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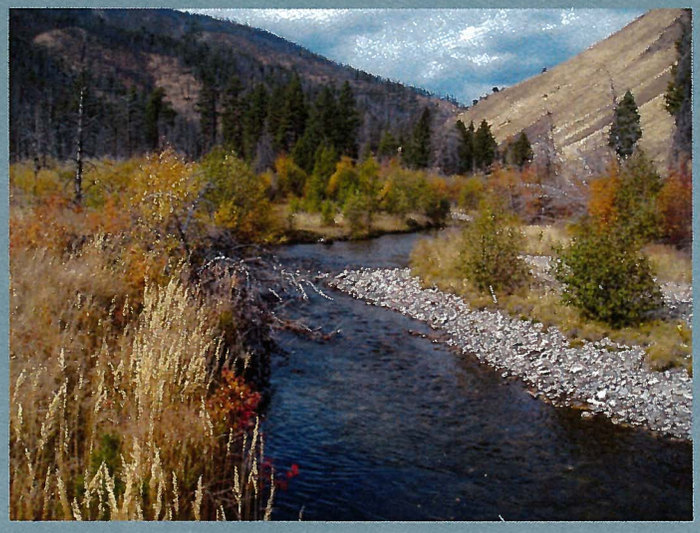
2010 WATER QUALITY DATA SUMMARY FOR THE IDAHO COBALT PROJECT

MARCH 2011



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IDAHO COBALT PROJECT - SAMPLE COORDINATES (As of October 2011)

Site ID	Mine Grid-E	Mine Grid-N	Easting	Northing	Elevation (ft)
WQ-1	14695.1262	32397.0699	711592.952	5005379.745	
WQ-2	14307.335	31387.977	711483.07	5005069.25	4380
WQ-3					
WQ-4	17041.4063	29922.6143	712332.675	5004649.692	
WQ-5	17231.16	29561.458	712418.384	5004589.037	4325
WQ-6	17546.8791	29760.3127	712488.291	5004605.36	
WQ-7	6557.936	24229.914	709201.221	5002815.857	
WQ-9	6178	23290	709087.412	5002553.888	7470
WQ-10	-234.583	23505.14	707149.302	5002515.569	6220
WQ-11	-72.135	25832.329	707105.434	5003220.096	5880
WQ-13	346.247	23164.158	707307.87	5002428.996	6370
WQ-14	5129.208	18602.8	708821.279	5001091.199	7660
WQ-15	6058.968	19029.862	709102	5001219	7555
WQ-16	-285.428	19225.93	707163	5001214	6983.802
WQ-17	396.35	19846.065	707450	5001363	6935
WQ-18	-422.703	21730.127	707101.997	5001871.612	6455
WQ-19	-236.527	24912.292	707154.802	5003078.956	5960
WQ-20	-1856.962	27551.515	706678.481	5003649.356	5350
WQ-21a					
WQ-22	-961.399	29945.797	706846.623	5004418.603	5150
WQ-23	-1243.165	30157.661	706775.871	5004526.678	5150
WQ-24a	-271.25	30530.84	707218.0447	5004665.502	
WQ-25	12467.675	34579.481	710976.24	5005960.274	4220
WQ-25a					
WQ-28	12830.1	33861.82	711010.0307	5005807.087	
WQ-29					
WQ-30					
SS-1	4029.6831	24068.7631	708428.23	5002735.02	
SS-2	5135.1587	26067.4625	708744.78	5003355.03	
SS-3	6791.6576	27423.0664	709235.68	5003784.71	
SS-5	7950.9832	19928.0118	709664.57	5001513.3	
SS-7	4471.2749	19117.4156	708612.781	5001231.215	
SS-9	5509.6916	19516.413	708925.069	5001363.25	
SS-11	565.8492	22988.6637	707384	5002371	
SS-12	1746.2224	25048.2366	707722.75	5003010.31	
BFMW-1a					
BFMW-3	6512.05	23881.76	709186.309	5002703.106	7459.09
BFMW-4s	6243.33	20958.12	709137.378	5001816.747	7683.19
BFMW-4d	6245.37	20962.38	709137.43	5001815.258	7683.15
BFMW-5a					
BFMW-6	3367.2	21124	708256.507	5001821.719	7963.82
BFMW-8					
BFMW-9					
BFMW-10					
BFMW-11			708800.7	5002327.1	
BFMW-12					
BFMW-13					
RMW-1	2025.84	22765.81	707834.624	5002322.398	7354.04
RMW-2	551.15	23251.1	707306.144	5002540.898	6506.27

RMW-3	673.52	22329.63	707426.738	5002177.165	6849.13
RMW-5a					
RMW-6	715.2429	24306.11	707416.1949	5002773.827	6536.216
RMW-7	419.7126	21559.12	707353.9301	5001934.059	6886.97
RMW-8					
RMW-9a					
RMW-10					
RMW-11					
RMW-12					
RMW-13					
RMW-14					
RCW-1					
RCW-2					
RCW-3					
RCW-4					
RCW-5					
RCW-6					
RCW-7					
RCW-8					
RCW-9					

2010 Water Quality Data Summary for the Idaho Cobalt Project

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2010 Water Quality Data Summary for the Idaho Cobalt Project

March 2011

TELESTO SOLUTIONS • INCORPORATED

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1.0 INTRODUCTION

In 2010, 10 samples were collected at 10 monitoring well locations, 6 samples were collected at 4 seep and spring locations, and 40 samples were collected at 26 surface water sampling locations in accordance with the 2009 Operational Water Monitoring Plan for the Idaho Cobalt Project (Version 1.1; November 2009) prepared by Telesto Solutions, Inc (Telesto). A reduced set of sites were sampled at a reduced frequency because baseline data were adequate for the majority of sites and the mine was not yet operational. The locations of monitoring wells and surface water monitoring locations sampled in 2010 are identified in Figure 1-1. A complete listing of 2010 water monitoring data is provided in Appendix A. This report focuses on the water quality of selected constituents within the historical period from 2000 through 2010.

2.0 GROUNDWATER REVIEW

2.1 Depth to Water

The 2010 water level measurements for all wells are provided in Tables 2-1 and 2-2. The water levels at BFMW-1 (Figure 2-1a), BFMW-3 (Figure 2-2a) and BFMW-4d (Figure 2-3a) exhibit a trend of decreasing water levels between May and October of each year and then water levels increase again in May of the following year. These trends have been visible since 2005. In general, water levels in BFMW-1 and BFMW-4d appear to be increasing since 2005. Water levels in BFMW-5d (Figure 2-4a) have increased approximately eight feet since November 2003. Water levels in BFMW-6 (Figure 2-5a) have increased over 60 feet between October 2008 and May 2010.

The measured water level in RMW-1 (Figure 2-6a) decreased approximately eight feet between September 2008 and May 2010. Water levels in RMW-2 (Figure 2-7a) have increased approximately two feet since 2003. Water levels in RMW-3 have increased slightly since 2007 (Figure 2-8a). The water levels in RMW-6 (Figures 2-9a) were stable in 2009 and 2010, with an increase of less than a half a foot between June 2009 and June 2010. The water levels in RMW-7 increased between September 2008 and June 2009 (Figure 2-10a). The water levels then decreased approximately six feet in the remainder of 2009 and into 2010.

2.2 Water Quality

Water quality samples were collected from ten ground water sampling sites in June 2010. Water quality data for select constituents for all current sample sites are provided in Tables 2-1 and 2-2. A table of all analytical and water level data for all locations sampled in 2010 is provided in Appendix A. Cobalt and copper reporting limits were increased in 2009 in an effort to utilize reporting limits that were protective of the environment while providing reliable data.

2.2.1 BFMW-1

Sulfate and hardness concentrations reported in 2010 were constant with values reported in 2009 (Figure 2-1a) with no visible historical trend. Total dissolved solids (TDS) reported in 2010 were within the range of concentrations reported in 2008 and 2009. Dissolved and total recoverable cobalt concentrations were not reported above the reporting limit (0.006 mg/L) in 2010 (Figure 2-1b). Dissolved and total recoverable copper concentrations reported in 2010 were relatively consistent with values reported since 2006 with no historical trend visible. Total suspended solids (TSS) concentrations have been at or below reporting limits since 2006 (Figure 2-1c).

2.2.2 BFMW-3

Sulfate, hardness and TDS concentrations reported in 2010 were at concentrations similar to those reported in 2009 (Figure 2-2a). The dissolved cobalt concentration reported in 2010 was within the range of concentrations reported in 2008 and 2009 (Figure 2-2b). Total recoverable cobalt decreased to an historical low in 2010. Dissolved and total recoverable copper concentrations increased in 2010 over the concentrations reported for October 2009. This trend is similar to that seen in 2007, 2008, and 2009.

2.2.3 BFMW-4d

Sulfate was not measured above the reporting limit of 1 mg/L in the sample collected in 2010 (Figure 2-3a). Hardness concentrations remained constant in 2009 and 2010. The TDS concentration reported in 2010 was lower than those reported in 2007, 2008, or 2009. Dissolved and total recoverable cobalt concentrations were not reported above the reporting limit (0.006 mg/L) in 2010 (Figure 2-3b). Dissolved and total recoverable copper concentrations increased in June 2010 over the concentrations reported for October 2009. This trend is similar to that seen in 2007, 2008, and 2009. TSS concentrations have been below reporting limits since 2006 (Figure 2-3c).

2.2.4 BFMW-5d

Sulfate was not measured above the 1 mg/L reporting limit for the sample collected in 2010 (Figure 2-4a). Hardness and TDS concentrations decreased in 2010 to concentrations similar to those reported in 2007. The dissolved cobalt concentration reported in 2010 decreased from concentrations reported in September 2008 (Figure 2-4b), but remained higher than pre-2008 values. Total cobalt concentration reported in 2010 was within range of concentrations reported in 2007 and 2008. The dissolved copper concentration in June 2010 was not reported at a concentration higher than the method detection limit (0.001 mg/L). Total copper concentration reported in 2010 is within range of reported concentrations. Total suspended solids concentrations increased in June 2010 to a value higher than past historical records (Figure 2-4c).

2.2.5 BFMW-6

Sulfate was not measured above the 1 mg/L reporting limit for the sample collected in 2010 (Figure 2-5a). The sulfate concentrations of samples collected at this well have remained stable since 2000 with the exception of an anomalous value in 2002. The hardness concentration measured in 2010 is within the historical variability measured in this well. TDS concentrations increased in 2010 but reported concentrations are within the range of historical values. Dissolved and total recoverable cobalt were not measured above the reporting limit of 0.006 mg/L (Figure 2-5b). Dissolved and total recoverable copper concentrations in the sample collected in 2010 were lower than 2007, 2008, and 2009 concentrations. TSS concentrations have been below reporting limits since 2005 (Figure 2-5c).

2.2.6 RMW-1

The sulfate concentration measured in the 2010 sample is lower than concentrations measured in 2007 and 2008 but is still within the historical range of concentrations reported from this well (Figure 2-6a). Sulfate concentrations have ranged from 3 mg/L to 6 mg/L. The hardness concentrations increased between 2001 and 2006. Hardness measured in the sample collected in 2010 is similar to that measured in the 2007 sample.

Hardness concentrations in this well have measured between 9.05 and 15 mg/L. TDS and dissolved and total recoverable cobalt and copper concentrations measured in 2010 are within the historical variability at this well (Figures 2-6a and 2-6b). TSS was below detectable concentrations in the sample collected from this well in 2010 (Figure 2-6c).

2.2.7 RMW-2

Sulfate decreased from 2008 to a historical low in 2009 (Figure 2-7a), and remained at this concentration in the sample collected in 2010. Hardness and TDS concentrations increased from October 2009 to 2010. The values measured in the 2010 sample are consistent with the historical variability of these analytes in this well. Dissolved and total recoverable cobalt and copper concentrations were not reported above the reporting limit (0.006 mg/L for cobalt and 0.001 mg/L for copper) in 2010 (Figure 2-7b). TSS concentrations have been below reporting limits since 2005 (Figure 2-7c).

2.2.8 RMW-3

Sulfate concentrations decreased to a historical low in 2009 (Figure 2-8a), and remained at this concentration in the sample collected in 2010. Hardness and TDS concentrations were similar to the concentrations measured in samples collected in 2005 through 2009. Dissolved and total recoverable copper and cobalt concentrations reported in 2010 were similar to those reported since late 2005 (Figures 2-8b). TSS concentrations have been below or close to reporting limits since 2006 (Figures 2-8c).

2.2.9 RMW-6

Sulfate concentrations decreased to a historical low in 2009 (Figure 2-9a). The sulfate and hardness concentrations measured in the sample collected in 2010 are similar to those reported in the samples collected in 2009. TDS concentrations were higher in 2010 than in the samples collected in late 2009, but remained within the historical range of concentrations measured at this well. Dissolved cobalt and copper concentrations reported in 2010 were lower than concentrations reported in 2008 and 2009, but were still within the historical range for these analytes in this well (Figure 2-9b). Reported total recoverable cobalt concentrations were relatively stable between 2009 and 2010. The

total recoverable copper concentration reported in 2010 was higher than the concentrations reported in 2008 and 2009, but is still within the historical range at this well.

2.2.10 RMW-7

Sulfate concentrations reported in 2010 were slightly higher than those reported in 2009 (Figures 2-10a) and remain lower than historical concentrations reported before 2009. Hardness concentrations reported in 2010 were slightly higher than those reported in 2009 and were below the concentrations reported in 2007. TDS concentrations reported in 2010 were slightly lower than those reported in late 2009 but remain within the historical variability of reported measurements at this well. Dissolved cobalt and copper concentrations reported in 2010 are higher than those reported in 2009, but remain within the historical range of concentrations measured at this well (Figures 2-10b). Total recoverable cobalt measured in 2010 was consistent with the concentration measured in late 2009. Total recoverable copper concentrations increased slightly to a historical high for this well. However, this higher value is only slightly higher than the historical values. Total recoverable copper concentrations have ranged from 0.0253 to 0.04 mg/L.

3.0 SEEPS AND SPRINGS REVIEW

3.1 Water Quality

Water quality samples were collected from four seep and spring sampling sites: SS-5, SS-7, SS-9, and SS-11 in 2010. Samples were collected at SS-5 and SS-11 in May (spring flow) and September (low-flow), and samples were collected at SS-7 and SS-9 in May. Water quality data for select constituents are provided in Table 3-1. Appendix A provides a listing of all constituents analyzed.

3.1.1 SS-5

The May sample displayed lower levels of sulfate and hardness concentrations compared to the previous data on record, although the September concentrations are consistent with previous years (Figure 3-1a). The flow rate measured in May 2010 was a historical high for this location. There is a slight decreasing trend of sulfate concentrations. TDS

concentrations in 2010 were relatively consistent with the data from previous years (Figure 3-1a). Concentrations of dissolved cobalt measured in 2010 were not reported above the current reporting limit (Figure 3-1b). The May 2010 sample exhibited a higher concentration of dissolved copper than in 2002-2009, but the September 2010 sample was relatively consistent with data from previous years (Figure 3-1b).

3.1.2 SS-7

The hardness and TDS concentrations from the May 2010 sample are within historical fluctuations for the period of record (Figure 3-2a). The sulfate concentration is at or below the detection limit. The dissolved cobalt concentration measured in 2010 was not reported above the current reporting limit of 0.006 mg/L (Figure 3-2b). The dissolved copper concentration is relatively consistent with data from previous years (Figured 3-2b).

3.1.3 SS-9

The hardness concentration from the 2010 sample was lower than the data from previous years; the sulfate concentration was at or below the detection limit, continuing the decreasing historical trend; and the TDS concentration was consistent with historical variability (Figure 3-3a). The dissolved cobalt concentration measured in 2010 was not reported above the current reporting limit of 0.006 mg/L (Figure 3-3b). The dissolved copper concentration reported in 2010 was higher than in 2007 and 2008, but was within the historical range of concentrations at this sampling location (Figure 3-3b).

3.1.4 SS-11

The sulfate, hardness, and dissolved cobalt concentrations in the May 2010 sample are lower than the data from previous years, although the concentrations in the September sample are within historical range of data from previous years (Figures 3-4a and 3-4b). TDS concentrations are within the historical range of concentrations at this sampling location (Figure 3-4a). The dissolved copper concentration in the May 2010 sample is consistent with data from previous years, but the concentration in the September sample is lower than all data from previous years (Figures 3-4b).

4.0 SURFACE WATER REVIEW

4.1 Flow

Spring (May) flow in Panther Creek was measured at WQ-1, WQ-3, WQ-4, WQ-6 and WQ-25/WQ-25a. In previous years, spring flow had never been measured due to safety concerns; therefore the spring flow measurements from 2010 are much higher than the historical range of flows for each site. Fall (September) flow was measured at WQ-4 and WQ-25/WQ-25a and was within the historical range of low flows at each respective site.

Spring (May) and fall (September) flows in Big Deer Creek were measured at WQ-23 (only May), WQ-24a, WQ-28, and WQ-30. The flows measured at WQ-23 and WQ-24a were within the historical range for each time period and respective site. Spring flow measured at WQ-28 had not been measured in previous years; therefore the flow measured in May 2010 is much higher than historical range of flows at this site. Spring and fall flows measured at WQ-30 are lower than the historical range for those time periods in previous years.

Spring flow in South Fork Big Deer Creek was measured at WQ-20 and WQ-22. Flow measurements at both sites were lower than the historical range of spring time flows for each site.

Spring (May) and fall (September) flows in Bucktail Creek were measured at WQ-17 (only September), WQ-18, WQ-19, WQ-21, and WQ-29. Flows measured at WQ-17 and WQ-18 were all within the historical range for each time period and site. Flows measured at WQ-19, WQ-21, and WQ-29 were lower than the historical range for each time period and site. No flow was measured at WQ-16 in 2010.

No flow was measured in the unnamed gulch at WQ-11 in 2010.

Spring (May) and fall (September) flows were measured in Ram Gulch at WQ-10 and fall flows were measured at WQ-13. All flow measurements were within the historical range for each time period and site.

Spring (May) and fall (September) flows were measured in Little Deer Creek at WQ-5 (only May), WQ-14, and WQ-15. The spring flows measured at WQ-5 and WQ-14 were higher than the historical range of flows for that time period. The fall flow measured at WQ-14, and both spring and fall flows measured at WQ-15 were within the historical range for each time period and site.

Spring (May) and fall (September) flows were measured in Big Flat Creek at WQ-2 (only May) and WQ-7. Spring flow measured at WQ-2 and WQ-7 were higher than the previous four years of spring flow measurements at each site. The fall flow measurement at WQ-7 was within the historical range of flows during the fall season.

4.2 Water Quality

Water quality samples were collected from 26 surface water sampling sites in May 2010 and 14 surface water sampling sites in September 2010. Water quality data for select constituents are provided in Table 4-1. Appendix A lists results of all constituents analyzed as specified in the 2009 Operational Water Monitoring Plan.

4.2.1 WQ-1

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations have fluctuated since 2000 with no visible trend (Figure 4-1a). Dissolved and total recoverable cobalt and dissolved copper concentrations measured in May 2010 fall within the historical range of concentrations with no visible trend (Figure 4-1b). Total recoverable copper concentration measured in May 2010 was lower than the historical high measured in 2008, but was higher than concentrations measured in the previous four years (Figure 4-1b).

4.2.2 WQ-2

One sample was collected at this site in May 2010. Sulfate concentrations have fluctuated slightly since 2002 but were consistent between late 2006 and the samples collected in 2007 and 2008, but the sample collected in May 2010 was lower than the historical range of concentrations at this site (Figure 4-2a). Hardness and TDS

concentrations from the sample collected in May 2010 were within the historical range of concentrations. Dissolved and total recoverable cobalt concentrations from the sample collected in May 2010 were within the historical range of concentrations (Figure 4-2b). Dissolved and total recoverable copper concentrations were within the range of historical values, but had higher concentrations than samples collected in 2005, 2006, 2007, and 2008.

4.2.3 WQ-3

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations were within the range of historical values, with no visible trend (Figure 4-3a). The dissolved cobalt concentration from the sample collected in May 2010 is within the historical range of concentrations (Figure 4-3b). Total recoverable cobalt, dissolved copper, and total recoverable copper concentrations from the sample collected in May 2010 are lower than the May samples collected in 2008 and 2009 (Figure 4-3b).

4.2.4 WQ-4

Two samples were collected at this site in 2010 (May and September). Hardness and sulfate concentrations in the samples collected at this location in 2010 were consistent with samples collected in previous years (Figure 4-4a). TDS concentrations decreased in 2008 and again in 2010 to a historical low in May 2010. The dissolved cobalt concentration in the September 2010 sample was lower than the range of concentrations measured at this site (Figure 4-4b). Total recoverable cobalt, dissolved copper and total recoverable copper concentrations were consistent with samples collected in previous years, but the May 2010 sample concentrations are lower than those reported in the May 2008 sample.

4.2.5 WQ-5

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations in the sample collected in May 2010 are lower than the historical range of concentrations at this site (Figure 4-5a). The TDS concentration is consistent with a trend of historically decreasing concentrations. The dissolved cobalt concentration in the

sample collected in May 2010 was consistent with samples collected in previous years (Figure 4-5b). Total recoverable cobalt, dissolved copper and total recoverable copper concentrations in the sample collected in May 2010 are all within the historical range of concentrations, but are higher than the concentrations measured in the last six years.

4.2.6 WQ-6

One sample was collected at this site in May 2010. The concentrations of sulfate and hardness are consistent with samples collected in previous years and within the range of historical values (Figure 4-6a). The TDS concentration was within the range of historical concentrations, but is lower than the concentrations measured in the last eight years. The dissolved cobalt concentration was within the range of historical concentrations, but is lower than concentrations measured in the last seven years (Figure 4-6b). Total recoverable cobalt, dissolved copper, and total recoverable copper are within the historical range of concentrations, but are lower than the concentrations measured in May 2008.

4.2.7 WQ-7

Two samples were collected at this site in 2010 (May and September). Sulfate, hardness, and TDS concentrations were within the historical range of concentrations at this sampling location (Figure 4-7a). Dissolved and total recoverable cobalt and copper concentrations were with the normal range of variability in 2010, with no visible trend (Figure 4-7b).

4.2.8 WQ-10

Two samples were collected at this site in 2010 (May and September). Sulfate and hardness concentrations were within the historical variability at this sampling site (Figure 4-8a). TDS concentrations exhibited a historical low in May 2010 but increased to within the historical range of values in the September sample. Dissolved and total recoverable cobalt and copper concentrations were within the range of historical values at this sampling site, with no visible trend (Figure 4-8b).

4.2.9 WQ-11

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations were within the historical variability at this sampling site (Figure 4-9a). Dissolved and total recoverable cobalt and copper concentrations were within the range of historical values at this sampling site, with no visible trend (Figure 4-9b).

4.2.10 WQ-13

One sample was collected at this site in May 2010. The sulfate and hardness concentrations were historical low concentrations for the period of record at this monitoring site (Figure 4-10a). A slight decreasing trend in sulfate concentrations is apparent. The TDS concentration is with the historical range of concentrations for this sampling site, but is lower than concentrations measured in the last eight years. A slight decreasing trend is apparent beginning in 2006. Dissolved and total recoverable cobalt and copper concentrations were within the historical range of concentrations measured at this sampling location (Figure 4-10b). There exists a slight decreasing trend in dissolved and total recoverable cobalt and dissolved copper concentrations. The total recoverable copper concentration is higher than all other samples, except for the historical high concentrations measured in 2000 and 2006.

4.2.11 WQ-14

Two samples were collected at this site in 2010 (May and September). Sulfate and hardness concentrations were within the range of historical concentrations (Figure 4-11a). TDS concentrations decreased to a historical low in August 2010, but the September sample was within the range of historical concentrations. Dissolved cobalt concentrations decreased from the sample collected in September 2008 and were at or below the reporting limit of 0.006 mg/L (Figure 4-11b). Total recoverable cobalt remained within normal historical values. Dissolved and total recoverable copper concentrations were consistent with the historical range of values (Figure 4-11b).

4.2.12 WQ-15

Two samples were collected at this site in 2010 (May and September). Sulfate and hardness concentrations in the May sample were historical low concentrations, but the concentrations in the September sample were within the historical range of concentrations (Figure 4-12a). TDS concentrations were within the range of historical variability. Dissolved cobalt concentrations were lower than the concentration in the sample collected in September 2008, and were at or below the reporting limit of 0.006 mg/L (Figure 4-12b). The total recoverable cobalt concentration from the May 2010 sample was below the reporting limit of 0.002 mg/L. Dissolved and total recoverable copper concentrations were within historical variability at this sampling location (Figure 4-12b).

4.2.13 WQ-16

One sample was collected at this site in May 2010. Sulfate and hardness concentrations were within the historical range of concentrations for this sampling location (Figure 4-13a). The TDS concentration in May 2010 was a historical low concentration for the period of record at this site. The general trend appears to be decreasing for these constituents. Dissolved and total recoverable cobalt and copper concentrations were within the historical variability at this sampling location (Figure 4-13b).

4.2.14 WQ-17

Two samples were collected at this site in 2010 (May and September). Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling site (Figure 4-14a). Dissolved and total recoverable cobalt and copper concentrations were within the range of historical variation (Figure 4-14b).

4.2.15 WQ-18

Two samples were collected at this site in 2010 (May and September). Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling site (Figure 4-15a). Concentrations of total recoverable and dissolved cobalt

and copper have fluctuated historically, but since 2005, the general trend is toward decreasing concentrations (Figure 4-15b), with the exception of the slightly elevated total recoverable cobalt and copper concentrations in the May 2009 sample.

4.2.16 WQ-19

Two samples were collected at this site in 2010 (May and September). Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling location (Figure 4-16a). The general trend appears to be decreasing for these constituents. Dissolved and total recoverable cobalt and copper concentrations have fluctuated historically but the general trend is toward decreasing concentrations (Figure 4-16b).

4.2.17 WQ-20

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling location (Figure 4-17a). The dissolved and total recoverable cobalt and copper concentrations were not reported above the reporting limits (Figure 4-17b).

4.2.18 WQ-21

Two samples were collected at this site in 2010 (May and September). Sulfate, hardness, and TDS concentrations were consistent with samples collected in previous years (Figure 4-18a). The general trend appears to be decreasing for these constituents. Dissolved and total recoverable cobalt and copper concentrations were consistent with samples collected in previous years, with an overall trend of decreasing concentrations (Figure 4-18b).

4.2.19 WQ-22

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling location (Figure 4-19a). Dissolved and total recoverable cobalt and copper concentrations were within the historical variability of concentrations for this sampling location (Figure 4-19b).

4.2.20 WQ-23

One sample was collected at this site in May 2010. Sulfate, hardness, and TDS concentrations were within the historical variability of concentrations for this sampling location (Figure 4-20a). The dissolved and total recoverable cobalt and copper concentrations were not reported above the reporting limits (Figure 4-20b).

4.2.21 WQ-24a

Sampling location WQ-24a was added to the monitoring plan in 2005 to obtain a sampling location more representative of a fully mixed stream below the confluence of Big Deer Creek and South Fork Big Deer Creek. Sampling location WQ-24 was not sampled after 2005.

Two samples were collected at WQ-24a in 2010 (May and September). Reported hardness, TDS, and sulfate concentrations in the 2010 samples fluctuated within historical values (Figure 4-21a). No long-term trends were visible. Dissolved and total recoverable cobalt concentrations were below the reporting limits (Figure 4-21b). Dissolved and total recoverable copper concentrations reported in 2010 fluctuated within historical values.

4.2.22 WQ-25a

Sampling location WQ-25a was added to the monitoring plan in 2010 to obtain a sampling location more representative of a fully mixed stream below the confluence of Big Deer Creek and Panther Creek. Flow will continue to be measured at WQ-25 with the water quality sample collected at WQ-25a. The last water quality sample was collected at WQ-25 in May 2010.

One sample was collected at WQ-25 (May) and two samples were collected at WQ-25a (May and September) in 2010. Reported hardness, TDS, and sulfate concentrations in the 2010 samples fluctuated within historical values (Figure 4-22a). Dissolved and total recoverable copper and cobalt concentrations reported in 2010 fluctuated within historical values (Figure 4-22b).

4.2.23 WQ-28

Two samples were collected at this site in 2010 (May and September). Reported hardness, TDS, and sulfate concentrations in the 2010 samples fluctuated within historical values (Figure 4-23a). The dissolved cobalt concentration from the May 2010 sample was a historical low concentration for the period of record at this sampling location, but the September concentration was within the historical range of concentrations (Figure 4-23b). Dissolved and total recoverable copper and total recoverable cobalt concentrations reported in 2010 fluctuated within the range of historical values (Figure 4-23b).

4.2.24 WQ-29

The BMSG (Blackbird Mine Site Group) installed a cut-off wall on Bucktail Creek downstream of WQ-18 in the winter of late 2006 and early 2007. The wall has the potential to significantly change the downstream water quality. Therefore, a new surface water sampling location (WQ-29) was established in 2007 downstream of the cut-off wall and upstream of Ram Gulch.

Two samples were collected at this site in 2010 (May and September). Reported hardness, TDS, and sulfate concentrations fluctuated within the range of concentrations measured in previous years (Figure 4-24a). Dissolved cobalt and copper concentrations were within the range of concentrations measured in previous years (Figure 4-24b). Total recoverable cobalt and copper concentrations were lower than the concentrations measured in previous years.

4.2.25 WQ-30

WQ-30 was added to the monitoring plan in 2007 to provide data downstream of National Pollutant Discharge Elimination System (NPDES) Outfall 001. Data from this location and WQ-24a, which is upstream of the proposed outfall, will document any potential changes in water quality from proposed NPDES discharge.

Two samples were collected at this site in 2010 (May and September). Reported hardness, TDS, and sulfate concentrations fluctuated within the range of concentrations measured in previous years (Figure 4-25a). Dissolved cobalt and copper concentrations were within the range of concentrations measured in previous years (Figure 4-25b). Total recoverable cobalt and copper concentrations in the May sample were lower than the concentrations measured in previous years, but the concentrations in the September sample were within the range of concentrations measured in previous years.

4.3 Bucktail Creek and South Fork Big Deer Creek Downstream Water Quality

In an effort to understand the water quality in Bucktail Creek and South Fork Big Deer Creek, data were reviewed from monitoring sites starting in upper Bucktail Creek at WQ-17 and going downstream on Bucktail Creek to WQ-18, WQ-29, WQ-19, WQ-21, and South Fork Big Deer Creek at WQ-22 (Figure 1-1). Data from 2001 through 2010 were graphed (Figures 4-26a and 4-26b). Data graphed from 2001-2004 include May and June sampling events, while data graphed from 2005-2009 include September and October sampling events (with the exception of sampling location WQ-17 which was only sampled in May of 2005) and 2010 data included May sampling events.

Flow increases downstream from WQ-17 for all years on record (Figure 4-26a), with the exception of higher flow at WQ-17 than WQ-18 in 2004 and 2005. The higher flow measured at WQ-17 in 2005 can be attributed to the fact that the flow was measured in May, a time of higher flows, and the other measurements at the other sites were collected during low flow times. Sulfate concentrations decrease downstream from WQ-17 (Figure 4-26a). Hardness concentrations increase at WQ-18 before decreasing downstream in samples collected after 2004. A slight increase in hardness occurred downstream at WQ-22 in 2007, 2008, 2009, and 2010. TDS decreased downstream from WQ-17 in all years other than 2005, which can be attributed to sample collection at a time of higher flows while the samples from the other sites were collected during low flow times. Copper and cobalt concentrations, both dissolved and total recoverable, generally decrease downstream from high values at WQ-17 (Figure 4-26b) in 2001 through 2004. In 2005

and 2006, concentrations of these analytes are lower at WQ-18 than at WQ-19, then decrease downstream from WQ-19. In 2007, 2008, 2009, and 2010 dissolved and total recoverable cobalt increase downstream from WQ-18 to WQ-21 and then decrease at WQ-22, with the exception of dissolved cobalt in the 2010 samples where the concentration at WQ-29 is less than the concentration at WQ-18. In 2007, 2008, 2009, and 2010 dissolved and total recoverable copper fluctuates downstream of WQ-18: increasing slightly from WQ-18 to WQ-29, then decreasing slightly from WQ-29 to WQ-19, then increasing slightly to WQ-21, and finally decreasing to WQ-22 (with the exception of the 2009 total recoverable copper concentrations, which decline downstream from WQ-29).

Tables

TABLES

Table 2-1 BFMW Wells Ground Water Quality Select Constituents
(units in mg/L unless noted)

Location	Date	Dissolved Cobalt	Dissolved Copper	Total Recoverable Cobalt	Total Recoverable Copper	Hardness	Sulfate	TDS	TSS	Depth to Water (ft)
BFMW-1	6/3/10	<0.006	0.038	<0.006	0.044	7	1	25	3	11.15
BFMW-3	6/2/10	0.032	0.01	0.032	0.015	8	1	26	<3	29.48
BFMW-4d	6/3/10	<0.006	0.011	<0.006	0.016	11	<1	18	<3	19.08
BFMW-5d	6/3/10	0.007	<0.001	<0.006	0.118	9	<1	48	11600	45.85
BFMW-6	6/2/10	<0.006	0.004	<0.006	0.005	5	<1	19	<3	20.15

Table 2-2 RMW Wells Ground Water Quality Select Constituents
(units in mg/L unless noted)

Location	Date	Dissolved Cobalt	Dissolved Copper	Total Recoverable Cobalt	Total Recoverable Copper	Hardness	Sulfate	TDS	TSS	Depth to Water (ft)
RMW-1	6/2/10	0.053	0.006	0.052	0.006	12	3	32	<3	331.85
RMW-2	6/1/10	<0.006	<0.001	<0.006	<0.001	126	24	144	<3	87.17
RMW-3	6/2/10	0.163	0.081	0.162	0.082	21	17	59	<3	195
RMW-6	6/1/10	0.225	0.032	0.235	0.095	21	19	58	71	166.33
RMW-7	6/1/10	0.079	0.039	0.078	0.04	34	24	78	<3	246.12

Table 3-1 Seeps and Springs Water Quality Select Constituents
(units in mg/L unless noted)

Sample	Date	Dissolved Cobalt	Dissolved Copper	Total Recoverable Cobalt	Total Recoverable Copper	Hardness	Sulfate	TDS	TSS	Flow (cfs)
SS-5	5/20/10	<0.006	0.003	<0.002	0.004	7	1	27	<3	0.081
	9/30/10	<0.006	0.001			8	2	28	4	TL
SS-7	5/11/10	<0.006	0.003	<0.002	0.004	7	<1	34	19	TL
SS-9	5/20/10	<0.006	0.006	0.005	0.012	7	<1	44	6	0.046
SS-11	5/11/10	0.156	0.036	0.173	0.039	20	15	58	<3	0.003
	9/29/10	0.198	0.012			24	21	65	4	0.0312

TL - flow too low/too braided to measure

NM - not measured

TH - too high to measure safely

TF - no flow measured, too much flow around flume

Table 4-1 Surface Water Quality Select Constituents
(units in mg/L unless noted)

Sample	Date	Dissolved Cobalt	Dissolved Copper	Total Recoverable Cobalt	Total Recoverable Copper	Hardness	Sulfate	TDS	TSS	Flow (cfs)
WQ-1	05/18/10	0.01	<0.001	0.02	0.013	22	4	70	36	330
WQ-2	5/18/10	<0.006	0.004	0.003	0.006	15	2	33	<3	0.51
WQ-3	5/18/10	0.009	0.004	0.019	0.013	22	4	45	28	330
WQ-4	5/18/10	0.009	0.002	0.019	0.013	23	4	46	26	320
	9/27/10	<0.006	0.001	0.011	0.002	36	6	54	<3	60
WQ-5	5/18/10	0.01	0.009	0.015	0.021	14	2	34	16	8.5
WQ-6	5/18/10	0.009	0.002	0.019	0.012	22	4	48	29	360
WQ-7	5/20/10	0.013	0.005	0.013	0.006	7	1	24	<3	0.51
	9/30/10	0.02	0.001			9	1	22	<3	0.02
WQ-10	5/18/10	0.119	0.018	0.134	0.038	24	14	50	4	0.09
	9/29/10	0.147	0.03			31	23	78	<3	0.04
WQ-11	5/18/10	<0.006	<0.001	0.006	0.002	14	2	23	8	NM
WQ-13	5/18/10	0.144	0.032	0.174	0.138	20	13	51	15	0.0276
WQ-14	5/20/10	<0.006	0.003	<0.002	0.004	6	<1	23	<3	0.23
	9/30/10	<0.006	0.002			10	<1	34	9	0.0023
WQ-15	5/20/10	<0.006	0.003	<0.002	0.004	7	1	34	5	0.0887
	9/30/10	<0.006	0.002			11	2	39	3	0.0002
WQ-16	5/18/10	0.117	0.194	0.252	3.09	26	21	40	996	TL
WQ-17	5/18/10	9.71	60.8	10.2	62.8	83	258	385	9	TL
	9/29/10	17.4	83.9	16.7	90.6	146	383	657	<3	0.0005
WQ-18	5/18/10	0.085	0.059	0.086	0.07	219	179	302	<3	0.0088
	9/29/10	0.075	0.088	0.073	0.091	232	181	329	<3	0.02
WQ-19	5/18/10	0.108	0.042	0.115	0.056	60	33	88	<3	0.2
	9/29/10	0.129	0.056	0.126	0.063	100	69	150	<3	0.08
WQ-20	5/17/10	<0.006	<0.001	<0.002	<0.001	63	4	78	17	4
WQ-21	5/17/10	0.123	0.073	0.131	0.115	49	25	82	4	0.3
	9/29/10	0.172	0.077	0.168	0.082	70	43	116	<3	0.2
WQ-22	5/17/10	0.018	0.018	0.019	0.048	65	7	85	9	4
WQ-23	5/17/10	<0.006	<0.001	<0.002	<0.001	15	1	36	5	50
WQ-24a	5/17/10	0.003	0.002	<0.002	0.003	20	2	35	5	52
	8/20/10					39				14
	9/28/10	0.004	0.006	0.005	0.007	42	4	62	<3	11
WQ-25	5/18/10	0.011	0.004	0.023	0.016	22	4	56	37	370
WQ-25a	5/18/10	0.012	0.004	0.024	0.019	22	4	45	43	TL
	9/27/10	0.008	0.002	0.012	0.003	38	5	63	<3	63
WQ-28	5/18/10	<0.002	0.007	0.004	0.019	18	2	45	16	70
	9/27/10	<0.006	0.006	0.004	0.007	43	4	56	<3	12
WQ-29	5/18/10	0.081	0.061	0.089	0.095	102	56	133	4	0.08
	9/29/10	0.093	0.085	0.087	0.093	137	91	193	<3	0.06
WQ-30	5/17/10	0.003	0.003	<0.002	0.005	21	2	44	5	51
	8/20/10					39				14
	9/28/10	0.003	0.005	0.005	0.007	42	4	62	<3	10

TL - flow too low/too braided to measure
NM - not measured
TH - too high to measure safely
TF - no flow measured, too much flow around flume

Figures

FIGURES

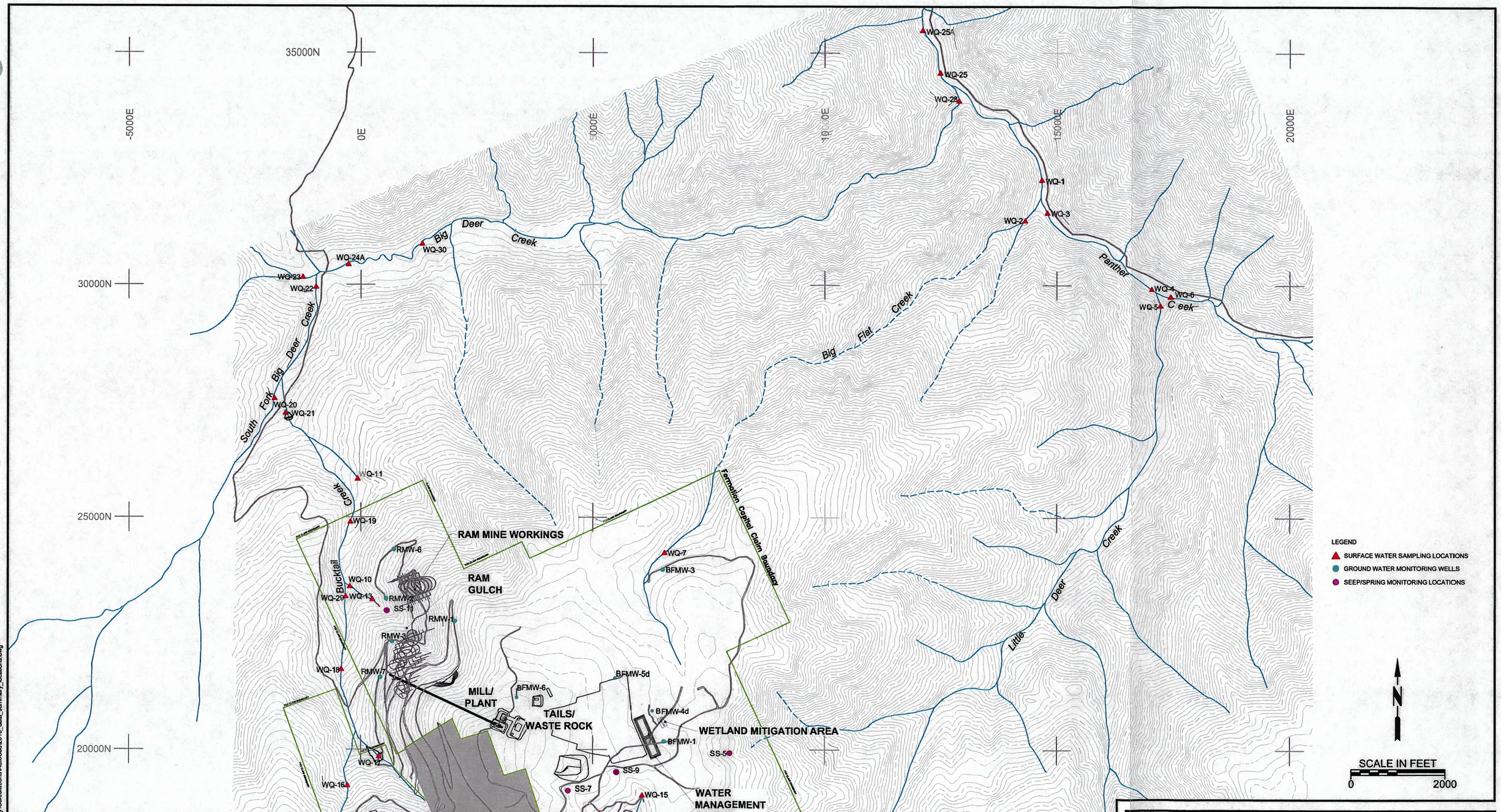

FIGURE 1-1
SITE LAYOUT AND SAMPLING LOCATIONS

PROJECT: 222100	TASK: 55

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PREPARED FOR: Formation

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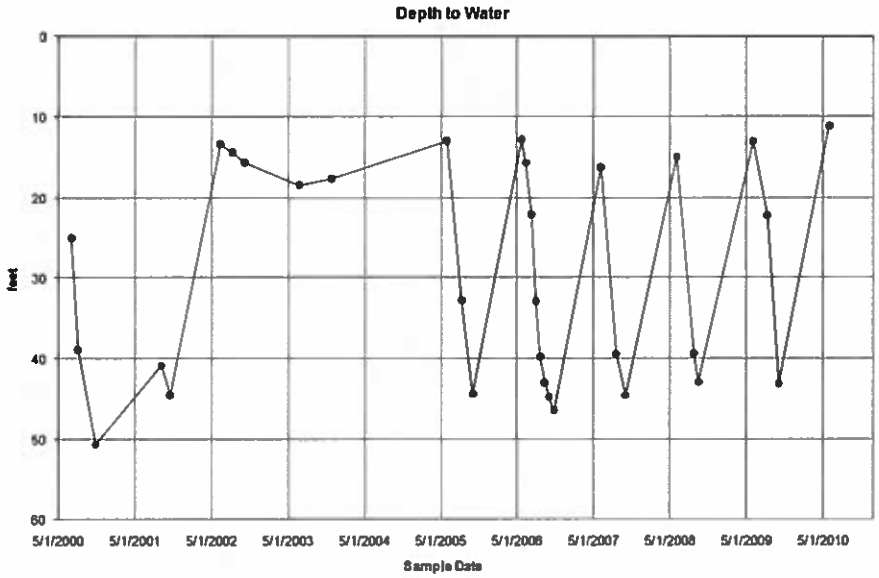

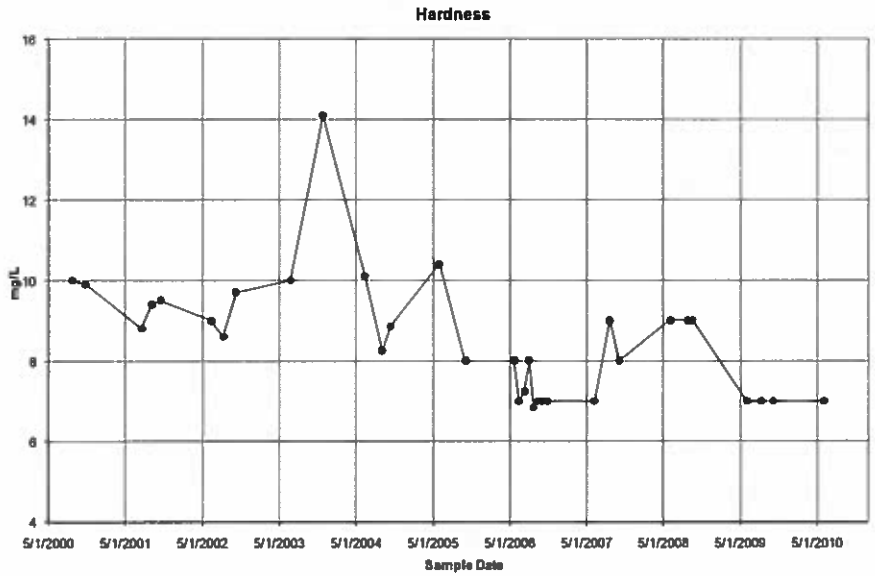

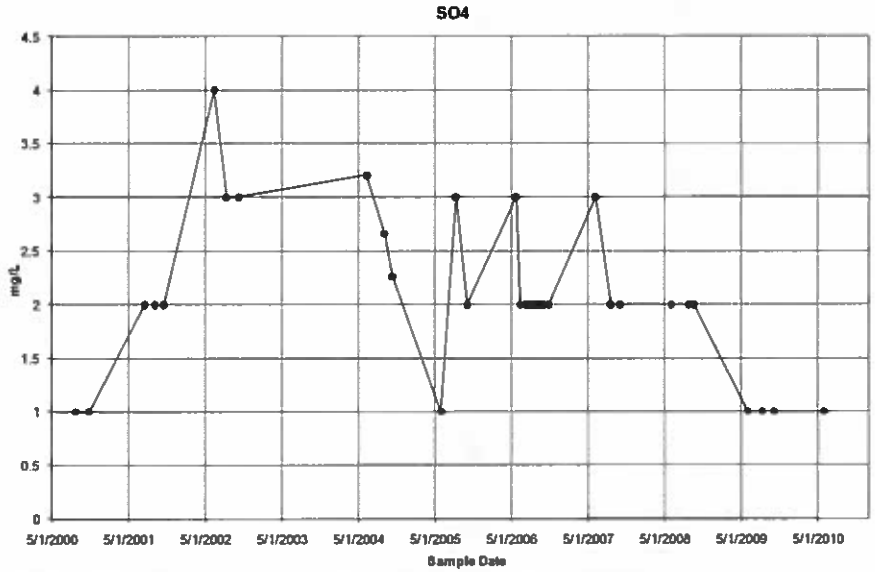

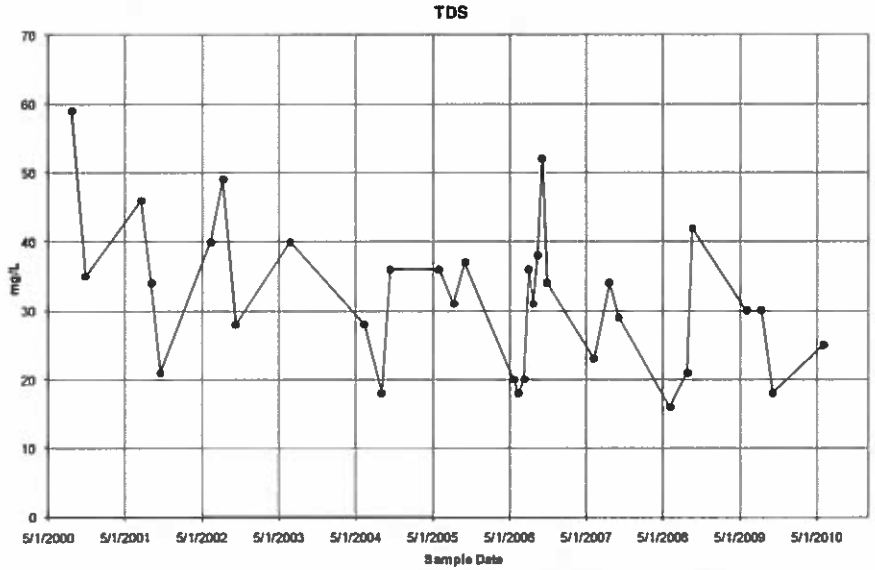

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FIGURE 2-1a
2000 – 2010 DATA FOR WELL BFMW-1

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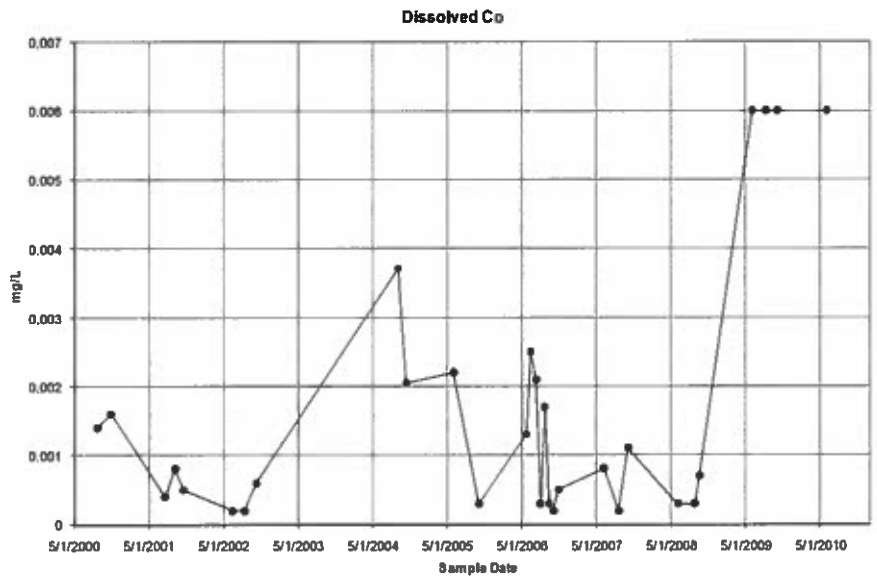

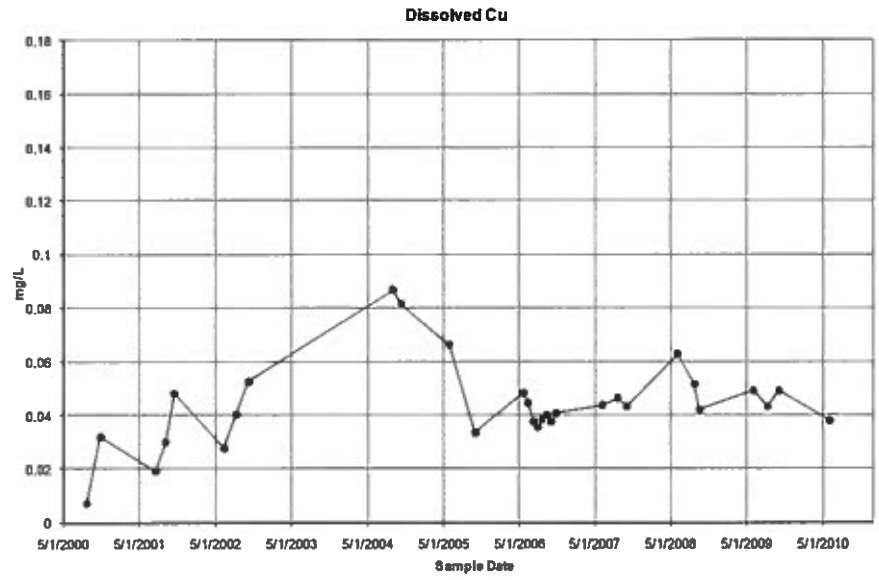

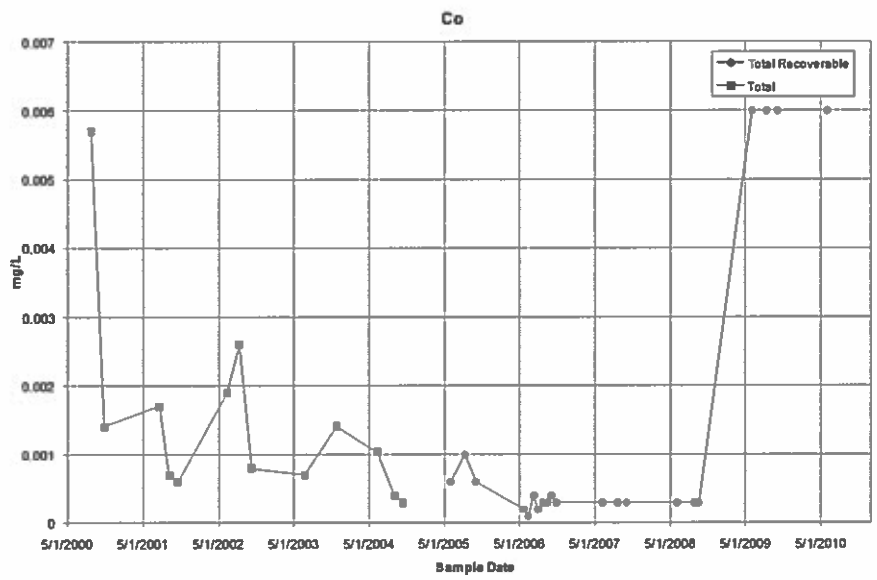

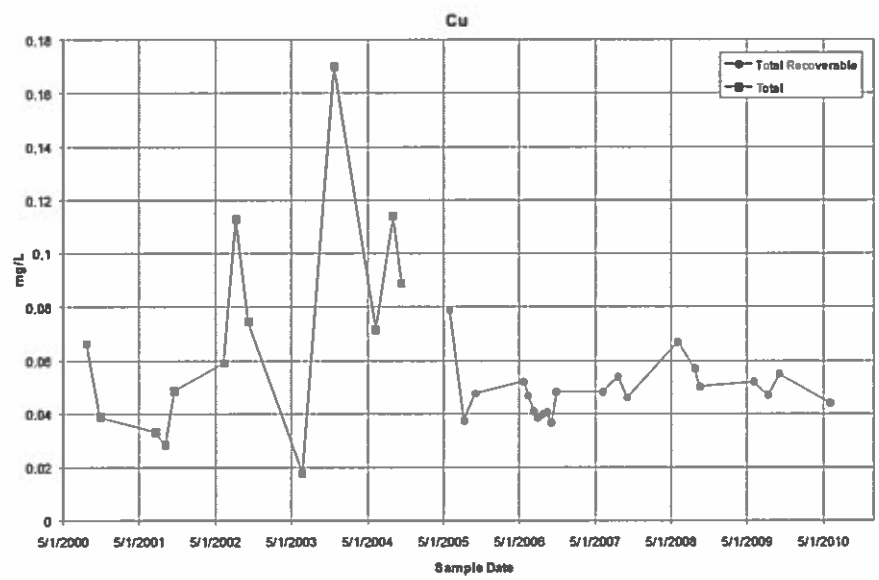

PROJECT: 222100	TASK: 66
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FIGURE 2-1b
2000 - 2010 DATA FOR WELL BFMW-1

PREPARED FOR: Formation

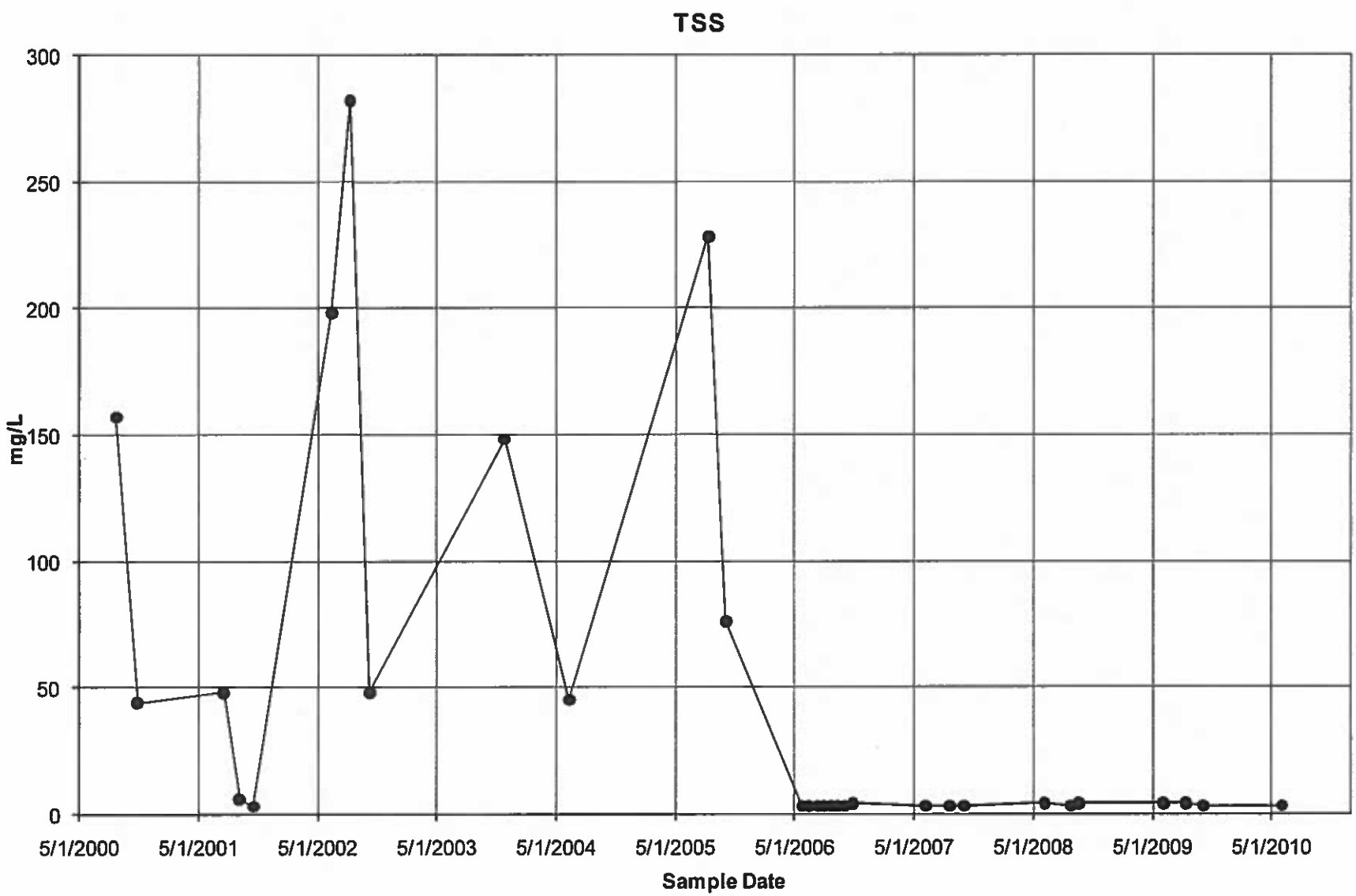

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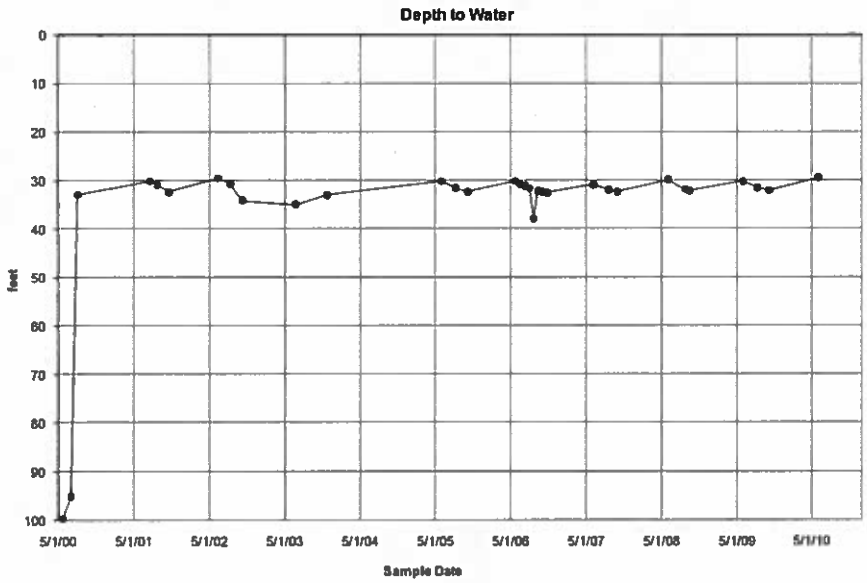
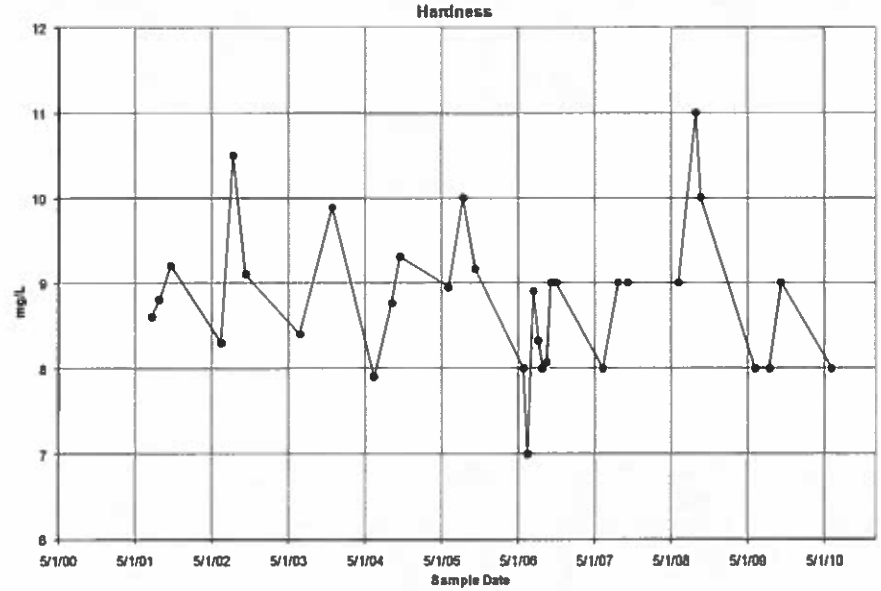
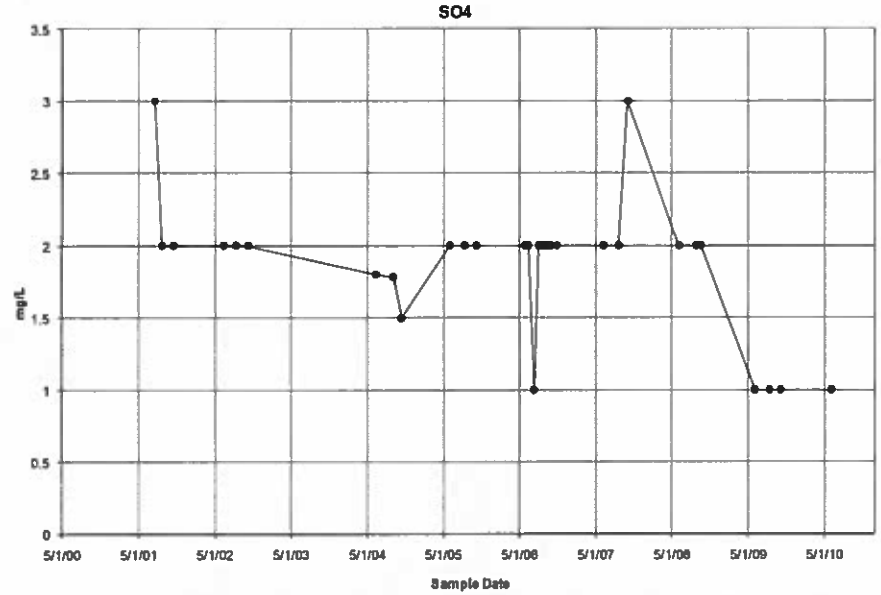
FIGURE 2-1c
2000 - 2010 DATA FOR WELL BFMW-1

PREPARED FOR: Formation







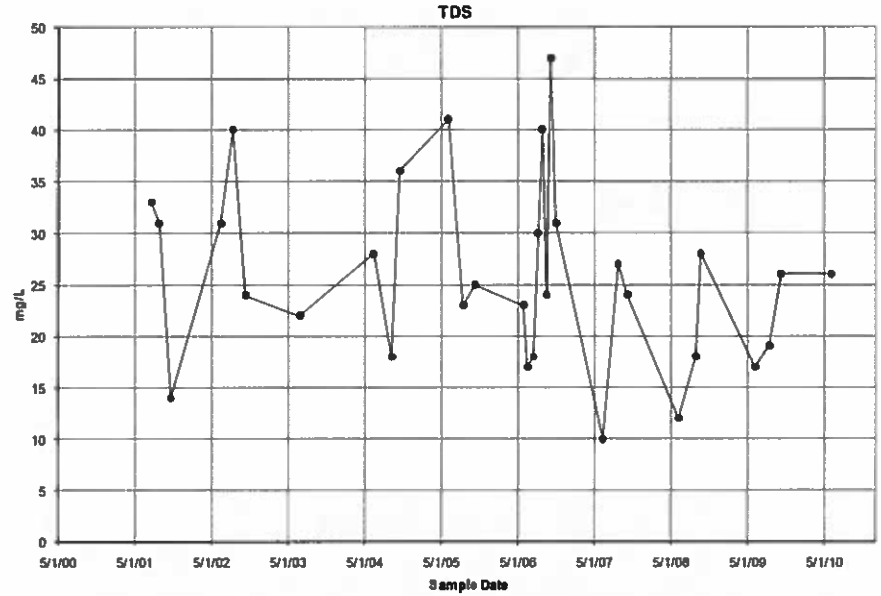


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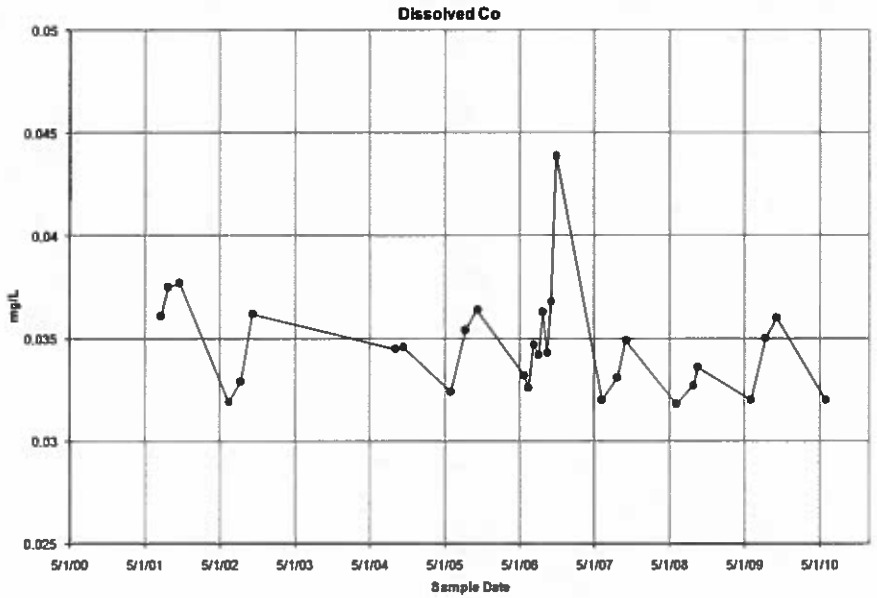
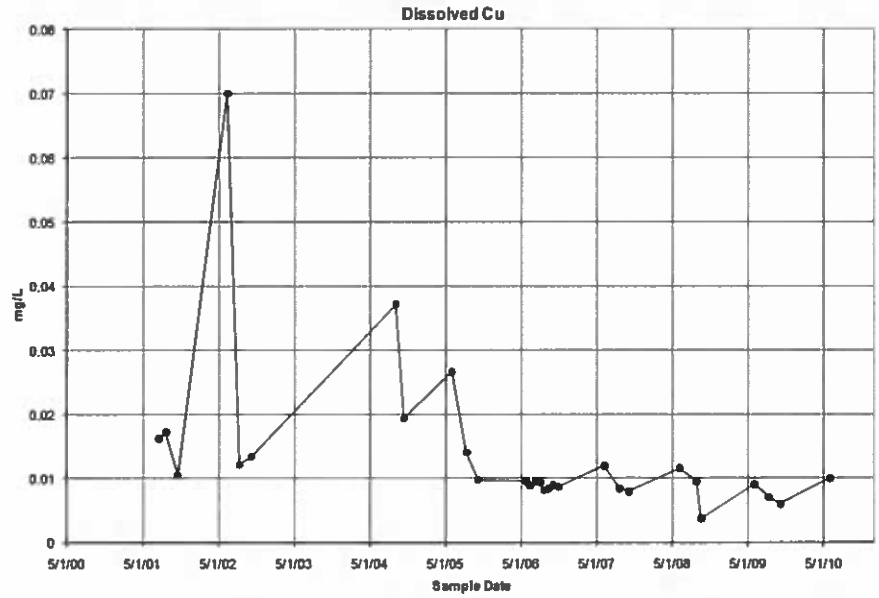
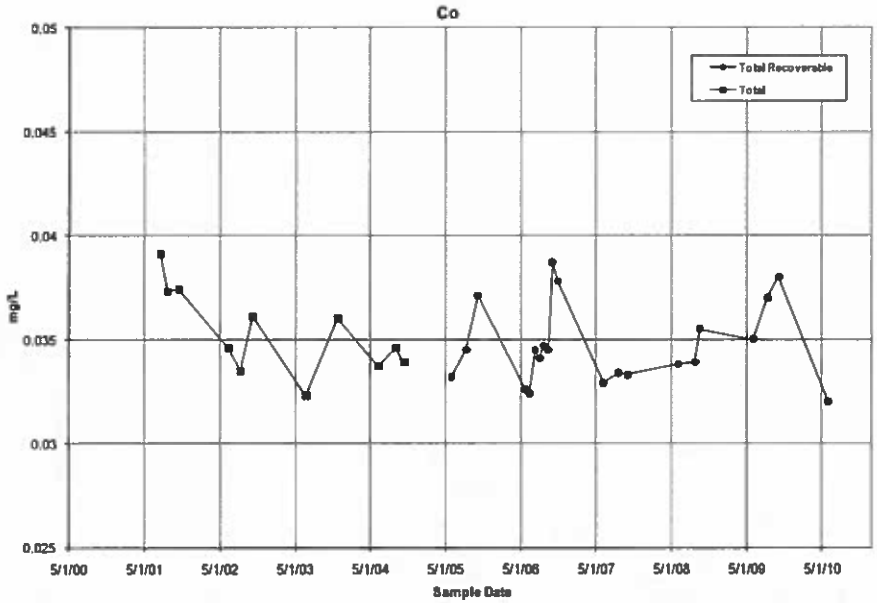
FIGURE 2-2a
2000 - 2010 DATA FOR WELL BFMW-3

