way as samples. A multiple point linear regression was performed to determine the linearity and slope of the calibration curve. Quality control information on calibration curves such as percent relative standard deviation and percent error and blank information were included with reported data. Extraction duplicates were performed on samples and results were acceptable when they agreed within 10%. Method Detection Limits (MDLs) were 1.1 *μg/L* for benzene, 0.8 *μg/L* for toluene, 0.8 *μg/L* for ethylbenzene, 1.5 *μg/L* for p/m-xylene, 0.4 *μg/L* for o-xylene, 0.7 *μg/L* for 1,3,5-trimethylbenzene (TMB), 0.8 *μg/L* for 1,2,4-TMB and 1,2,3 TMB, and 2.2 *μg/L* for naphthalene.

Hydrocarbon (soil)

Aqueous hydrocarbon samples were equilibrated to room temperature prior to extraction. BTEX, trimethylbenzene isomers (TMBs) and naphthalene analyses were performed by solvent extraction with methylene chloride followed by gas chromatography. The vials with the soil samples and methylene chloride were shaken at 350 *rpm* for 18 hours and then settled for approximately 3 weeks. Consequently, samples were reweighed to ensure there was no solvent loss during this period. A 0.7 *mL* aliquot of extraction solvent was placed in a Teflon® sealed auto-sampler vial and injected into a HP 5890 capillary GC equipped with a 0.25 *mm* × 30 *m* long DB5 capillary column with a stationary phase film thickness of 0.25 *μm*, a HP7673A auto-sampler, and a flame ionization detector. The method detection limits for benzene was 0.03 *mg/kg* of wet soil, 0.03 *mg/kg* for toluene, 0.01 *mg/kg* for ethylbenzene, 0.03 *mg/kg* for p/m-xylene, 0.02 *mg/kg* for o-xylene, 0.02 *mg/kg* for 1,3,5-trimethylbenzene (TMB), 0.03 *mg/kg* for 1,2,4-TMB, 0.01 *mg/kg* 1,2,3 TMB, and 0.03 *mg/kg* for naphthalene.

Persulphate

Persulphate is highly reactive hence; samples were analyzed within days of being collected in the field. While awaiting analysis, samples would be refrigerated and stored at approximately 4°C.

Persulphate (groundwater)

In order to determine the sodium persulphate concentration, samples were prepared by placing 0.1 *mL* of sample in a 20 *mL* glass vial. Then, 0.9 *mL* of DI water, 10 *mL* of 2.5 *N* sulphuric acid solution and 0.1 *mL* of 0.4 *N* ferrous ammonium sulphate solution were added. The contents were mixed and allowed to react for 40 minutes. 0.2 *mL* of 0.6 *N* NH_4SCN (ammonium thiocyanate) solution was then added, and the absorbance was read with a spectrophotometer at a wavelength of 450 *nm*. The calibration curve established by the above procedures using $Na_2S_2O_8$ solutions ranging from 200 *mg/L* to 2000 *mg/L* showed a high linear correlation coefficient of $R^2 = 0.99$ (Huang, 2002).

Persulphate (soil)

Samples were equilibrated to room temperature and were shaken at 350 *rpm* for a few hours. The samples were then allowed to settle and 0.1 *mL* of aqueous solution was extracted from each vial using a glass syringe and transferred into a 20 *mL* glass vial. Following this, the steps outlined in the persulphate (groundwater) section were completed.

Sulphate (groundwater)

Sulphate analysis was conducted using an ion chromatograph. 2 *mL* of aqueous sample was initially transferred into appropriate glass vials for the ion chromatograph auto-sampler. Simultaneously, 2 *mL* of anion standard at a variety of concentrations were also transferred into glass vials to be run in conjunction with blanks every 10 samples.

Sulphate (soil)

This procedure used the same method as used for the sulphate groundwater analysis, with the following modification: samples were shaken at 350 *rpm* for a few hours so they would equilibrate to room temperature. The samples were then allowed to settle and 2 *mL* of aqueous solution was extracted from each vial using a glass syringe and transferred into glass vials for the chromatograph auto-sampler.

Sodium

Sodium samples were filtered through a 0.45 μm syringe filter and acidified used concentrated nitric acid prior to analysis.

Sodium (groundwater)

The sodium analysis was conducted on the Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) using an iCAP series from Thermo Instruments.

After every 10 samples, a standard and a blank were run to assume quality control. Standards ranged between 1 ppm to 100 ppm and showed a very high correlation coefficient of $R^2 = 0.9999$.

Sodium (soil)

This procedure used the method outlined in above for sodium in groundwater, however with the following modification: samples were equilibrated to room temperature by shaking at 350 *rpm* for a few hours. The samples were then allowed to settle and 15 *mL* of the aqueous solution were extracted from each vial using a glass syringe and filtered using a 0.45 μm syringe filter and acidified with concentrated nitric acid prior to analysis.

Electrical Conductivity and Temperature (groundwater)

An Orion model 135 meter was used to measure conductivity and temperature in the field. The Orion meter's conductivity probe has a built-in temperature sensor which allows for each electrical conductivity measurement to be temperature corrected and reported at standard temperature of 20°C.

The conductivity meter was manually calibrated using a standard calibration solution of 1413 *μS/cm*. The reported relative accuracy of the Orion meter is ±0.005 while the temperature probe has a relative accuracy of ±1.0°C.

pH and Temperature (groundwater)

An Orion Model 290A pH meter was used to measure pH in the field. The portable pH meter was used in conjunction with a temperature sensor that was able to give real time pH and temperature data. The recorded pH measurements were temperature corrected and reported at 20 °C.

Before every sampling episode, the pH meter was manually calibrated using standard solutions with pH values of 4, 7, and 10. The 290A meter compares the theoretical values to the measured values to determine if the buffer is within range. The reported relative accuracy of the pH meter is ±0.005 while the temperature probe has a relative accuracy of ±1.0 °C.

Analytical Data quality control

In addition to field quality controls, each laboratory run consisted of analyzing laboratory equipment blanks. Laboratory equipment blanks were taken and analyzed to show whether the equipment used was a source of cross-contamination between samples.

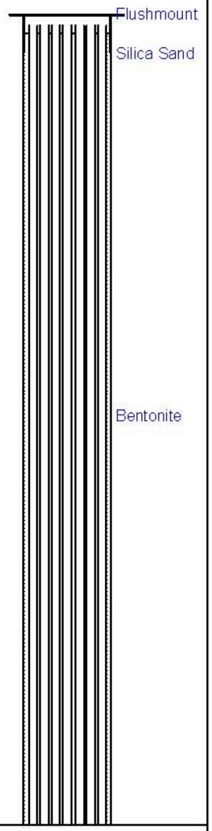
Appendix B: Borehole Logs

[redacted]

Borehole/Monitoring Well ID: BH-301 (MW-301)

Page 1 of 2

DEPTH ft m	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
0							Ground Surface	330.98
	NA	BH-301-1		25	40		SAND & GRAVEL FILL dry to moist, brown, fine to medium	
	NA	BH-301-2		<25	56		SAND dry to moist, brown, fine, some silt, trace clay	
	NA	BH-301-3		75	57		bands of orange oxidation	
	NA	BH-301-4		50	67			
	NA	BH-301-5		<25	96		fine to medium, trace silt	
	NA	BH-301-6		NA	0		COBBLES No recovery	
	NA	BH-301-7		NA	0			
20	NA	BH-301-8		<25	80		SAND moist, brown, fine, trace silt, orange bands of oxidation	



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

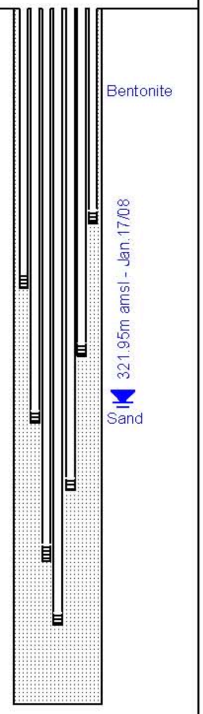
◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-301 (MW-301)

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
21 22	NA	BH-301-9		25	84			
23 7	NA	BH-301-10a		125	84		medium	
24		BH-301-10b		25			fine, some silt	
25 26 8	NA	BH-301-11a		75% LEL	61		silty SAND moist, brown, fine to medium	
27		BH-301-11b		10% LEL				
28	NA	BH-301-12a	◆	375	100		dry to moist, silt & clay seam from 8.3m to 8.4m bgs	
29 9		BH-301-12b		5% LEL			moist, brown SAND moist to wet, brown/grey, trace silt	
30	NA	BH-301-13a		60% LEL	100		grey/ black	
31		BH-301-13b	◆	>100% LEL			wet, grey/black, sheen on water	
32		BH-301-13c		5% LEL			grey	
33 34 10	NA	BH-301-14		15% LEL	69		brown/grey	
35 36 11	NA	BH-301-15	◆	75	80		brown, fine, some silt	
37 38 39 40 12							End of Borehole at 11.3 m bgs	



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

BH-301-12a, BH-301-13b & BH-301-15 submitted for BTEX & PHC F1-F4 analysis.

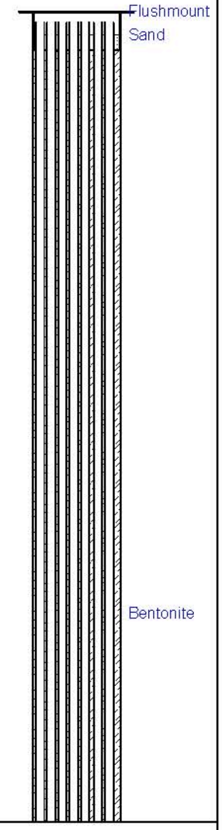
[redacted]

Borehole/Monitoring Well ID: BH-302 (MW-302)

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
ft m 0 0							Ground Surface	330.94
	NA	BH-302-1		25	61		SAND & GRAVEL FILL dry to moist, brown, asphalt pieces	
	NA	BH-302-2a		25	75			330.00
		BH-302-2b	◆	75			SAND dry to moist, dark brown, fine, trace silt some gravel	
	NA	BH-302-3		75	100			329.00
	NA	BH-302-4		50	25		moist, brown	328.00
	NA	BH-302-5		NA	0		COBBLES No recovery	
	NA	BH-302-6		NA	0			327.00
	NA	BH-302-7		125	4		SAND & GRAVEL dry to moist, brown, some cobbles	326.00
	NA	BH-302-8		50	100		SAND dry to moist, brown, fine	325.00

ft: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

m: 0 1 2 3 4 5 6



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

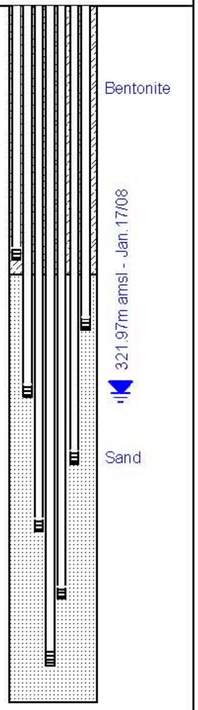
BH-302-2b submitted for pH analysis.

[redacted]

Borehole/Monitoring Well ID: BH-302 (MW-302)

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
21 22	NA	BH-302-9		25	100			
23 7 24	NA	BH-302-10		50	85		trace gravel, very fine	324.00
25	NA	BH-302-11a		15% LEL	87		odours	
26 8		BH-302-11b		15% LEL			silty clay seam at 8.0m to 8.2m bgs, odours	323.00
27		BH-302-11c		10% LEL				
28 29 9	NA	BH-302-12	◆	45% LEL	85		moist to wet	322.00
30	NA	BH-302-13a		55% LEL	89		wet	
31		BH-302-13b		95% LEL			grey staining, odours	
		BH-302-13c	◆	>100% LEL			black staining, sheen on water	
32		BH-302-13d		225			grey, odours	321.00
33 10 34	NA	BH-302-14		10% LEL	75			
35	5-13-17-17	BH-302-15a		5% LEL	92		medium dense	
36 11		BH-302-15b	◆	100			brown	320.00
37 38 39 12 40							End of Borehole at 11.3m bgs	319.00



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

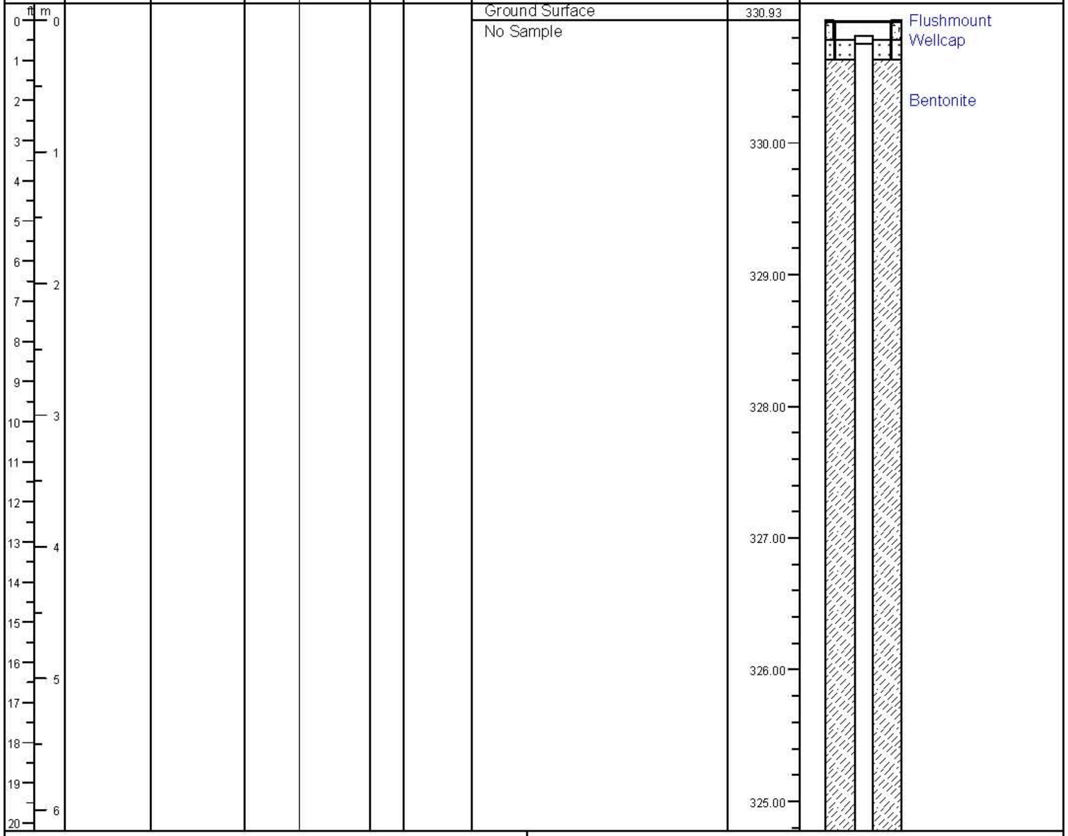
BH-302-12, BH-302-13c & BH-302-15b submitted for BTEX, PHC F1 to F4 analysis.

[redacted]

Borehole/Monitoring Well ID: BH-401 (MW-401)

Page 1 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
							Ground Surface	330.93	
							No Sample		



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-401 (MW-401)

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)
23 (7)	NA	BH-401-1A		<25	80
25	NA	BH-401-1B		50	80
	NA	BH-401-2A		25	80
26 (8)	NA	BH-401-2B		40% LEL	80
27	NA	BH-401-2C		45% LEL	80
28	NA	BH-401-3A		60% LEL	83
30 (9)	NA	BH-401-3B		80% LEL	83
31	NA	BH-401-4	◆	75% LEL	11
33 (10)	NA	BH-401-5A		10% LEL	80
34	NA	BH-401-5B	◆	25	80

DESCRIPTION

SAND
moist, brown, fine

some silt, trace gravel, fine

no gravel, trace silt, 4 cm brown/red SILT and CLAY seam at 7.8 m bgs

no silt

wet to moist, some silt

wet, grey, no silt

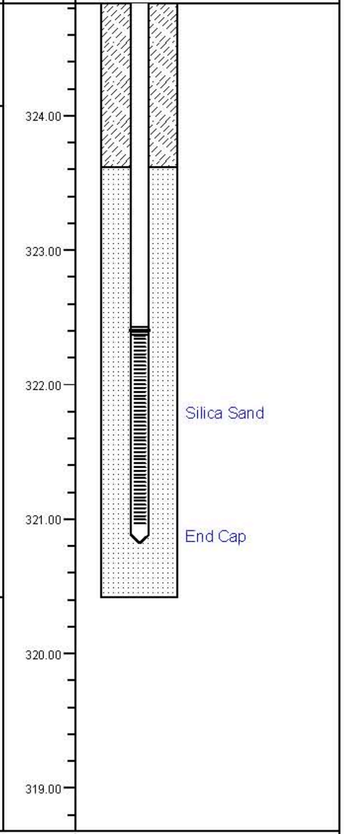
grey staining

grey/black staining

brown/grey, trace silt, grey staining

grey, some silt, no staining

End of Borehole at 10.5 m bgs



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

BH-401-4 and BH-401-5B were submitted for BTEX and PHC F1 to F4 analysis.

[redacted]

Borehole/Monitoring Well ID: BH-402 (MW-402)

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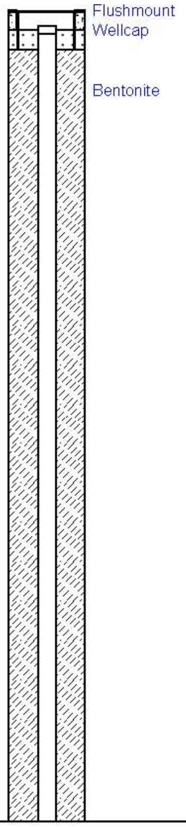
DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
ft m 0 0							Ground Surface	330.94	
							No Sample		
3 1								330.00	
6 2								329.00	
10 3								328.00	
13 4								327.00	
16 5								326.00	
19 6								325.00	
20									



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

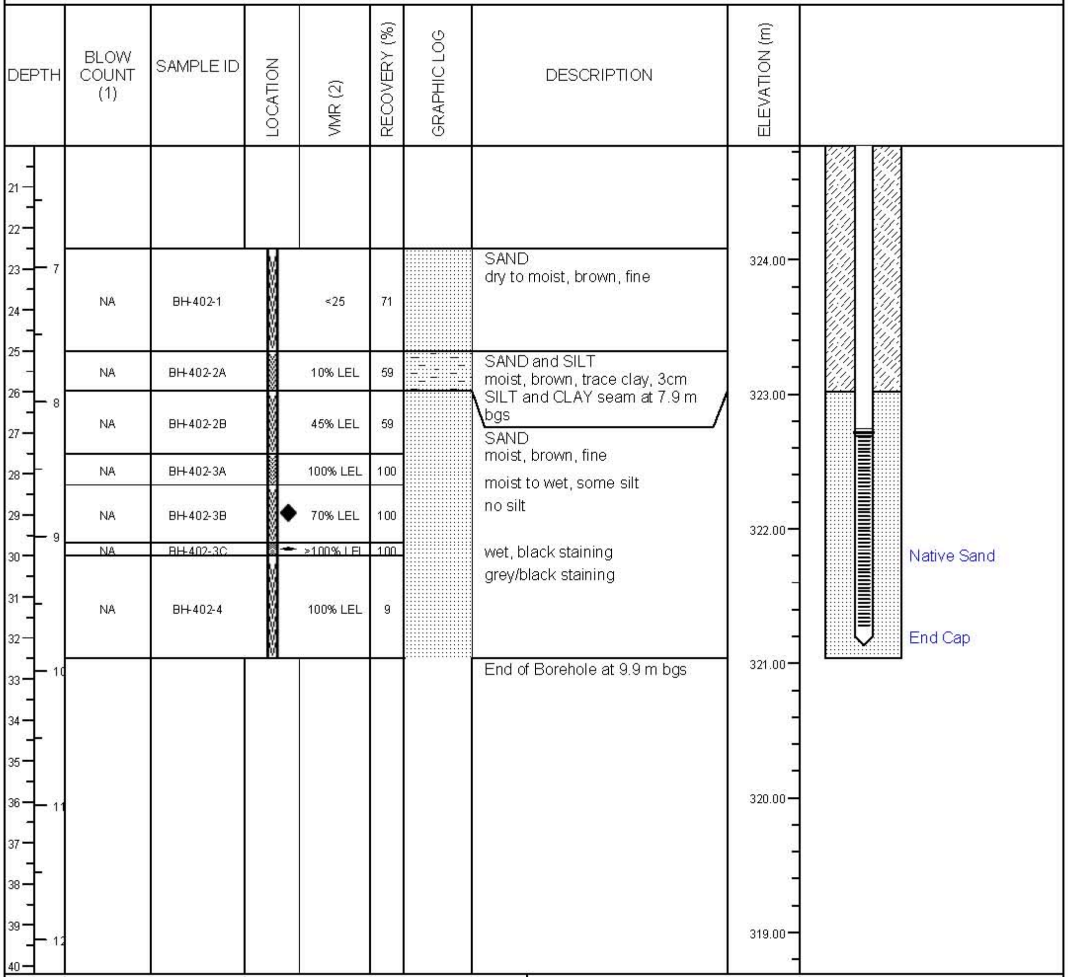
Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-402 (MW-402)

Page 2 **of** 2



BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION
NA	BH-402-1		<25	71		SAND dry to moist, brown, fine
NA	BH-402-2A		10% LEL	59		SAND and SILT moist, brown, trace clay, 3cm SILT and CLAY seam at 7.9 m bgs
NA	BH-402-2B		45% LEL	59		SAND moist, brown, fine
NA	BH-402-3A		100% LEL	100		moist to wet, some silt
NA	BH-402-3B	◆	70% LEL	100		no silt
NA	BH-402-3C	◆	>100% LEL	100		wet, black staining
NA	BH-402-4		100% LEL	9		grey/black staining
						End of Borehole at 9.9 m bgs

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

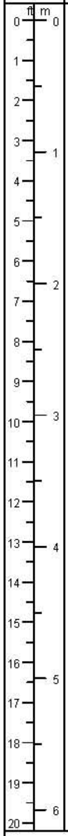
BH-402-3B and BH-402-3C were submitted for BTEX and PHC F1 to F4 analysis.

