

**Carbon Monoxide Network Assessment
Bend, Oregon
2003-2004**

**DEQ05-LAB-0034-TR
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Environmental
Quality

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PROJECT WORK PLAN

PURPOSE

This study is being conducted for the purpose of re-evaluating the current siting of the carbon monoxide (CO) monitoring station in Bend, Oregon. This type of site assessment study has not been conducted in Bend for a number of years. During that time Bend has experienced a large amount of population growth and rapid expansion. New arterial traffic routes have developed, most notably the completion of the Highway 97 bypass. Traffic volume has increased and traffic flows are not the same as they used to be making it desirable to reassess current traffic patterns and the resultant levels of carbon monoxide in Bend with an eye toward determining whether or not the current CO monitoring station is still optimally placed to characterize overall CO levels in Bend.

HOW ACCOMPLISHED

The study will begin in November of 2003 and continue for a period of three months. Ten strategically located monitoring sites will be selected in order to accomplish the goals of this study. One of these sites includes the existing CO site and one will be a neighborhood scale or background site. Compact and portable CO monitors will be placed at each of these sites. Permission to hang them from power poles and city street signs has already been granted.

The samplers for this project are Draeger Pac III personal hygiene monitors equipped with carbon monoxide sensors. They operate via passive exposure to the ambient air. They have been used successfully by the Desert Research Institute (DRI) in a similar CO survey in Las Vegas for Clark County in the state of Nevada. Initial testing for precision and accuracy has also been performed in Portland by DEQ staff. Results of this brief testing are discussed later in this report. The Draeger Pac III units are also equipped with internal data loggers.

Once deployed in the field, these samplers will run continuously except for 3 or 4 hours each week when they are collected, brought to a central location, zero and span checks performed, data downloaded, batteries changed, etc. in preparation for their redeployment into the field. The network will be serviced by local air monitoring network personnel as required. Discs containing the downloaded data will be returned to the Lab weekly for analysis.

SITE SELECTION

Utilizing recent traffic counts, input from local DEQ officials and CO siting criteria, eight sites in addition to the current monitoring site will be selected. All of these sites are located along major arterial roads in anticipated areas of heavy traffic flow. One additional neighborhood scale site has been selected to observe background CO levels as they relate to overall CO levels in Bend. The selected sites are listed by their 3 or 4 letter site acronyms with sampler designation in parentheses and are as follows:

#1&2	BCO	The current CO site located on the east side of 3 rd St. (U.S. Hwy #97 and south of Greenwood Ave.
#3	BPS	The neighborhood scale or background site located at the current particulate monitoring site at 35 NW Portland Ave.
#4	BTR	West side of 3 rd St. and north of Revere Ave.
#5	BTRM	West side of 3 rd St. and north of Reed Market Rd.
#6	BEO	East side of 8 th St. and south of the Olney/Penn intersection.
#7	BEG	East side of 8 th St. and south of Greenwood Ave.
#8	BTG	West side of 27 th Ave. and north of Greenwood Ave.
#9	BNE	South side on Newport Ave. and west of 11 th St.
#10	BGW	North side of Greenwood Ave. and east of Wall St.
#11	BTBM	East side of 3 rd St. and north of Butler Market Rd.

NETWORK QA/QC

A federal reference method carbon monoxide analyzer operates continuously at the regular DEQ CO site at 3rd and Greenwood (BCO). Two survey samplers will be co-located along with this monitor where they can provide data used to determine the precision and accuracy of the study.

The survey samplers will be subject to periodic independent performance audits performed by ODEQ Lab staff during regularly scheduled (monthly) network reviews. The performance of the local operator will also be reviewed during these visits. The operator will maintain a "journal" of the project, noting significant events (equipment problems, unusual weather, etc.), and documentation of the weekly zero and span results, downloading of data, battery changes, and the like.

Additional standard quality control (QC) procedures will be followed at the laboratory during the review of the data and field notes before and after analysis.

SUMMARY AND REPORT

A report detailing the results of this study will be generated at the end of the three-month sampling period. The report will include sampling data from all nine of the study sites along with data from the main CO site in Bend. The data from each of the sites will be compared to each other and a determination made as to the suitability of the current CO monitor siting in Bend.

PROJECT SCHEDULE

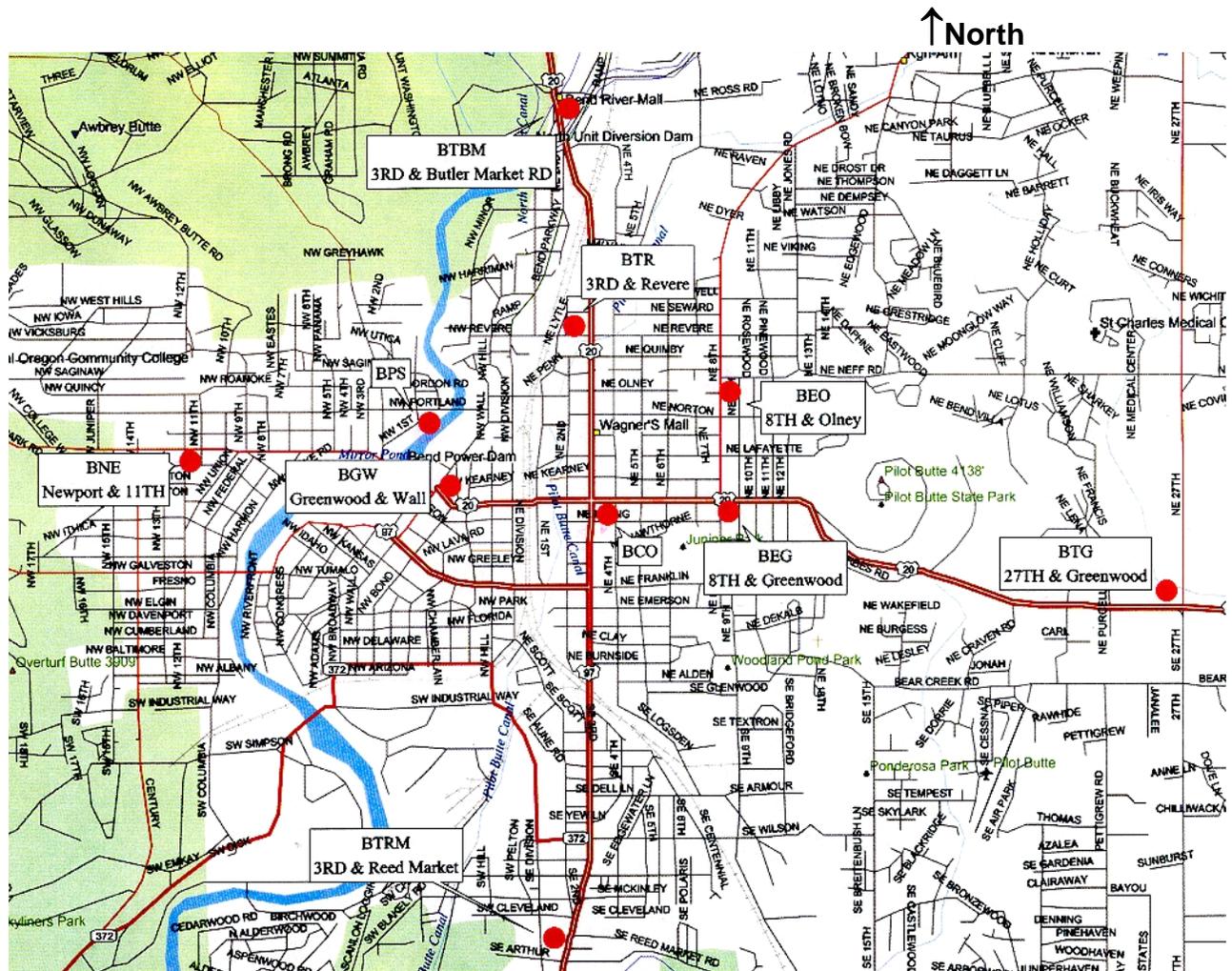
Activity

Develop Work Plan.
Site search and procurement.
Equipment preparation and testing.
Begin sampling
End sampling.
Final report.

Date

October 2003
November 2003
Oct.-Nov. 2003
November 2003
February 2004
May 2004

MAP of BEND CO SURVEY SITES



BEND CO SURVEY SITES

BCO-3rd & Greenwood
N44 3 34.31 / W121 18 8.7
Monitor# 1 & 2 Site# 10098



BTG-27th & Greenwood
N44 5 55.0 / W121 26 38.7
Monitor #8 Site#30932



BEG-8th & Greenwood
N44 5 97.2 / W121 29 37.7
Monitor #7 Site#30925



BEO-8th & Olney/Penn
N44 6 51.2 / W121 29 37.7
Monitor #6 Site#30926



BGW-Greenwood & Wall
N44 6 3.3 / W121 31 20.4
Monitor #10 Site#30927



BNE-Newport & 11th
N44 6 22.9 / W121 32 81.9
Monitor #9 Site#30928



BTBM-3rd & Butler Market
N44 8 10.9 / W121 30 49.9
Monitor #11 Site#30929



BTR-3rd & Revere
N44 6 78.9 / W121 30 26.6
Monitor #4 Site#30930



BTRM-3rd & Reed Market
N44 3 90.5 / W121 30 42.7
Monitor #5 Site#30931



BPS-35 NW Portland Ave
N44 3 50.05 / W121 18 45.28
Monitor #3 Site#24172



CLOSEUPS OF SAMPLERS IN ENCLOSURES



PROJECT RESULTS

DISCUSSION OF SAMPLERS AND OVERALL SURVEY SAMPLING

The samplers used in this survey were Draeger Pac III personal hygiene monitors, each outfitted with a CO sensor and data logger package. They operate via passive exposure to the air. This differs from the reference method CO monitors which actively pull-in the surrounding air through a probe. Another difference is that the resolution of the measurement method for the Draegers is to the nearest part per million (ppm) while the reference method monitor measures to the nearest 0.1 ppm. The reference method CO monitor also operates in the 0-50 ppm range while the measurement threshold for the Draeger's is 2,000 ppm. In order to be able to fit at least seven or eight days of data into the Draeger's data logger, the Draeger units were set to poll every two minutes as opposed to polls every ten seconds the datalogging system used with the reference method CO monitor.

The Draeger samplers were fitted into an enclosure (see photos above) that would protect them from the weather while at the same time allowing them adequate exposure to ambient air. This enclosure also allowed them to be hung from hangers attached to telephone poles and street signs (in order to site them properly and uniformly at each sampling location).

Initially the Draegers were gathered at a central location where their internal data loggers were cleared and zero and span checks were performed and recorded. Adjustments to zero and span values were made as needed. The units were then taken into the field and deployed at the various sampling sites. This was on Nov. 25th, 2003. They would remain sampling in the field for between 6 and 11 days (as the local operators schedule allowed) when they were collected and taken back to the central location. Here the data was downloaded and zero and span checks were performed and recorded. Other as needed maintenance and adjustments were performed at this time. They were then redeployed into the field where they remained for another 6-11 days.

The early stages of project sampling were fraught with many difficulties. Periods of stormy weather and snow hampered the project early on. Sampler #11 from the site on Third St. (Hwy 97) north of Butler Market Rd. disappeared. It was eventually found and returned to the Bend DEQ office unharmed. Next, the cradle used for data downloading proved defective when the first set of samples were collected and brought to the central location for downloading and service. This occurred on Dec 5th, 2003. In order to save the data, the Draegers needed to be turned off for 10 days until a replacement cradle was obtained.

Then it was discovered that a dead battery would wipe out the entire data record which had been stored in the data logger. To remedy this, and to improve battery performance in Bend's cold conditions, lithium batteries were placed into the Draegers. This proved to be a serious error. After several days, off-gassing from the lithium

batteries “poisoned” the CO sensors rendering them ineffectual with more data lost. In time the sensors were able to purge themselves and resume normal operation. After further testing, the samplers were finally redeployed and the network became operational again on Jan. 21st, 2004. With only a few data loss problems, they sampled successfully through the end of the project on Mar. 3rd, 2004. Unfortunately, due to the down time, we missed much of our targeted sampling window from which we had anticipated the highest CO levels of the survey. As a result of the equipment problems only 2 valid data sets were collected between November 25th and Jan 21st. One on November 26th and the other from December 1st through 4th.