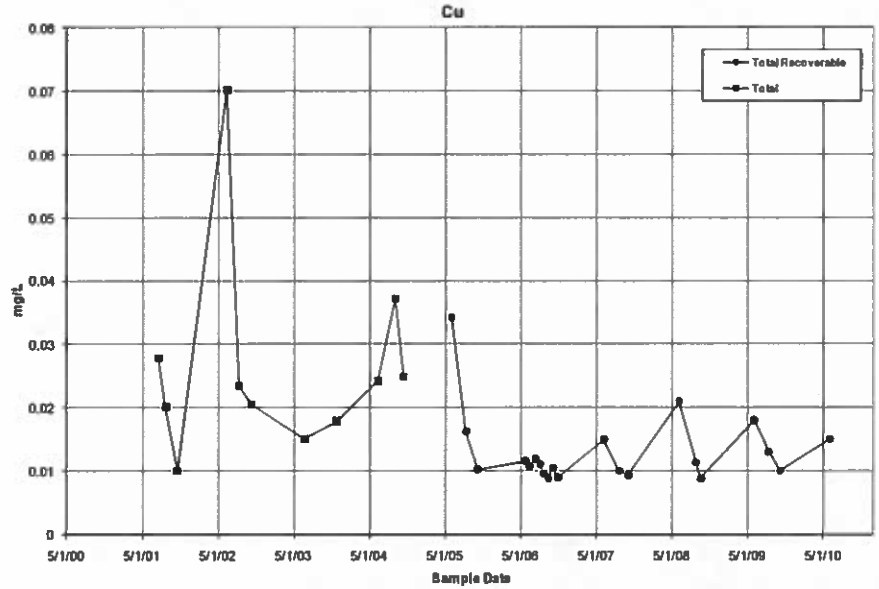
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\BFMW_graphs_2010.ppt





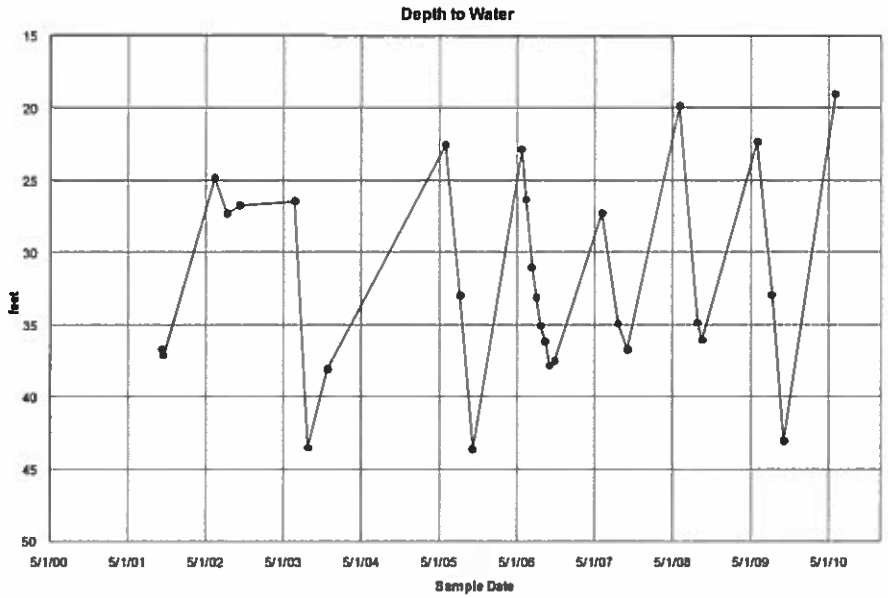


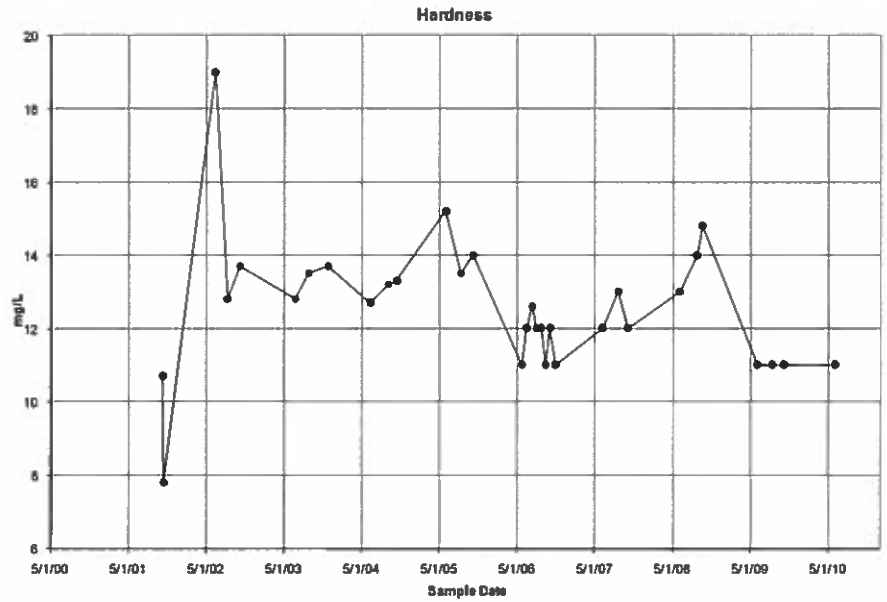


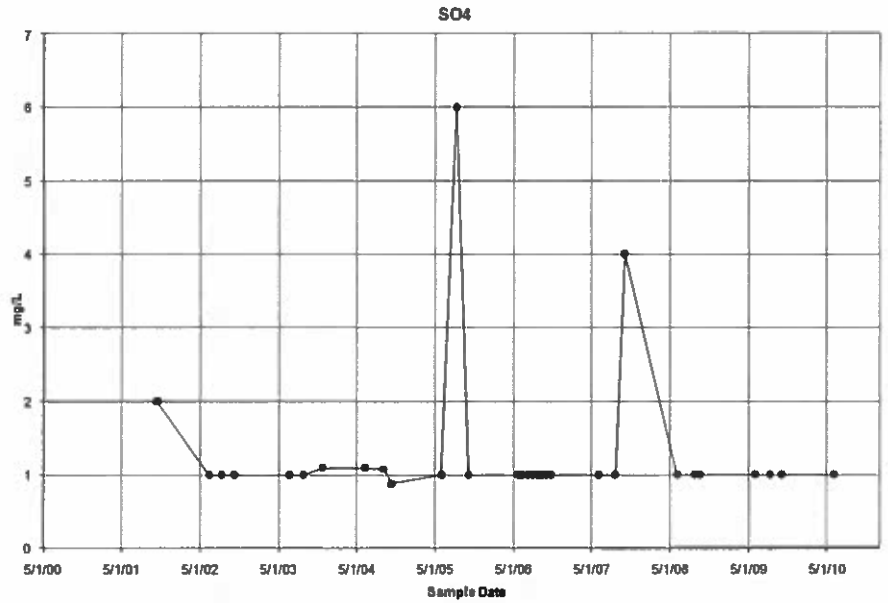
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

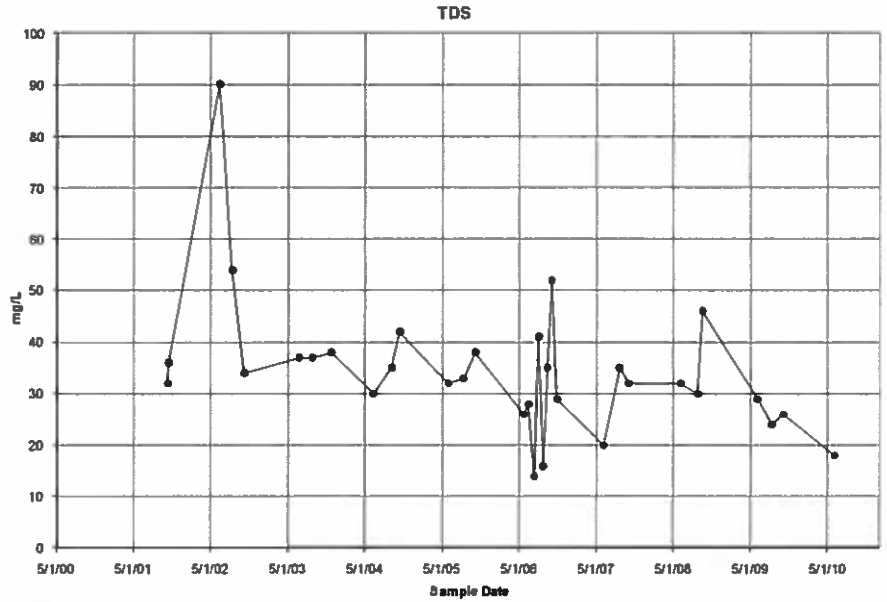
FIGURE 2-2b
2000 - 2010 DATA FOR WELL BFMW-3

PREPARED FOR: Formation





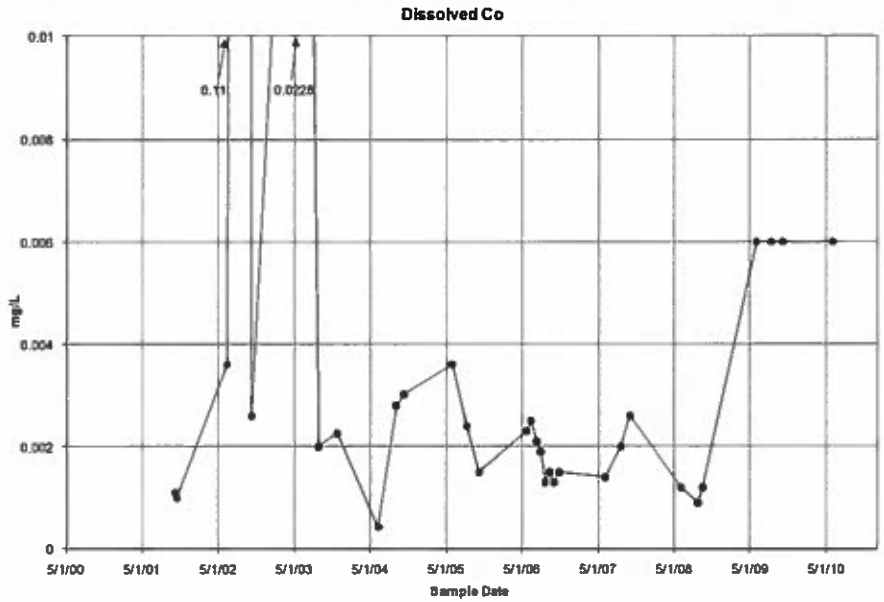


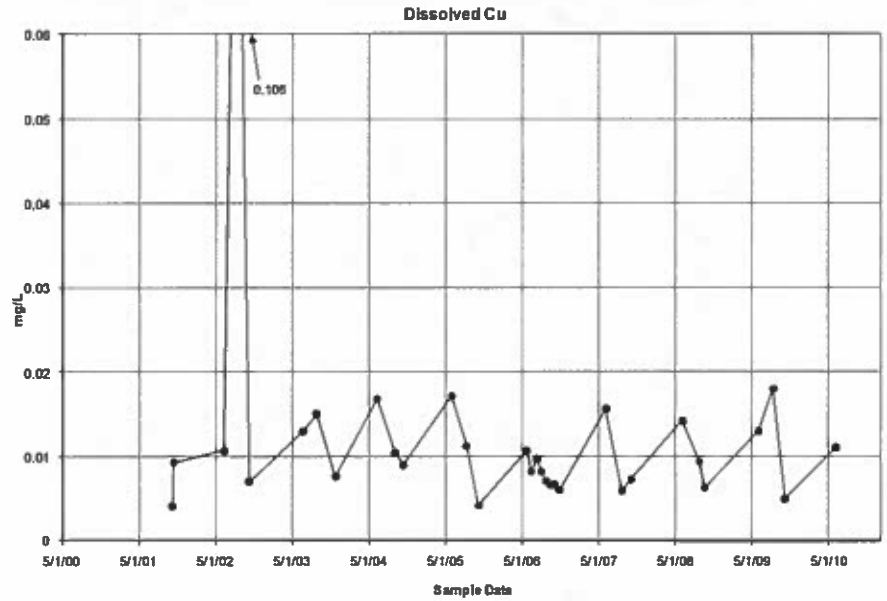


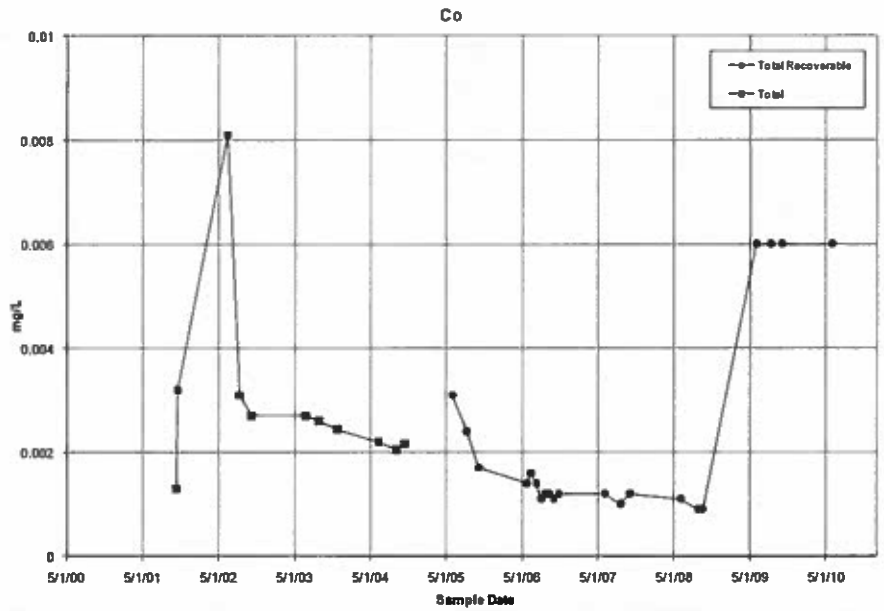
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

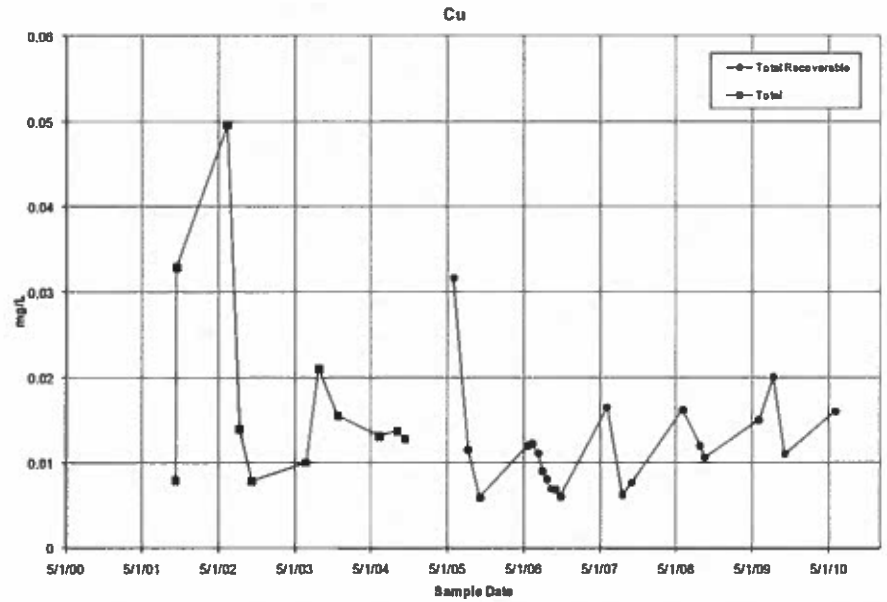
FIGURE 2-3a
2000 - 2010 DATA FOR WELL BFMW-4d

PREPARED FOR: Formation









PROJECT	TASK
222100	66

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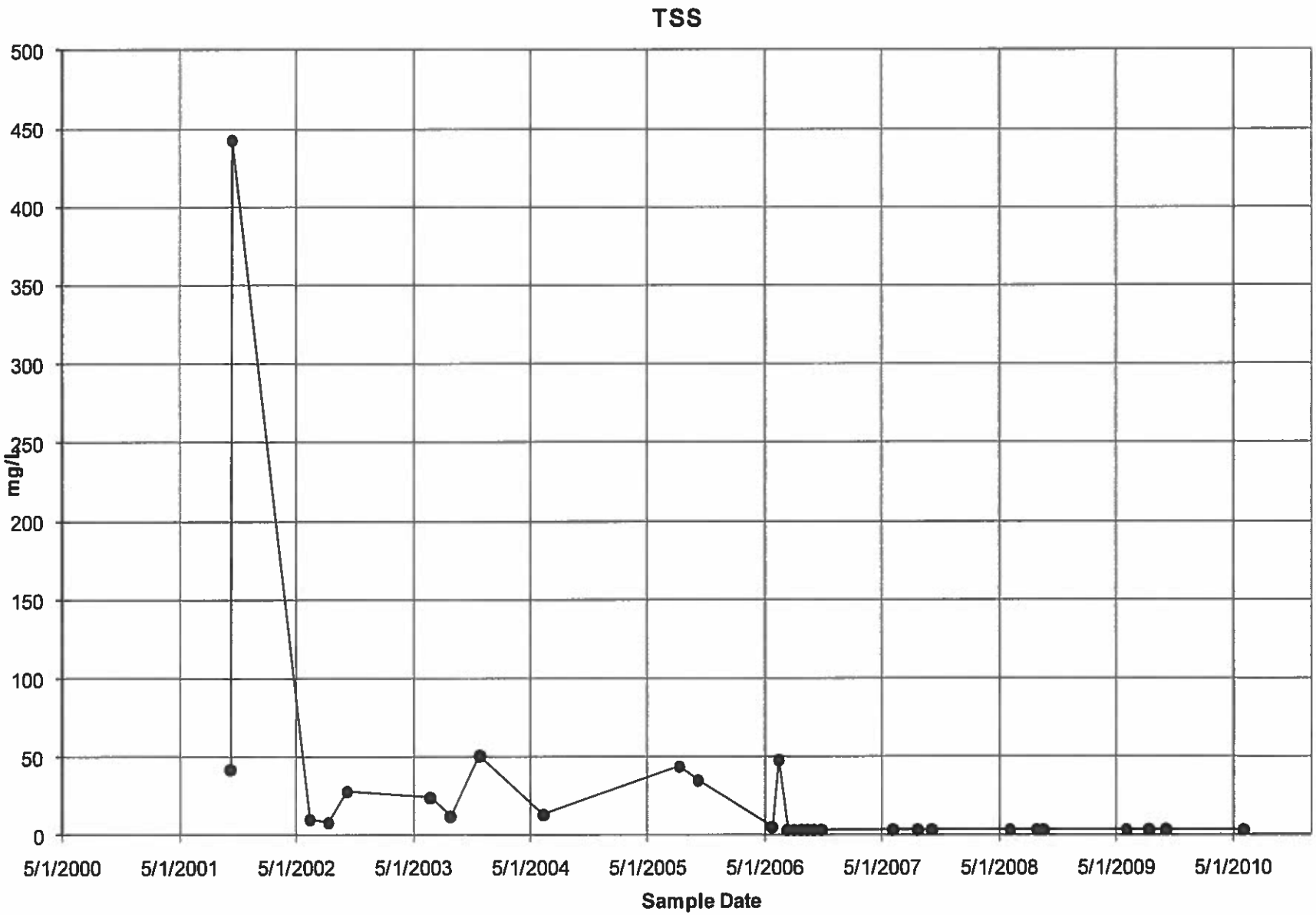
FIGURE 2-3b
2000 - 2010 DATA FOR WELL BFMW-4d

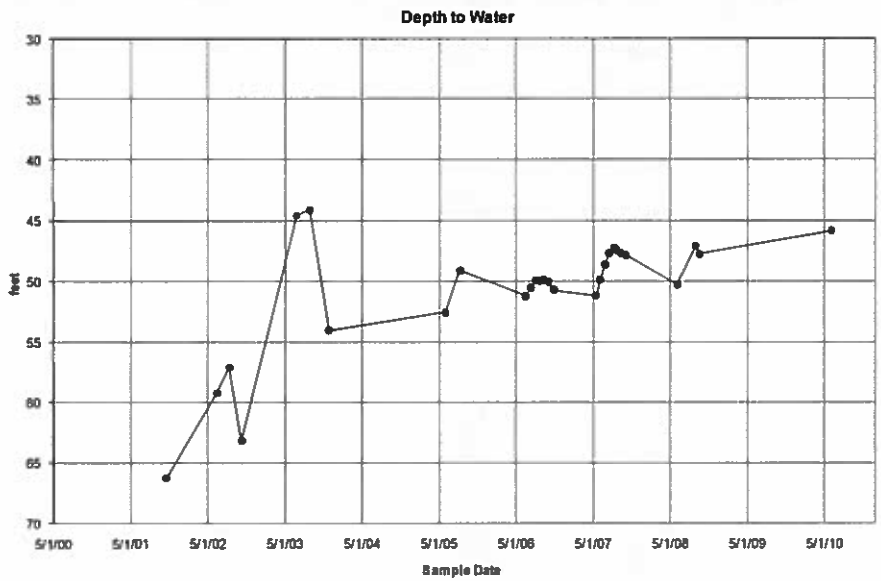
PREPARED FOR: Formation

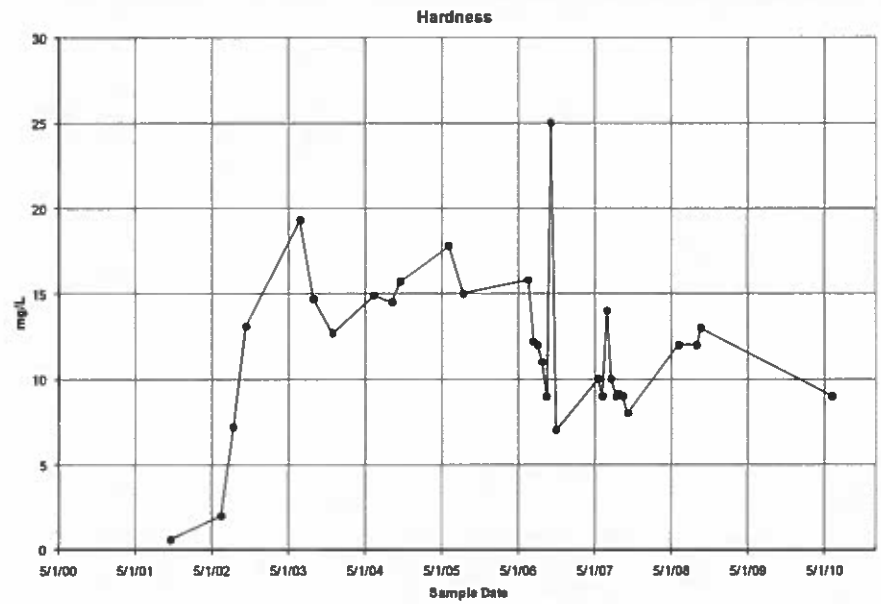


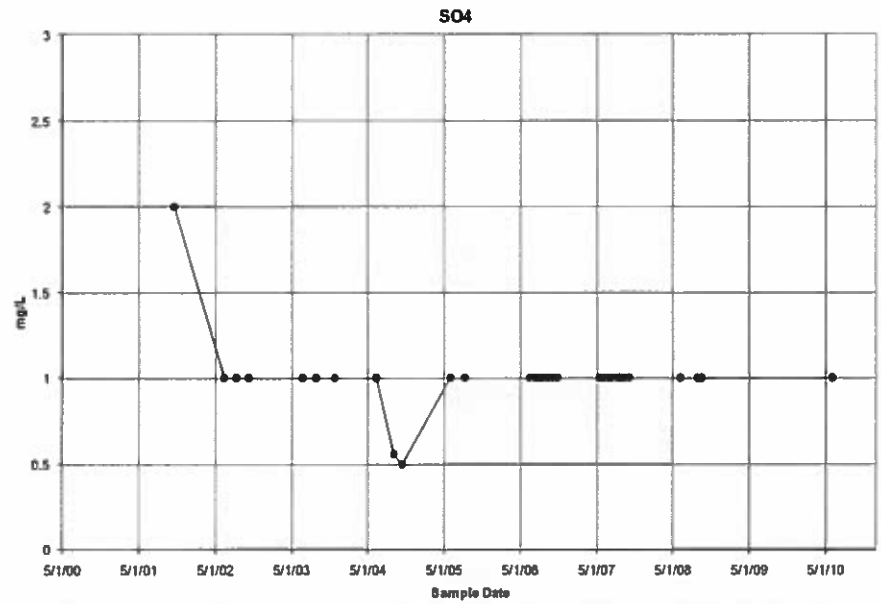
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

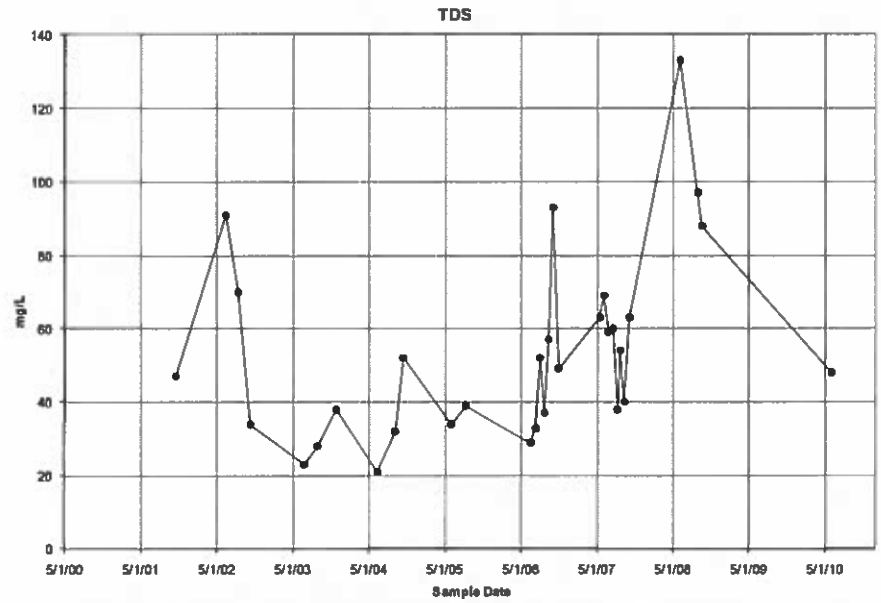
FIGURE 2-3c
2000 - 2010 DATA FOR WELL BFMW-4d

PREPARED FOR: Formation









PROJECT	TASK
222100	66

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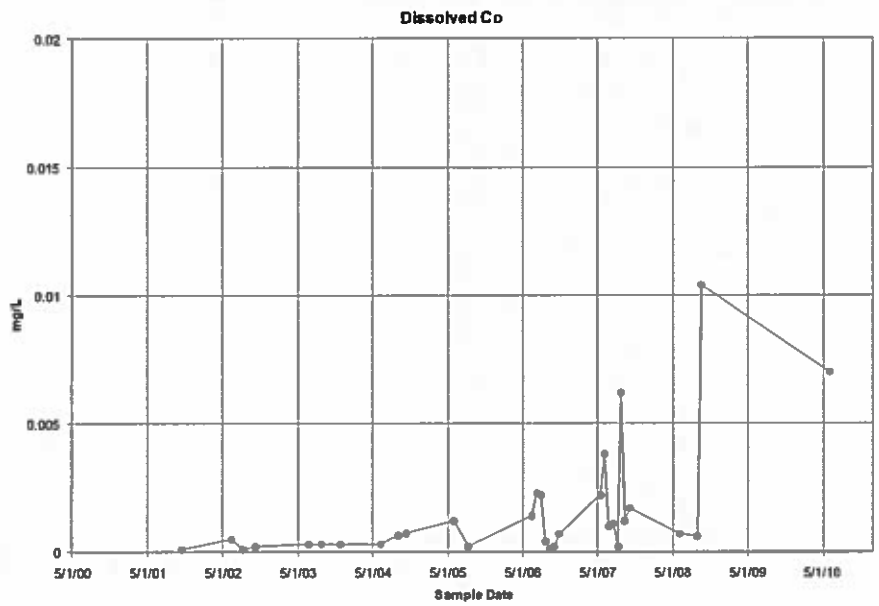
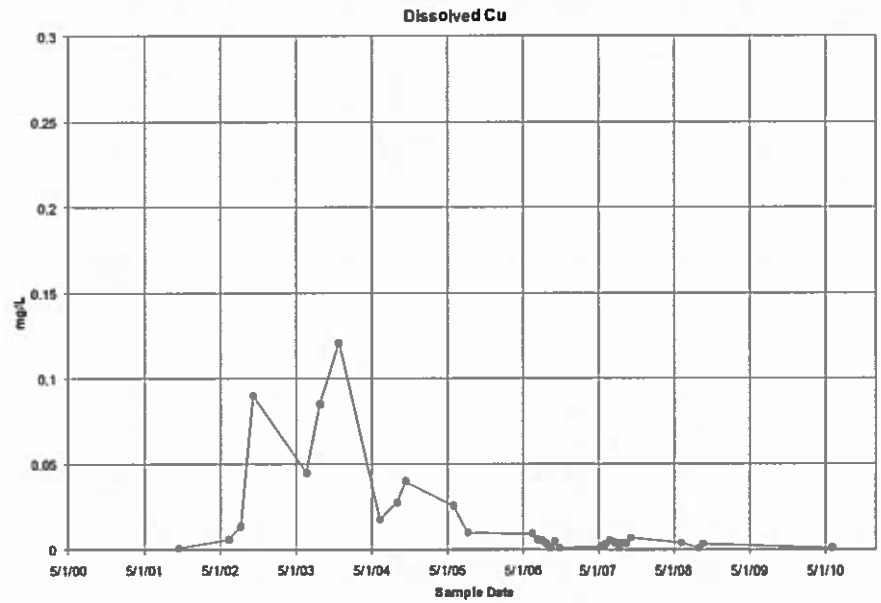
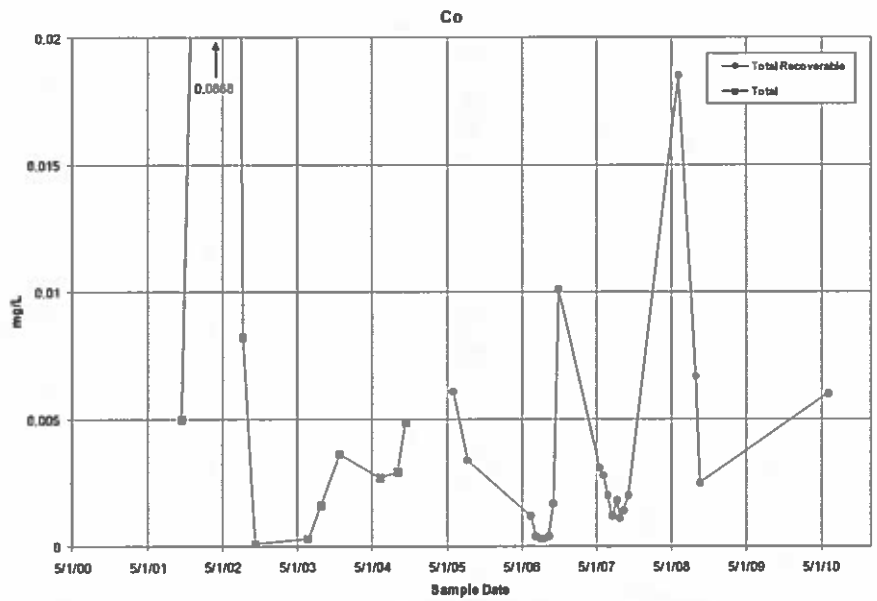
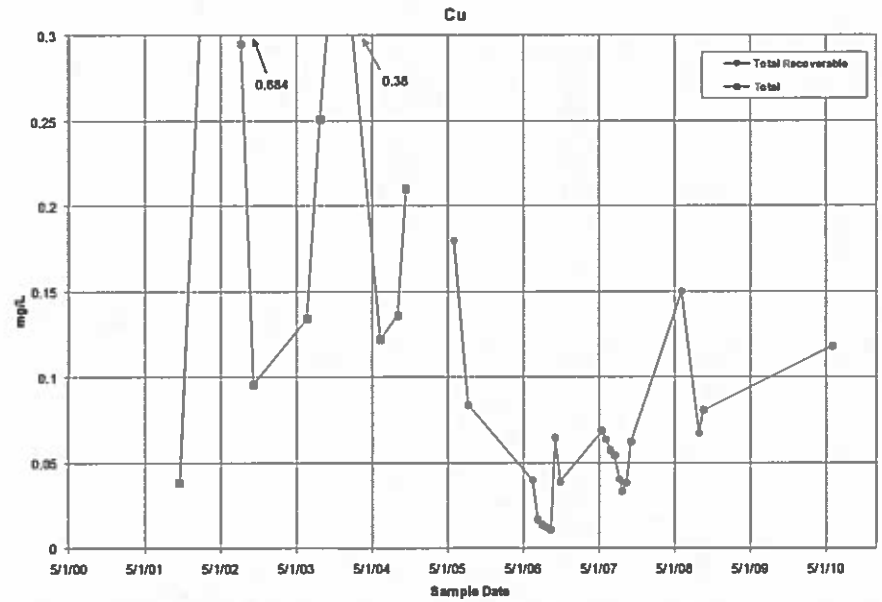
FIGURE 2-4a
2000 - 2010 DATA FOR WELL BFMW-5d

PREPARED FOR: Formation









PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 2-4b
2000 - 2010 DATA FOR WELL BFMW-5d

PREPARED FOR: Formation

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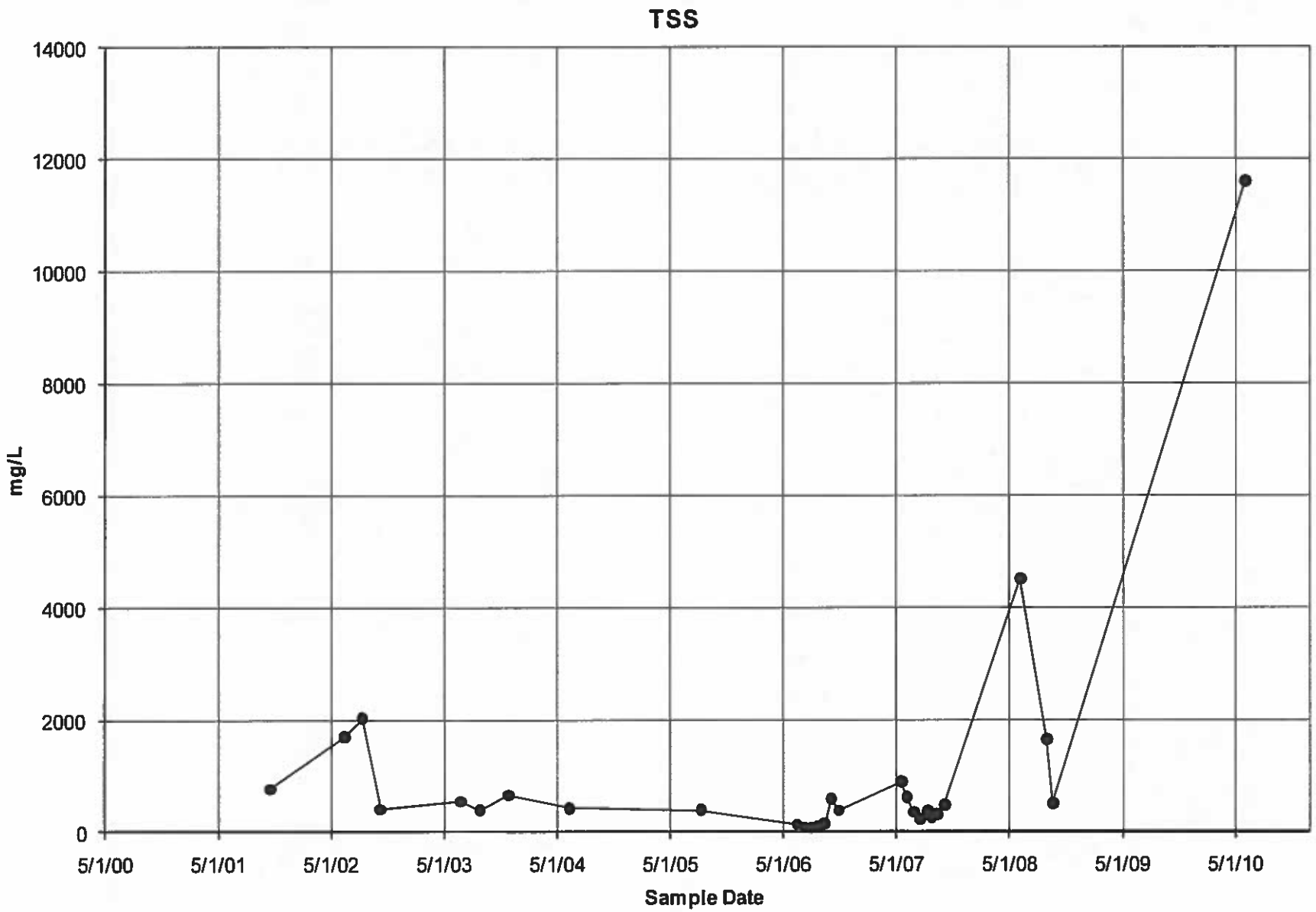
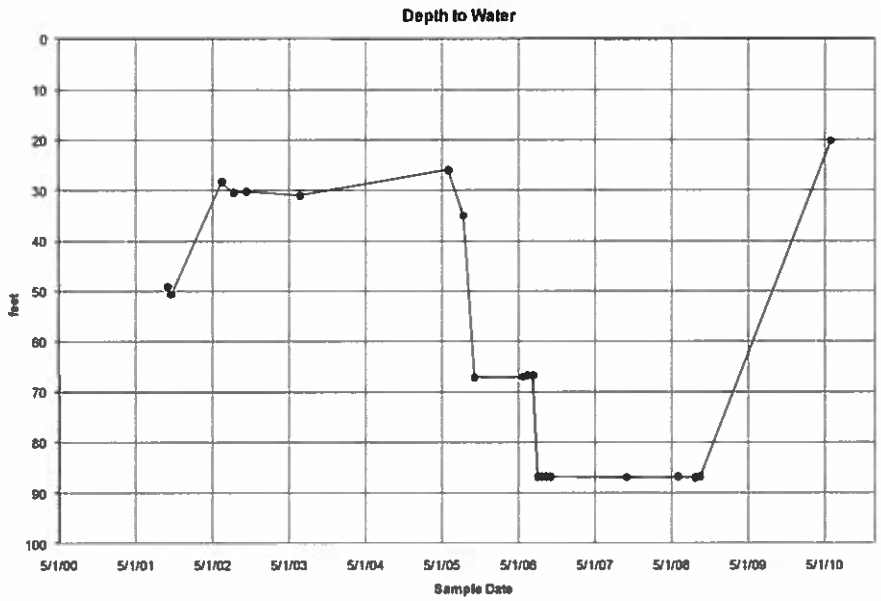
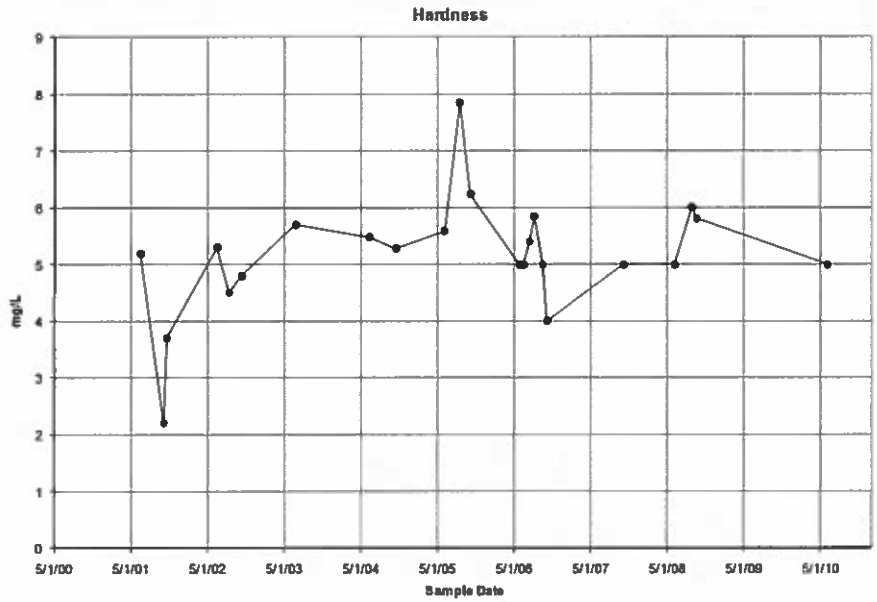


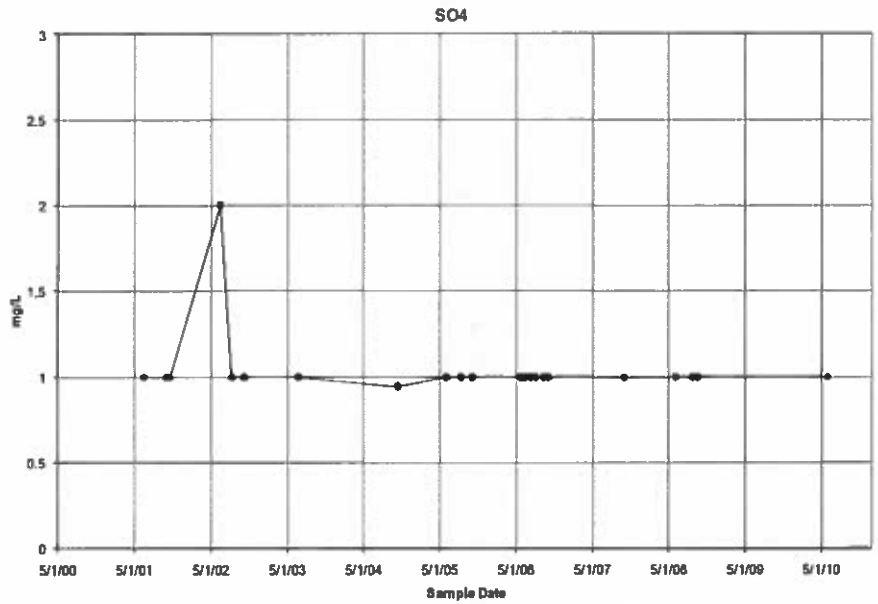
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED	

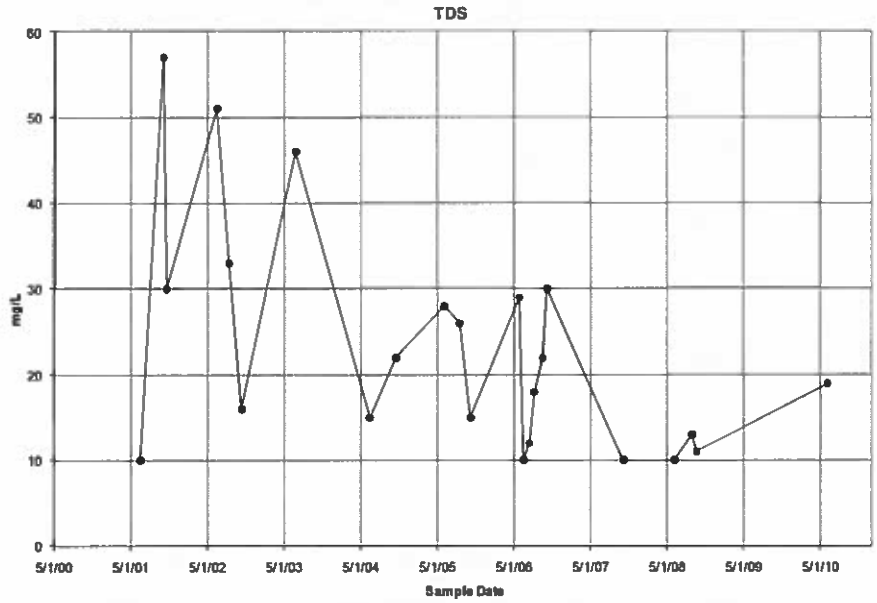
FIGURE 2-4c
2000 - 2010 DATA FOR WELL BFMW-5d

PREPARED FOR: Formation







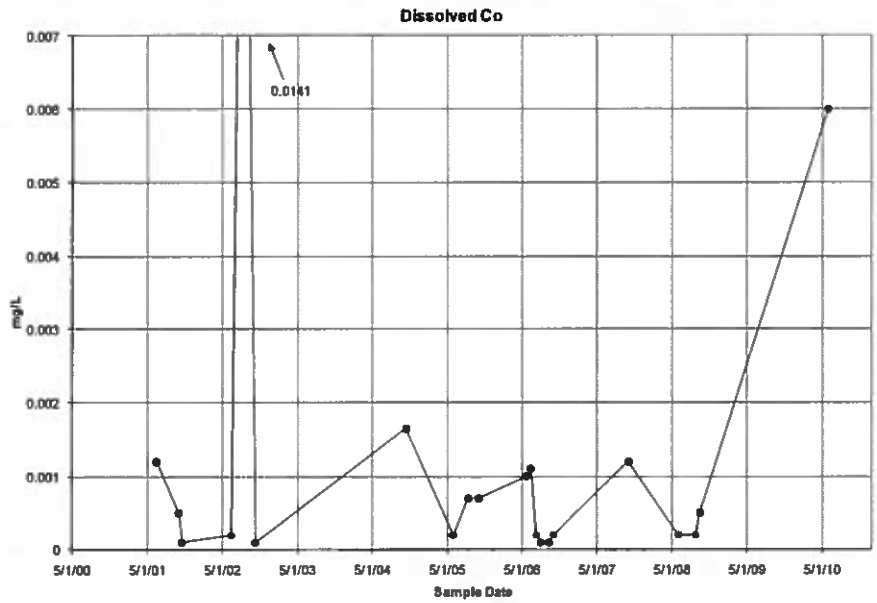


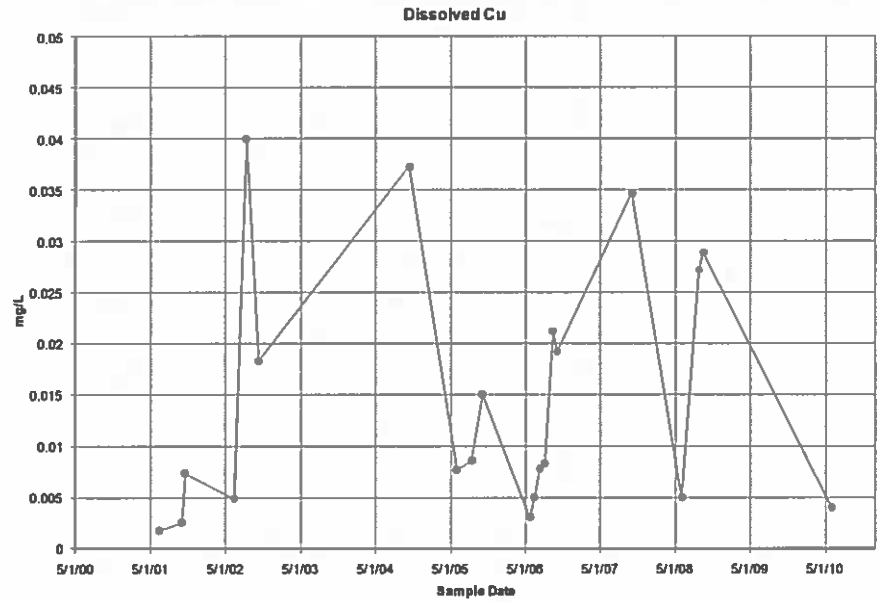
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

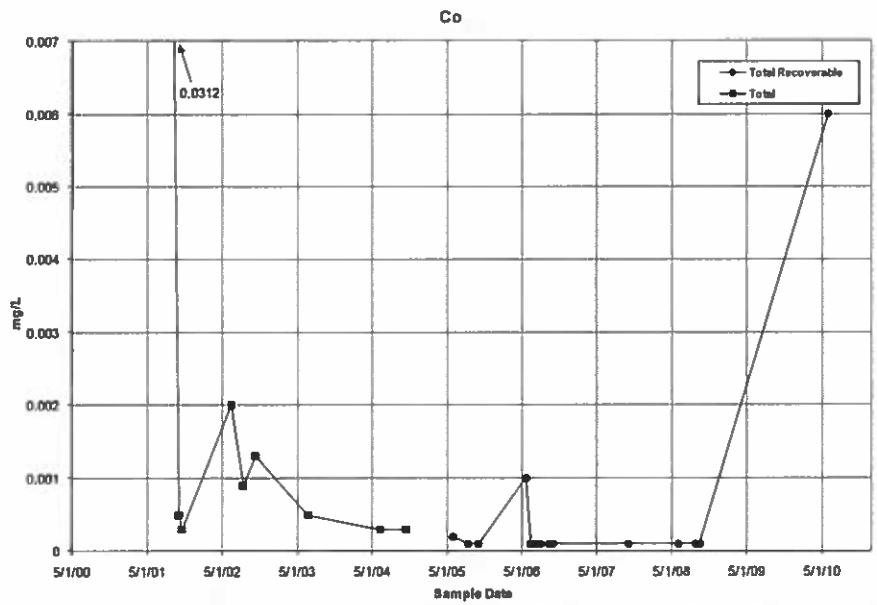
FIGURE 2-5a
2000 - 2010 DATA FOR WELL BFMW-6

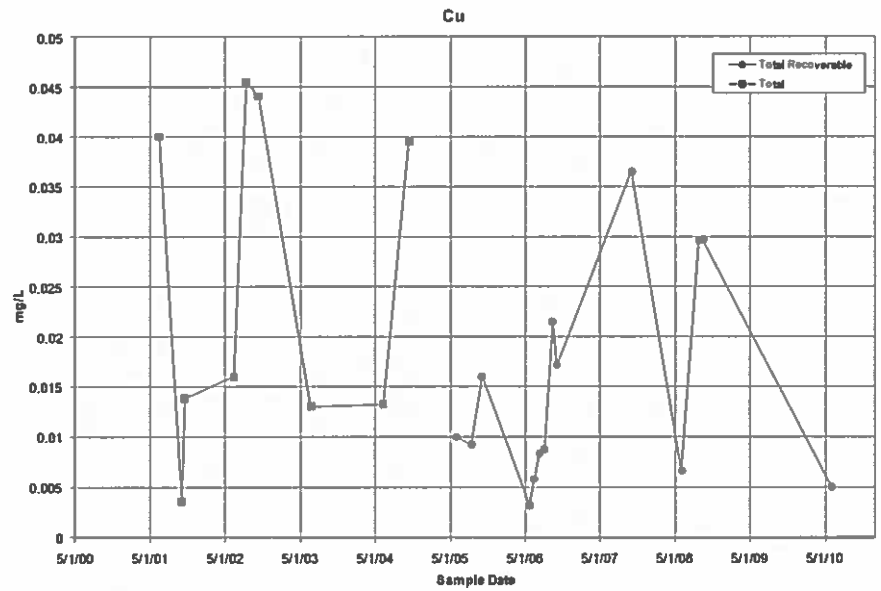
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\BFMW_graphs_2010.ppt







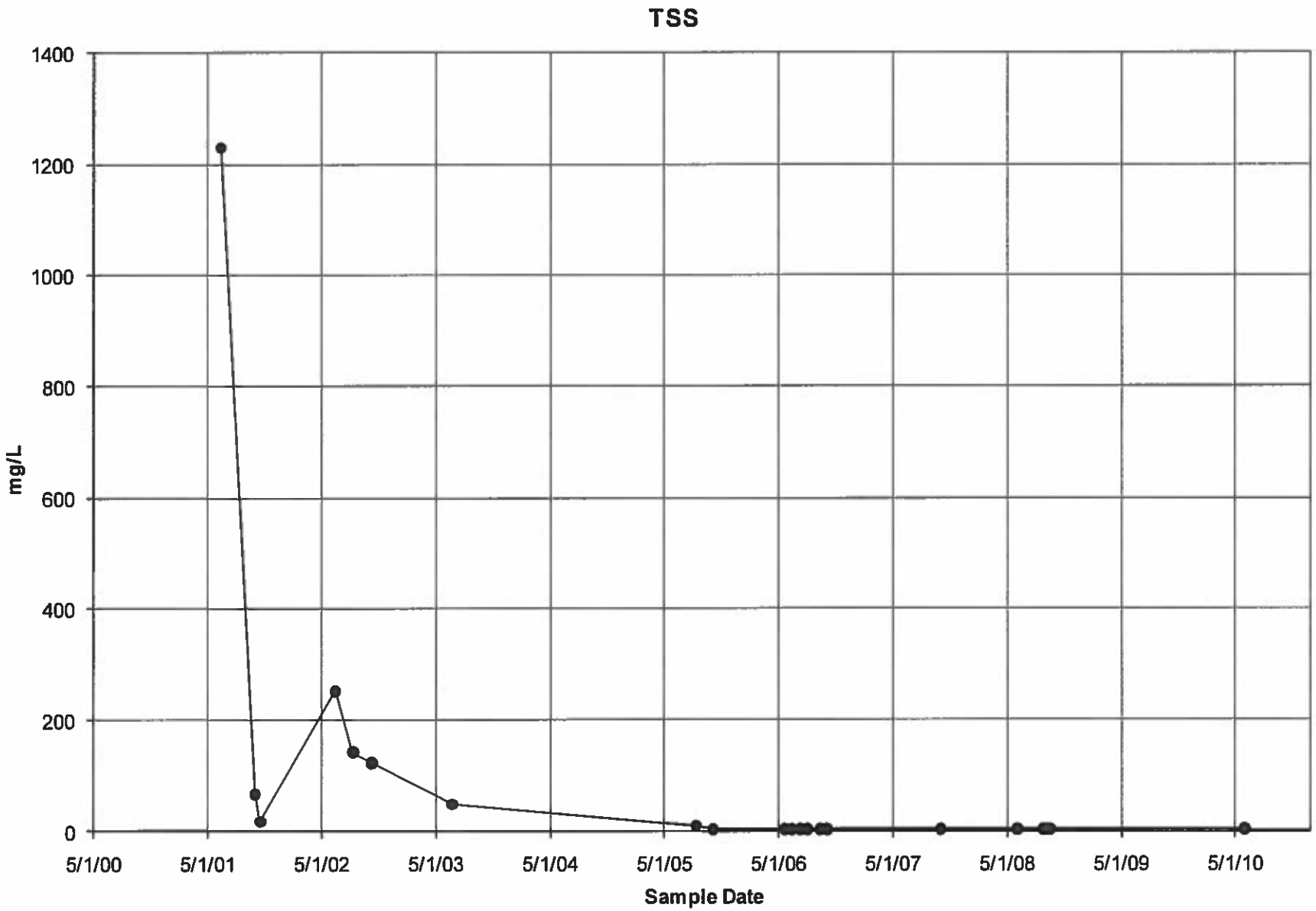


PROJECT: 222100	TASK: 66

PREPARED BY: TELESTO SOLUTIONS INCORPORATED

FIGURE 2-5b
2000 - 2010 DATA FOR WELL BFMW-6

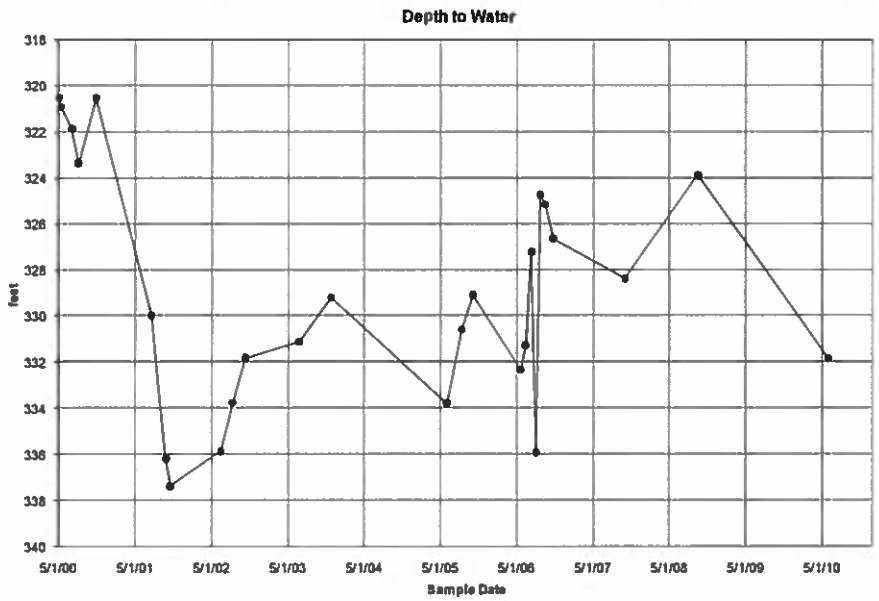
PREPARED FOR: Formation

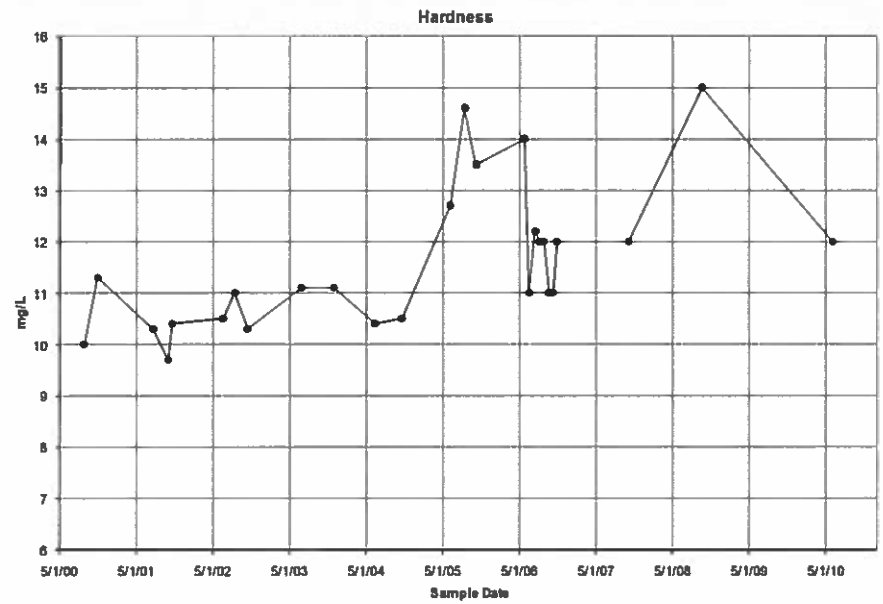


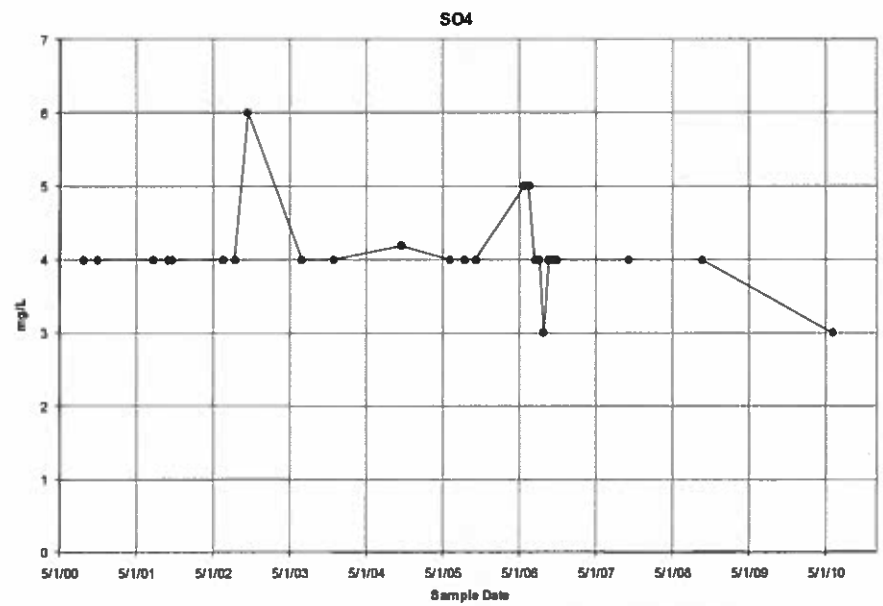
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

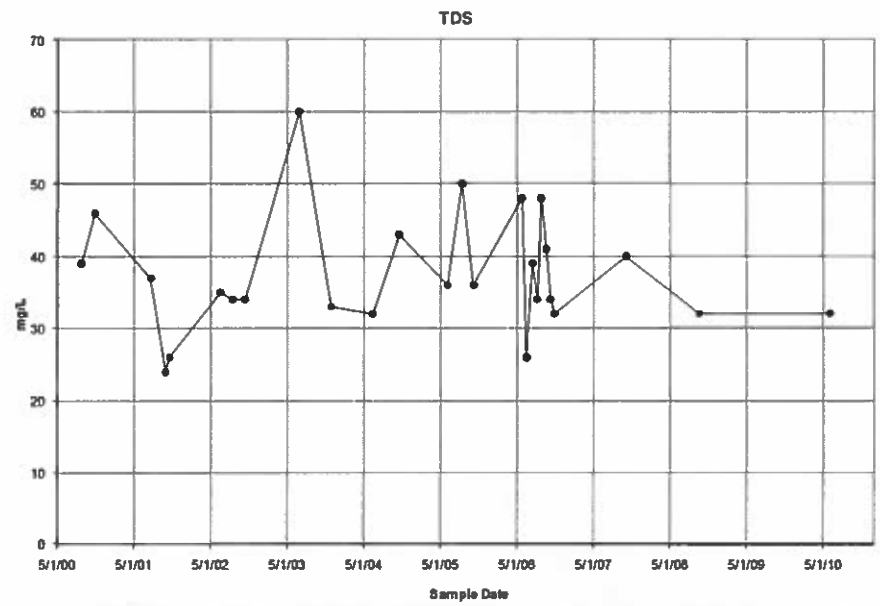
FIGURE 2-5c
2000 - 2010 DATA FOR WELL BFMW-6

PREPARED FOR: Formation







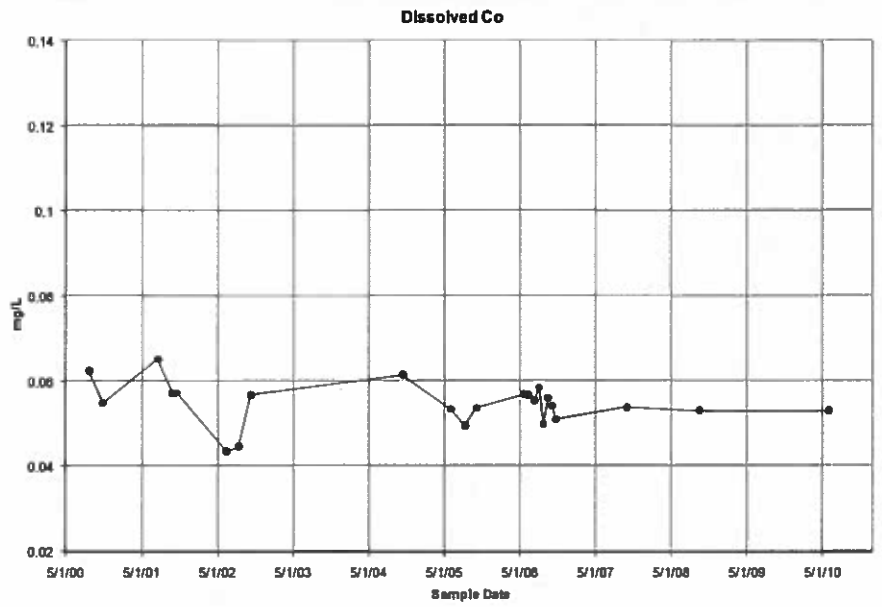


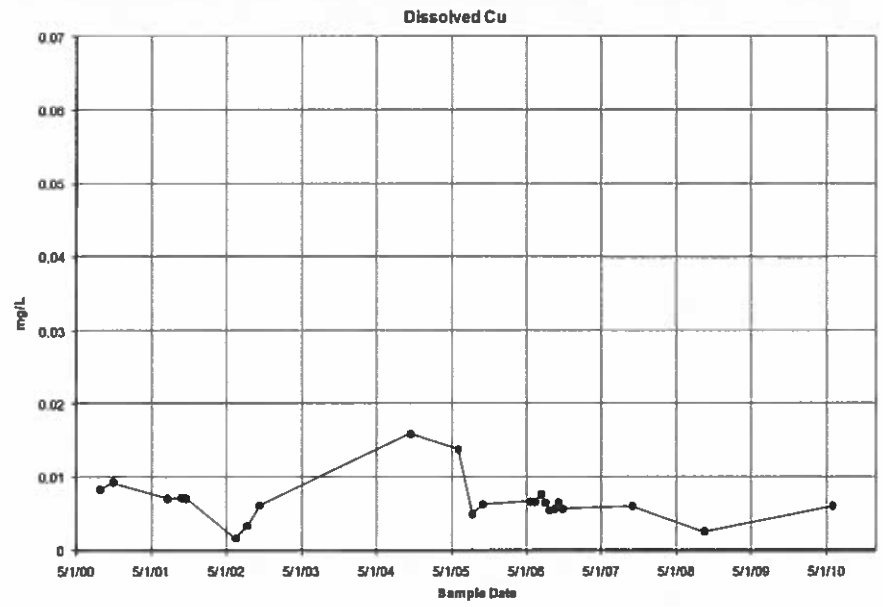
PROJECT	TASK
222100	66

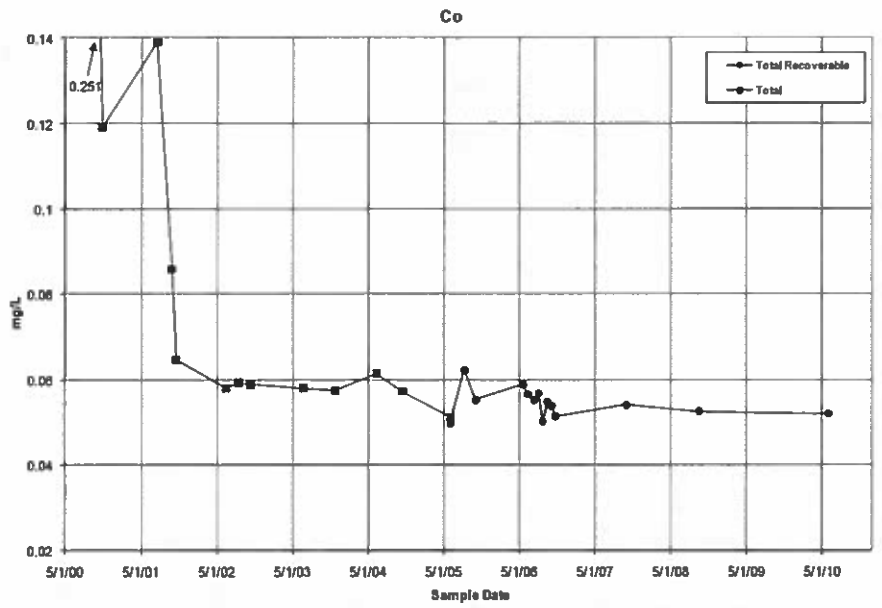
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

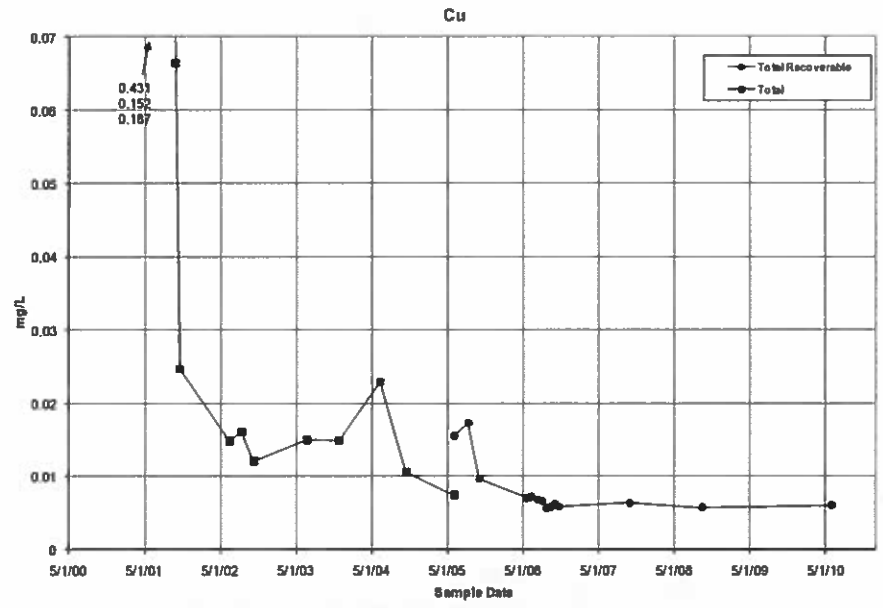
FIGURE 2-6a
2000 – 2010 DATA FOR WELL RMW-1