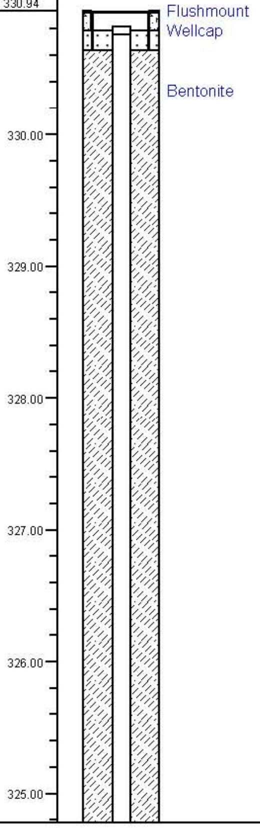
[redacted]

Borehole/Monitoring Well ID: BH-403 (MW-403)

Page 1 **of** 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
ft m							Ground Surface	330.94
							No Sample	





(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

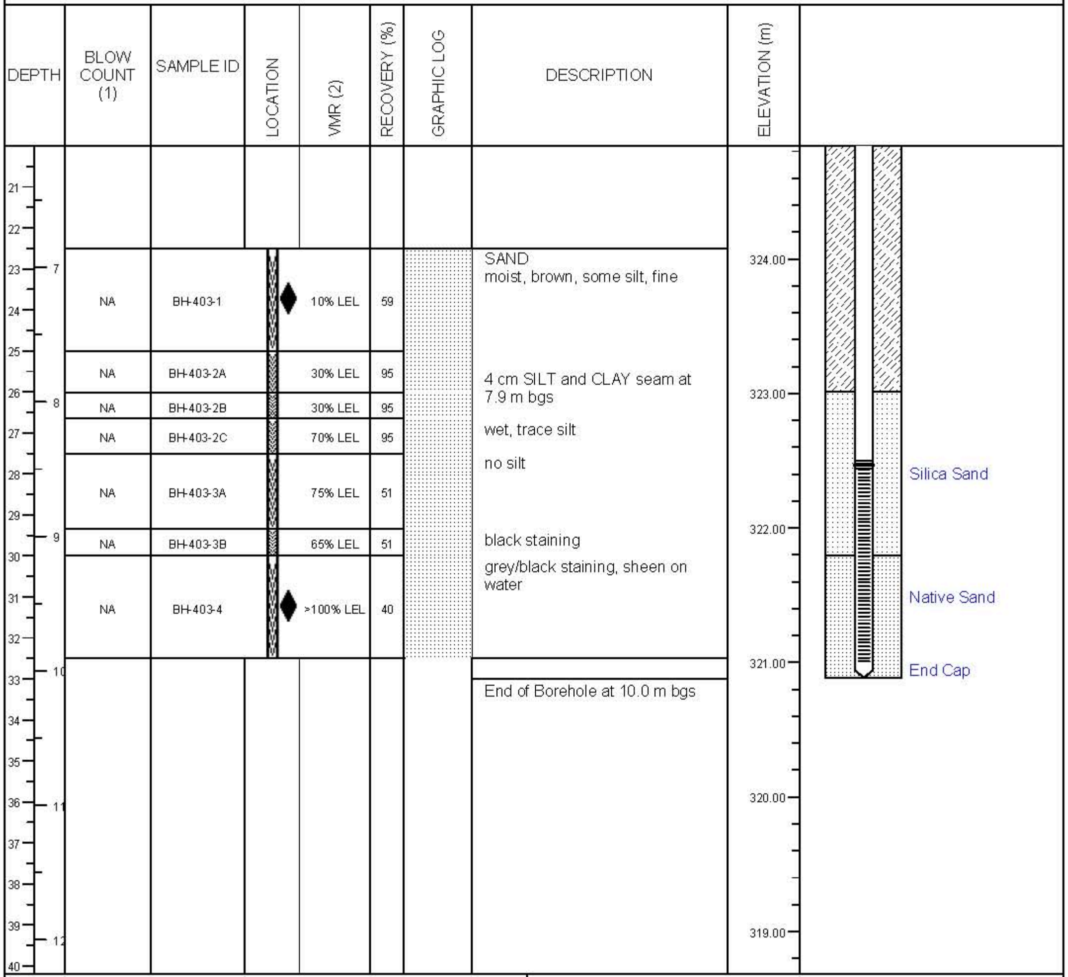
Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-403 (MW-403)

Page 2 of 2



BLOW COUNT (1)	SAMPLE ID	VMR (2)	RECOVERY (%)	DESCRIPTION
NA	BH-403-1	10% LEL	59	SAND moist, brown, some silt, fine
NA	BH-403-2A	30% LEL	95	4 cm SILT and CLAY seam at 7.9 m bgs
NA	BH-403-2B	30% LEL	95	
NA	BH-403-2C	70% LEL	95	wet, trace silt
NA	BH-403-3A	75% LEL	51	no silt
NA	BH-403-3B	65% LEL	51	black staining
NA	BH-403-4	>100% LEL	40	grey/black staining, sheen on water
				End of Borehole at 10.0 m bgs

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

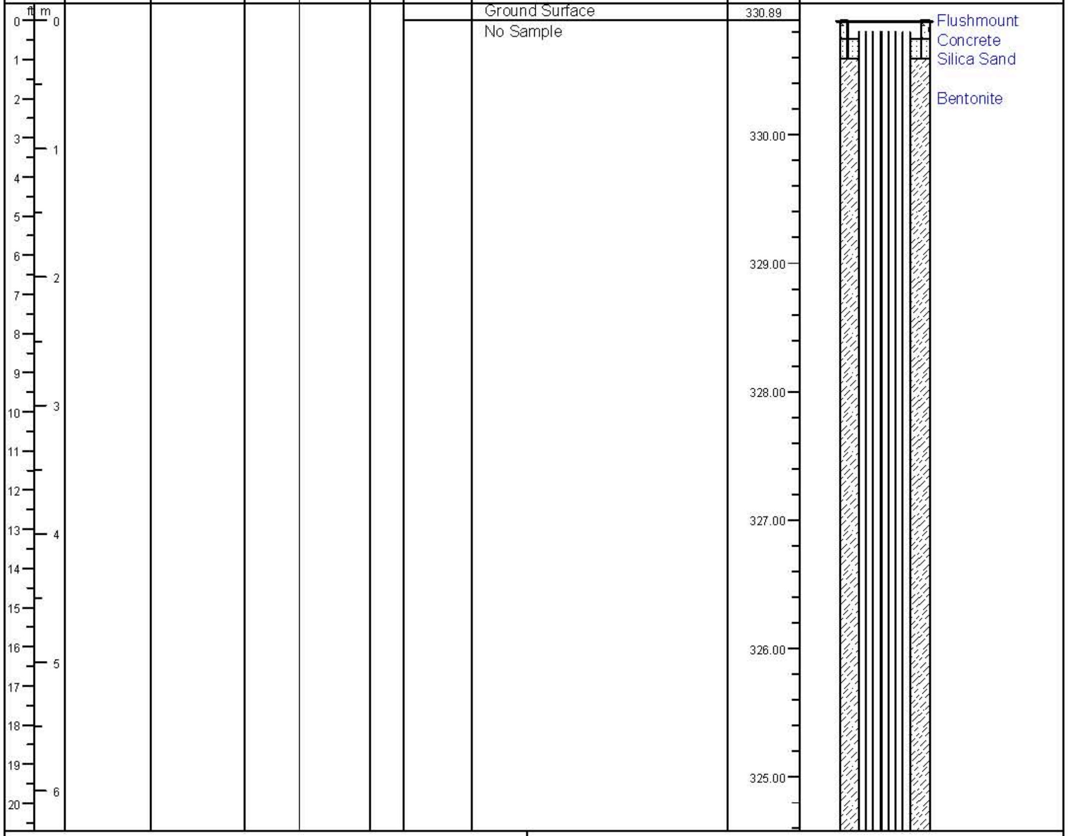
BH-403-1 and BH-403-4 were submitted for BTEX and PHC F1 to F4 analysis.

[redacted]

Borehole/Monitoring Well ID: BH-501 (MW-501)

Page 1 **of** 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

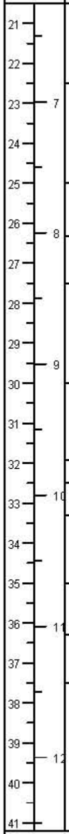
Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

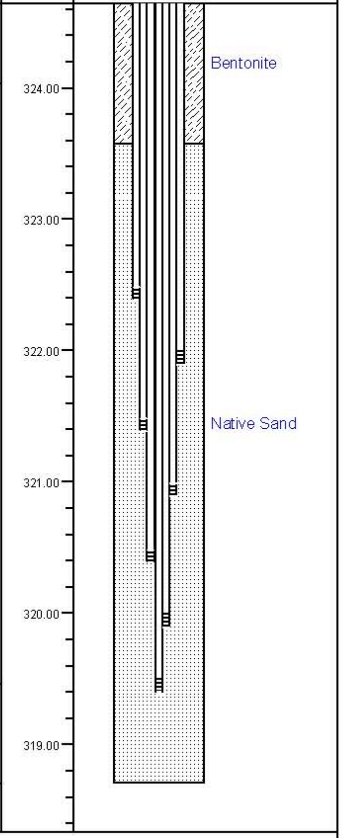
[redacted]

Borehole/Monitoring Well ID: BH-501 (MW-501)

Page 2 **of** 2



BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION
NA	BH-501-1		20% LEL	71		SAND moist, brown, some silt, fine
NA	BH-501-2A		25% LEL	51		moist to wet, 3 cm SILT and CLAY seam at 8.0 m bgs
NA	BH-501-2B		375	51		moist, brown/grey, no silt grey staining
NA	BH-501-3	◆	60% LEL	49		wet
NA	BH-501-4A		80% LEL	80		black staining, sheen
NA	BH-501-4B		175	80		brown/grey, no staining
NA	BH-501-5A		20% LEL	79		grey staining
NA	BH-501-5B		75	79		brown, trace silt, no staining
NA	BH-501-6A	◆	25% LEL	83		brown/grey
NA	BH-501-6B		50	83		brown, some silt
						End of Borehole at 12.2 m bgs



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

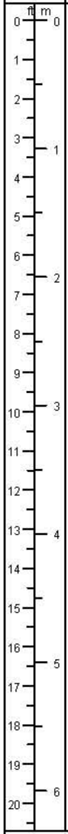
BH-501-3 and BH-501-6A were submitted for BTEX & PHC F1-F4 analysis.

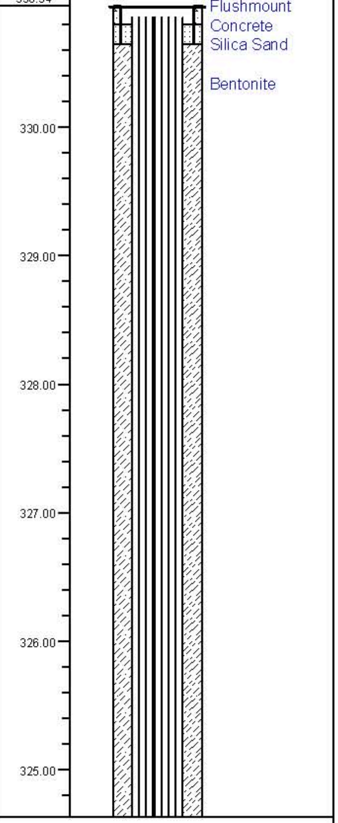
[redacted]

Borehole/Monitoring Well ID: BH-502 (MW-502)

Page 1 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
							Ground Surface	330.94	
							No Sample		





(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

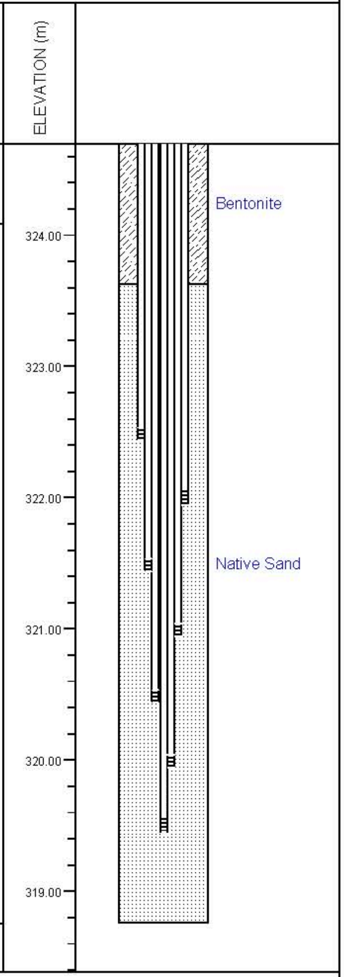
◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-502 (MW-502)

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION
21 22							
23 7	NA	BH-502-1A		250	79		SAND dry to moist, brown, fine
24	NA	BH-502-1B		25	79		moist, brown/grey, some silt
25 26 8 27	NA	BH-502-2		80% LEL	53		3 cm SILT and CLAY seam at 8.2 m bgs
28 29 9	NA	BH-502-3		45% LEL	57		wet, brown black/grey staining
30 31	NA	BH-502-4A	◆	85% LEL	77		grey staining, 4 cm band of black staining at 9.4 m bgs
32	NA	BH-502-4B		150	77		brown/grey, no staining
33 10 34	NA	BH-502-5		10% LEL	100		trace silt
35 36 11 37	NA	BH-502-6	◆	5% LEL	73		
38 39 12	NA	BH-502-7		5% LEL	100		grey, no silt
40 41							End of Borehole at 12.2 m bgs



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

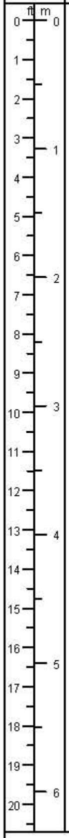
BH-502-4A and BH-502-6 were submitted for BTEX & PHC F1-F4 analysis.

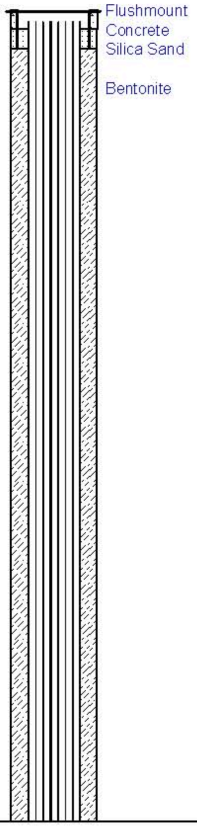
[redacted]

Borehole/Monitoring Well ID: BH-503 (MW-503)

Page 1 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
							Ground Surface	330.92	
							No Sample	330.00 329.00 328.00 327.00 326.00 325.00	





(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

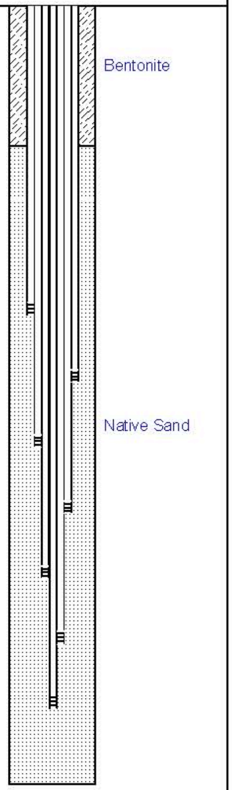
◆ = Sample submitted for laboratory analysis

[redacted]

Borehole/Monitoring Well ID: BH-503 (MW-503)

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	VMR (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
7	NA	BH-503-1A		25	87		SAND moist, brown, trace silt, fine	324.00
	NA	BH-503-1B		50	87		grey, some silt, black staining at 7.6 m bgs	
8	NA	BH-503-2A	◆	75% LEL	57		moist to wet, 1 cm SILT and CLAY seam at 8.0 m bgs	323.00
	NA	BH-503-2B		5% LEL	57		brown/grey, no silt	
	NA	BH-503-3A		15% LEL	72		wet, grey	
9	NA	BH-503-3B		10% LEL	72		grey/black staining	322.00
	NA	BH-503-4A	◆	10% LEL	84		grey staining	
	NA	BH-503-4B		125	84		brown/grey, no staining	
10	NA	BH-503-5A		225	100			321.00
	NA	BH-503-5B		50	100		brown, trace silt	
11	NA	BH-503-6		50	80		some silt	320.00
12							End of Borehole at 12.2 m bgs	319.00



(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Vapour Meter Reading (VMR), operated in methane exclusion mode and in ppmv unless noted

Monitoring well equipped with dedicated inertial foot valve and polyethylene tubing for sampling.

◆ = Sample submitted for laboratory analysis

BH-503-2A and BH-503-4A were submitted for BTEX & PHC F1-F4 analysis.

[redacted]

Borehole ID: BH-601

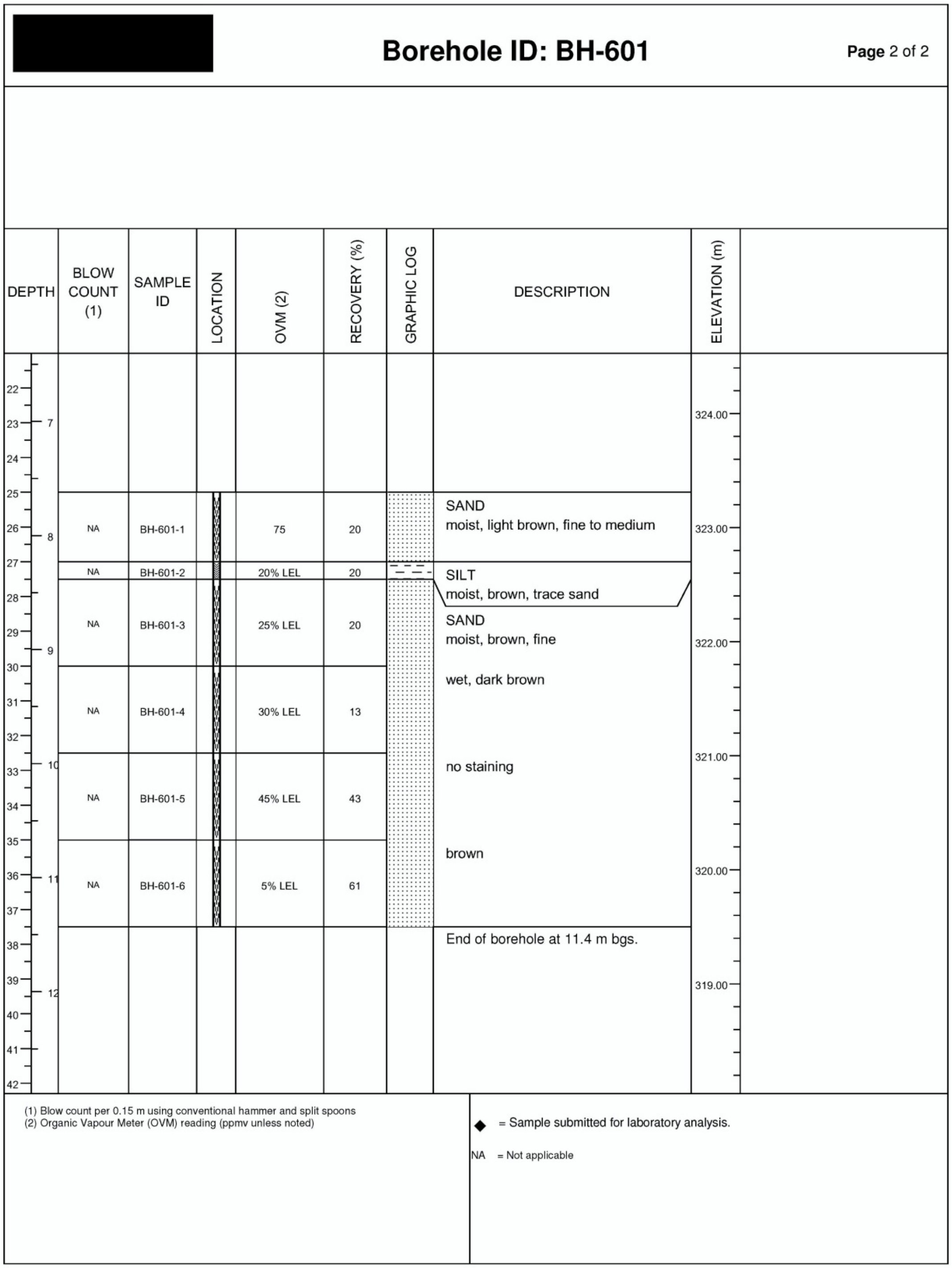
Page 1 of 2

DEPTH		BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
ft	m							Ground Surface	330.93
0	0							No Sample	
1									
2									
3	1								330.00
4									
5									
6									
	2								329.00
7									
8									
9									
10	3								328.00
11									
12									
13	4								327.00
14									
15									
16	5								326.00
17									
18									
19									
	6								325.00
20									
21									

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

◆ = Sample submitted for laboratory analysis.

NA = Not applicable



[redacted]

Borehole ID: BH-601

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
22 23 7 24								324.00
25 26 8	NA	BH-601-1		75	20		SAND moist, light brown, fine to medium	323.00
27	NA	BH-601-2		20% LEL	20		SILT moist, brown, trace sand	
28 29 9	NA	BH-601-3		25% LEL	20		SAND moist, brown, fine	322.00
30 31 32	NA	BH-601-4		30% LEL	13		wet, dark brown	
33 10 34	NA	BH-601-5		45% LEL	43		no staining	321.00
35 36 11 37	NA	BH-601-6		5% LEL	61		brown	320.00
38 39 12 40 41 42							End of borehole at 11.4 m bgs.	319.00

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

◆ = Sample submitted for laboratory analysis.