Figure 1 below shows the maximum 8 hour average CO concentration at the benchmark site (BCO) for the entire winter of 2003-2004. Two things should be noted from this data. First, almost all of the 8 hour maximums are less than 2.0 ppm. This value is less than 25% of the federal 8 hour standard. And second, it appears that we may have missed a couple of promising survey periods in late December 2003 and early January 2004. Sampling during those periods might have provided better comparison data. The final 2 months of the project were similar to November and early December. Despite the lost data, we believe that we were able to generate an adequate data set to achieve the objectives of this project.

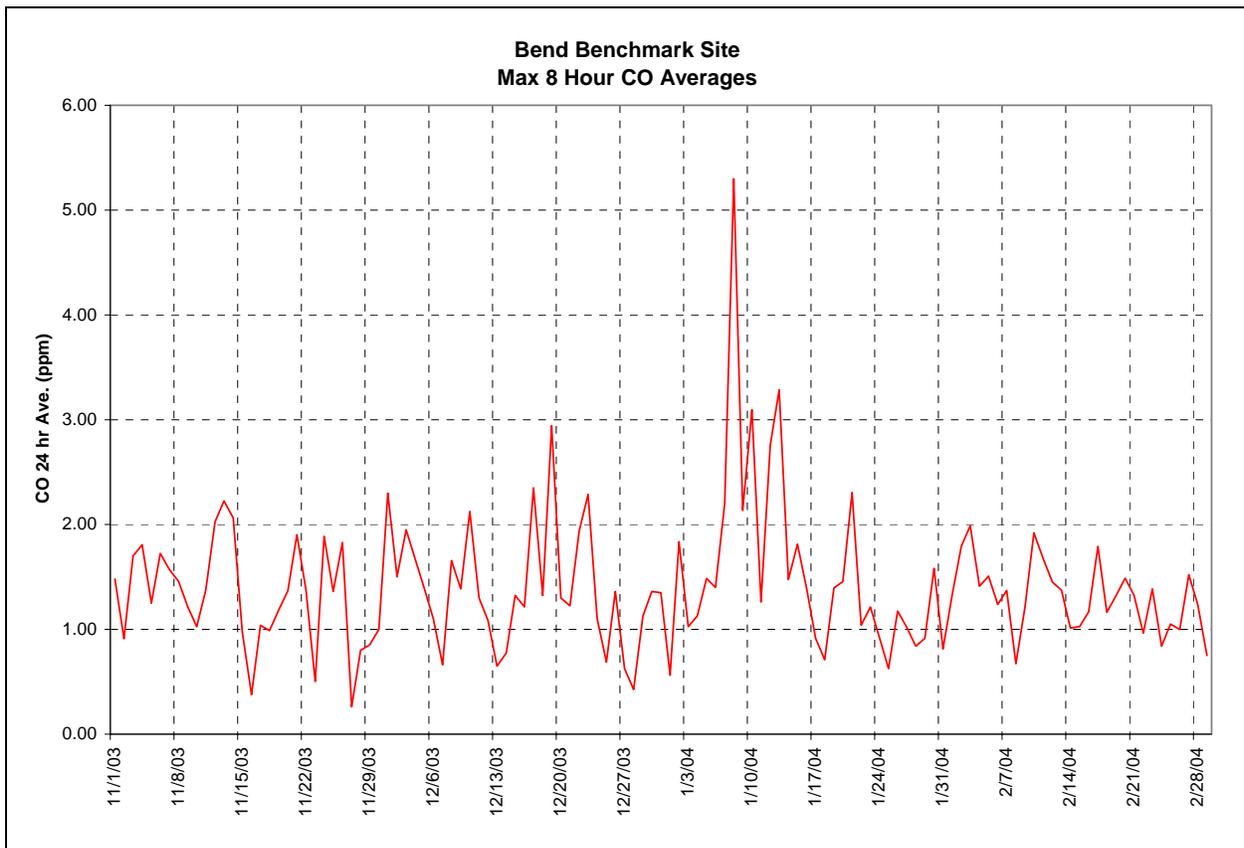


Figure 1.

NETWORK QA/QC

A pre-survey test of a demo Draeger co-located alongside the probe inlet at the Forth & Alder DEQ CO site in Portland was performed. The testing lasted a few days. Results of this test showed that the Draeger Pac III monitors generally compared favorably to the Federal Reference Method CO monitor. These results are shown below in Figure 2. These results also demonstrate the lack of sensitivity at values below 0.5 ppm and a slope significantly less than 1.0. While marginally satisfactory, these initial results may later have been shown to be somewhat premature, they did lead DEQ to conclude that the Draeger units could and would fulfill the objectives of this project.

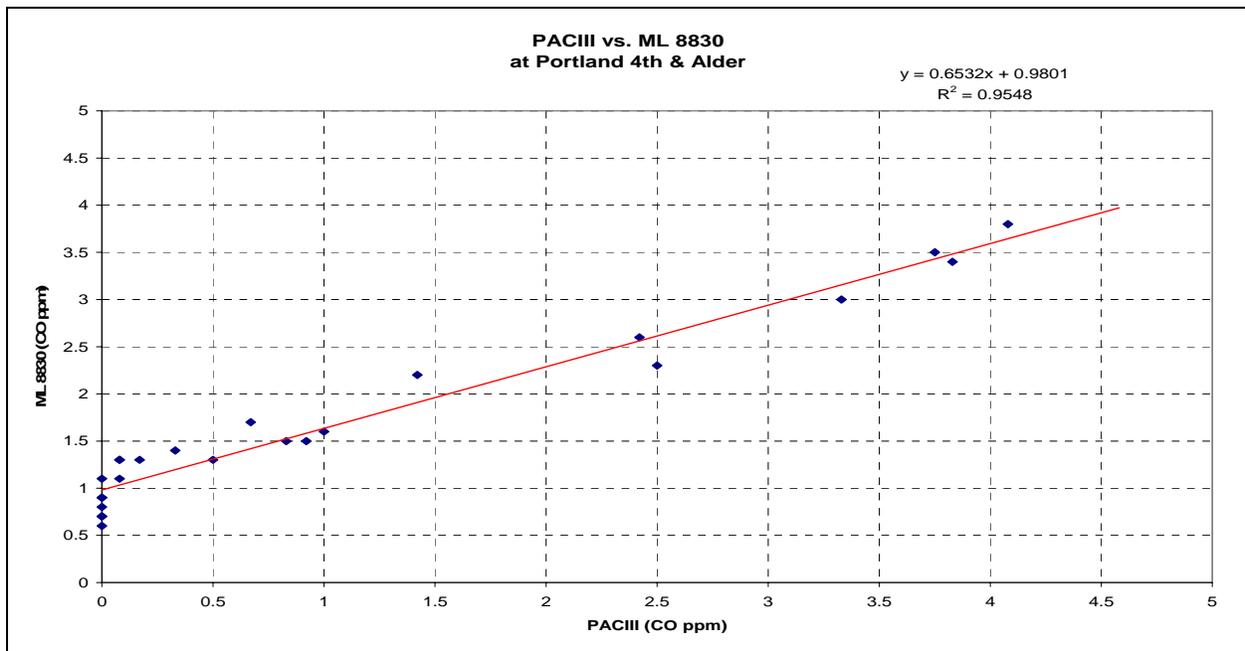


Figure 2

Working zero and span cylinders were analyzed vs NIST standards and dedicated to this project. A complete review of operator records indicated that nearly all of the samplers responded quickly and accurately to the zero and span gases. Only a few instances occurred where minor zero drift may have affected the data.

The benchmark Federal Reference Method CO monitor was recently calibrated for linearity of response utilizing NIST standards. Analysis of the working zero, span and precision span cylinders was also performed at this time. The monitor was kept adjusted to within 0.5 ppm of the working gas concentrations with at least weekly service visits by the local network operator. Additional quarterly Quality Assurance (QA) audits of the CO monitor were performed by the DEQ Laboratory QA section and were within EPA established limits.

RESULTS

Precision

The precision of the Draeger survey samplers was determined by locating two of them (primary and duplicate samplers) at the benchmark site (BCO). Siting at the benchmark site also allows collection of data to determine the accuracy of the survey samplers. Data from the Draegers was converted into hourly averages in order to make meaningful comparisons. The precision data from this pair of samplers was disappointing. The standard deviation of the differences between the two (sigma value) was 0.76 ppm. The statistical correlation between the two was 0.699 with a corresponding R squared value of only 0.4892. For the survey, the primary sampler averaged 1.1 ppm while the duplicate sampler averaged 0.6 ppm. The average difference between the two was 0.5 ppm with a maximum difference of 3.6 ppm. The average CO value for the entire survey of the primary and duplicate samplers was 0.9 ppm.

An R squared less than 0.5 and a sigma nearly equal to the average value raises serious questions about the quality of the data set. With this particular survey it appears that a majority of the ambient CO values were near the detection limit of the sampler. There were many zero or near zero points included in the comparison. With a measurement resolution of only 1 ppm, and the vast majority of CO concentrations less than 2 ppm, we were operating at the very lower detection limit of the Draeger. 2 ppm is only 0.1% of the full scale range of the instrument. The precision results are shown in Figure 3 below.

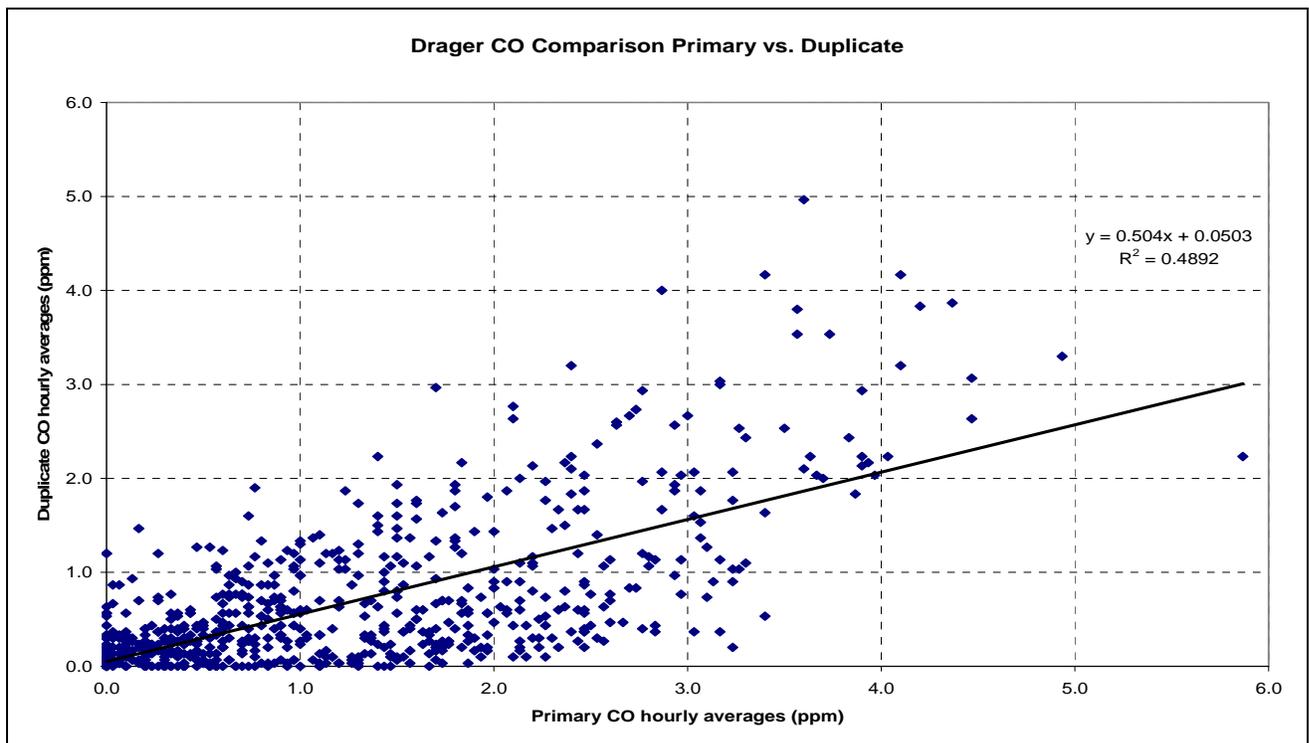


FIGURE 3.