PREPARED FOR: Formation









PROJECT: 222100	TASK 66
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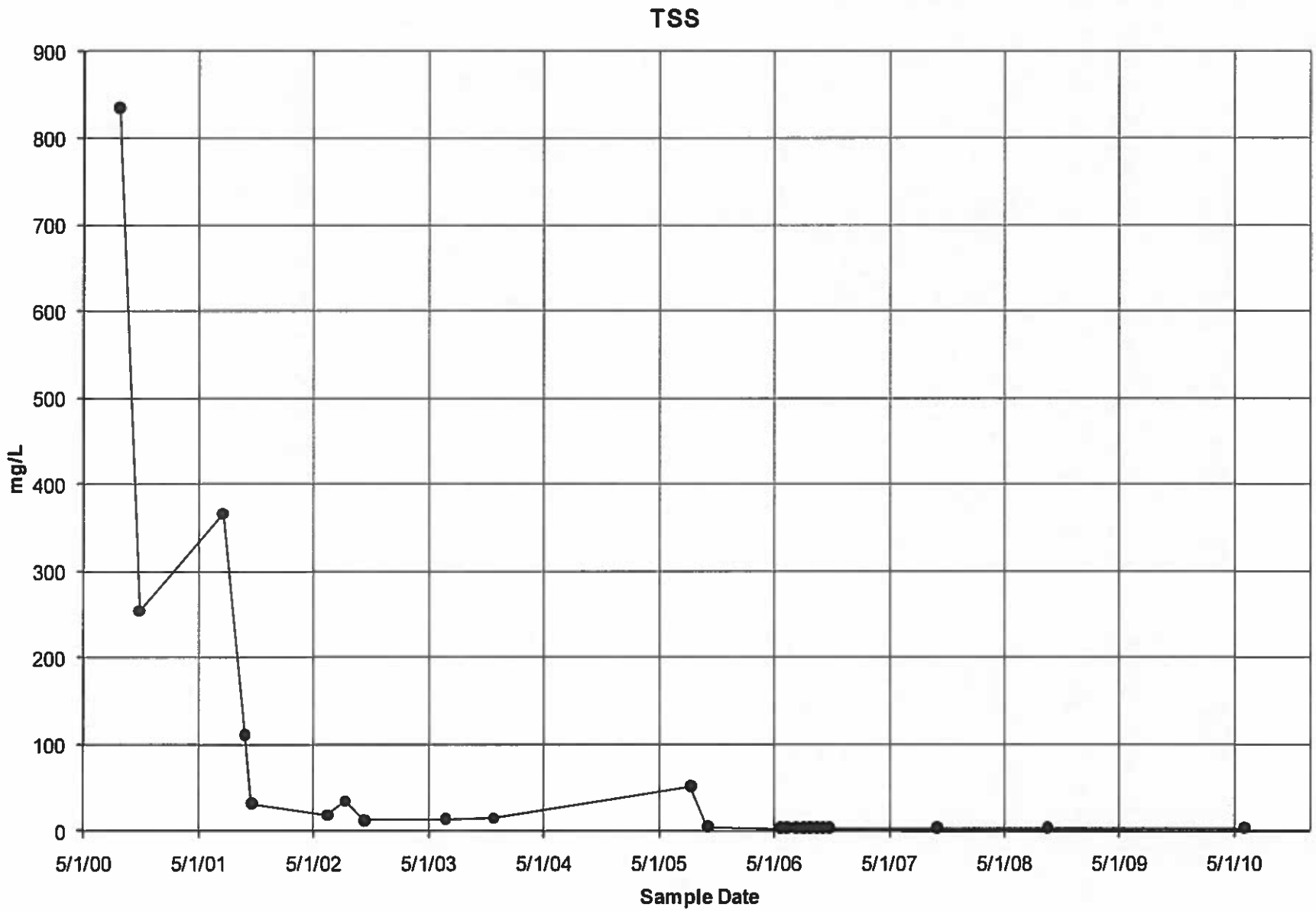
FIGURE 2-6b
2000 - 2010 DATA FOR WELL RMW-1

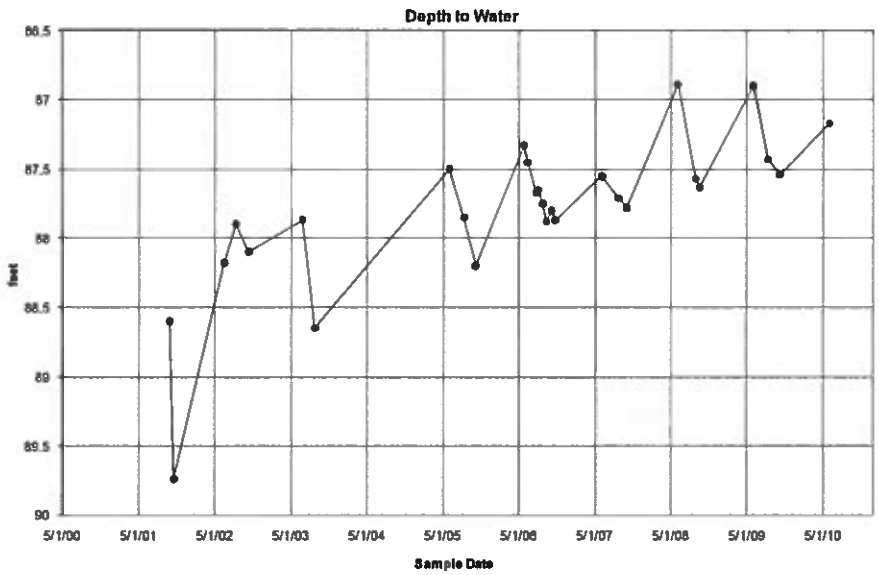
PREPARED FOR: Formation

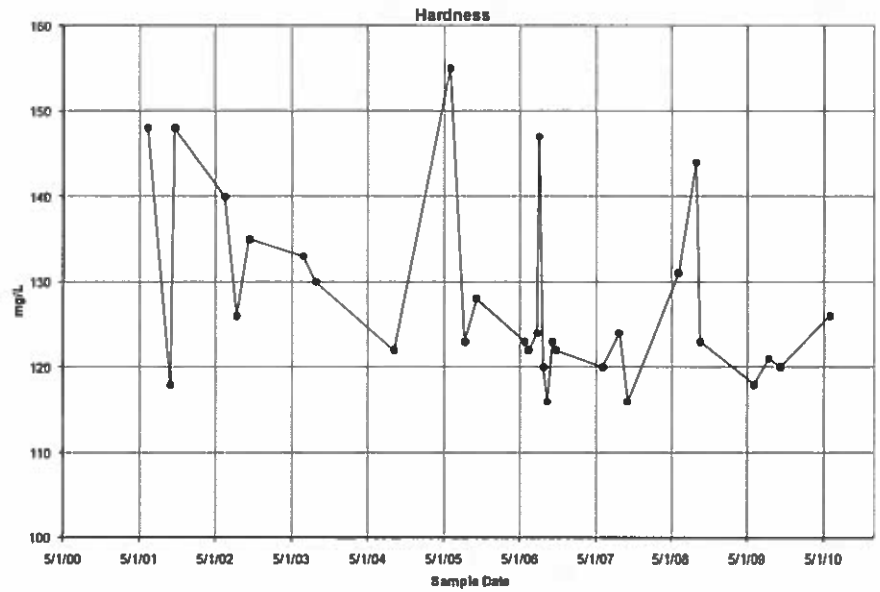


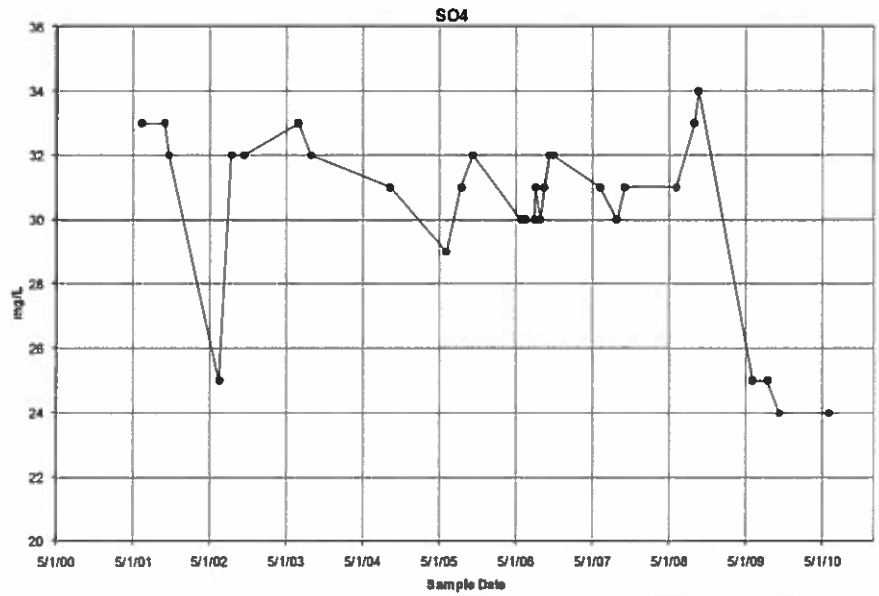
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

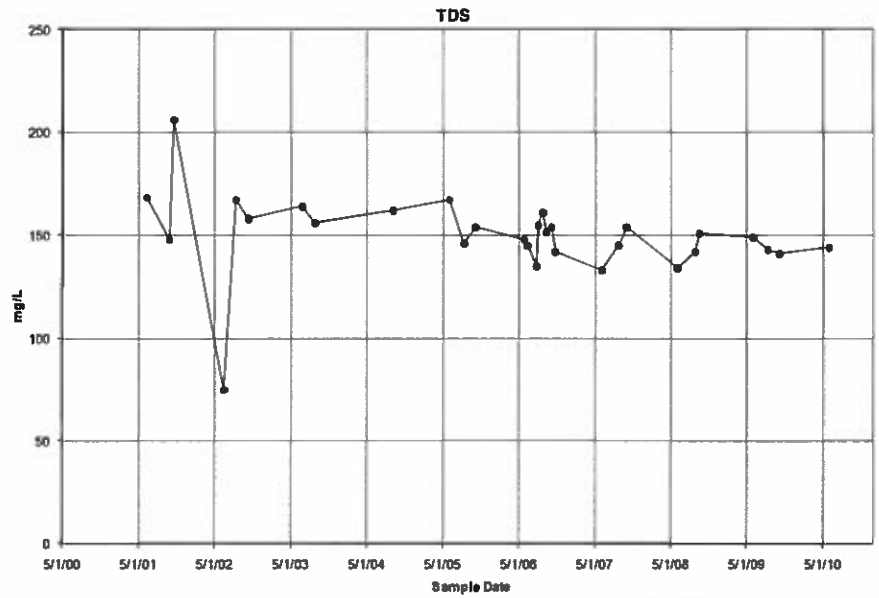
FIGURE 2-6c
2000 - 2010 DATA FOR WELL RMW-1

PREPARED FOR: Formation









PROJECT: 222100	TASK 66

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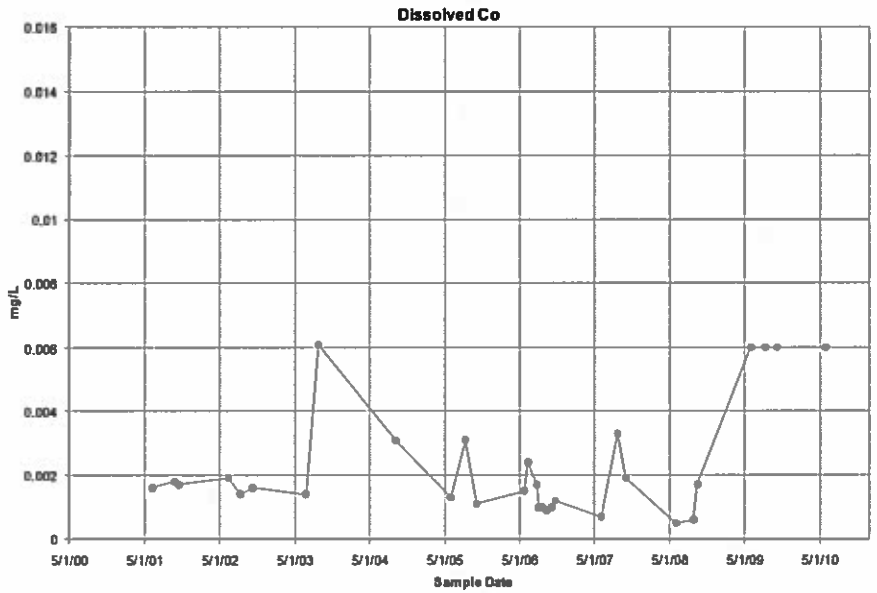
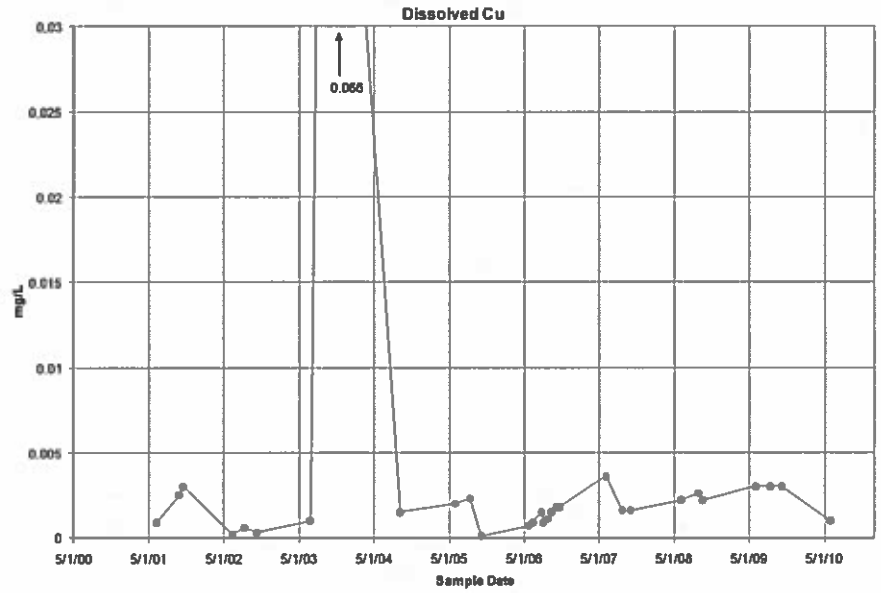
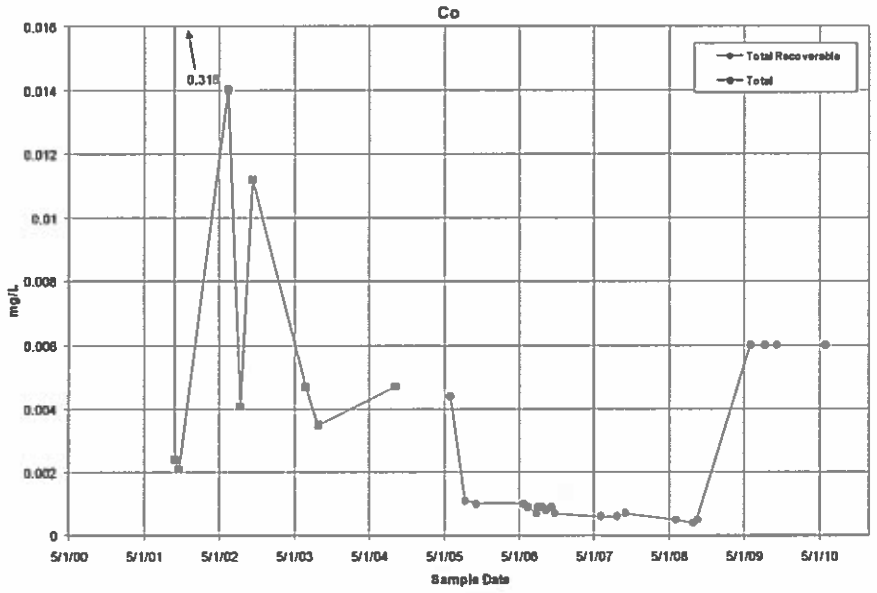
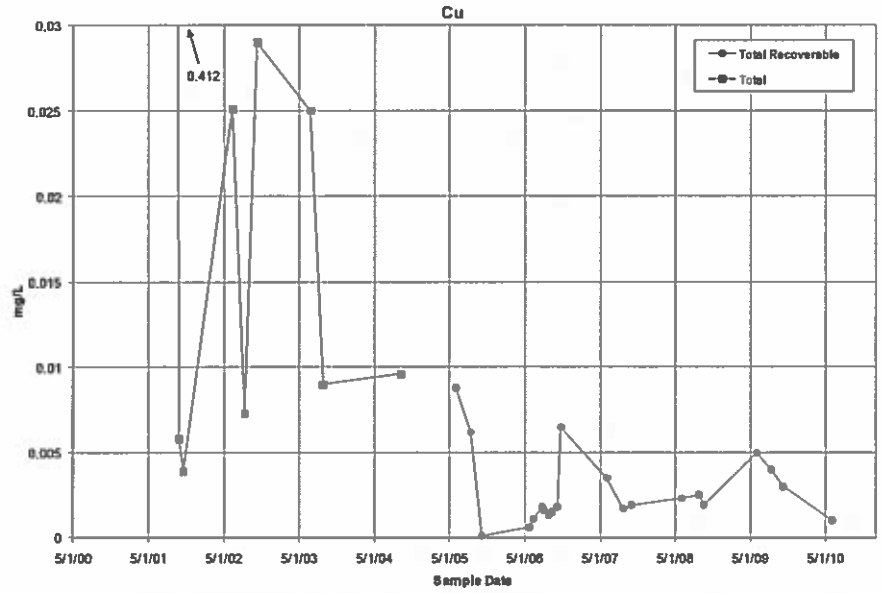
FIGURE 2-7a
2000 – 2010 DATA FOR WELL RMW-2

PREPARED FOR: Formation





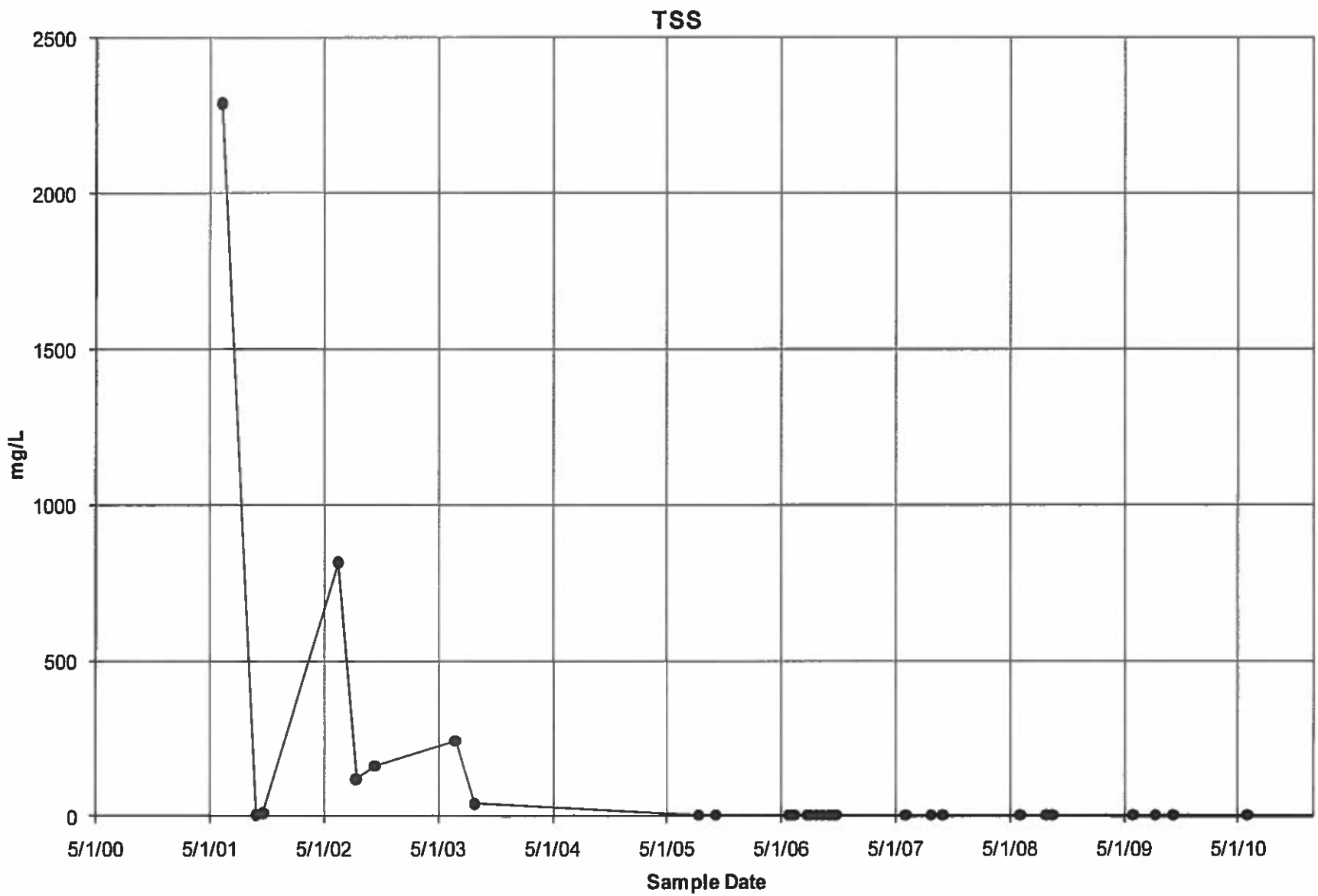




PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS • INCORPORATED	

FIGURE 2-7b
2000 - 2010 DATA FOR WELL RMW-2

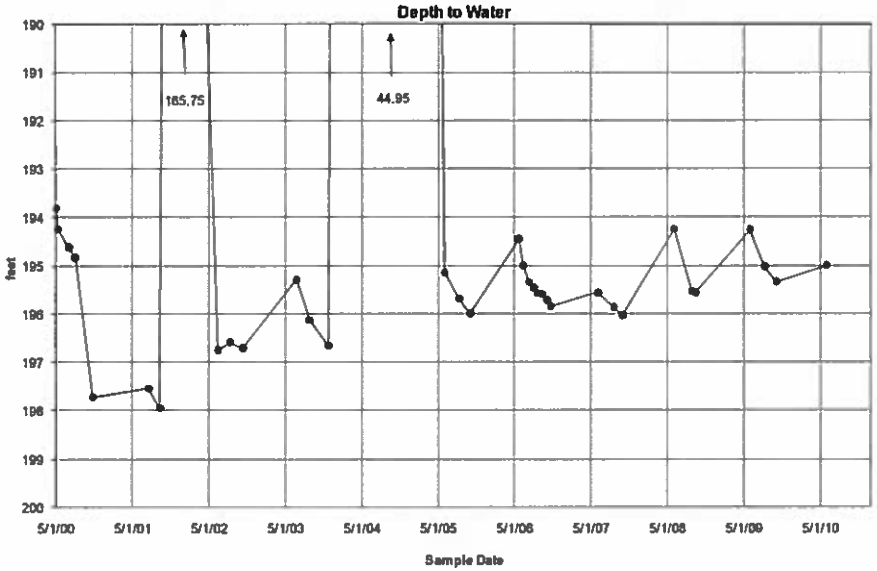
PREPARED FOR: Formation

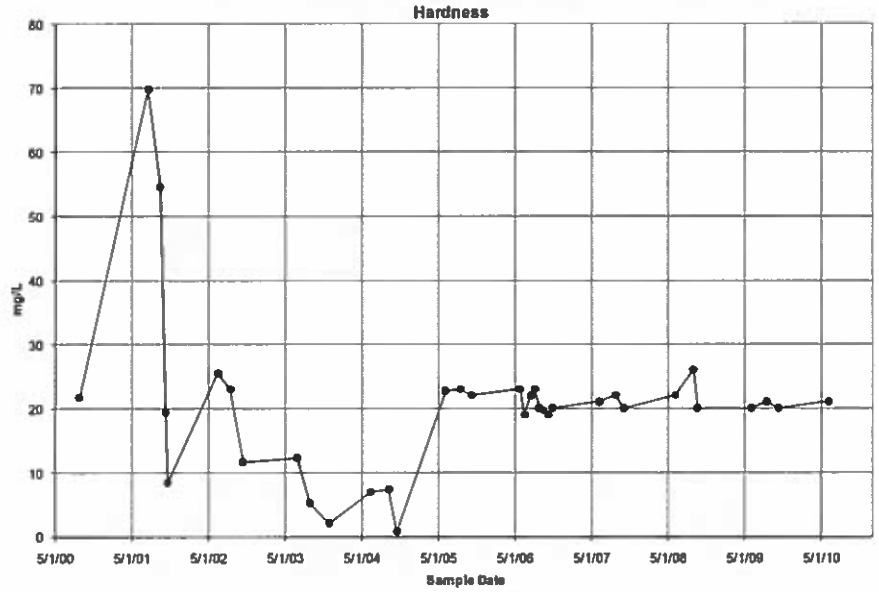


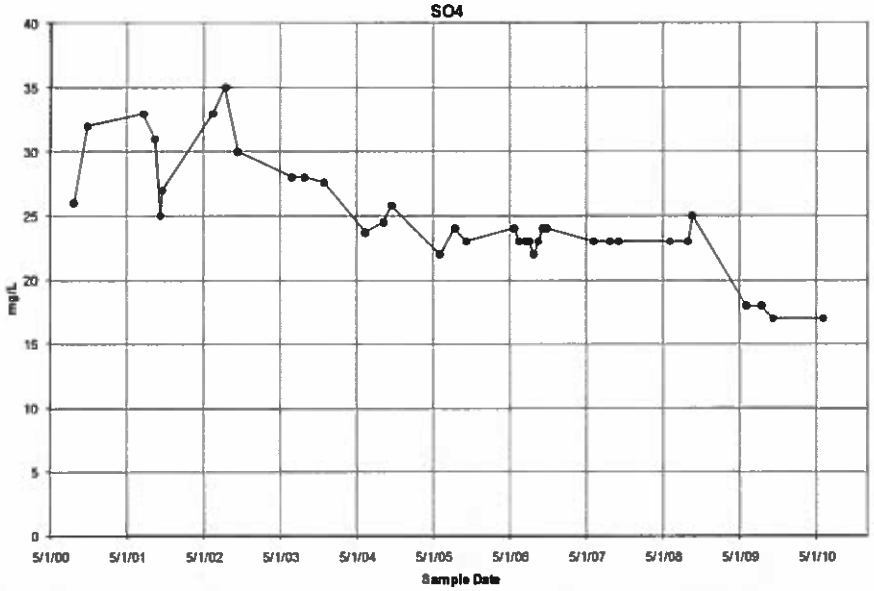
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

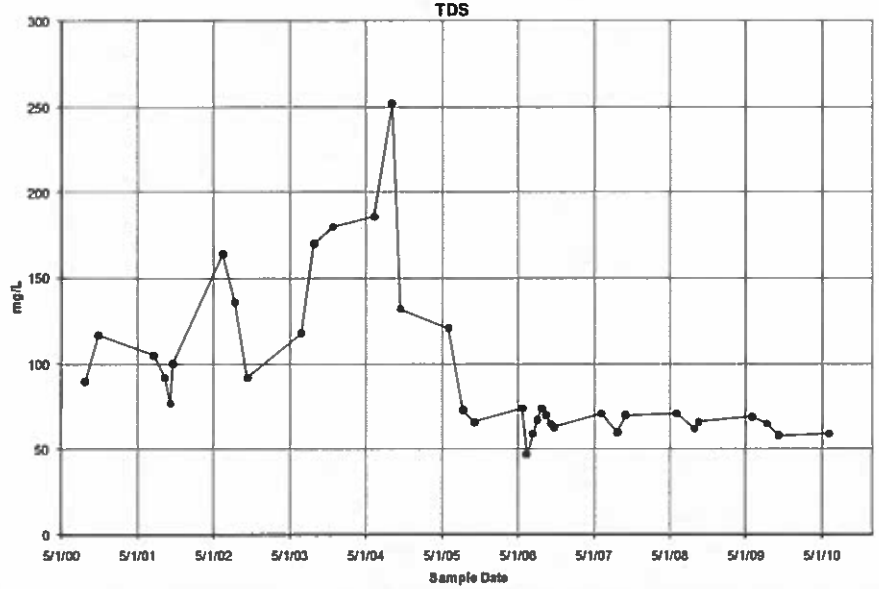
FIGURE 2-7c
2000 - 2010 DATA FOR WELL RMW-2

PREPARED FOR: Formation









PROJECT	TASK
222100	66

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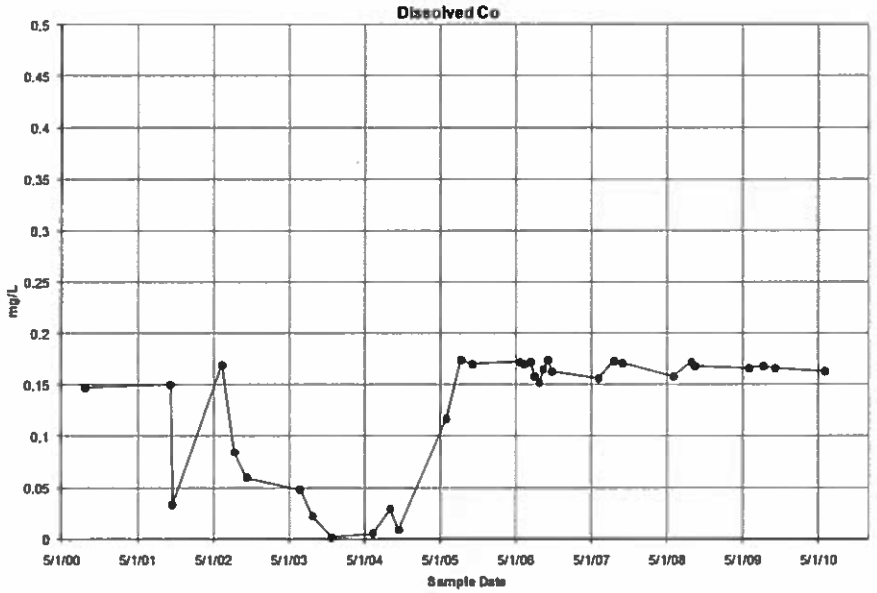
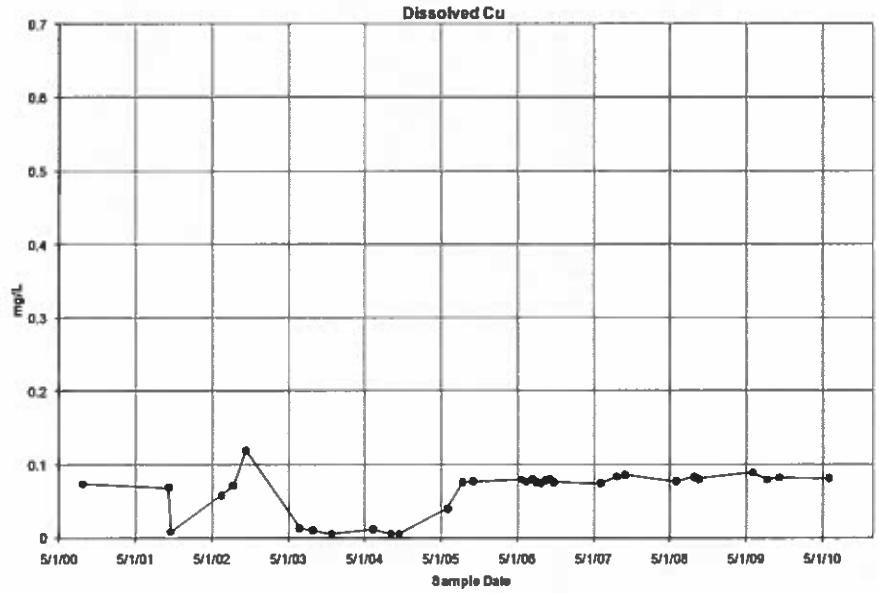
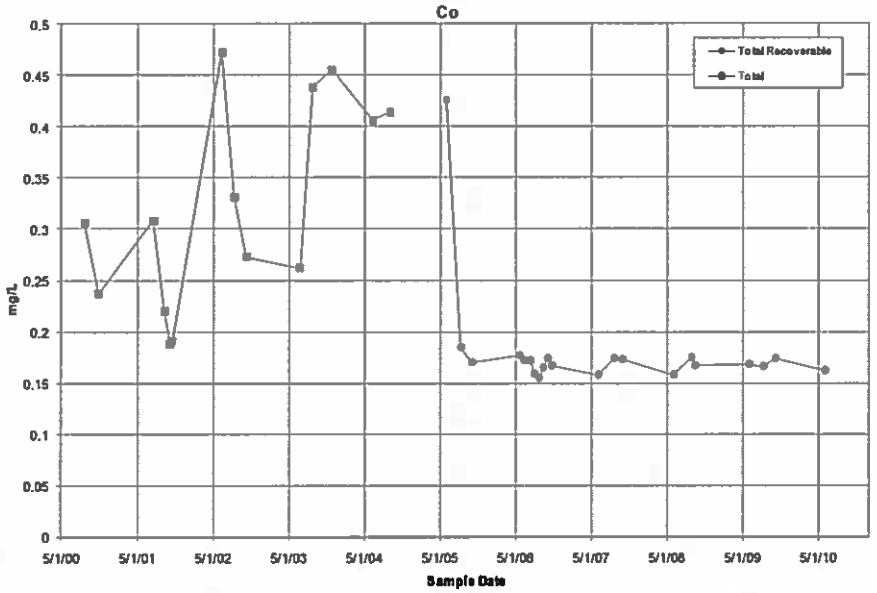
FIGURE 2-8a
2000 - 2010 DATA FOR WELL RMW-3

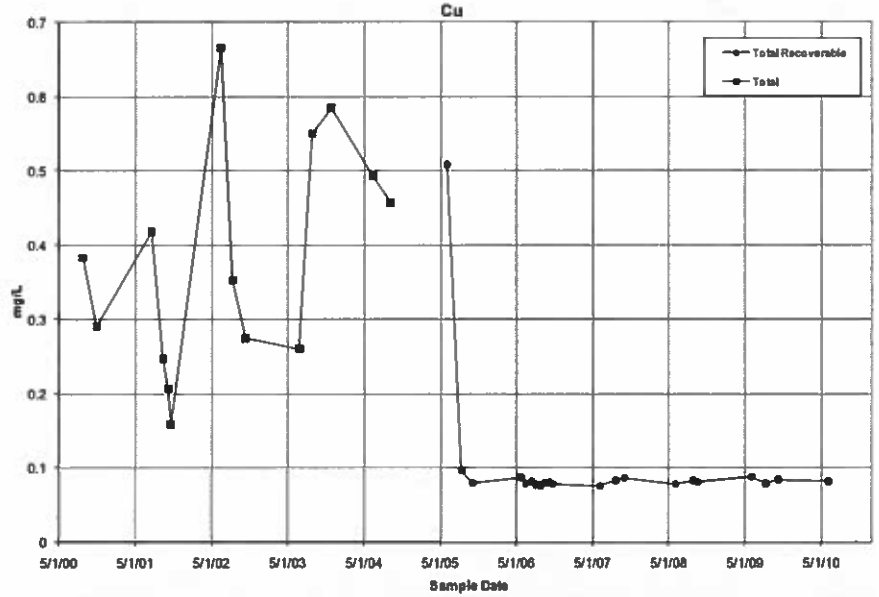
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\RMW_graphs_2010.ppt





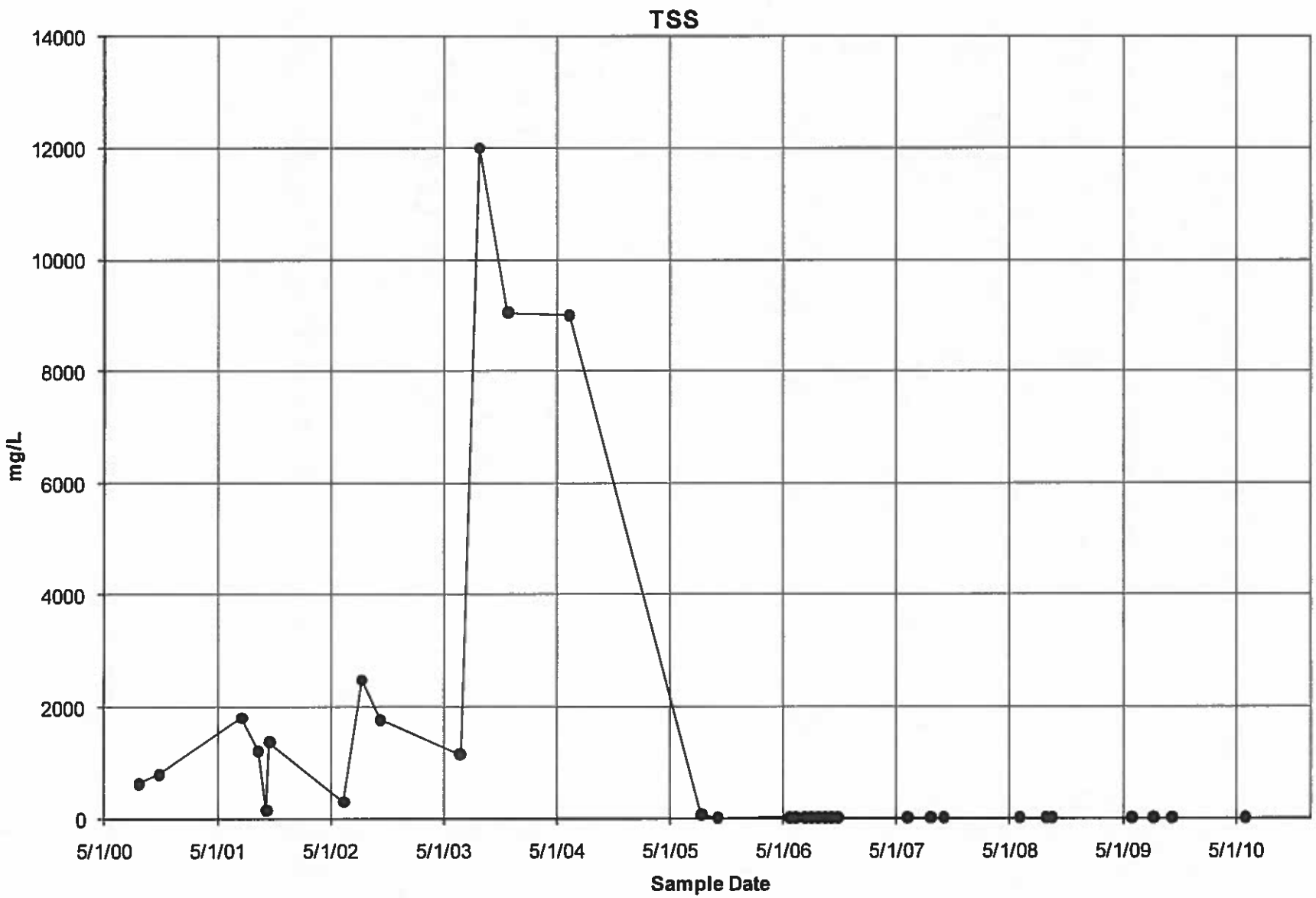




PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 2-8b
2000 - 2010 DATA FOR WELL RMW-3

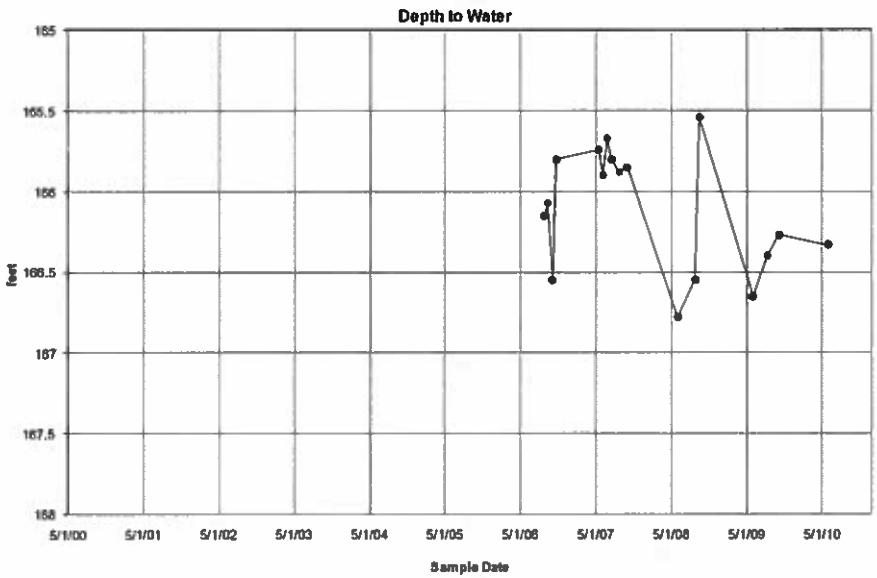
PREPARED FOR: Formation

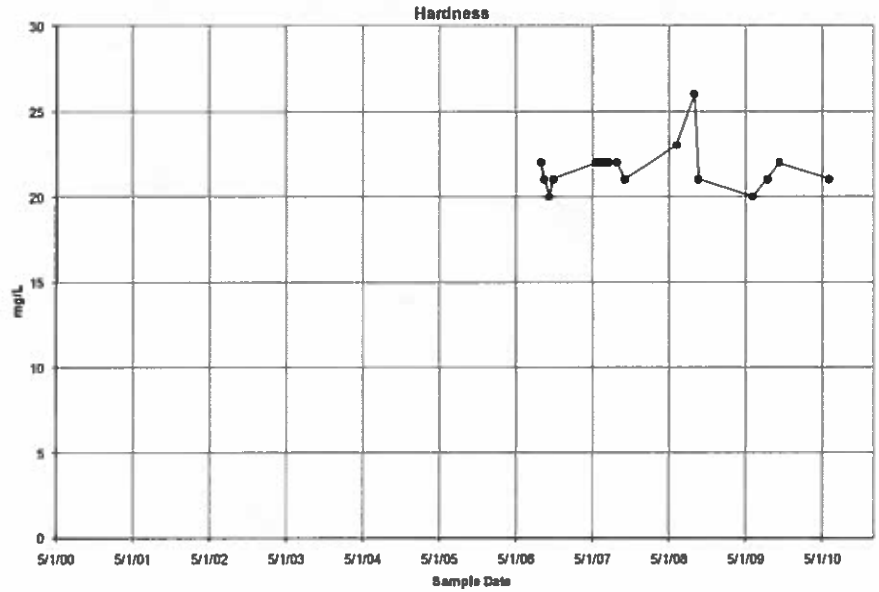


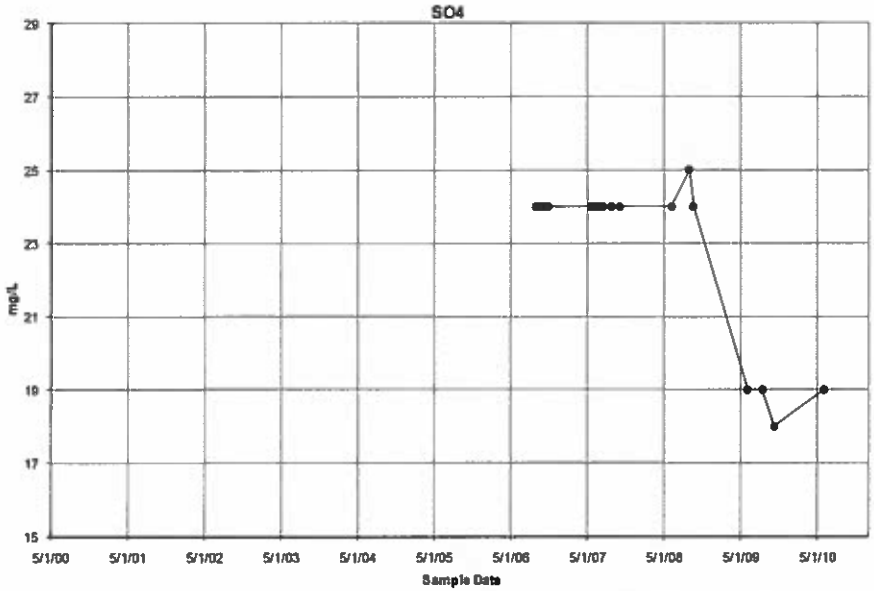
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

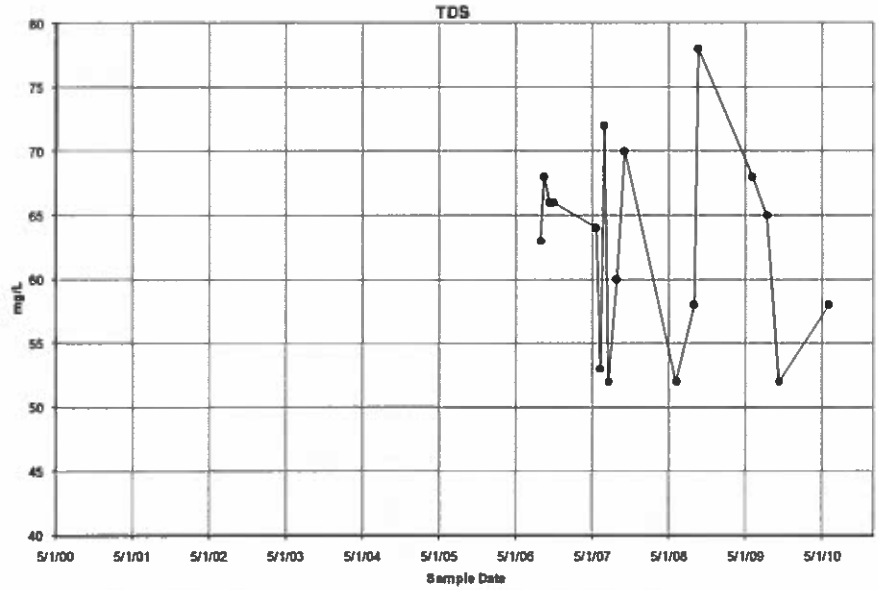
FIGURE 2-8c
2000 - 2010 DATA FOR WELL RMW-3

PREPARED FOR: Formation





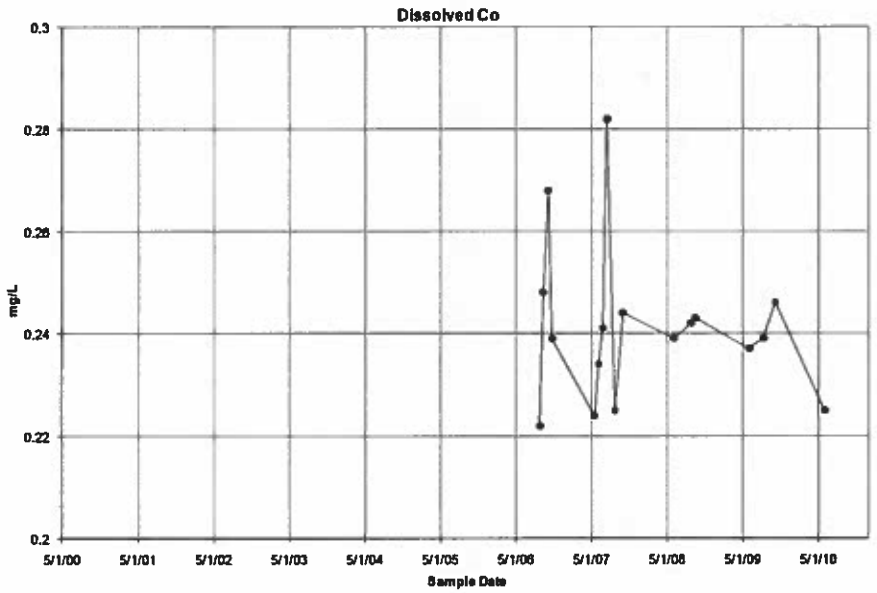


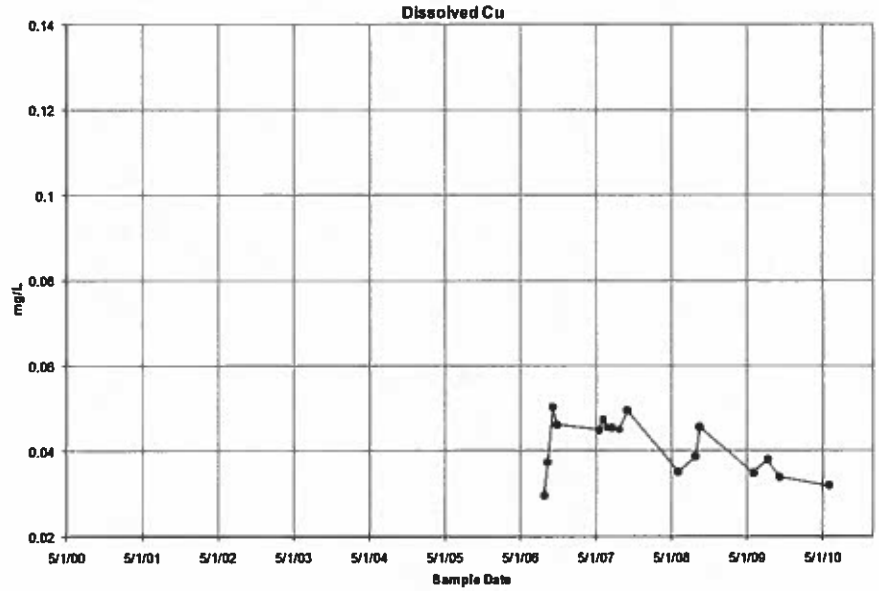


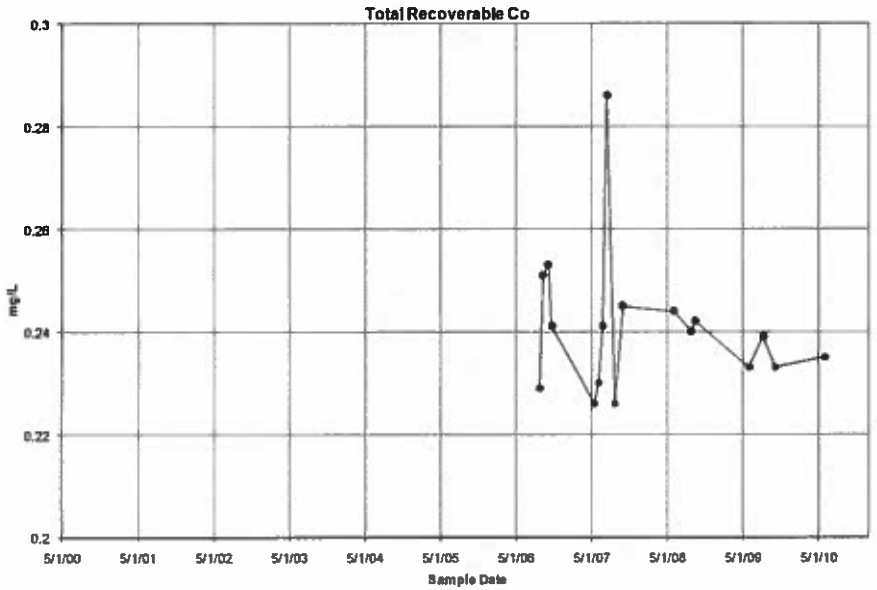
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

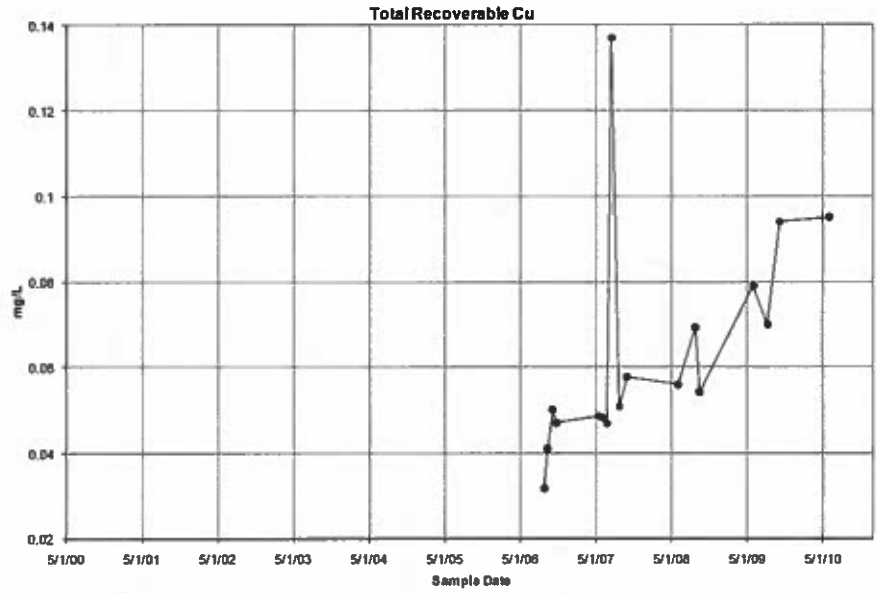
FIGURE 2-9a
2000 - 2010 DATA FOR WELL RMW-6

PREPARED FOR: Formation





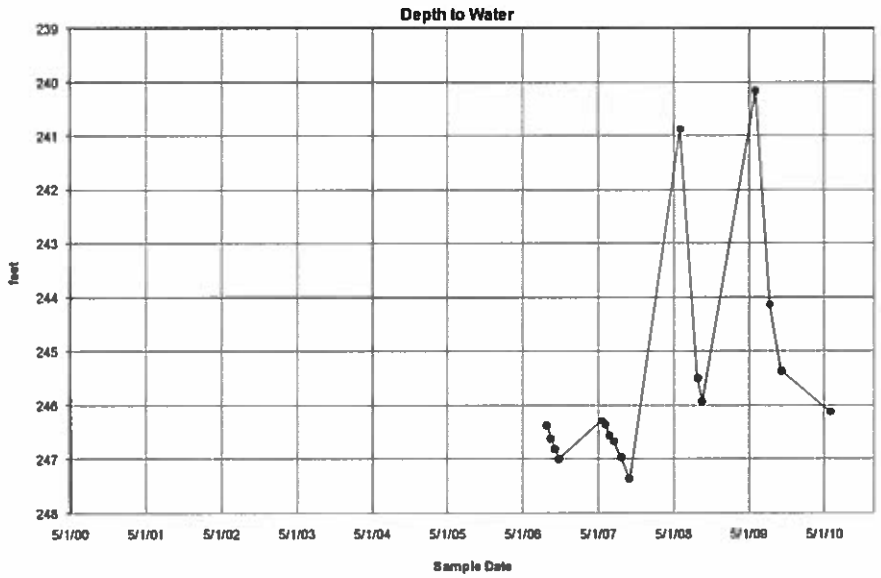


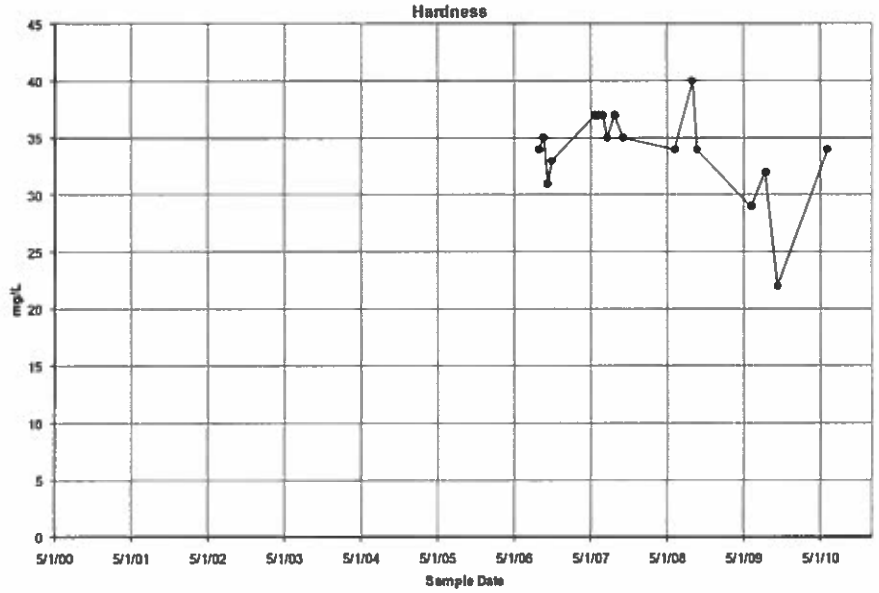


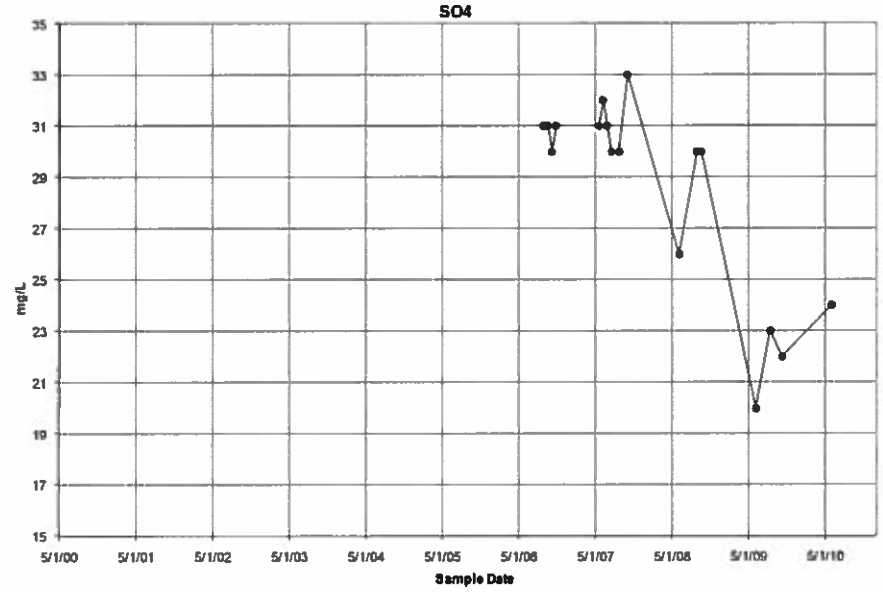
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS • INCORPORATED	

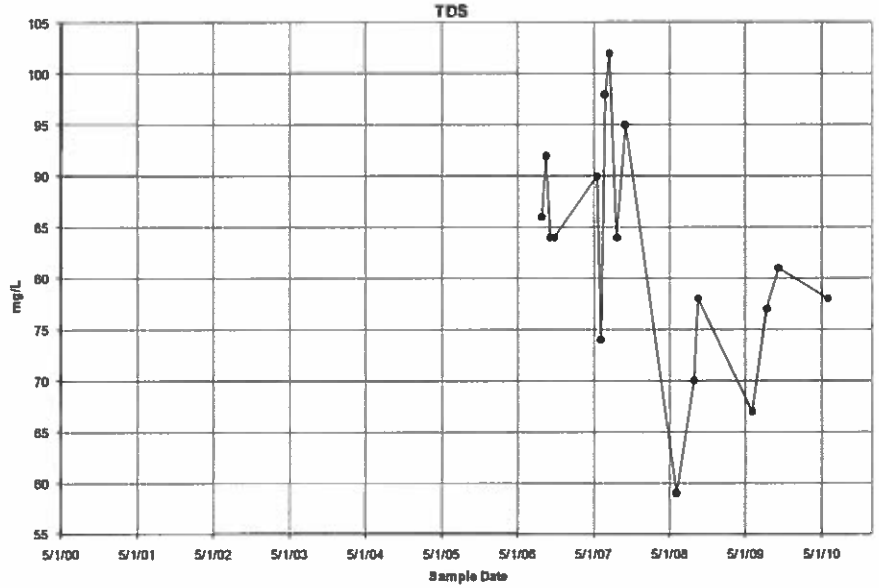
FIGURE 2-9b
2000 - 2010 DATA FOR WELL RMW-6

PREPARED FOR: Formation





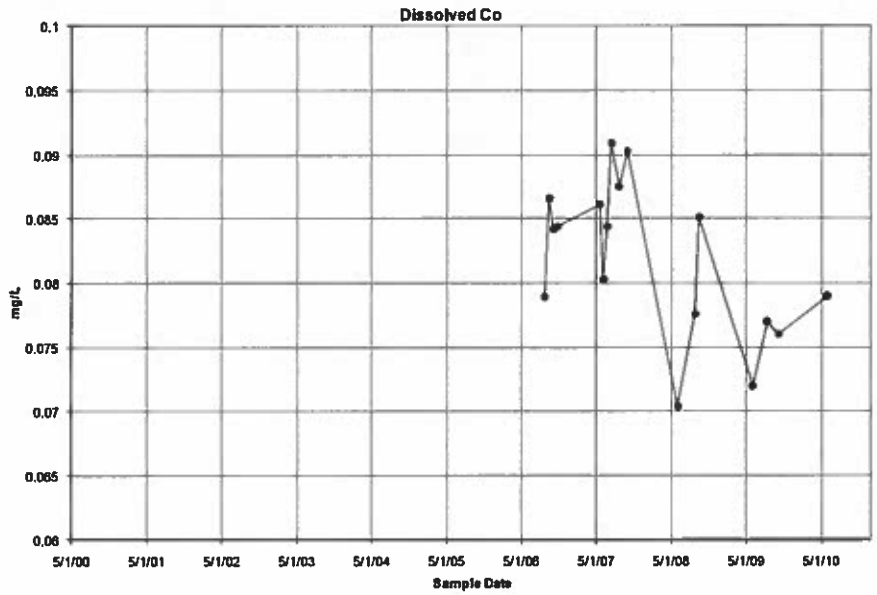


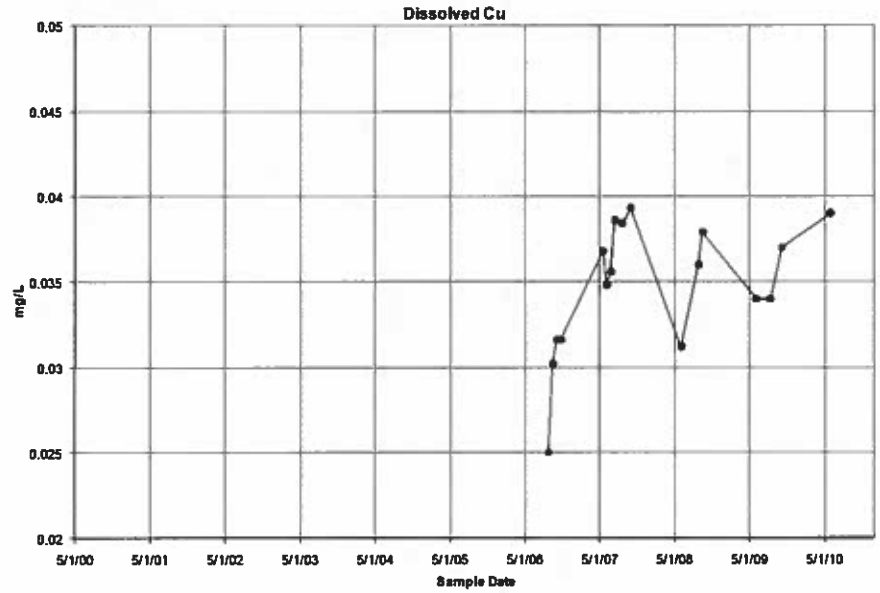


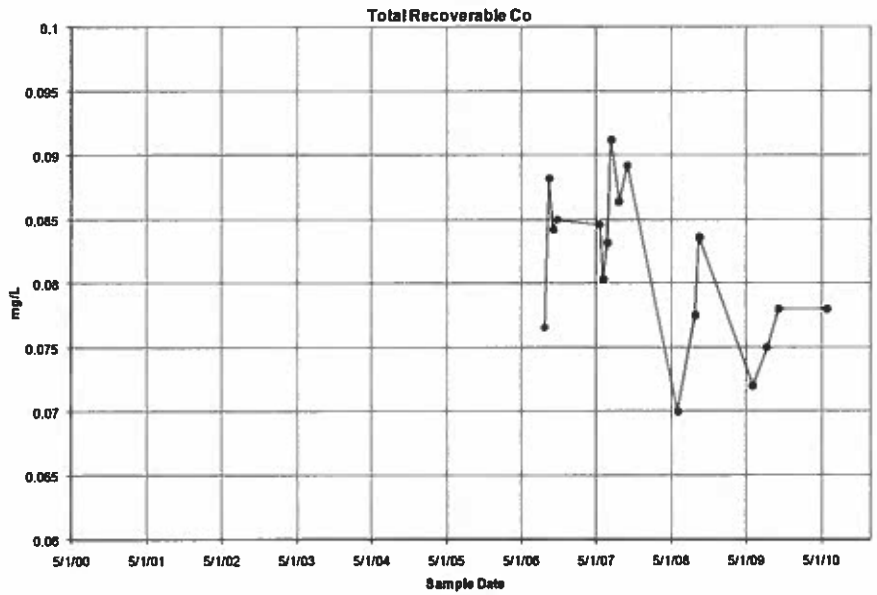
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

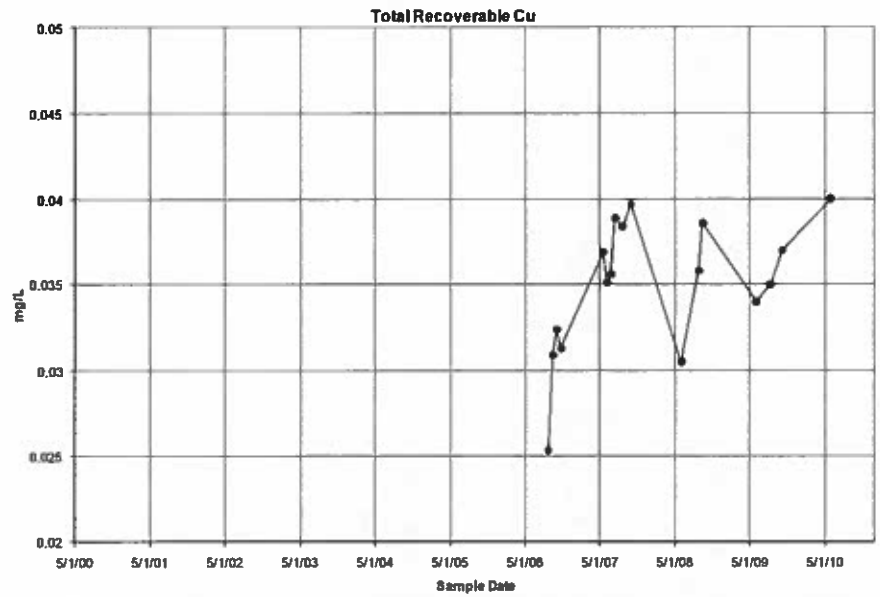
FIGURE 2-10a
2000 - 2010 DATA FOR WELL RMW-7

PREPARED FOR: Formation





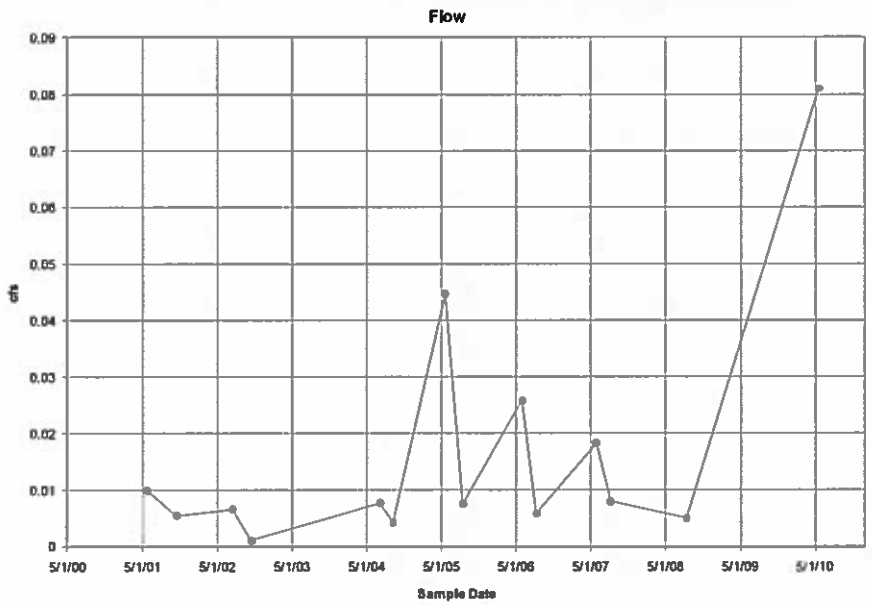


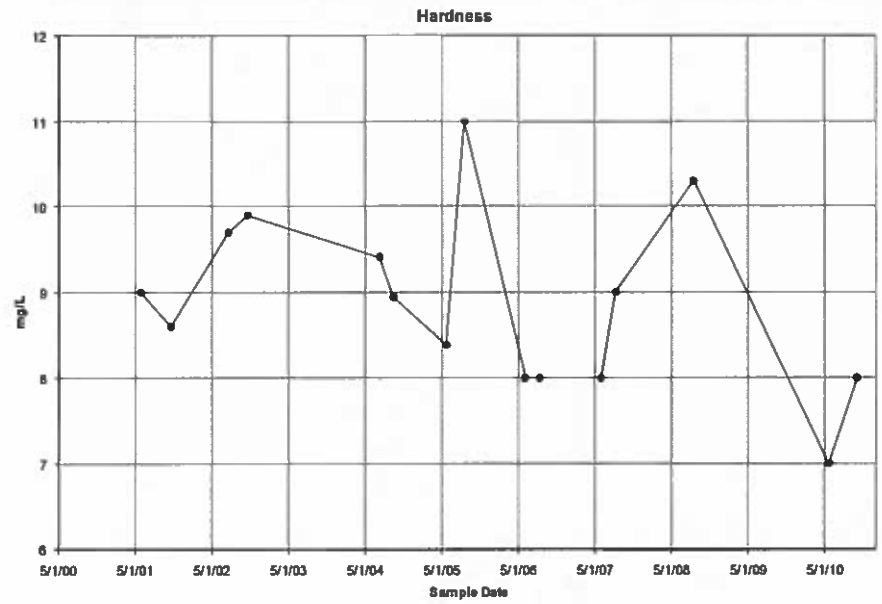


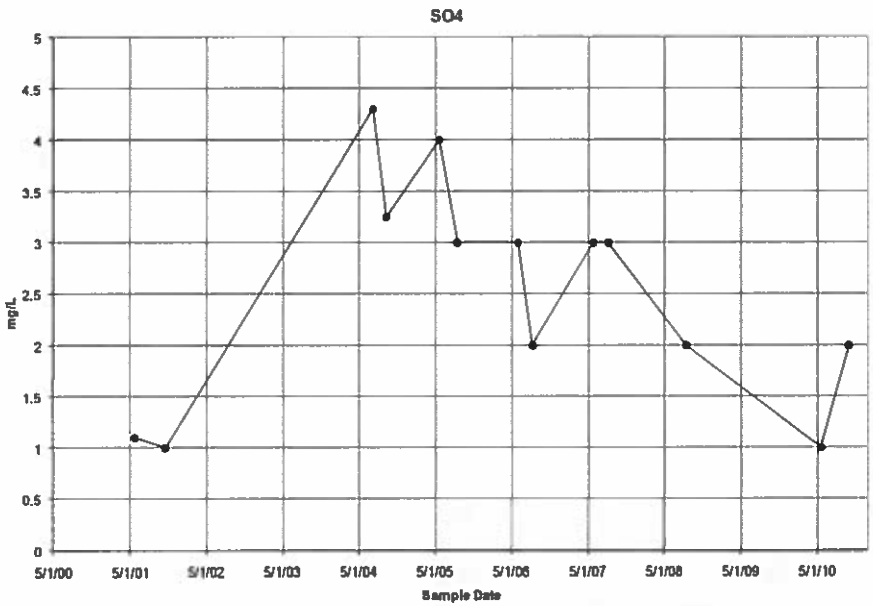
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