NA = Not applicable

[redacted]

Borehole ID: BH-602

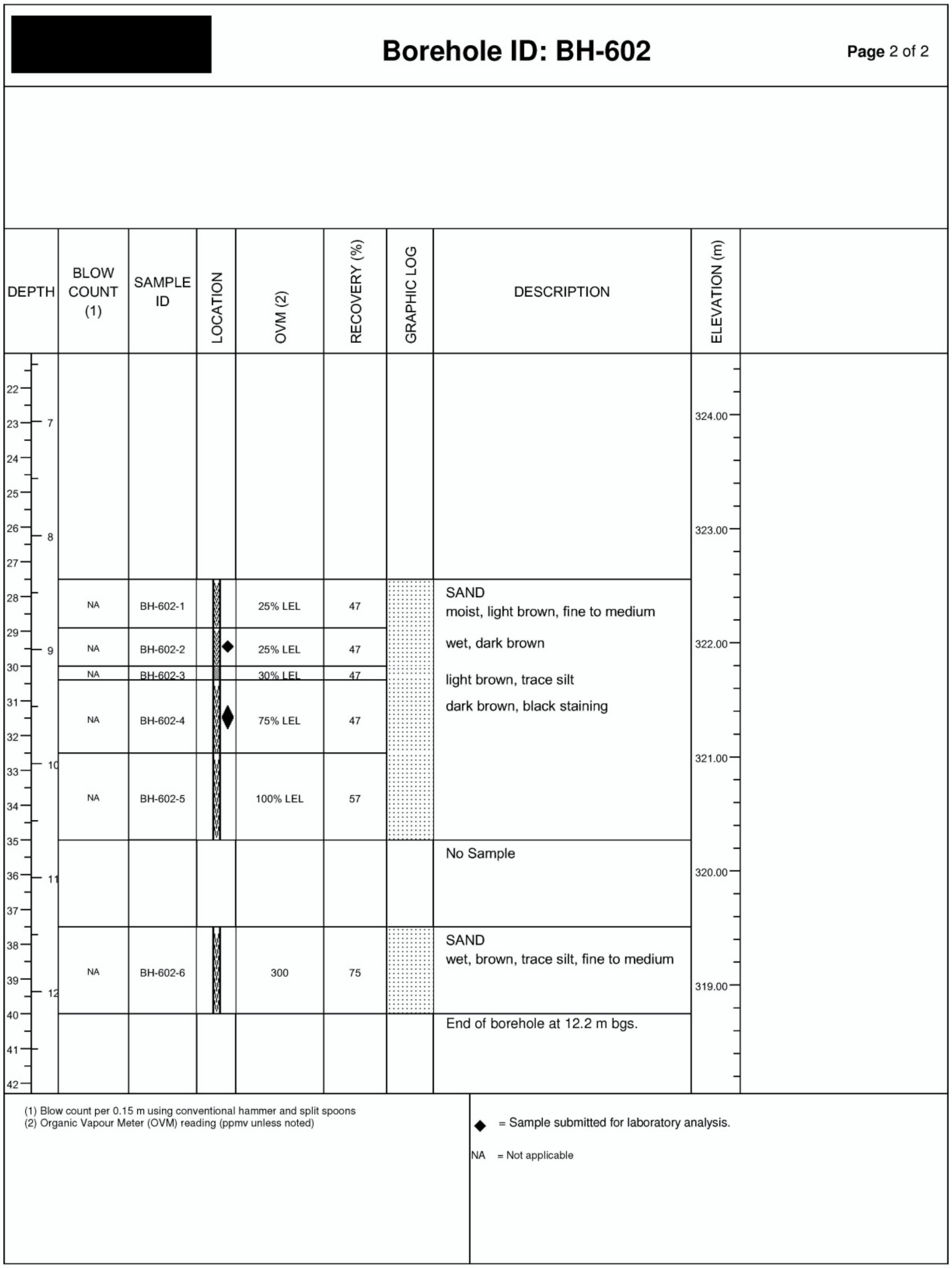
Page 1 of 2

DEPTH		BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
ft	m							Ground Surface	330.94	
0	0							No Sample		
1										
2										
3									330.00	
	1									
4										
5										
6									329.00	
	2									
7										
8										
9										
10	3								328.00	
11										
12										
13	4								327.00	
14										
15										
16	5								326.00	
17										
18										
19										
	6								325.00	
20										
21										

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

◆ = Sample submitted for laboratory analysis.

NA = Not applicable



[redacted]

Borehole ID: BH-602

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
22 23 / 7 24 25 26 / 8 27								324.00 323.00
28	NA	BH-602-1		25% LEL	47		SAND moist, light brown, fine to medium	
29 / 9	NA	BH-602-2	◆	25% LEL	47		wet, dark brown	322.00
30	NA	BH-602-3		30% LEL	47		light brown, trace silt	
31 32	NA	BH-602-4	◆	75% LEL	47		dark brown, black staining	
33 / 10 34	NA	BH-602-5		100% LEL	57			321.00
35 36 / 11 37							No Sample	320.00
38 39 / 12	NA	BH-602-6		300	75		SAND wet, brown, trace silt, fine to medium	319.00
40 41 42							End of borehole at 12.2 m bgs.	

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

◆ = Sample submitted for laboratory analysis.

NA = Not applicable

[redacted]

Borehole ID: BH-603

Page 1 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)	
ft m							Ground Surface	330.94	
0 0 1 2 3 1 4 5 6 2 7 8 9 3 10 11 12 13 4 14 15 16 5 17 18 19 6 20 21							No Sample	330.00 329.00 328.00 327.00 326.00 325.00	

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

◆ = Sample submitted for laboratory analysis.

NA = Not applicable

[redacted]

Borehole ID: BH-603

Page 2 of 2

DEPTH	BLOW COUNT (1)	SAMPLE ID	LOCATION	OVM (2)	RECOVERY (%)	GRAPHIC LOG	DESCRIPTION	ELEVATION (m)
	NA	BH-603-1		25% LEL	33		SAND moist to wet, brown, trace silt, fine	
	NA	BH-603-2		5% LEL	33		wet, dark brown, no silt, gray staining	
	NA	BH-603-3	◆	250	7			
	NA	BH-603-4	◆	15% LEL	53		fine to medium	
	NA	BH-603-5		10% LEL	92			
	NA	BH-603-6		5% LEL	47			
							End of borehole at 12.2 m bgs.	

DEPTH: 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42

7 8 9 10 11 12

ELEVATION (m): 324.00 323.00 322.00 321.00 320.00 319.00

(1) Blow count per 0.15 m using conventional hammer and split spoons
(2) Organic Vapour Meter (OVM) reading (ppmv unless noted)

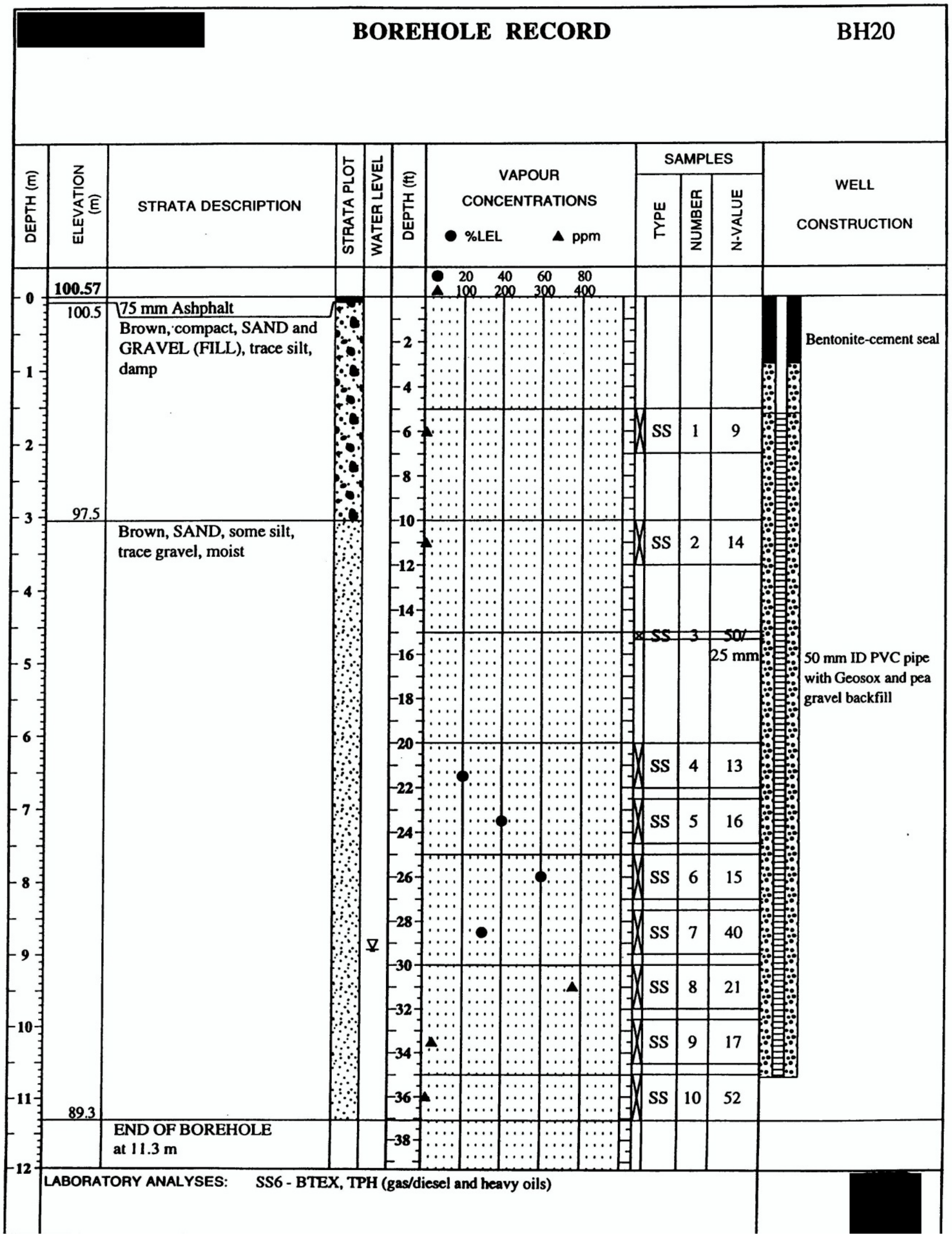
◆ = Sample submitted for laboratory analysis.

NA = Not applicable

[redacted]

BOREHOLE RECORD

BH20



DEPTH (m)	ELEVATION (m)	STRATA DESCRIPTION
0	100.57	
	100.5	75 mm Ashphalt
		Brown, compact, SAND and GRAVEL (FILL), trace silt, damp
3	97.5	Brown, SAND, some silt, trace gravel, moist
11.3	89.3	END OF BOREHOLE at 11.3 m

SAMPLES		
TYPE	NUMBER	N-VALUE
SS	1	9
SS	2	14
~~SS~~	~~3~~	~~50/~~ 25 mm
SS	4	13
SS	5	16
SS	6	15
SS	7	40
SS	8	21
SS	9	17
SS	10	52

Bentonite-cement seal

50 mm ID PVC pipe with Geosox and pea gravel backfill

LABORATORY ANALYSES: SS6 - BTEX, TPH (gas/diesel and heavy oils)

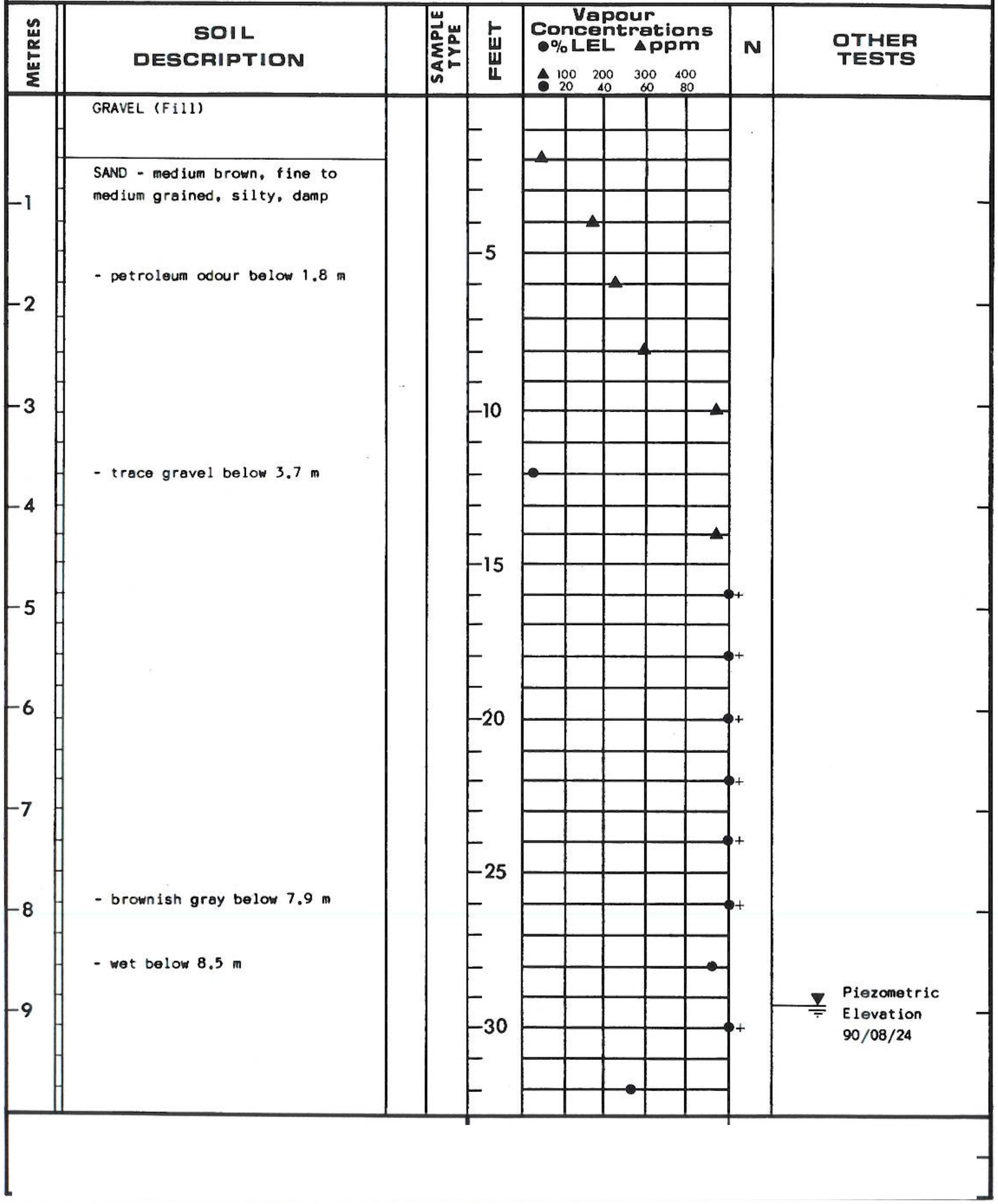
[redacted]

[redacted]

HOLE No.: BH5

DRILL: Auger

SAMPLE TYPE: ☐ SHELBY ☒ SPLIT SPOON ☐ CORE ☐ DISTURBED ☐ NO RECOVERY ☐ OTHER



GRAVEL (Fill)

SAND - medium brown, fine to medium grained, silty, damp

- petroleum odour below 1.8 m
- trace gravel below 3.7 m
- brownish gray below 7.9 m
- wet below 8.5 m

Piezometric Elevation 90/08/24

Appendix C: Calculation of residual BTEX mass in study area

Pre-injection residual BTEX concentrations were calculated using data from boreholes 401, 402, 403, 501, 502 and 503. Post-injection contaminant mass calculations were based on data from boreholes 601, 602 and 603. The post-injection boreholes were drilled adjacent to the previous ones to facilitate comparison.

Each soil sample was considered to represent a certain volume of aquifer material. The representative volume of each sample was based on its proximity to the next nearest sample; each sample was considered to represent half the distance to the next sample. The BTEX concentration in each representative volume of soil was calculated, and these values were summed to give an estimate of the total residual BTEX concentration for the study area.

Figure 1 below shows the plan view of study area divided up to show the representative volumes.

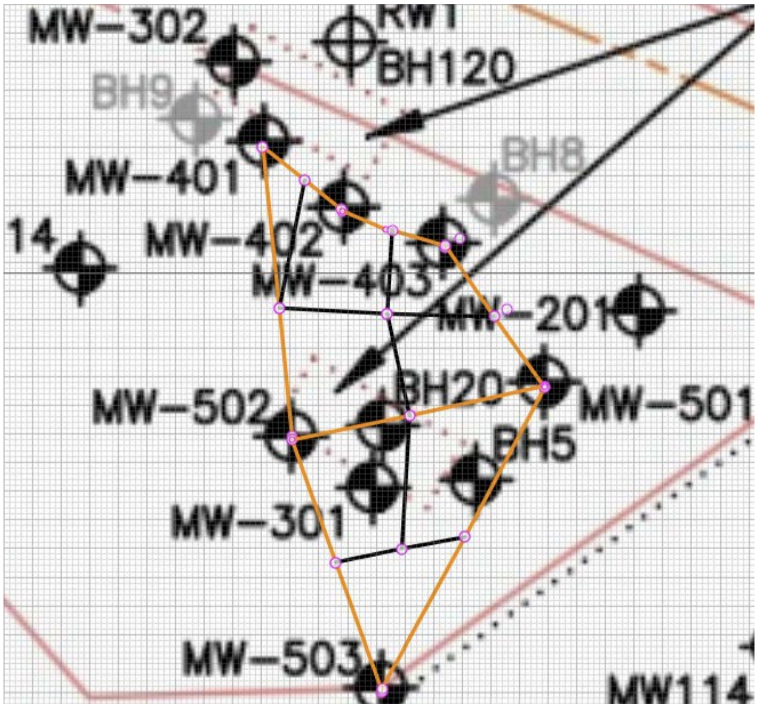
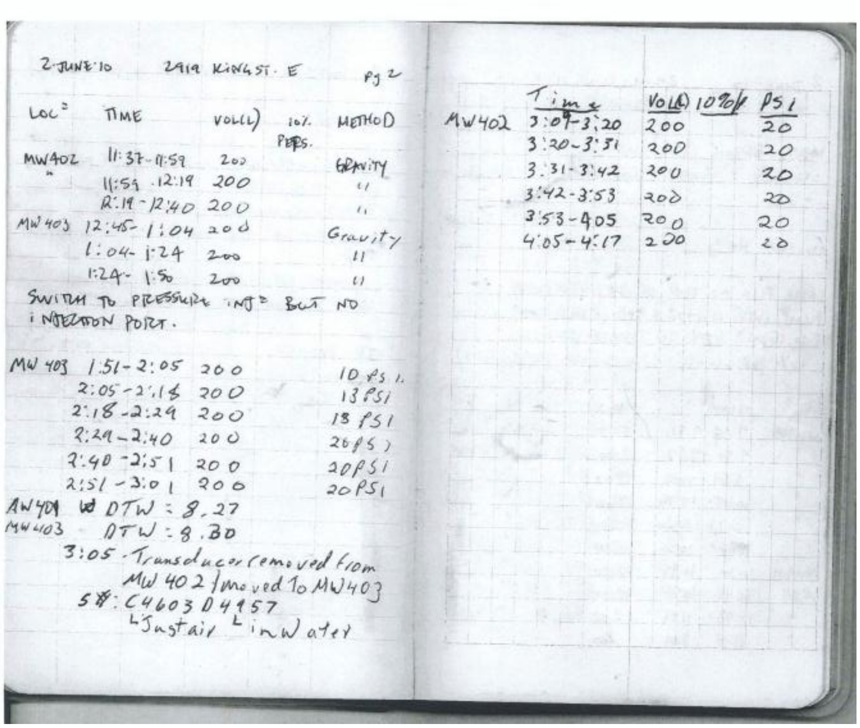


Figure 1 - Map in plan view showing the area represented by each borehole

For example, soil sample 502-3 was collected at a depth of 8.29 *m* and had 644.9 *mg/kg* of BTEX. 502-2 and 502-4 were collected at 8.12 *m* and 8.78 *m* respectively. The midpoint between 502-2 and 502-3 is thus 8.21 *m* and between 502-3 and 502-4 is 8.54 *m*. Therefore 502-3 represents the depth between 8.54 *m* and 8.21 *m*, which is a length of 0.33 *m*. The area represented by this well was found to be 7.26 m^2, so the volume represented by sample 502-3 is $0.33\ m \times 7.26\ m^2 = 2.40\ m^3$. Assuming the density of the soil to be about 2100 kg/m^3, this gives us 5040 *kg* of soil, which would theoretically contain about 3.25 *kg* of BTEX.

In this way, the estimated contaminant mass from all the boreholes was summed to determine the amount of BTEX mass in the study area before and after the injection.

Appendix D: Field Notes for Injection



2·JUNE·10 2919 KING ST. E Pg 2

LOC=	TIME	VOL(L)	10% PERS.	METHOD
MW402	11:37-11:59	200		GRAVITY
"	11:59 -12:19	200		"
	12:19-12:40	200		"
MW403	12:45-1:04	200		Gravity
	1:04-1:24	200		"
	1:24-1:50	200		"

SWITCH TO PRESSURE INJ= BUT NO INJECTION PORT.

MW 403	1:51-2:05	200	10 PSI
	2:05-2:18	200	13 PSI
	2:18-2:29	200	18 PSI
	2:29-2:40	200	20 PSI
	2:40-2:51	200	20 PSI
	2:51-3:01	200	20 PSI

AW404 DTW = 8.27

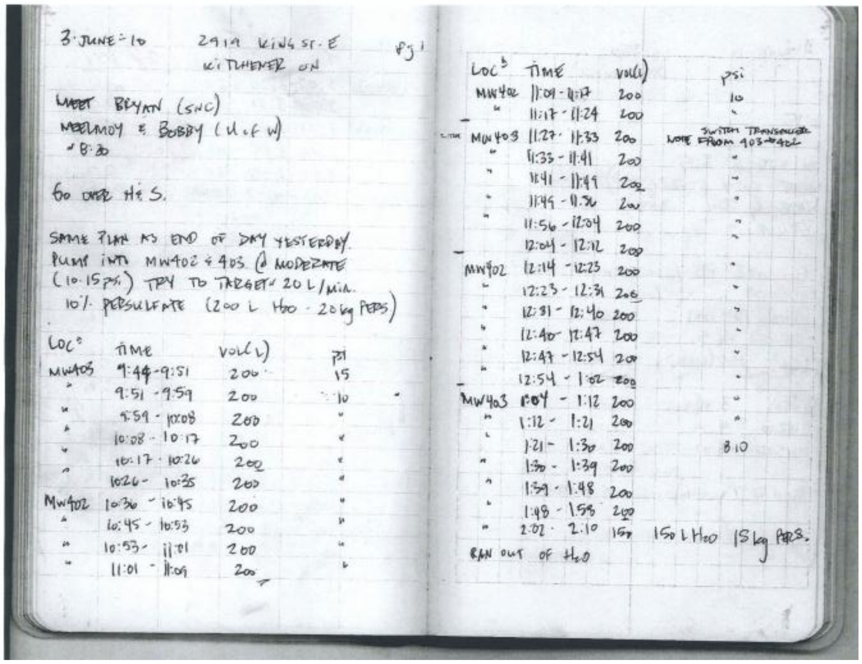
MW403 DTW = 8.30

3:05 - Transducer removed from MW 402 / moved to MW403

S#: C4603 D4957

└Just air └in Water

	Time	Vol(L)	10%/	PSI
MW402	3:09-3:20	200		20
	3:20-3:31	200		20
	3:31-3:42	200		20
	3:42-3:53	200		20
	3:53-4:05	200		20
	4:05-4:17	200		20



3·JUNE·10 2919 KING ST. E Pg 1

KITCHENER ON

MEET BRYAN (SNC)

MCELMOY & BOBBY (U of W)

~8:30

GO OVER H&S.