Accuracy

The accuracy of the Draeger survey samplers was determined by locating two of them (primary and duplicate samplers) in close proximity to the probe inlet of the benchmark CO monitor at the BCO site. Interestingly, the accuracy of the Draeger samplers (using the average of the primary and duplicate samplers vs. the benchmark CO) rated much higher than the precision. The average for the reference method benchmark CO monitor was 0.8 ppm as compared to 0.9 ppm for the average of the Draegers. The average difference was 0.1 ppm with a maximum difference of 1.9 ppm and a sigma value of 0.46 ppm. The statistical correlation between the two was 0.853 with a corresponding R squared value of 0.7268. Taken individually, the correlation between the primary Draeger and the Bend CO site was 0.766 while the correlation between the duplicate sampler and the Bend CO site was 0.812. The better correlation with the duplicate sampler is probably a function of more data points for comparison as the primary sampler lost it's data record on two occasions. Based on these overall precision and accuracy results, as mentioned above, it seems clear that we were operating near the detection limits of the Draeger samplers. While the samplers did not perform as well as hoped, they appear to be adequate to provide a rough comparison of CO levels at the survey sites. The accuracy data is shown in Figure 4 below.

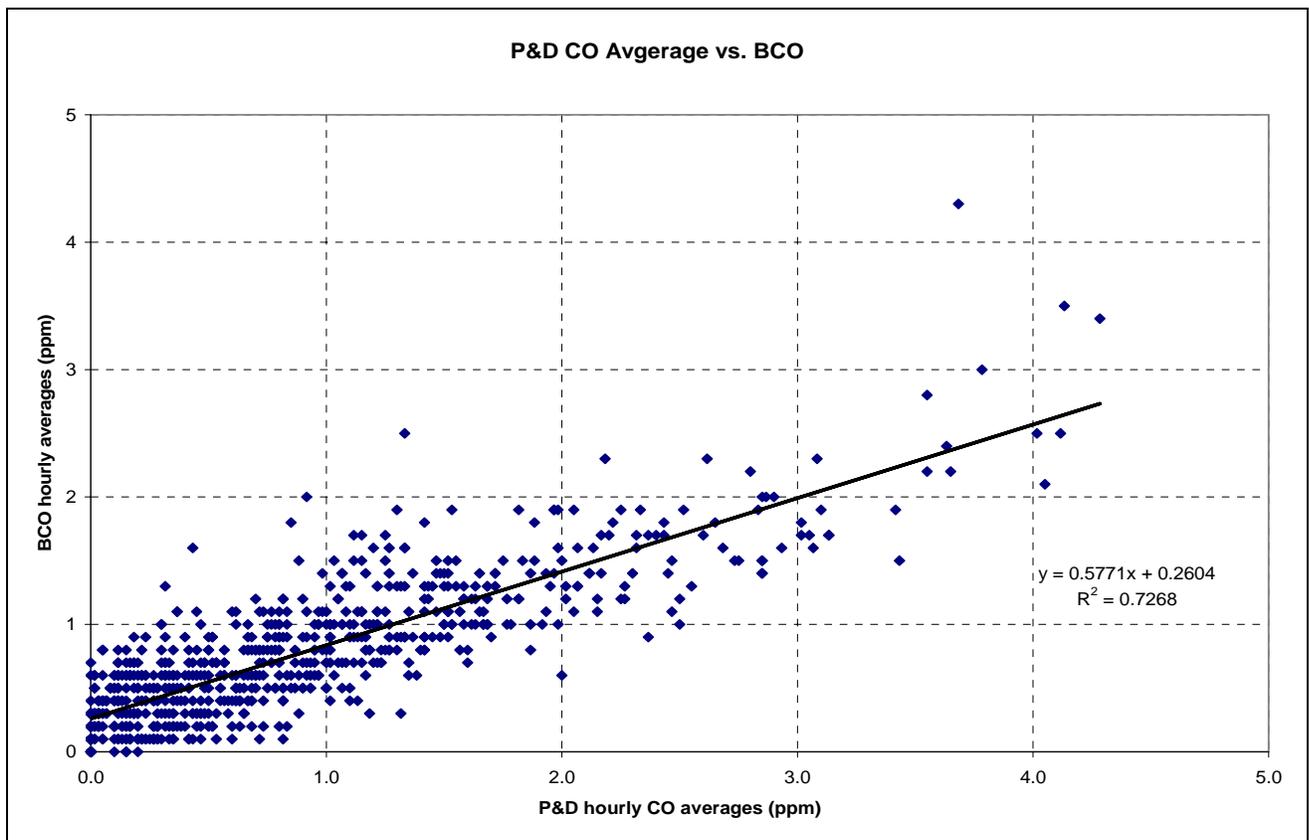


Figure 4.

As compared to the Benchmark CO analyzer, the Draegers tended to under report CO levels when the concentrations were below about 1-1.5 ppm. This is understandable considering their measurement resolution, e.g. while the ambient monitor reported 0.4 ppm the survey sampler would have called this 0 ppm. They also appear to over report CO levels above 1.5 ppm. We have no explanation of this. All things considered, the Draeger samplers appeared to do a reasonable job of measuring CO levels at the different monitoring locations.

Survey Results

Results of the Bend CO survey are most easily compared using the survey averages from each site. The thirty 2-minute averages from the Draegers were converted into hourly averages to provide for useful comparison between the samplers and the reference method monitor. For comparison purposes, only the segments of data showing relatively elevated CO concentrations were deemed useful. This data was gleaned from the available data record and appears in Table 1 at the end of this report. One section of near zero data was included as an example of how the sites generally compared during such times. Graphs of each survey site versus the benchmark site are also included at the end of this report.

As expected, the site with the lowest CO exposure was the neighborhood scale (background) site at BPS. Normally at or near zero, it did show some "hits" which generally corresponded with peak home heating hours. Overall results suggest that background CO levels did not significantly affect curbside CO measurements in Bend during this survey. One possible exception exists but this will be discussed later.

The sites at Third & Butler Market (BTBM) and 27th & Greenwood (BTG) also had low survey averages. This is partly the result of some data loss problems at these two sites. However, overall results show the CO levels at these sites to be lower than at the current benchmark site (BCO) which reported a survey average of 1.4 ppm.

Several other sites compared more favorably with the BCO benchmark site. The sites at 8th & Olney (BEO), 3rd & Reed Market (BTRM), Newport & 11th (BNE), 8th & Greenwood (BEG) and downtown at Greenwood & Wall (BGW) reported survey averages of 1.4, 1.5, 1.5, 1.8 and 1.9 ppm respectively. Considering that the averages for the primary and duplicate samplers were 1.9 and 1.4 ppm, and that all are at or within the sigma value of the accuracy of the method, it is concluded that all of these sites essentially monitor the same levels of CO as at the current benchmark site. If we can assume that the over reporting of the primary and duplicate samplers at the benchmark sites holds true for all of the sites, then when comparing hours of higher CO concentrations, all of the sites similarly over reported CO levels as compared to the benchmark CO site. Never the less, when comparing the sites using all of the available data, none of these sites averaged as high as the benchmark CO site.

The single site that averaged significantly higher than the BCO benchmark site was the site at 3rd & Revere (BTR) at 2.7 ppm (1.3 ppm higher than the benchmark). When using all of the available data it still averaged higher (1.6 vs. 1.1 ppm). This site

generally out reported all of the other sites when comparing periods of higher CO levels. In fact, the highest hourly averages for the survey came from this site at 8.6 ppm (see Figure 6). The sampler at this site seldom seemed to measure zero or near zero values, as would be expected at certain times of the day or during certain weather conditions. Although the zero and span quality assurance performance of this sampler was good (within 1 ppm), it is unclear whether this particular sampler suffered from excessive baseline drifting during operation or if real sources of CO actually helped to elevate its measurements. There is at least one restaurant located nearby which operates both early and late which are possible sources of non-vehicular CO. If the data is adjusted for more realistic "background" readings, this site then falls into line with the majority of the other survey sites which essentially monitored the same levels of CO as at the benchmark CO site.

CONCLUSIONS

The most obvious conclusion from this project is that CO values in Bend during the study period were well below the federal standards. While limited valid survey data was collected during the months of November and December due to equipment problems, the conclusion remains that Bend does not have a significant CO problem. We must also conclude that the Draeger sampler is not particularly well suited for survey work in areas with CO concentrations less than 2 ppm. The passive nature of the CO sensor and the units lack of resolution limit its use in this type of study.

Overall results indicate that the areas of highest CO exposure tend to be along the main corridors of 3rd St (U.S. Hwy 97) and Greenwood Ave. (which turns into Newport St. west of the Deschutes River). This is pretty much as expected since they generate the largest volumes of vehicular traffic. With the possible exception of the 3rd & Revere site, none of the sites out-performed the benchmark CO site, and it makes sense that locating at the junction of these two main arteries (as is the benchmark CO site) would produce results characteristic of any other spots along these routes. Therefore it is concluded that the current CO siting in Bend remains the best location to represent overall CO levels in Bend.

RECOMMENDATIONS

Further study of the 3rd & Revere site as compared to the benchmark CO site would be desirable to further clarify any discrepancies between the two sites. However, considering that the Draegers generally tended to over report CO levels, none of the sites seriously threatened exceeding any of the Federal CO standards. Overall CO levels in Bend do not pose any public health threats.

If further study is pursued at any of the sites, it is recommended that pairs of Draegers be placed at each location and that the data logger poll rate be increased from two minutes to one minute to double the number of data points. This would, by necessity, increase the sampler service frequency which, in turn, would probably reduce problems and periods of lost data.

Further work should also be done to investigate the sampler's response characteristics at both low and high levels of CO as it compares to a reference method CO monitor. Work should also be done to determine how well the unit performs in cold conditions.