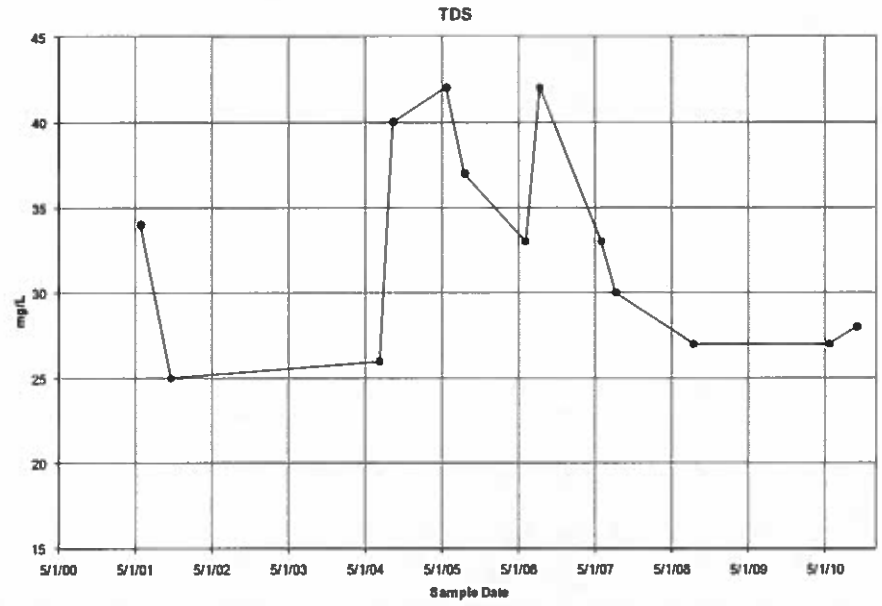
FIGURE 2-10b
2000 – 2010 DATA FOR WELL RMW-7

PREPARED FOR: Formation





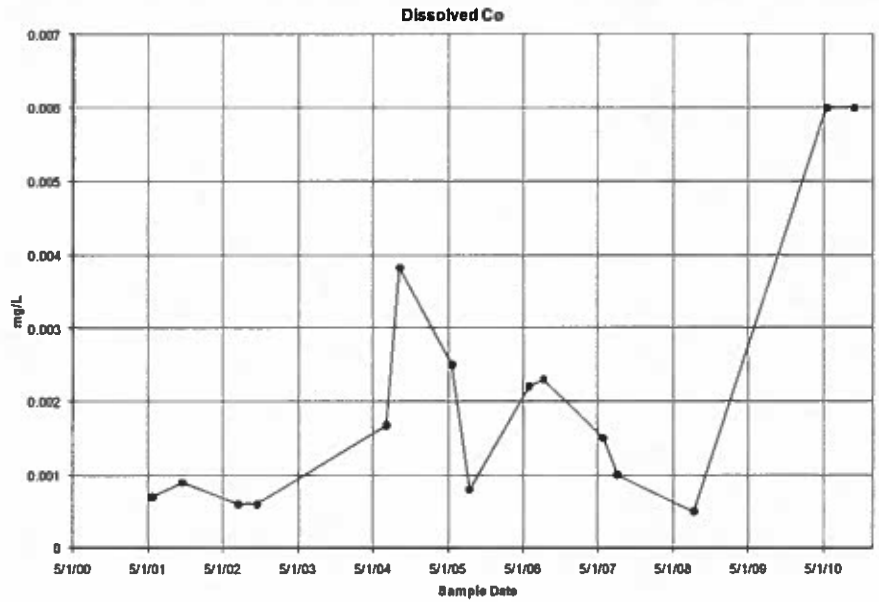


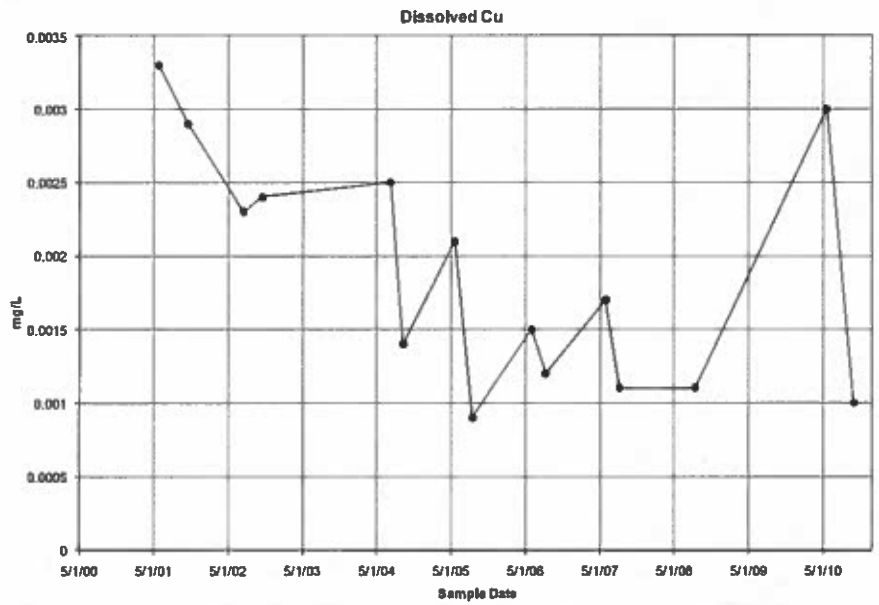


PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 3-1a
2000 – 2010 DATA FOR SAMPLING LOCATION SS-5

PREPARED FOR: Formation

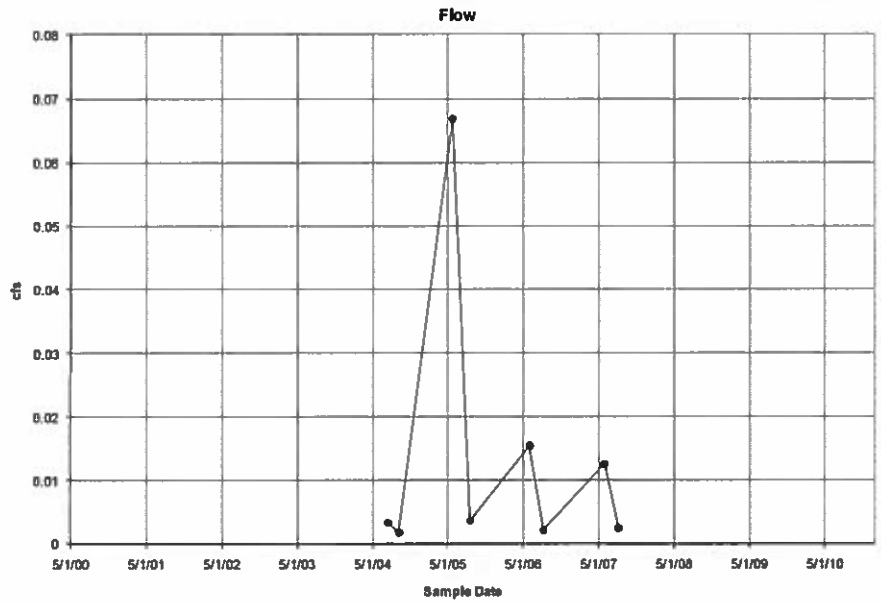


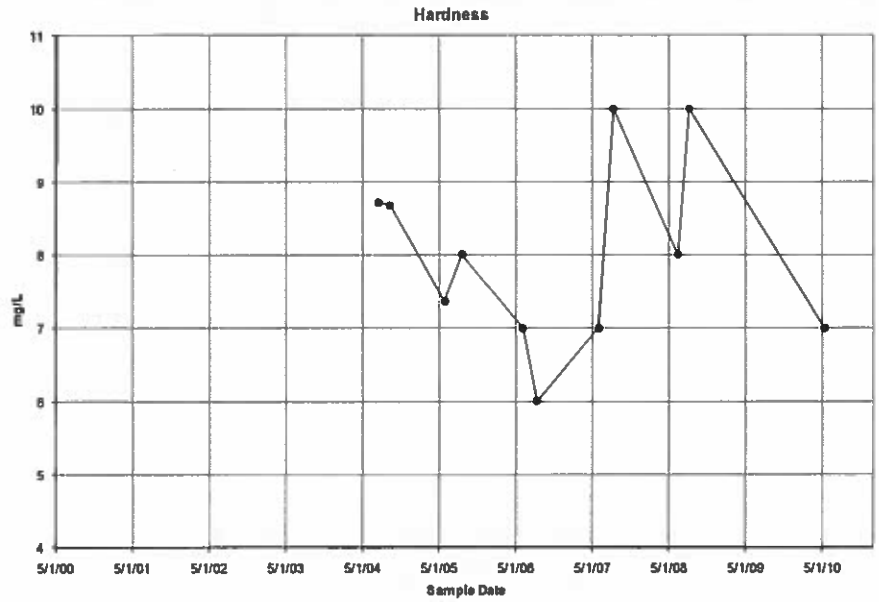


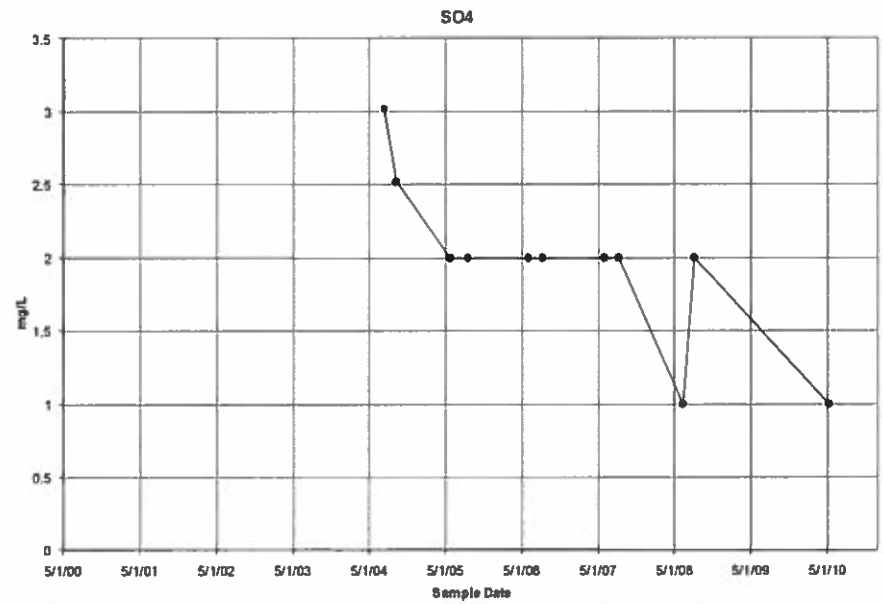
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

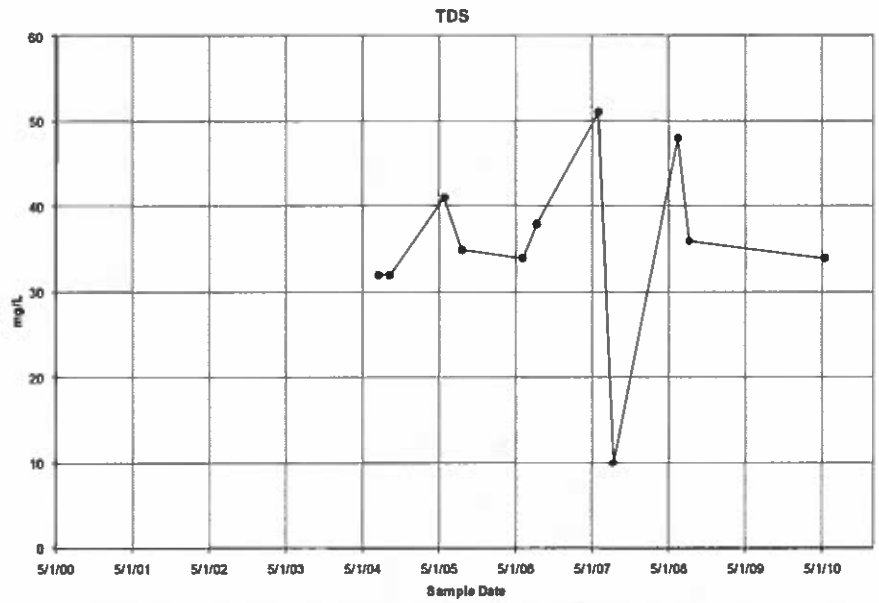
FIGURE 3-1b
2000 – 2010 DATA FOR SAMPLING LOCATION SS-5

PREPARED FOR: Formation





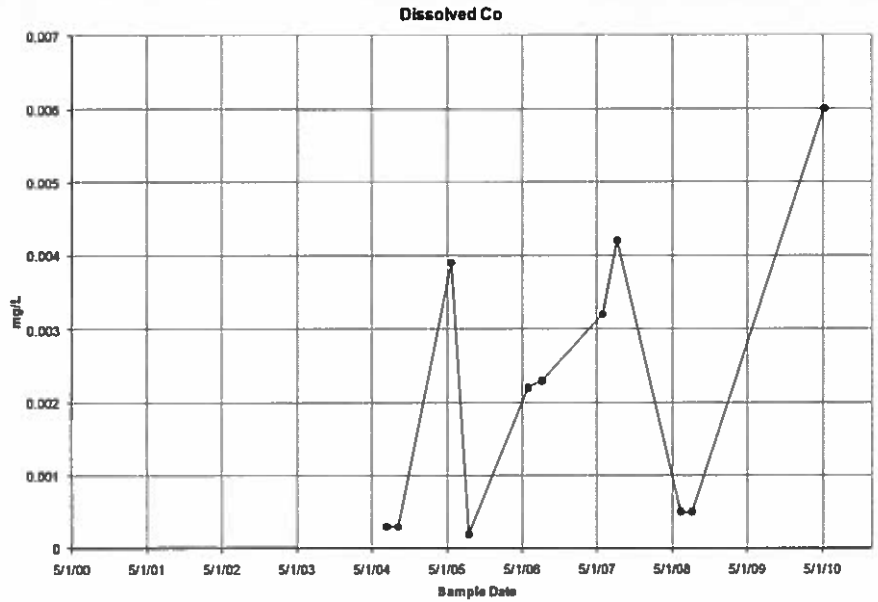


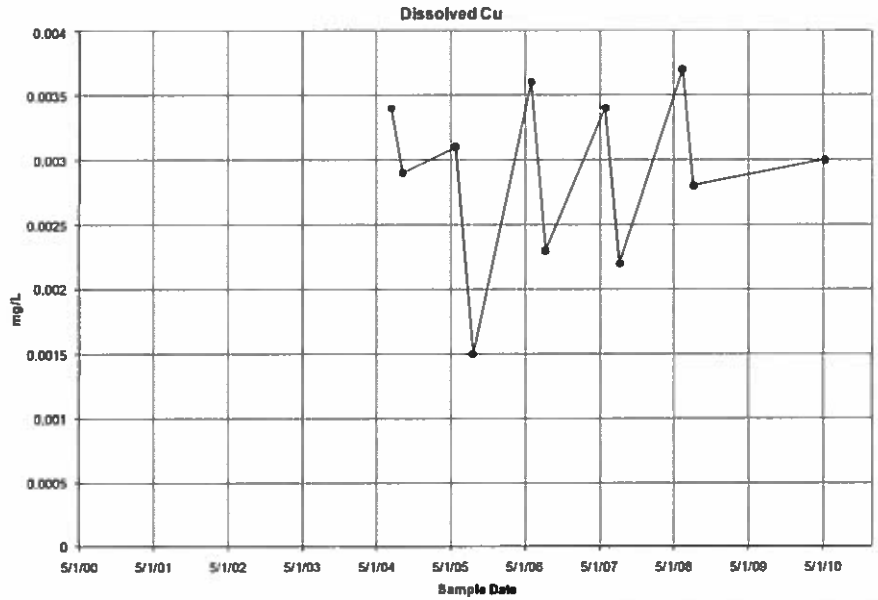


PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 3-2a
2000 – 2010 DATA FOR SAMPLING LOCATION SS-7

PREPARED FOR: Formation

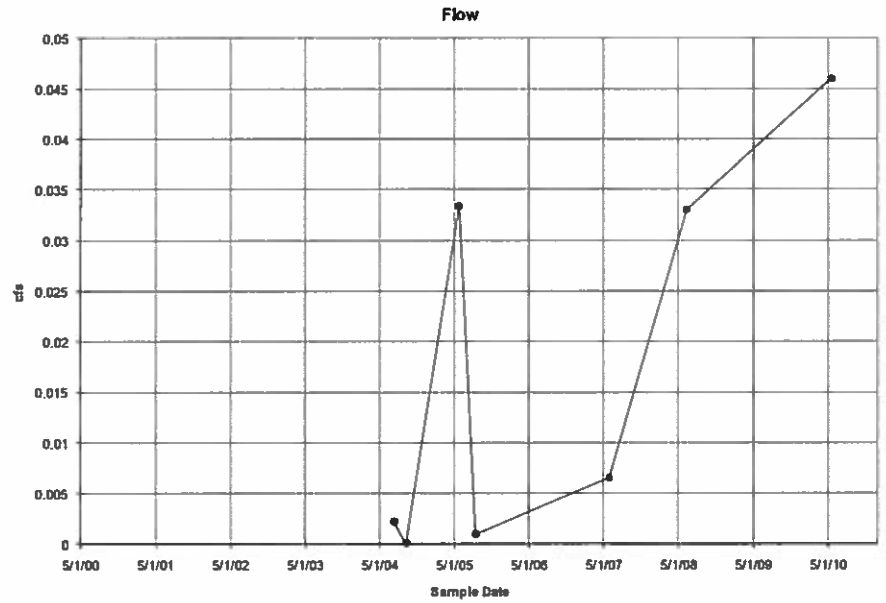


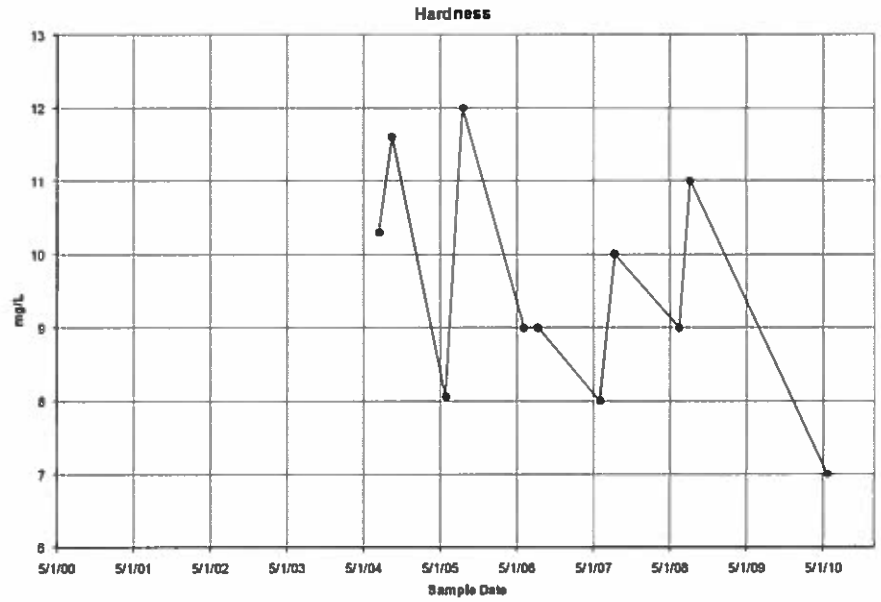


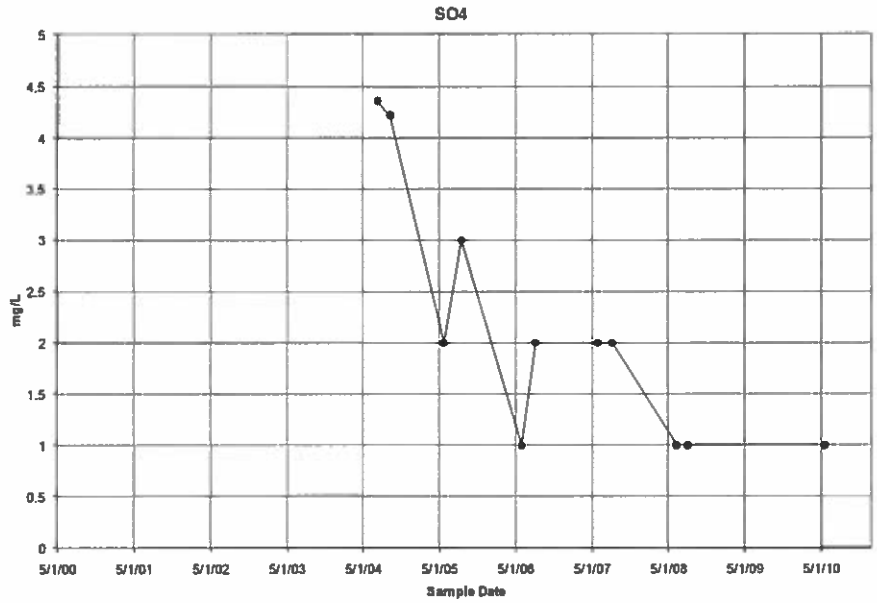
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

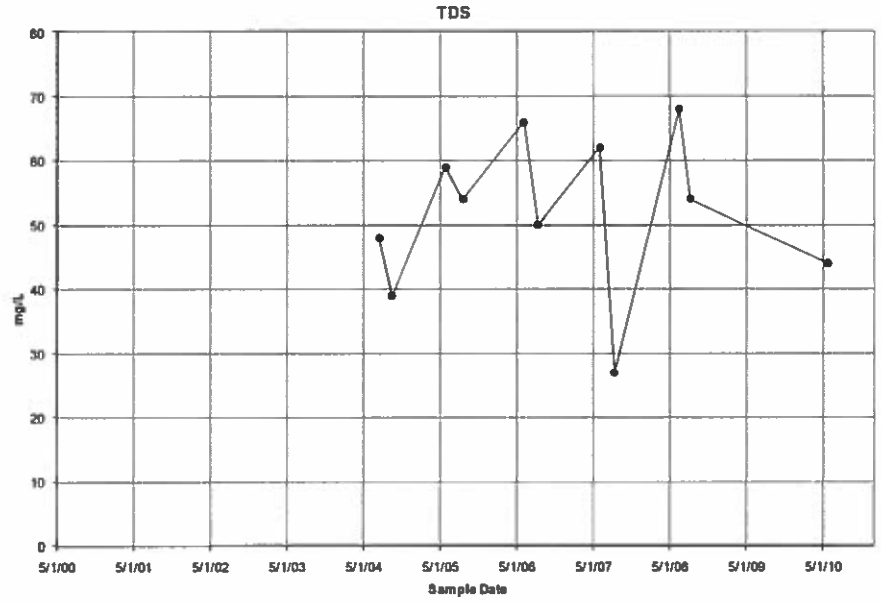
FIGURE 3-2b
2000 – 2010 DATA FOR SAMPLING LOCATION SS-7

PREPARED FOR: Formation





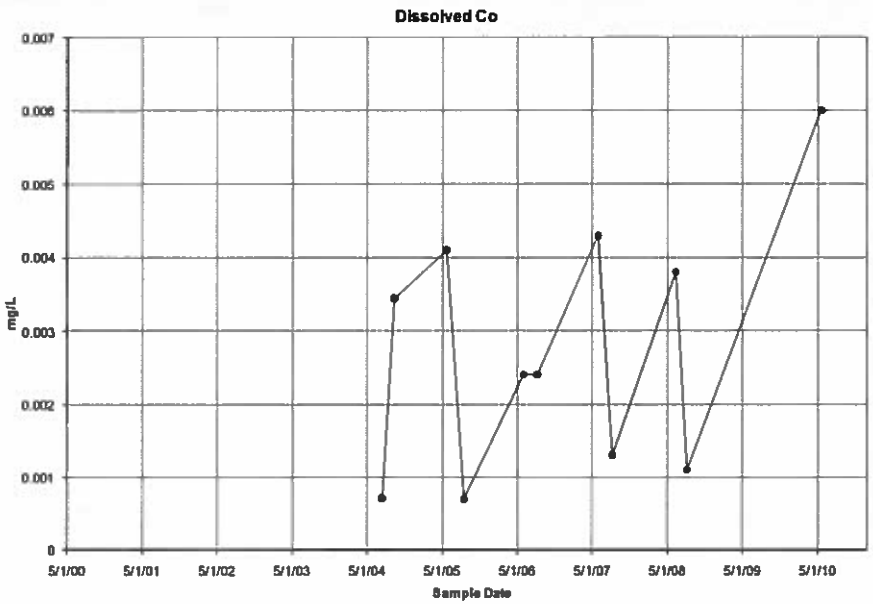


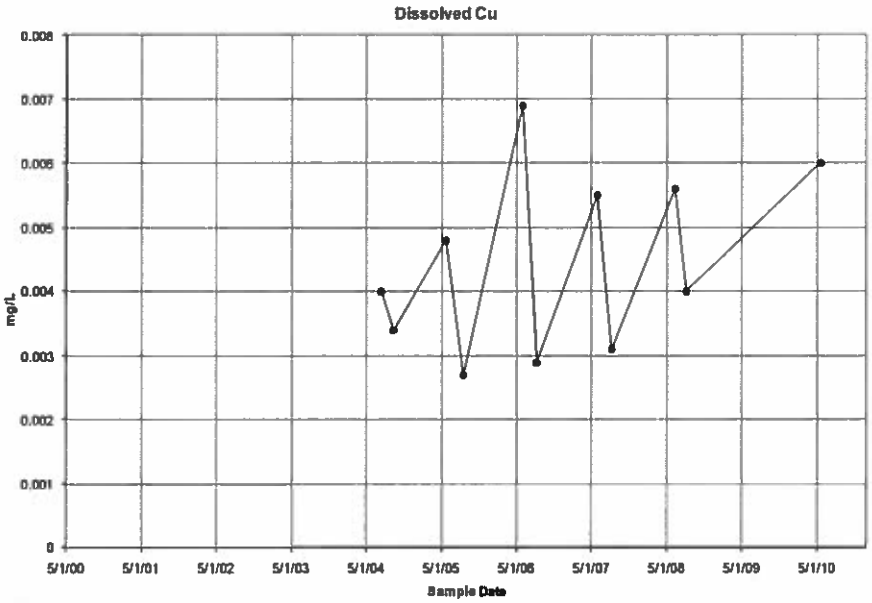


PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS • INCORPORATED	

FIGURE 3-3a
2000 – 2010 DATA FOR SAMPLING LOCATION SS-9

PREPARED FOR: Formation





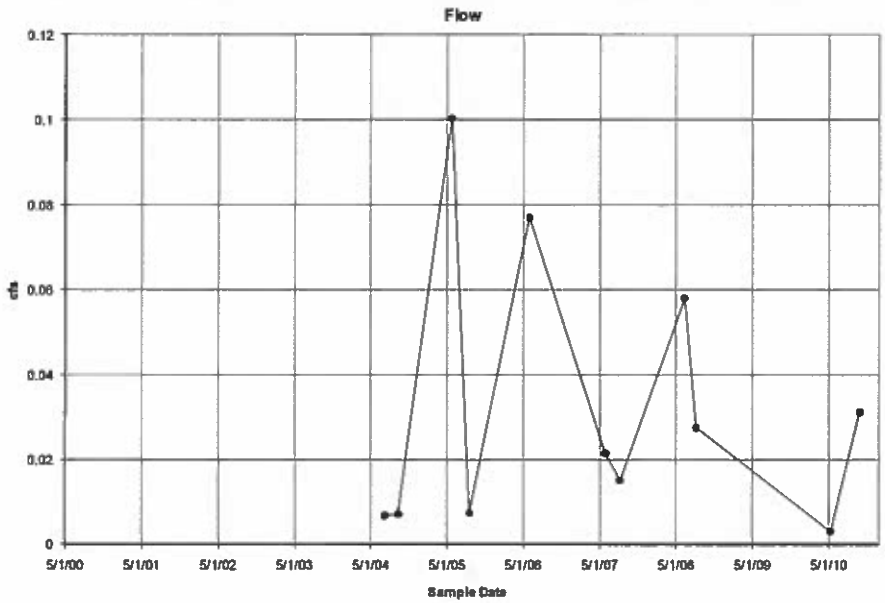
PROJECT	TASK
222100	66

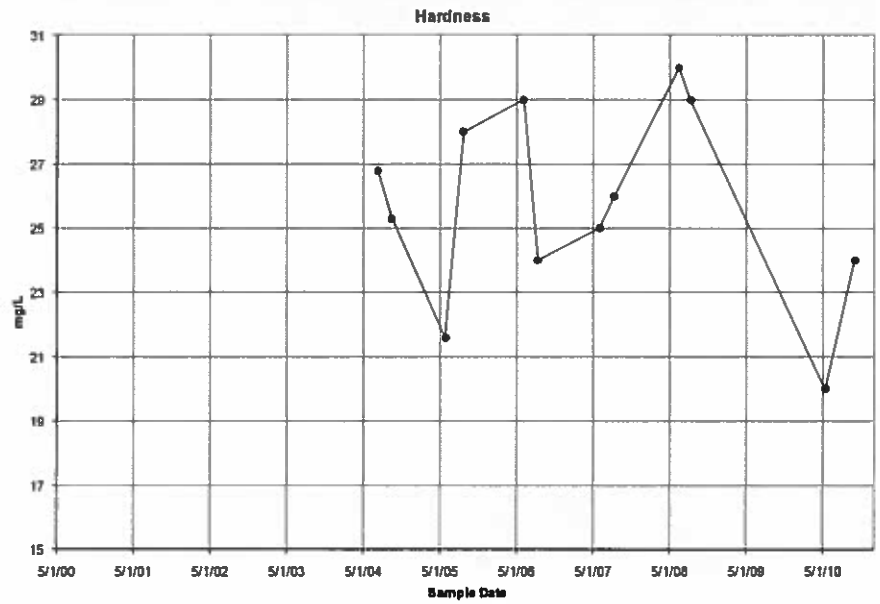
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

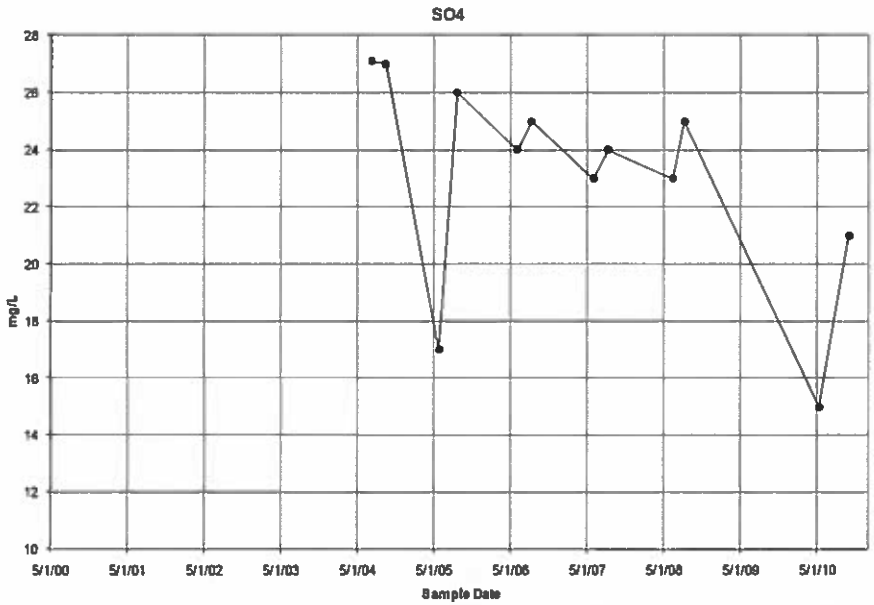
FIGURE 3-3b
2000 – 2010 DATA FOR SAMPLING LOCATION SS-9

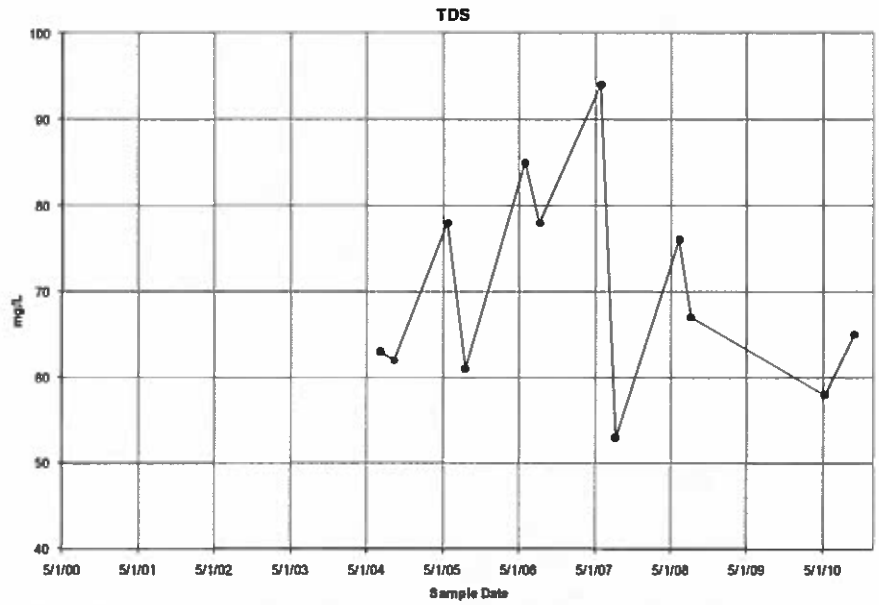
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\SS_graphs_2010.ppt





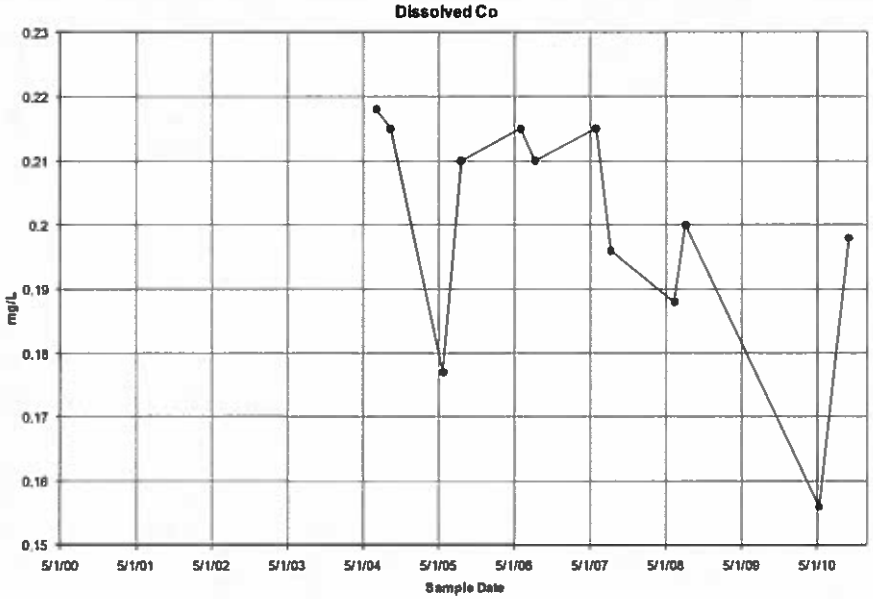


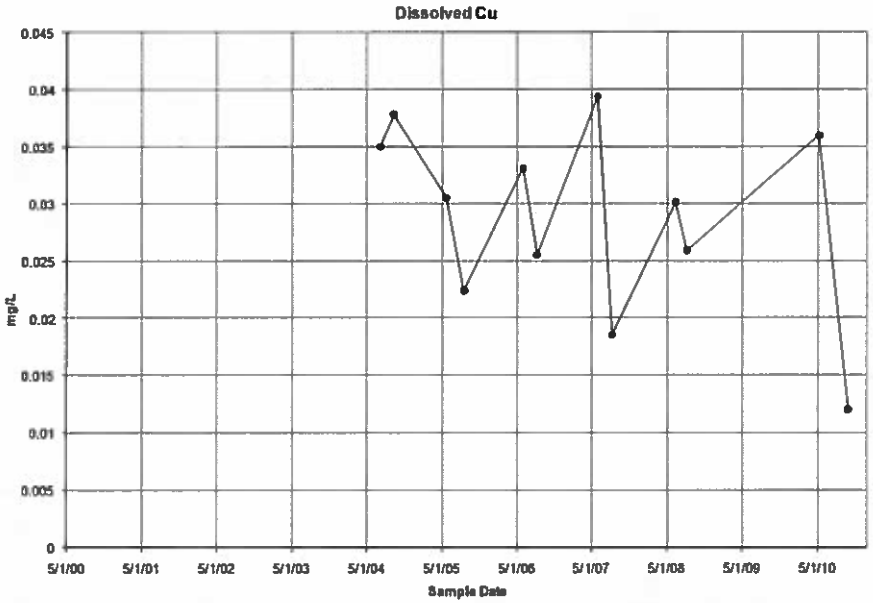


PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 3-4a
2000 – 2010 DATA FOR SAMPLING LOCATION SS-11

PREPARED FOR: Formation

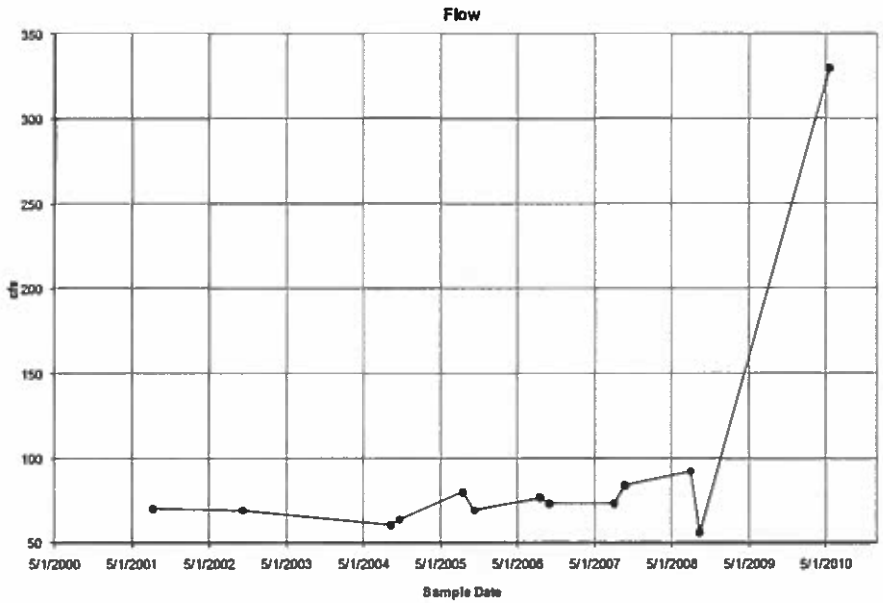


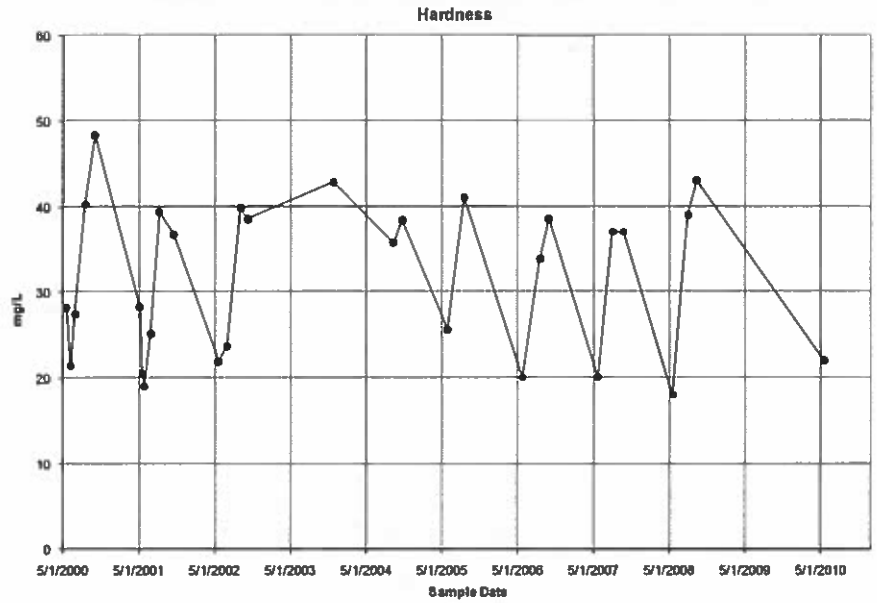


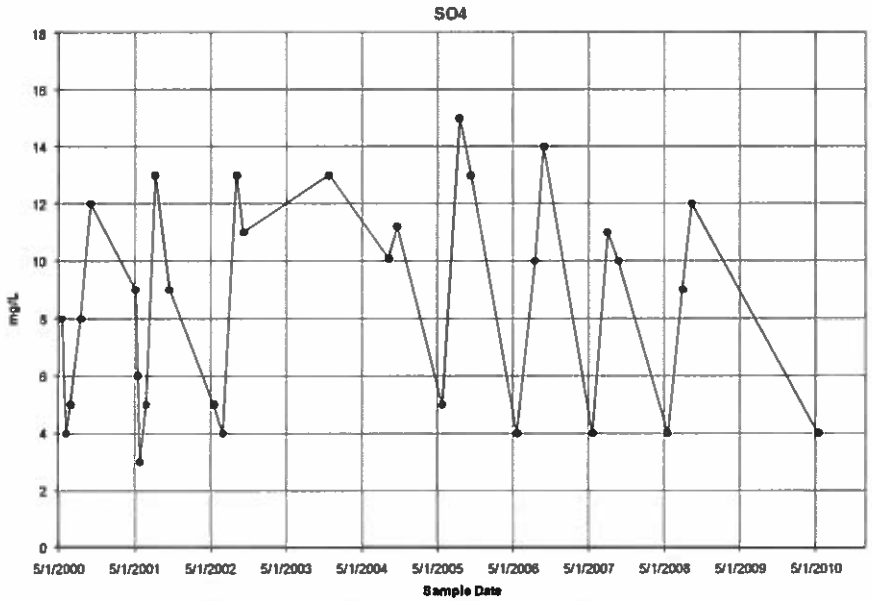
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED	

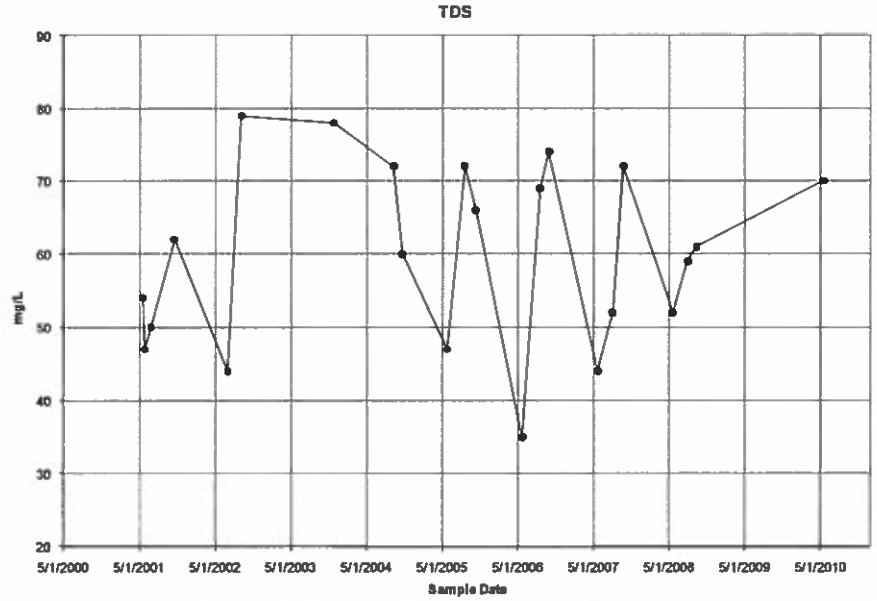
FIGURE 3-4b
2000 – 2010 DATA FOR SAMPLING LOCATION SS-11

PREPARED FOR: Formation





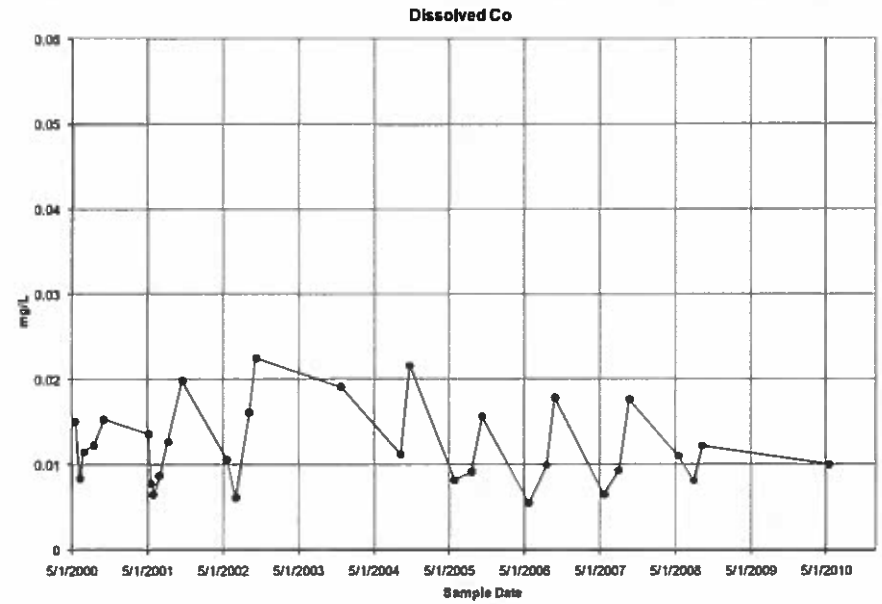


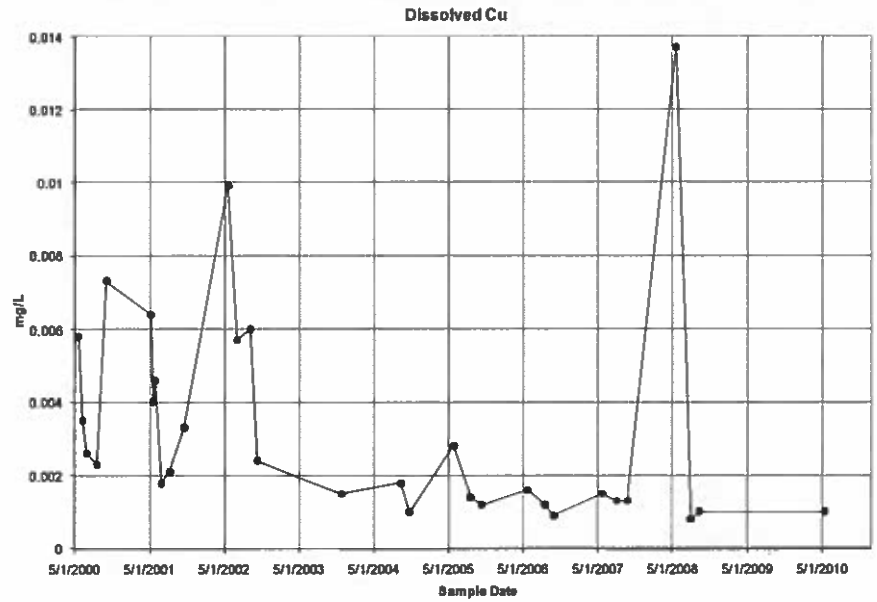


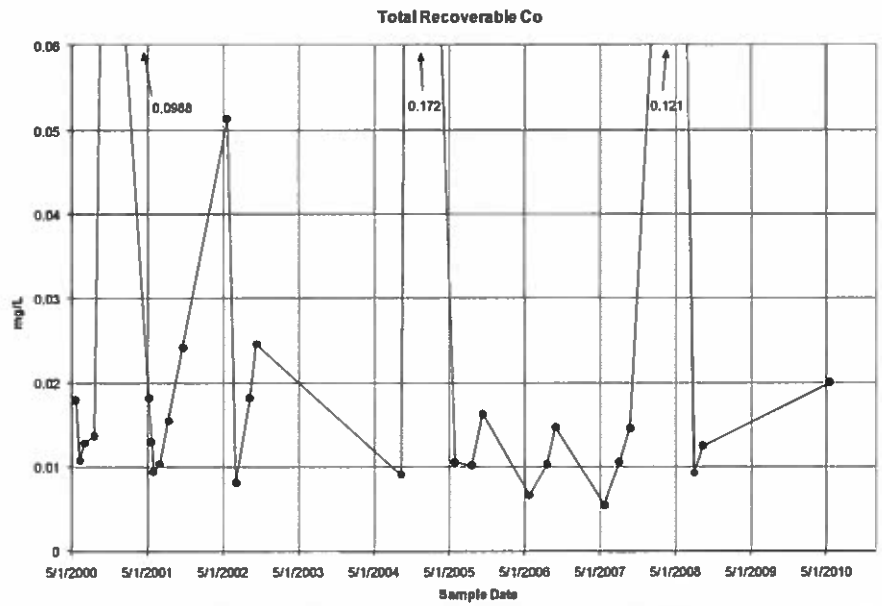
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

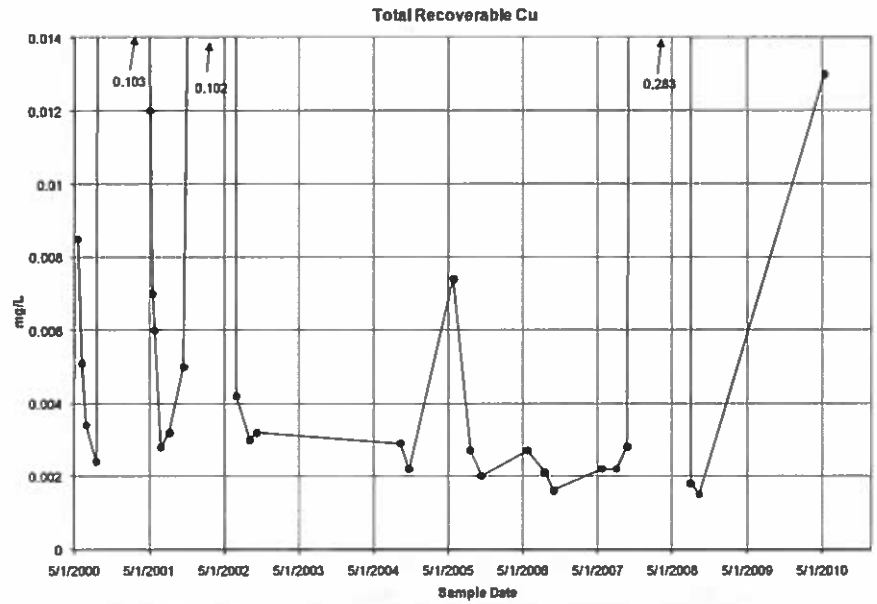
FIGURE 4-1a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-1

PREPARED FOR: Formation





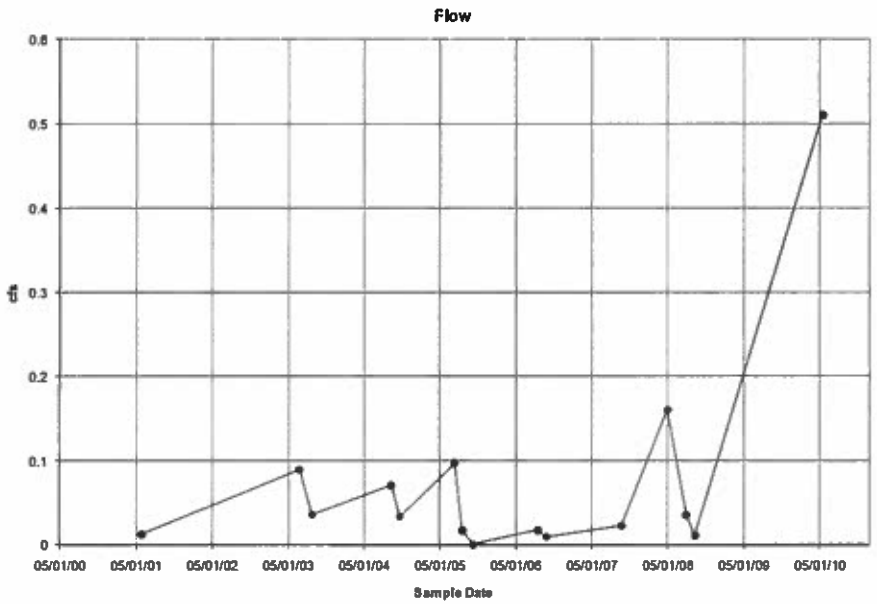


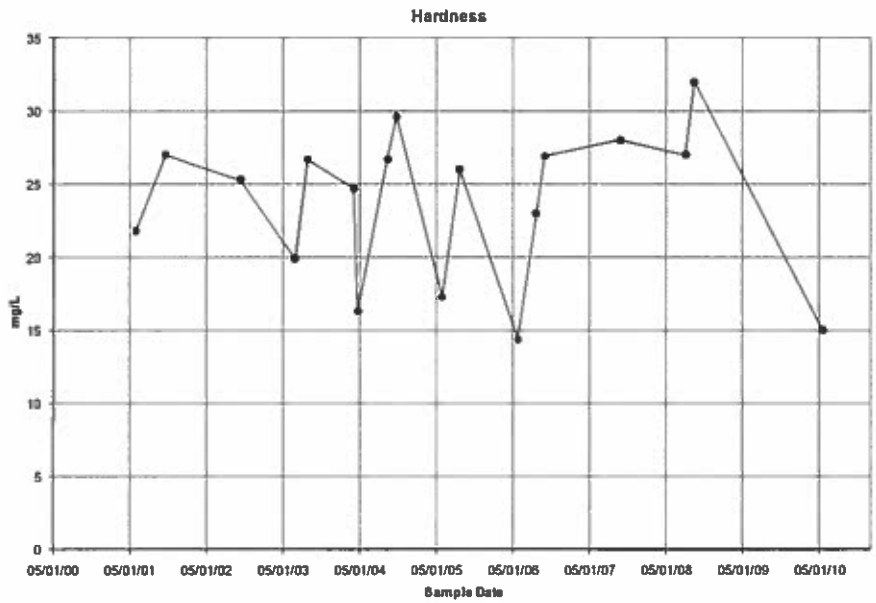


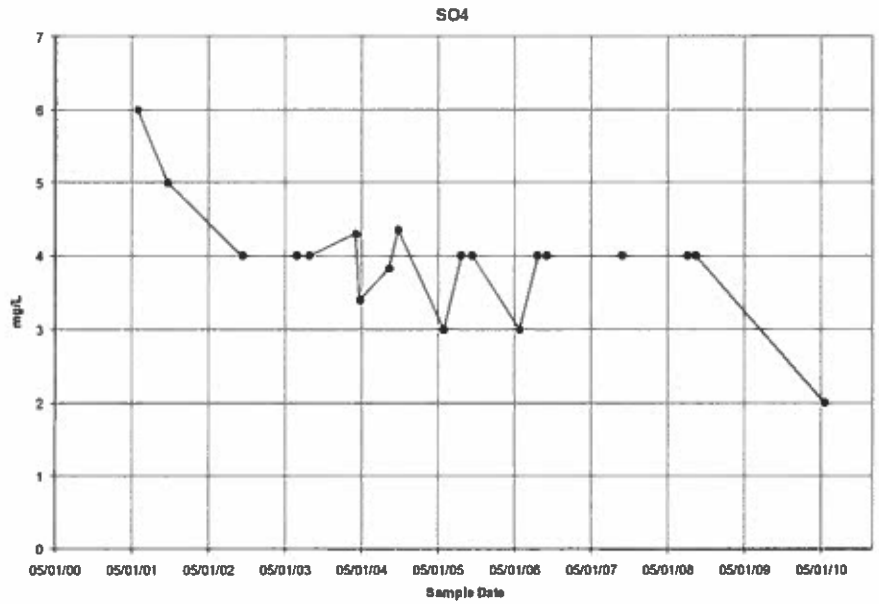
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

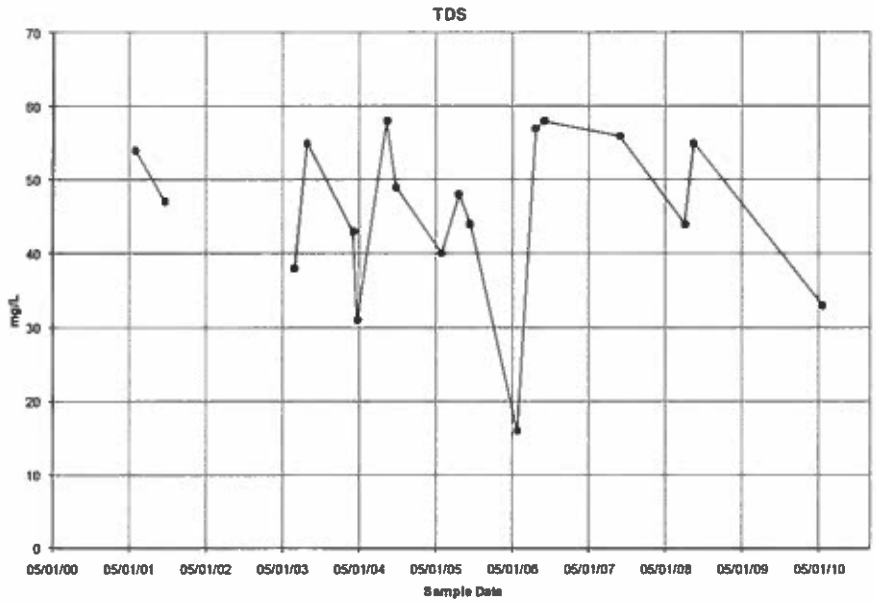
FIGURE 4-1b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-1

PREPARED FOR: Formation





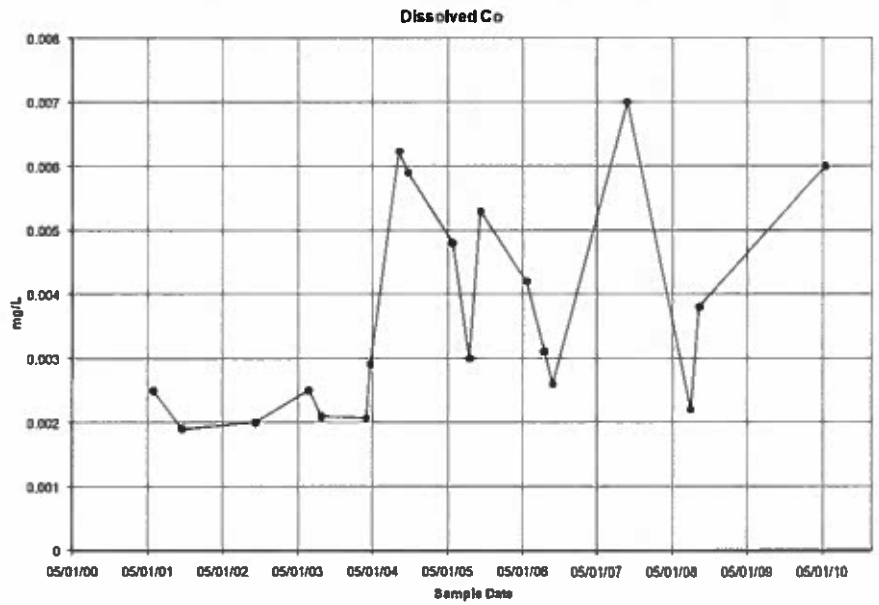


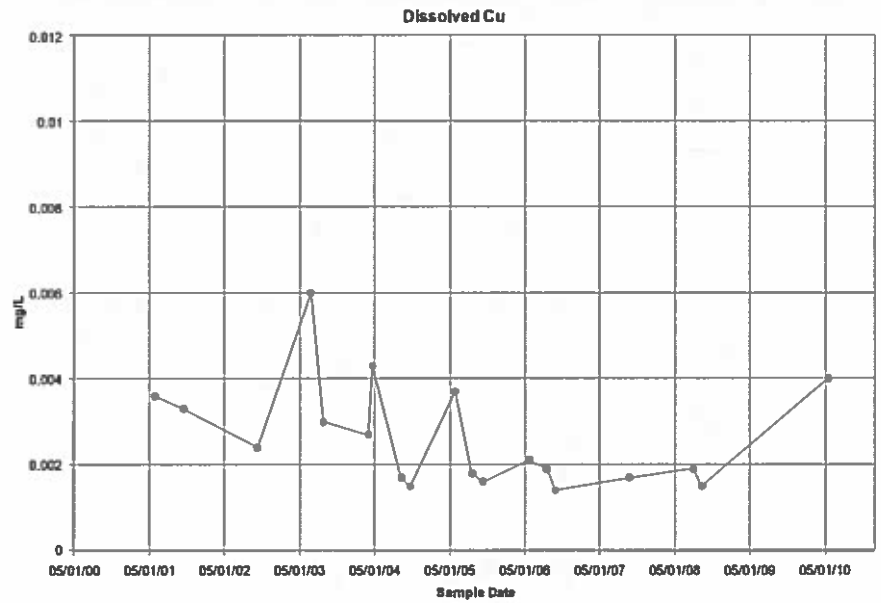


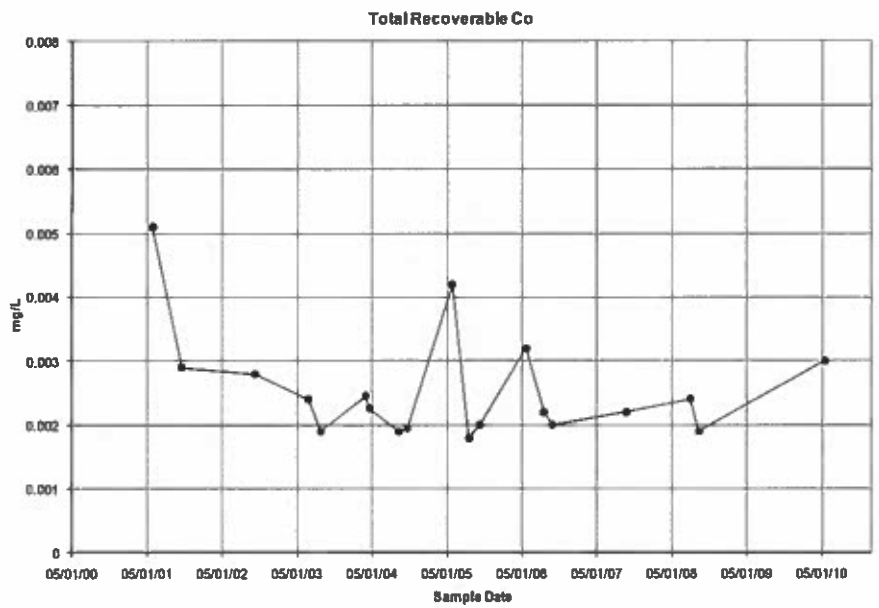
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

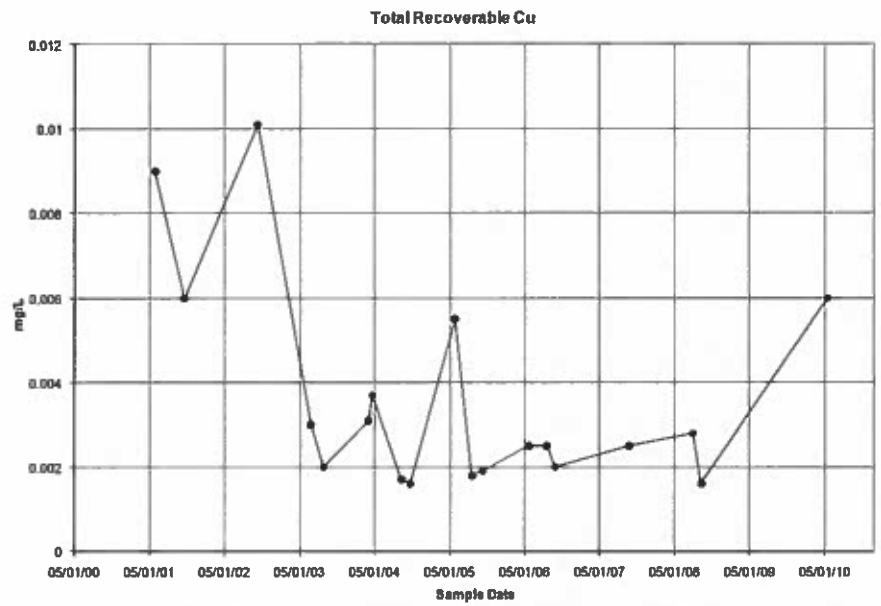
FIGURE 4-2a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-2

PREPARED FOR: Formation





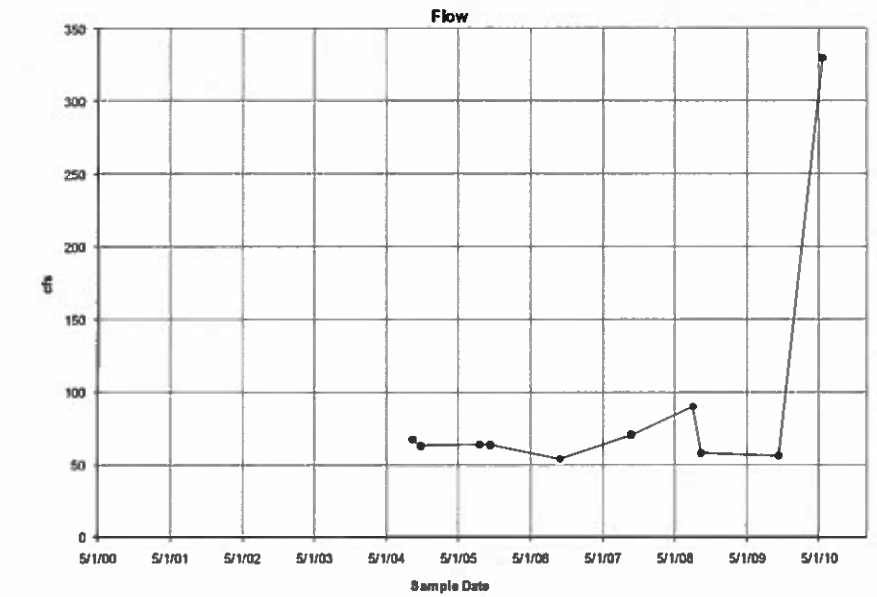


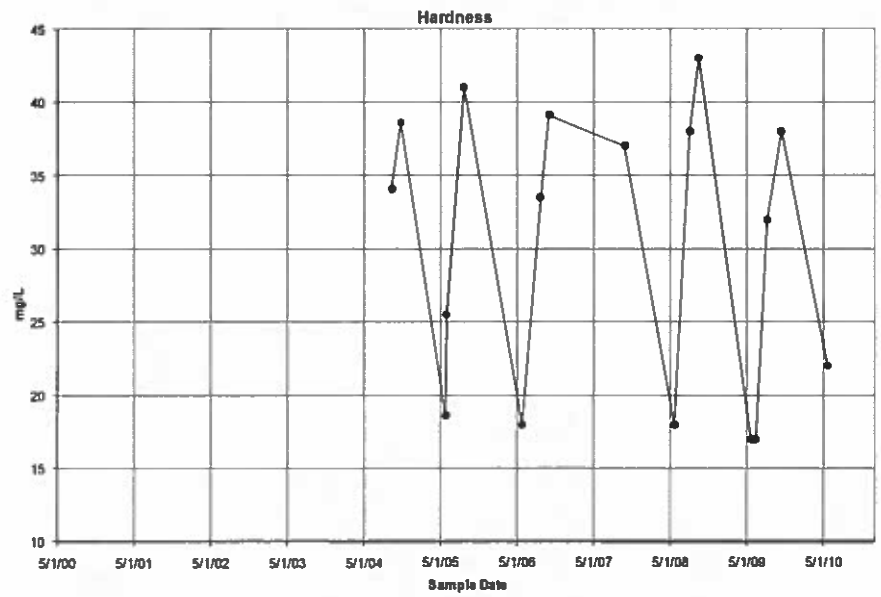


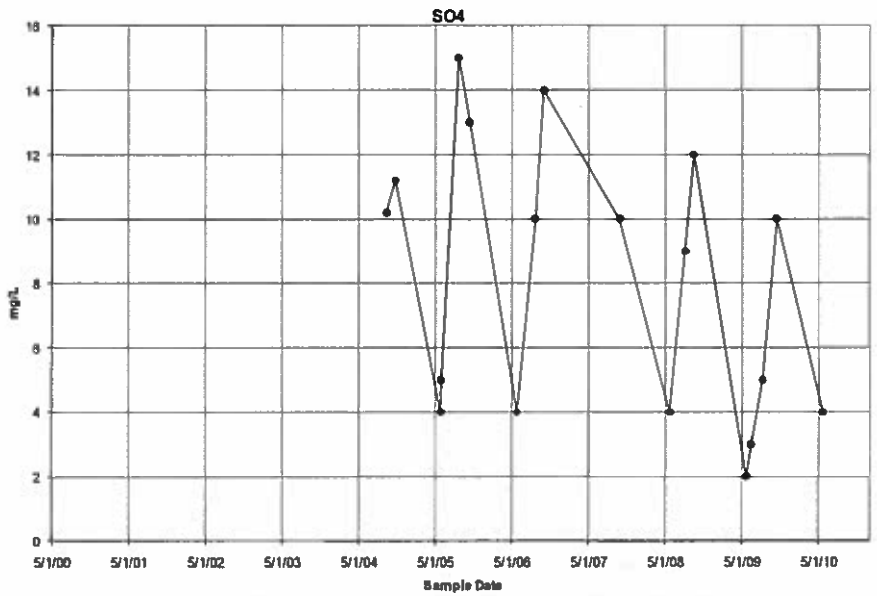
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

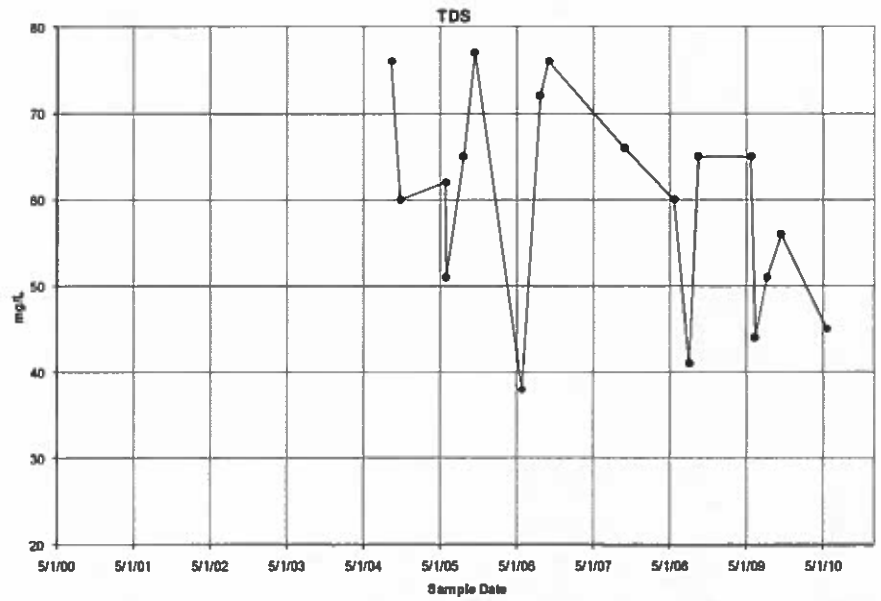
FIGURE 4-2b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-2