SAME PLAN AS END OF DAY YESTERDAY. PUMP INTO MW402 & 403 @ MODERATE (10-15 psi) TRY TO TARGET ~ 20 L/MIN.

10% PERSULFATE (200 L H2O - 20 kg PERS)

LOC=	TIME	VOL(L)	psi
MW403	9:44-9:51	200	15
"	9:51-9:59	200	10
"	9:59-10:08	200	"
"	10:08-10:17	200	"
"	10:17-10:26	200	"
"	10:26-10:35	200	"
MW402	10:36-10:45	200	"
"	10:45-10:53	200	"
"	10:53-11:01	200	"
"	11:01-11:09	200	"

LOC=	TIME	VOL(L)	psi
MW402	11:09-11:17	200	10
"	11:17-11:24	200	"
MW403	11:27-11:33	200	NOTE SWITCH TRANSDUCER FROM 403→402
"	11:33-11:41	200	"
"	11:41-11:49	200	"
"	11:49-11:56	200	"
"	11:56-12:04	200	"
	12:04-12:12	200	"
MW402	12:14-12:23	200	"
"	12:23-12:31	200	"
"	12:31-12:40	200	"
"	12:40-12:47	200	"
"	12:47-12:54	200	"
"	12:54-1:02	200	"
MW403	1:04-1:12	200	"
"	1:12-1:21	200	"
"	1:21-1:30	200	8-10
"	1:30-1:39	200	
"	1:39-1:48	200	
"	1:48-1:58	200	
"	2:02-2:10	150	150 L H2O 15 kg PERS.

RAN OUT OF H2O

Appendix E: Theoretical treatability of residual BTEX with xylene as proxy

Taking xylene (C_8H_{10}) as a proxy for BTEX, the reaction between xylene and persulphate is as follows:

$$\mathrm{C_8H_{10} + 21S_2O_8^{2-} + 16H_2O \rightarrow 8CO_2 + 42SO_4^{2-} + 42H^+} \text{ - (1)}$$

Now, $Na_2S_2O_8$ dissociates as shown below:

$$\mathrm{Na_2S_2O_8 \rightarrow 2Na^+ + S_2O_8^{2-}} \text{ - (2)}$$

1 mole of sodium persulphate thus dissociates to give one mole of persulphate. 1000 *kg* of sodium persulphate is $\frac{1\times10^6\,g}{238.03\ {}^{g}\!/_{mol}} = 4201.15\ mol$ of both sodium persulphate and the persulphate anion.

For every 21 moles of persulphate, 1 mole of xylene is consumed. Thus for about 4201 moles of persulphate, about 200 moles of xylene are consumed.

$$200\ mol \text{ of xylene} = \frac{200\ mol \times 106.16\ {}^{g}\!/_{mol}}{1000\ {}^{g}\!/_{kg}} = 21.2\ kg \text{ of xylene.}$$

Thus, 1000 *kg* of sodium persulphate can theoretically treat about 21 *kg* of xylene or BTEX.

Appendix F: Correction for dilution of BTEX levels by injection

The ratio of the volume of injected water to the total volume was calculated using the following relationships, with electrical conductivity acting as the conservative tracer:

$$C_{measured} = \left(\frac{V_{background}}{V_{total}}\right)\left(C_{\ background}\right) + \left(\frac{V_{injected}}{V_{total}}\right)\left(C_{\ injected}\right) \tag{8}$$

$$\begin{aligned} &V_{injected} + V_{background} = V_{total} \\ &\Rightarrow V_{background} = V_{total} - V_{injected} \end{aligned} \tag{9}$$

Putting equation (2) in equation (1),

$$C_{measured} = \left(\frac{V_{total} - V_{injected}}{V_{total}}\right)\left(C_{\ background}\right) + \left(\frac{V_{injected}}{V_{total}}\right)\left(C_{\ injected}\right)$$

$$C_{measured} = \frac{C_{\ background} \cdot \cancel{V_{total}}}{\cancel{V_{total}}} - \frac{C_{\ background} \cdot V_{injected}}{V_{total}} + C_{\ injected}\left(\frac{V_{injected}}{V_{total}}\right)$$

$$C_{measured} - C_{background} = \frac{V_{injected}}{V_{total}}\left(C_{injected} - C_{background}\right)$$

$$\Rightarrow \frac{V_{injected}}{V_{total}} = \frac{C_{measured} - C_{background}}{C_{injected} - C_{background}}$$

For example, let us consider MW 503-2.

Background EC was about 1300 *µS/cm*. The EC of the injectate solution was about 55000 *µS/cm*. The measured EC for day 78 was found to be 4120 *µS/cm*. Background BTEX was 34772 *µg/L*. Measured BTEX was 14227 *µg/L*.

Putting these values into $\frac{V_{injected}}{V_{total}} = \frac{C_{measured} - C_{background}}{C_{injected} - C_{background}}$, we get

$$\frac{V_{injected}}{V_{total}} = \frac{4120\ {}^{\mu S}\!/_{cm} - 1300\ {}^{\mu S}\!/_{cm}}{55000\ {}^{\mu S}\!/_{cm} - 1300\ {}^{\mu S}\!/_{cm}}$$

$$\Rightarrow \frac{V_{injected}}{V_{total}} = 0.05$$

Thus this sample was composed of about 5% injectate and 95% groundwater.

Therefore, if only dilution were occurring, the measured BTEX concentration should have been $C_{Background\ BTEX} \times 95\% = 32946\ {}^{\mu g}\!/_{L}$.

The measured concentration of BTEX was actually found to be 14227 $\mu g/L$. Thus, this reduction of about 56% took place due to factors other than dilution, presumed to be degradation due to the oxidant.

Appendix G: Correction for the dilution of inorganic soil samples in sample vial

Volume of soil collected = 8 *mL*

Average porosity = 0.31 (Chow, 2008)

Volume of solvent (DI water) in vial = 20 *mL*

$$\text{Porosity} = \frac{V_{voids}}{V_{total}}$$

$$\Rightarrow 0.31 = \frac{V_{voids}}{8\ mL}$$

$\Rightarrow V_{voids} = 2.48\ mL$ in each sample.

If we assume that the soil samples were 80% saturated (i.e. contained pore water in 80% of the volume of voids)

$V_{pore\ water} = 2.48 \times 80\% = 1.984\ mL$ per soil sample collected.

Thus for BH 601-1,

Measured sulphate concentration was 22.04 *mg/L*.

$$Concentration_1 \times Volume_1 = Concentration_2 \times Volume_2$$

$$\Rightarrow C_1 = \frac{22.04 \, {}^{mg}\!/_{L} \times (20\ mL + 1.984\ mL)}{1.984\ mL}$$

$$\Rightarrow C_1 = 244.2\ {}^{mg}\!/_{L}$$

Thus, the concentration of sulphate in the porewater of the soil sample before dilution was 244.2 *mg/L*.

Appendix H: SALTFLOW Model assumptions and parameters

Numerical model, SALTFLOW, was used to solve this two-dimensional density-dependent groundwater flow and mass transport problem.

The model is based on the following assumptions:
Chemical reactions are neglected, porous media is homogeneous, fluid is incompressible, saturated flow, isothermal, isotropic, uniform viscosity, 3D symmetric system.

The following physical parameters were also defined:

Physical Parameter	**Value**
Retardation	1
Longitudinal dispersivities	1.0 m
Transverse horizontal dispersivities	0.1 m
Transverse vertical dispersivities	0.005 m
Porosity	0.3
Hydraulic conductivity (K)	1×10^{-5} m/s
Gradient (i)	0.125
Flow Gradient (i)	0.005

Appendix I: Data tables

Lab Experiment – Natural Oxidant Interaction

Sample ID	Date	Sodium Persulphate (*g/L*)
1A	29-Apr-10	101.7
1B	29-Apr-10	96.7
2A	30-Apr-10	83.6
2B	30-Apr-10	92.6
3A	03-May-10	100.4
3B	03-May-10	103.8
4A	18-May-10	95.9
4B	18-May-10	92.3
Persulphate stock solution	03-May-10	101.5
Persulphate stock solution	18-May-10	101.5
Control 1	29-Apr-10	Not Detected
Control 2	30-Apr-10	Not Detected
Control 3	03-May-10	Not Detected
Control 4	18-May-10	Not Detected

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
401	24-Mar-10	-71	ND	12.504	900.165	N/A	394.9	9613.6	2268.0
	2-Jun-10	-1	N/A	N/A	N/A	4600	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			3046			
	3-Jun-10	0.625	N/A			3979			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1963			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			1636			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	50.224	349.8	2210			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	2820			
	2-Nov-10	152	N/A	N/A	N/A	N/A	N/A	N/A	N/A
402	24-Mar-10	-71	N/A	N/A	N/A	N/A	244.0	11482.1	2207.5
	2-Jun-10	-1	ND	39.479	288.448	3377	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			38000			
	3-Jun-10	0.625	N/A			52200			
	4-Jun-10	1	N/A			49400			
	11-Jun-10	8	N/A			17500			
	15-Jun-10	12	N/A			16480			
	28-Jun-10	25	N/A			5600			
	29-Jul-10	56	N/A			1462			
	9-Aug-10	67	N/A			1418			
	18-Aug-10	76	ND	125.283	177.8	1336			
	20-Aug-10	78	N/A			1806	74.001716	5139.245	711.1918254
	26-Aug-10	84	N/A			1938			
	7-Sep-10	96	ND	28.2234	188.4	1825	N/A	N/A	N/A
	20-Sep-10	109	N/A			1750			
	13-Oct-10	132	ND	25.6645	196.2	1509			
	2-Nov-10	152	ND	93.9012	N/A	1475	81.00165	5755.934	1047.709968
403	24-Mar-10	-71	ND	6.135	635.216	N/A	381.1	18745.7	2625.2
	2-Jun-10	-1	N/A	N/A	N/A	3495	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			30000			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			42200			
	11-Jun-10	8	N/A			13370			
	15-Jun-10	12	N/A			6020			
	28-Jun-10	25	N/A			3090			
	29-Jul-10	56	N/A			2920			
	9-Aug-10	67	N/A			3580			
	18-Aug-10	76	930.6	367.524	631.9	3100			
	20-Aug-10	78	N/A			3830	171.19194	13888.73	1238.133303
	26-Aug-10	84	N/A			3050			
	7-Sep-10	96	902.8	567.323	560.7	3860	277.83574	16424.91	1792.552325
	20-Sep-10	109	N/A			3440			
	13-Oct-10	132	460.8	N/A	343.2	2410			
	2-Nov-10	152	<MDL	116.5203	N/A	1894	175.55411	7072.576	1582.667308
301-3	24-Mar-10	-71	N/A	N/A	N/A	N/A	0.0	29814.5	2205.3
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	DRY			
	2-Nov-10	152	N/A	N/A	N/A	DRY	N/A	N/A	N/A
	24-Mar-10	-71	ND	5.057	N/A	N/A	95.1	14522.0	2387.4
	2-Jun-10	-1	N/A	N/A	N/A	3426	0.0	28.3	1.0
	3-Jun-10	0.375	N/A			2612			
	3-Jun-10	0.625	N/A			3050			
	4-Jun-10	1	N/A			1809			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
301-4	11-Jun-10	8	N/A			1585			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			1850			
	29-Jul-10	56	N/A			1163			
	9-Aug-10	67	N/A			1638			
	18-Aug-10	76	ND	31.525	N/A	1697			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			2230			
	7-Sep-10	96	ND	0.3073	N/A	2480	N/A	N/A	N/A
	20-Sep-10	109	N/A			2250			
	13-Oct-10	132	ND	6.6471	N/A	1945			
	2-Nov-10	152	ND	20.6262	N/A	1920	N/A	N/A	N/A
301-5	24-Mar-10	-71	ND	59.283	N/A	N/A	26.6	2128.6	292.3
	2-Jun-10	-1	N/A	N/A	N/A	3051	7.3	302.0	0.0
	3-Jun-10	0.375	N/A			2239			
	3-Jun-10	0.625	N/A			2317			
	4-Jun-10	1	N/A			1258			
	11-Jun-10	8	N/A			1297			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			1170			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	31.779	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			2020			
	7-Sep-10	96	ND	10.8525	N/A	2160	37.123087	3564.456	502.7145313
	20-Sep-10	109	N/A			2080			
	13-Oct-10	132	ND	21.7652	N/A	1768			
	2-Nov-10	152	ND	88.6458	N/A	1766	N/A	N/A	N/A
301-6	24-Mar-10	-71	N/A	N/A	N/A	N/A	44.2	3662.0	379.1
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1050			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			1009			
	29-Jul-10	56	N/A			1332			
	9-Aug-10	67	N/A			1731			
	18-Aug-10	76	N/A	N/A	N/A	1792			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			2130			
	7-Sep-10	96	N/A	N/A	N/A	2080	N/A	N/A	N/A
	20-Sep-10	109	N/A			1857			
	13-Oct-10	132	N/A	N/A	N/A	1885			
	2-Nov-10	152	N/A	N/A	N/A	1795	N/A	N/A	N/A
301-7	24-Mar-10	-71	N/A	N/A	N/A	N/A	3.2	44.0	3.2
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			982			
	9-Aug-10	67	N/A			1070			
	18-Aug-10	76	N/A	N/A	N/A	1155			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			1382			
	7-Sep-10	96	N/A	N/A	N/A	1503	N/A	N/A	N/A
	20-Sep-10	109	N/A			1376			
	13-Oct-10	132	N/A	N/A	N/A	1662			
	2-Nov-10	152	N/A	N/A	N/A	1645	N/A	N/A	N/A
302-2	24-Mar-10	-71	N/A	N/A	N/A	N/A	0.9	1.0	0.0
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	N/A			
	2-Nov-10	152	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302-3	24-Mar-10	-71	N/A	N/A	670.771	N/A	157.5	12293.4	1851.9
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	4.4474	509.9	3160	N/A	N/A	N/A
	20-Sep-10	109	N/A			3210			
	13-Oct-10	132	ND	10.5159	490.7	2570			
	2-Nov-10	152	ND	44.2764	N/A	3130	191.32479	10277.23	1260.071635
302-4	24-Mar-10	-71	ND	4.855	612.186	N/A	45.6	786.9	515.6
	2-Jun-10	-1	N/A	N/A	259.256	3646	63.3	438.7	18.6
	3-Jun-10	0.375	N/A			3218			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	<MDL	1.906	221	1525			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	0.2572	240.2	2220	N/A	N/A	N/A
	20-Sep-10	109	N/A			1931			
	13-Oct-10	132	ND	2.4111	362.5	2200			
	2-Nov-10	152	ND	8.3931	N/A	2180	81.784367	4523.247	703.8490253
302-5	24-Mar-10	-71	ND	45.027	533.6	N/A	75.0	305.6	173.4
	2-Jun-10	-1	N/A	N/A	239.963	5830	44.9	174.6	9.0
	3-Jun-10	0.375	N/A			2201			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	31.932	228.3	1486			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	15.6768	207	1852	N/A	N/A	N/A
	20-Sep-10	109	N/A			1590			
	13-Oct-10	132	ND	23.5841	210.1	1368			
	2-Nov-10	152	ND	81.4536	N/A	1577	90.22303	1473.743	849.6989025
302-6	24-Mar-10	-71	N/A	N/A	437.337	N/A	3.0	198.4	29.7
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (μS/cm)	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)
	13-Oct-10	132	N/A	N/A	N/A	1384			
	2-Nov-10	152	N/A	N/A	N/A	1590	N/A	N/A	N/A
302-7	24-Mar-10	-71	N/A	N/A	N/A	N/A	0.0	1.1	0.0
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	1517			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	1811	N/A	N/A	N/A
	20-Sep-10	109	N/A			1717			
	13-Oct-10	132	N/A	N/A	N/A	1537			
	2-Nov-10	152	N/A	N/A	N/A	1746	N/A	N/A	N/A
501-1	24-Mar-10	-71	N/A	N/A	N/A	N/A	124.7	11296.8	1063.3
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	N/A			
	2-Nov-10	152	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-2	24-Mar-10	-71	ND	2.103	N/A	N/A	94.3	3893.0	3070.4
	2-Jun-10	-1	ND	17.732	N/A	3284	79.9	1438.2	2813.0
	3-Jun-10	0.375	N/A			2353			
	3-Jun-10	0.625	N/A			2947			
	4-Jun-10	1	N/A			974			
	11-Jun-10	8	N/A			2100			
	15-Jun-10	12	N/A			1642			
	28-Jun-10	25	N/A			1567			
	29-Jul-10	56	N/A			1507			
	9-Aug-10	67	N/A			1550			
	18-Aug-10	76	ND	40.899	N/A	1522			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			1833			
	7-Sep-10	96	ND	12.7927	N/A	1901	N/A	N/A	N/A
	20-Sep-10	109	N/A			1790			
	13-Oct-10	132	ND	5.01605	N/A	1724			
	2-Nov-10	152	ND	10.1214	N/A	2340	62.571524	1185.824	2247.821283
501-3	24-Mar-10	-71	ND	45.211	N/A	N/A	91.4	483.6	3294.3
	2-Jun-10	-1	ND	51.036	N/A	3360	90.0	296.1	2514.5
	3-Jun-10	0.375	N/A			2302			
	3-Jun-10	0.625	N/A			2250			
	4-Jun-10	1	N/A			513			
	11-Jun-10	8	N/A			1579			
	15-Jun-10	12	N/A			1555			
	28-Jun-10	25	N/A			1603			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	50.966	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	17.2855	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	166.7	20.0641	N/A	1695			
	2-Nov-10	152	<MDL	96.4539	N/A	1904	N/A	N/A	N/A
	24-Mar-10	-71	N/A	N/A	N/A	N/A	5.7	150.5	33.7
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
501-4	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1235			
	15-Jun-10	12	N/A			1219			
	28-Jun-10	25	N/A			1542			
	29-Jul-10	56	N/A			1761			
	9-Aug-10	67	N/A			1740			
	18-Aug-10	76	N/A	N/A	N/A	1706			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			1958			
	7-Sep-10	96	N/A	N/A	N/A	2060	N/A	N/A	N/A
	20-Sep-10	109	N/A			1873			
	13-Oct-10	132	N/A	N/A	N/A	1475			
	2-Nov-10	152	N/A	N/A	N/A	1194	N/A	N/A	N/A
501-5	24-Mar-10	-71	N/A	N/A	N/A	N/A	7.4	184.3	33.7
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	N/A			
	2-Nov-10	152	N/A	N/A	N/A	1703	N/A	N/A	N/A
501-6	24-Mar-10	-71	N/A	N/A	N/A	N/A	11.1	190.1	12.2
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1080			
	15-Jun-10	12	N/A			1044			
	28-Jun-10	25	N/A			1085			
	29-Jul-10	56	N/A			1084			
	9-Aug-10	67	N/A			1198			
	18-Aug-10	76	N/A	N/A	N/A	1250			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			1568			
	7-Sep-10	96	N/A	N/A	N/A	1614	N/A	N/A	N/A
	20-Sep-10	109	N/A			1543			
	13-Oct-10	132	N/A	N/A	N/A	1431			
	2-Nov-10	152	N/A	N/A	N/A	1646	N/A	N/A	N/A
501-7	24-Mar-10	-71	N/A	N/A	N/A	N/A	26.4	143.6	46.5
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			1495			
	9-Aug-10	67	N/A			1663			
	18-Aug-10	76	N/A	N/A	N/A	1700			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			1715			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			1600			
	13-Oct-10	132	N/A	N/A	N/A	1493			
	2-Nov-10	152	N/A	N/A	N/A	1705	N/A	N/A	N/A
	24-Mar-10	-71	ND	5.277	740.569	N/A	87.0	5186.8	418.5
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
502-1	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			0			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			0	N/A	N/A	N/A
	26-Aug-10	84	N/A			0			
	7-Sep-10	96	N/A	N/A	N/A	0	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	N/A			
	2-Nov-10	152	N/A	N/A	N/A	DRY	N/A	N/A	N/A
502-2	24-Mar-10	-71	ND	2.08	671.58	N/A	103.6	5725.3	965.2
	2-Jun-10	-1	ND	5.441	372.186	3872	197.8	9932.0	2120.3
	3-Jun-10	0.375	N/A			3158			
	3-Jun-10	0.625	N/A			3150			
	4-Jun-10	1	N/A			2050			
	11-Jun-10	8	N/A			1910			
	15-Jun-10	12	N/A			2000			
	28-Jun-10	25	N/A			1682			
	29-Jul-10	56	N/A			2700			
	9-Aug-10	67	N/A			3760			
	18-Aug-10	76	ND	531.389	355.5	2360			
	20-Aug-10	78	N/A			2710	124.06463	7866.995	1328.833082
	26-Aug-10	84	N/A			3600			
	7-Sep-10	96	ND	1136.511	615.4	4550	36.187172	2255.122	260.6285082
	20-Sep-10	109	N/A			2100			
	13-Oct-10	132	ND	N/A	316.9	2340			
	2-Nov-10	152	ND	60.2097	N/A	2910	79.619335	3784.541	1032.77155
502-3	24-Mar-10	-71	ND	52.351	491.883	N/A	54.4	1406.6	372.0
	2-Jun-10	-1	ND	43.705	154.307	2735	22.3	205.9	8.2
	3-Jun-10	0.375	N/A			2102			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			1160			
	11-Jun-10	8	N/A			1304			
	15-Jun-10	12	N/A			1290			
	28-Jun-10	25	N/A			1307			
	29-Jul-10	56	N/A			3070			
	9-Aug-10	67	N/A			4360			
	18-Aug-10	76	79.5	1113.094	532.8	3200			
	20-Aug-10	78	N/A			4510	N/A	N/A	N/A
	26-Aug-10	84	N/A			4470			
	7-Sep-10	96	ND	818.755	458	3410	35.419609	992.169	433.8079102
	20-Sep-10	109	N/A			1759			
	13-Oct-10	132	259.8	N/A	234.2	1797			
	2-Nov-10	152	ND	143.3013	N/A	1730	27.179631	570.7634	217.0313856
502-4	24-Mar-10	-71	N/A	N/A	N/A	N/A	58.4	324.5	67.5
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1250			
	15-Jun-10	12	N/A			1175			
	28-Jun-10	25	N/A			1265			
	29-Jul-10	56	N/A			2620			
	9-Aug-10	67	N/A			2350			
	18-Aug-10	76	626.4	303.075	505.7	2590			
	20-Aug-10	78	N/A			2920	28.457469	952.7338	165.6904156
	26-Aug-10	84	N/A			1785			
	7-Sep-10	96	138.8	12.3665	197.2	1644	N/A	N/A	N/A
	20-Sep-10	109	N/A			1462			
	13-Oct-10	132	ND	9.0582	196.8	1534			
	2-Nov-10	152	ND	34.8186	N/A	1719	42.577394	1144.322	282.9717876
502-5	24-Mar-10	-71	ND	40.276	451.176	N/A	12.9	473.3	49.2
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			3060			
	9-Aug-10	67	N/A			2770			
	18-Aug-10	76	265	116.567	352.4	1988			
	20-Aug-10	78	N/A			2050	25.287694	744.4486	125.8030077
	26-Aug-10	84	N/A			2070			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (μS/cm)	Benzene (μg/L)	Toluene (μg/L)	Ethylbenzene (μg/L)
	7-Sep-10	96	97.2	15.184	147.5	1888	N/A	N/A	N/A
	20-Sep-10	109	N/A			1740			
	13-Oct-10	132	<MDL	10.2343	199.1	1669			
	2-Nov-10	152	ND	41.22645	N/A	1769	18.006269	605.6373	143.0323467
502-6	24-Mar-10	-71	ND	29.327	436.226	N/A	0.0	23.6	4.3
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1077			
	15-Jun-10	12	N/A			1037			
	28-Jun-10	25	N/A			1041			
	29-Jul-10	56	N/A			4490			
	9-Aug-10	67	N/A			5770			
	18-Aug-10	76	1169	253.486	599.9	2560			
	20-Aug-10	78	N/A			2200	26.326373	965.5678	111.3449358
	26-Aug-10	84	N/A			2030			
	7-Sep-10	96	138.8	36.5042	374.2	2000	21.76814	756.1222	141.707055
	20-Sep-10	109	N/A			1872			
	13-Oct-10	132	235.3	13.5714	199.1	1918			
	2-Nov-10	152	123.6	80.4957	N/A	1893	16.209643	449.6687	72.31264935
502-7	24-Mar-10	-71	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			4880			
	18-Aug-10	76	N/A	N/A	N/A	4200			
	20-Aug-10	78	N/A			3840	N/A	N/A	N/A
	26-Aug-10	84	N/A			0			
	7-Sep-10	96	N/A	N/A	N/A	0	N/A	N/A	N/A
	20-Sep-10	109	N/A			0			
	13-Oct-10	132	N/A	N/A	N/A	MUD			
	2-Nov-10	152	N/A	N/A	N/A	MUD	N/A	N/A	N/A
503-1	24-Mar-10	-71	N/A	N/A	N/A	N/A	131.4	7334.6	2252.8
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	0			
	20-Aug-10	78	N/A			3060	9.027515	1662.609	510.2820164
	26-Aug-10	84	N/A			`			
	7-Sep-10	96	ND	2.7753	408.6	0	N/A	N/A	N/A
	20-Sep-10	109	N/A			0			
	13-Oct-10	132	N/A	N/A	N/A	DRY			
	2-Nov-10	152	N/A	N/A	N/A	DRY	N/A	N/A	N/A
503-2	24-Mar-10	-71	ND	17.031	512.388	N/A	83.4	7477.0	2597.2
	2-Jun-10	-1	ND	1.706	272.186	3602	81.3	6294.5	2444.1
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			1293			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	2.423	504.1	3150			
	20-Aug-10	78	N/A			4120	26.533346	2888.835	1097.182219
	26-Aug-10	84	N/A			4090			
	7-Sep-10	96	ND	0.3769	583.5	4130	28.288531	2736.646	1152.017195
	20-Sep-10	109	N/A			3690			
	13-Oct-10	132	ND	0.6424	647.8	3790			
	2-Nov-10	152	142.6	6.9534	595.9	2154	65.62994	4124.553	2214.298706
	24-Mar-10	-71	N/A	N/A	N/A	N/A	49.8	83.2	429.2