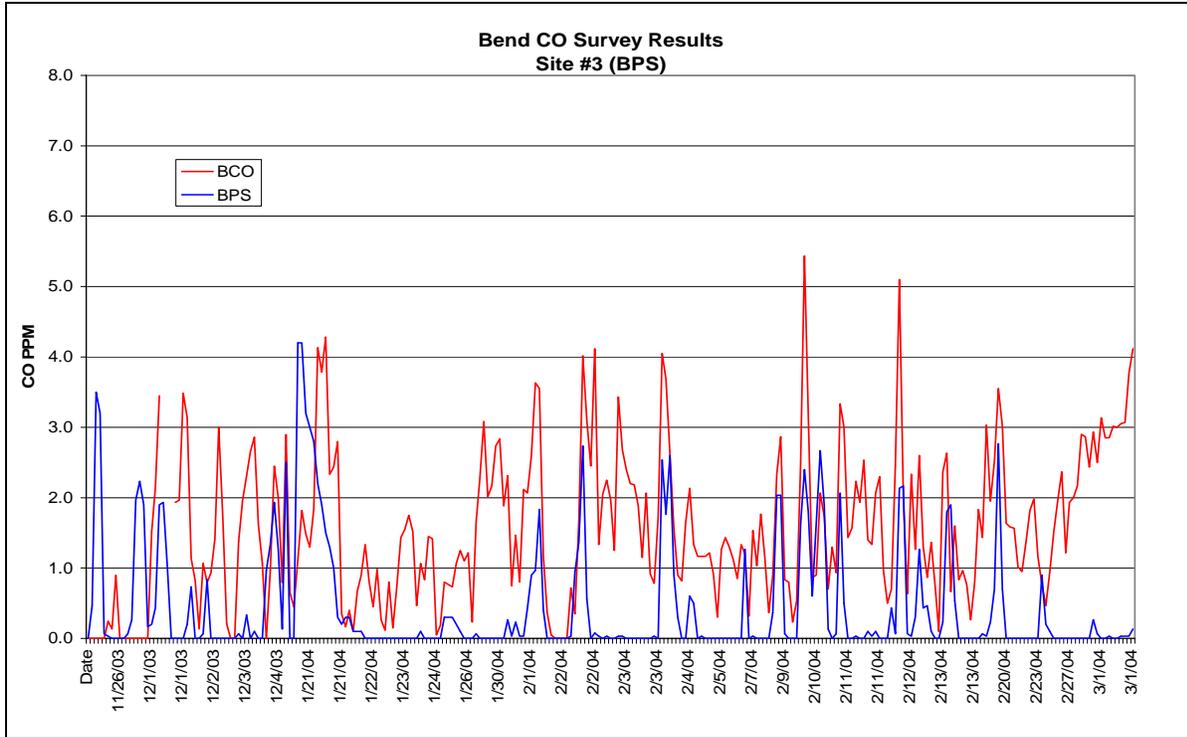


Figure 5

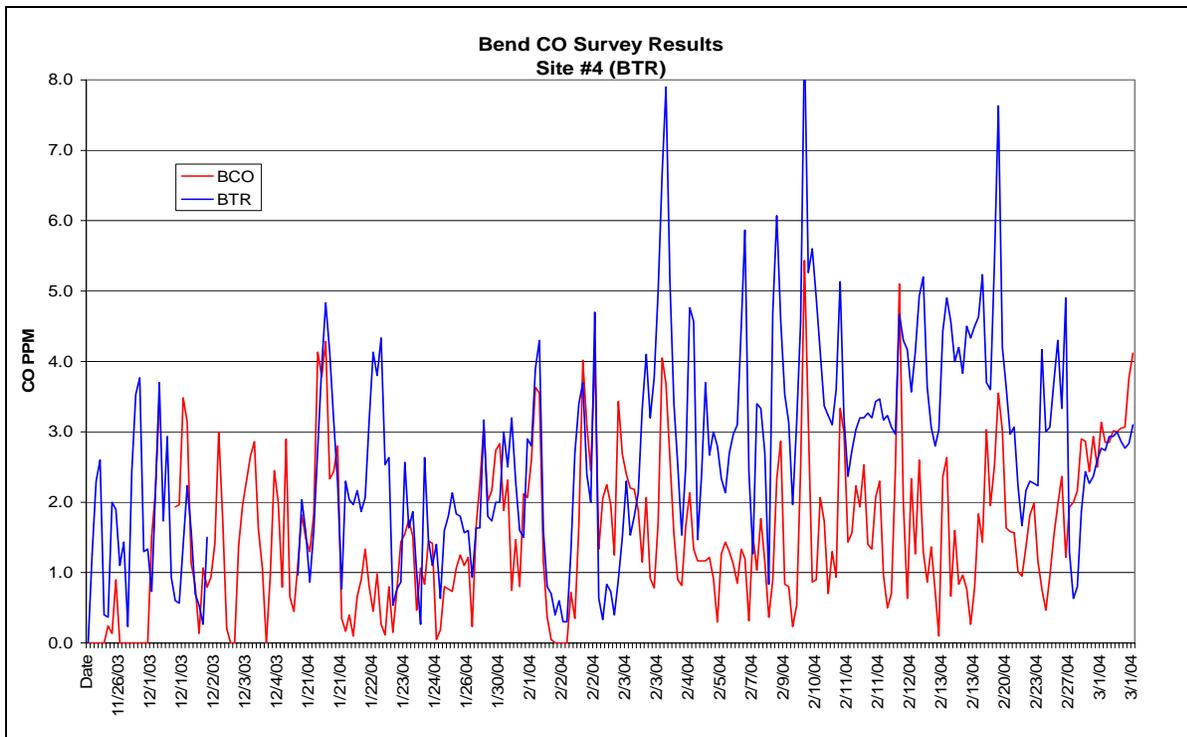


Figure 6

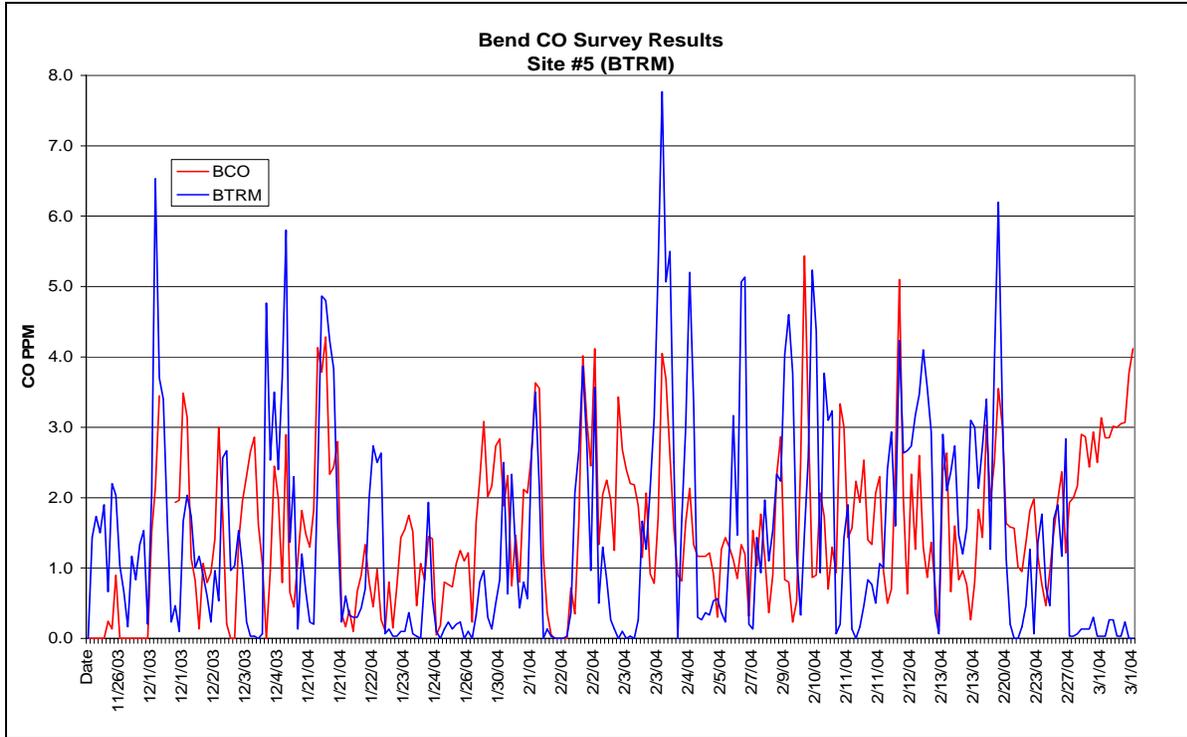


Figure 7

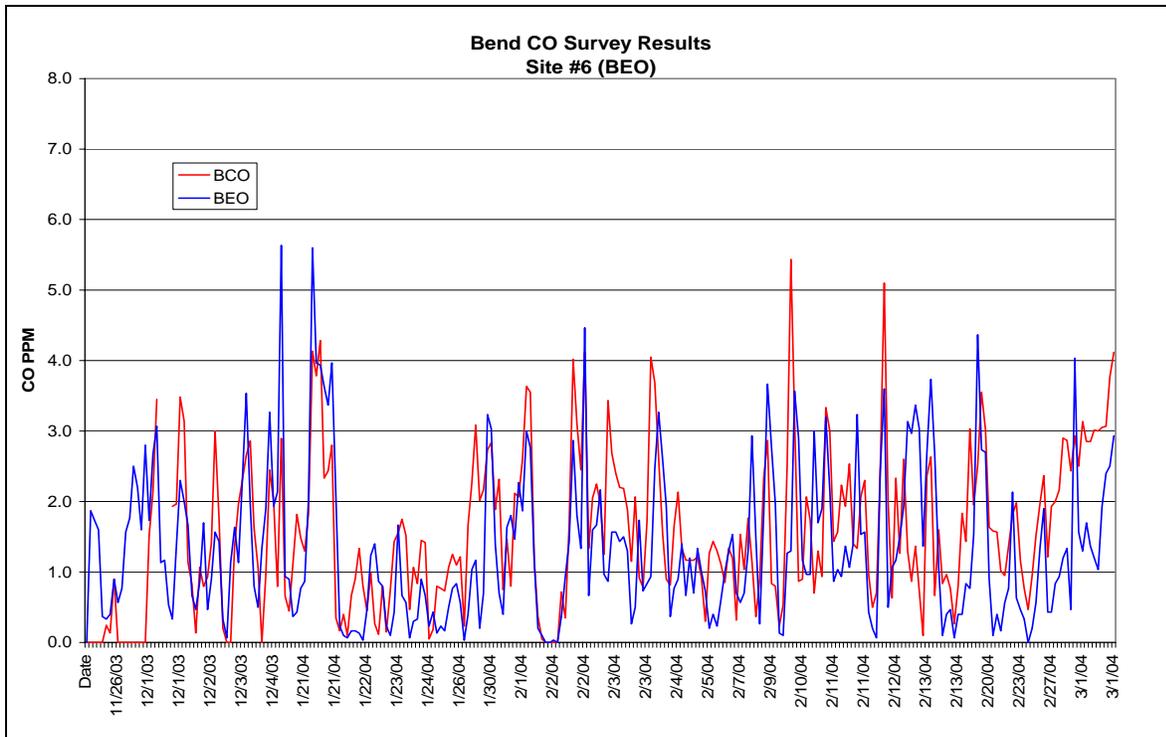


Figure 8

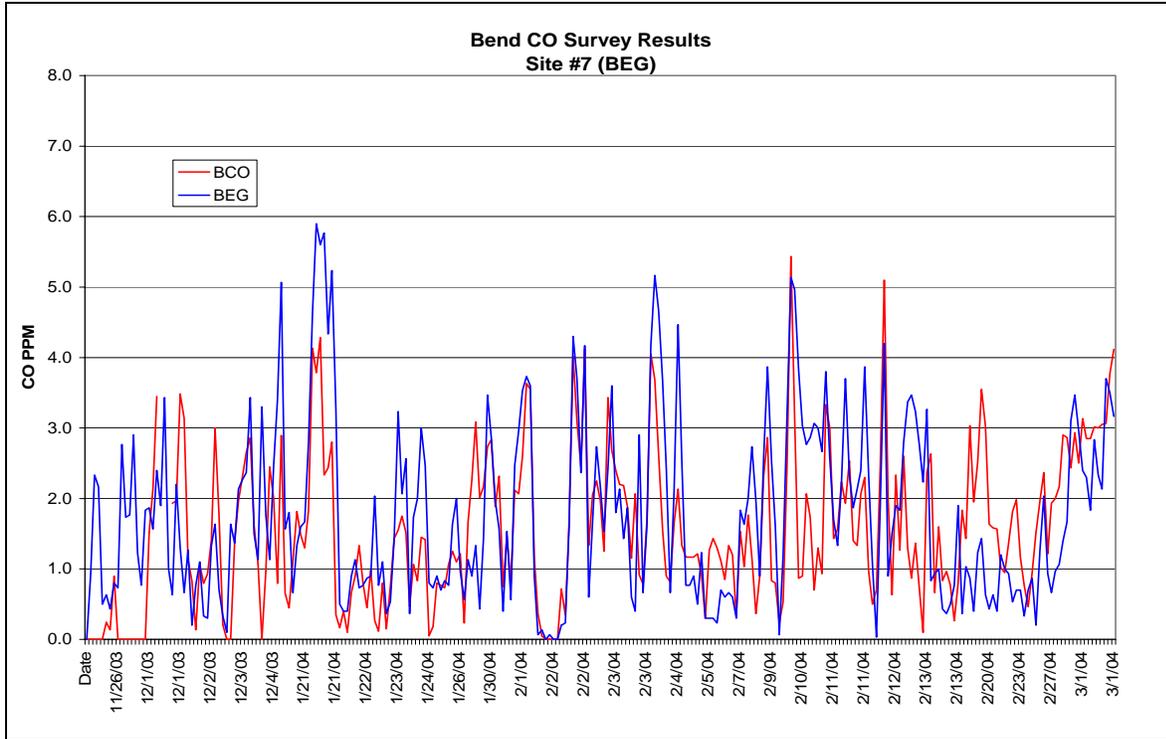