PREPARED FOR: Formation





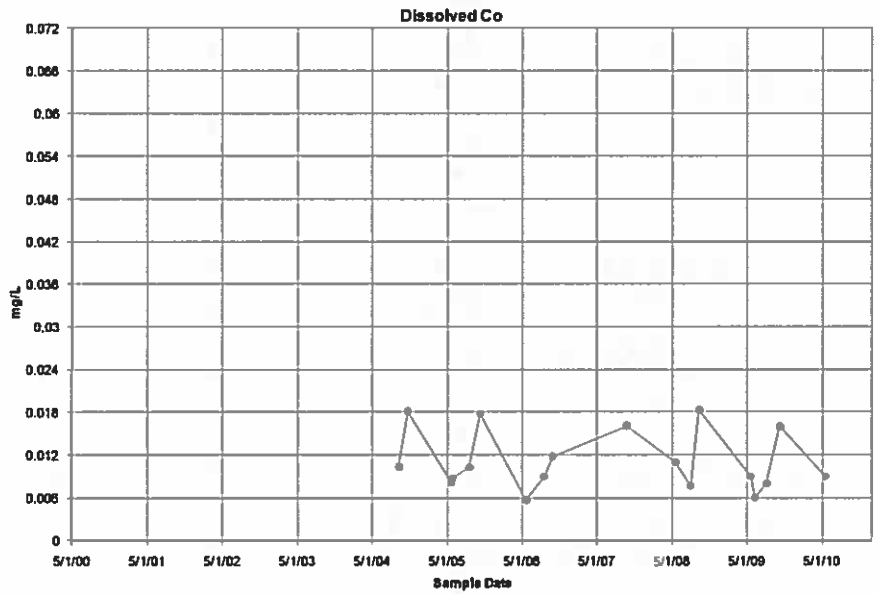


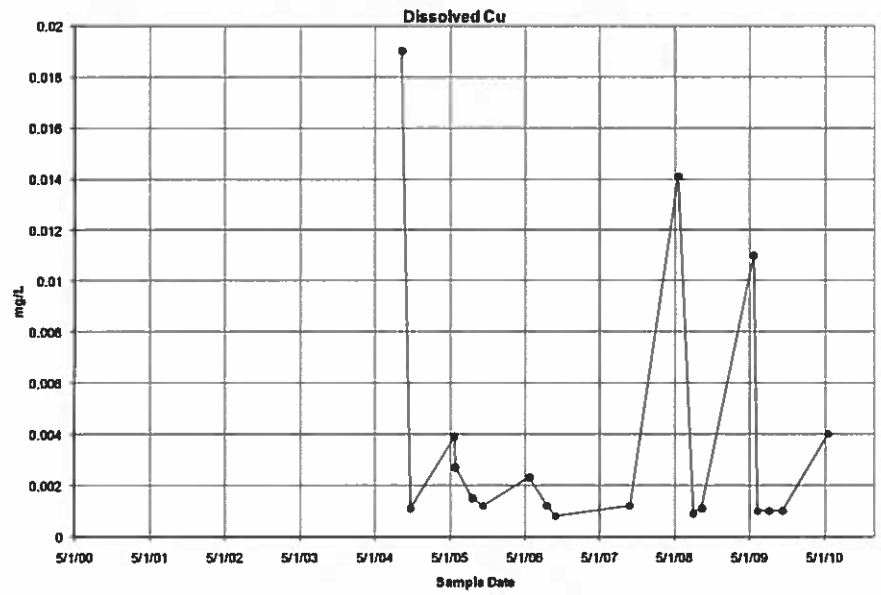


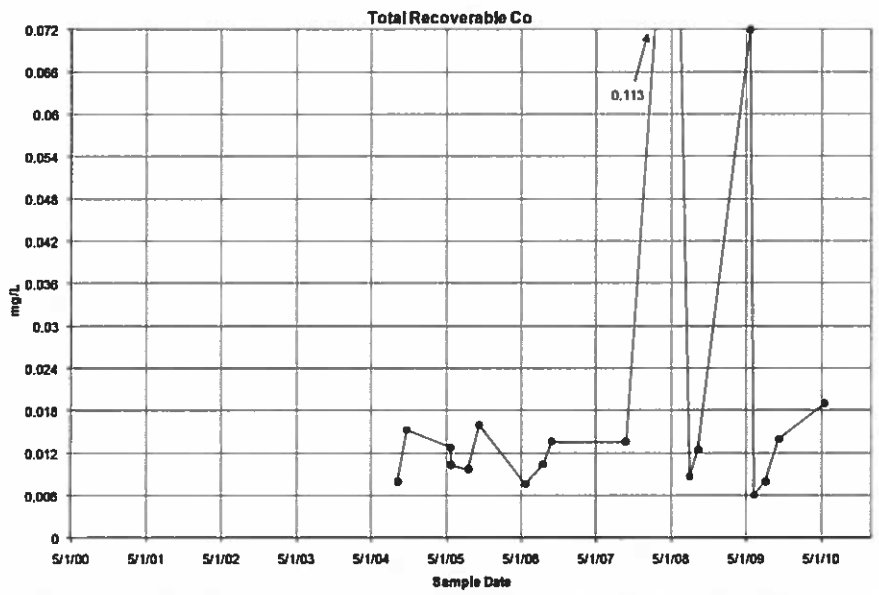
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED	

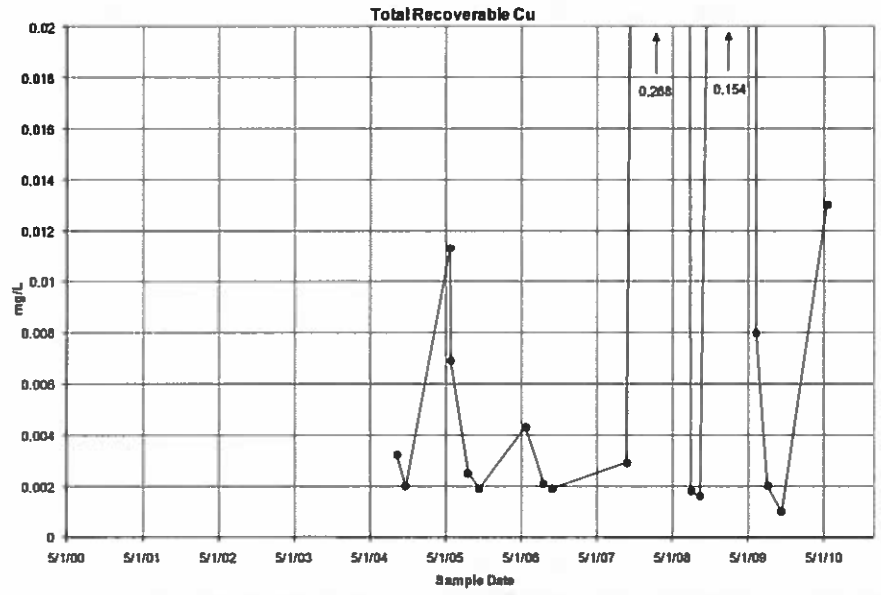
FIGURE 4-3a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-3

PREPARED FOR: Formation





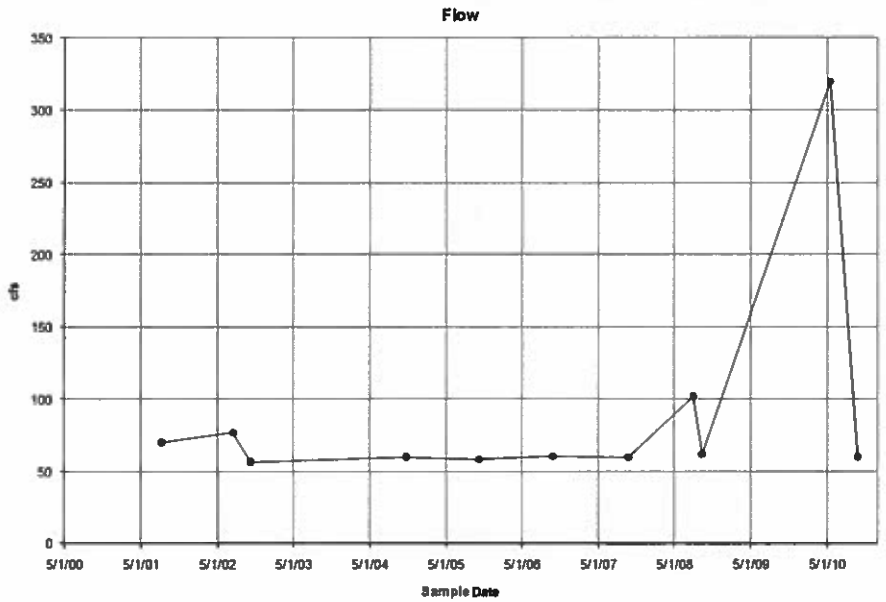


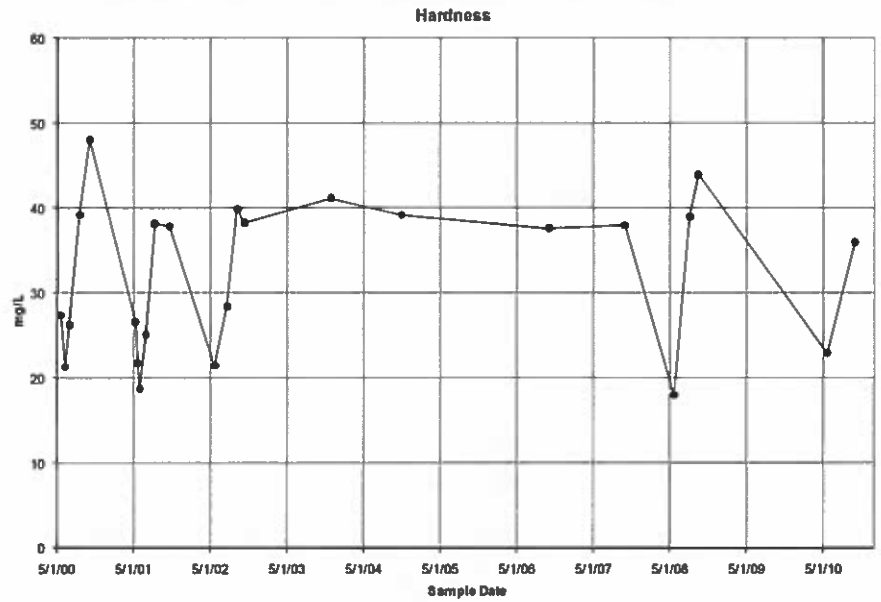


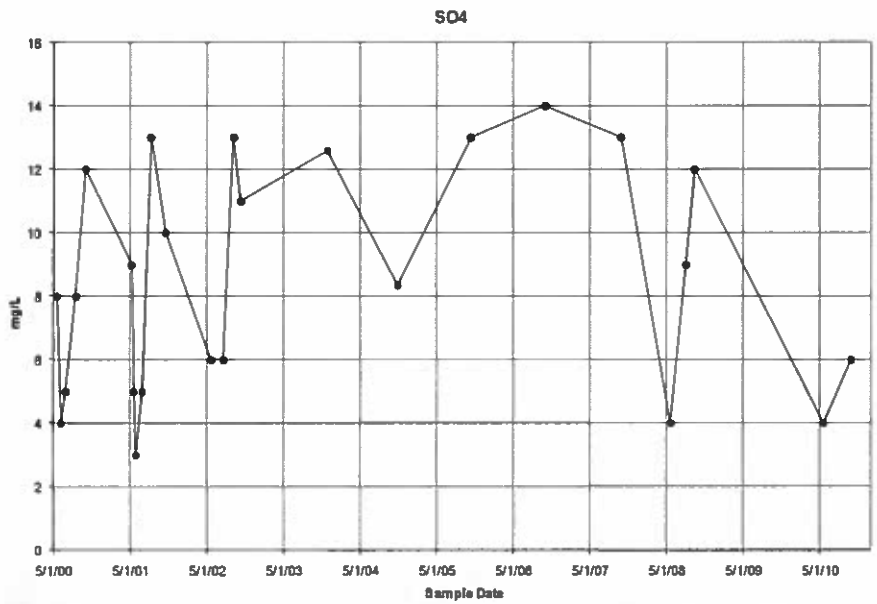
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

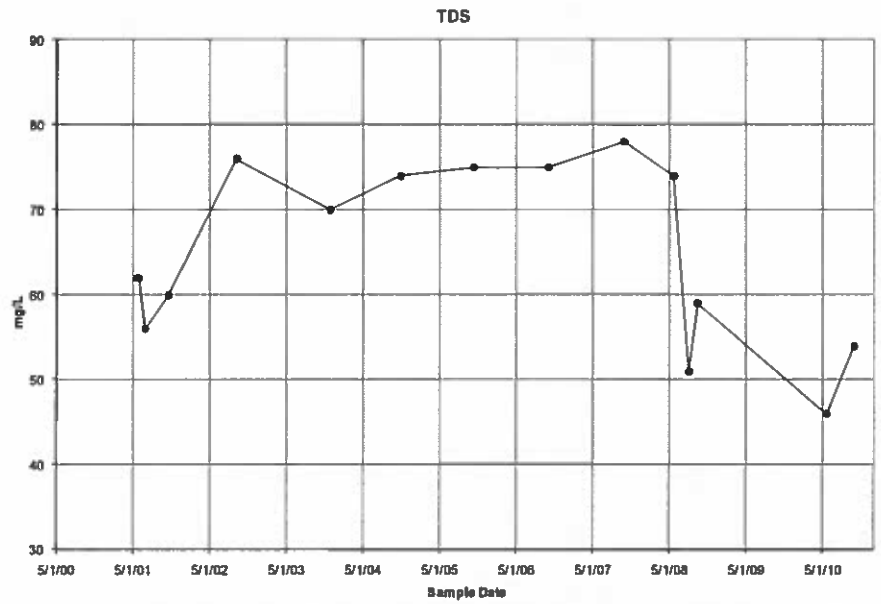
FIGURE 4-3b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-3

PREPARED FOR: Formation





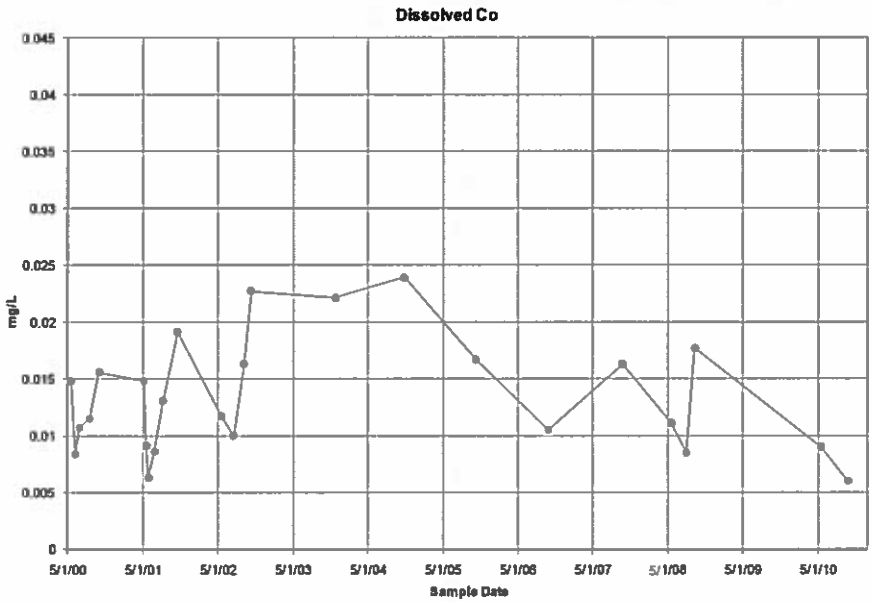


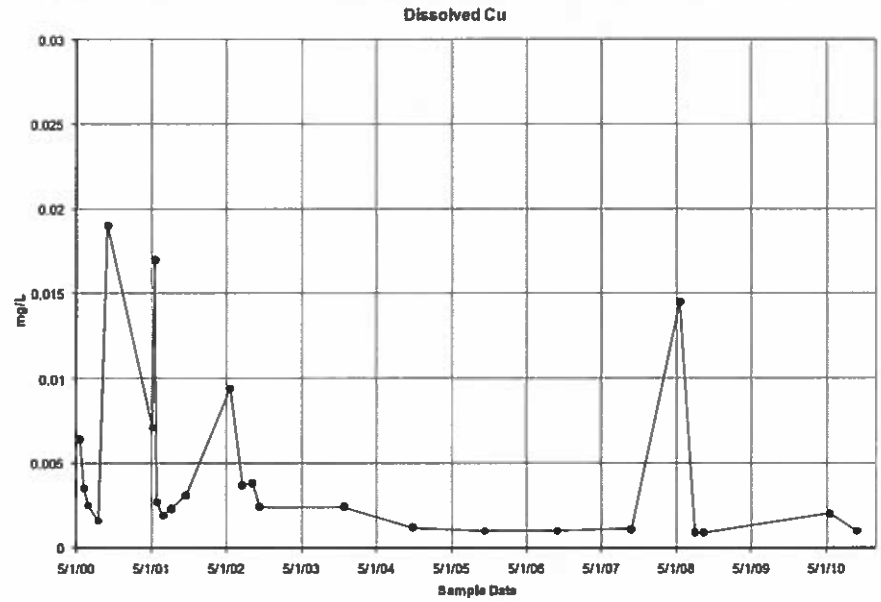


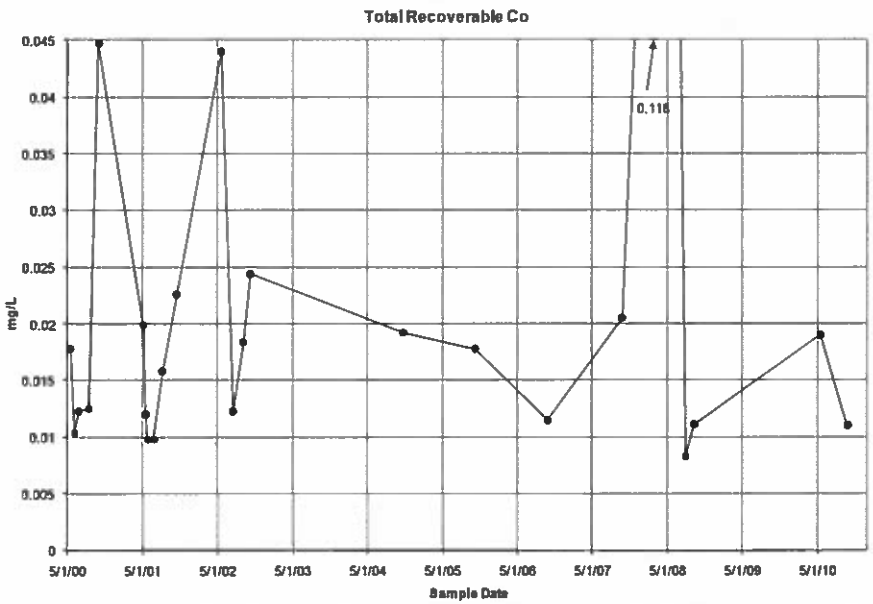
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

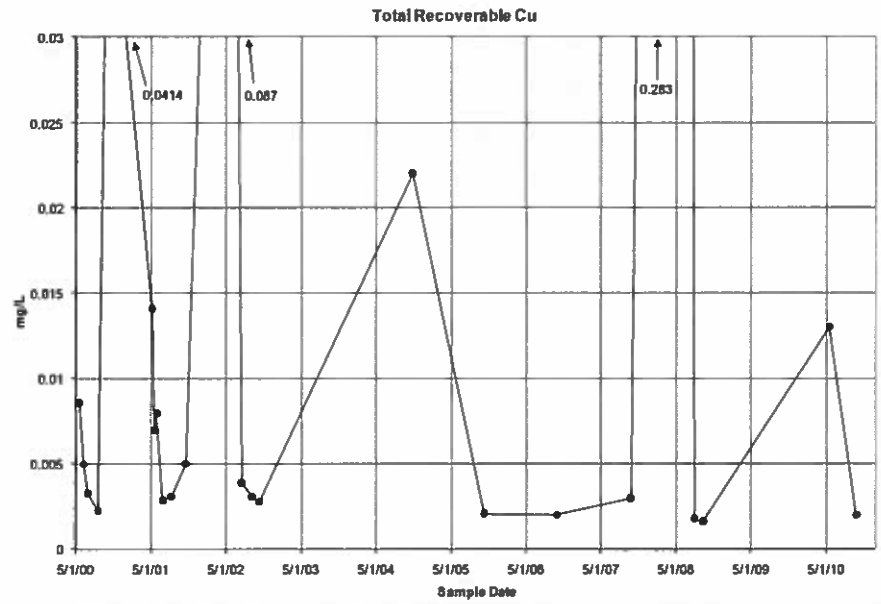
FIGURE 4-4a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-4

PREPARED FOR: Formation







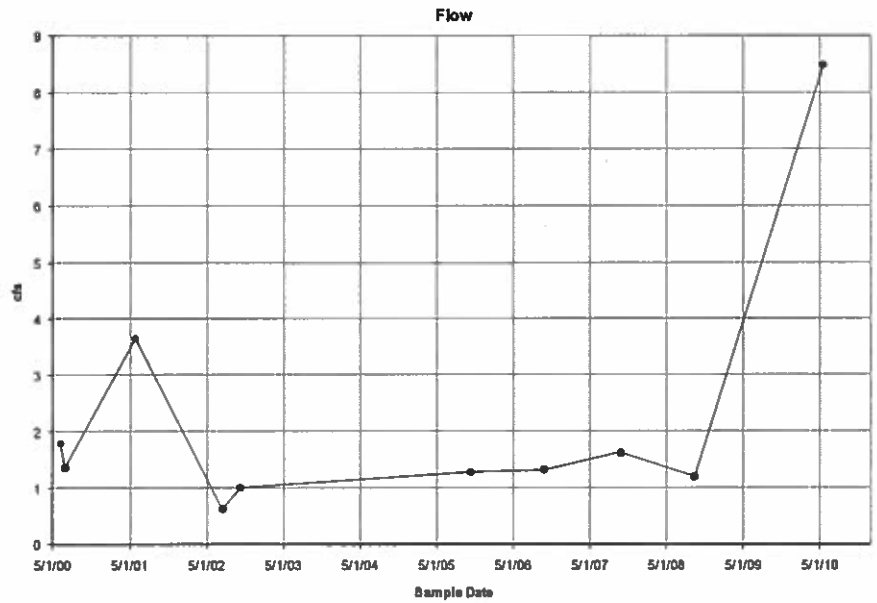


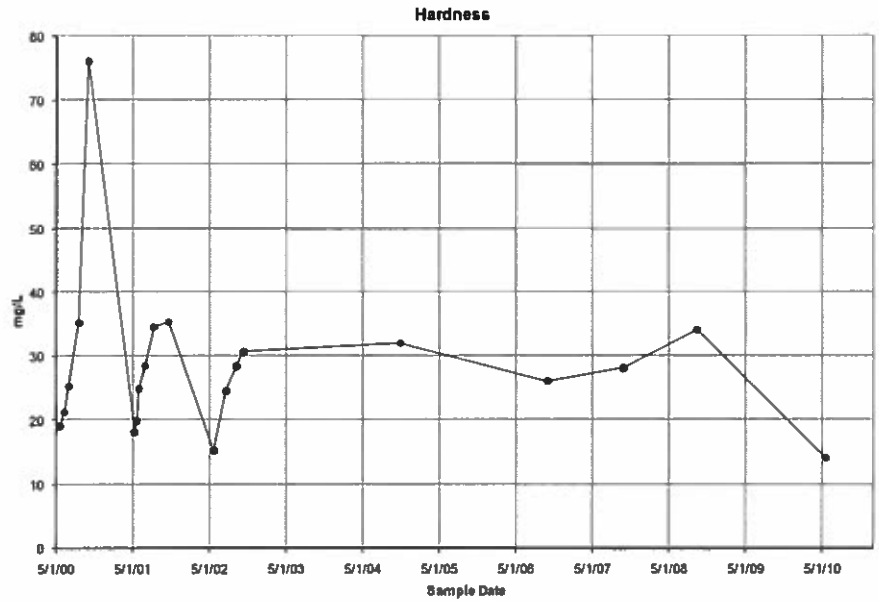
PROJECT: 222100	TASK 66

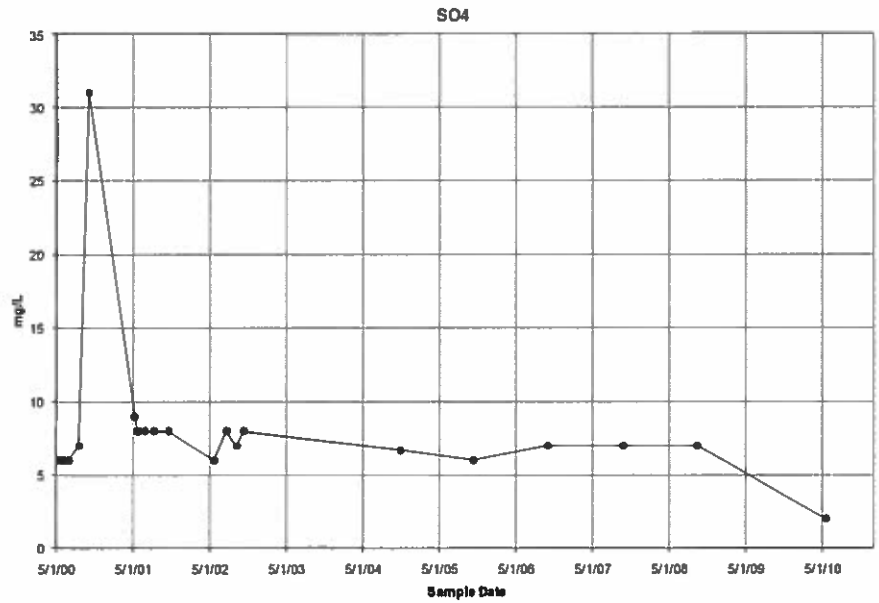
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

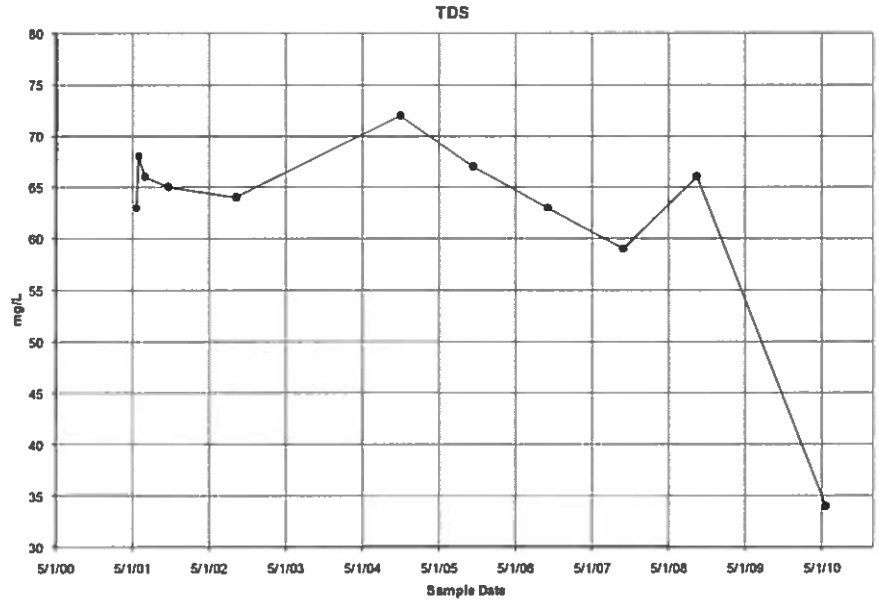
FIGURE 4-4b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-4

PREPARED FOR: Formation





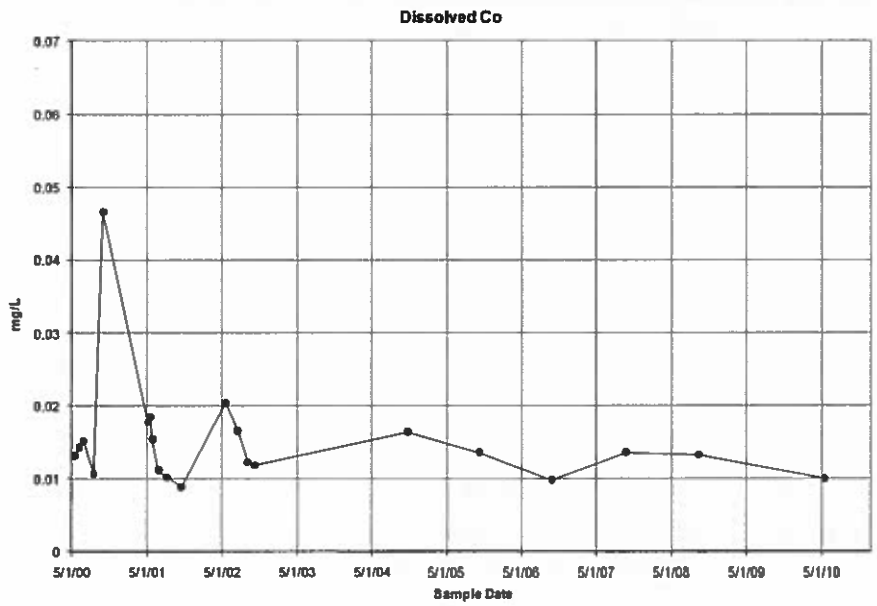


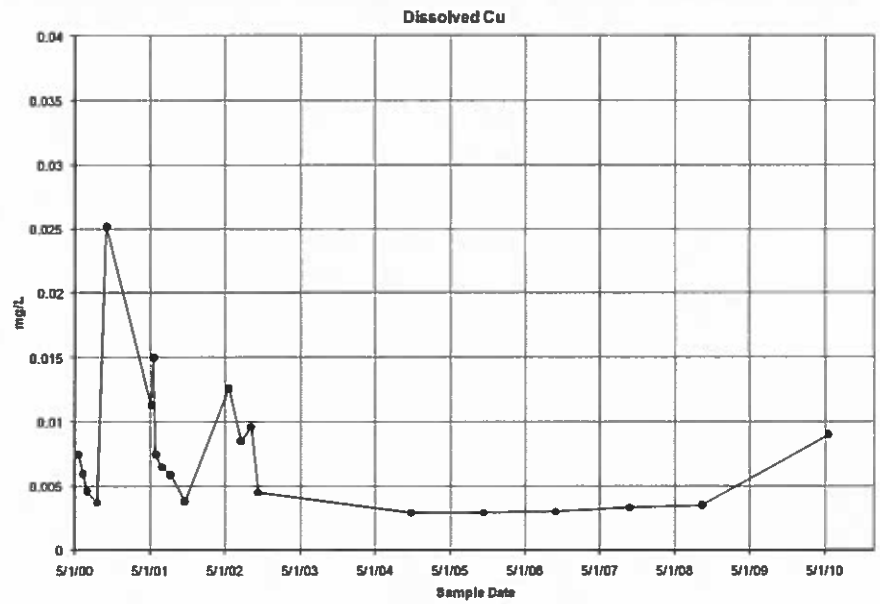


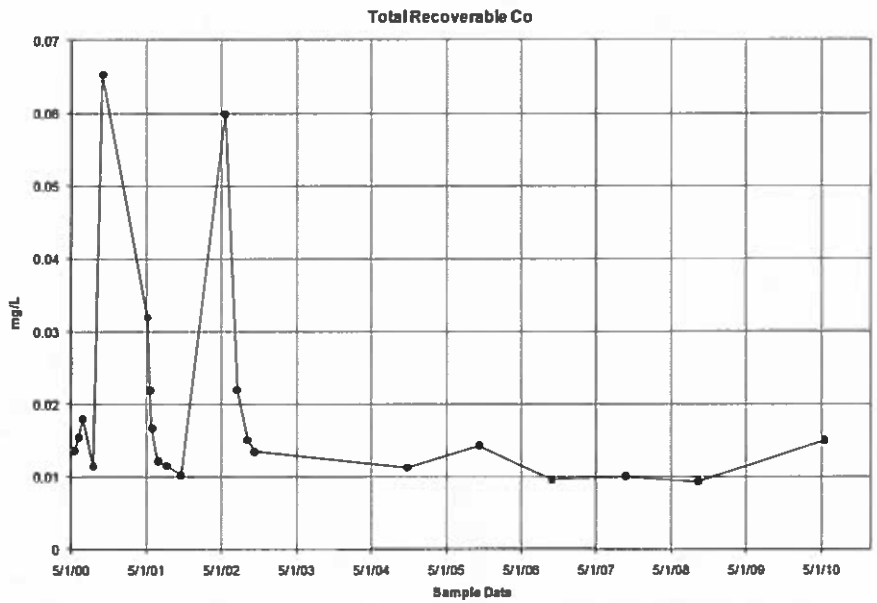
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

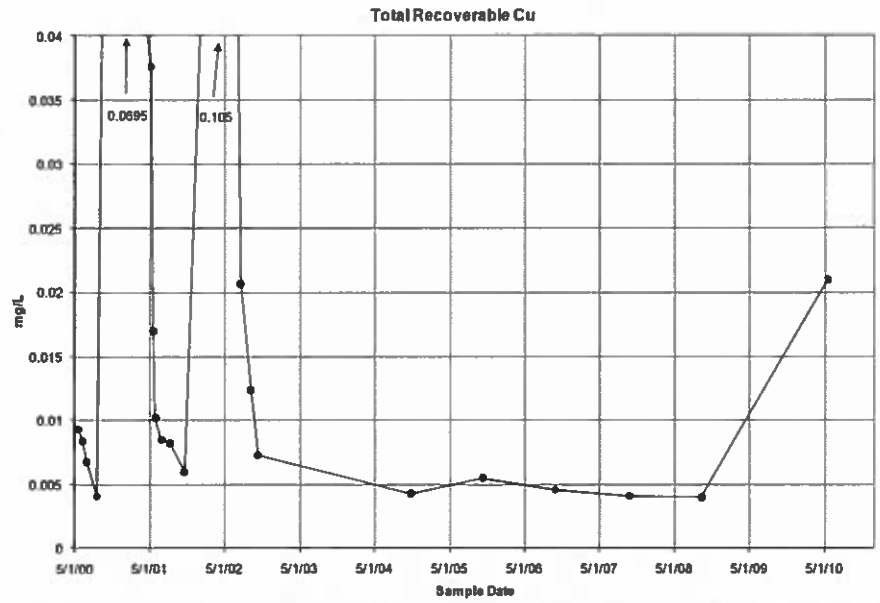
FIGURE 4-5a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-5

PREPARED FOR: Formation





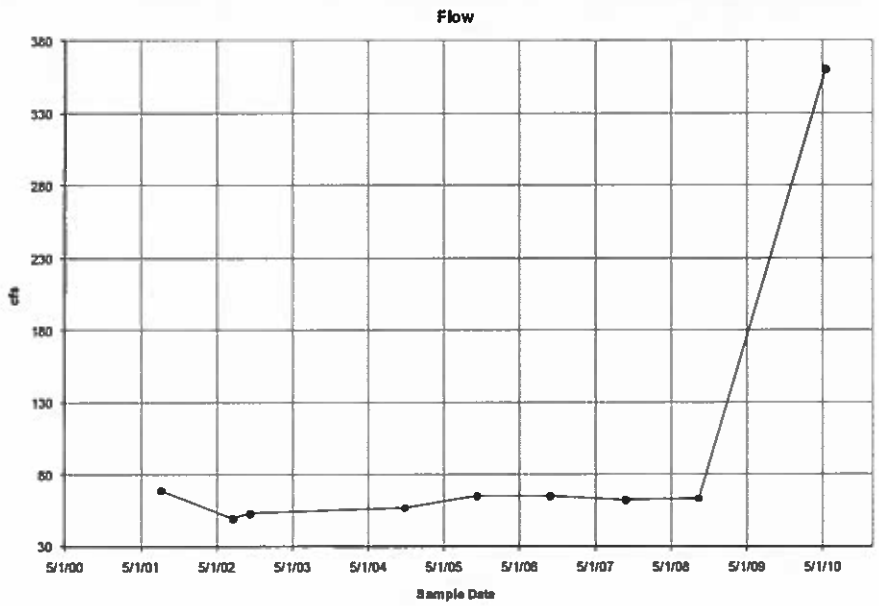


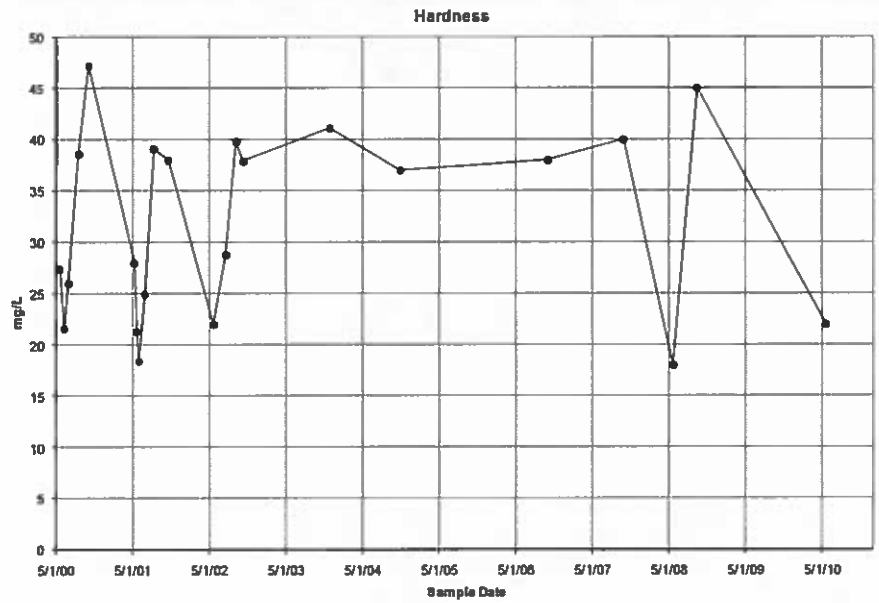


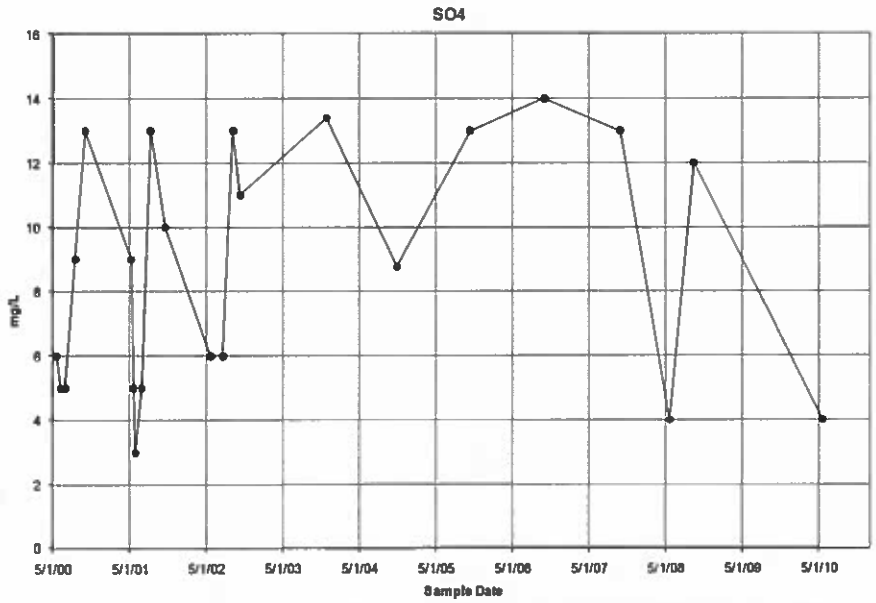
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

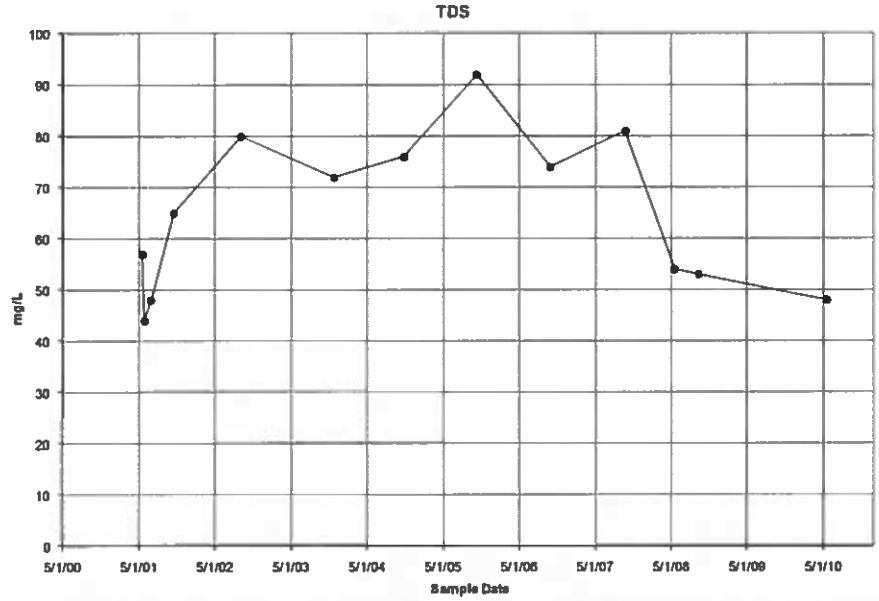
FIGURE 4-5b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-5

PREPARED FOR: Formation









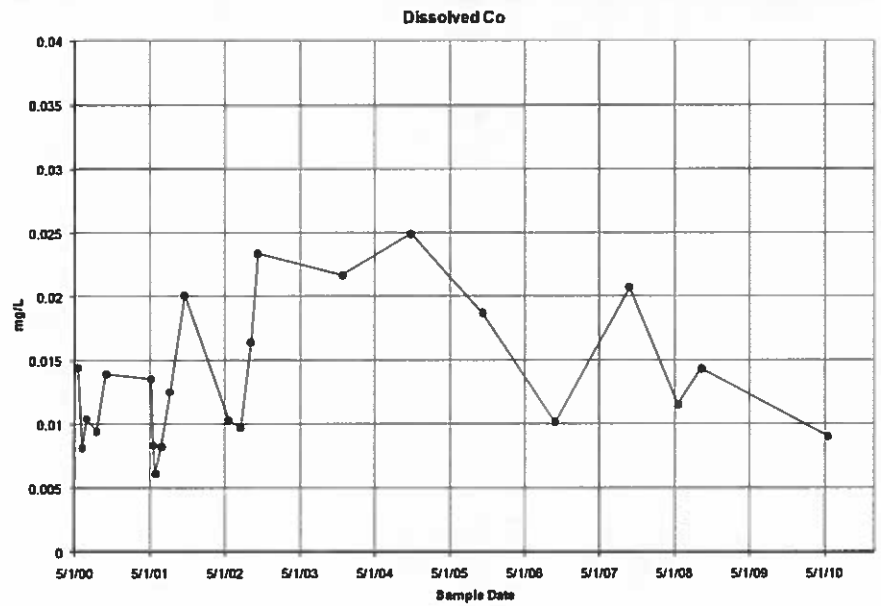
PROJECT	TASK
222100	66

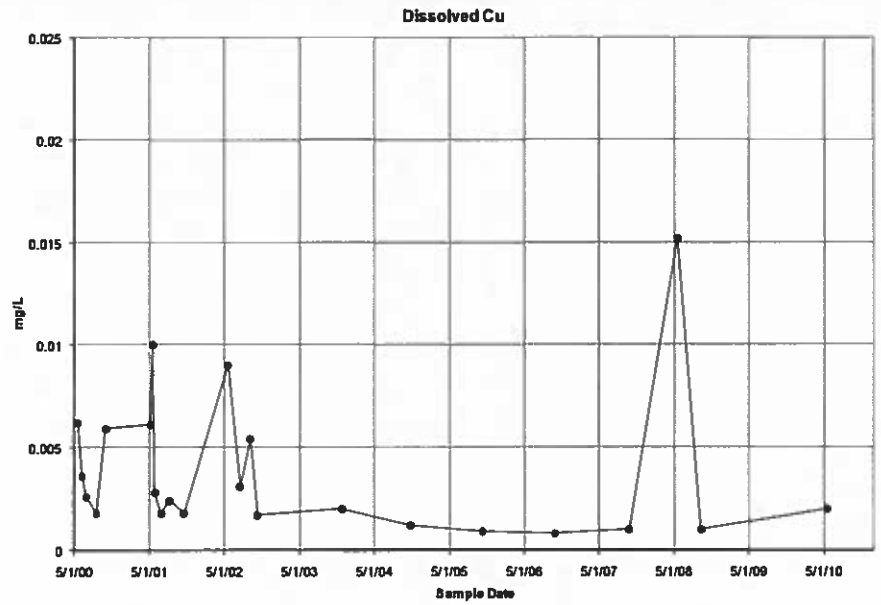
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

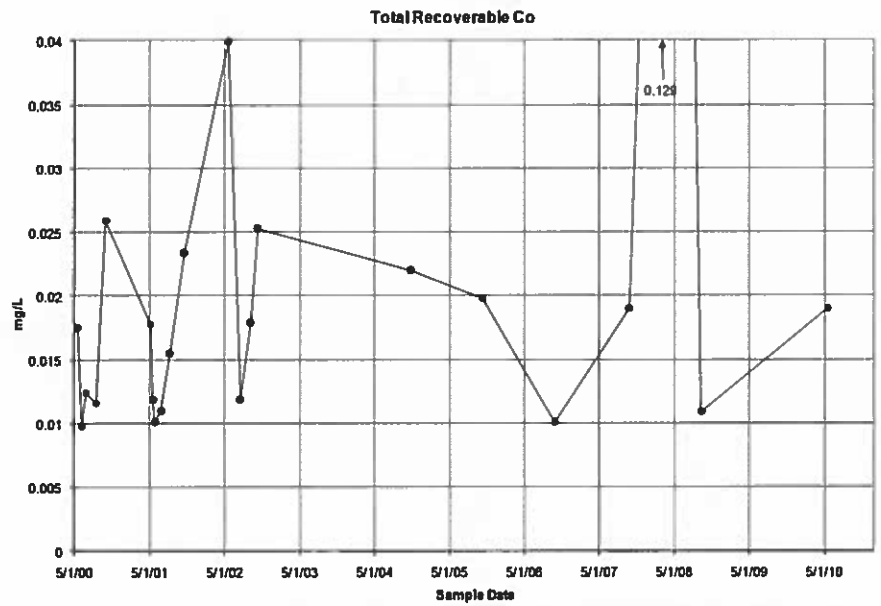
FIGURE 4-6a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-6

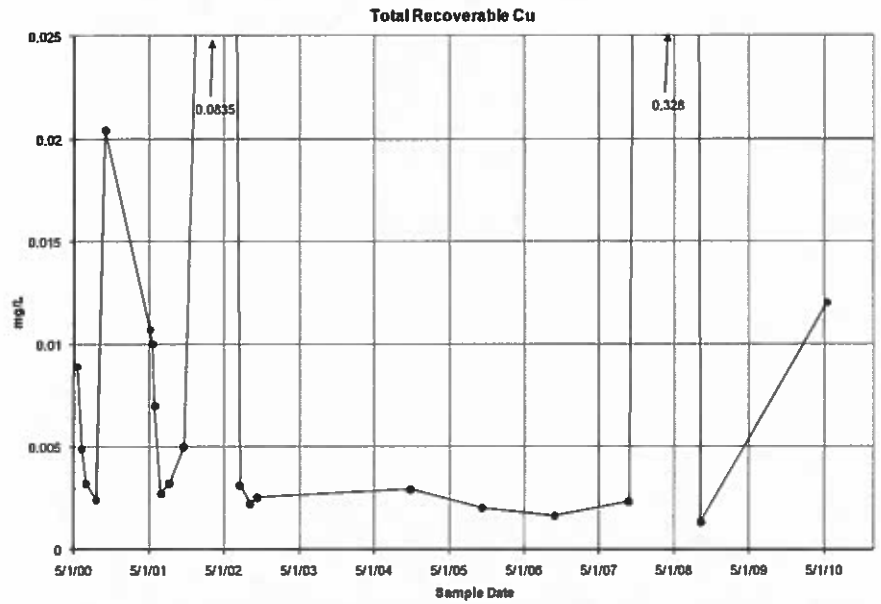
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





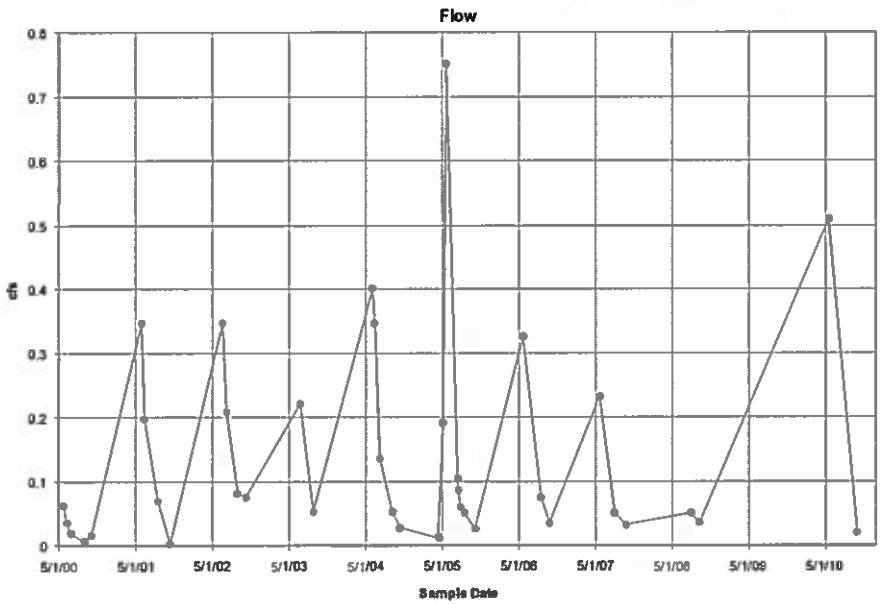


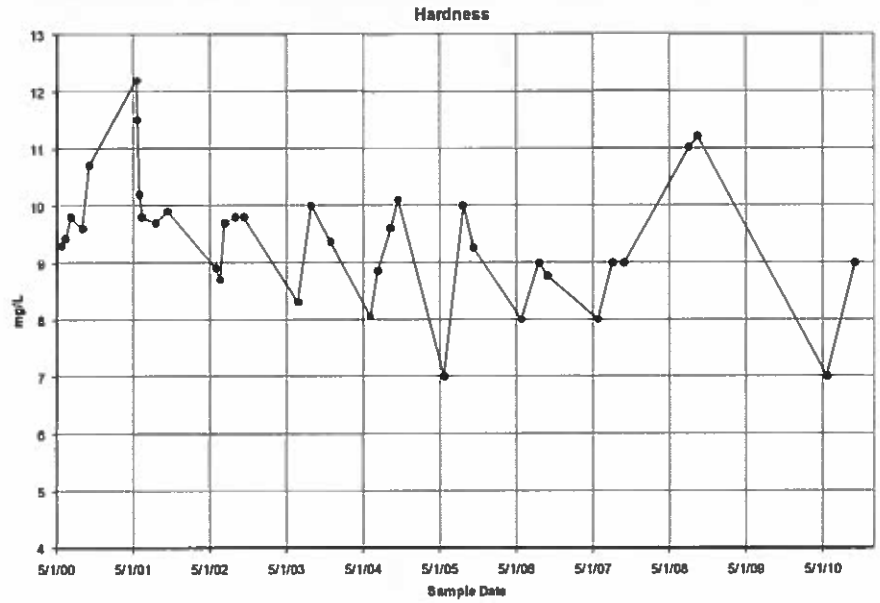


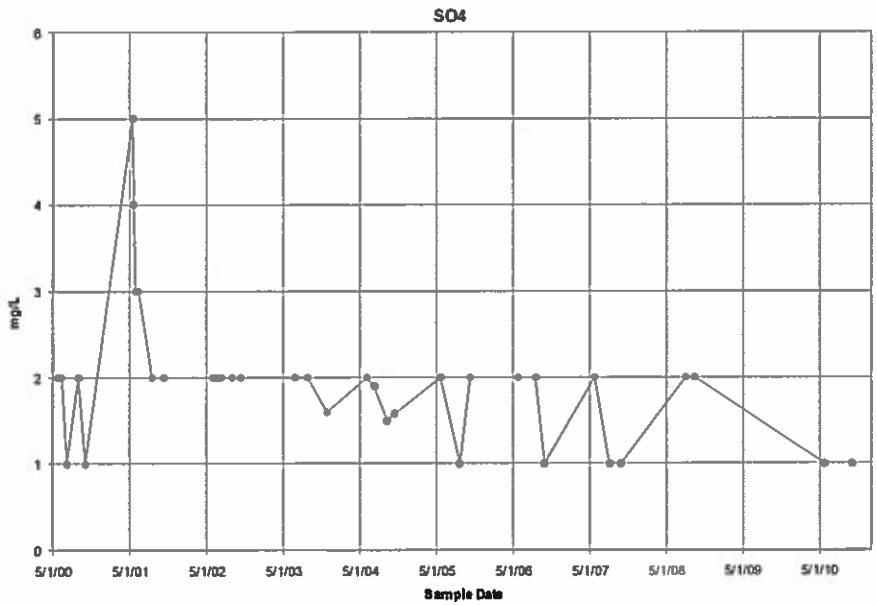
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

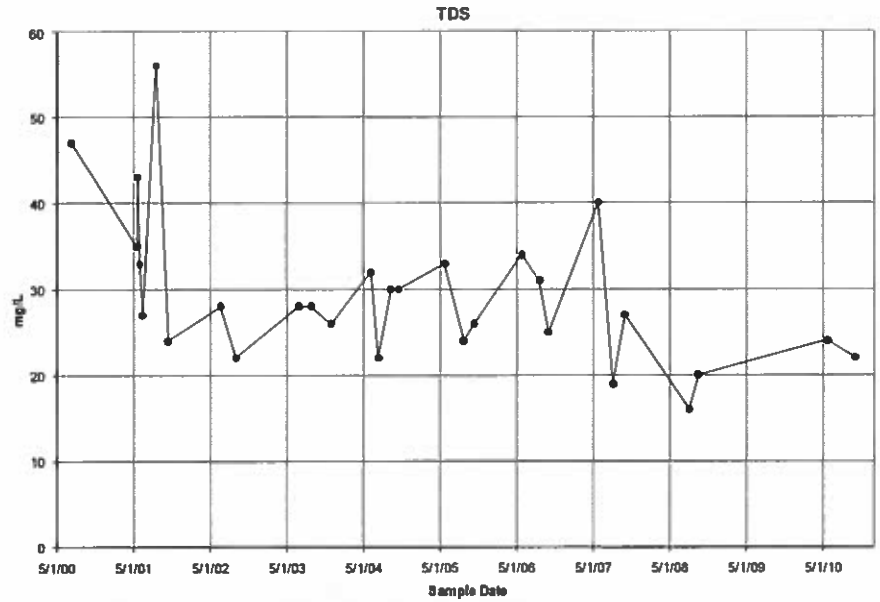
FIGURE 4-6b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-6

PREPARED FOR: Formation





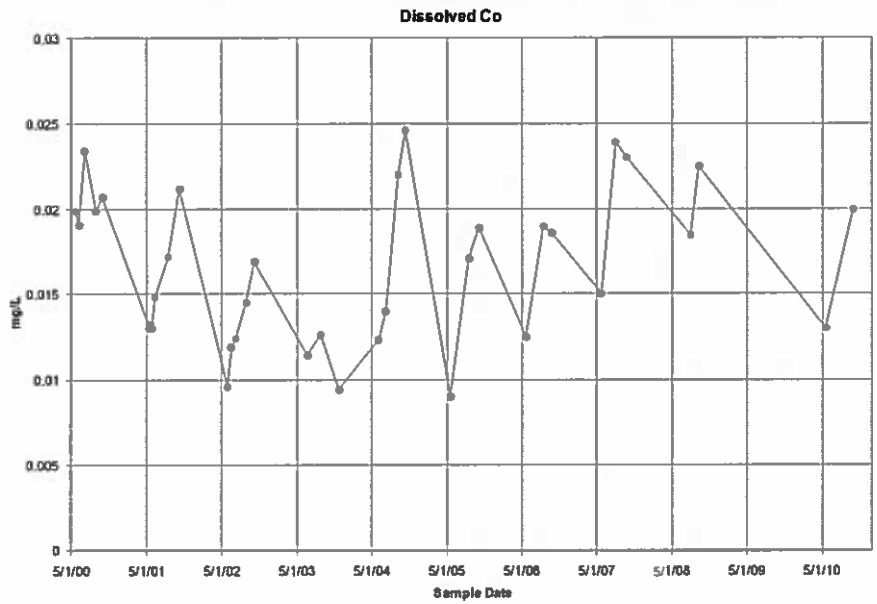


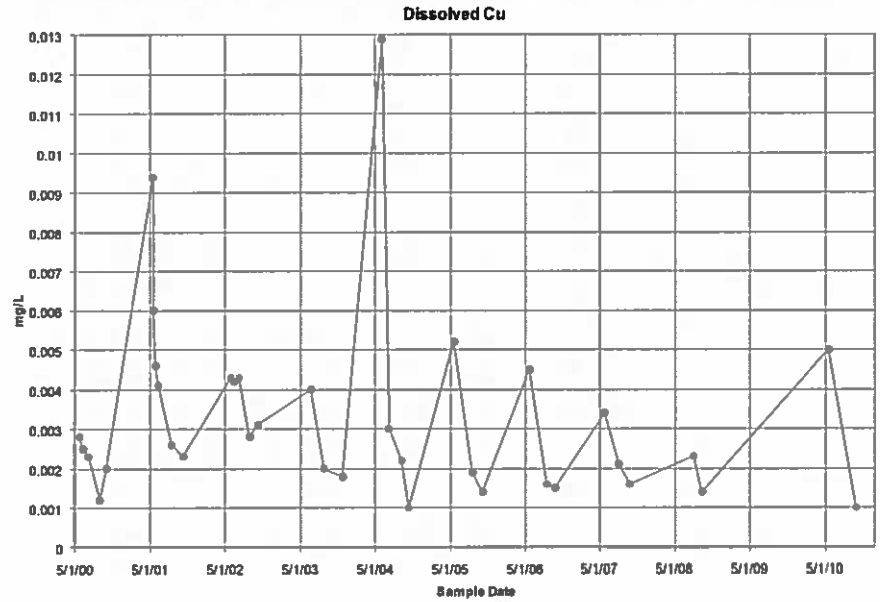


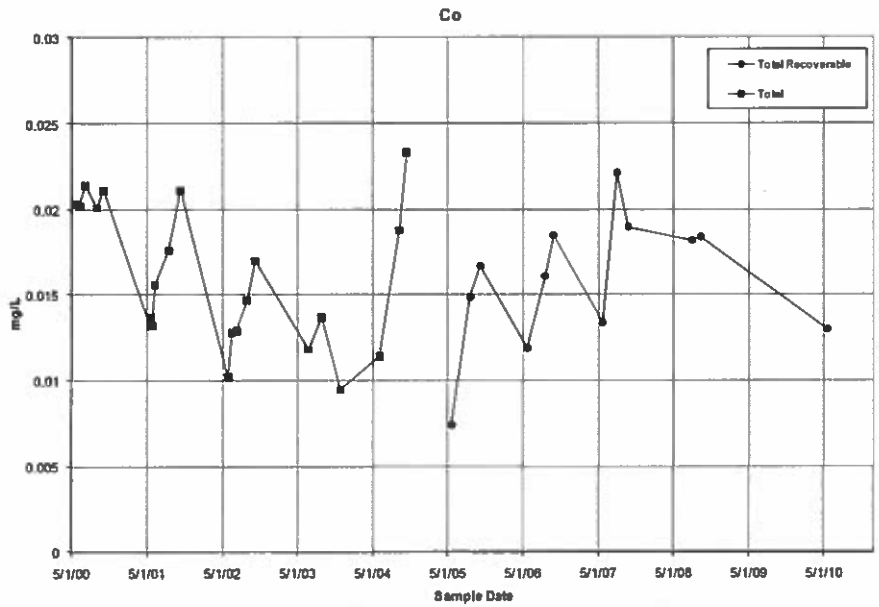
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

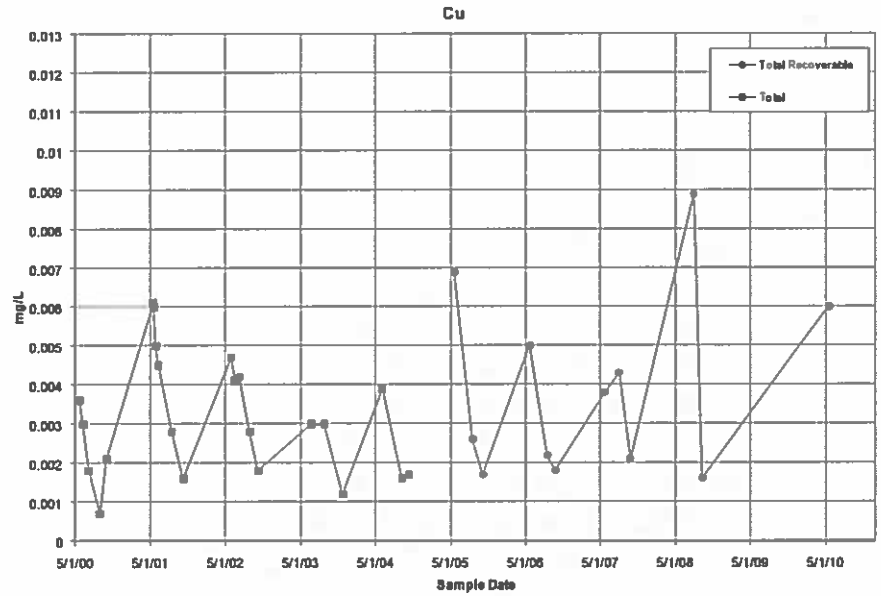
FIGURE 4-7a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-7

PREPARED FOR: Formation





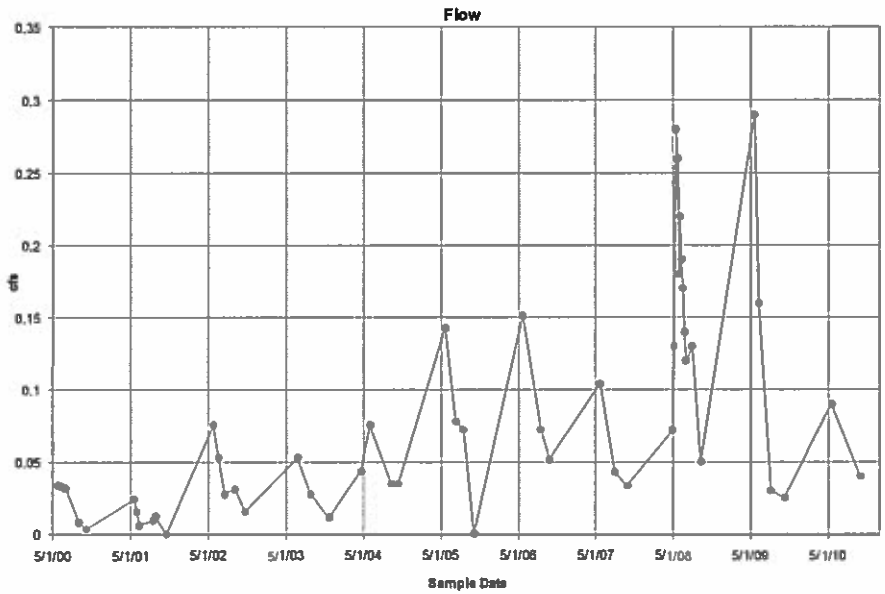


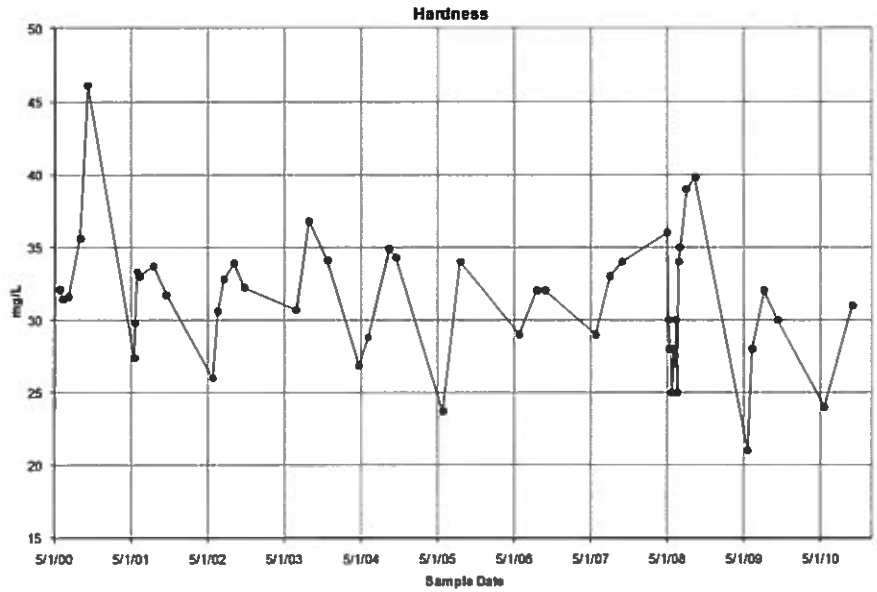


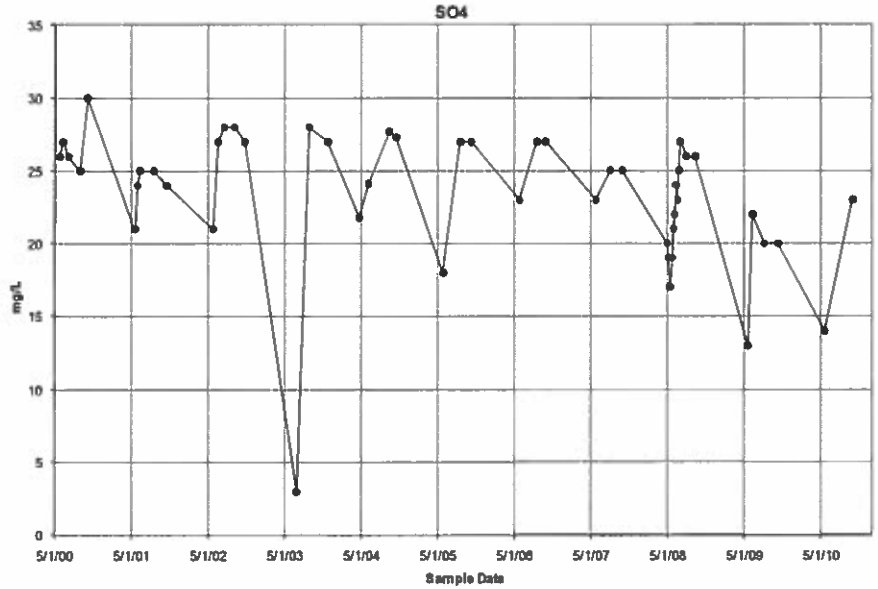
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

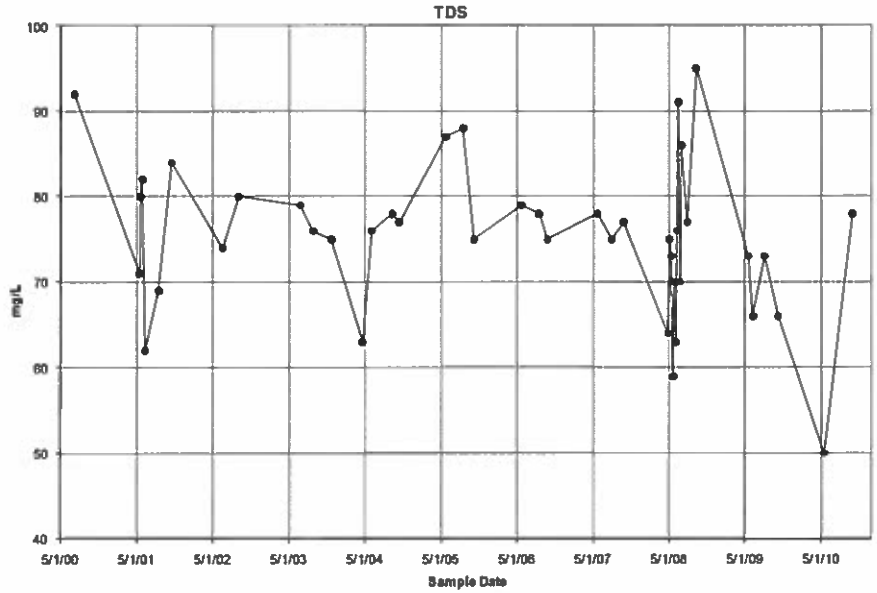
FIGURE 4-7b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-7