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
503-3	2-Jun-10	-1	186	87.892	169.862	4556	33.6	186.0	150.0
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			1306			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	ND	61.889	517.7	3290			
	20-Aug-10	78	N/A			4010	11.863926	282.9297	109.0909497
	26-Aug-10	84	N/A			3440			
	7-Sep-10	96	291.7	18.41785	304.4	1889	27.632394	596.8506	340.6095808
	20-Sep-10	109	N/A			1540			
	13-Oct-10	132	ND	16.7065	450.1	2950			
	2-Nov-10	152	ND	83.2035	576.2	3920	16.675171	617.6052	338.0946206
503-4	24-Mar-10	-71	ND	40.821	427.64	N/A	0.0	39.3	7.4
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	2820			
	20-Aug-10	78	N/A			3290	5.0402461	353.1913	109.0079374
	26-Aug-10	84	N/A			3530			
	7-Sep-10	96	ND	17.6507	376.7	2630	5.1019356	277.3256	72.52085989
	20-Sep-10	109	N/A			2130			
	13-Oct-10	132	ND	12.564	223.9	2220			
	2-Nov-10	152	ND	59.7843	208.4	2310	9.8632978	670.0157	304.798163
503-5	24-Mar-10	-71	ND	33.903	457.741	N/A	0.0	19.2	1.5
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	2300			
	20-Aug-10	78	N/A			2460	3.1990217	203.3953	73.60313164
	26-Aug-10	84	N/A			2640			
	7-Sep-10	96	ND	13.5521	330.2	2690	N/A	N/A	N/A
	20-Sep-10	109	N/A			2080			
	13-Oct-10	132	ND	11.2808	263.3	1610			
	2-Nov-10	152	ND	34.6182	N/A	1616	N/A	N/A	N/A
503-6	24-Mar-10	-71	ND	35.606	404.913	N/A	0.0	47.3	6.0
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	1656			
	20-Aug-10	78	N/A			1808	4.5670051	279.0824	129.7890264
	26-Aug-10	84	N/A			1725			
	7-Sep-10	96	<MDL	19.4116	180.5	2100	N/A	N/A	N/A
	20-Sep-10	109	N/A			1709			
	13-Oct-10	132	ND	32.8931	183.9	1683			
	2-Nov-10	152	ND	102.4173	N/A	1748	N/A	N/A	N/A
	24-Mar-10	-71	N/A	N/A	N/A	N/A	2.2	162.9	31.9
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			

Well	Date Sampled	Days since Injection	Persulphate (mg/L)	Sulphate (mg/L)	Sodium (mg/L)	Electrical Conductivity (µS/cm)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)
503-7	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	1505			
	20-Aug-10	78	N/A			1554	0	7.174575	0
	26-Aug-10	84	N/A			1772			
	7-Sep-10	96	ND	55.3584	223.1	1852	1.1253206	26.45401	4.856345444
	20-Sep-10	109	N/A			1392			
	13-Oct-10	132	ND	37.7886	242.5	1931			
	2-Nov-10	152	ND	107.0151	N/A	1967	0	14.77547	1.251761471
BH 20	24-Mar-10	-71	ND	28.925	N/A	N/A	43.8	2879.6	642.6
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			2925			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			1778			
	15-Jun-10	12	N/A			1578			
	28-Jun-10	25	N/A			1456			
	29-Jul-10	56	N/A			1374			
	9-Aug-10	67	N/A			1591			
	18-Aug-10	76	ND	20.722	N/A	1532			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	12.2787	N/A	1815	N/A	N/A	N/A
	20-Sep-10	109	N/A			1691			
	13-Oct-10	132	ND	9.546	N/A	1593			
	2-Nov-10	152	ND	24.6114	N/A	1893	N/A	N/A	N/A
BH 28	24-Mar-10	-71	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	ND	33.115	N/A	3620	N/A	N/A	N/A
	20-Sep-10	109	N/A			3130			
	13-Oct-10	132	519.6	13.1261	N/A	2890			
	2-Nov-10	152	ND	69.0798	N/A	0	N/A	N/A	N/A
BH 5	24-Mar-10	-71	N/A	N/A	N/A	N/A	240.0	7715.0	2131.1
	2-Jun-10	-1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10	0.375	N/A			N/A			
	3-Jun-10	0.625	N/A			N/A			
	4-Jun-10	1	N/A			N/A			
	11-Jun-10	8	N/A			N/A			
	15-Jun-10	12	N/A			N/A			
	28-Jun-10	25	N/A			N/A			
	29-Jul-10	56	N/A			N/A			
	9-Aug-10	67	N/A			N/A			
	18-Aug-10	76	N/A	N/A	N/A	N/A			
	20-Aug-10	78	N/A			N/A	N/A	N/A	N/A
	26-Aug-10	84	N/A			N/A			
	7-Sep-10	96	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10	109	N/A			N/A			
	13-Oct-10	132	N/A	N/A	N/A	N/A			
	2-Nov-10	152	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
401	24-Mar-10	11618.0	5405.9	29300.3	700.8	2964.6	776.1	589.6	34331.3
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
402	24-Mar-10	9662.4	4955.1	28551.1	512.2	2238.2	632.2	430.9	32364.6
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	3490.12	1667.2122	11081.8	180.8482226	805.3628785	216.240375	153.9992869	12438.21719
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	4969.71	2400.5112	14254.9	230.3452174	978.198525	279.032743	216.0620937	15958.50146
403	24-Mar-10	16154.4	7487.8	45394.2	990.3	4120.7	1091.0	796.2	52392.3
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	8137.5	4073.9216	27509.5	307.7541555	1338.739744	380.7811	291.9668411	29828.72234
	26-Aug-10								
	7-Sep-10	12157.7	5852.3522	36505.3	478.5601683	2143.502861	593.775097	460.2809662	40181.42228
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	8327.8	3918.0558	21076.7	351.2540194	1719.143634	446.247549	343.9084249	23937.21075
301-3	24-Mar-10	22102.2	11464.7	65586.7	1252.2	4302.6	1321.1	691.1	73153.6
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	24-Mar-10	13976.8	6556.3	37537.6	661.4	2629.9	782.0	576.4	42187.3
	2-Jun-10	67.1	48.0	144.4	5.9	27.1	13.5	10.2	201.1
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
301-4	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301-5	24-Mar-10	1942.6	1028.1	5418.3	118.3	473.7	143.8	73.0	6227.0
	2-Jun-10	638.3	347.9	1295.6	45.9	156.7	56.0	25.0	1579.2
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	3688.6	1905.8587	9698.8	226.1151427	757.9000187	243.452374	132.155997	11058.37561
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301-6	24-Mar-10	2857.4	1511.0	8453.8	171.8	582.5	191.5	92.6	9492.2
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
301-7	24-Mar-10	31.2	70.9	152.4	1.5	7.3	1.9	3.7	166.8
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302-2	24-Mar-10	2.8	9.9	14.7	0.0	0.7	0.0	1.5	16.9
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302-3	24-Mar-10	10249.5	5109.5	29661.9	452.1	1678.7	560.8	412.3	32765.7
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	6795.07	3488.9189	22012.6	285.5725908	1139.206535	394.18099	295.3995337	24126.97337
302-4	24-Mar-10	1610.3	693.6	3652.0	84.5	558.4	172.6	239.6	4707.2
	2-Jun-10	847.5	411.9	1780.1	98.4	924.1	269.1	102.3	3174.0
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	2666.15	1388.5831	9363.6	112.2021774	701.2795491	224.230315	158.0562245	10559.38197
302-5	24-Mar-10	414.1	196.1	1164.1	28.6	176.1	48.6	39.9	1457.4
	2-Jun-10	425.2	192.6	846.3	23.0	151.3	41.3	2.1	1064.0
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	3545.44	951.46448	6910.6	144.3642088	1200.602559	284.915037	282.8087725	8823.262416
302-6	24-Mar-10	178.0	107.0	516.1	9.1	43.9	20.2	20.0	609.4
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
302-7	24-Mar-10	2.2	42.3	45.6	0.0	0.9	0.0	0.0	46.5
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-1	24-Mar-10	7879.2	4051.3	24415.4	322.9	1343.5	399.5	286.4	26767.7
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-2	24-Mar-10	18068.6	8316.0	33442.3	797.6	3300.3	935.8	708.4	39184.5
	2-Jun-10	16357.6	7544.1	28232.8	719.4	2907.4	869.0	498.7	33227.2
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	13544.5	5962.6227	23003.4	659.6527531	2456.122093	779.314388	456.2083994	27354.66834
501-3	24-Mar-10	16249.6	5733.6	25852.5	715.5	2991.3	858.1	685.1	31102.6
	2-Jun-10	12535.1	4623.5	20059.0	658.5	2683.1	835.6	611.8	24848.0
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	24-Mar-10	256.4	118.7	565.0	20.6	93.1	27.0	9.9	715.5
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
501-4	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-5	24-Mar-10	174.8	94.1	494.3	8.7	38.1	14.2	5.2	560.5
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-6	24-Mar-10	107.8	154.7	475.8	7.9	63.1	19.3	2.8	568.9
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
501-7	24-Mar-10	534.8	4.7	756.0	55.6	240.6	61.2	6.9	1120.3
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	24-Mar-10	6280.9	3421.6	15394.8	240.9	719.8	198.7	77.8	16632.1
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
502-1	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
502-2	24-Mar-10	4918.3	2546.5	14258.9	181.3	778.8	247.7	208.4	15675.1
	2-Jun-10	10964.6	5468.1	28682.8	442.5	1794.9	570.6	395.1	31886.0
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	7874.69	4135.5022	21330.1	308.2851652	1183.600886	390.012307	247.7264945	23459.70676
	26-Aug-10								
	7-Sep-10	2206.53	1436.6452	6195.1	82.21014739	269.4156191	99.4445437	51.992191	6698.177711
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	5693.17	3043.6622	13633.8	214.9524977	869.8259212	292.643462	202.7713742	15213.95542
502-3	24-Mar-10	1747.8	745.5	4326.3	120.7	622.8	129.0	98.2	5296.9
	2-Jun-10	895.4	351.3	1483.1	88.5	158.1	44.4	0.0	1774.1
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	2738.84	1065.7019	5265.9	169.2218086	714.3804756	216.392515	115.7547529	6481.689441
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	1647.06	819.05608	3281.1	111.5567797	450.58433	129.575951	67.85477676	4040.660599
502-4	24-Mar-10	371.4	165.1	986.8	26.0	105.3	48.3	15.0	1181.3
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	1504.81	917.10666	3568.8	79.03274479	300.9321827	106.275695	38.17897549	4093.218719
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	2628.76	1413.2753	5511.9	142.2571252	474.3796143	164.590541	62.11095822	6355.247668
502-5	24-Mar-10	268.0	151.1	954.5	12.9	58.2	20.5	14.9	1061.0
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	1943.44	1073.6126	3912.6	110.6738301	425.7238372	143.812758	50.75468632	4643.556327
	26-Aug-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	1934.07	1127.048	3827.8	118.9294463	352.9889304	136.025876	36.2557193	4471.991838
502-6	24-Mar-10	28.0	15.9	71.7	0.7	3.5	2.0	1.9	79.8
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	1733.42	1010.8728	3847.5	73.37926667	277.5505298	102.066461	32.7665962	4333.292237
	26-Aug-10								
	7-Sep-10	1907.39	1152.5356	3979.5	100.7325767	307.6679089	118.574464	27.80054442	4534.295375
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	1616.1	1000.6085	3154.9	110.9411288	297.566502	116.937408	17.18858631	3697.532013
502-7	24-Mar-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
503-1	24-Mar-10	17214.2	6982.4	33915.4	718.1	2949.0	847.1	684.1	39113.8
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	3946.22	1734.8845	7863.0	127.340023	502.0088699	195.559368	151.2890618	8839.216822
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
503-2	24-Mar-10	13875.3	5687.9	29720.8	699.5	2899.0	813.9	639.3	34772.5
	2-Jun-10	13754.6	5770.0	28344.5	685.4	2868.5	822.4	606.5	33327.1
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	5868.42	2641.7392	12522.7	237.6031006	944.3271616	299.729384	223.1202968	14227.48468
	26-Aug-10								
	7-Sep-10	6082.55	2742.7526	12742.3	273.7611263	1138.81869	354.664165	294.539601	14804.03638
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	12123.5	5015.853	23543.8	631.1052422	2612.207032	738.860933	562.3917636	28088.36393
	24-Mar-10	2644.4	683.4	3890.1	525.5	1954.0	483.6	266.1	7119.2

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
503-3	2-Jun-10	976.2	273.4	1619.1	396.9	1324.4	360.0	153.1	3853.5
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	691.856	240.03952	1335.8	135.8751195	449.5879521	114.767556	40.98540397	2076.995869
	26-Aug-10								
	7-Sep-10	2203.93	709.33007	3878.4	248.8684583	842.8074739	219.28479	104.5702959	5293.881785
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	2131.93	725.95271	3830.3	159.609734	555.7980629	150.627873	73.07699137	4769.365954
503-4	24-Mar-10	43.3	18.2	108.3	0.9	4.5	2.3	2.2	118.1
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	748.691	239.45218	1455.4	25.38637525	73.72098582	28.0981068	12.30672493	1594.894874
	26-Aug-10								
	7-Sep-10	497.224	176.75459	1028.9	15.74751197	47.72182298	16.6986599	8.20686081	1117.302308
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	1998.91	603.14421	3586.7	64.3436066	199.8673519	64.4358535	30.5827366	3945.962783
503-5	24-Mar-10	12.4	6.1	39.2	0.0	1.1	0.8	0.0	41.1
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	508.39	159.37518	948.0	19.46632199	53.80842047	22.3456328	8.473545894	1052.056751
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
503-6	24-Mar-10	55.2	29.0	137.4	1.9	5.7	3.5	1.0	149.5
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	852.416	296.08784	1561.9	31.64976346	111.2835769	39.1794066	21.88066993	1765.935675
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	24-Mar-10	264.0	165.2	626.1	13.4	50.3	17.0	11.8	718.7
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								

Well	Date Sampled	p,m-Xylene (µg/L)	o-Xylene (µg/L)	Total BTEX (µg/L)	1,3,5-Trimethyl-Benzene (µg/L)	1,2,4-Trimethyl-Benzene (µg/L)	1,2,3-Trimethyl-Benzene (µg/L)	Naphthalene (µg/L)	Total BTEX, TMBs, Naphthalene (µg/L)
503-7	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	11.5194	1971.1374	1989.8	1.143352099	2.560490985	1.68050721	0	1995.215687
	26-Aug-10								
	7-Sep-10	27.2233	139.83662	199.5	1.168391342	5.040126319	1.83083332	0.859906008	208.3948313
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	10.0891	33.759563	59.9	0	2.125334694	0.95764751	0	62.95892008
BH 20	24-Mar-10	3841.4	1724.8	9132.2	300.9	1243.8	336.4	243.3	11256.5
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BH 28	24-Mar-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
BH 5	24-Mar-10	26076.6	12558.2	48720.9	3584.0	13874.7	3350.9	1559.4	71089.9
	2-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	3-Jun-10								
	3-Jun-10								
	4-Jun-10								
	11-Jun-10								
	15-Jun-10								
	28-Jun-10								
	29-Jul-10								
	9-Aug-10								
	18-Aug-10								
	20-Aug-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	26-Aug-10								
	7-Sep-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	20-Sep-10								
	13-Oct-10								
	2-Nov-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
401	24-Mar-10	38885.2	9484.9	101.3	48471.4	80.22%	19.57%	0.21%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
402	24-Mar-10	36986.5	8276.1	142.1	45404.6	81.46%	18.23%	0.31%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	14738.26	2050.631	86.33567	16875.22211	87.34%	12.15%	0.51%
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	18399.97	3720.958	11.88287	22132.80669	83.13%	16.81%	0.05%
403	24-Mar-10	59114.8	13213.4	245.5	72573.6	81.45%	18.21%	0.34%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	33254.99	8177.672	43.50053	41476.16173	80.18%	19.72%	0.10%
	26-Aug-10							
	7-Sep-10	44536.31	8542.894	2106.291	55185.4945	80.70%	15.48%	3.82%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	27185.51	6375.305	290.6816	33851.4987	80.31%	18.83%	0.86%
301-3	24-Mar-10	85087.8	5687.2	199.5	90974.5	93.53%	6.25%	0.22%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
	24-Mar-10	46365.3	6861.9	86.6	53313.8	86.97%	12.87%	0.16%
	2-Jun-10	233.4	101.2	189.8	524.5	44.51%	19.30%	36.19%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							