Figure 9

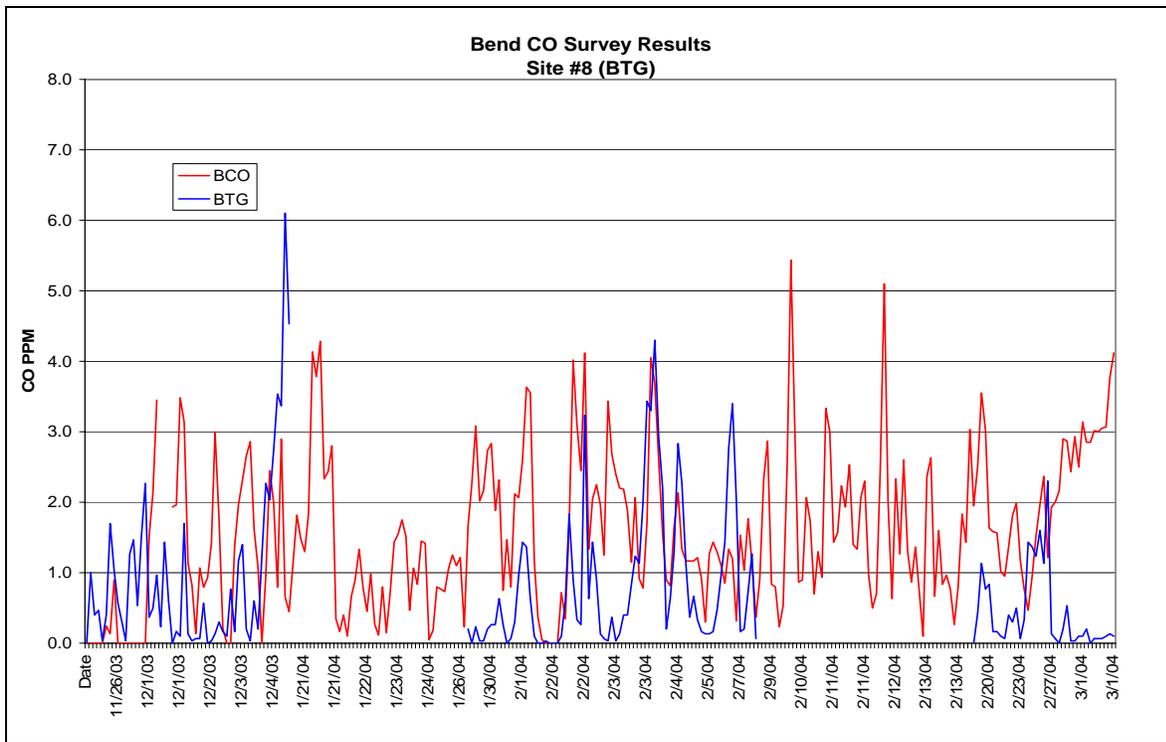


Figure 10

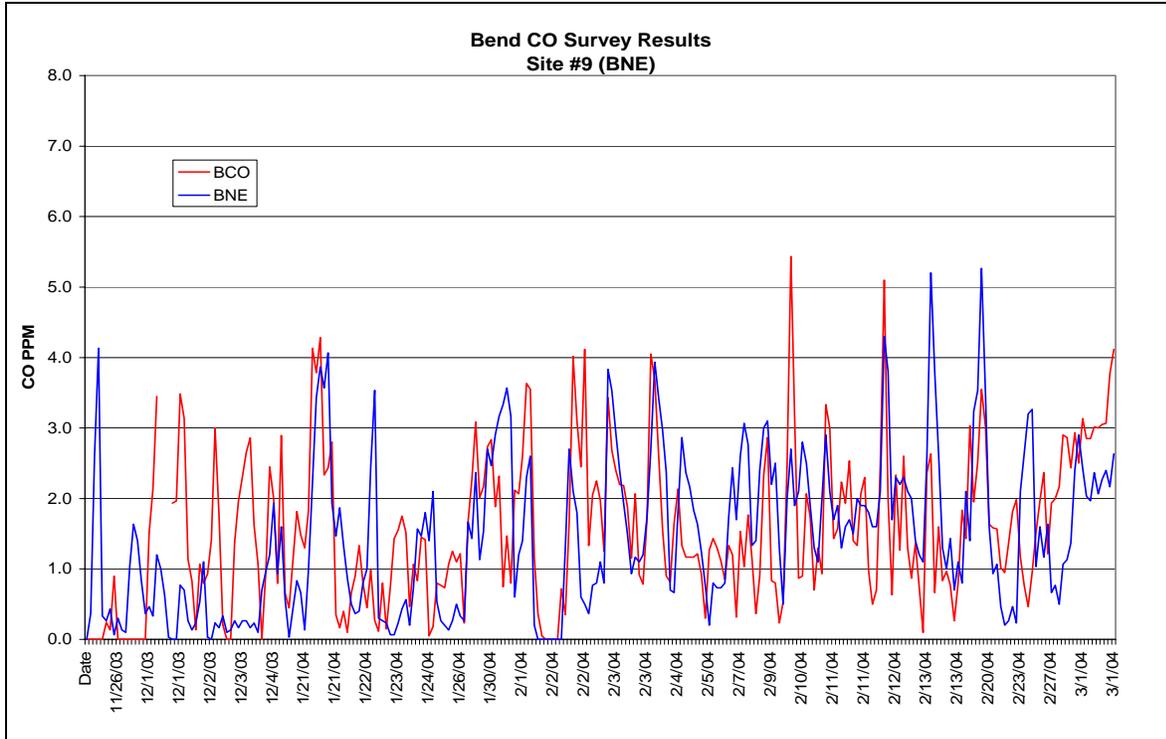


Figure 11

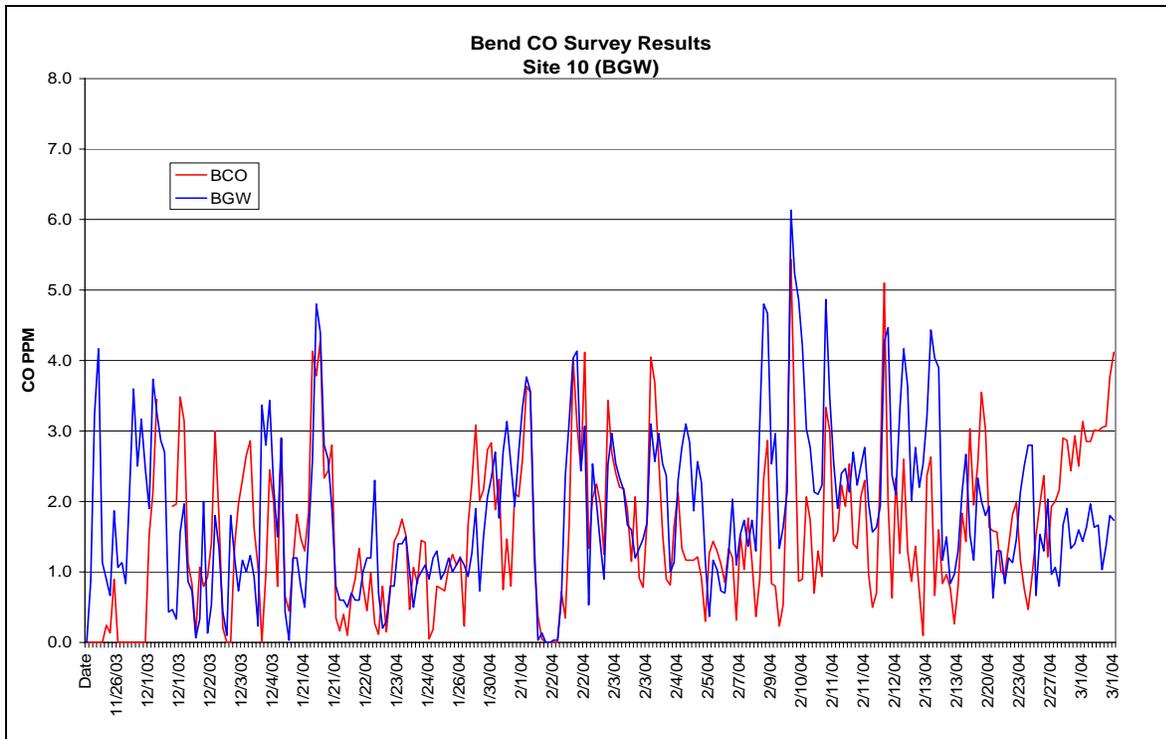


Figure 12

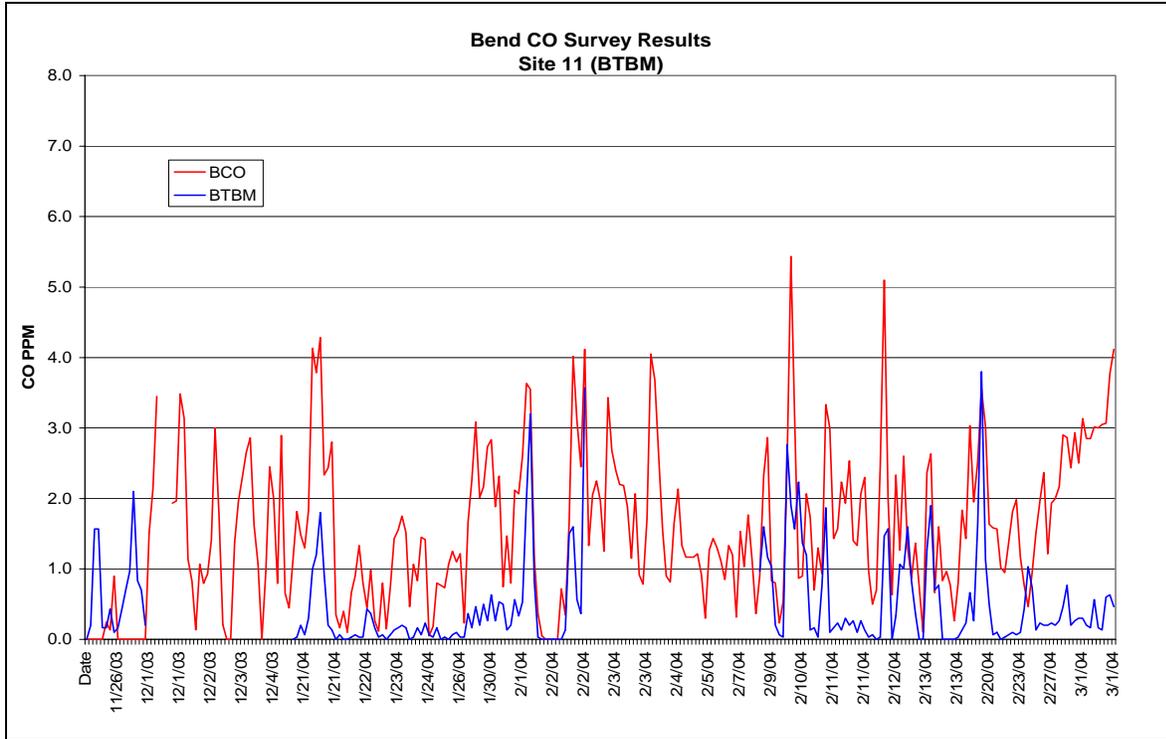


Figure 13

Table 1.