PREPARED FOR: Formation





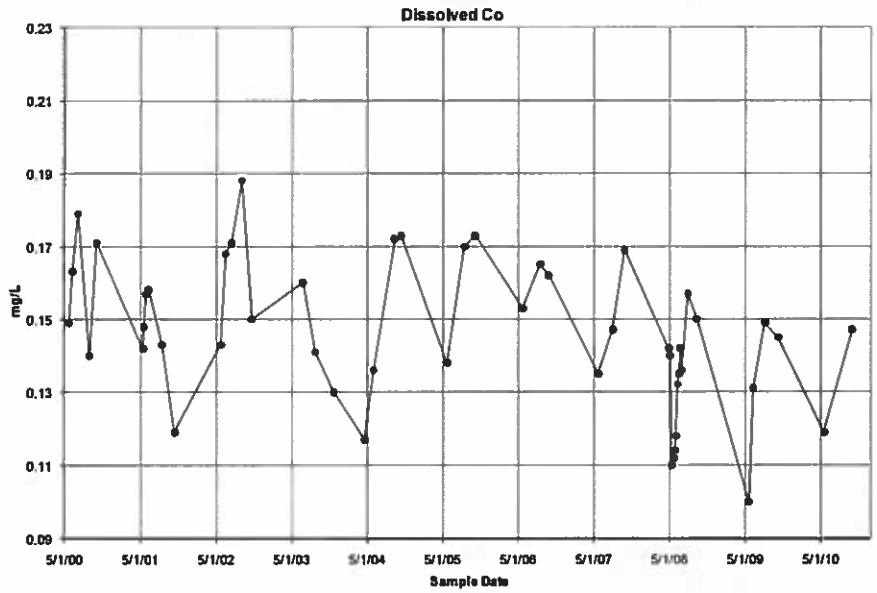


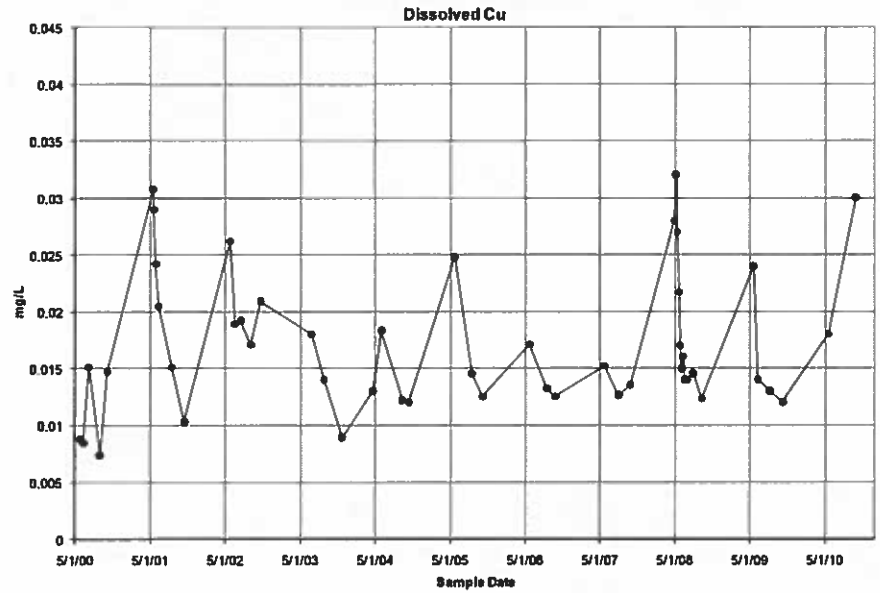


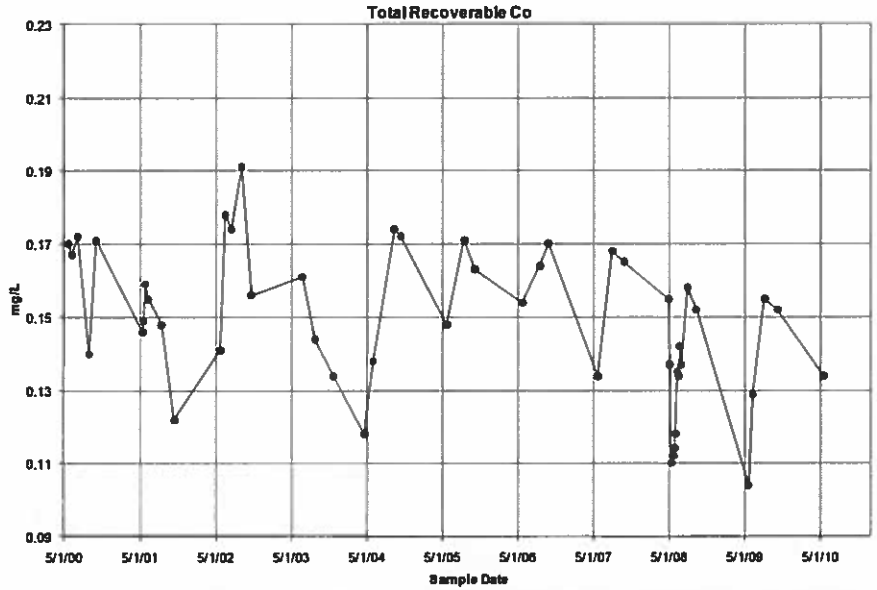
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

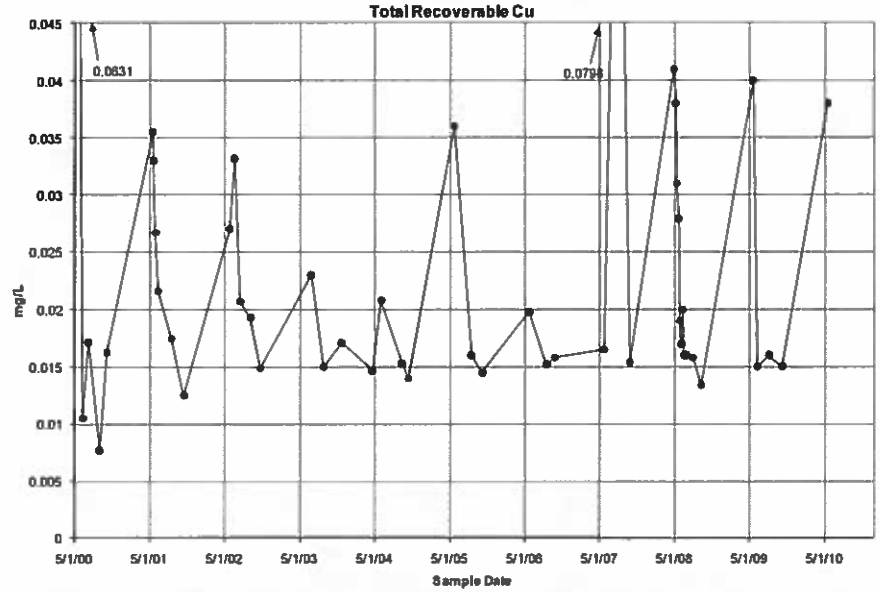
FIGURE 4-8a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-10

PREPARED FOR: Formation





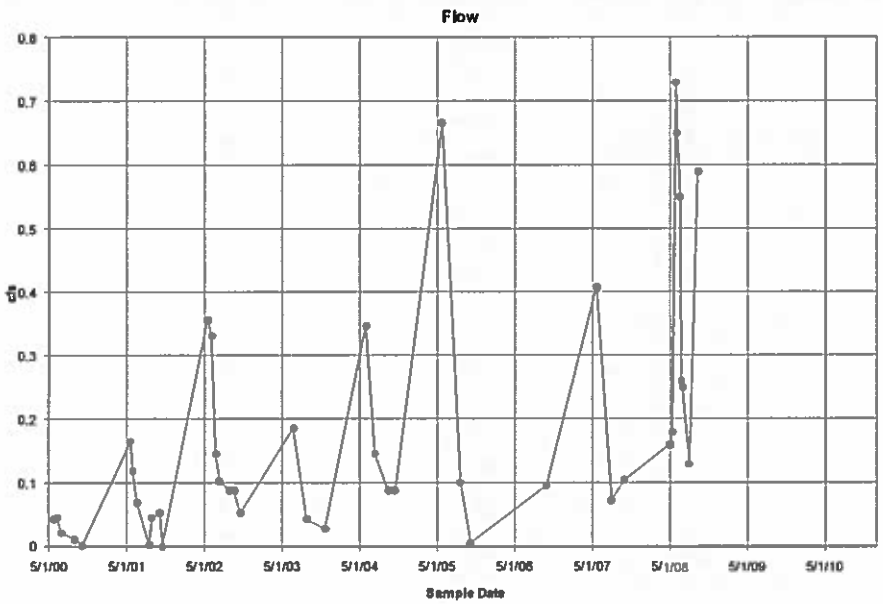


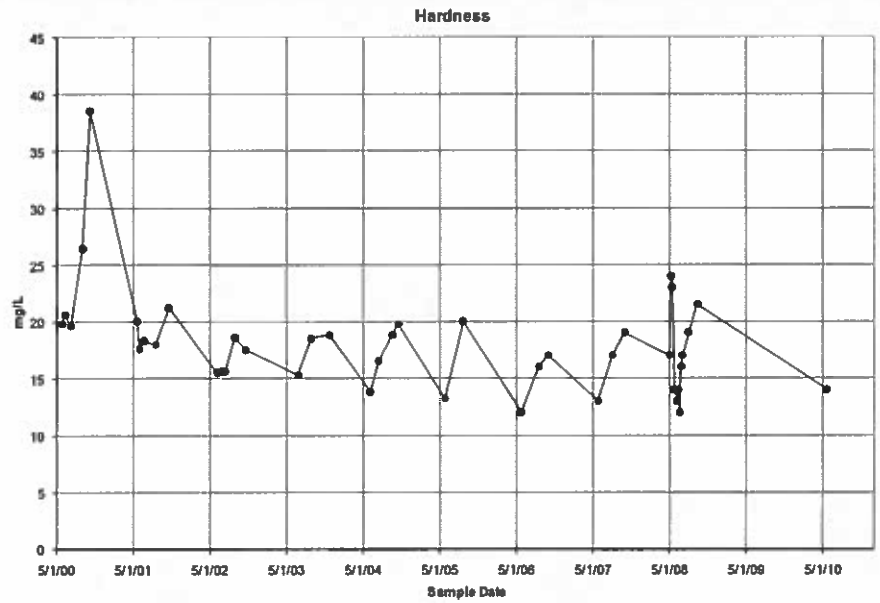


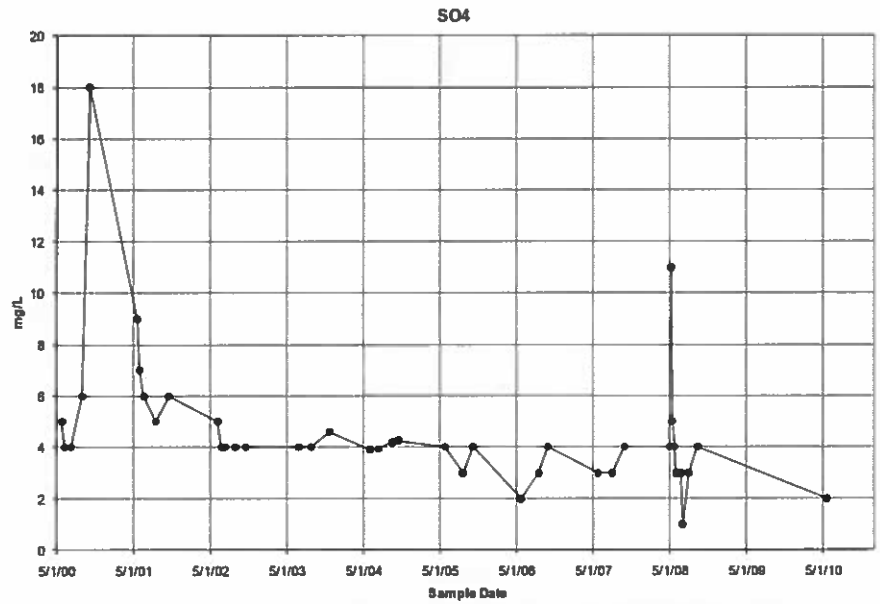
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED	

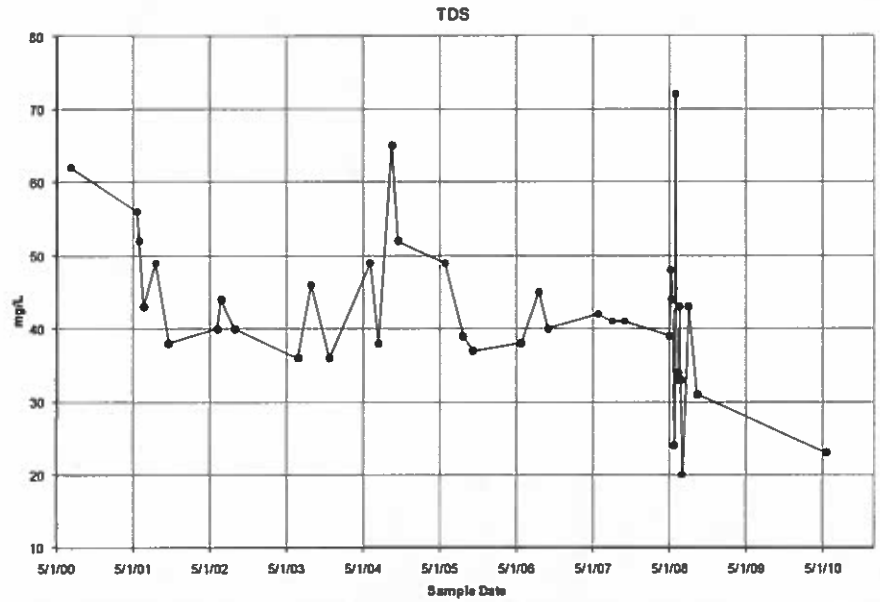
FIGURE 4-8b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-10

PREPARED FOR: Formation





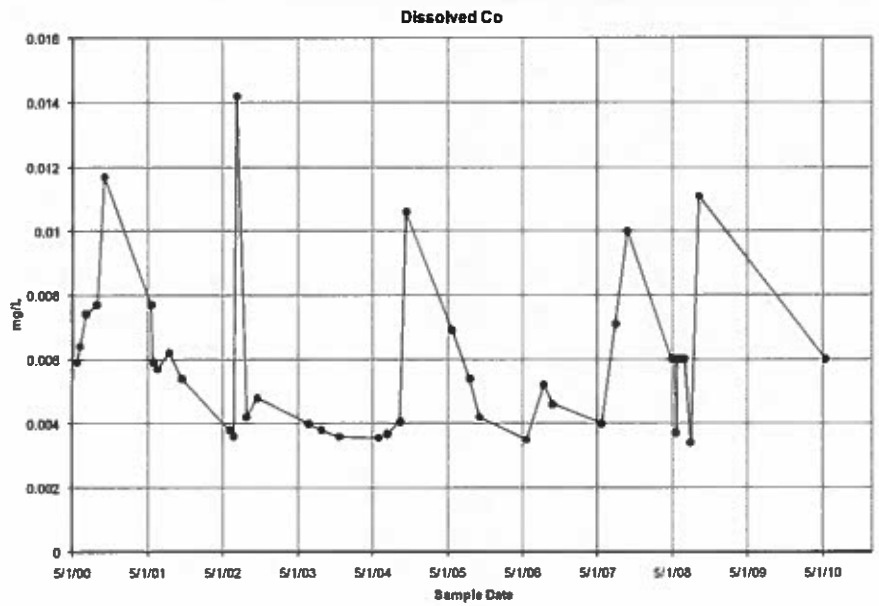


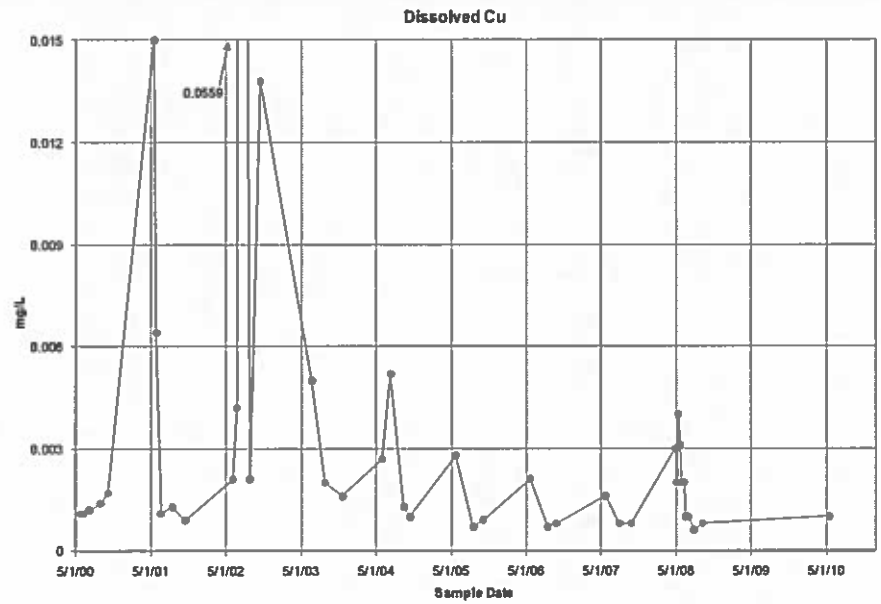


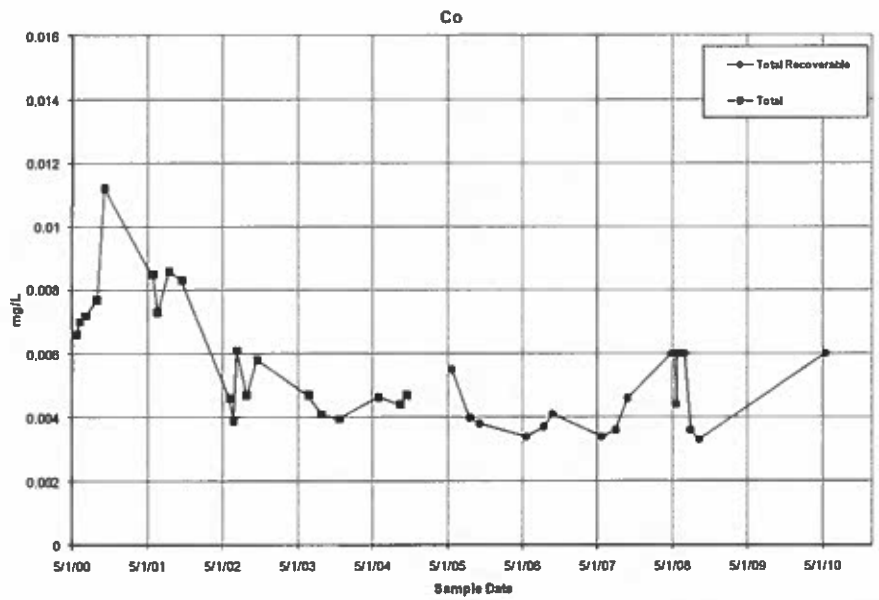
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

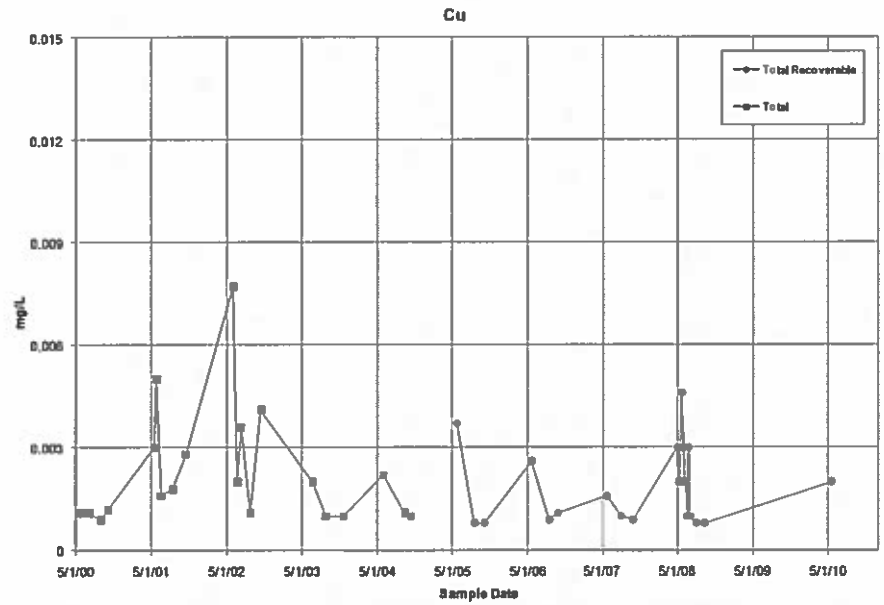
FIGURE 4-9a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-11

PREPARED FOR: Formation





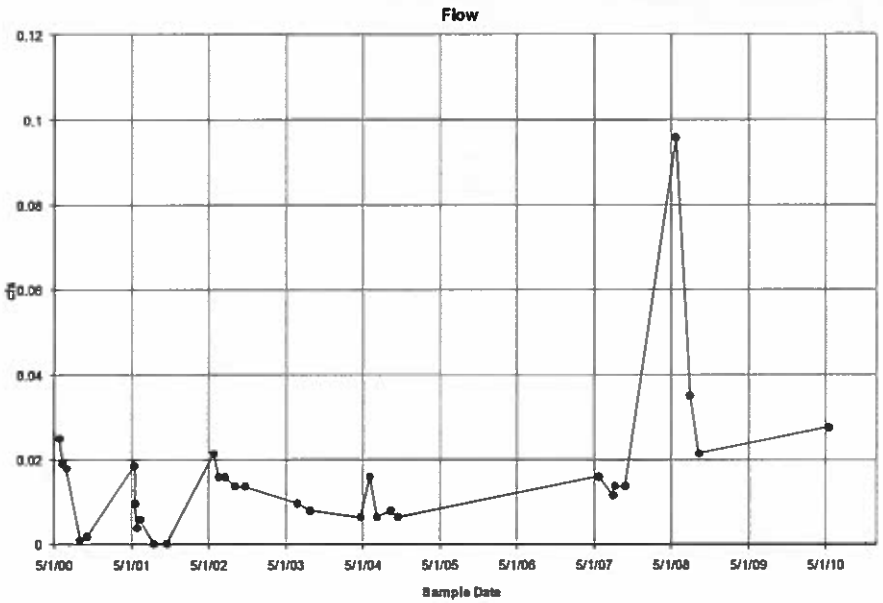


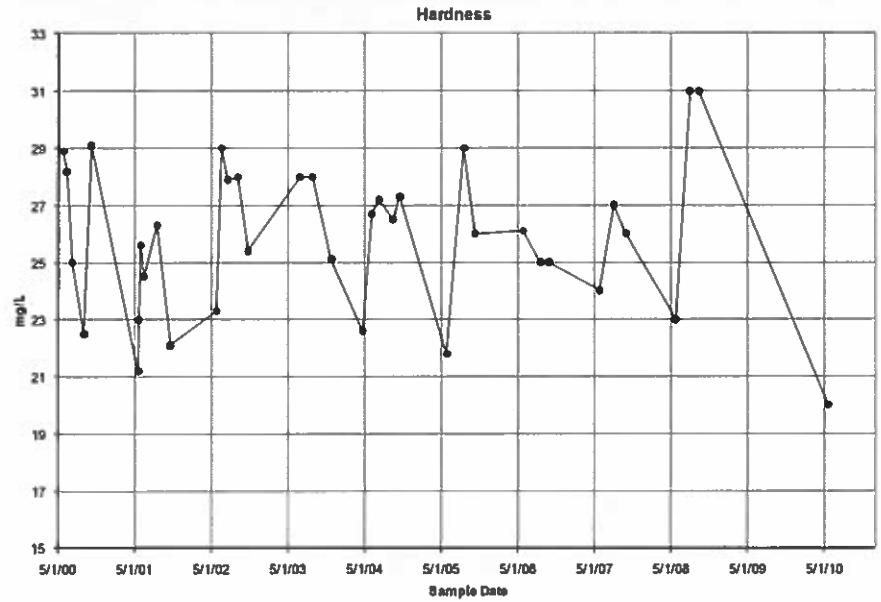


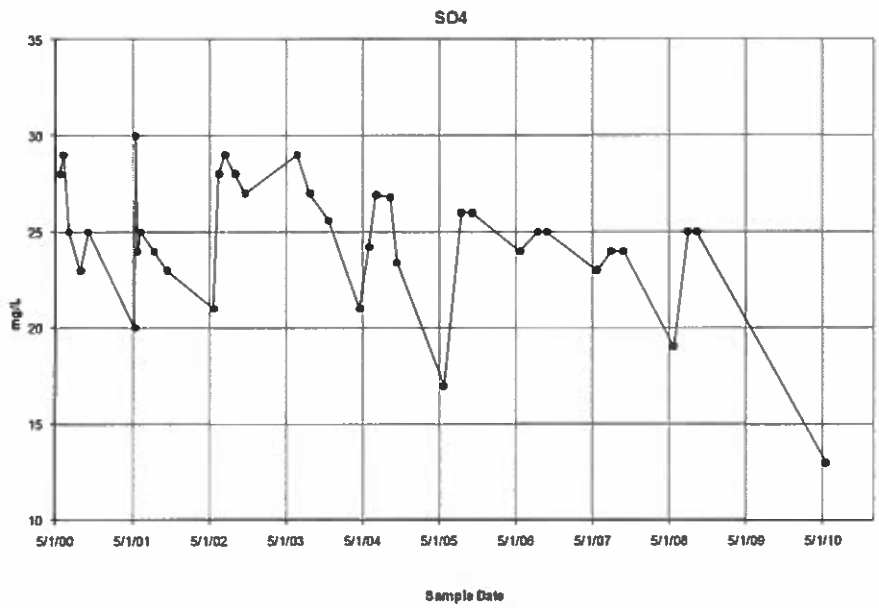
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

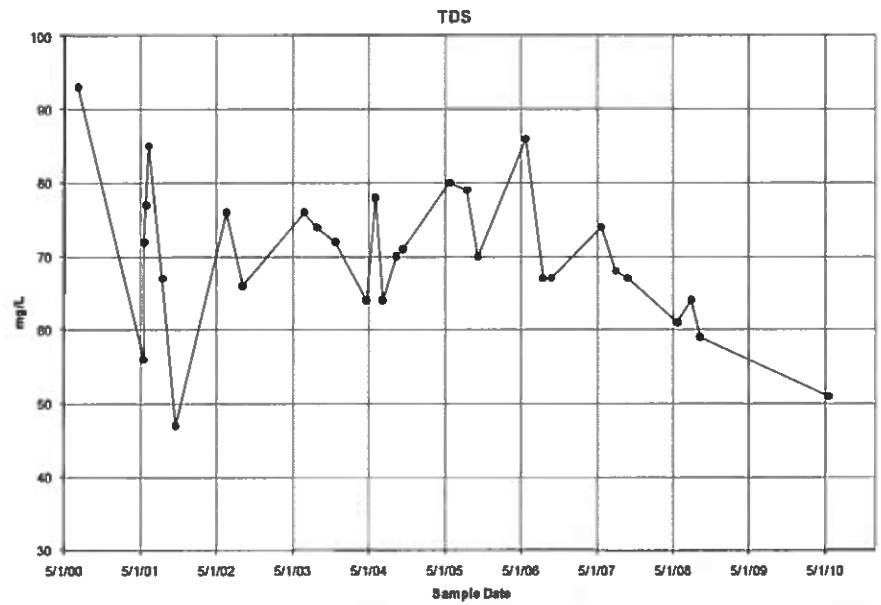
FIGURE 4-9b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-11

PREPARED FOR: Formation





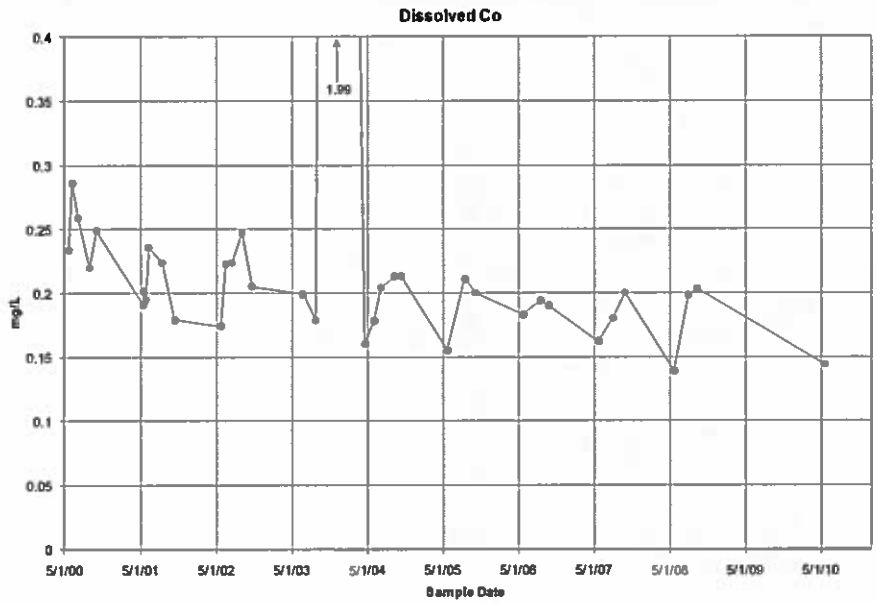


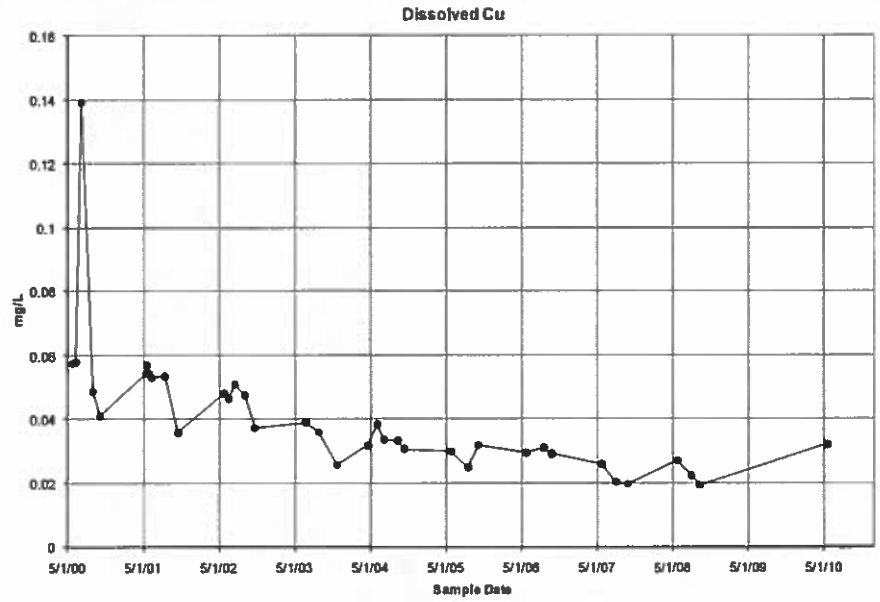


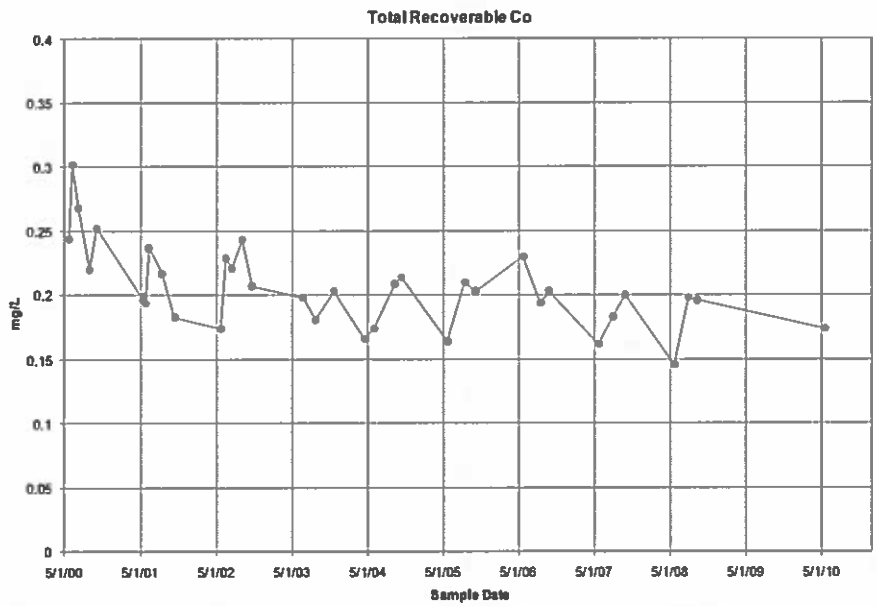
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

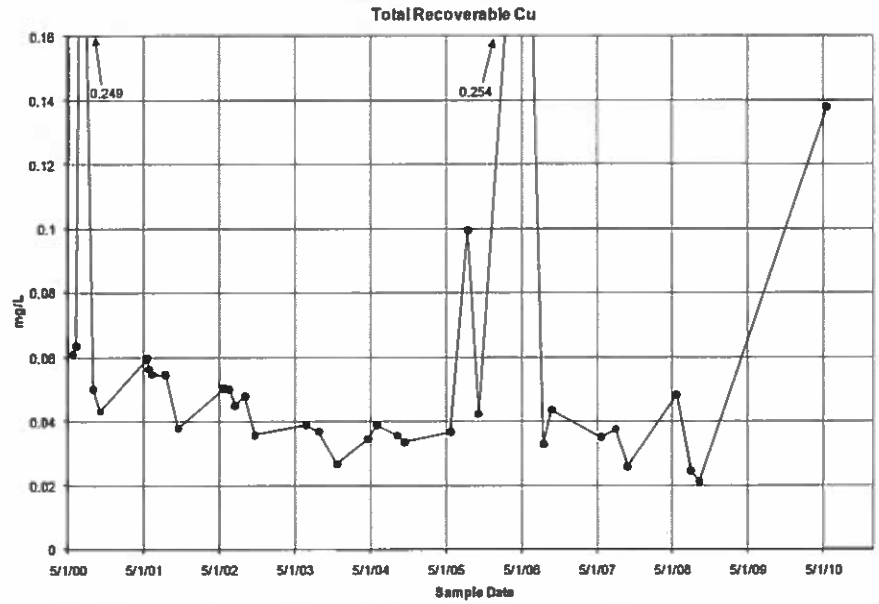
FIGURE 4-10a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-13

PREPARED FOR: Formation









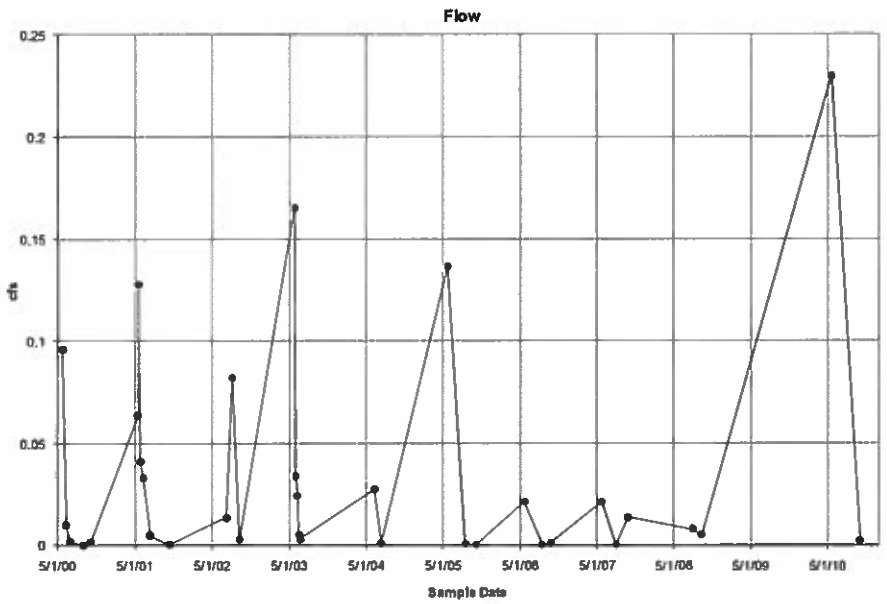
PROJECT	TASK
222100	66

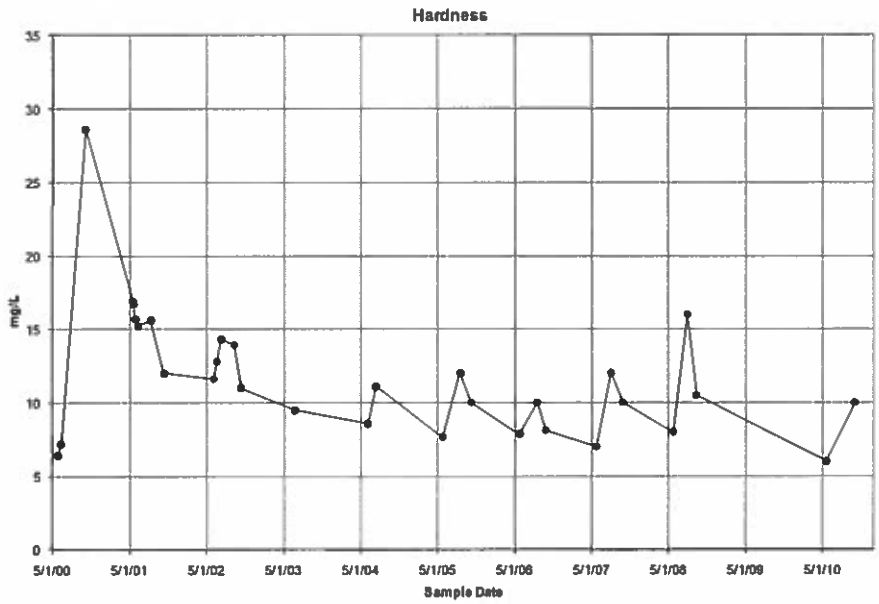
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

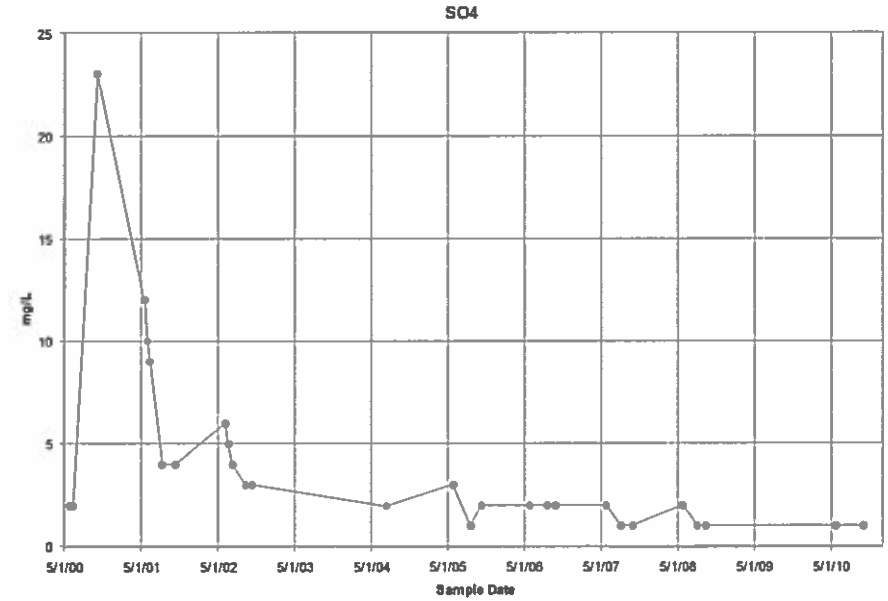
FIGURE 4-10b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-13

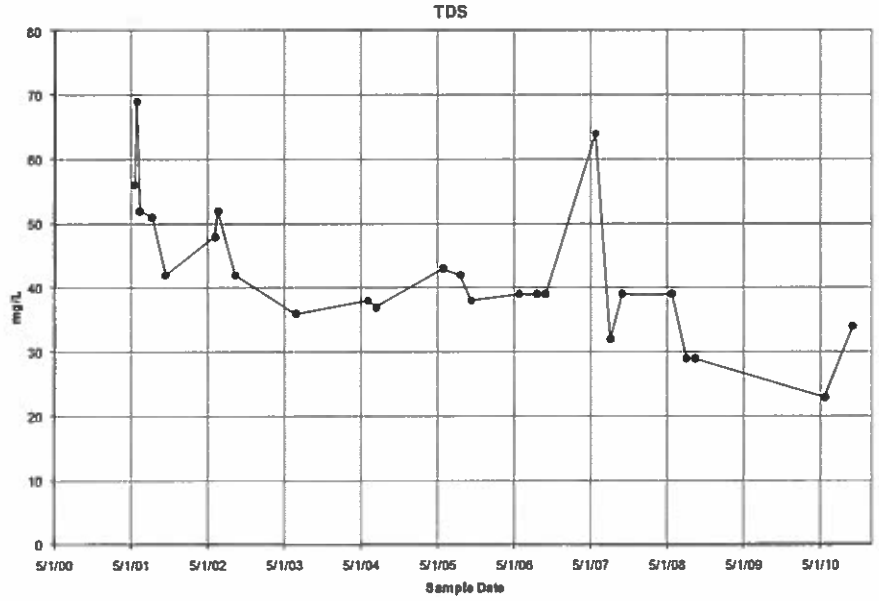
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





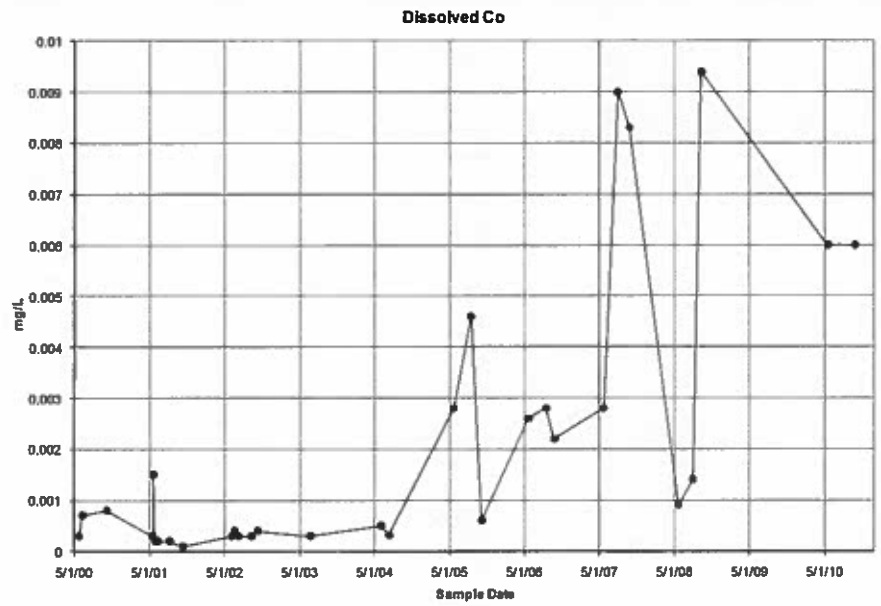


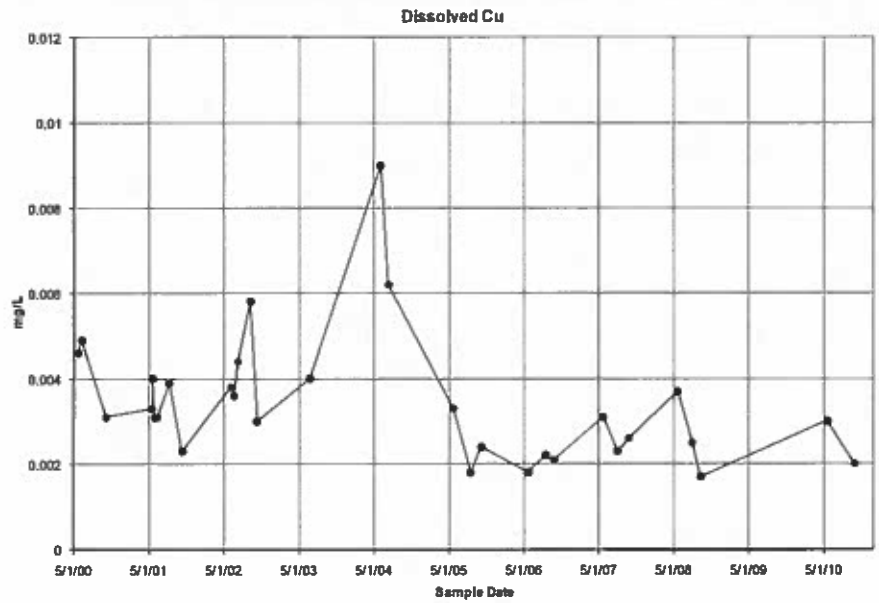


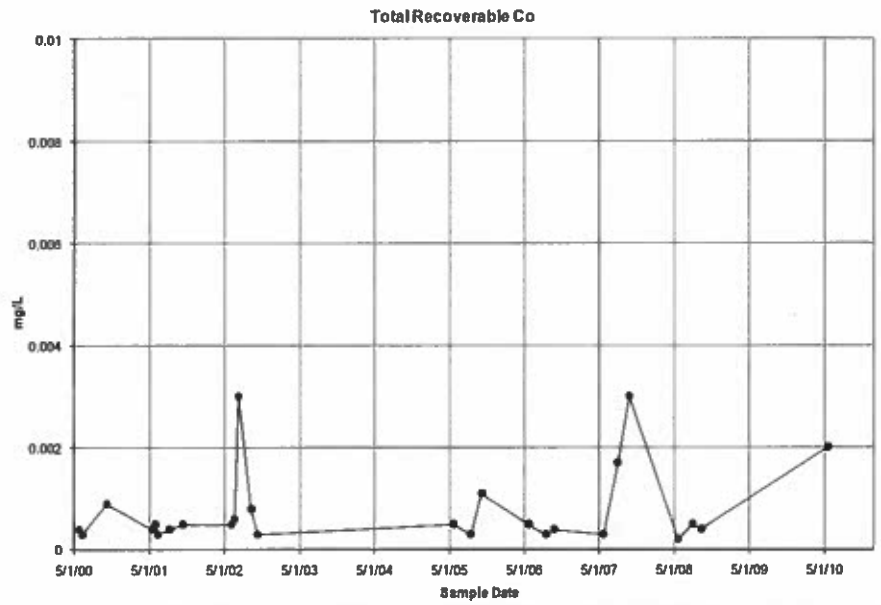
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

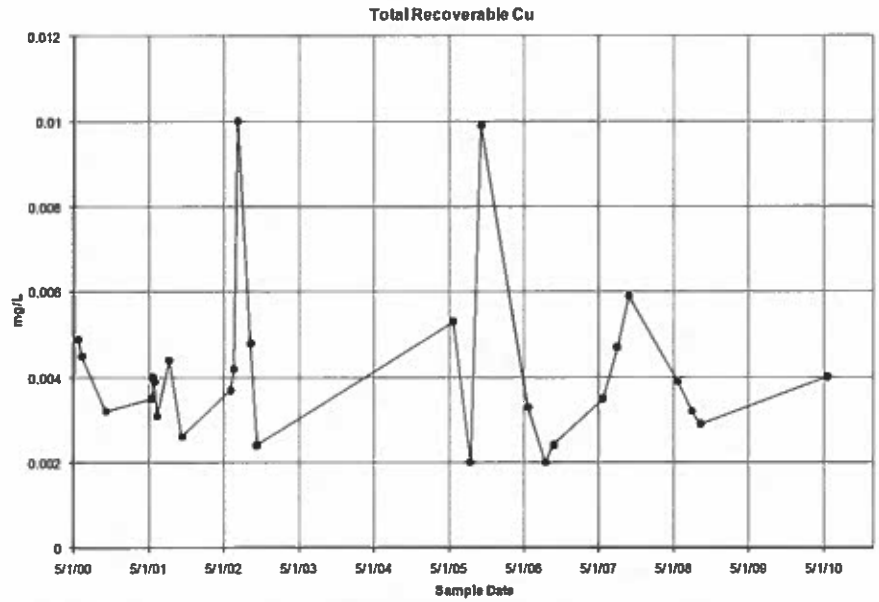
FIGURE 4-11a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-14

PREPARED FOR: Formation





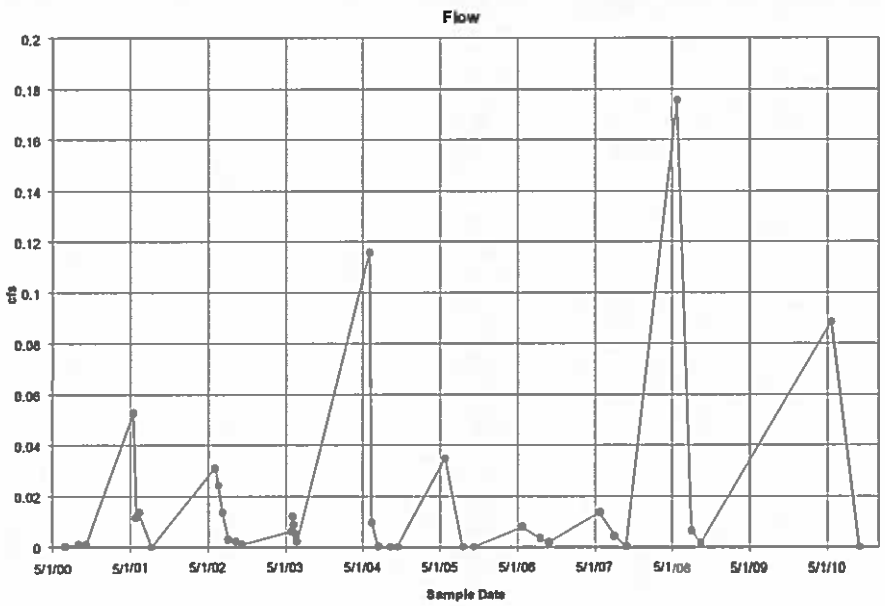


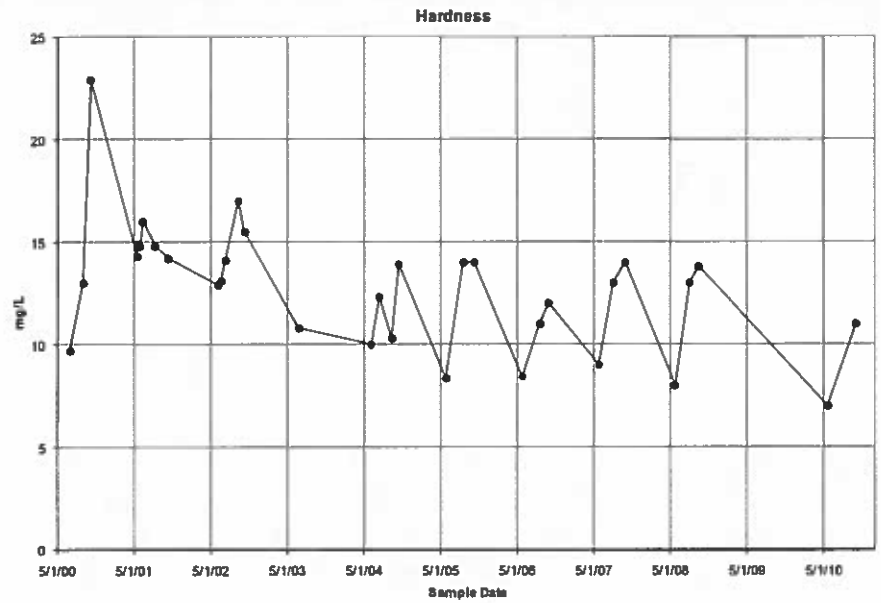


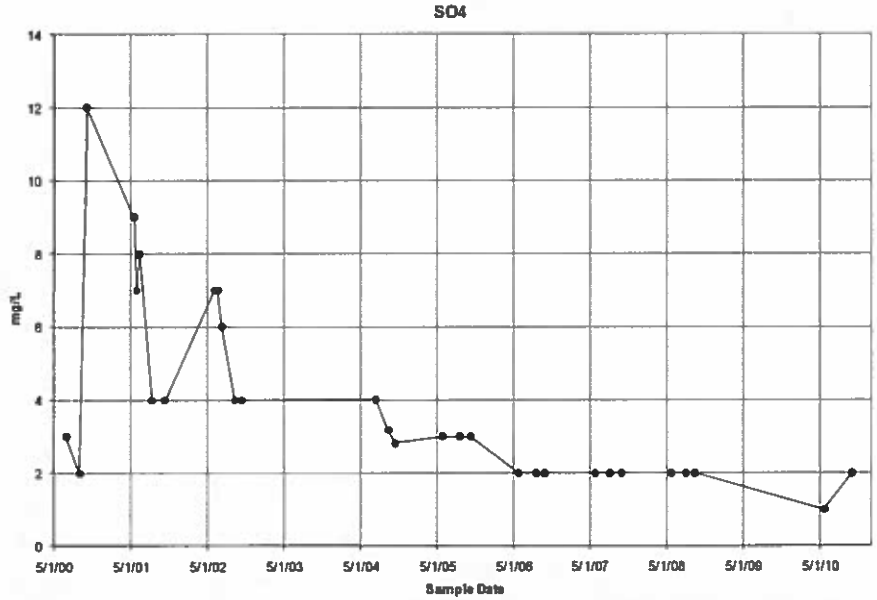
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

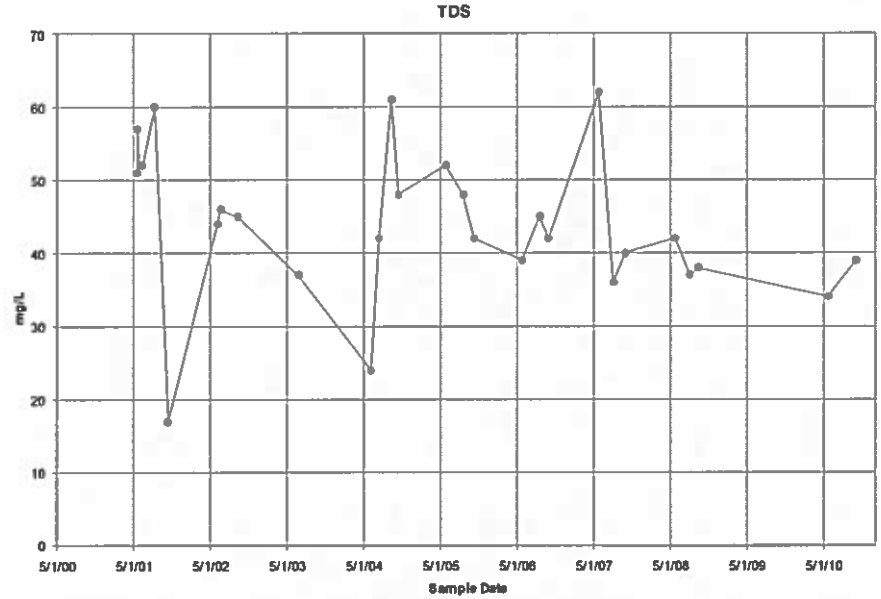
FIGURE 4-11b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-14

PREPARED FOR: Formation







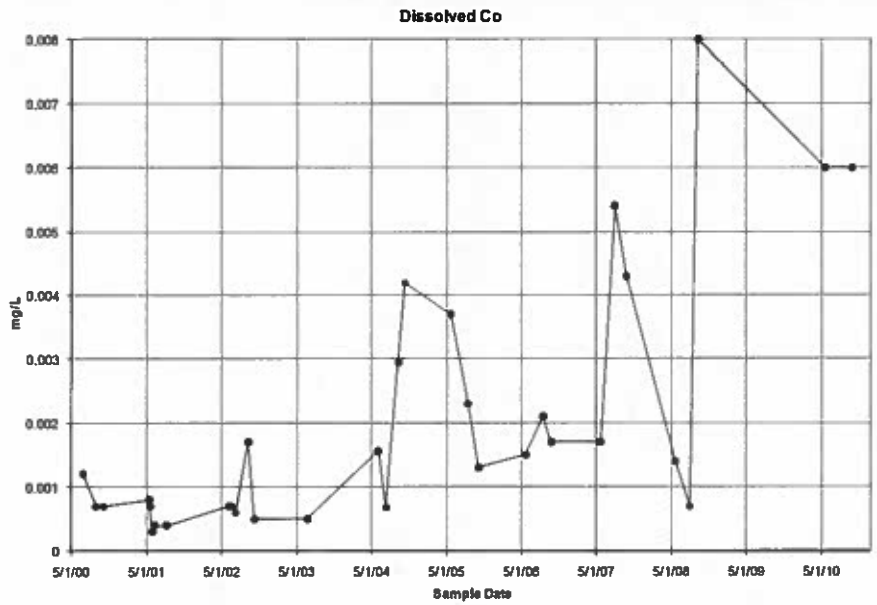


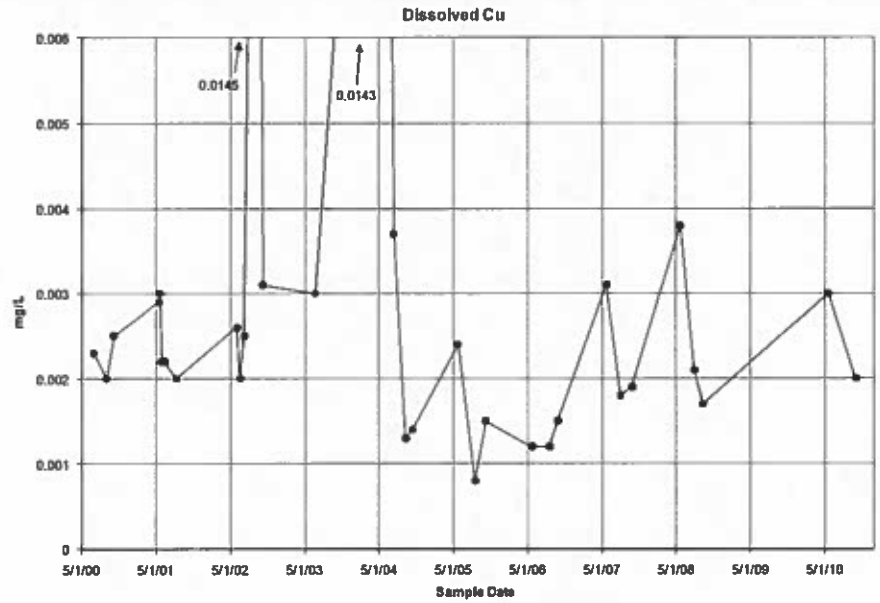
PROJECT	TASK
222100	66

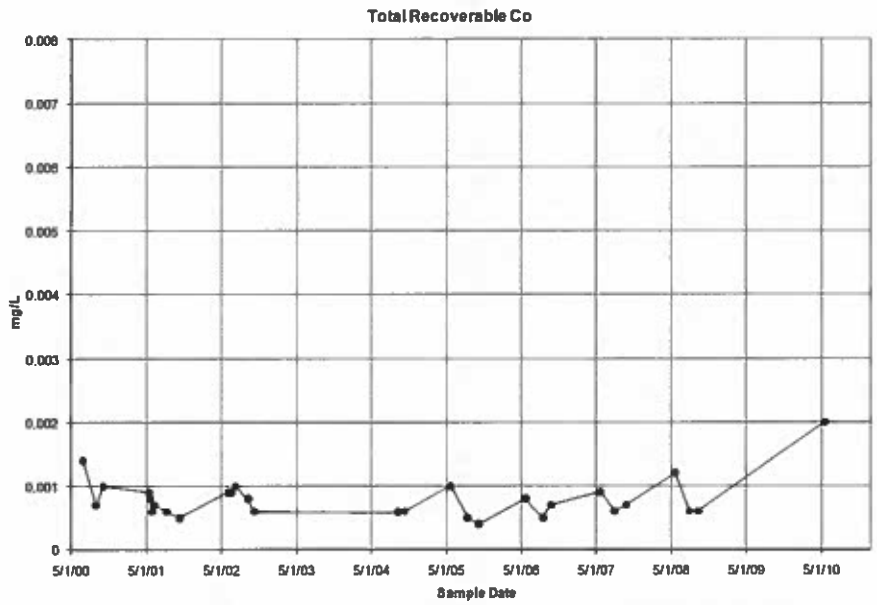
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED

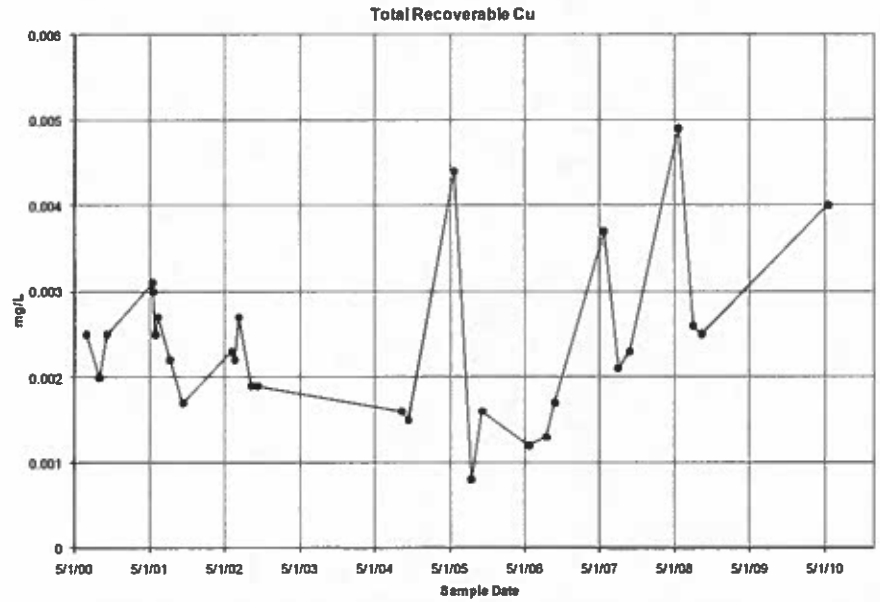
FIGURE 4-12a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-15

PREPARED FOR: Formation





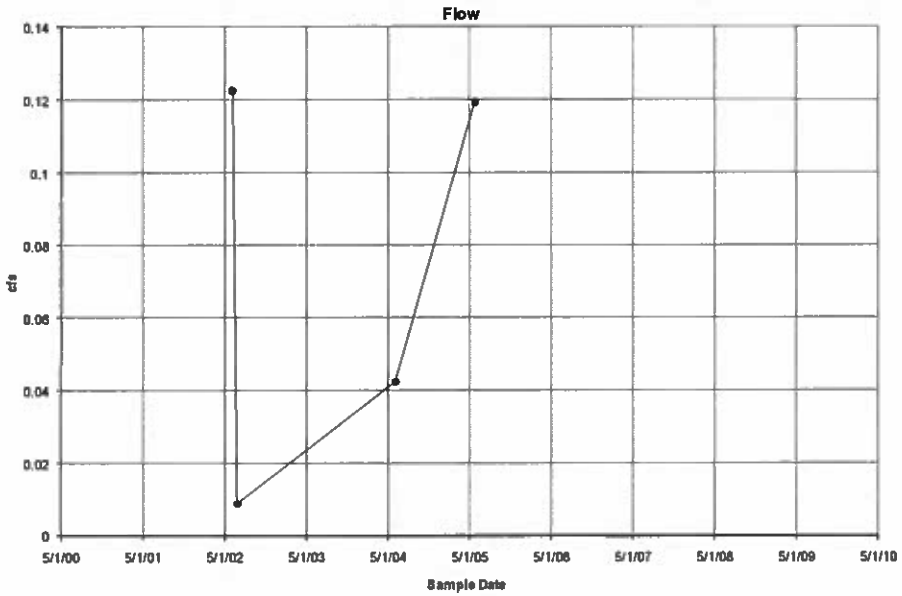


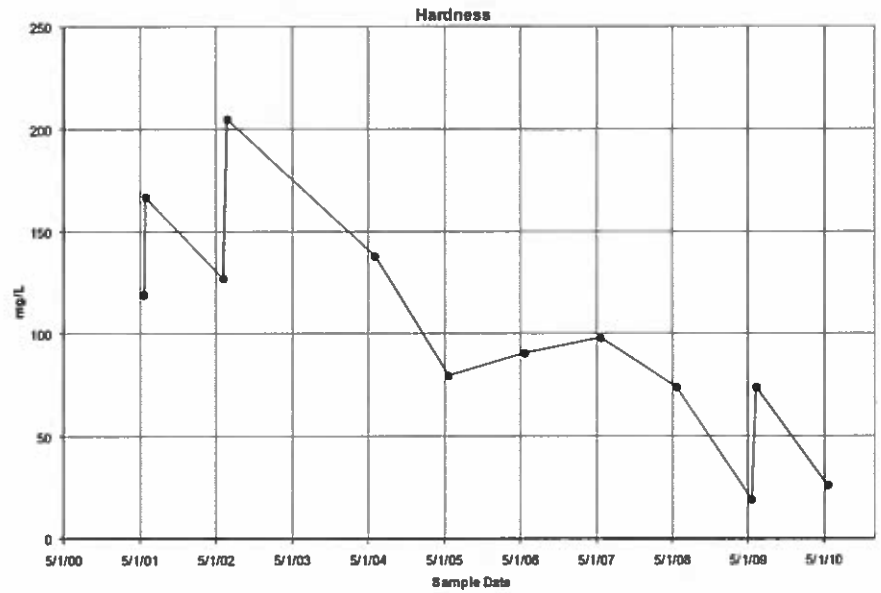


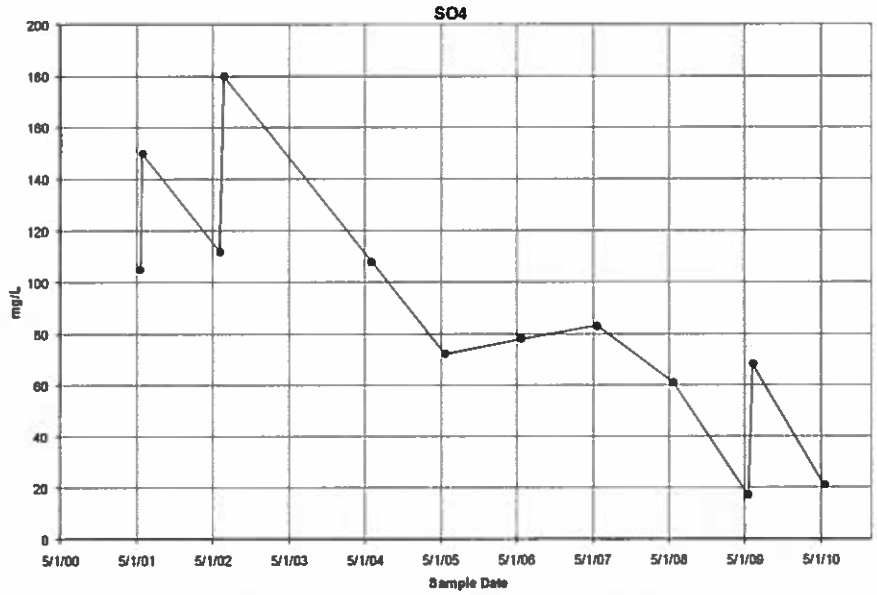
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

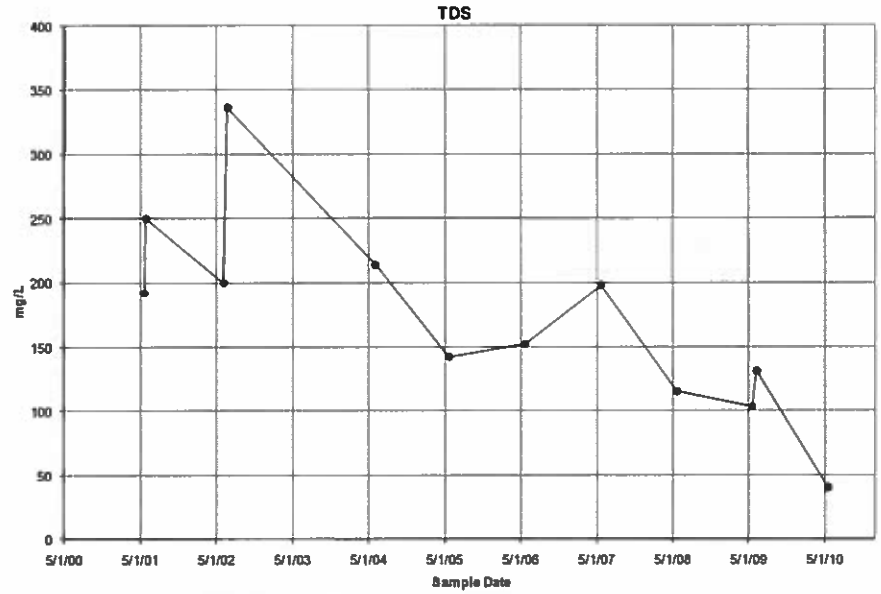
FIGURE 4-12b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-15

PREPARED FOR: Formation





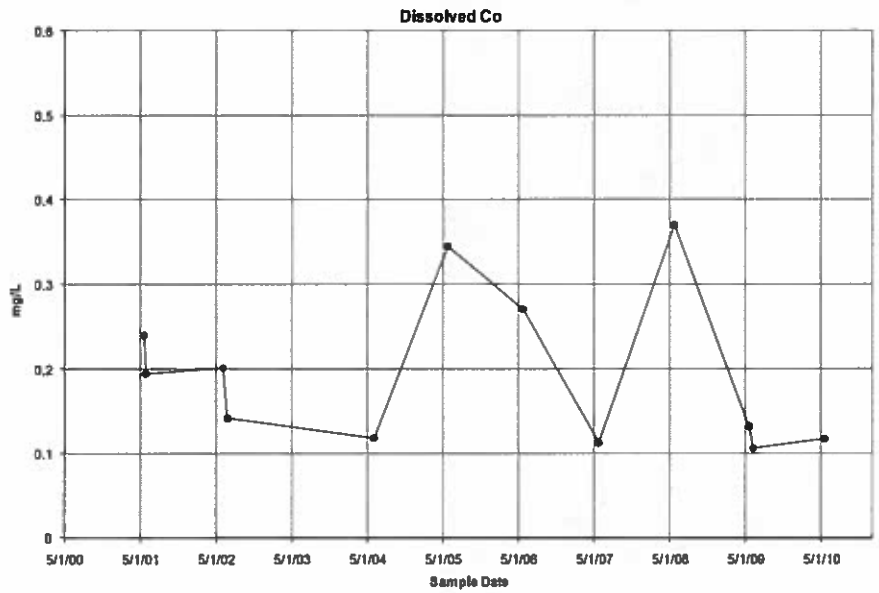


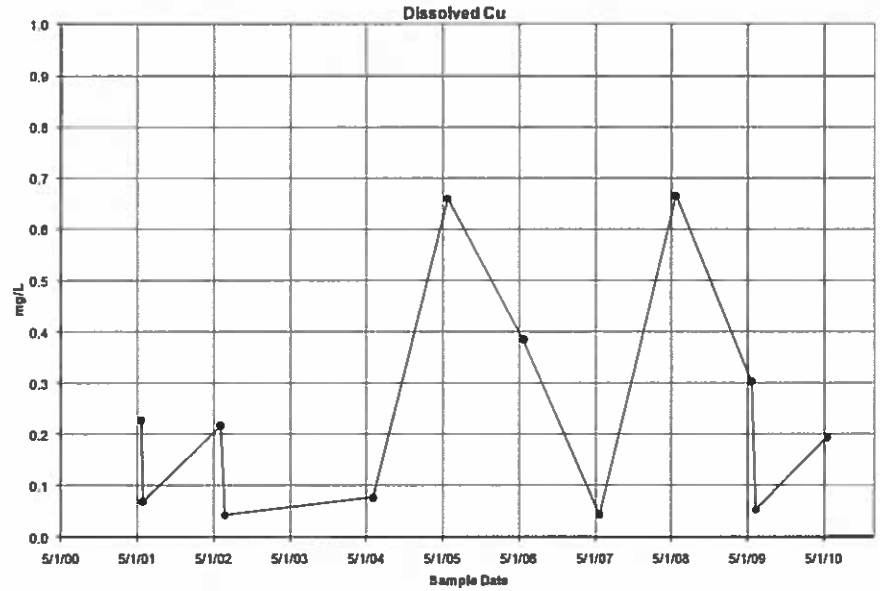


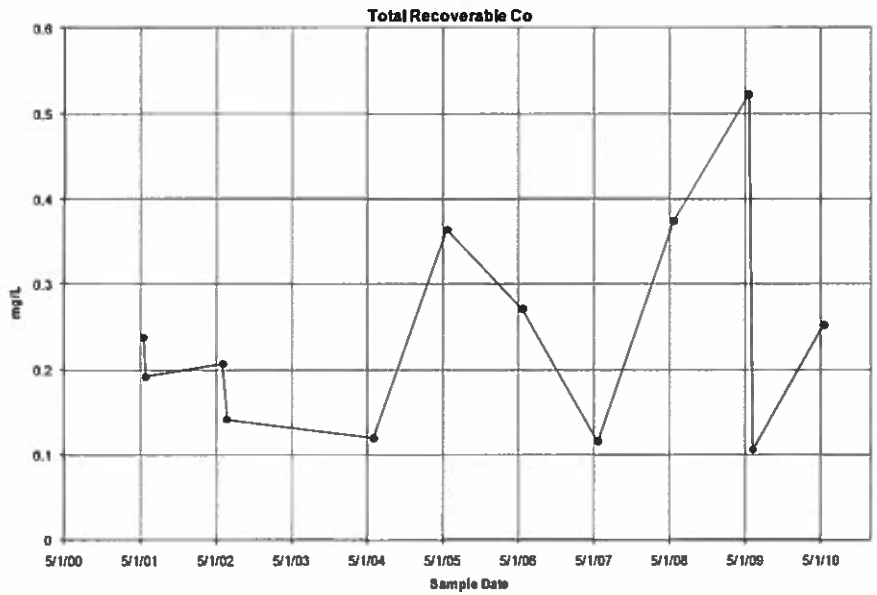
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