Well	Date Sampled	F1 Fraction (μg/L)	F2 Fraction (μg/L)	F3 Fraction (μg/L)	Total (μg/L)	%F1	%F2	%F3
301-4	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
301-5	24-Mar-10	6980.8	2508.0	57.1	9545.9	73.13%	26.27%	0.60%
	2-Jun-10	1960.6	427.3	127.5	2515.4	77.94%	16.99%	5.07%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	13260.4	1913.955	6.435897	15180.79022	87.35%	12.61%	0.04%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
301-6	24-Mar-10	10665.9	2220.6	77.0	12963.4	82.28%	17.13%	0.59%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
301-7	24-Mar-10	219.6	36.1	236.3	492.0	44.64%	7.34%	48.02%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
302-2	24-Mar-10	24.4	8.1	203.0	235.5	10.34%	3.44%	86.21%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
302-3	24-Mar-10	36242.5	4828.7	181.1	41252.4	87.86%	11.71%	0.44%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	27061.86	4567.19	29.51995	31658.57496	85.48%	14.43%	0.09%
302-4	24-Mar-10	5023.1	3141.7	220.3	8385.1	59.90%	37.47%	2.63%
	2-Jun-10	4552.6	2571.3	4.0	7127.9	63.87%	36.07%	0.06%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	11962.34	2946.682	10.65632	14919.67785	80.18%	19.75%	0.07%
302-5	24-Mar-10	2007.6	832.5	142.3	2982.4	67.32%	27.91%	4.77%
	2-Jun-10	1487.2	445.7	51.2	1984.1	74.96%	22.46%	2.58%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	9951.708	3833.149	6.369776	13791.22667	72.16%	27.79%	0.05%
302-6	24-Mar-10	639.3	177.3	81.9	898.5	71.16%	19.73%	9.11%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
302-7	24-Mar-10	63.0	17.9	49.8	130.8	48.19%	13.71%	38.10%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
501-1	24-Mar-10	29513.3	4350.8	27.2	33891.3	87.08%	12.84%	0.08%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
501-2	24-Mar-10	43181.5	8448.2	25.5	51655.2	83.60%	16.35%	0.05%
	2-Jun-10	37315.5	10143.9	3.0	47462.4	78.62%	21.37%	0.01%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	30969.62	8629.062	14.18255	39612.86386	78.18%	21.78%	0.04%
501-3	24-Mar-10	34161.4	7665.6	40.6	41867.6	81.59%	18.31%	0.10%
	2-Jun-10	27257.1	8814.2	4.4	36075.7	75.56%	24.43%	0.01%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
	24-Mar-10	1073.6	641.1	24.8	1739.5	61.72%	36.85%	1.43%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
501-4	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
501-5	24-Mar-10	655.8	174.7	32.1	862.6	76.02%	20.25%	3.73%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
501-6	24-Mar-10	1468.0	643.4	54.3	2165.7	67.78%	29.71%	2.51%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
501-7	24-Mar-10	2536.6	1447.0	168.4	4152.0	61.09%	34.85%	4.06%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
	24-Mar-10	18954.4	4941.3	110.5	24006.1	78.96%	20.58%	0.46%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
502-1	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
502-2	24-Mar-10	17223.1	2499.1	63.6	19785.9	87.05%	12.63%	0.32%
	2-Jun-10	35549.6	6116.2	69.0	41734.7	85.18%	14.65%	0.17%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	28047.37	5885.823	24.72465	33957.91336	82.59%	17.33%	0.07%
	26-Aug-10							
	7-Sep-10	8131.532	5603.075	55.62615	13790.23337	58.97%	40.63%	0.40%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	17172.01	4879.678	19.16425	22070.8527	77.80%	22.11%	0.09%
502-3	24-Mar-10	5931.6	2283.0	68.9	8283.5	71.61%	27.56%	0.83%
	2-Jun-10	2350.3	577.1	8.2	2935.6	80.06%	19.66%	0.28%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	7216.419	4374.312	70.35297	11661.08445	61.88%	37.51%	0.60%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	5213.702	1969.205	37.19787	7220.105779	72.21%	27.27%	0.52%
502-4	24-Mar-10	2085.4	1688.0	34.0	3807.4	54.77%	44.34%	0.89%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	4987.509	1990.783	42.03007	7020.322083	71.04%	28.36%	0.60%
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	8292.076	2219.021	19.27377	10530.37034	78.74%	21.07%	0.18%
502-5	24-Mar-10	1206.9	213.9	29.3	1450.2	83.22%	14.75%	2.02%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	5619.895	1616.685	71.89509	7308.47416	76.90%	22.12%	0.98%
	26-Aug-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	5462.392	1404.157	113.221	6979.770733	78.26%	20.12%	1.62%
502-6	24-Mar-10	88.7	17.7	20.0	126.5	70.15%	14.02%	15.83%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	5160.148	1866.571	198.1678	7224.886737	71.42%	25.84%	2.74%
	26-Aug-10							
	7-Sep-10	5468.165	1092.261	25.3467	6585.772124	83.03%	16.59%	0.38%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	4550.628	1244.463	9.928657	5805.018978	78.39%	21.44%	0.17%
502-7	24-Mar-10	N/A	N/A	N/A	N/A			
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
503-1	24-Mar-10	42754.8	8466.5	34.4	51255.7	83.41%	16.52%	0.07%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	10229.12	1805.29	27.20577	12061.62058	84.81%	14.97%	0.23%
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
503-2	24-Mar-10	38132.2	7580.1	10.2	45722.5	83.40%	16.58%	0.02%
	2-Jun-10	36780.0	10063.4	2.7	46846.1	78.51%	21.48%	0.01%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	16692.99	1875.805	5.939177	18574.73699	89.87%	10.10%	0.03%
	26-Aug-10							
	7-Sep-10	16120.03	3676.626	18.8401	19815.49615	81.35%	18.55%	0.10%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	31461.84	8477.578	4.897922	39944.31425	78.76%	21.22%	0.01%
	24-Mar-10	7856.9	5271.5	76.0	13204.4	59.50%	39.92%	0.58%

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
503-3	2-Jun-10	6003.0	3288.0	2.7	9293.7	64.59%	35.38%	0.03%
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	2853.787	1071.7	4.434559	3929.921532	72.62%	27.27%	0.11%
	26-Aug-10							
	7-Sep-10	6114.616	3250.865	43.72985	9409.211142	64.99%	34.55%	0.46%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	6191.167	1580.252	5.395719	7776.814055	79.61%	20.32%	0.07%
503-4	24-Mar-10	176.2	1257.5	1503.6	2937.3	6.00%	42.81%	51.19%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	1884.657	178.8815	6.787449	2070.326012	91.03%	8.64%	0.33%
	26-Aug-10							
	7-Sep-10	1317.836	187.1036	13.81814	1518.758234	86.77%	12.32%	0.91%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	4710.61	425.4772	21.92159	5158.008396	91.33%	8.25%	0.43%
503-5	24-Mar-10	49.6	12.6	503.5	565.8	8.77%	2.24%	88.99%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	1268.407	140.2692	1.686942	1410.362702	89.93%	9.95%	0.12%
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
503-6	24-Mar-10	170.1	54.3	227.7	452.1	37.62%	12.02%	50.37%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	2096.29	224.841	1.405143	2322.536524	90.26%	9.68%	0.06%
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
	24-Mar-10	1187.6	179.7	120.3	1487.6	79.83%	12.08%	8.09%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							

Well	Date Sampled	F1 Fraction (µg/L)	F2 Fraction (µg/L)	F3 Fraction (µg/L)	Total (µg/L)	%F1	%F2	%F3
503-7	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	31941.23	38.87363	25.078	32005.17829	99.80%	0.12%	0.08%
	26-Aug-10							
	7-Sep-10	3323.195	33.84816	19.18548	3376.228354	98.43%	1.00%	0.57%
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	145.7231	19.44209	20.28477	185.4499744	78.58%	10.48%	10.94%
BH 20	24-Mar-10	12320.4	3752.6	29.3	16102.4	76.51%	23.30%	0.18%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
BH 28	24-Mar-10	N/A	N/A	N/A	N/A			
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			
BH 5	24-Mar-10	82396.9	63964.4	260.6	146621.9	56.20%	43.63%	0.18%
	2-Jun-10	N/A	N/A	N/A	N/A			
	3-Jun-10							
	3-Jun-10							
	4-Jun-10							
	11-Jun-10							
	15-Jun-10							
	28-Jun-10							
	29-Jul-10							
	9-Aug-10							
	18-Aug-10							
	20-Aug-10	N/A	N/A	N/A	N/A			
	26-Aug-10							
	7-Sep-10	N/A	N/A	N/A	N/A			
	20-Sep-10							
	13-Oct-10							
	2-Nov-10	N/A	N/A	N/A	N/A			

Average Baseline EC for site (µS/cm)	1300		EC of Injectant	55000			
401	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (401)**	**Electrical Conductivity (µS/cm) (401)**	**Volume fraction of injected water**	**Volume fraction of background water**	**Corrected BTEX**
	24-Mar-10	-71	34331.27765				
	2-Jun-10	-1		4600	0.06	0.94	
	3-Jun-10	0.375		3046	0.03	0.97	
	3-Jun-10	0.625		3979	0.05	0.95	
	4-Jun-10	1					
	11-Jun-10	8		1963	0.01	0.99	
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56		1636	0.01	0.99	
	9-Aug-10	67					
	18-Aug-10	76		2210	0.02	0.98	
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132		2820	0.03	0.97	
	2-Nov-10	152					
402	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (402)**	**Electrical Conductivity (µS/cm) (402)**			
	24-Mar-10	-71	32364.56206				32364.56206
	2-Jun-10	-1		3377	0.04	0.96	
	3-Jun-10	0.375		38000	0.68	0.32	
	3-Jun-10	0.625		52200	0.95	0.05	
	4-Jun-10	1		49400	0.90	0.10	
	11-Jun-10	8		17500	0.30	0.70	
	15-Jun-10	12		16480	0.28	0.72	
	28-Jun-10	25		5600	0.08	0.92	
	29-Jul-10	56		1462	0.00	1.00	
	9-Aug-10	67		1418	0.00	1.00	
	18-Aug-10	76		1336	0.00	1.00	
	20-Aug-10	78	12438.21719	1806	0.01	0.99	32059.5999
	26-Aug-10	84		1938	0.01	0.99	
	7-Sep-10	96		1825	0.01	0.99	
	20-Sep-10	109		1750	0.01	0.99	
	13-Oct-10	132		1509	0.00	1.00	
	2-Nov-10	152	15958.50146	1475	0.00	1.00	32259.09096
403	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (403)**	**Electrical Conductivity (µS/cm) (403)**			
	24-Mar-10	-71	52392.34348				52392.34348
	2-Jun-10	-1		3495	0.04	0.96	
	3-Jun-10	0.375		30000	0.53	0.47	
	3-Jun-10	0.625					
	4-Jun-10	1		42200	0.76	0.24	
	11-Jun-10	8		13370	0.22	0.78	
	15-Jun-10	12		6020	0.09	0.91	
	28-Jun-10	25		3090	0.03	0.97	
	29-Jul-10	56		2920	0.03	0.97	
	9-Aug-10	67		3580	0.04	0.96	
	18-Aug-10	76		3100	0.03	0.97	
	20-Aug-10	78	29828.72234	3830	0.05	0.95	49923.95188
	26-Aug-10	84		3050	0.03	0.97	
	7-Sep-10	96	40181.42228	3860	0.05	0.95	49894.68242
	20-Sep-10	109		3440	0.04	0.96	
	13-Oct-10	132		2410	0.02	0.98	
	2-Nov-10	152	23937.21075	1894	0.01	0.99	51812.80807

301-3	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (301-3)**	**Electrical Conductivity (µS/cm) (301-3)**			
	24-Mar-10	-71	73153.55308				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132		DRY			
	2-Nov-10	152		DRY			
301-4	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (301-4)**	**Electrical Conductivity (µS/cm) (301-4)**			
	24-Mar-10	-71	42187.30452				40517.09578
	2-Jun-10	-1	201.0632786	3426	0.04	0.96	
	3-Jun-10	0.375		2612	0.02	0.98	
	3-Jun-10	0.625		3050			
	4-Jun-10	1		1809	0.01	0.99	
	11-Jun-10	8		1585	0.01	0.99	
	15-Jun-10	12					
	28-Jun-10	25		1850	0.01	0.99	
	29-Jul-10	56		1163			
	9-Aug-10	67		1638	0.01	0.99	
	18-Aug-10	76		1697	0.01	0.99	
	20-Aug-10	78					
	26-Aug-10	84		2230	0.02	0.98	
	7-Sep-10	96		2480	0.02	0.98	
	20-Sep-10	109		2250	0.02	0.98	
	13-Oct-10	132		1945	0.01	0.99	
	2-Nov-10	152		1920	0.01	0.99	
301-5	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (301-5)**	**Electrical Conductivity (µS/cm) (301-5)**			
	24-Mar-10	-71	6227.022171				6227.022171
	2-Jun-10	-1	1579.224811	3051	0.03	0.97	6023.977184
	3-Jun-10	0.375		2239	0.02	0.98	
	3-Jun-10	0.625		2317	0.02	0.98	
	4-Jun-10	1		1258	0.00	1.00	
	11-Jun-10	8		1297	0.00	1.00	
	15-Jun-10	12					
	28-Jun-10	25		1170	0.00	1.00	
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84		2020	0.01	0.99	
	7-Sep-10	96	11058.37561	2160	0.02	0.98	6127.297049
	20-Sep-10	109		2080	0.01	0.99	
	13-Oct-10	132		1768	0.01	0.99	
	2-Nov-10	152		1766	0.01	0.99	
301-6	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (301-6)**	**Electrical Conductivity (µS/cm) (301-6)**			
	24-Mar-10	-71	9492.210941				
	2-Jun-10	-1					

	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8		1050			
	15-Jun-10	12					
	28-Jun-10	25		1009			
	29-Jul-10	56		1332			
	9-Aug-10	67		1731			
	18-Aug-10	76		1792			
	20-Aug-10	78					
	26-Aug-10	84		2130			
	7-Sep-10	96		2080			
	20-Sep-10	109		1857			
	13-Oct-10	132		1885			
	2-Nov-10	152		1795			
301-7	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (301-7)**	**Electrical Conductivity (µS/cm) (301-7)**			
	24-Mar-10	-71	166.8421722				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56		982			
	9-Aug-10	67		1070			
	18-Aug-10	76		1155			
	20-Aug-10	78					
	26-Aug-10	84		1382			
	7-Sep-10	96		1503			
	20-Sep-10	109		1376			
	13-Oct-10	132		1662			
	2-Nov-10	152		1645			
302-2	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-2)**	**Electrical Conductivity (µS/cm) (302-2)**			
	24-Mar-10	-71	16.91074878				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132					
	2-Nov-10	152					
302-3	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-3)**	**Electrical Conductivity (µS/cm) (302-3)**			
	24-Mar-10	-71	32765.69847				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					

	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96		3160			
	20-Sep-10	109		3210			
	13-Oct-10	132		2570			
	2-Nov-10	152	24126.97337	3130			
302-4	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-4)**	**Electrical Conductivity (µS/cm) (302-4)**			
	24-Mar-10	-71	4707.214773				4707.214773
	2-Jun-10	-1	3173.984873	3646	0.04	0.96	4501.569972
	3-Jun-10	0.375		3218	0.04	0.96	
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		1525			
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96		2220	0.02	0.98	
	20-Sep-10	109		1931	0.01	0.99	
	13-Oct-10	132		2200	0.02	0.98	
	2-Nov-10	152	10559.38197	2180	0.02	0.98	4630.076058
302-5	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-5)**	**Electrical Conductivity (µS/cm) (302-5)**			
	24-Mar-10	-71	1457.371714				1457.371714
	2-Jun-10	-1	1064.025155	5830	0.08	0.92	1334.431418
	3-Jun-10	0.375		2201	0.02	0.98	
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		1486	0.00	1.00	
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96		1852	0.01	0.99	
	20-Sep-10	109		1590	0.01	0.99	
	13-Oct-10	132		1368	0.00	1.00	
	2-Nov-10	152	8823.262416	1577	0.01	0.99	1449.854172
302-6	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-6)**	**Electrical Conductivity (µS/cm) (302-6)**			
	24-Mar-10	-71	609.3800985				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					

	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132		1384			
	2-Nov-10	152		1590			
302-7	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (302-7)**	**Electrical Conductivity (µS/cm) (302-7)**			
	24-Mar-10	-71	46.50649864				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		1517			
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96		1811			
	20-Sep-10	109		1717			
	13-Oct-10	132		1537			
	2-Nov-10	152		1746			
501-1	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-1)**	**Electrical Conductivity (µS/cm) (501-1)**			
	24-Mar-10	-71	26767.69769				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132					
	2-Nov-10	152					
501-2	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-2)**	**Electrical Conductivity (µS/cm) (501-2)**			
	24-Mar-10	-71	39184.46771				39184.46771
	2-Jun-10	-1	33227.2345	3284	0.04	0.96	37736.75851
	3-Jun-10	0.375		2353	0.02	0.98	
	3-Jun-10	0.625		2947	0.03	0.97	
	4-Jun-10	1		974			
	11-Jun-10	8		2100	0.01	0.99	
	15-Jun-10	12		1642	0.01	0.99	
	28-Jun-10	25		1567	0.00	1.00	
	29-Jul-10	56		1507	0.00	1.00	
	9-Aug-10	67		1550	0.00	1.00	
	18-Aug-10	76		1522	0.00	1.00	
	20-Aug-10	78					
	26-Aug-10	84		1833			
	7-Sep-10	96		1901	0.01	0.99	
	20-Sep-10	109		1790	0.01	0.99	
	13-Oct-10	132		1724	0.01	0.99	
	2-Nov-10	152	27354.66834	2340	0.02	0.98	38425.58789

501-3	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-3)**	**Electrical Conductivity (µS/cm) (501-3)**			
	24-Mar-10	-71	31102.56888				
	2-Jun-10	-1	24848.02751	3360			
	3-Jun-10	0.375		2302			
	3-Jun-10	0.625		2250			
	4-Jun-10	1		513			
	11-Jun-10	8		1579			
	15-Jun-10	12		1555			
	28-Jun-10	25		1603			
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132		1695			
	2-Nov-10	152		1904			
501-4	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-4)**	**Electrical Conductivity (µS/cm) (501-4)**			
	24-Mar-10	-71	715.4899274				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8		1235			
	15-Jun-10	12		1219			
	28-Jun-10	25		1542			
	29-Jul-10	56		1761			
	9-Aug-10	67		1740			
	18-Aug-10	76		1706			
	20-Aug-10	78					
	26-Aug-10	84		1958			
	7-Sep-10	96		2060			
	20-Sep-10	109		1873			
	13-Oct-10	132		1475			
	2-Nov-10	152		1194			
501-5	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-5)**	**Electrical Conductivity (µS/cm) (501-5)**			
	24-Mar-10	-71	560.5045307				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76					
	20-Aug-10	78					
	26-Aug-10	84					
	7-Sep-10	96					
	20-Sep-10	109					
	13-Oct-10	132					
	2-Nov-10	152		1703			
501-6	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-6)**	**Electrical Conductivity (µS/cm) (501-6)**			
	24-Mar-10	-71	568.9249562				

	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8		1080			
	15-Jun-10	12		1044			
	28-Jun-10	25		1085			
	29-Jul-10	56		1084			
	9-Aug-10	67		1198			
	18-Aug-10	76		1250			
	20-Aug-10	78					
	26-Aug-10	84		1568			
	7-Sep-10	96		1614			
	20-Sep-10	109		1543			
	13-Oct-10	132		1431			
	2-Nov-10	152		1646			
501-7	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (501-7)**	**Electrical Conductivity (µS/cm) (501-7)**			
	24-Mar-10	-71	1120.277808				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56		1495			
	9-Aug-10	67		1663			
	18-Aug-10	76		1700			
	20-Aug-10	78					
	26-Aug-10	84		1715			
	7-Sep-10	96					
	20-Sep-10	109		1600			
	13-Oct-10	132		1493			
	2-Nov-10	152		1705			
502-1	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-1)**	**Electrical Conductivity (µS/cm) (502-1)**			
	24-Mar-10	-71	16632.05523				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67		0			
	18-Aug-10	76					
	20-Aug-10	78		0			
	26-Aug-10	84		0			
	7-Sep-10	96		0			
	20-Sep-10	109					
	13-Oct-10	132					
	2-Nov-10	152		DRY			
502-2	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-2)**	**Electrical Conductivity (µS/cm) (502-2)**			
	24-Mar-10	-71	15675.09943				15675.09943
	2-Jun-10	-1	31886.03922	3872	0.05	0.95	14924.32931
	3-Jun-10	0.375		3158	0.03	0.97	
	3-Jun-10	0.625		3150	0.03	0.97	
	4-Jun-10	1		2050	0.01	0.99	
	11-Jun-10	8		1910	0.01	0.99	

	15-Jun-10	12		2000	0.01	0.99	
	28-Jun-10	25		1682	0.01	0.99	
	29-Jul-10	56		2700	0.03	0.97	
	9-Aug-10	67		3760	0.05	0.95	
	18-Aug-10	76		2360	0.02	0.98	
	20-Aug-10	78	23459.70676	2710	0.03	0.97	15263.51861
	26-Aug-10	84		3600	0.04	0.96	
	7-Sep-10	96	6698.177711	4550	0.06	0.94	14726.42023
	20-Sep-10	109		2100	0.01	0.99	
	13-Oct-10	132		2340	0.02	0.98	
	2-Nov-10	152	15213.95542	2910	0.03	0.97	15205.13835
502-3	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-3)**	**Electrical Conductivity (µS/cm) (502-3)**			
	24-Mar-10	-71	5296.943103				5296.943103
	2-Jun-10	-1	1774.080938	2735	0.03	0.97	5155.40
	3-Jun-10	0.375		2102	0.01	0.99	
	3-Jun-10	0.625					
	4-Jun-10	1		1160	0.00	1.00	
	11-Jun-10	8		1304	0.00	1.00	
	15-Jun-10	12		1290	0.00	1.00	
	28-Jun-10	25		1307	0.00	1.00	
	29-Jul-10	56		3070	0.03	0.97	
	9-Aug-10	67		4360	0.06	0.94	
	18-Aug-10	76		3200	0.04	0.96	
	20-Aug-10	78		4510	0.06	0.94	
	26-Aug-10	84		4470	0.06	0.94	
	7-Sep-10	96	6481.689441	3410	0.04	0.96	5088.81
	20-Sep-10	109		1759	0.01	0.99	
	13-Oct-10	132		1797	0.01	0.99	
	2-Nov-10	152	4040.660599	1730	0.01	0.99	5254.53
502-4	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-4)**	**Electrical Conductivity (µS/cm) (502-4)**			
	24-Mar-10	-71	1181.316905				1181.316905
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8		1250	0.00	1.00	
	15-Jun-10	12		1175	0.00	1.00	
	28-Jun-10	25		1265	0.00	1.00	
	29-Jul-10	56		2620	0.02	0.98	
	9-Aug-10	67		2350	0.02	0.98	
	18-Aug-10	76		2590	0.02	0.98	
	20-Aug-10	78	4093.218719	2920	0.03	0.97	1145.679412
	26-Aug-10	84		1785	0.01	0.99	
	7-Sep-10	96		1644	0.01	0.99	
	20-Sep-10	109		1462	0.00	1.00	
	13-Oct-10	132		1534	0.00	1.00	
	2-Nov-10	152	6355.247668	1719	0.01	0.99	1172.099553
502-5	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-5)**	**Electrical Conductivity (µS/cm) (502-5)**			
	24-Mar-10	-71	1060.970521				1060.970521
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56		3060	0.03	0.97	
	9-Aug-10	67		2770	0.03	0.97	
	18-Aug-10	76		1988	0.01	0.99	