BEND CO SURVEY SITE COMPARISON													Table #1	
Draeger Sampler #		1 Hour Averages											Units ppm	
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM
11/26/03	6	2.1		0	0.0	0.5	1.3	1.4	1.9	0.9	1.0	0.4	0.9	0.2
11/26/03	7	2.2		0	0.0	3.5	2.3	1.7	1.7	2.3	0.4	2.6	3.2	1.6
11/26/03	8	2.5		0	0.0	3.2	2.6	1.5	1.6	2.2	0.5	4.1	4.2	1.6
11/26/03	9	1.4		0	0.0	0.1	0.4	1.9	0.4	0.5	0	0.3	1.1	0.2
11/26/03	10	1.4		0.2	0.2	0	0.4	0.7	0.3	0.6	0.4	0.3	0.9	0.2
11/26/03	11	1.2		0.1	0.1	0	2.0	2.2	0.4	0.4	1.7	0.4	0.7	0.4
11/26/03	12	2.0		0.9	0.9	0	1.9	2.0	0.9	0.8	1.0	0.1	1.9	0.1
11/26/03	13			0	0.0	0	1.1	1.0	0.6	0.7	0.6	0.3	1.1	0.2
11/26/03	14	2.5		0	0.0	0	1.4	0.7	0.8	2.8	0.3	0.1	1.1	0.4
11/26/03	15	2.6		0	0.0	0.1	0.2	0.2	1.6	1.7	0	0.1	0.8	0.7
11/26/03	16	2.8		0	0.0	0.3	2.4	1.2	1.8	1.8	1.3	1.0	2.2	1.0
11/26/03	17	3.5		0	0.0	2.0	3.5	0.8	2.5	2.9	1.5	1.6	3.6	2.1
11/26/03	18	1.7		0	0.0	2.2	3.8	1.3	2.2	1.2	0.5	1.4	2.5	0.8
11/26/03	19	2.2		0	0.0	1.9	1.3	1.5	1.6	0.8	1.5	0.8	3.2	0.7
11/26/03	20	2.4		0	0.0	0.2	1.3	0.2	2.8	1.8	2.3	0.4	2.5	0.2
12/1/03	7	2.3		1.5	1.5	0.2	0.7	2.1	1.7	1.9	0.4	0.5	1.9	
12/1/03	8	2.5		2.1	2.1	0.4	2.1	6.5	2.7	1.6	0.5	0.3	3.7	
12/1/03	9	3.7		3.4	3.4	1.9	3.7	3.7	3.1	2.4	1.0	1.2	3.3	
12/1/03	10	2.8				1.9	1.7	3.4	1.1	1.9	0.2	1.0	2.9	
12/1/03	11	3.2				1.0	2.9	1.7	1.2	3.4	1.4	0.6	2.7	
12/1/03	12	2.1				0	0.9	0.2	0.5	1.0	0.6	0	0.4	
12/1/03	13	2.7		1.9	1.9	0	0.6	0.5	0.3	0.6	0	0	0.5	
12/1/03	14	2.8		2.0	2.0	0	0.6	0.1	1.4	2.2	0.2	0.0	0.3	
12/1/03	15	3.7		3.5	3.5	0	1.4	1.7	2.3	1.3	0.1	0.8	1.6	
12/1/03	16			3.1	3.1	0.2	2.2	2.0	2.0	0.7	1.7	0.7	2.0	
12/1/03	17	2.3		1.1	1.1	0.7	1.6	1.7	1.7	1.3	0.1	0.3	0.9	
12/1/03	18	2.1		0.8	0.8	0	0.7	1.0	0.7	0.2	0	0.1	0.7	
12/1/03	19	1.6		0.1	0.1	0	0.5	1.2	0.5	0.8	0.1	0.2	0.1	
12/1/03	20	2.0		1.1	1.1	0.1	0.3	0.9	0.9	1.1	0.1	0.5	0.3	
12/1/03	21	2.0		0.8	0.8	0.8	1.5	0.6	1.7	0.3	0.6	1.1	2.0	
12/2/03	14	2.0		0.9	0.9	0		0.2	0.5	0.3	0	0	0.1	
12/2/03	15	2.3		1.4	1.4	0		1.0	0.9	1.3	0	0	0.5	
12/2/03	16	3.9		3.0	3.0	0		0.5	1.6	1.6	0.1	0.2	1.8	
12/2/03	17	2.8		1.8	1.8	0		2.6	1.4	0.7	0.3	0.2	1.3	
12/2/03	18	1.5		0.2	0.2	0		2.7	0.3	0.3	0.2	0.3	0.4	
12/2/03	19	1.3		0	0.0	0		1.0	0.1	0.1	0.1	0.1	0.1	
12/3/03	12	2.1		0	0.0	0		1.0	1.1	1.6	0.8	0.1	1.8	
12/3/03	13	2.1		1.4	1.4	0.1		1.5	1.6	1.4	0.2	0.3	1.2	
12/3/03	14	2.7		2.0	2.0	0		1.0	1.1	2.1	1.2	0.2	0.7	
12/3/03	15	3.0		2.3	2.3	0.3		0.2	2.3	2.3	1.4	0.3	1.2	
12/3/03	16	3.2		2.7	2.7	0		0	3.5	2.4	0.2	0.3	1.0	
12/3/03	17	3.4		2.9	2.9	0.1		0	2.0	3.4	0	0.2	1.2	
12/3/03	18	2.7		1.6	1.6	0		0	0.8	1.5	0.6	0.2	0.9	
12/3/03	19	2.0		1.1	1.1	0		0.1	0.5	1.1	0.2	0.1	0.2	
12/4/03	12	2.5		0	0.0	1.0		4.8	1.3	3.3	1.2	0.7	3.4	

BEND CO SURVEY SITE COMPARISON												Table #1		
Draeger Sampler #		1 Hour Averages											Units ppm	
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM
12/4/03	13	2.0		1.0	1.0	1.3		2.5	1.9	1.8	2.3	1.0	2.8	
12/4/03	14	2.9		2.4	2.4	1.9		3.5	3.3	1.1	2.0	1.2	3.4	
12/4/03	15	2.6		2.0	2.0	1.3		2.4	1.9	2.5	2.7	1.9	2.2	
12/4/03	16	2.2		0.8	0.8	0.1		3.7	2.1	3.4	3.5	0.9	1.5	
12/4/03	17	3.3		2.9	2.9	2.5		5.8	5.6	5.1	3.4	1.6	2.9	
12/4/03	18	1.8		0.7	0.7	0		1.4	0.9	1.6	6.1	0.6	0.4	
12/4/03	19	2.0		0.4	0.4	0		2.3	0.9	1.8	4.5	0.0	0.0	
1/21/04	11	1.5	1.2	1.0	1.1	4.2	1.0	0.1	0.4	0.7		0.4	1.2	0
1/21/04	12	1.2	1.4	2.2	1.8	4.2	2.0	1.2	0.4	1.3		0.8	1.2	0
1/21/04	13	1.4	1.5	1.5	1.5	3.2	1.6	0.7	0.8	1.6		0.7	0.8	0.2
1/21/04	14	1.3	1.3	1.3	1.3	3.0	0.9	0.2	0.9	1.7		0.1	0.5	0.1
1/21/04	15	1.5	1.8	1.9	1.8	2.8	1.6	0.2	2.0	2.8		1.0	1.5	0.3
1/21/04	16	3.5	4.1	4.2	4.1	2.2	2.8	2.3	5.6	4.6		2.2	2.6	1.0
1/21/04	17	3.0	3.4	4.2	3.8	1.9	3.9	4.9	4.0	5.9		3.4	4.8	1.2
1/21/04	18	3.4	3.6	5.0	4.3	1.5	4.8	4.8	3.9	5.6		3.9	4.4	1.8
1/21/04	19	1.9	1.7	3.0	2.3	1.3	4.1	4.2	3.6	5.8		3.6	2.8	0.9
1/21/04	20	1.8	2.1	2.8	2.4	1.0	3.2	3.8	3.4	4.3		4.1	2.6	0.2
1/21/04	21	2.2	2.4	3.2	2.8	0.3	2.3	1.7	4.0	5.2		1.9	1.9	0.1
1/21/04	22	0.6	0.4	0.3	0.4	0.2	0.8	0.2	2.1	3.3		1.5	0.8	0
1/22/04	8	0.7	0	0.3	0.2	0.3	2.3	0.6	0.2	0.5		1.9	0.6	0.1
1/22/04	9	0.9	0.4	0.4	0.4	0.3	2.0	0.3	0.1	0.4		1.3	0.6	0
1/22/04	10	0.6	0.1	0.1	0.1	0.1	2.0	0.3	0.1	0.4		0.9	0.5	0
1/22/04	11	0.9	0.8	0.5	0.7	0.1	2.2	0.3	0.2	0.9		0.5	0.7	0
1/22/04	12	1.2	1.1	0.7	0.9	0.1	1.9	0.4	0.2	1.1		0.4	0.6	0.1
1/22/04	13	1.6	1.5	1.2	1.3	0	2.1	0.7	0.1	0.7		0.4	0.6	0
1/22/04	14	1.1	1.0	0.6	0.8	0	3.2	2.0	0	0.8		0.8	1.0	0
1/22/04	15	0.8	0.5	0.4	0.5	0	4.1	2.7	0.5	0.9		1.0	1.2	0.4
1/22/04	16	1.4	1.0	1.0	1.0	0	3.8	2.5	1.2	0.9		2.5	1.2	0.4
1/22/04	17	0.6	0.5	0	0.3	0	4.3	2.6	1.4	2.0		3.5	2.3	0.2
1/22/04	18	0.7	0.1	0.1	0.1	0	2.5	0.1	0.9	0.8		0.3	0.7	0
1/22/04	19	0.9	0.7	0.9	0.8	0	2.6	0.1	0.8	1.1		0.3	0.2	0.1
1/22/04	20	0.8	0	0.3	0.2	0	0.5	0	0.2	0.4		0.2	0.3	0
1/23/04	13	1	0.8	0.7	0.8	0	0.8	0	0.1	0.5		0.1	0.8	0.1
1/23/04	14	1.3	1.5	1.4	1.4	0	0.9	0.1	0.4	1.4		0.1	0.8	0.1
1/23/04	15	1.5	1.5	1.6	1.6	0	2.6	0.1	1.7	3.2		0.2	1.4	0.2
1/23/04	16	1.5	1.8	1.7	1.8	0	1.6	0.4	0.7	2.1		0.4	1.4	0.2
1/23/04	17	1.4	1.7	1.3	1.5	0	1.9	0.1	0.6	2.6		0.6	1.5	0.2
1/23/04	18	0.7	0.7	0.2	0.5	0	1.0	0	0.1	0.4		0.2	1.0	0
1/24/04	15	1.4	0.8	1.3	1.1	0.1	0.3	0	0.3	1.7		0.7	0.5	0
1/24/04	16	1.1	0.8	0.9	0.8	0	2.6	0.8	0.3	2.0		1.6	0.9	0.2
1/24/04	17	1.3	1.4	1.5	1.5	0	1.5	1.9	0.9	3.0		1.5	1.0	0.1
1/24/04	18	1.3	1.4	1.4	1.4	0	1.1	0.6	0.7	2.5		1.8	1.1	0.2
1/24/04	19	0.6	0	0.1	0.1	0	1.4	0.1	0.2	0.8		1.4	0.9	0.1
1/24/04	20	0.6	0.1	0.3	0.2	0	0.6	0	0.4	0.7		2.1	1.2	0.0
1/26/04	11	1.0	0.9	0.7	0.8	0.3	1.6	0.1	0.1	0.9		0.5	1.3	0.2
1/26/04	12	1.1	0.9	0.6	0.8	0.3	1.8	0.2	0.2	0.7		0.3	0.9	0