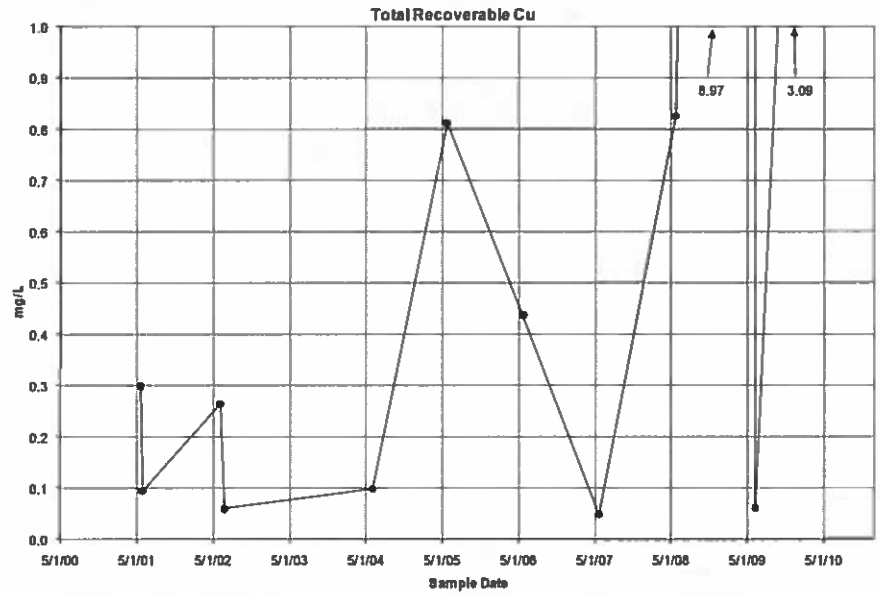
FIGURE 4-13a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-16

PREPARED FOR: Formation





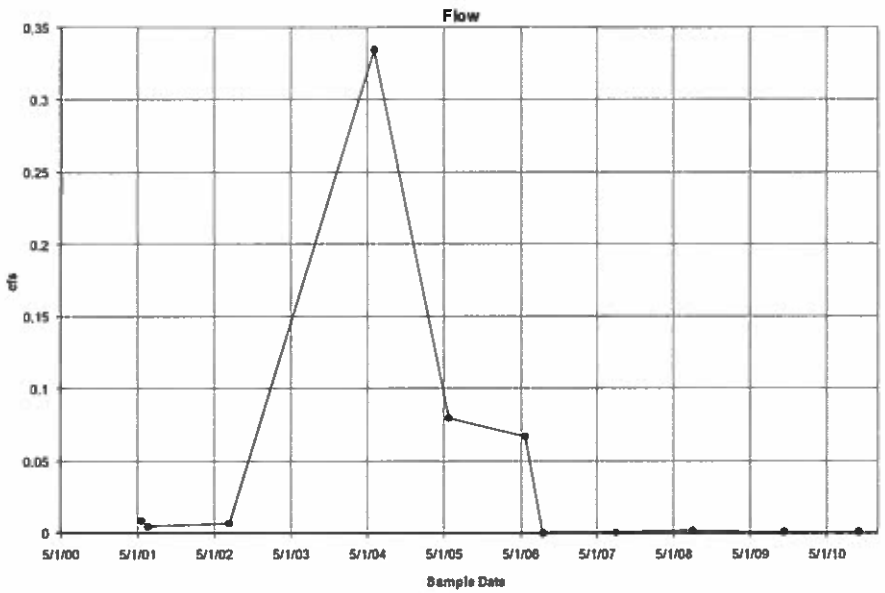


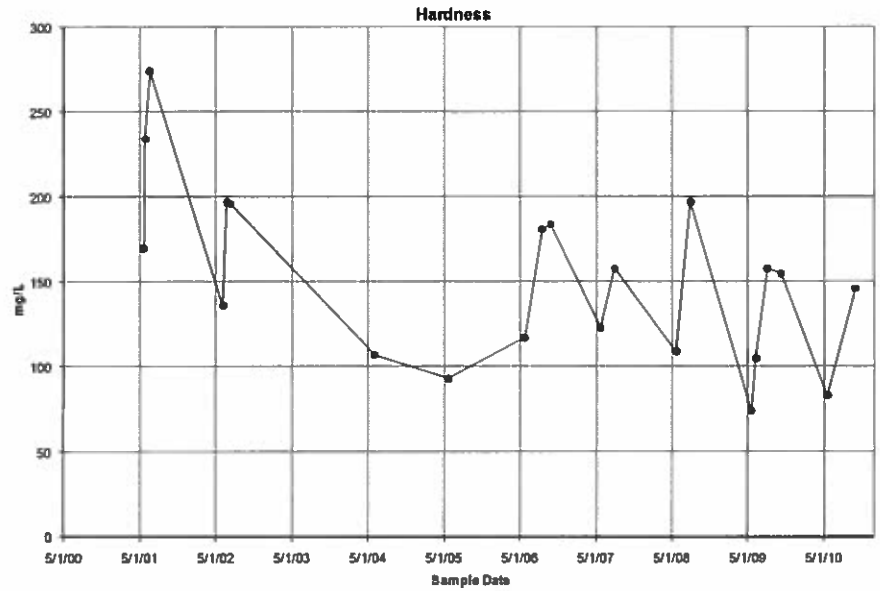


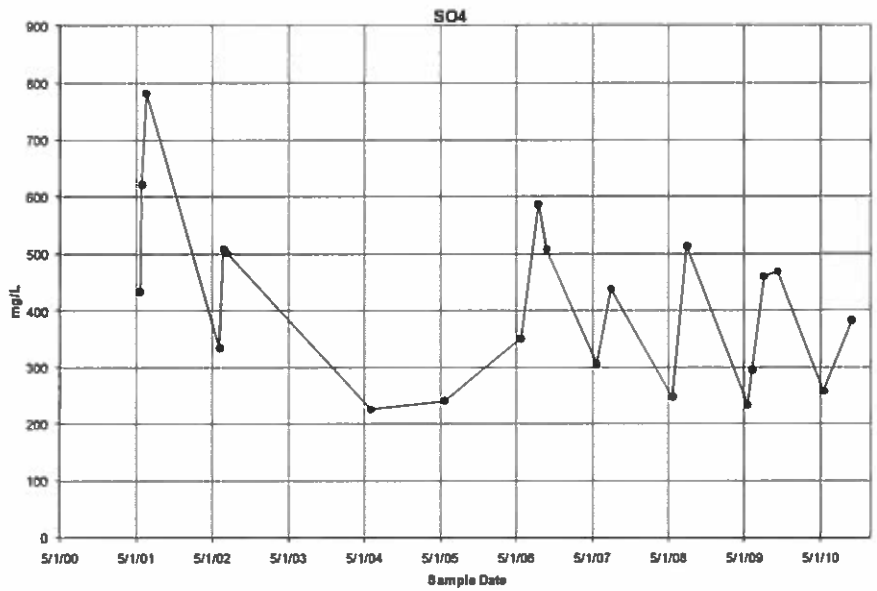
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

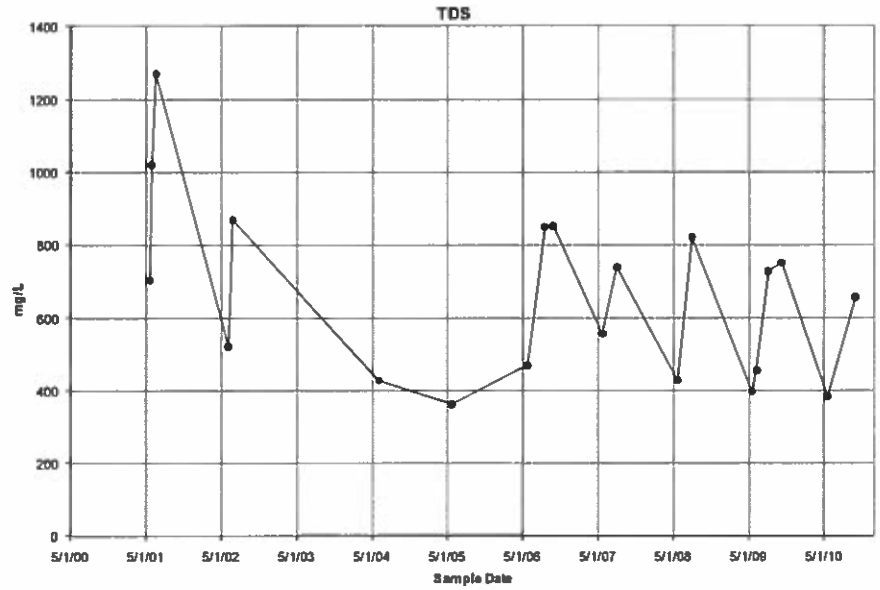
FIGURE 4-13b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-16

PREPARED FOR: Formation





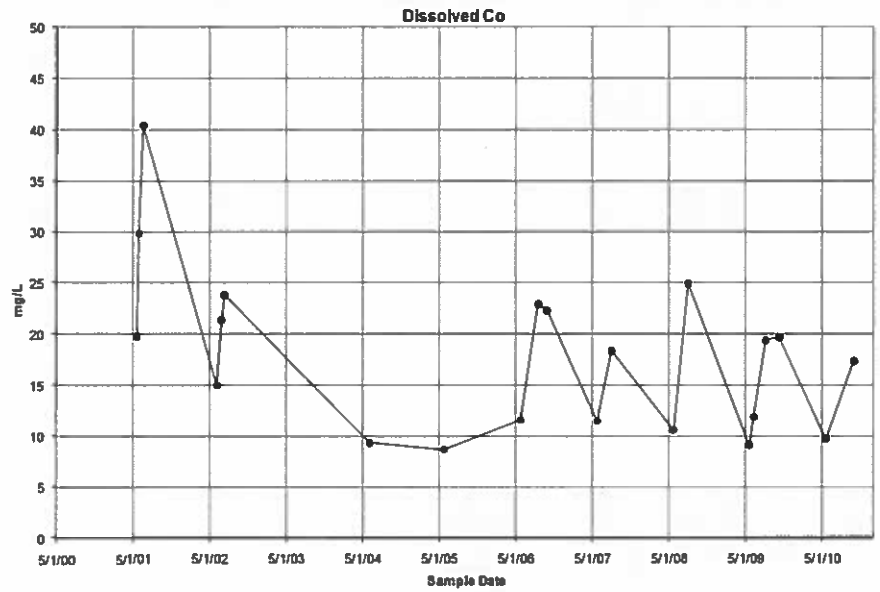


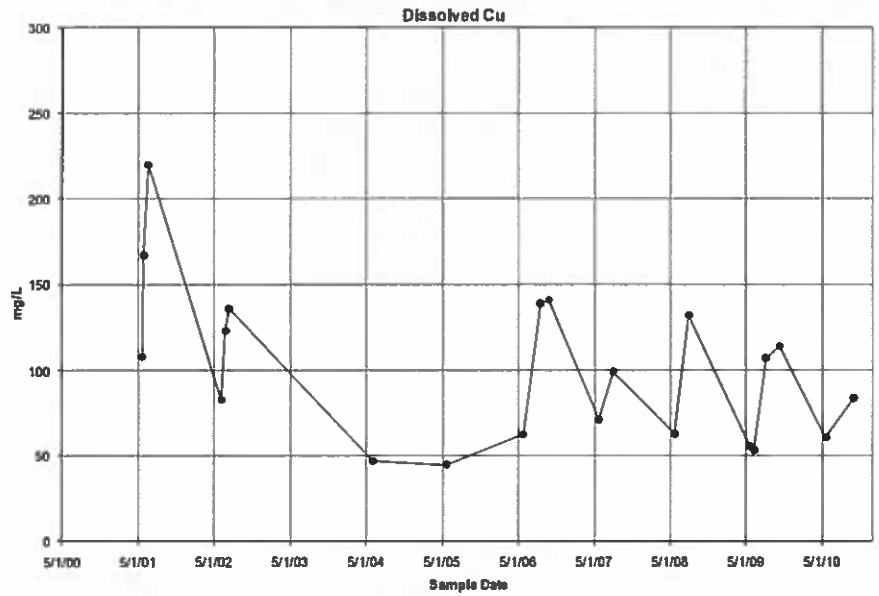


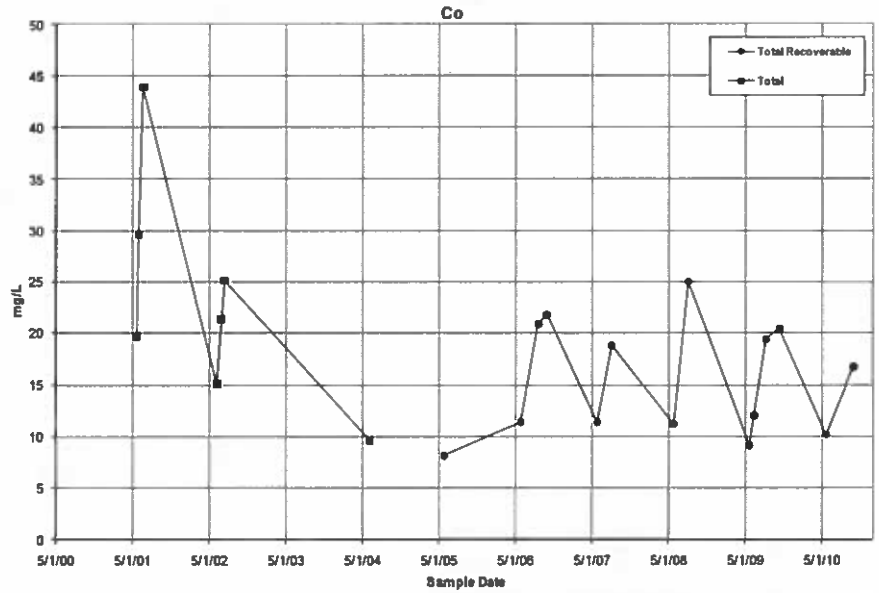
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

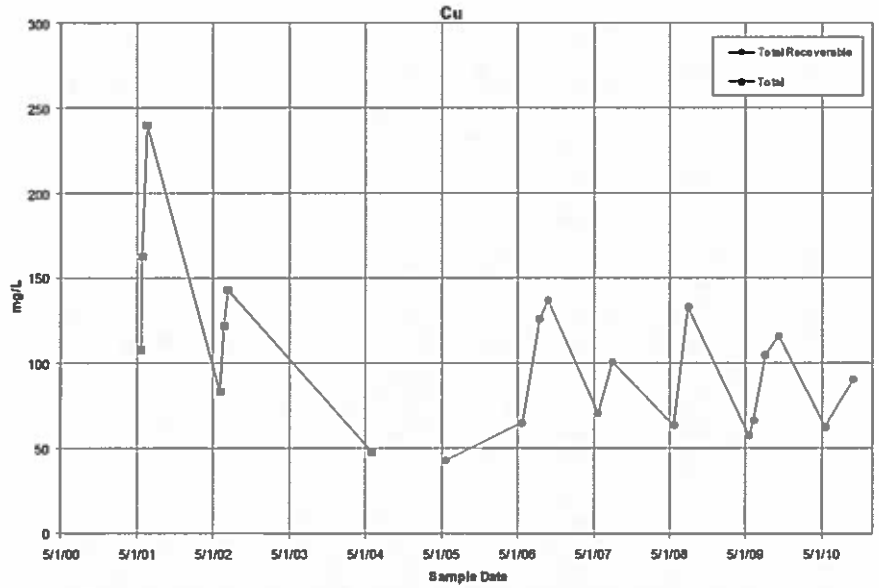
FIGURE 4-14a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-17

PREPARED FOR: Formation







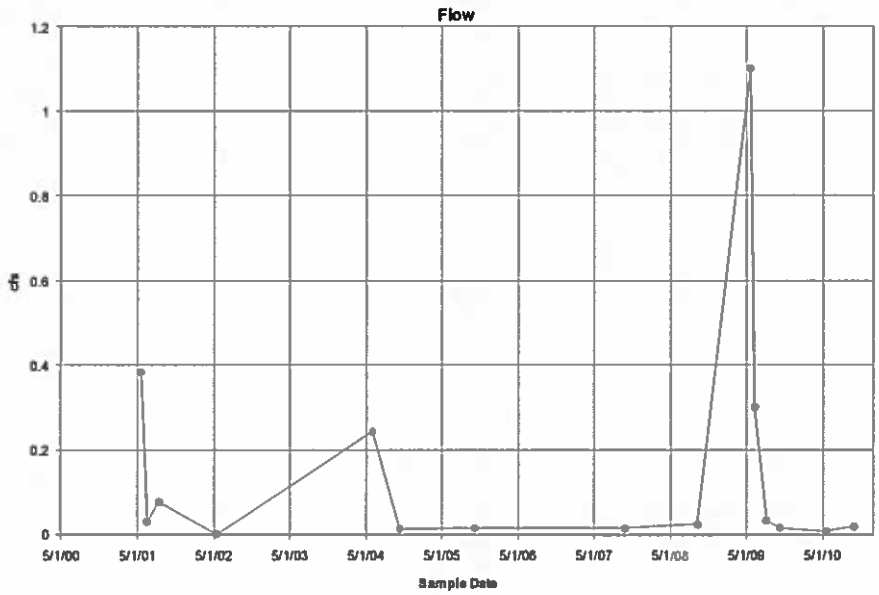


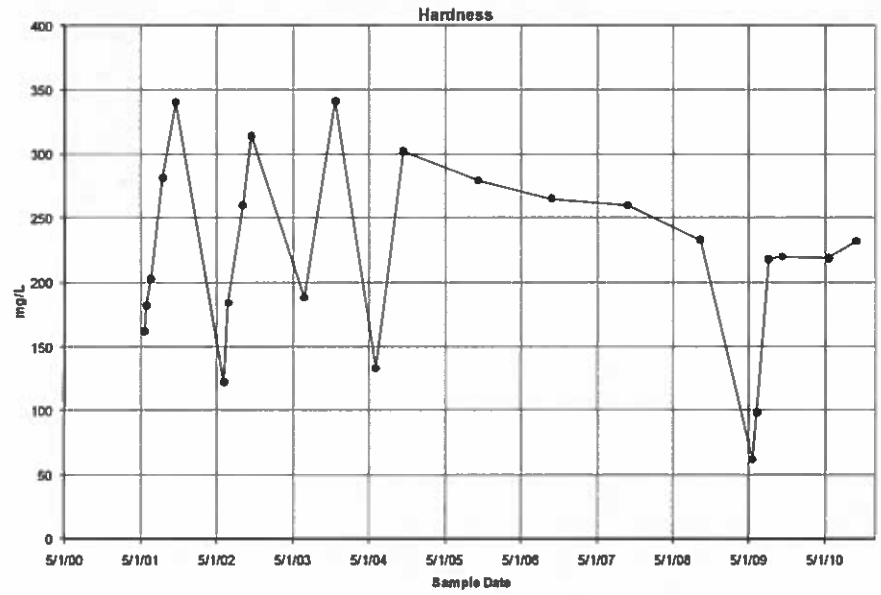
PROJECT: 222100	TASK 66

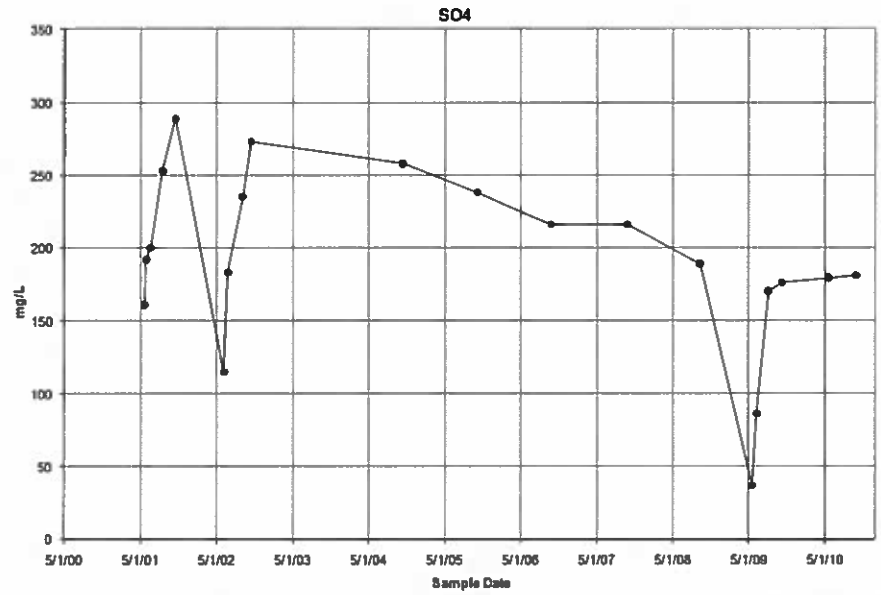
PREPARED BY: TELESTO SOLUTIONS INCORPORATED

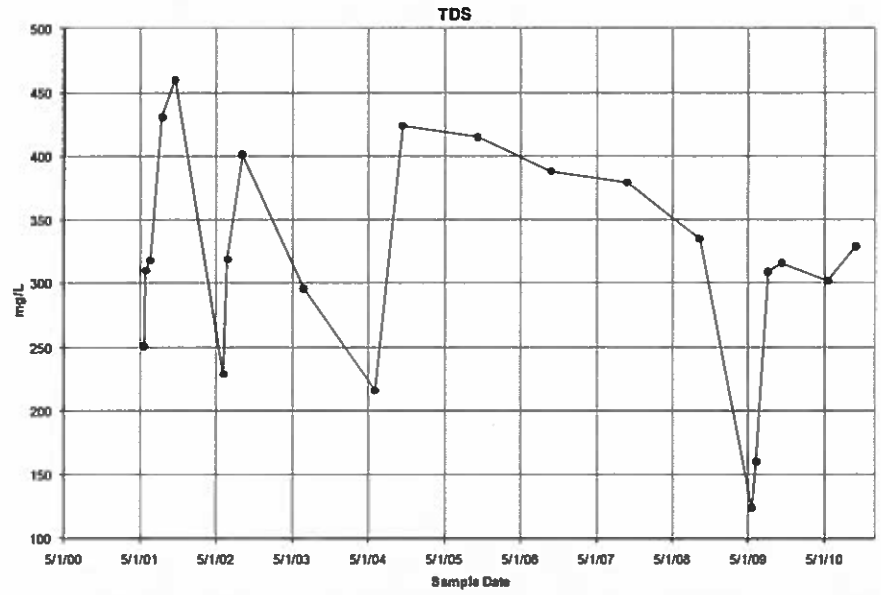
FIGURE 4-14b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-17

PREPARED FOR: Formation







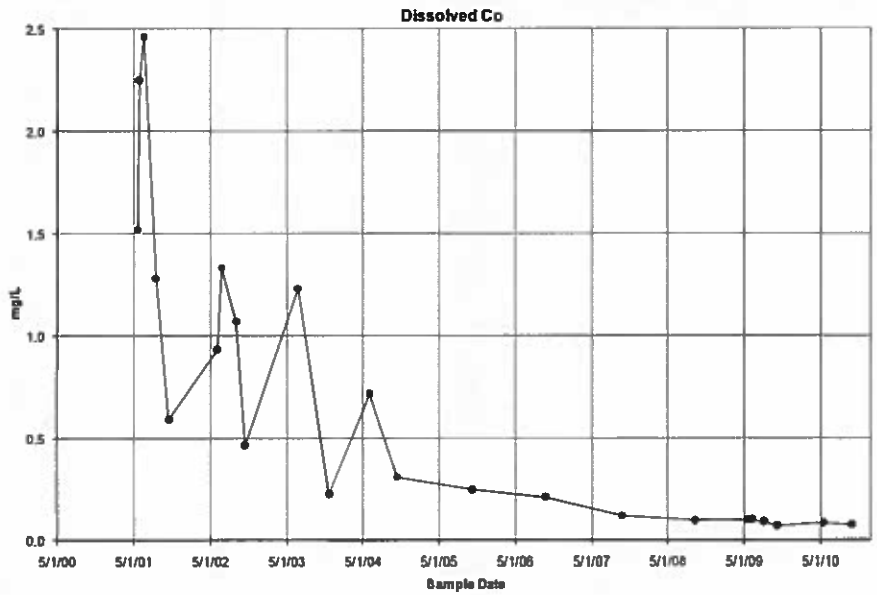


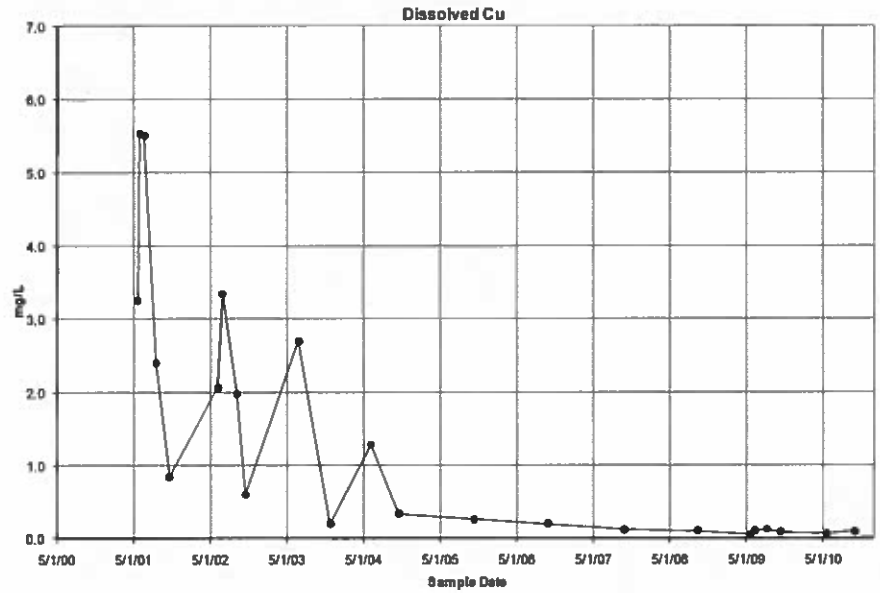
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

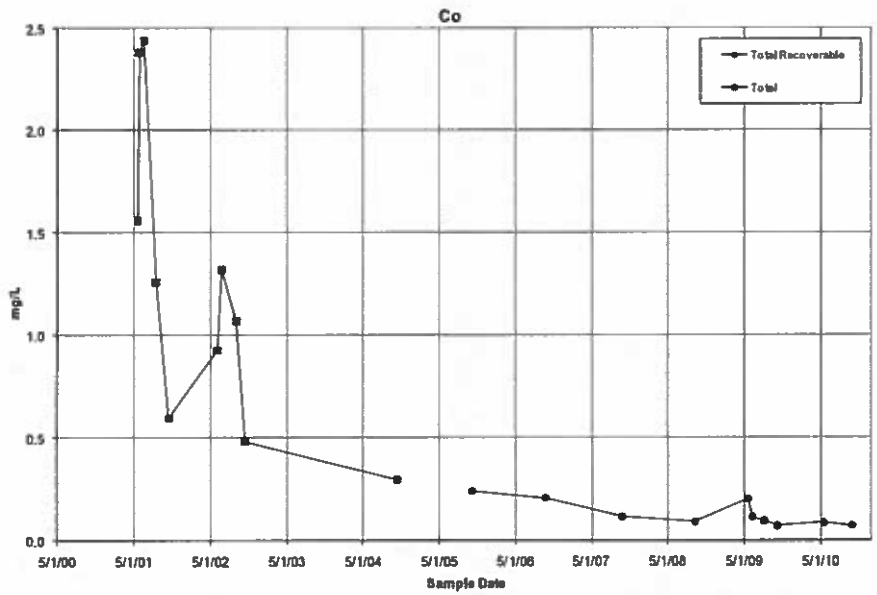
FIGURE 4-15a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-18

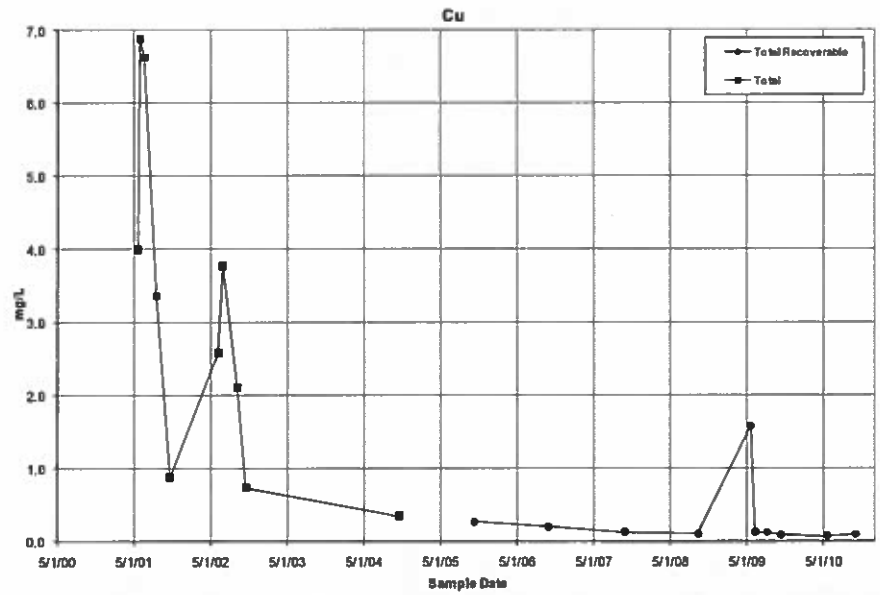
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





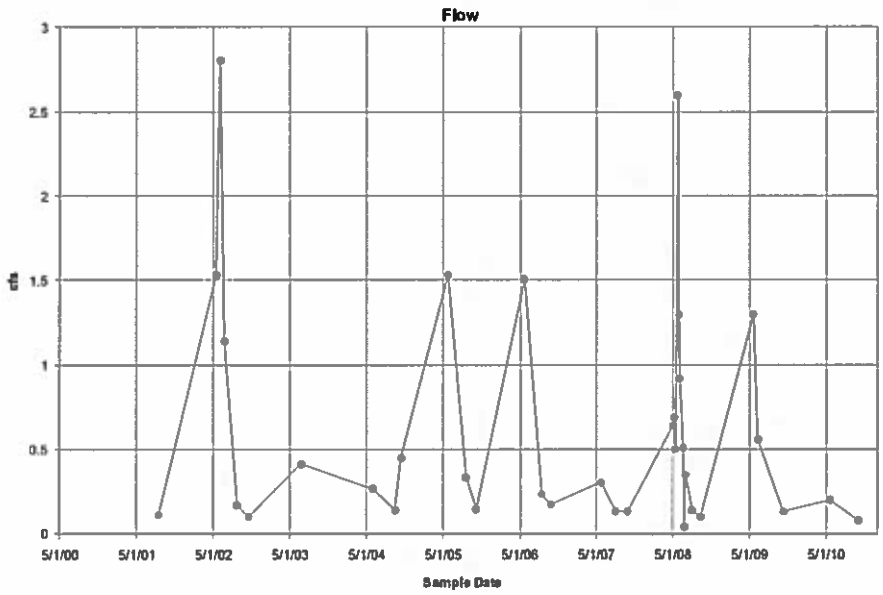


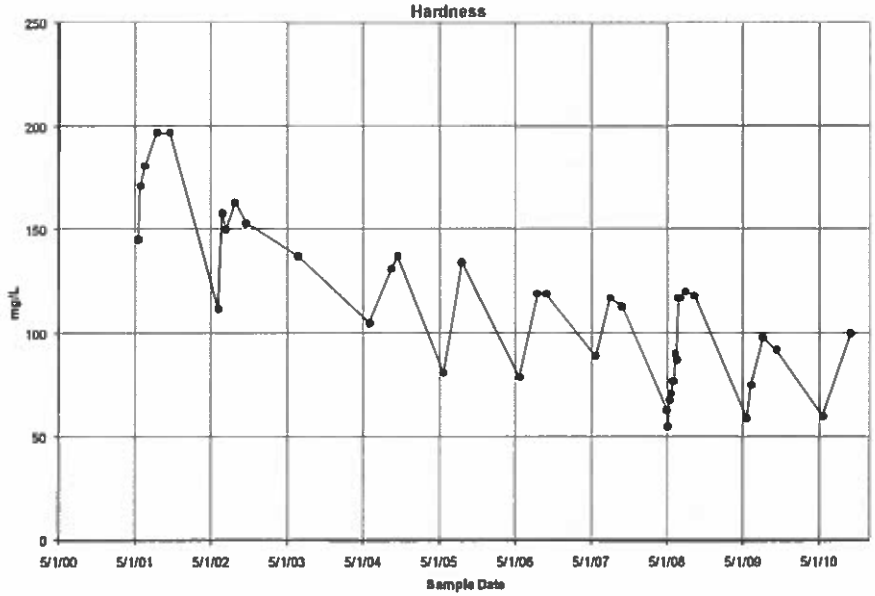


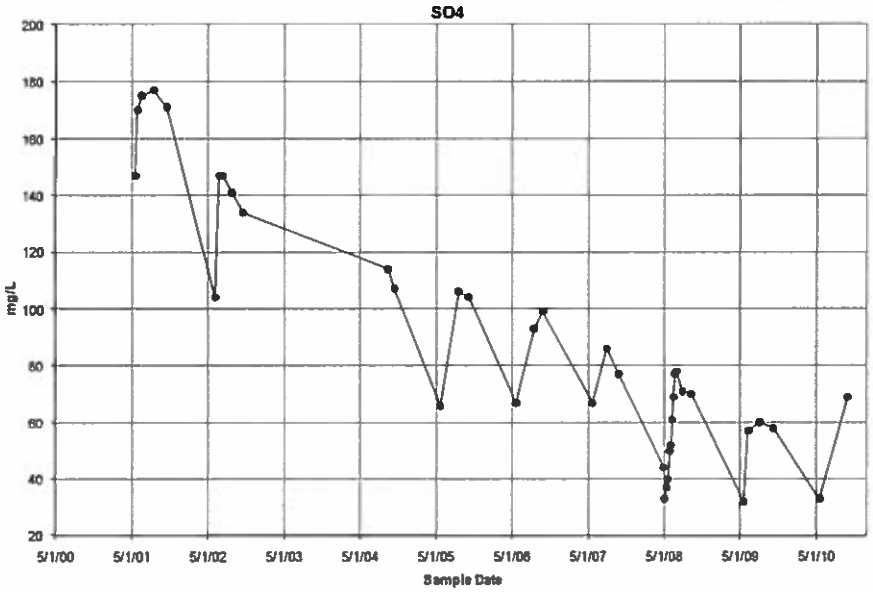
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

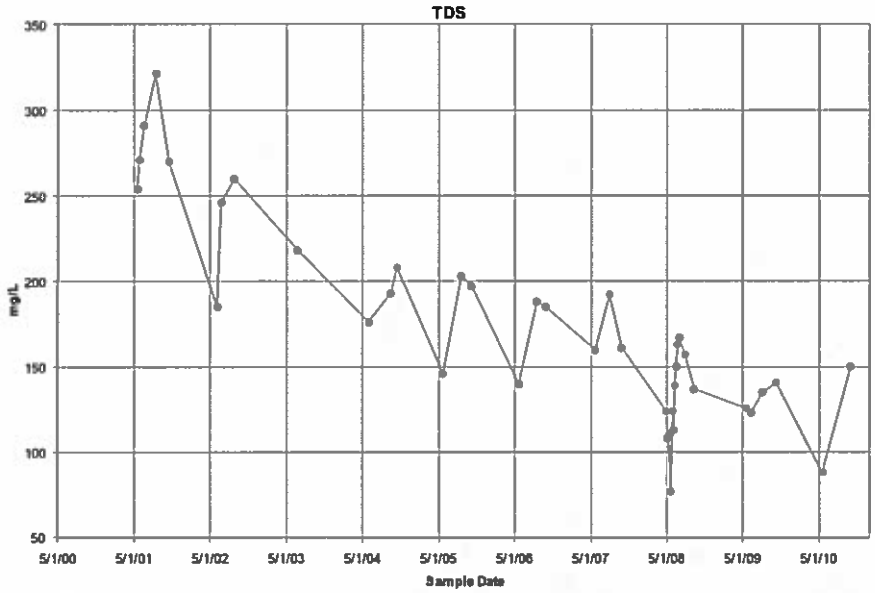
FIGURE 4-15b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-18

PREPARED FOR: Formation







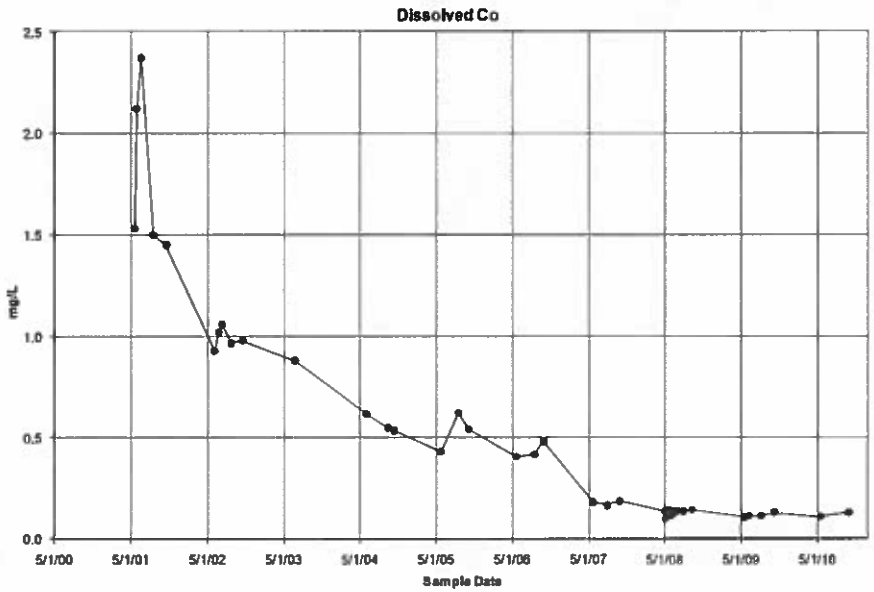


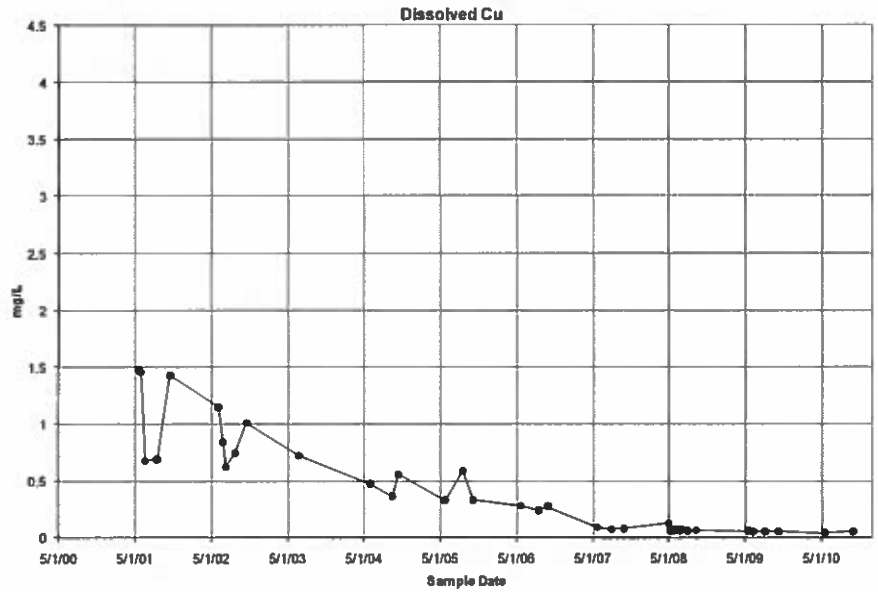
PROJECT	TASK
222100	66

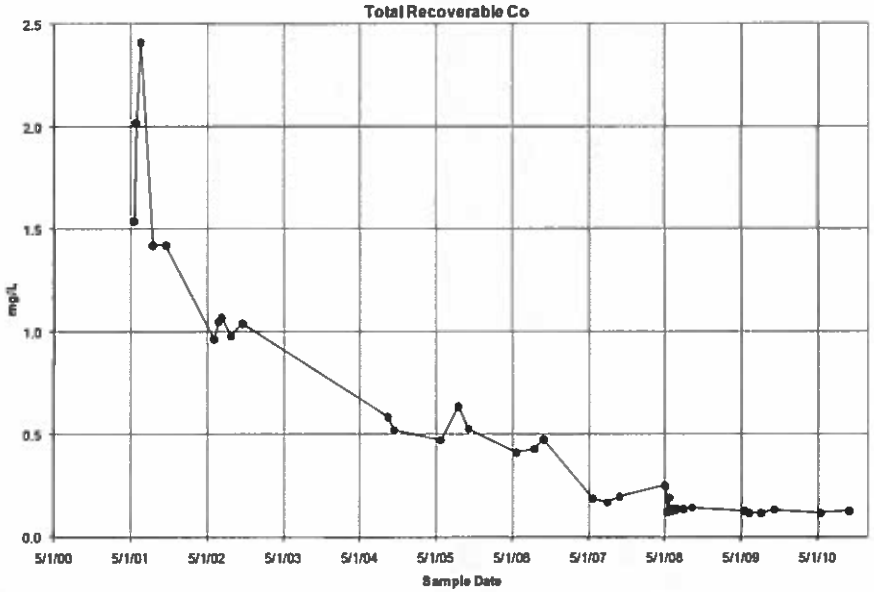
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED

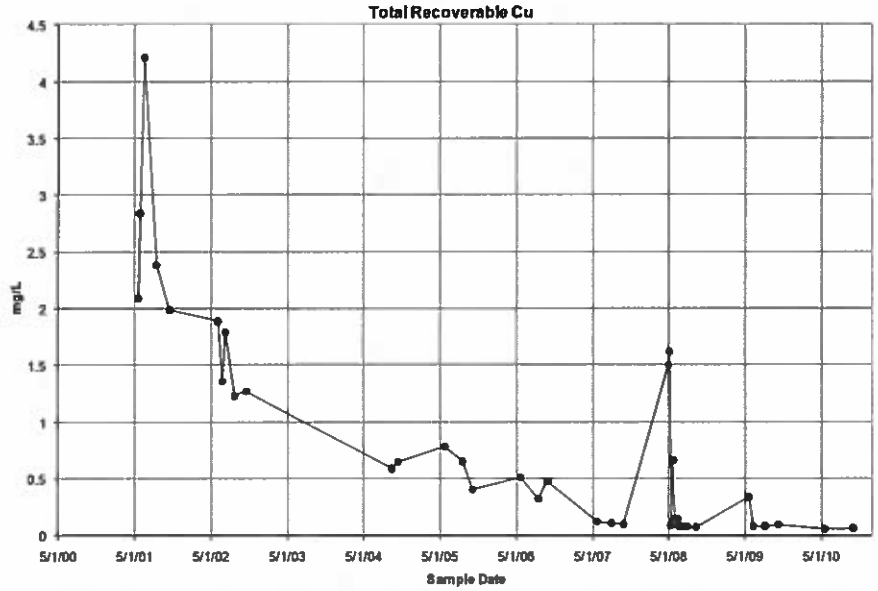
FIGURE 4-16a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-19

PREPARED FOR: Formation





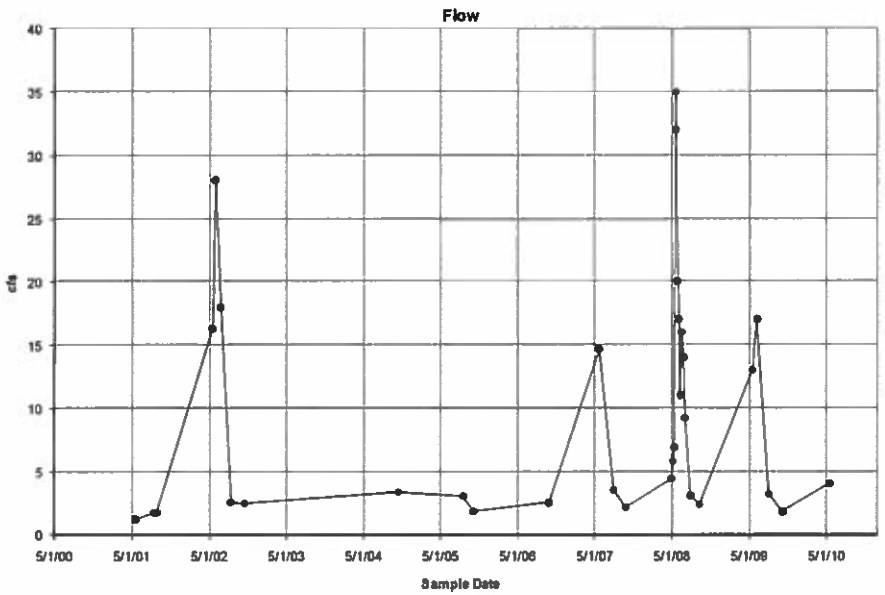


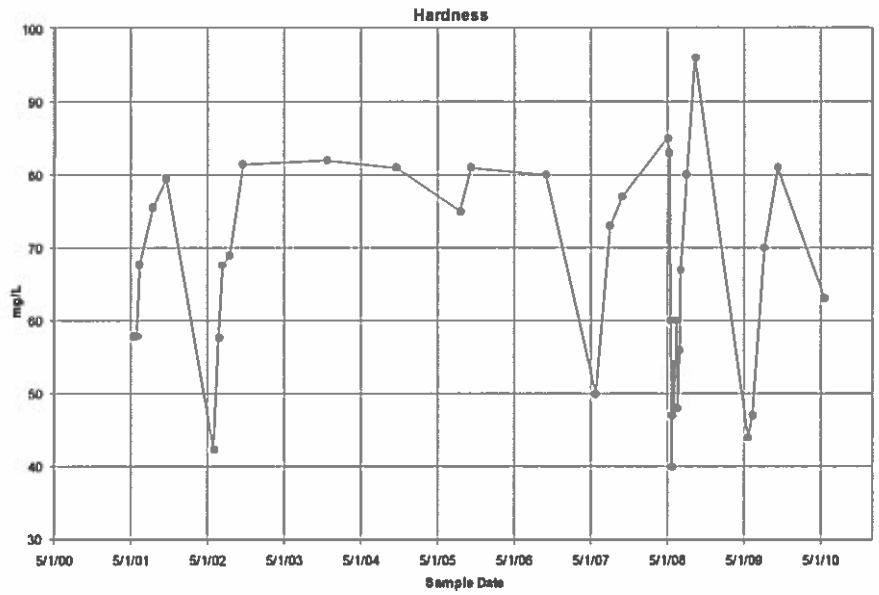


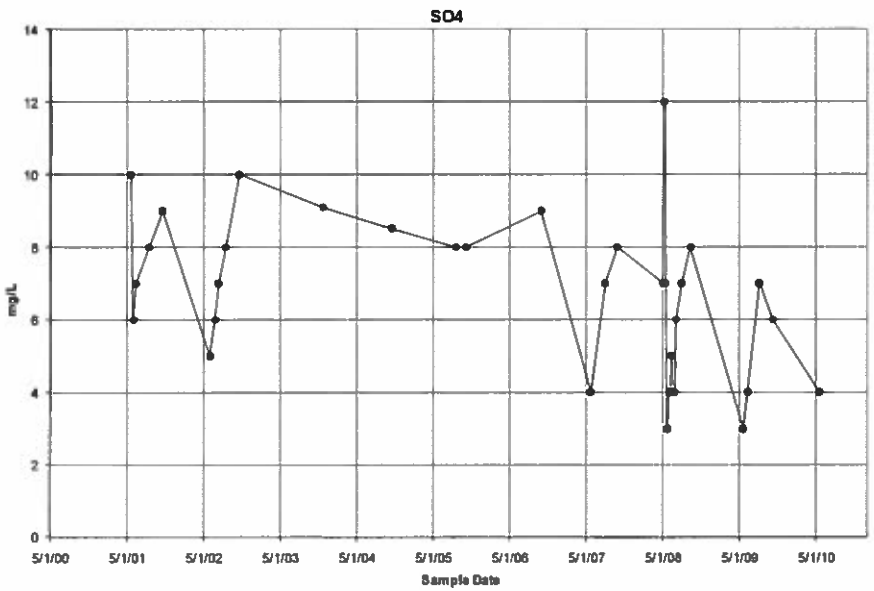
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

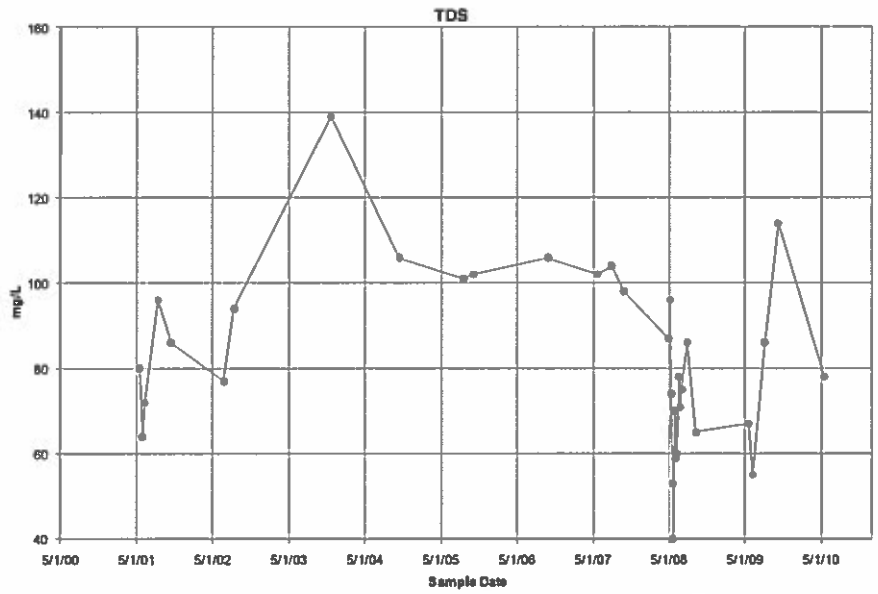
FIGURE 4-16b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-19

PREPARED FOR: Formation







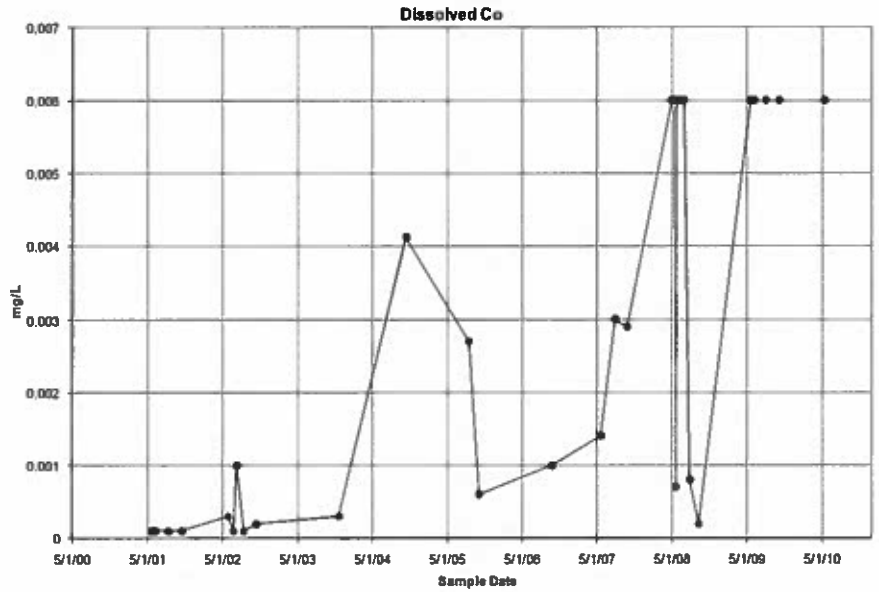


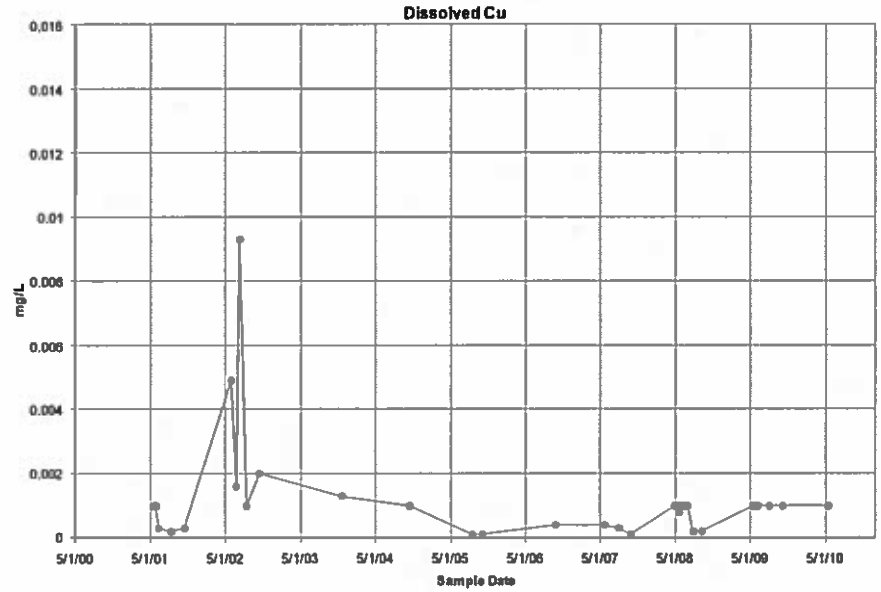
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

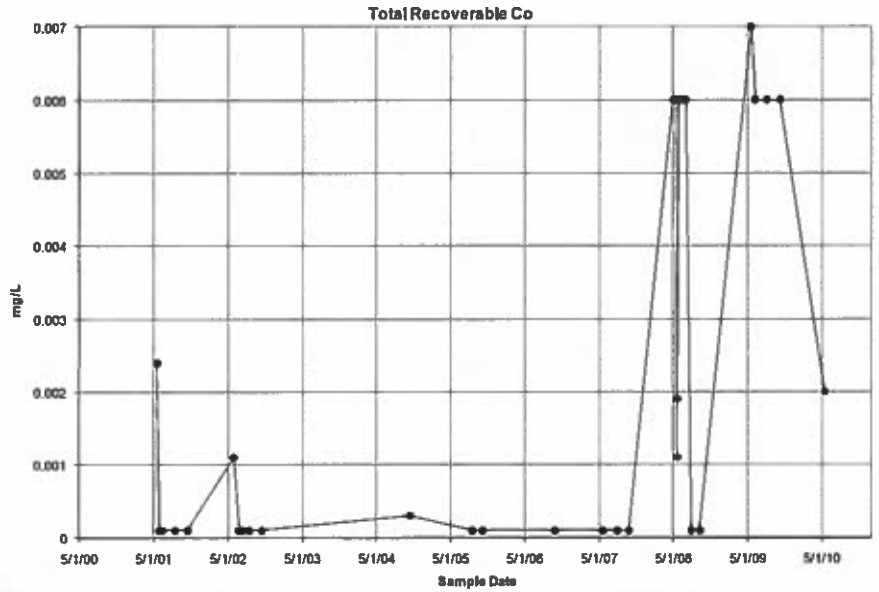
FIGURE 4-17a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-20

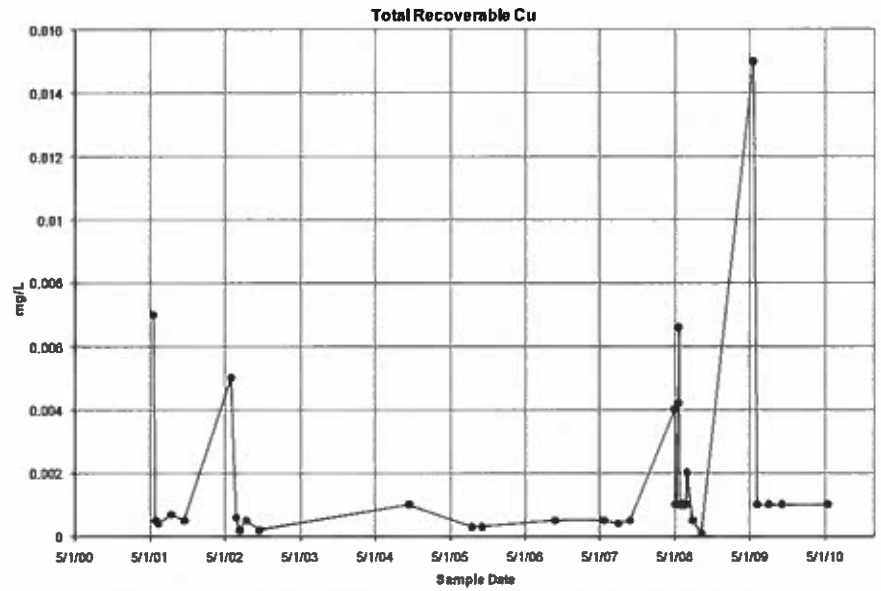
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt







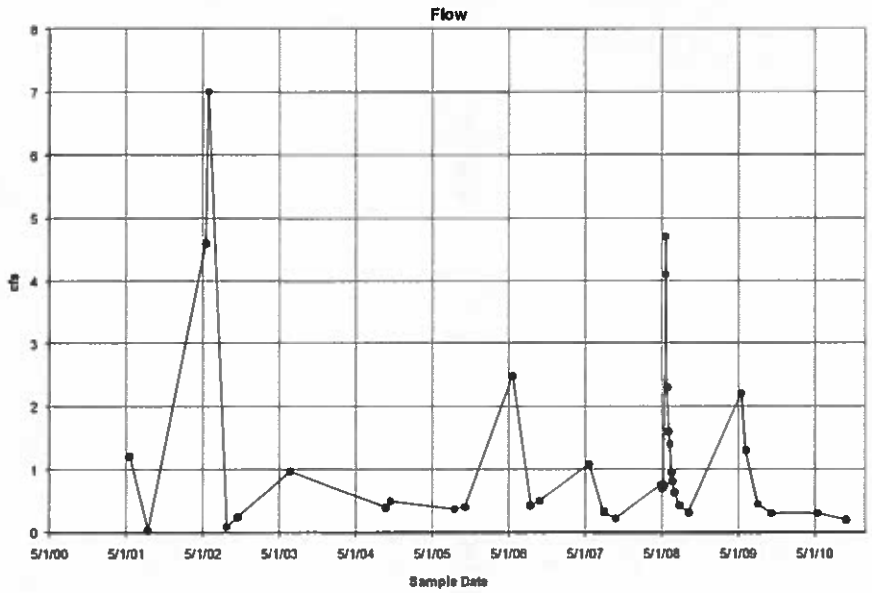


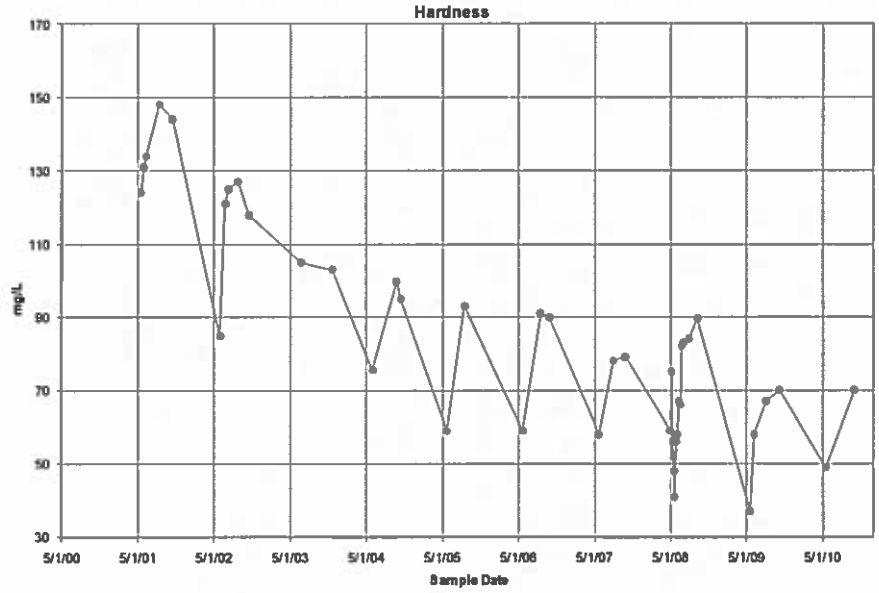
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

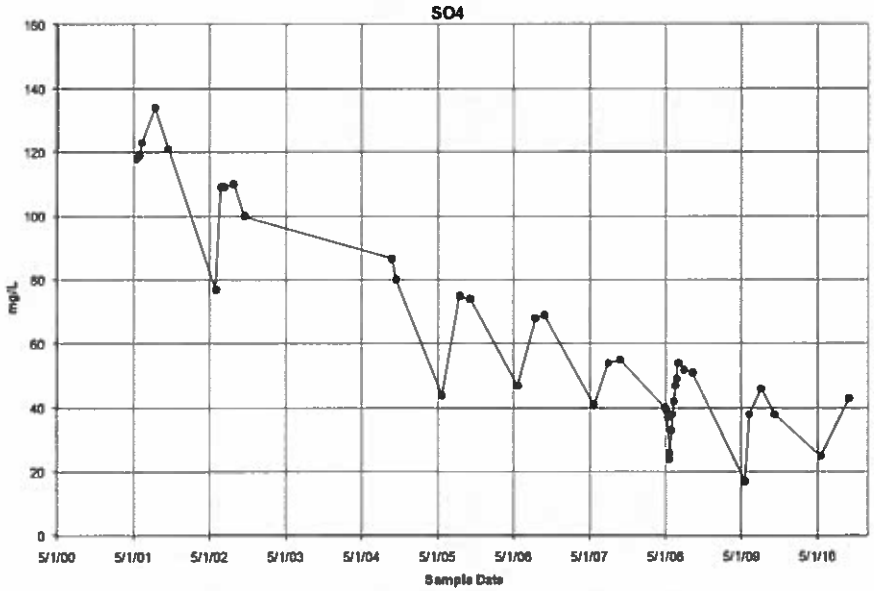
FIGURE 4-17b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-20

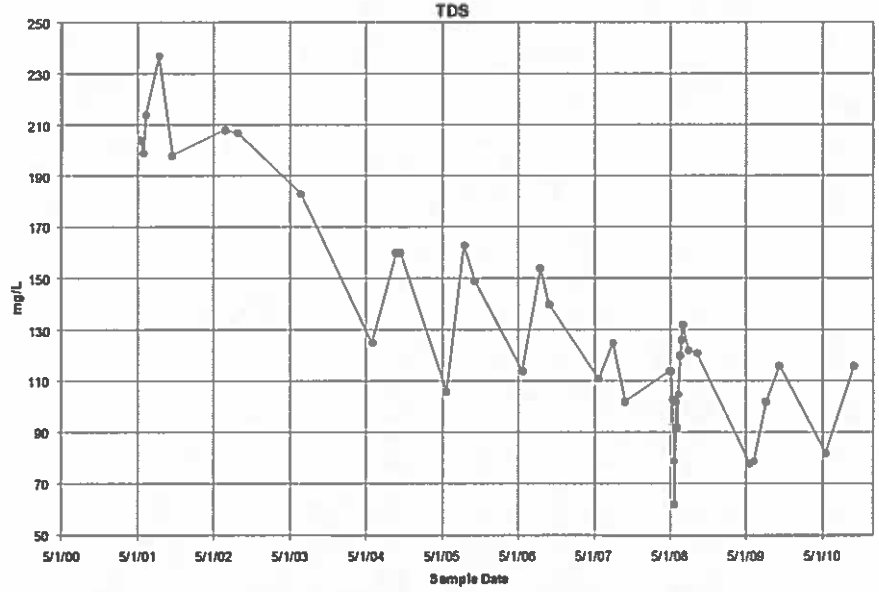
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





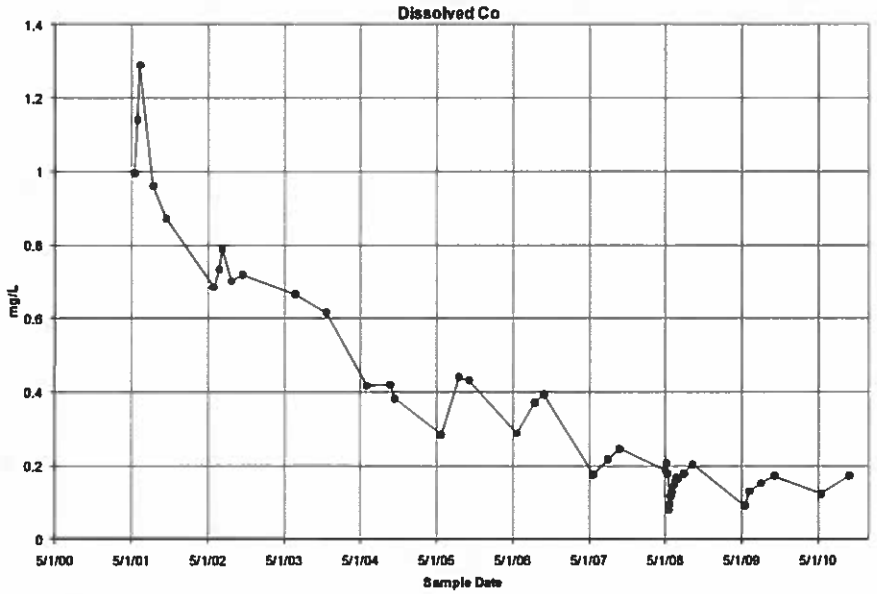


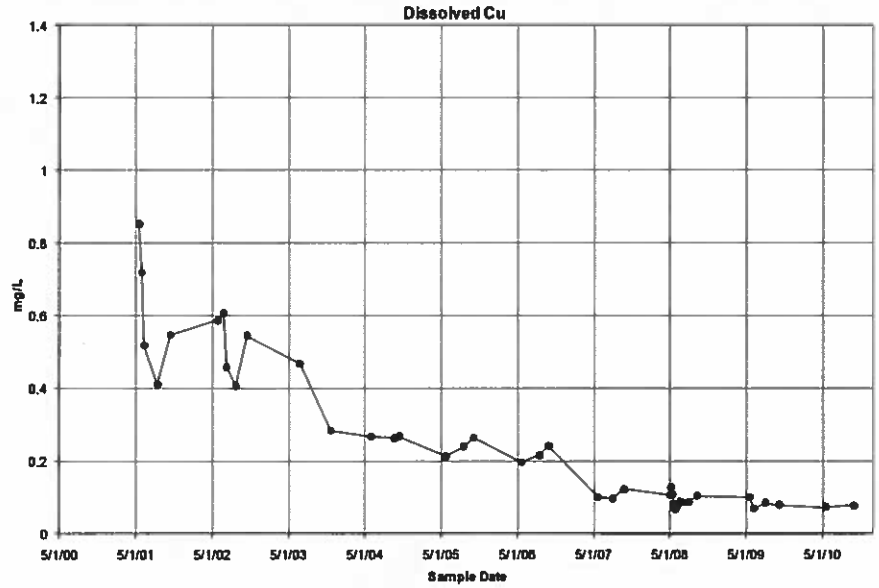


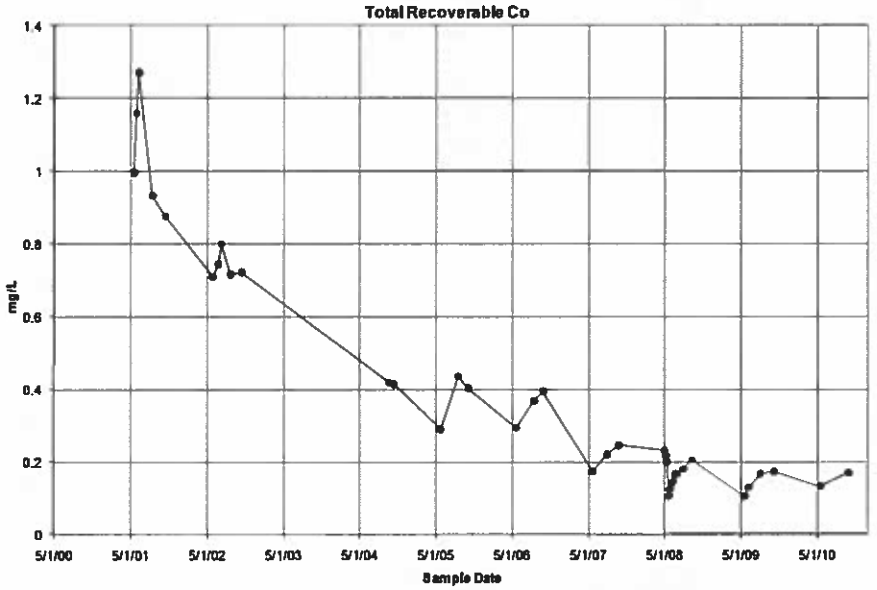
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

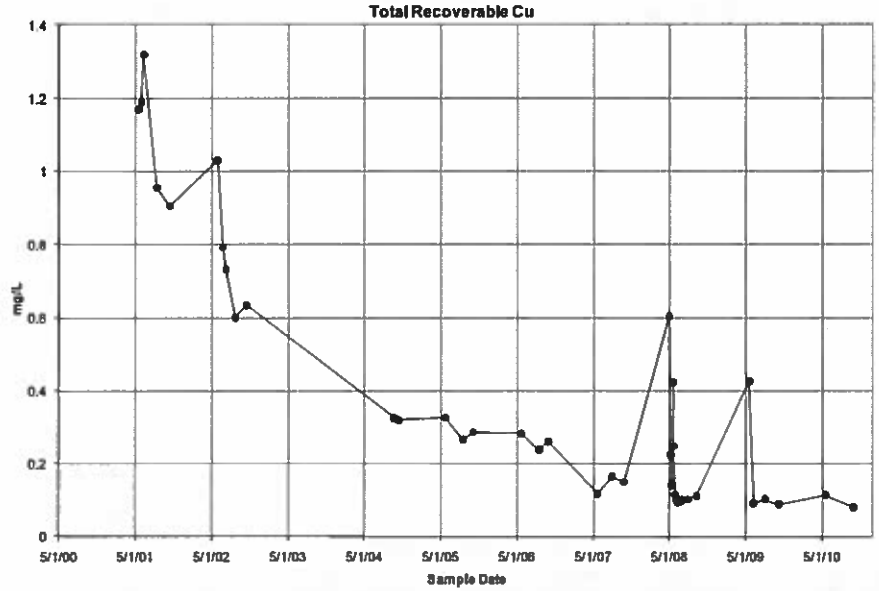
FIGURE 4-18a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-21