	20-Aug-10	78	4643.556327	2050	0.01	0.99	1046.152497
	26-Aug-10	84		2070	0.01	0.99	
	7-Sep-10	96		1888	0.01	0.99	
	20-Sep-10	109		1740	0.01	0.99	
	13-Oct-10	132		1669	0.01	0.99	
	2-Nov-10	152	4471.991838	1769	0.01	0.99	1051.704317
502-6	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-6)**	**Electrical Conductivity (µS/cm) (502-6)**			
	24-Mar-10	-71	79.84936528				79.84936528
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8		1077	0.00	1.00	
	15-Jun-10	12		1037	0.00	1.00	
	28-Jun-10	25		1041	0.00	1.00	
	29-Jul-10	56		4490	0.06	0.94	
	9-Aug-10	67		5770	0.08	0.92	
	18-Aug-10	76		2560	0.02	0.98	
	20-Aug-10	78	4333.292237	2200	0.02	0.98	78.51110776
	26-Aug-10	84		2030	0.01	0.99	
	7-Sep-10	96	4534.295375	2000	0.01	0.99	78.80849832
	20-Sep-10	109		1872	0.01	0.99	
	13-Oct-10	132		1918	0.01	0.99	
	2-Nov-10	152	3697.532013	1893	0.01	0.99	78.96760227
502-7	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (502-7)**	**Electrical Conductivity (µS/cm) (502-7)**			
	24-Mar-10	-71					
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67		4880			
	18-Aug-10	76		4200			
	20-Aug-10	78		3840			
	26-Aug-10	84		0			
	7-Sep-10	96		0			
	20-Sep-10	109		0			
	13-Oct-10	132		MUD			
	2-Nov-10	152		MUD			
503-1	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-1)**	**Electrical Conductivity (µS/cm) (503-1)**			
	24-Mar-10	-71	39113.7785				
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		0			
	20-Aug-10	78	8839.216822	3060			
	26-Aug-10	84		`			
	7-Sep-10	96		0			
	20-Sep-10	109		0			
	13-Oct-10	132		DRY			

	2-Nov-10	152		DRY			
503-2	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-2)**	**Electrical Conductivity (µS/cm) (503-2)**			
	24-Mar-10	-71	34772.4516				34772.4516
	2-Jun-10	-1	33327.09103	3602	0.04	0.96	33281.83366
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1		1293	0.00	1.00	
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		3150	0.03	0.97	
	20-Aug-10	78	14227.48468	4120	0.05	0.95	32946.41224
	26-Aug-10	84		4090	0.05	0.95	
	7-Sep-10	96	14804.03638	4130	0.05	0.95	32939.93692
	20-Sep-10	109		3690	0.04	0.96	
	13-Oct-10	132		3790	0.05	0.95	
	2-Nov-10	152	28088.36393	2154	0.02	0.98	34219.45954
503-3	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-3)**	**Electrical Conductivity (µS/cm) (503-3)**			
	24-Mar-10	-71	7119.232823				7119.232823
	2-Jun-10	-1	3853.495398	4556	0.06	0.94	6687.571332
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1		1306	0.00	1.00	
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		3290	0.04	0.96	
	20-Aug-10	78	2076.995869	4010	0.05	0.95	6759.956828
	26-Aug-10	84		3440	0.04	0.96	
	7-Sep-10	96	5293.881785	1889	0.01	0.99	7041.146638
	20-Sep-10	109		1540	0.00	1.00	
	13-Oct-10	132		2950	0.03	0.97	
	2-Nov-10	152	4769.365954	3920	0.05	0.95	6771.888503
503-4	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-4)**	**Electrical Conductivity (µS/cm) (503-4)**			
	24-Mar-10	-71	118.1180525				118.1180525
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		2820	0.03	0.97	
	20-Aug-10	78	1594.894874	3290	0.04	0.96	113.7408658
	26-Aug-10	84		3530	0.04	0.96	
	7-Sep-10	96	1117.302308	2630	0.02	0.98	115.1925961
	20-Sep-10	109		2130	0.02	0.98	
	13-Oct-10	132		2220	0.02	0.98	
	2-Nov-10	152	3945.962783	2310	0.02	0.98	115.8964653
503-5	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-5)**	**Electrical Conductivity (µS/cm) (503-5)**			

	24-Mar-10	-71	41.06742427				41.06742427
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		2300	0.02	0.98	
	20-Aug-10	78	1052.056751	2460	0.02	0.98	40.18030672
	26-Aug-10	84		2640	0.02	0.98	
	7-Sep-10	96		2690	0.03	0.97	
	20-Sep-10	109		2080	0.01	0.99	
	13-Oct-10	132		1610	0.01	0.99	
	2-Nov-10	152		1616	0.01	0.99	
503-6	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-6)**	**Electrical Conductivity (µS/cm) (503-6)**			
	24-Mar-10	-71	149.5102374				149.5102374
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		1656	0.01	0.99	
	20-Aug-10	78	1765.935675	1808	0.01	0.99	148.0958761
	26-Aug-10	84		1725	0.01	0.99	
	7-Sep-10	96		2100	0.01	0.99	
	20-Sep-10	109		1709	0.01	0.99	
	13-Oct-10	132		1683	0.01	0.99	
	2-Nov-10	152		1748	0.01	0.99	
503-7	**Date Sampled**	**Days since Injection**	**Total BTEX (µg/L) (503-7)**	**Electrical Conductivity (µS/cm) (503-7)**			
	24-Mar-10	-71	718.6527252				718.6527252
	2-Jun-10	-1					
	3-Jun-10	0.375					
	3-Jun-10	0.625					
	4-Jun-10	1					
	11-Jun-10	8					
	15-Jun-10	12					
	28-Jun-10	25					
	29-Jul-10	56					
	9-Aug-10	67					
	18-Aug-10	76		1505	0.00	1.00	
	20-Aug-10	78	1995.215687	1554	0.00	1.00	715.2535112
	26-Aug-10	84		1772	0.01	0.99	
	7-Sep-10	96	208.3948313	1852	0.01	0.99	711.2654569
	20-Sep-10	109		1392	0.00	1.00	
	13-Oct-10	132		1931	0.01	0.99	
	2-Nov-10	152	62.95892008	1967	0.01	0.99	709.7264427

Units are µg/g or mg/kg (Wet Soil)						
Sample Identification	**Date Sampeld**	**Benzene**	**Toluene**	**Ethylbenzene**	**P,M-xylene**	**O-xylene**
1	**9-Nov-09**	2.9	10.3	4.8	28.0	12.1
2	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
3	**9-Nov-09**	0.3	1.3	0.3	3.1	1.4
5	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
6	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
7	**9-Nov-09**	0.0	0.1	0.0	0.9	0.6
8	**9-Nov-09**	25.1	50.9	16.7	161.0	37.5
9	**9-Nov-09**	2.1	10.4	6.3	34.6	13.9
10	**9-Nov-09**	0.1	1.5	0.6	5.9	2.5
11	**9-Nov-09**	0.2	3.5	1.0	8.5	3.3
12	**9-Nov-09**	0.3	2.9	1.9	12.5	5.1
13	**9-Nov-09**	1.5	6.1	4.4	23.5	9.0
14	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
15	**9-Nov-09**	0.1	0.4	0.2	1.4	0.5
16	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
17	**9-Nov-09**	0.0	0.0	0.0	0.0	0.0
18	**9-Nov-09**	1.1	14.6	39.5	154.3	124.8
19	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
20	**9-Nov-09**	0.0	0.0	0.0	0.0	0.0
21	**9-Nov-09**	0.0	0.0	0.0	0.0	0.0
22	**9-Nov-09**	0.0	0.0	0.0	0.0	0.0
401-1	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
401-10	**9-Nov-09**	0.0	0.0	0.0	0.0	0.0
401-2	**9-Nov-09**	0.2	0.0	0.0	0.1	0.1
401-3	**9-Nov-09**	0.5	1.7	1.4	9.0	4.6
401-4	**9-Nov-09**	7.5	41.2	38.0	228.8	122.6
401-4	**9-Nov-09**	8.7	39.6	34.5	229.9	122.5
401-5	**9-Nov-09**	1.1	6.0	6.0	36.8	20.5
401-5	**9-Nov-09**	1.1	5.8	5.8	34.7	20.5
401-6	**9-Nov-09**	2.2	12.0	7.8	54.9	24.6
401-7	**9-Nov-09**	24.9	59.9	37.8	201.1	84.8
401-8	**9-Nov-09**	1.0	2.1	1.4	7.4	3.1
401-9	**9-Nov-09**	0.0	0.0	0.0	0.3	0.2
402-2	**9-Nov-09**	1.0	8.7	0.0	32.8	58.3
402-3	**9-Nov-09**	1.0	10.2	8.5	55.6	26.9
402-3	**9-Nov-09**	0.9	9.9	7.6	56.1	27.0
402-4	**9-Nov-09**	0.2	6.1	1.3	7.6	3.5
402-5	**9-Nov-09**	2.2	15.0	5.1	40.1	17.7
402-6	**9-Nov-09**	9.4	53.4	16.6	121.6	52.4
402-7	**9-Nov-09**	82.7	561.7	253.0	949.3	405.7
402-8	**9-Nov-09**	18.5	52.2	33.9	174.2	74.5
402-8	**9-Nov-09**	18.3	51.3	50.6	175.9	74.3
403-1	**9-Nov-09**	0.0	0.2	0.0	0.2	0.5
403-2	**9-Nov-09**	0.2	1.5	0.0	12.5	6.9
403-4	**9-Nov-09**	33.2	303.0	71.1	1025.1	457.3
403-5	**9-Nov-09**	0.7	7.6	1.7	12.7	5.7
403-6	**9-Nov-09**	4.0	31.4	3.7	73.6	32.9
403-6	**9-Nov-09**	4.0	30.7	8.0	74.4	32.9
403-7	**9-Nov-09**	36.8	245.8	76.4	434.9	185.0
403-8	**9-Nov-09**	17.7	58.7	16.5	105.2	45.1
403-9	**9-Nov-09**	29.5	81.6	23.3	150.3	64.0
501-2	**9-Nov-09**	1.0	8.8	9.1	93.4	44.4
501-2	**9-Nov-09**	1.0	8.5	9.3	93.4	44.2
501-3	**9-Nov-09**	0.1	0.8	0.2	4.9	2.4
501-4	**9-Nov-09**	46.9	226.8	128.2	929.5	360.5
501-5	**9-Nov-09**	15.3	44.5	44.2	264.7	105.6
501-6	**9-Nov-09**	0.9	5.1	0.0	0.2	2.1
501-7	**9-Nov-09**	0.0	0.1	0.0	0.2	0.1
501-8	**9-Nov-09**	7.0	19.1	30.8	117.0	47.2
501-9	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
501-10	**9-Nov-09**	3.0	8.2	6.0	46.5	19.8
501-10	**9-Nov-09**	3.0	8.0	8.7	49.4	19.8
502-1	**9-Nov-09**	0.0	0.0	0.0	0.1	0.1
502-2	**9-Nov-09**	13.9	65.7	54.3	367.7	174.9
502-3	**9-Nov-09**	17.1	83.5	53.0	214.4	91.7
502-4	**9-Nov-09**	2.2	18.4	5.9	50.0	21.9
502-5	**9-Nov-09**	8.7	60.2	20.9	133.7	55.6

Units are µg/g or mg/kg (Wet Soil)						
Sample Identification	**Date Sampeld**	**Benzene**	**Toluene**	**Ethylbenzene**	**P,M-xylene**	**O-xylene**
502-6	**9-Nov-09**	4.5	26.6	8.9	54.2	22.3
502-7	**9-Nov-09**	0.0	1.8	0.7	7.2	3.2
502-8	**9-Nov-09**	0.0	0.1	0.4	0.8	0.4
502-9	**9-Nov-09**	3.6	14.2	5.9	34.2	14.8
502-10	**9-Nov-09**	0.0	0.0	0.0	0.1	0.0
Laboratory Blank	**19-Jan-10**	0.0	0.0	0.0	0.0	0.0

Units are µg/g or mg/kg (Wet Soil)					
Sample Identification	**Date Sampeld**	**1,3,5-trimethylbenzene**	**1,2,4-trimethylbenzene**	**1,2,3-trimethylbenzene**	**Naphthalene**
1	**9-Nov-09**	4.4	18.4	3.9	1.7
2	**9-Nov-09**	0.0	0.0	0.0	0.0
3	**9-Nov-09**	0.5	2.1	0.5	0.2
5	**9-Nov-09**	0.0	0.0	0.0	0.0
6	**9-Nov-09**	0.0	0.0	0.0	0.0
7	**9-Nov-09**	0.3	0.5	0.4	0.0
8	**9-Nov-09**	64.1	234.9	47.5	11.1
9	**9-Nov-09**	5.4	22.3	5.0	2.7
10	**9-Nov-09**	0.6	2.3	0.6	0.5
11	**9-Nov-09**	0.8	3.3	0.8	0.7
12	**9-Nov-09**	1.3	5.3	1.2	1.2
13	**9-Nov-09**	3.5	14.1	3.1	1.9
14	**9-Nov-09**	0.0	0.0	0.0	0.0
15	**9-Nov-09**	0.2	0.8	0.2	0.1
16	**9-Nov-09**	0.0	0.0	0.0	0.0
17	**9-Nov-09**	0.0	0.0	0.0	0.0
18	**9-Nov-09**	131.7	363.9	119.7	18.4
19	**9-Nov-09**	0.0	0.0	0.0	0.0
20	**9-Nov-09**	0.0	0.0	0.0	0.0
21	**9-Nov-09**	0.0	0.0	0.0	0.0
22	**9-Nov-09**	0.0	0.0	0.0	0.0
401-1	**9-Nov-09**	0.0	0.0	0.0	0.0
401-10	**9-Nov-09**	0.0	0.0	0.0	0.0
401-2	**9-Nov-09**	0.0	0.1	0.0	0.0
401-3	**9-Nov-09**	4.0	14.7	4.1	1.6
401-4	**9-Nov-09**	61.5	228.5	54.9	27.3
401-4	**9-Nov-09**	70.1	230.0	53.7	34.6
401-5	**9-Nov-09**	10.0	38.5	9.3	2.3
401-5	**9-Nov-09**	10.1	38.0	9.4	3.6
401-6	**9-Nov-09**	8.2	33.5	7.4	4.9
401-7	**9-Nov-09**	31.1	128.1	27.6	11.3
401-8	**9-Nov-09**	1.2	5.5	1.1	0.5
401-9	**9-Nov-09**	0.0	0.3	0.1	0.1
402-2	**9-Nov-09**	114.5	186.6	116.7	41.3
402-3	**9-Nov-09**	12.6	48.7	11.4	2.9
402-3	**9-Nov-09**	12.9	48.4	11.5	4.3
402-4	**9-Nov-09**	0.6	2.4	0.6	0.6
402-5	**9-Nov-09**	5.7	23.5	5.1	2.3
402-6	**9-Nov-09**	15.9	68.2	14.8	6.0
402-7	**9-Nov-09**	140.8	552.7	118.8	67.0
402-8	**9-Nov-09**	27.8	115.3	24.9	2.5
402-8	**9-Nov-09**	29.2	114.5	24.7	13.6
403-1	**9-Nov-09**	1.7	1.1	0.5	2.3
403-2	**9-Nov-09**	2.2	8.4	2.0	1.6
403-4	**9-Nov-09**	163.1	631.9	138.3	60.0
403-5	**9-Nov-09**	1.3	5.6	1.3	0.9
403-6	**9-Nov-09**	9.8	41.3	8.9	3.0
403-6	**9-Nov-09**	9.8	41.0	9.0	4.2
403-7	**9-Nov-09**	56.4	227.3	47.2	16.4
403-8	**9-Nov-09**	25.1	101.8	20.2	6.1
403-9	**9-Nov-09**	38.1	151.3	29.9	9.5
501-2	**9-Nov-09**	16.4	64.1	14.0	5.6
501-2	**9-Nov-09**	16.8	63.7	14.0	8.3
501-3	**9-Nov-09**	0.9	3.6	0.8	0.6
501-4	**9-Nov-09**	159.5	620.6	135.7	52.9
501-5	**9-Nov-09**	40.1	156.6	33.9	13.6
501-6	**9-Nov-09**	0.3	4.2	0.0	0.0
501-7	**9-Nov-09**	0.0	0.2	0.0	0.0
501-8	**9-Nov-09**	18.7	75.1	16.0	5.9
501-9	**9-Nov-09**	0.0	0.0	0.0	0.0
501-10	**9-Nov-09**	8.2	33.4	7.0	2.1
501-10	**9-Nov-09**	8.3	33.3	7.1	2.9
502-1	**9-Nov-09**	0.0	0.0	0.0	0.0
502-2	**9-Nov-09**	75.0	283.0	63.5	22.6
502-3	**9-Nov-09**	29.7	118.2	26.0	11.4
502-4	**9-Nov-09**	6.8	28.3	6.2	2.9
502-5	**9-Nov-09**	20.8	82.6	17.9	7.1

Units are µg/g or mg/kg (Wet Soil)					
Sample Identification	**Date Sampeld**	**1,3,5-trimethylbenzene**	**1,2,4-trimethylbenzene**	**1,2,3-trimethylbenzene**	**Naphthalene**
502-6	**9-Nov-09**	10.3	40.7	9.3	4.5
502-7	**9-Nov-09**	1.0	5.5	1.0	0.5
502-8	**9-Nov-09**	0.0	0.3	0.1	0.0
502-9	**9-Nov-09**	5.2	21.6	4.7	2.1
502-10	**9-Nov-09**	0.0	0.0	0.0	0.0
Laboratory Blank	**19-Jan-10**	0.0	0.0	0.0	0.0

Units are µg/g or mg/kg (Wet Soil)			
Sample Identification	**Date Sampeld**	**Total BTEX, TMBs and Naphthalene**	**Depth of sample (mbgs)**
1	**9-Nov-09**	86.5	11.07
2	**9-Nov-09**	0.1	11.32
3	**9-Nov-09**	9.7	11.64
5	**9-Nov-09**	0.1	12.08
6	**9-Nov-09**	0.1	7.26
7	**9-Nov-09**	2.8	7.54
8	**9-Nov-09**	648.8	8.11
9	**9-Nov-09**	102.7	8.26
10	**9-Nov-09**	14.5	8.32
11	**9-Nov-09**	22.2	8.76
12	**9-Nov-09**	31.7	8.94
13	**9-Nov-09**	67.2	9.46
14	**9-Nov-09**	0.1	9.82
15	**9-Nov-09**	3.9	10.07
16	**9-Nov-09**	0.1	10.57
17	**9-Nov-09**	0.0	11.23
18	**9-Nov-09**	967.9	7.35
19	**9-Nov-09**	0.1	11.34
20	**9-Nov-09**	0.0	#N/A
21	**9-Nov-09**	0.0	#N/A
22	**9-Nov-09**	0.0	#N/A
401-1	**9-Nov-09**	0.1	7.16
401-10	**9-Nov-09**	0.0	#N/A
401-2	**9-Nov-09**	0.5	7.36
401-3	**9-Nov-09**	41.6	7.96
401-4	**9-Nov-09**	810.5	8.04
401-4	**9-Nov-09**	823.6	8.04
401-5	**9-Nov-09**	130.5	8.23
401-5	**9-Nov-09**	129.1	8.23
401-6	**9-Nov-09**	155.5	8.68
401-7	**9-Nov-09**	606.8	9.78
401-8	**9-Nov-09**	23.3	10.22
401-9	**9-Nov-09**	1.0	10.53
402-2	**9-Nov-09**	559.9	8.09
402-3	**9-Nov-09**	177.8	8.25
402-3	**9-Nov-09**	178.5	8.25
402-4	**9-Nov-09**	23.0	8.58
402-5	**9-Nov-09**	116.7	8.78
402-6	**9-Nov-09**	358.2	8.93
402-7	**9-Nov-09**	3131.7	9.07
402-8	**9-Nov-09**	523.7	9.82
402-8	**9-Nov-09**	552.5	9.82
403-1	**9-Nov-09**	6.4	7.30
403-2	**9-Nov-09**	35.4	7.92
403-4	**9-Nov-09**	2883.0	8.23
403-5	**9-Nov-09**	37.5	8.88
403-6	**9-Nov-09**	208.6	8.93
403-6	**9-Nov-09**	214.1	8.93
403-7	**9-Nov-09**	1326.1	9.11
403-8	**9-Nov-09**	396.5	9.62
403-9	**9-Nov-09**	577.3	9.79
501-2	**9-Nov-09**	256.6	8.17
501-2	**9-Nov-09**	259.1	8.17
501-3	**9-Nov-09**	14.2	8.31
501-4	**9-Nov-09**	2660.7	8.95
501-5	**9-Nov-09**	718.6	9.43
501-6	**9-Nov-09**	12.9	9.69
501-7	**9-Nov-09**	0.5	9.83
501-8	**9-Nov-09**	336.7	10.26
501-9	**9-Nov-09**	0.1	10.53
501-10	**9-Nov-09**	134.3	11.16
501-10	**9-Nov-09**	140.6	11.16
502-1	**9-Nov-09**	0.2	7.53
502-2	**9-Nov-09**	1120.6	8.12
502-3	**9-Nov-09**	644.9	8.29
502-4	**9-Nov-09**	142.6	8.78
502-5	**9-Nov-09**	407.5	9.05

Units are µg/g or mg/kg (Wet Soil)			
Sample Identification	**Date Sampeld**	**Total BTEX, TMBs and Naphthalene**	**Depth of sample (mbgs)**
502-6	**9-Nov-09**	181.1	9.13
502-7	**9-Nov-09**	20.8	9.57
502-8	**9-Nov-09**	2.0	9.61
502-9	**9-Nov-09**	106.4	10.19
502-10	**9-Nov-09**	0.1	10.43
Laboratory Blank	**19-Jan-10**	0.0	