BEND CO SURVEY SITE COMPARISON												Table #1		
Draeger Sampler #		1 Hour Averages											Units ppm	
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM
1/26/04	13	1.1	0.9	0.6	0.7	0.3	2.1	0.1	0.2	0.8		0.2	1.0	0
1/26/04	14	1.4	1.0	1.1	1.1	0.2	1.8	0.2	0.5	0.8		0.1	1.2	0
1/26/04	15	1.5	1.3	1.2	1.3	0.1	1.8	0.2	0.8	1.6		0.3	1.0	0.1
1/26/04	16	1.3	1.1	1.1	1.1	0	1.6	0	0.8	2.0		0.5	1.1	0.1
1/26/04	17	1.3	1.2	1.2	1.2	0	1.6	0.1	0.6	1.0		0.3	1.2	0
1/26/04	18	0.6	0.2	0.3	0.2	0	0.9	0	0	0.6		0.3	1.1	0
1/30/04	10	1	1.6	1.7	1.7	0.1	1.6	0.3	0.4	1.1	0.2	1.7	0.9	0.4
1/30/04	11	1.2	2.4	2.2	2.3	0	1.6	0.8	1.0	0.9	0	1.4	1.3	0.2
1/30/04	12	2.3	3.2	3	3.1	0	3.2	1.0	1.2	1.3	0.2	2.4	1.9	0.5
1/30/04	13	1.2	2.3	1.8	2.0	0	1.8	0.3	0.2	0.4	0	1.1	0.7	0.2
1/30/04	14	1.4	2.2	2.1	2.2	0	1.7	0.1	0.7	1.4	0	1.5	1.5	0.5
1/30/04	15	1.5	2.7	2.7	2.7	0	2.0	0.5	3.2	3.5	0.2	2.7	2.1	0.3
1/30/04	16	1.9	3.0	2.7	2.8	0	2.0	0.8	3.0	2.9	0.3	2.5	2.3	0.6
1/30/04	17	1.5	2.0	1.8	1.9	0	3.0	2.5	1.4	2.0	0.3	2.9	2.7	0.3
1/30/04	18	1.6	2.4	2.2	2.3	0.3	2.5	0.6	0.7	1.6	0.6	3.2	1.8	0.5
1/30/04	19	0.8	0.8	0.7	0.8	0	3.2	2.3	0.4	0.4	0.3	3.3	2.7	0.5
1/30/04	20	1.1	1.6	1.4	1.5	0.2	2.3	1.2	1.6	1.5	0	3.6	3.1	0.1
1/30/04	21	0.8	0.9	0.7	0.8	0	1.6	0.4	1.8	0.6	0.1	3.2	2.5	0.2
2/1/04	17	1.4	2.3	2.0	2.1	0	1.5	0.8	1.5	2.5	0.3	0.6	1.9	0.6
2/1/04	18	1.3	2.1	2	2.1	0.4	2.9	0.6	2.3	3.0	1.0	1.2	2.7	0.3
2/1/04	19	1.7	2.6	2.6	2.6	0.9	2.8	2.6	1.9	3.5	1.4	1.4	3.3	0.5
2/1/04	20	2.4	3.7	3.5	3.6	1.0	3.9	3.5	3.0	3.7	1.4	2.3	3.8	2.0
2/1/04	21	2.2	3.6	3.5	3.6	1.8	4.3	2.1	2.8	3.6	0.6	2.6	3.6	3.2
2/1/04	22	0.9	1.2	1.1	1.2	0.4	1.6	0	1.1	0.9	0.1	0.2	1.4	0.8
2/1/04	23	0.6	0.5	0.3	0.4	0	0.8	0.1	0.2	0.1	0	0	0	0.0
2/2/04	0	0.4	0.1	0	0.1	0	0.7	0	0.1	0.1	0	0	0.1	0.0
2/2/04	1	0.2	0	0	0.0	0	0.4	0	0	0	0	0	0	0.0
2/2/04	2	0.1	0	0	0.0	0	0.6	0	0	0.1	0	0	0	0.0
2/2/04	3	0.1	0	0	0.0	0	0.3	0	0	0	0	0	0	0.0
2/2/04	4	0.2	0	0	0.0	0	0.3	0	0	0	0	0	0	0.0
2/2/04	5	0.6	0.8	0.6	0.7	0	1.3	0.4	0.4	0.2	0.1	0	0.6	0.0
2/2/04	6	0.5	0.5	0.2	0.4	0.9	2.7	2.1	0.9	0.2	0.6	1.3	2.4	0.1
2/2/04	7	1	1.9	1.4	1.7	1.4	3.4	2.7	1.4	1.6	1.8	2.7	3.1	1.5
2/2/04	8	2.5	4.2	3.8	4.0	2.7	3.7	3.9	2.9	4.3	0.9	2.1	4.0	1.6
2/2/04	9	1.9	3.2	3.0	3.1	0.6	2.4	2.8	1.8	3.7	0.3	1.8	4.1	0.6
2/2/04	10	1.4	2.5	2.4	2.5	0	2.0	1.0	1.3	2.4	0.3	0.6	2.4	0.4
2/2/04	11		4.4	3.9	4.1	0.1	4.7	3.6	4.5	4.2	3.2	0.5	3.1	3.6
2/2/04	14	1.6	2.0	0.6	1.3	0	0.6	0.5	0.7	0.6	0.6	0.4	0.5	
2/2/04	15	1.9	2.4	1.7	2.1	0	0.3	1.3	1.6	1.7	1.4	0.8	2.5	
2/2/04	16	1.9	2.5	2.0	2.3	0	0.8	0.8	1.7	2.7	0.9	0.8	2.0	
2/2/04	17	1.9	2.1	1.9	2.0	0	0.7	0.3	2.2	2.2	0.1	1.1	1.4	
2/2/04	18	1.7	1.1	1.4	1.3	0	0.4	0.1	1.0	1.5	0.1	0.8	0.9	
2/3/04	6	1.5	2.9	4	3.4	0	0.9	0	0.9	2.4	0.0	3.8	2.5	
2/3/04	7	1.6	2.7	2.7	2.7	0	1.5	0.1	1.6	3.6	0.4	3.5	3.0	
2/3/04	8	1.7	2.9	1.9	2.4	0	2.3	0	1.6	1.8	0.0	2.9	2.5	
2/3/04	9	1.7	3.3	1.1	2.2	0	1.5	0	1.4	2.1	0.1	2.4	2.3	

BEND CO SURVEY SITE COMPARISON													Table #1		
Draeger Sampler #		1 Hour Averages											Units ppm		
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM	
2/3/04	10	2.3	3.1	1.3	2.2	0	1.8	0	1.5	1.4	0.4	1.9	2.2		
2/3/04	11	1.8	2.3	1.5	1.9	0	2.1	0.3	1.3	1.9	0.4	1.5	1.7		
2/3/04	12	1.5	2.1	0.2	1.2	0	3.3	1.7	0.3	0.6	0.8	0.9	1.6		
2/3/04	13	1.3	3.2	0.9	2.1	0	4.1	1.3	0.5	0.4	1.2	1.2	1.2		
2/3/04	14	2.0	0.6	1.2	0.9	0	3.2	2.1	1.7	2.9	1.1	1.1	1.3		
2/3/04	15	1.0	1.5	0.1	0.8	0	3.8	3.1	0.7	0.7	2.0	1.2	1.5		
2/3/04	16	1.4	3.2	0.2	1.7	0	5.0	5.3	0.8	1.6	3.4	1.7	1.7		
2/3/04	17	2.1	5.9	2.2	4.1	2.5	6.7	7.8	0.9	4.2	3.3	2.7	3.1		
2/3/04	18	4.3	3.6	3.8	3.7	1.8	7.9	5.1	2.5	5.2	4.3	3.9	2.6		
2/3/04	19	2.3	2.6	2.6	2.6	2.6	5.1	5.5	3.3	4.7	2.9	3.4	3.0		
2/3/04	20	1.3	1.2	1.9	1.6	0.9	3.4	2.5	2.6	3.7	2.2	3.0	2.5		
2/3/04	21	0.9	0.7	1.1	0.9	0.3	2.5	0	1.9	2.4	0.2	2.4	2.4		
2/4/04	15	1.2	1.3	0.3	0.8	0	1.5	1.7	0.4	0.7	0.6	0.7	1.0		
2/4/04	16	1.4	2.6	0.7	1.7	0	2.5	3.0	0.8	2.1	1.3	0.7	1.1		
2/4/04	17	1.6	3.2	1.0	2.1	0.6	4.8	5.2	0.9	4.5	2.8	1.8	2.3		
2/4/04	18	2.5	0.8	1.9	1.3	0.5	4.6	3.3	1.4	2.5	2.3	2.9	2.8		
2/4/04	19	0.8	0.7	1.6	1.2	0	1.5	0.3	0.7	0.8	1.1	2.4	3.1		
2/4/04	20	0.8	1.0	1.3	1.2	0	2.4	0.3	1.2	0.8	0.4	2.2	2.8		
2/4/04	21	1.0	1.1	1.2	1.2	0	3.7	0.4	0.7	0.9	0.7	1.8	1.9		
2/4/04	22	1.1	1.4	1.0	1.2	0	2.7	0.3	1.3	0.5	0.3	1.6	2.6		
2/4/04	23	1.1	1.2	0.6	0.9	0	3.0	0.5	1.0	1.2	0.2	1.2	2.3		
2/5/04	0	1.0	0.2	0.4	0.3	0	2.8	0.6	0.7	0.3	0.1	0.8	1.2		
2/5/04	11	1.4	2.0	0.6	1.3	0	2.3	0.4	0.2	0.3	0.1	0.2	0.4		
2/5/04	12	1.2	2.5	0.4	1.4	0	2.1	0.2	0.4	0.3	0.2	0.8	1.2		
2/5/04	13	1.9	1.4	1.2	1.3	0	2.7	1.3	0.2	0.2	0.5	0.7	1.0		
2/5/04	14	1.7	1.4	0.8	1.1	0	3.0	3.2	0.6	0.7	0.9	0.7	0.7		
2/5/04	15	1.8	0.8	0.9	0.9	0	3.1	1.5	1.0	0.6	1.4	0.8	0.7		
2/5/04	16	1.3	2.5	0.2	1.3	0	4.5	5.1	1.3	0.7	2.8	1.7	1.3		
2/5/04	17	1.6	1.8	0.6	1.2	1.3	5.9	5.1	1.5	0.6	3.4	2.4	2.0		
2/5/04	18	1.3	0	0.6	0.3	0	2.4	0.2	0.7	0.3	2.0	1.7	1.1		
2/7/04	18	1.9	1.8	1.3	1.5	0	1.3	0.1	0.6	1.8	0.2	2.6	1.5		
2/7/04	19	1.5	1.4	0.7	1.0	0	3.4	1.4	0.7	1.6	0.2	3.1	1.7		
2/7/04	20	1.2	2.7	0.8	1.8	0	3.3	0.9	1.3	2.0	0.7	2.8	1.4		
2/7/04	21	1.7	1.0	1.3	1.2	0	2.7	2.0	2.9	2.7	1.3	1.3	1.7		
2/7/04	22	1.1	0.3	0.4	0.4	0	0.8	1.1	1.5	2.0	0.1	1.4	1.3		
2/9/04	17	1.4		0.9	0.9	0.4	4.7	1.5	0.3	0.9		2.4	3.1	1.0	
2/9/04	18	2.1		2.3	2.3	2.0	6.1	2.3	1.8	2.6		3.0	4.8	1.6	
2/9/04	19	2.0		2.9	2.9	2.0	4.6	2.2	3.7	3.9		3.1	4.7	1.2	
2/9/04	20	1.0		0.8	0.8	0.1	3.5	4.0	2.8	2.5		2.2	2.5	1.0	
2/9/04	21	1.0		0.8	0.8	0	3.1	4.6	2.0	1.6		2.5	3.0	0.2	
2/9/04	22	0.3		0.2	0.2	0	2.0	3.8	0.1	0.1		1.3	1.3	0.1	
2/10/04	16	0.9		0.5	0.5	0	3.1	1.2	0.1	1.2		0.5	1.6	0	
2/10/04	17	2.0		2.5	2.5	1.6	4.6	0.3	1.3	3.2		2.0	2.1	2.8	
2/10/04	18	4.5		5.4	5.4	2.4	8.6	1.5	1.3	5.1		2.7	6.1	1.9	
2/10/04	19	2.8		3.2	3.2	1.8	5.3	2.6	3.6	5.0		1.9	5.2	1.6	
2/10/04	20	1.2		0.9	0.9	0.6	5.6	5.2	2.9	3.8		2.1	4.9	2.2	

BEND CO SURVEY SITE COMPARISON												Table #1			
Draeger Sampler #		1 Hour Averages											Units ppm		
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM	
2/10/04	21	1.1		0.9	0.9	1.6	4.9	4.4	1.2	3.0		2.8	4.2	1.4	
2/10/04	22	1.5		2.1	2.1	2.7	4.1	0.9	1.0	2.8		2.5	3.0	1.2	
2/10/04	23	1.4		1.7	1.7	1.9	3.4	3.8	1.0	2.9		1.9	2.8	0.1	
2/11/04	0	1.1		0.7	0.7	0.1	3.2	3.1	3.0	3.1		1.3	2.1	0.2	
2/11/04	1	1.3		1.3	1.3	0	3.1	3.2	1.7	3.0		1.1	2.1	0	
2/11/04	6	1.2		0.9	0.9	0.1	3.6	0.1	1.9	2.7		2.0	2.2	0.8	
2/11/04	7	2.5		3.3	3.3	2.1	5.1	0.2	3.2	3.8		2.9	4.9	1.9	
2/11/04	8	1.9		3.0	3.0	0.5	3.2	1.4	2.2	2.6		2.1	3.5	0.1	
2/11/04	9	1.3		1.4	1.4	0	2.4	1.9	0.9	1.7		1.7	2.6	0.2	
2/11/04	10	1.4		1.6	1.6	0	2.7	0.1	1.0	1.3		1.9	1.9	0.2	
2/11/04	11	1.7		2.2	2.2	0	3.0	0	0.9	2.2		1.3	2.4	0.1	
2/11/04	12	1.6		1.9	1.9	0	3.2	0.2	1.4	3.7		1.6	2.5	0.3	
2/11/04	13	1.7		2.5	2.5	0	3.2	0.5	1.1	2.3		1.7	2.1	0.2	
2/11/04	14	1.3		1.4	1.4	0.1	3.3	0.8	1.4	1.9		1.5	2.7	0.3	
2/11/04	15	1.1		1.3	1.3	0	3.2	0.8	3.2	2.1		2.0	2.2	0.1	
2/11/04	16	1.5		2.1	2.1	0.1	3.4	0.5	1.5	2.4		1.9	2.5	0.3	
2/11/04	17	1.8		2.3	2.3	0	3.5	1.1	1.6	3.9		1.9	2.8	0.1	
2/11/04	18	1.0		1.0	1.0	0	3.2	1.0	0.4	2.3		1.8	2.0	0	
2/11/04	19	0.8		0.5	0.5	0	3.2	2.4	0.2	1.1		1.6	1.6	0.1	
2/11/04	20	1.0		0.7	0.7	0.4	3.1	2.9	0.1	0.0		1.6	1.6	0	
2/12/04	6	1.7		2.5	2.5	0.1	3.0	1.6	2.4	1.9		2.1	1.9	0	
2/12/04	7	3.6		5.1	5.1	2.1	4.7	4.2	3.6	4.2		4.3	4.3	1.5	
2/12/04	8	2.0		2.0	2.0	2.2	4.3	2.6	0.5	0.9		3.8	4.5	1.6	
2/12/04	17	1		0.6	0.6	0.1	4.2	2.7	1.1	1.5		1.7	2.4	0	
2/12/04	18	2.6		2.3	2.3	0	3.6	2.7	1.2	1.9		2.3	2.1	0.3	
2/12/04	19	1.1		1.3	1.3	0.3	4.1	3.2	1.5	1.8		2.2	3.3	1.1	
2/12/04	20	1.8		2.6	2.6	1.3	4.9	3.5	1.9	2.8		2.3	4.2	1.0	
2/12/04	21	1.4		1.3	1.3	0.4	5.2	4.1	3.1	3.4		2.1	3.6	1.6	
2/12/04	22	1.2		0.9	0.9	0.5	3.6	3.6	3.0	3.5		2.0	2.0	0.8	
2/12/04	23	1.3		1.4	1.4	0.1	3.1	2.9	3.4	3.2		1.4	2.8	0.4	
2/13/04	0	1.2		0.7	0.7	0	2.8	0.4	3.0	2.8		1.2	2.2	0	
2/13/04	1	0.8		0.1	0.1	0	3.0	0.1	1.4	2.2		1.1	2.5	0	
2/13/04	6	1.8		2.4	2.4	0.2	4.4	2.9	2.7	3.3		2.6	3.2	1.3	
2/13/04	7	2.3		2.6	2.6	1.8	4.9	2.1	3.7	0.8		5.2	4.4	1.9	
2/13/04	8	1		0.7	0.7	1.9	4.6	2.4	2.7	0.9		3.8	4.0	0.7	
2/13/04	9	1.5		1.6	1.6	0.5	4.0	2.7	1.1	1.0		2.6	3.9	0.8	
2/13/04	10	1.1		0.8	0.8	0	4.2	1.5	0.1	0.4		1.3	1.2	0	
2/13/04	11	1.2		1.0	1.0	0	3.8	1.2	0.4	0.4		1.0	1.5	0	
2/13/04	12	1.2		0.8	0.8	0	4.5	1.6	0.5	0.5		1.4	0.8	0	
2/13/04	13	0.7		0.3	0.3	0	4.3	3.1	0.1	0.8		0.7	1.0	0	
2/13/04	14	1.1		0.8	0.8	0	4.5	3.0	0.4	1.9		1.1	1.3	0	
2/13/04	15	1.9		1.8	1.8	0	4.6	2.1	0.4	0.4		0.8	2.1	0.1	
2/13/04	16	1.4		1.4	1.4	0.1	5.2	2.7	0.8	1.0		2.1	2.7	0.2	
2/13/04	17	2.5		3.0	3.0	0	3.7	3.4	0.8	0.9		1.4	1.5	0.7	
2/20/04	5	1.3	2.9	1.0	2.0	0.2	3.6	1.3	1.5	0.4	0	3.2	1.2	0.3	
2/20/04	6	1.9	3.4	1.6	2.5	0.7	5.4	3.9	4.4	1.23	0.4	3.5	2.3	1.6	
2/20/04	7	2.8	4.5	2.6	3.6	2.8	7.6	6.2	2.7	1.43	1.1	5.3	2	3.8	

BEND CO SURVEY SITE COMPARISON											Table #1				
Draeger Sampler #		1 Hour Averages											Units ppm		
Date	Hr	BCO	Pri	Dup	BCO	BPS	BTR	BTRM	BEO	BEG	BTG	BNE	BGW	BTBM	
2/20/04	8	1.8	3.5	2.5	3.0	0.7	4.2	3.2	2.7	0.63	0.8	3.5	1.8	1.1	
2/20/04	9	1.2	2.5	0.8	1.6	0	3.6	1.1	0.9	0.43	0.8	1.6	1.9	0.5	
2/23/04	11	1.2	2.8	0.4	1.6	0	3.0	0.2	0.1	0.63	0.2	0.9	0.6	0.1	
2/23/04	12	1.1	2.7	0.5	1.6	0	3.1	0	0.4	0.4	0.2	1.1	1.3	0.1	
2/23/04	13	1.0	1.8	0.3	1.0	0	2.2	0	0.2	1.2	0.1	0.5	1.3	0	
2/23/04	14	1.0	1.7	0.2	1.0	0	1.7	0.2	0.6	1	0.1	0.2	0.8	0	
2/23/04	15	1.4	2.2	0.5	1.4	0	2.2	0.5	0.8	0.93	0.4	0.3	1.2	0.1	
2/23/04	16	1.9	2.6	1.1	1.8	0	2.3	1.3	2.1	0.53	0.3	0.5	1.1	0.1	
2/23/04	17	1.9	2.8	1.1	2.0	0	2.3	0.1	0.6	0.7	0.5	0.2	1.5	0.1	
2/23/04	18	1.4	2.1	0.2	1.2	0	2.2	1.4	0.5	0.7	0.1	2.1	2.1	0.1	
2/23/04	19	0.7	0.9	0.6	0.8	0.9	4.2	1.8	0.3	0.33	0.3	2.6	2.5	0.4	
2/23/04	20	0.3	0.5	0.4	0.5	0.2	3.0	0.7	0	0.7	1.4	3.2	2.8	1.0	
2/23/04	21	0.6	1.5	0.4	1.0	0.1	3.1	0.5	0.2	0.87	1.4	3.3	2.8	0.7	
2/25/04	14	1.1	2.0	1.0	1.5	0	3.7	1.7	0.6	0.2	1.2	1.0	0.7	0.1	
2/25/04	15	1.4	2.5	1.4	2.0	0	4.3	1.9	1.3	1.3	1.6	1.6	1.5	0.2	
2/25/04	16	1.7	2.8	2.0	2.4	0	3.3	1.2	1.9	2.0	1.1	1.2	1.3	0.2	
2/25/04	17	1.1	1.7	0.7	1.2	0	4.9	2.8	0.4	0.9	2.3	1.6	2.0	0.2	
2/27/04	13	1.4	2.4	1.5	1.9	0	1.3	0	0.4	0.7	0.1	0.7	1.0	0.2	
2/27/04	14	1.5	2.3	1.7	2.0	0	0.6	0	0.8	1.0	0.1	0.8	1.1	0.2	
2/27/04	15	1.7	2.5	1.9	2.2	0	0.8	0.1	0.9	1.1	0	0.5	0.8	0.3	
2/27/04	16	2.0	3.3	2.5	2.9	0	1.9	0.1	1.2	1.4	0.2	1.1	1.7	0.5	
2/27/04	17	2.0	3.3	2.4	2.9	0	2.4	0.1	1.3	1.7	0.5	1.1	1.9	0.8	
2/27/04	18	1.7	2.9	1.9	2.4	0	2.3	0.1	0.5	3.1	0	1.4	1.3	0.2	
3/1/04	7	1.6	3.6	2.2	2.9	0.3	2.4	0.3	4.0	3.5	0	2.4	1.4	0.3	
3/1/04	8	1.2	3.2	1.8	2.5	0.1	2.6	0	1.6	3.0	0.1	2.9	1.6	0.3	
3/1/04	9	1.7	3.8	2.4	3.1	0	2.8	0	1.3	2.4	0.1	2.4	1.4	0.3	
3/1/04	10	1.5	3.7	2.0	2.9	0	2.7	0	1.7	2.3	0.2	2.0	1.6	0.2	
3/1/04	11	1.4	3.7	2.0	2.9	0	2.9	0.3	1.4	1.8	0	2.0	2.0	0.2	
3/1/04	12	1.7	3.9	2.1	3.0	0	2.9	0.3	1.2	2.8	0.1	2.4	1.6	0.6	
3/1/04	13		4.0	2.0	3.0	0	3.0	0	1.0	2.3	0.1	2.1	1.7	0.2	
3/1/04	14	1.7	3.9	2.2	3.1	0	2.9	0	1.9	2.1	0.1	2.3	1.0	0.1	
3/1/04	15	1.6	3.9	2.2	3.1	0	2.8	0.2	2.4	3.7	0.1	2.4	1.4	0.6	
3/1/04	16		4.5	3.1	3.8	0	2.8	0	2.5	3.5	0.1	2.2	1.8	0.6	
3/1/04	17	2.5	4.9	3.3	4.1	0.1	3.1	0	2.9	3.2	0.1	2.6	1.7	0.5	
Average		1.4	1.9	1.4		0.4	2.7	1.5	1.4	1.8	0.8	1.5	1.9	0.5	