Units are μg/g or mg/Kg (Wet Soil)					
Sample Identification	**Date Sampled**	**Benzene**	**Toluene**	**Ethylbenzene**	**P,M-xylene**
Laboratory Blank	**24-Nov-10**	0.0	0.0	0.0	0.0
601-1	**3-Nov-10**	0.0	0.0	0.0	0.2
601-2	**3-Nov-10**	4.3	25.2	20.0	92.2
601-3	**3-Nov-10**	6.5	38.6	20.9	94.0
601-4	**3-Nov-10**	4.3	14.6	10.1	35.1
601-5	**3-Nov-10**	0.7	2.7	1.9	7.4
601-6	**3-Nov-10**	0.0	0.0	0.0	0.0
602-1	**3-Nov-10**	43.7	151.5	92.4	466.2
602-2	**3-Nov-10**	2.1	13.8	8.7	40.4
602-3	**3-Nov-10**	6.6	20.2	18.6	78.2
602-4	**3-Nov-10**	35.1	52.4	49.0	180.7
602-5	**3-Nov-10**	1.6	5.1	4.9	16.7
602-6	**3-Nov-10**	63.3	54.0	69.9	214.7
602-7	**3-Nov-10**	0.1	0.5	0.4	1.8
602-8	**3-Nov-10**	0.3	0.9	0.9	3.1
602-9	**3-Nov-10**	0.2	0.0	0.7	2.7
602-10	**3-Nov-10**	0.0	0.0	0.0	0.0
603-1	**3-Nov-10**	35.6	144.3	83.6	430.9
603-2	**3-Nov-10**	0.4	3.7	1.6	8.8
603-3	**3-Nov-10**	0.9	5.9	3.1	15.4
603-4	**3-Nov-10**	1.6	5.4	4.7	18.5
603-5	**3-Nov-10**	1.9	6.3	5.5	21.3
603-6	**3-Nov-10**	0.5	1.5	1.6	6.3
603-7	**3-Nov-10**	0.2	0.8	0.7	2.9
603-8	**3-Nov-10**	0.8	1.9	2.0	7.7
603-9	**3-Nov-10**	1.0	2.1	2.3	8.3
603-10	**3-Nov-10**	0.5	1.7	1.7	6.8
603-11	**3-Nov-10**	0.4	1.1	1.3	4.7
603-12	**3-Nov-10**	0.0	0.0	0.0	0.0

Units are µg/g or mg/Kg (Wet Soil)				
Sample Identification	**Date Sampled**	**O-xylene**	**1,3,5-trimethylbenzene**	**1,2,4-trimethylbenzene**
Laboratory Blank	**24-Nov-10**	0.0	0.0	0.0
601-1	**3-Nov-10**	0.2	0.1	0.1
601-2	**3-Nov-10**	42.7	15.6	65.0
601-3	**3-Nov-10**	41.4	12.9	55.0
601-4	**3-Nov-10**	15.4	5.6	23.2
601-5	**3-Nov-10**	3.3	1.1	4.9
601-6	**3-Nov-10**	0.0	0.0	0.0
602-1	**3-Nov-10**	205.2	254.2	268.3
602-2	**3-Nov-10**	18.2	5.1	23.4
602-3	**3-Nov-10**	34.3	9.8	42.4
602-4	**3-Nov-10**	75.1	24.6	106.5
602-5	**3-Nov-10**	6.9	3.1	12.3
602-6	**3-Nov-10**	80.6	52.4	181.6
602-7	**3-Nov-10**	0.7	0.2	1.0
602-8	**3-Nov-10**	1.3	0.6	2.5
602-9	**3-Nov-10**	1.1	0.5	2.0
602-10	**3-Nov-10**	0.0	0.0	0.0
603-1	**3-Nov-10**	196.8	75.4	260.7
603-2	**3-Nov-10**	3.7	0.8	4.0
603-3	**3-Nov-10**	6.7	1.8	7.9
603-4	**3-Nov-10**	8.0	2.5	10.4
603-5	**3-Nov-10**	9.2	2.8	12.0
603-6	**3-Nov-10**	2.7	0.9	3.7
603-7	**3-Nov-10**	1.3	0.3	1.5
603-8	**3-Nov-10**	3.3	1.1	4.6
603-9	**3-Nov-10**	3.6	1.2	5.4
603-10	**3-Nov-10**	2.9	1.0	4.1
603-11	**3-Nov-10**	2.0	0.7	3.1
603-12	**3-Nov-10**	0.0	0.0	0.0

Units are µg/g or mg/Kg (Wet Soil)				
Sample Identification	**Date Sampled**	**1,2,3-trimethylbenzene**	**Naphthalene**	**Total BTEX, TMBs, Naphthalene**
Laboratory Blank	**24-Nov-10**	0.0	0.0	0.0
601-1	**3-Nov-10**	0.1	0.0	0.7
601-2	**3-Nov-10**	14.5	5.7	285.2
601-3	**3-Nov-10**	12.1	5.6	286.8
601-4	**3-Nov-10**	5.1	2.0	115.4
601-5	**3-Nov-10**	1.1	0.4	23.5
601-6	**3-Nov-10**	0.0	0.0	0.0
602-1	**3-Nov-10**	63.9	63.8	1609.3
602-2	**3-Nov-10**	5.1	2.3	119.1
602-3	**3-Nov-10**	9.1	3.9	223.3
602-4	**3-Nov-10**	22.4	12.9	558.6
602-5	**3-Nov-10**	2.8	1.0	54.5
602-6	**3-Nov-10**	37.4	29.3	783.3
602-7	**3-Nov-10**	0.2	0.1	5.1
602-8	**3-Nov-10**	0.5	0.1	10.2
602-9	**3-Nov-10**	0.4	0.1	7.6
602-10	**3-Nov-10**	0.0	0.0	0.0
603-1	**3-Nov-10**	56.0	45.4	1328.7
603-2	**3-Nov-10**	0.9	0.7	24.6
603-3	**3-Nov-10**	1.8	1.4	44.9
603-4	**3-Nov-10**	2.3	0.9	54.3
603-5	**3-Nov-10**	2.7	1.1	62.9
603-6	**3-Nov-10**	0.8	0.3	18.4
603-7	**3-Nov-10**	0.4	0.1	8.2
603-8	**3-Nov-10**	1.0	0.4	22.7
603-9	**3-Nov-10**	1.2	0.4	25.5
603-10	**3-Nov-10**	0.9	0.3	20.0
603-11	**3-Nov-10**	0.7	0.2	14.3
603-12	**3-Nov-10**	0.0	0.0	0.0

Units are µg/g or mg/Kg (Wet Soil)

Sample Identification	Date Sampled	F1	F2	F3	Total (F1, F2, F3)	Depth (mbgs)
Laboratory Blank	**24-Nov-10**	0.0	0.0	0.0	0.0	
601-1	**3-Nov-10**	1.3	0.7	0.0	1.9	8.2
601-2	**3-Nov-10**	459.4	330.8	0.8	791.0	9.1
601-3	**3-Nov-10**	468.2	284.4	0.4	753.0	9.8
601-4	**3-Nov-10**	206.0	116.4	0.1	322.4	10.5
601-5	**3-Nov-10**	29.9	17.1	0.0	47.1	11.2
601-6	**3-Nov-10**	0.0	0.0	0.0	0.0	Blank
602-1	**3-Nov-10**	2352.5	1664.5	14.7	4031.8	9.0
602-2	**3-Nov-10**	188.9	122.3	0.1	311.3	9.1
602-3	**3-Nov-10**	389.2	219.9	0.5	609.6	9.7
602-4	**3-Nov-10**	1016.1	605.6	1.8	1623.5	9.9
602-5	**3-Nov-10**	89.7	64.8	0.1	154.5	10.4
602-6	**3-Nov-10**	1565.3	1098.0	4.6	2667.8	10.6
602-7	**3-Nov-10**	5.5	2.6	0.0	8.1	11.8
602-8	**3-Nov-10**	12.8	8.3	0.0	21.1	12.0
602-9	**3-Nov-10**	9.9	5.8	0.0	15.7	12.1
602-10	**3-Nov-10**	0.0	0.0	0.0	0.0	Blank
603-1	**3-Nov-10**	2201.1	1527.2	2.8	3731.1	8.6
603-2	**3-Nov-10**	26.9	12.5	0.0	39.4	9.4
603-3	**3-Nov-10**	61.7	31.7	0.0	93.5	10.7
603-4	**3-Nov-10**	88.1	45.5	0.0	133.6	10.5
603-5	**3-Nov-10**	108.6	53.1	0.0	161.7	11.4
603-6	**3-Nov-10**	23.9	13.2	0.5	37.6	10.9
603-7	**3-Nov-10**	9.5	4.6	0.2	14.2	11.0
603-8	**3-Nov-10**	39.1	20.6	0.0	59.7	11.2
603-9	**3-Nov-10**	45.4	25.0	0.0	70.5	11.4
603-10	**3-Nov-10**	32.3	19.7	0.8	52.9	12.0
603-11	**3-Nov-10**	24.1	13.8	0.2	38.1	12.1
603-12	**3-Nov-10**	0.0	0.0	0.0	0.0	Blank

Sample Name	Date and Time Sampled	Set	Benzene	Toluene	Ethylbenzene	P,M-xylene
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial A	130.2	15513.4	2618.7	14828.4
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial B	128.7	15578.1	2634.0	14898.8
Initial GW - GW, Soil Expt	03/11/2009 11:00	Final C	130.4	15743.3	2660.1	15058.4
Control GW Soil A	04/11/2009 12:00	Set 1	87.5	14088.7	2338.4	13208.1
Control GW Soil B	04/11/2009 12:00	Set 1	93.6	14097.6	2346.1	13248.5
Persulphate GW Soil A	04/11/2009 12:00	Set 1	69.0	13572.7	2236.2	12843.6
Persulphate GW Soil B	04/11/2009 12:00	Set 1	65.0	13811.2	2282.5	13096.4
Control GW Soil A	04/11/2009 17:00	Set 2	83.9	13581.2	2244.7	12655.3
Control GW Soil B	04/11/2009 17:00	Set 2	80.9	13159.4	2170.2	12232.3
Persulphate GW Soil A	04/11/2009 17:00	Set 2	55.8	12880.8	2103.7	12157.2
Persulphate GW Soil B	04/11/2009 17:00	Set 2	55.6	12622.6	2061.1	11872.0
Control GW Soil A	05/11/2009 18:00	Set 3	73.4	13170.1	2165.1	12195.4
Control GW Soil B	05/11/2009 18:00	Set 3	76.5	13277.4	2183.3	12277.9
Persulphate GW Soil A	05/11/2009 18:00	Set 3	57.0	12841.2	2078.7	12218.6
Persulphate GW Soil B	05/11/2009 18:00	Set 3	46.0	12047.0	1932.3	11412.2
Control GW Soil A	06/11/2009 19:00	Set 4	62.5	11220.4	1823.2	10353.5
Control GW Soil B	06/11/2009 19:00	Set 4	61.1	13604.8	2193.9	12411.7
Persulphate GW Soil A	06/11/2009 19:00	Set 4	41.6	11369.9	1810.1	10722.2
Persulphate GW Soil B	06/11/2009 19:00	Set 4	56.8	12605.0	2024.9	12135.7
Control GW Soil A	12/11/2009 19:00	Set 5	66.8	14273.0	2290.0	12872.4
Control GW Soil B	12/11/2009 19:00	Set 5	58.7	13320.4	2140.8	12042.6
Persulphate GW Soil A	12/11/2009 19:00	Set 5	45.1	9977.0	1585.4	10459.8
Persulphate GW Soil B	12/11/2009 19:00	Set 5	32.3	8411.5	1313.7	8694.8
Control GW Soil A	23/11/2009 13:00	Set 6	28.5	9233.7	1469.8	8504.7
Control GW Soil B	23/11/2009 13:00	Set 6	70.3	12982.5	2075.5	11570.6
Persulphate GW Soil A	23/11/2009 13:00	Set 6	35.7	5101.7	822.6	4877.2
Persulphate GW Soil B	23/11/2009 13:00	Set 6	2.7	6221.3	1017.9	6423.4
Initial GW - GW only Expt	03/11/2009 11:00	Initial A	133.0	15167.5	2596.8	14664.1
Initial GW - GW only Expt	03/11/2009 11:00	Initial B	135.9	15538.9	2652.3	15002.7
Initial GW - GW only Expt	03/11/2009 11:00	Final C	138.4	15779.3	2697.3	15275.5
Control GW A	04/11/2009 12:00	Set 1	99.7	14097.6	2406.0	13598.5
Control GW B	04/11/2009 12:00	Set 1	101.0	14275.3	2439.6	13790.7
Control GW C	04/11/2009 12:00	Set 1	101.0	14467.3	2467.8	13981.9
Persulphate GW A	04/11/2009 12:00	Set 1	118.4	14157.2	2408.2	13839.1
Persulphate GW B	04/11/2009 12:00	Set 1	116.2	14360.4	2441.3	14041.5
Persulphate GW C	04/11/2009 12:00	Set 1	109.3	13977.0	2380.4	13664.2
Control GW A	04/11/2009 17:00	Set 2	97.0	14338.1	2441.5	13799.9
Control GW B	04/11/2009 17:00	Set 2	100.1	14169.0	2415.0	13644.2
Control GW C	04/11/2009 17:00	Set 2	96.9	14289.4	2422.1	13655.4
Persulphate GW A	04/11/2009 17:00	Set 2	100.0	13677.5	2288.7	13259.1
Persulphate GW B	04/11/2009 17:00	Set 2	106.8	13537.0	2300.1	13258.1
Persulphate GW C	04/11/2009 17:00	Set 2	106.0	14049.2	2386.4	13755.9
Control GW A	05/11/2009 18:00	Set 3	81.7	13157.3	2242.1	12633.3
Control GW B	05/11/2009 18:00	Set 3	84.9	13609.8	2311.3	13032.1
Control GW C	05/11/2009 18:00	Set 3	78.8	12944.3	2201.7	12416.3
Persulphate GW A	05/11/2009 18:00	Set 3	39.6	7018.2	1185.2	6921.8
Persulphate GW B	05/11/2009 18:00	Set 3	76.2	13250.4	2240.2	13210.9

Sample Name	Date and Time Sampled	Set	O-xylene	1,3,5-Trimethybenzene	1,2,4-Trimethylbenzene
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial A	6712.4	687.0	2904.1
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial B	6752.5	689.8	2918.8
Initial GW - GW, Soil Expt	03/11/2009 11:00	Final C	6808.6	696.9	2943.5
Control GW Soil A	04/11/2009 12:00	Set 1	6048.6	597.4	2538.6
Control GW Soil B	04/11/2009 12:00	Set 1	6061.9	599.7	2554.4
Persulphate GW Soil A	04/11/2009 12:00	Set 1	5916.0	575.8	2456.0
Persulphate GW Soil B	04/11/2009 12:00	Set 1	6026.9	589.4	2510.2
Control GW Soil A	04/11/2009 17:00	Set 2	5801.7	568.9	2419.0
Control GW Soil B	04/11/2009 17:00	Set 2	5614.0	549.1	2337.3
Persulphate GW Soil A	04/11/2009 17:00	Set 2	5684.2	543.2	2337.6
Persulphate GW Soil B	04/11/2009 17:00	Set 2	5533.2	530.8	2268.9
Control GW Soil A	05/11/2009 18:00	Set 3	5644.3	547.3	2330.9
Control GW Soil B	05/11/2009 18:00	Set 3	5665.8	551.9	2336.4
Persulphate GW Soil A	05/11/2009 18:00	Set 3	5704.8	541.0	2311.6
Persulphate GW Soil B	05/11/2009 18:00	Set 3	5419.8	500.3	2177.9
Control GW Soil A	06/11/2009 19:00	Set 4	4892.1	461.4	1996.4
Control GW Soil B	06/11/2009 19:00	Set 4	5746.6	545.1	2329.2
Persulphate GW Soil A	06/11/2009 19:00	Set 4	5165.7	467.3	2034.2
Persulphate GW Soil B	06/11/2009 19:00	Set 4	5689.2	531.6	2286.7
Control GW Soil A	12/11/2009 19:00	Set 5	6053.8	547.5	2349.6
Control GW Soil B	12/11/2009 19:00	Set 5	5691.6	514.2	2216.5
Persulphate GW Soil A	12/11/2009 19:00	Set 5	5038.6	445.3	2072.7
Persulphate GW Soil B	12/11/2009 19:00	Set 5	4369.5	366.3	1752.4
Control GW Soil A	23/11/2009 13:00	Set 6	4320.9	368.6	1691.0
Control GW Soil B	23/11/2009 13:00	Set 6	5436.7	483.0	2061.7
Persulphate GW Soil A	23/11/2009 13:00	Set 6	2921.7	136.7	1427.1
Persulphate GW Soil B	23/11/2009 13:00	Set 6	3334.4	183.2	1677.1
Initial GW - GW only Expt	03/11/2009 11:00	Initial A	6619.7	685.0	2896.6
Initial GW - GW only Expt	03/11/2009 11:00	Initial B	6775.1	700.1	2962.9
Initial GW - GW only Expt	03/11/2009 11:00	Final C	6892.1	712.9	3023.9
Control GW A	04/11/2009 12:00	Set 1	6194.2	632.8	2702.9
Control GW B	04/11/2009 12:00	Set 1	6270.8	644.1	2738.3
Control GW C	04/11/2009 12:00	Set 1	6361.9	653.8	2783.8
Persulphate GW A	04/11/2009 12:00	Set 1	6295.7	643.8	2735.0
Persulphate GW B	04/11/2009 12:00	Set 1	6398.7	649.7	2777.3
Persulphate GW C	04/11/2009 12:00	Set 1	6214.9	634.8	2697.1
Control GW A	04/11/2009 17:00	Set 2	6299.6	640.0	2736.1
Control GW B	04/11/2009 17:00	Set 2	6220.3	634.5	2705.3
Control GW C	04/11/2009 17:00	Set 2	6250.4	633.2	2692.9
Persulphate GW A	04/11/2009 17:00	Set 2	6068.7	605.4	2611.2
Persulphate GW B	04/11/2009 17:00	Set 2	6037.5	614.9	2612.8
Persulphate GW C	04/11/2009 17:00	Set 2	6276.8	638.3	2711.5
Control GW A	05/11/2009 18:00	Set 3	5764.3	588.8	2496.9
Control GW B	05/11/2009 18:00	Set 3	5973.1	605.2	2575.4
Control GW C	05/11/2009 18:00	Set 3	5680.2	578.3	2456.5
Persulphate GW A	05/11/2009 18:00	Set 3	3175.6	320.7	1359.6
Persulphate GW B	05/11/2009 18:00	Set 3	6052.8	610.2	2608.9

Sample Name	Date and Time Sampled	Set	1,2,3-Trimethylbenzene	Naphthalene	Total
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial A	895.0	741.0	**45030.1**
Initial GW - GW, Soil Expt	03/11/2009 11:00	Initial B	900.5	746.6	**45247.8**
Initial GW - GW, Soil Expt	03/11/2009 11:00	Final C	905.6	744.0	**45690.9**
Control GW Soil A	04/11/2009 12:00	Set 1	754.4	658.7	**40320.5**
Control GW Soil B	04/11/2009 12:00	Set 1	759.0	661.0	**40421.9**
Persulphate GW Soil A	04/11/2009 12:00	Set 1	735.7	648.6	**39053.6**
Persulphate GW Soil B	04/11/2009 12:00	Set 1	751.8	662.1	**39795.5**
Control GW Soil A	04/11/2009 17:00	Set 2	722.0	632.6	**38709.3**
Control GW Soil B	04/11/2009 17:00	Set 2	699.6	613.7	**37456.4**
Persulphate GW Soil A	04/11/2009 17:00	Set 2	711.6	635.4	**37109.4**
Persulphate GW Soil B	04/11/2009 17:00	Set 2	690.6	615.2	**36250.0**
Control GW Soil A	05/11/2009 18:00	Set 3	703.6	613.3	**37443.5**
Control GW Soil B	05/11/2009 18:00	Set 3	704.1	610.5	**37683.8**
Persulphate GW Soil A	05/11/2009 18:00	Set 3	703.9	624.3	**37081.3**
Persulphate GW Soil B	05/11/2009 18:00	Set 3	672.4	606.2	**34814.0**
Control GW Soil A	06/11/2009 19:00	Set 4	619.0	583.1	**32011.7**
Control GW Soil B	06/11/2009 19:00	Set 4	702.6	601.5	**38196.5**
Persulphate GW Soil A	06/11/2009 19:00	Set 4	637.9	572.1	**32821.0**
Persulphate GW Soil B	06/11/2009 19:00	Set 4	697.8	611.5	**36639.1**
Control GW Soil A	12/11/2009 19:00	Set 5	725.7	629.0	**39807.8**
Control GW Soil B	12/11/2009 19:00	Set 5	687.9	601.8	**37274.6**
Persulphate GW Soil A	12/11/2009 19:00	Set 5	623.0	558.0	**30805.0**
Persulphate GW Soil B	12/11/2009 19:00	Set 5	546.3	502.9	**25989.8**
Control GW Soil A	23/11/2009 13:00	Set 6	557.9	529.7	**26704.7**
Control GW Soil B	23/11/2009 13:00	Set 6	671.9	548.9	**35901.1**
Persulphate GW Soil A	23/11/2009 13:00	Set 6	336.7	426.1	**16085.5**
Persulphate GW Soil B	23/11/2009 13:00	Set 6	384.2	444.9	**19689.0**
Initial GW - GW only Expt	03/11/2009 11:00	Initial A	893.4	747.2	**44403.2**
Initial GW - GW only Expt	03/11/2009 11:00	Initial B	913.6	761.3	**45442.9**
Initial GW - GW only Expt	03/11/2009 11:00	Final C	931.2	777.7	**46228.4**
Control GW A	04/11/2009 12:00	Set 1	840.2	711.0	**41282.9**
Control GW B	04/11/2009 12:00	Set 1	849.7	718.8	**41828.3**
Control GW C	04/11/2009 12:00	Set 1	863.6	728.9	**42409.9**
Persulphate GW A	04/11/2009 12:00	Set 1	807.6	718.1	**41723.1**
Persulphate GW B	04/11/2009 12:00	Set 1	820.6	731.6	**42337.3**
Persulphate GW C	04/11/2009 12:00	Set 1	796.4	705.4	**41179.4**
Control GW A	04/11/2009 17:00	Set 2	853.1	723.2	**41928.4**
Control GW B	04/11/2009 17:00	Set 2	841.8	713.0	**41443.3**
Control GW C	04/11/2009 17:00	Set 2	843.4	712.5	**41596.0**
Persulphate GW A	04/11/2009 17:00	Set 2	773.1	684.9	**40068.6**
Persulphate GW B	04/11/2009 17:00	Set 2	773.0	684.9	**39925.2**
Persulphate GW C	04/11/2009 17:00	Set 2	804.2	716.8	**41445.1**
Control GW A	05/11/2009 18:00	Set 3	778.6	655.5	**38398.5**
Control GW B	05/11/2009 18:00	Set 3	807.4	686.4	**39685.5**
Control GW C	05/11/2009 18:00	Set 3	742.0	648.5	**37746.7**
Persulphate GW A	05/11/2009 18:00	Set 3	407.3	358.4	**20786.5**
Persulphate GW B	05/11/2009 18:00	Set 3	775.5	689.8	**39515.1**