PREPARED FOR: Formation





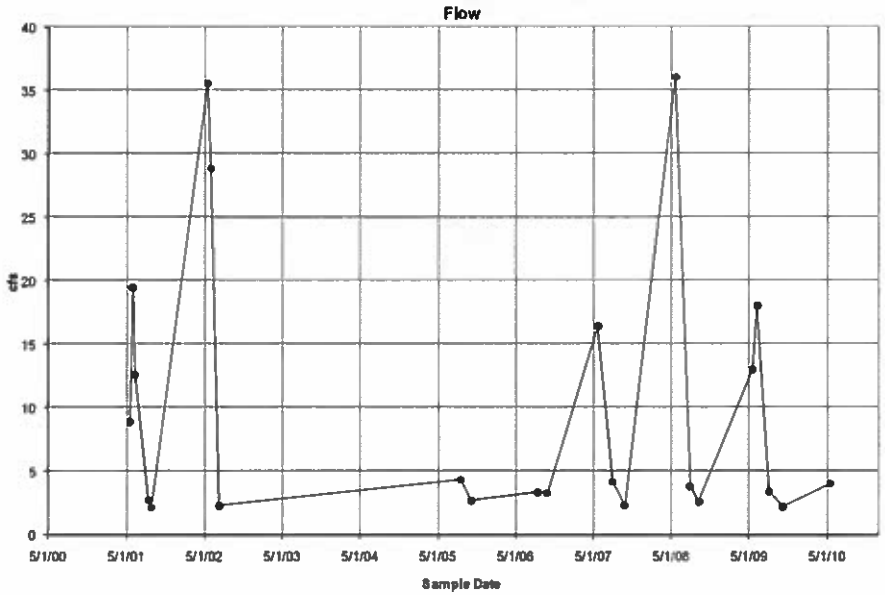


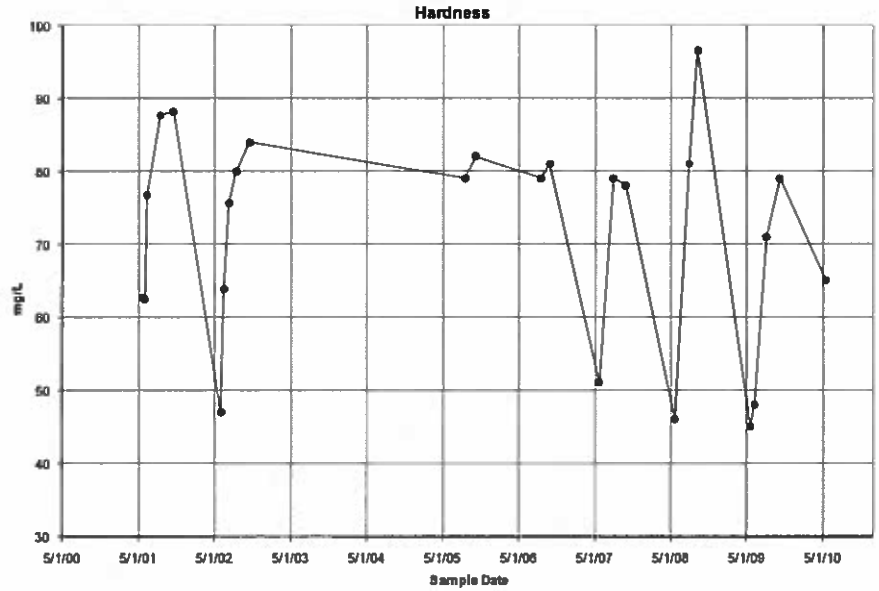


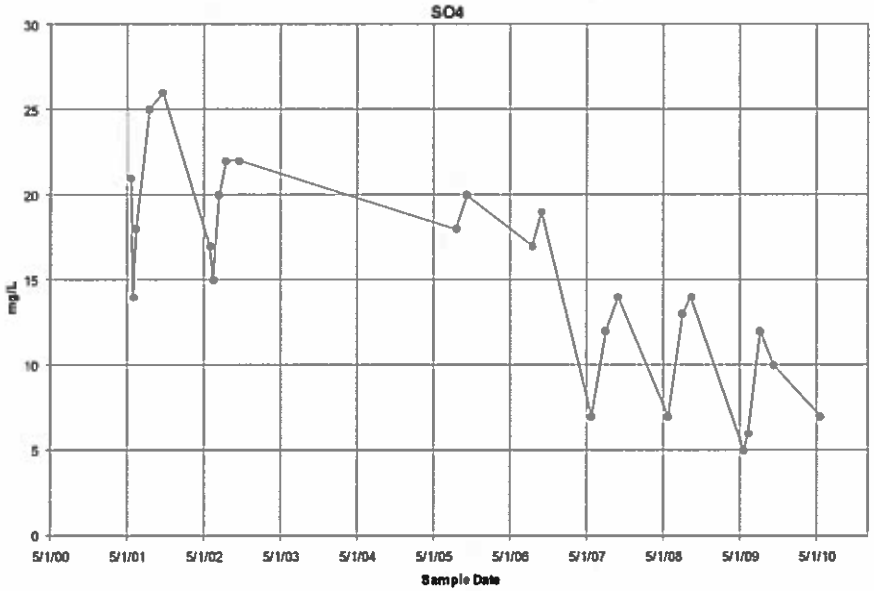
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

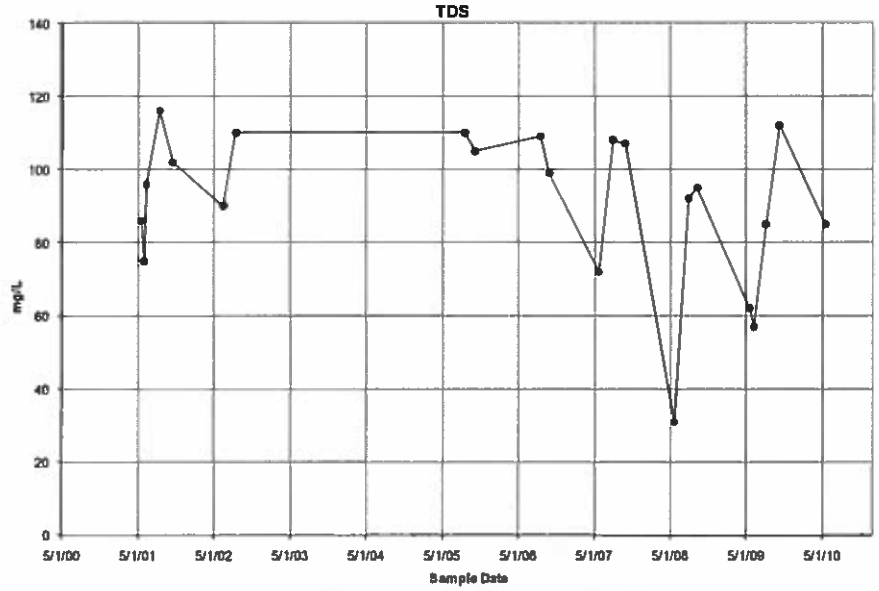
FIGURE 4-18b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-21

PREPARED FOR: Formation





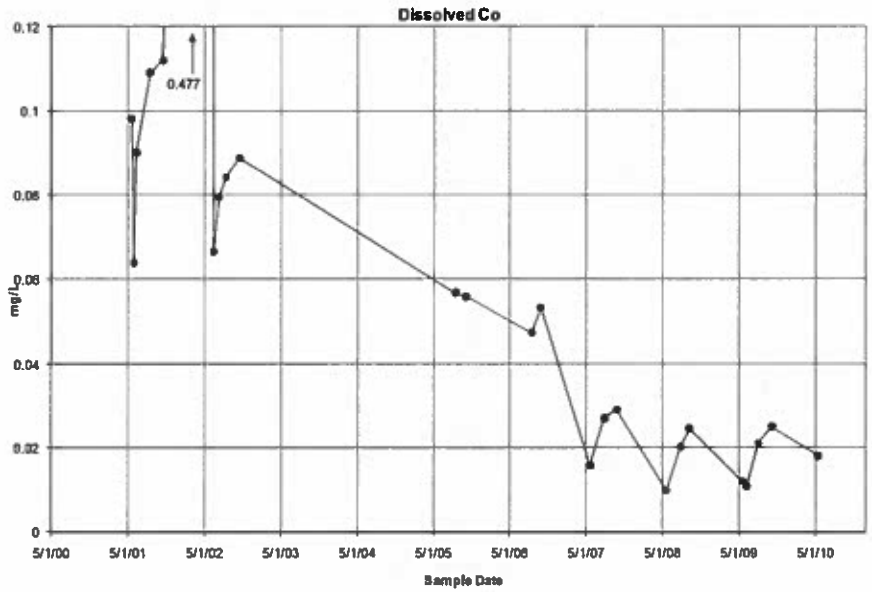


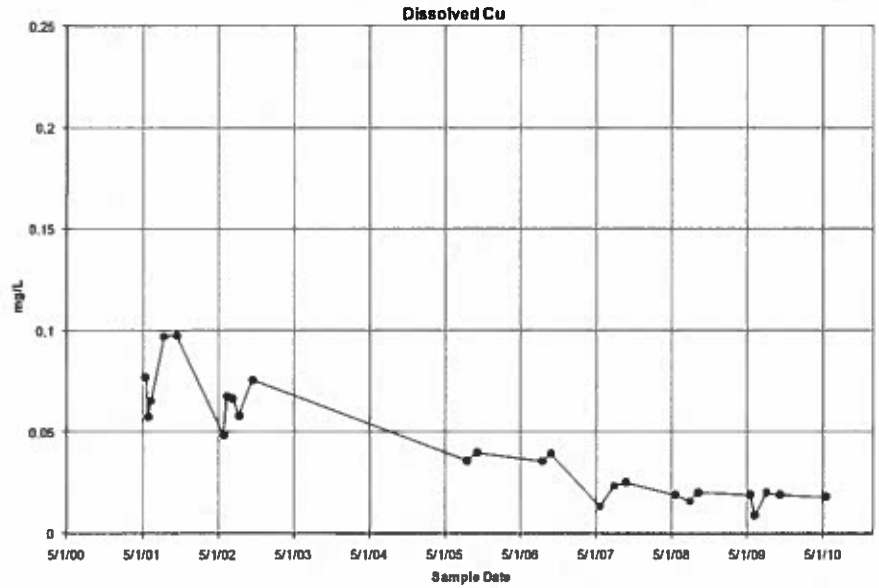


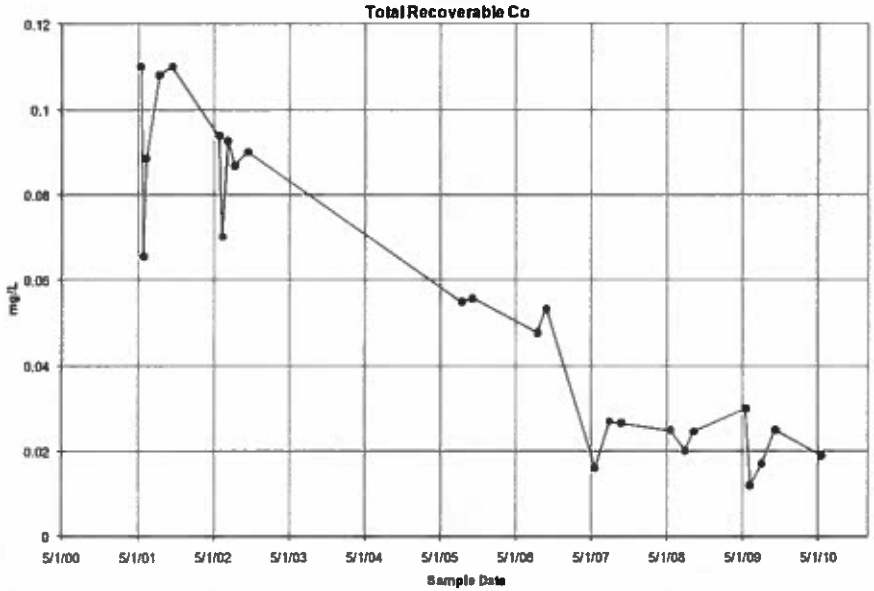
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

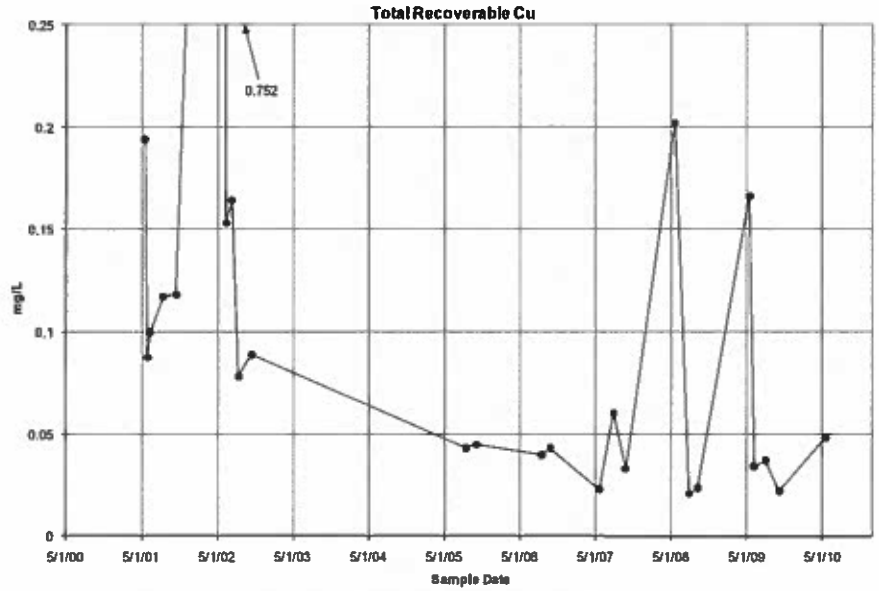
FIGURE 4-19a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-22

PREPARED FOR: Formation





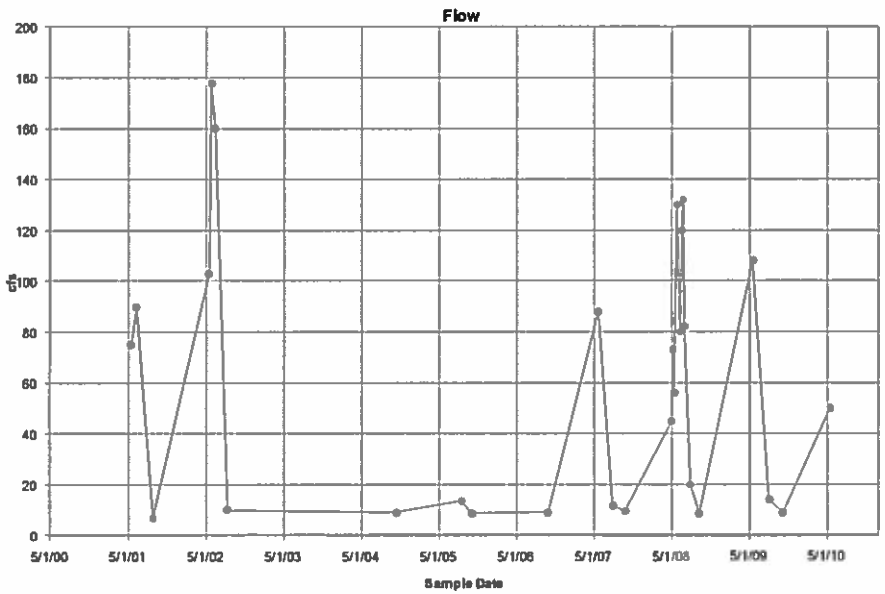


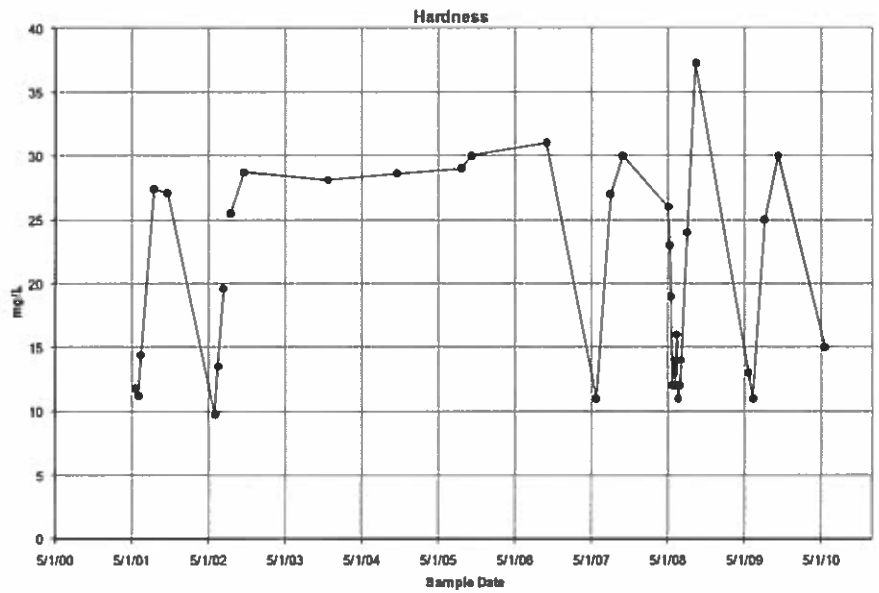


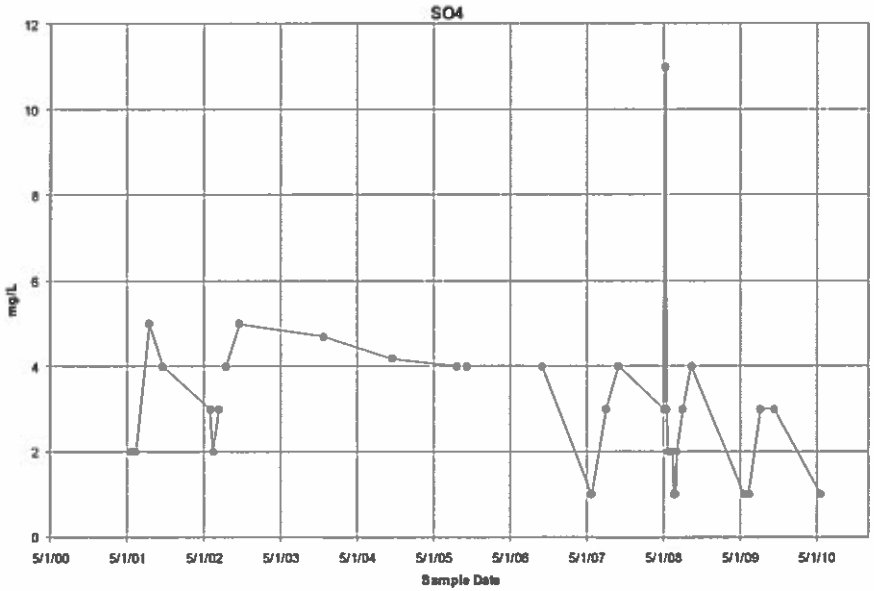
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS • INCORPORATED	

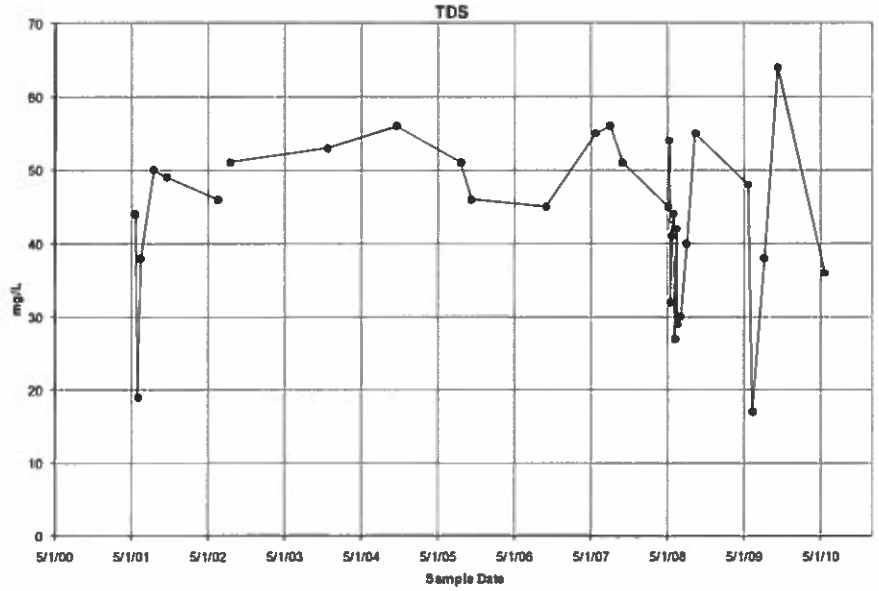
FIGURE 4-19b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-22

PREPARED FOR: Formation





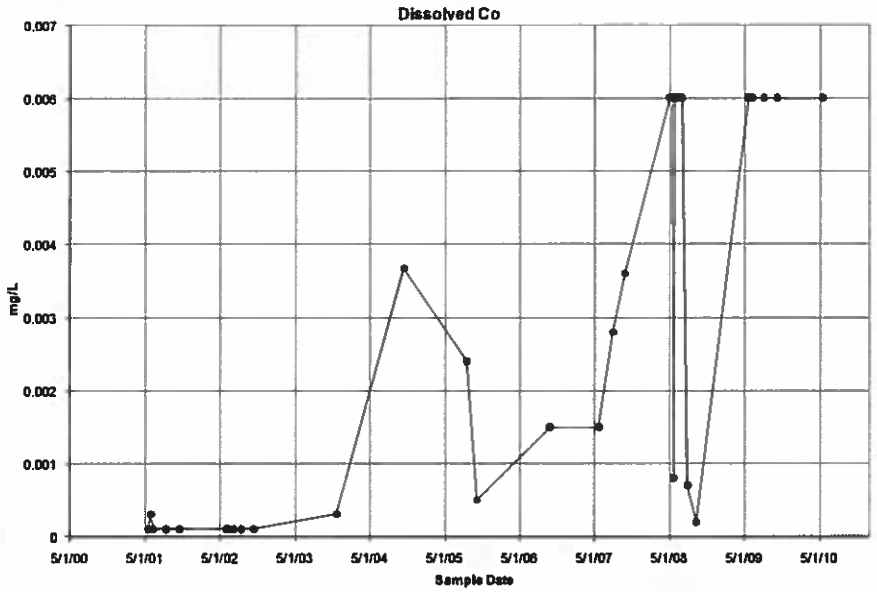


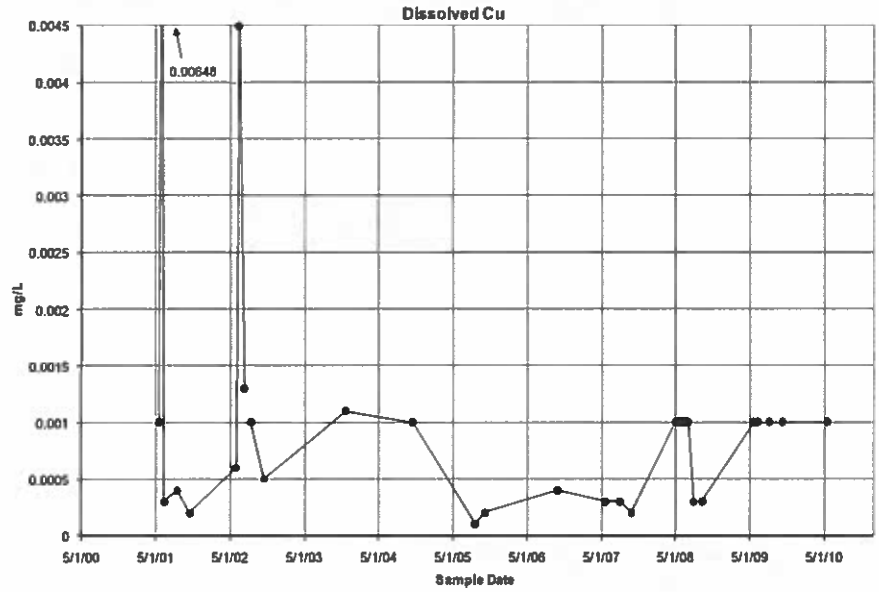


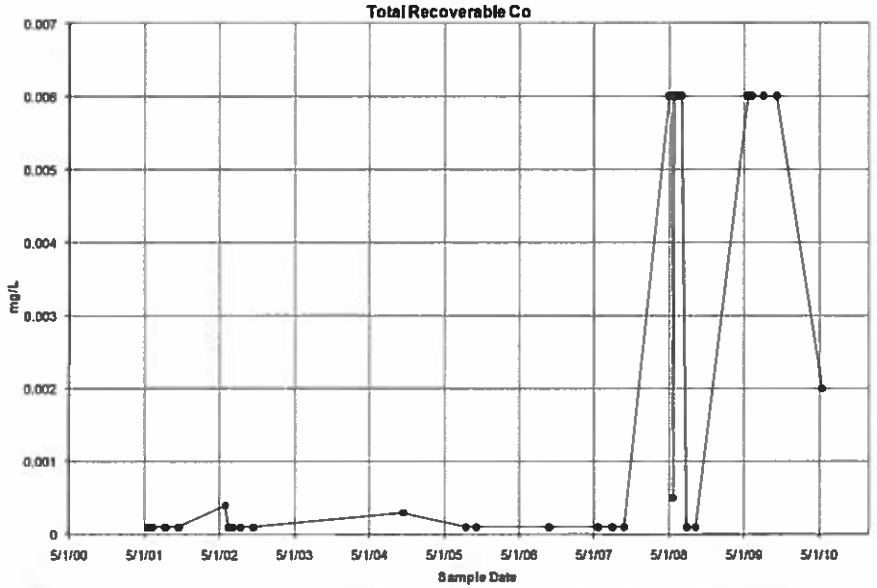
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

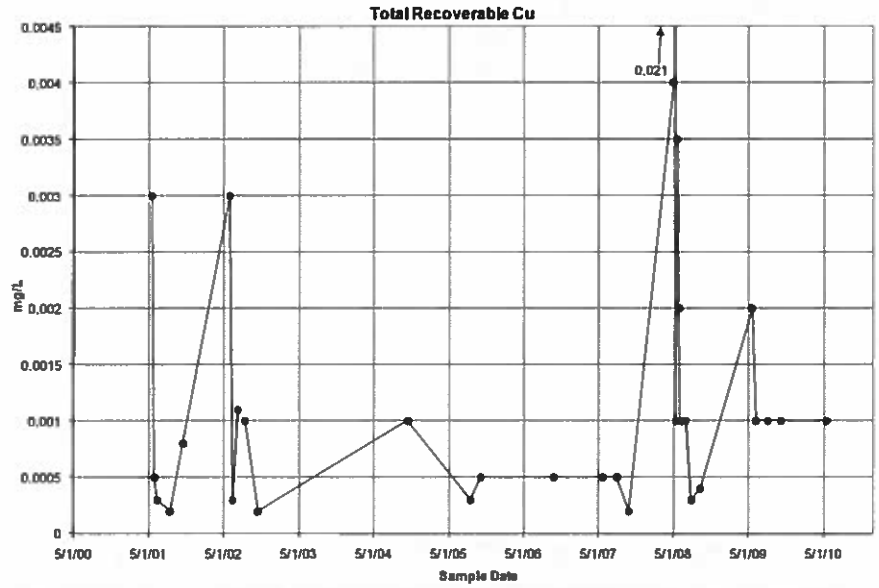
FIGURE 4-20a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-23

PREPARED FOR: Formation





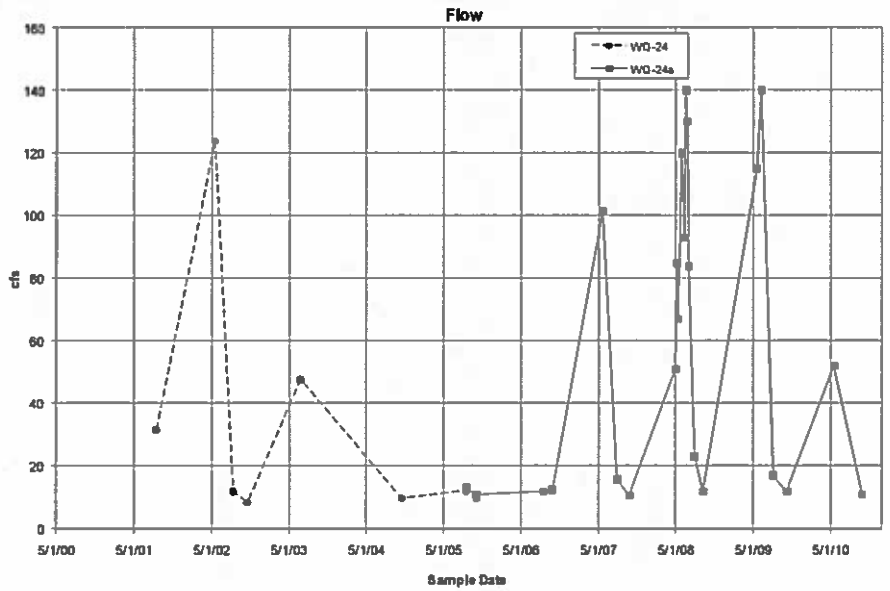


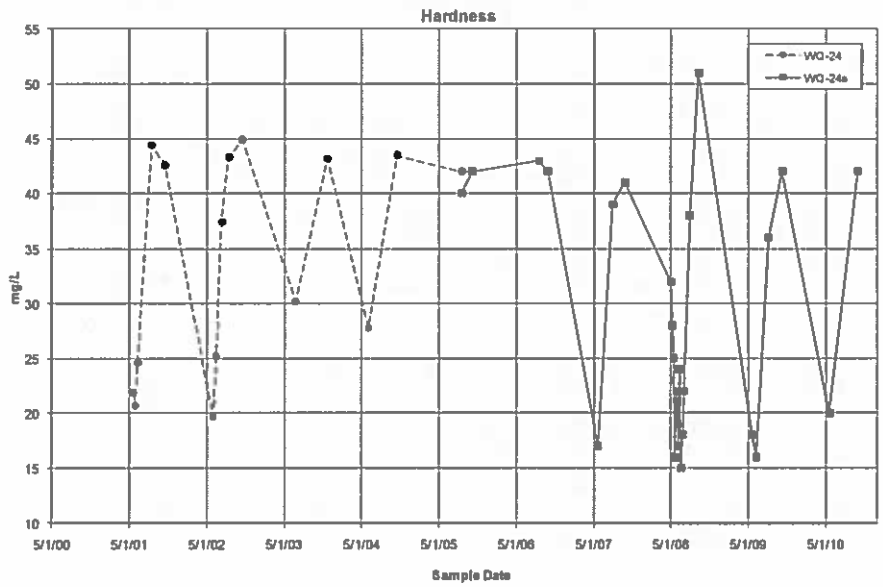


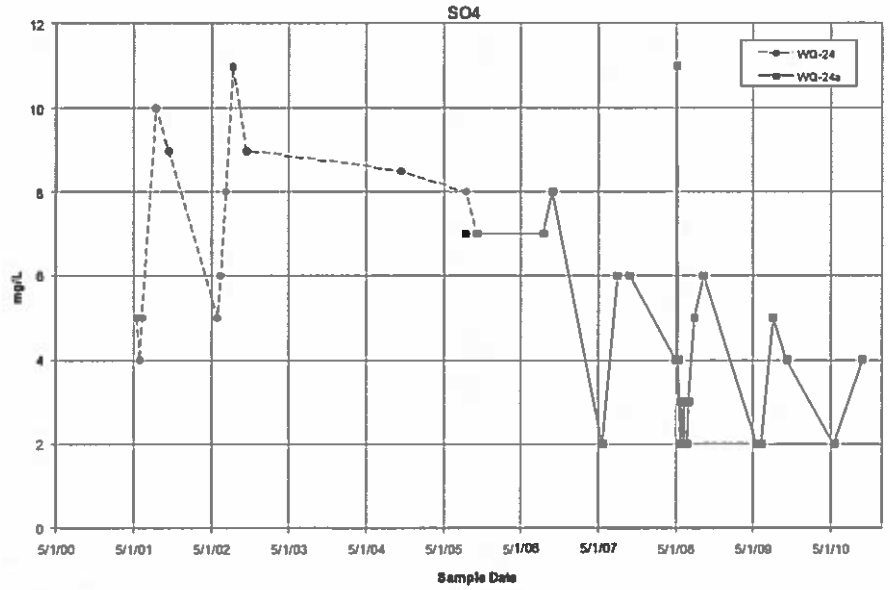
PROJECT: 222100	TASK: 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

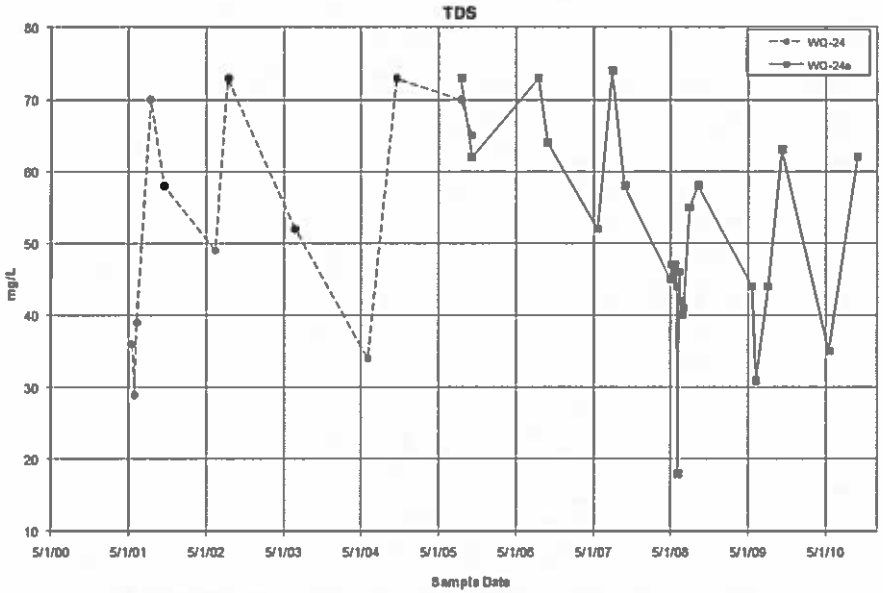
FIGURE 4-20b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-23

PREPARED FOR: Formation





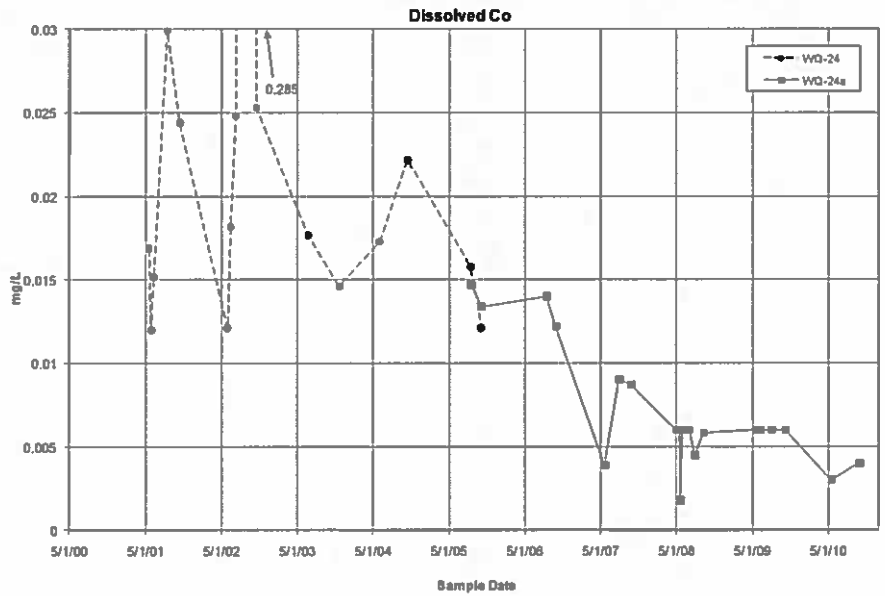


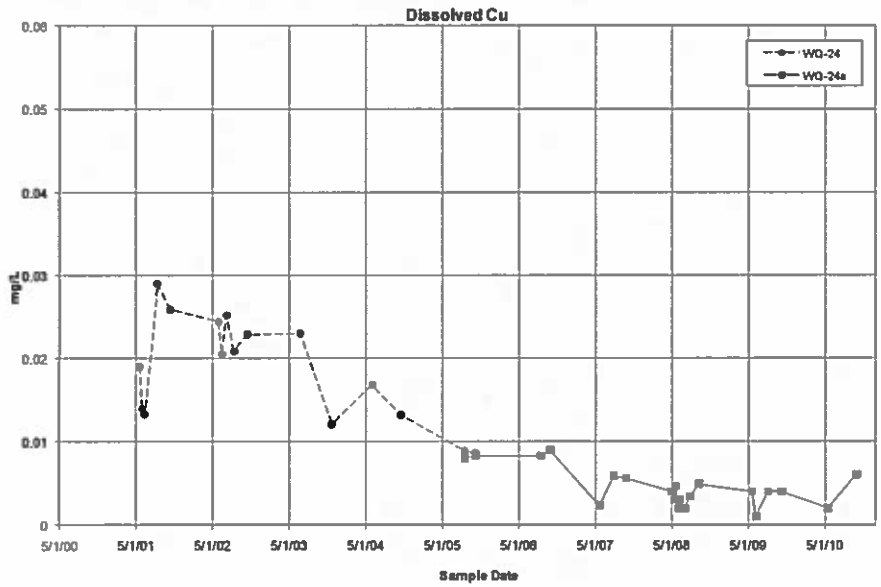


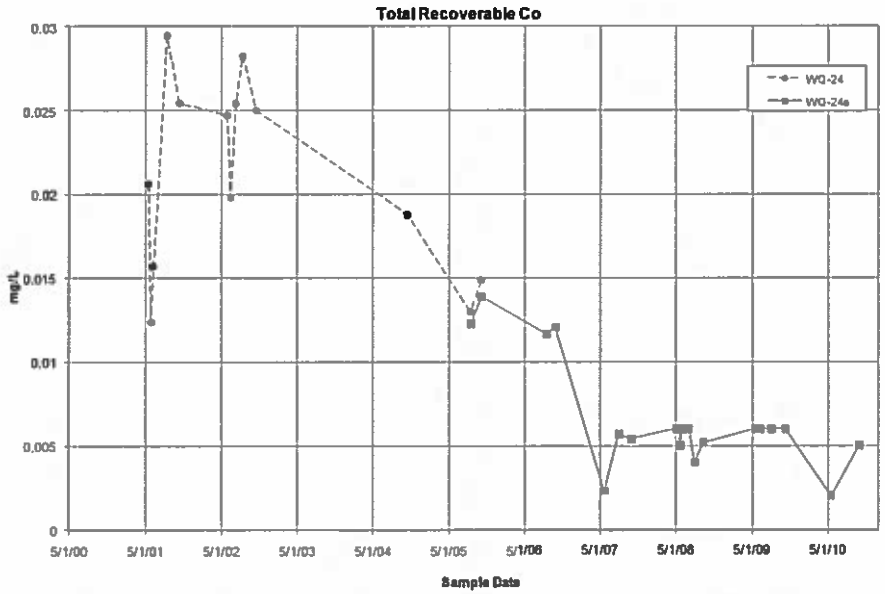
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS, INCORPORATED	

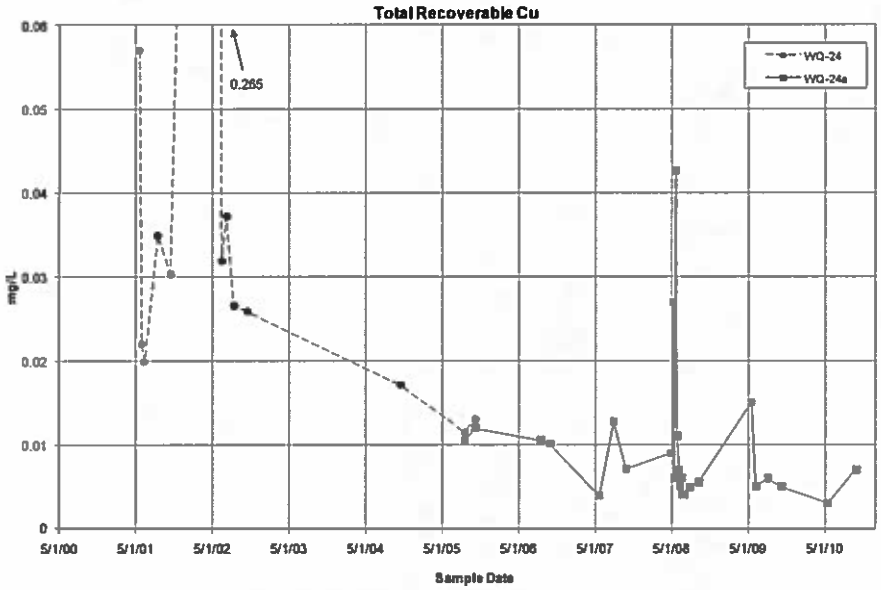
FIGURE 4-21a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-24 and WQ-24a

PREPARED FOR: Formation





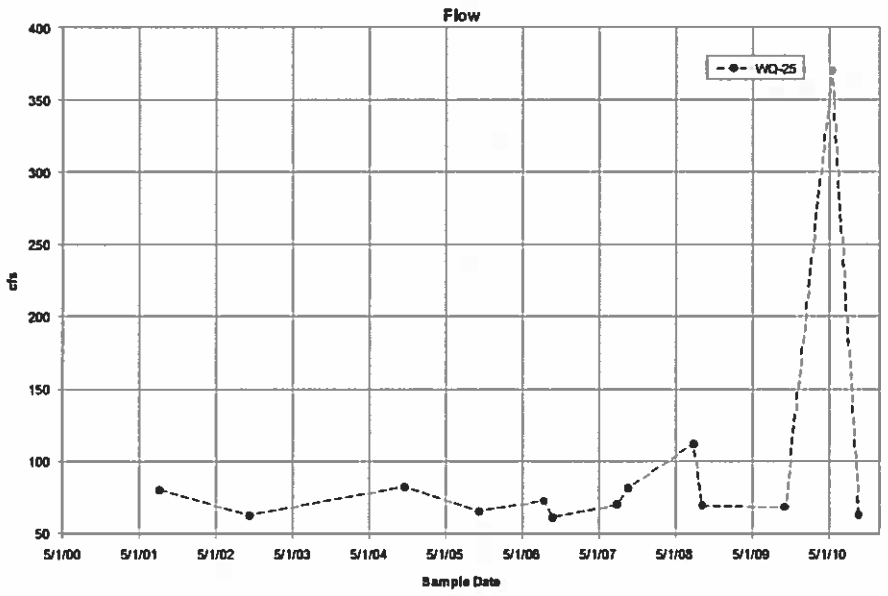


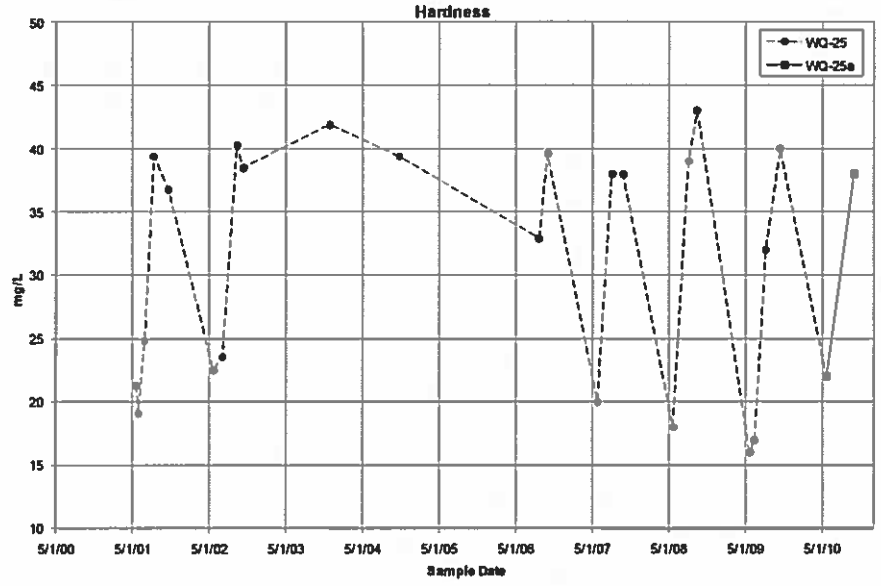


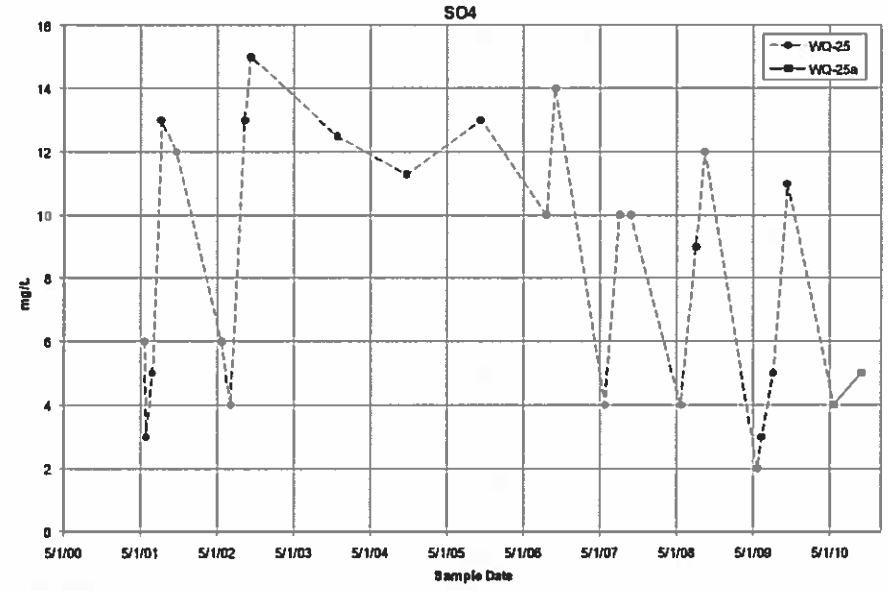
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

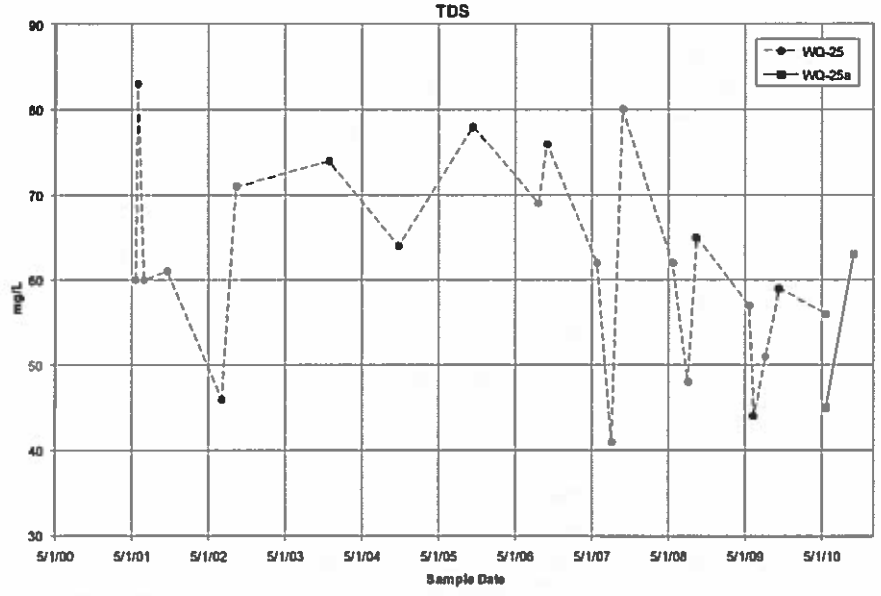
FIGURE 4-21b
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-24 and WQ-24a

PREPARED FOR: Formation





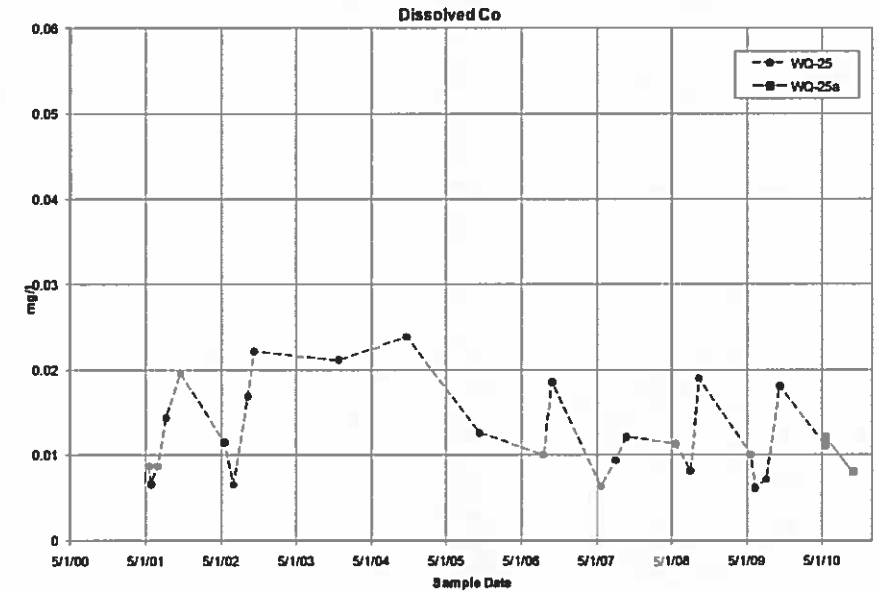


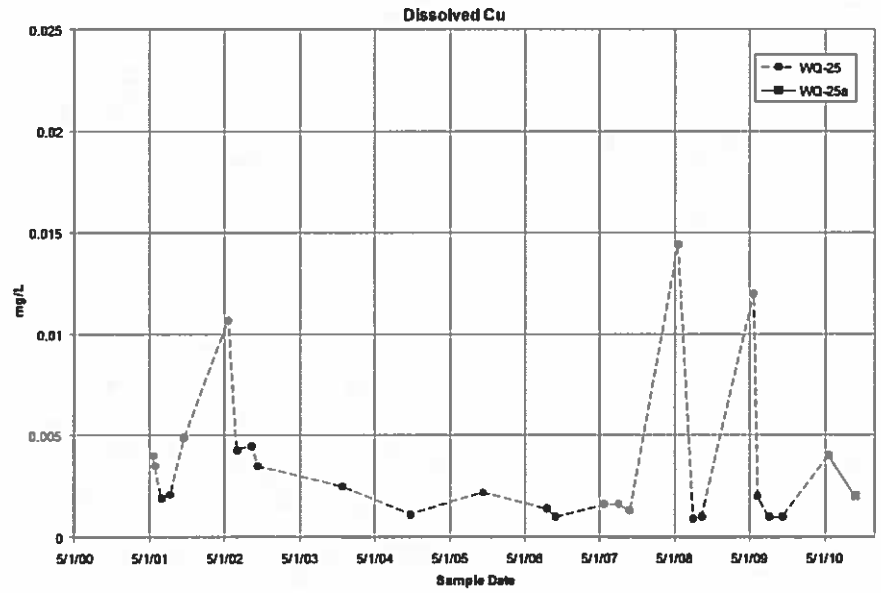


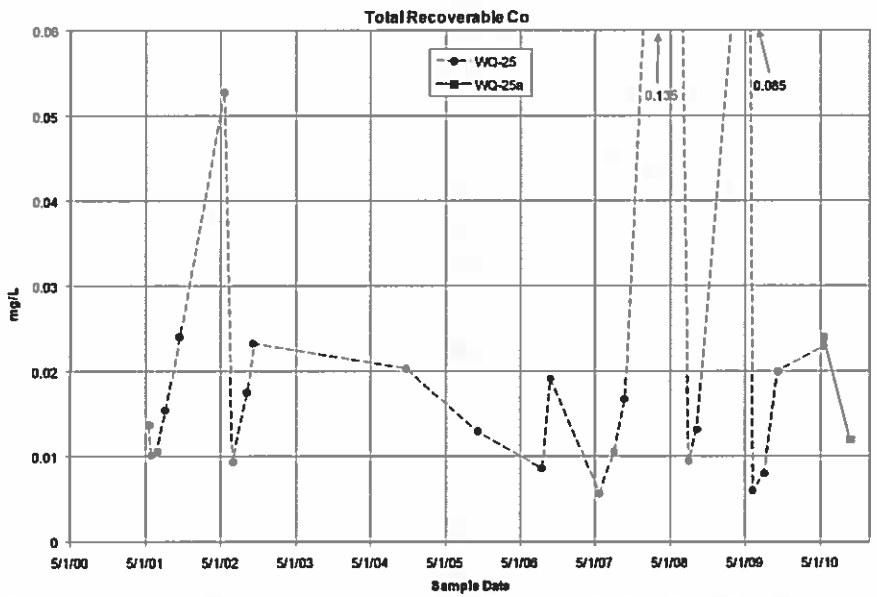
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

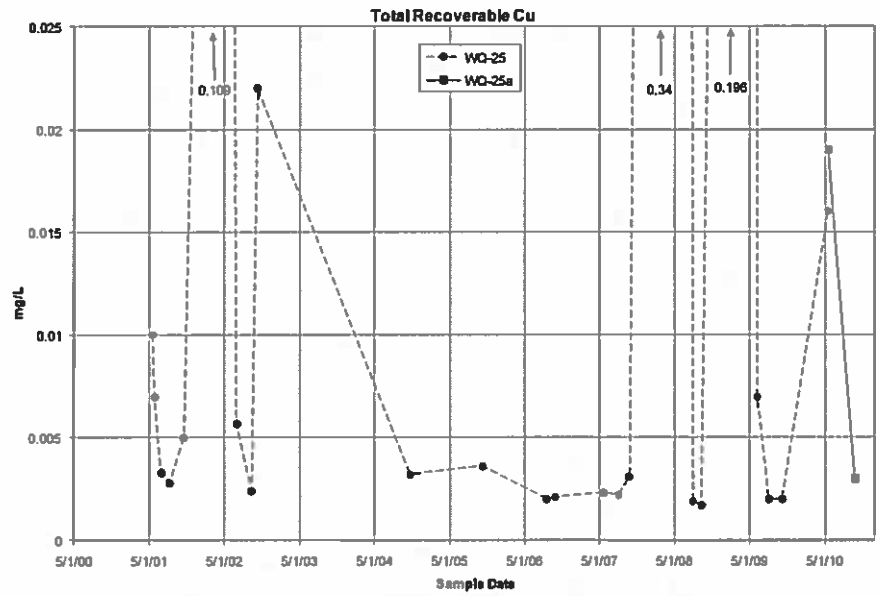
FIGURE 4-22a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-25 and WQ-25a

PREPARED FOR: Formation









PROJECT: 222100	TASK 66
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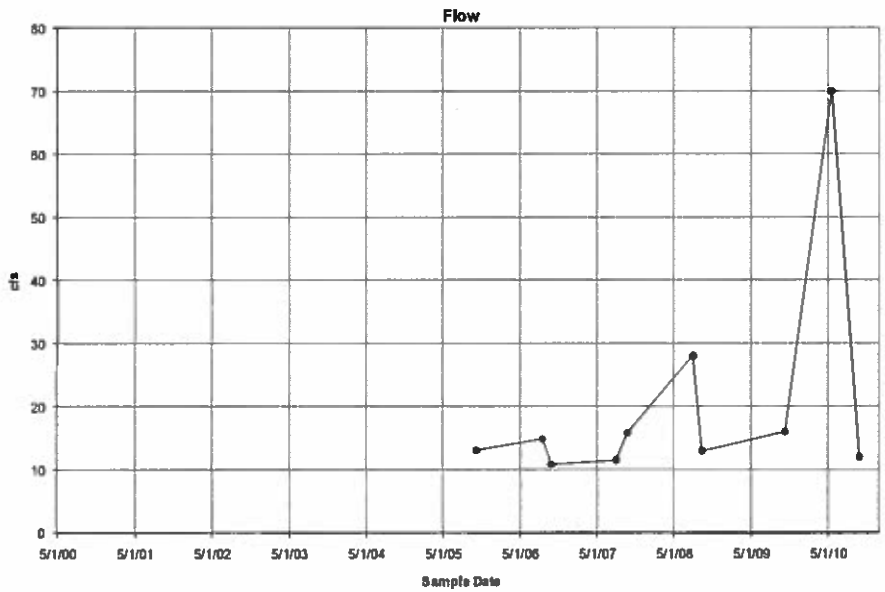
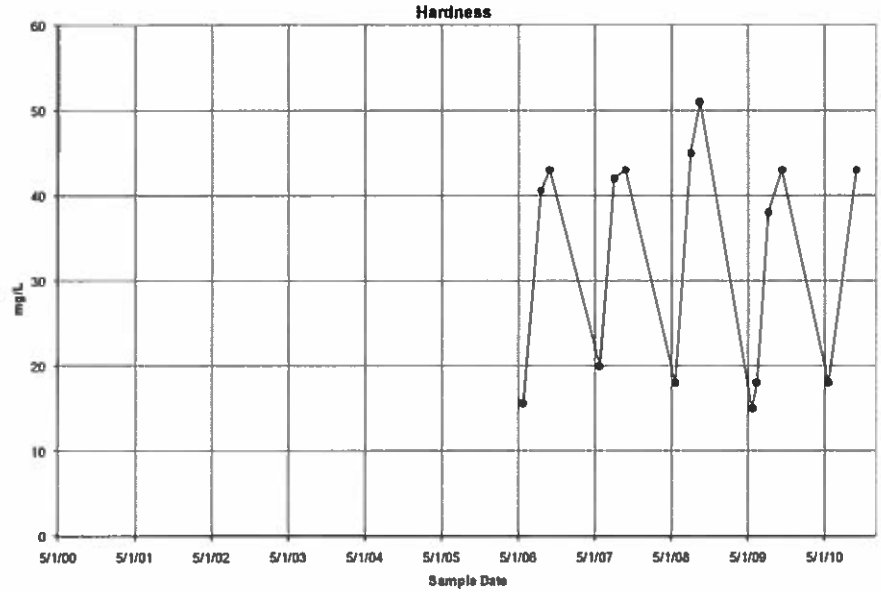
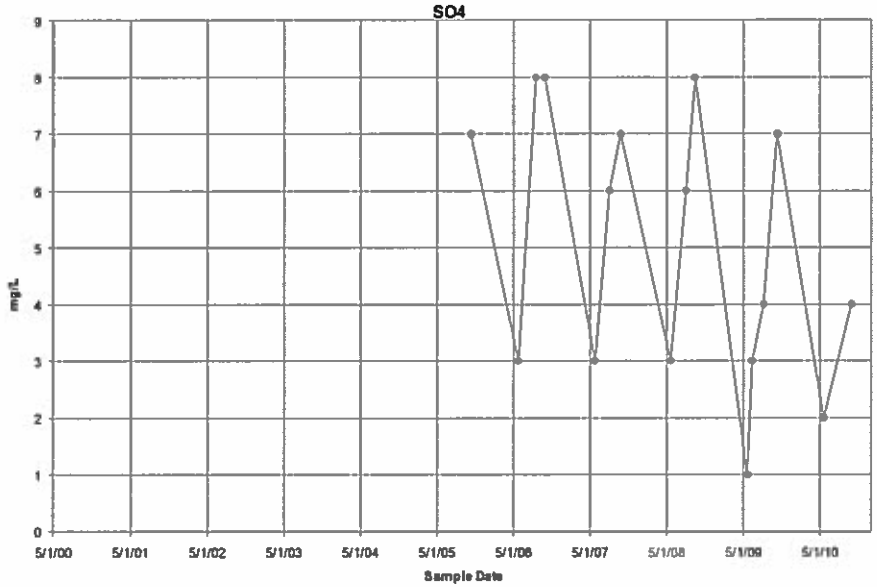
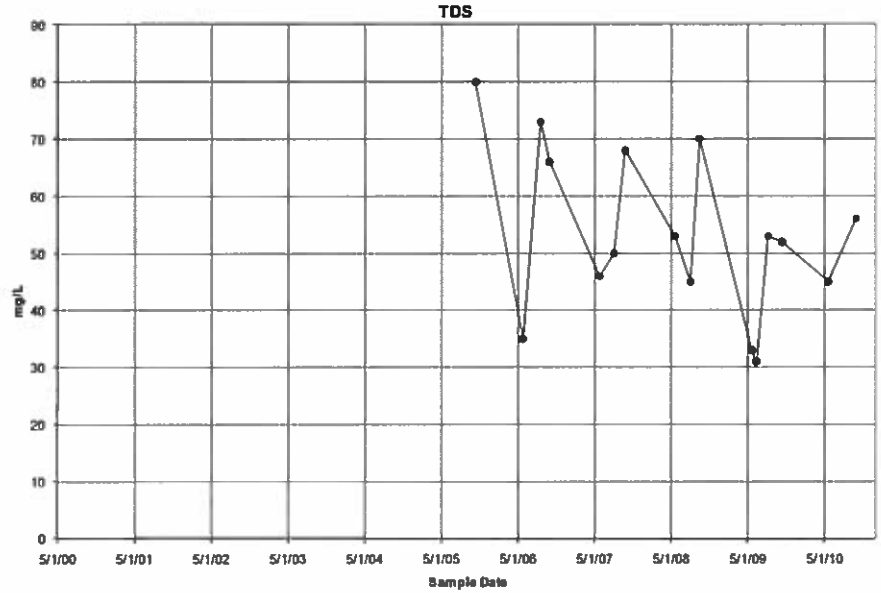
FIGURE 4-22b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-25 and WQ-25a

PREPARED FOR: Formation







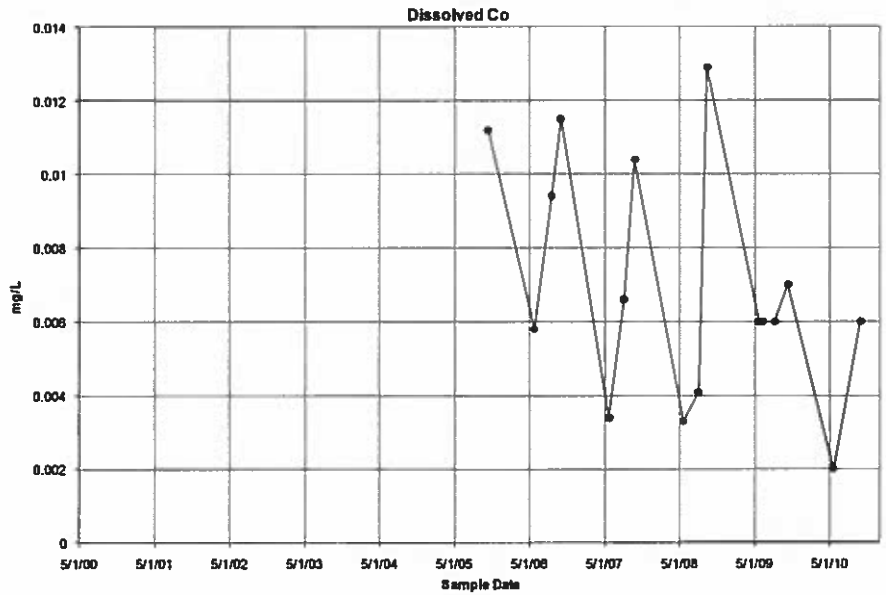


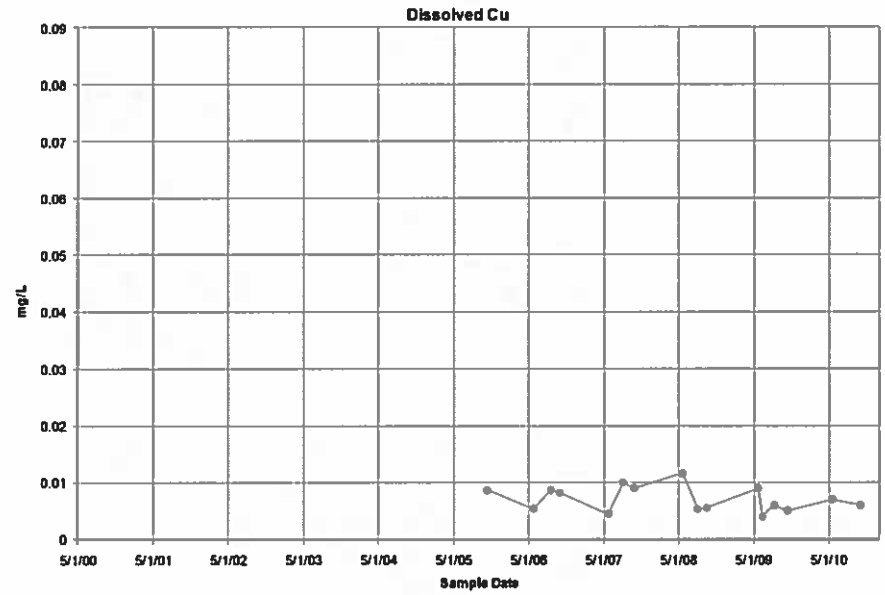
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

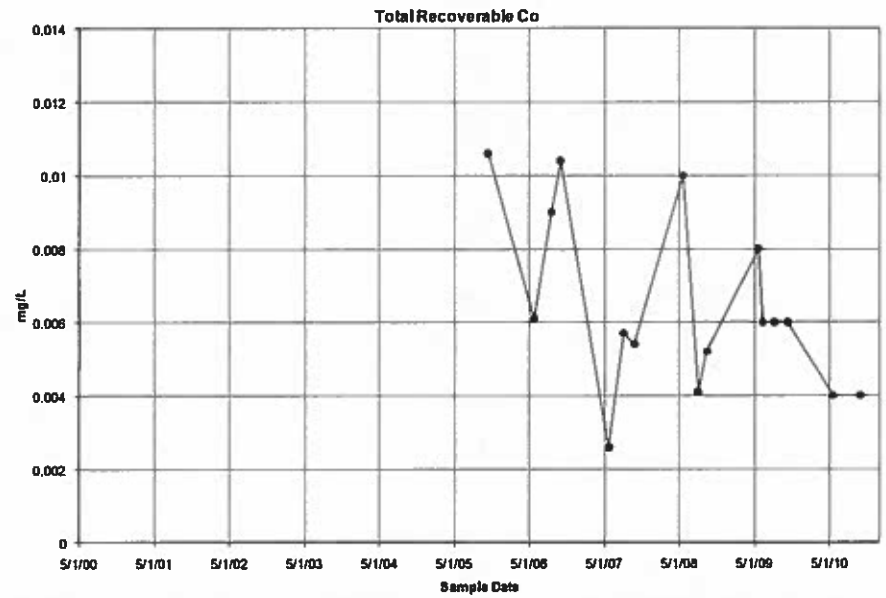
FIGURE 4-23a
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-28

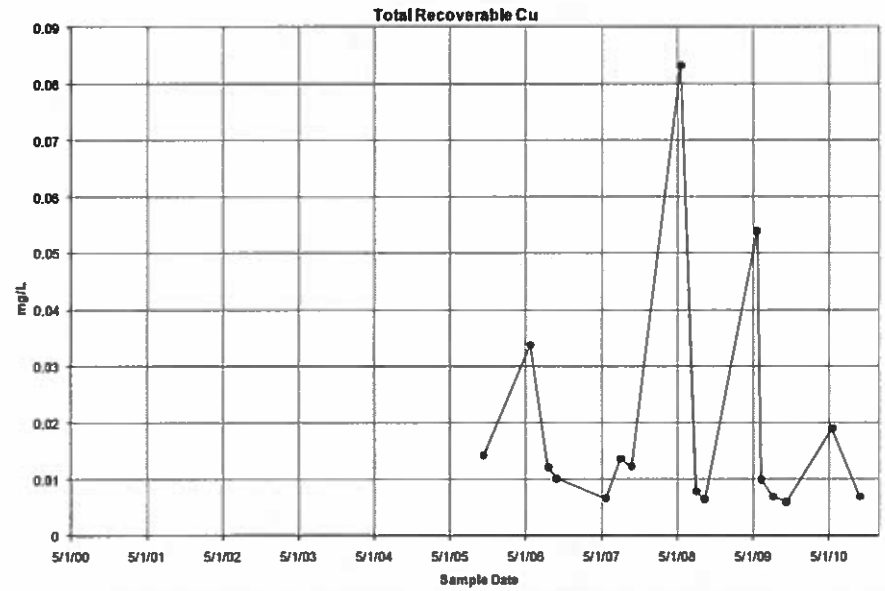
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





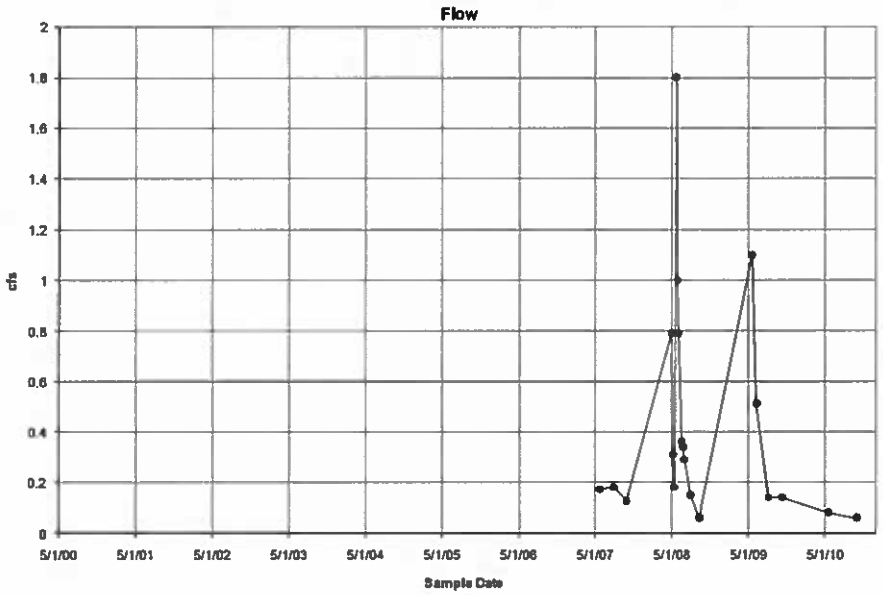


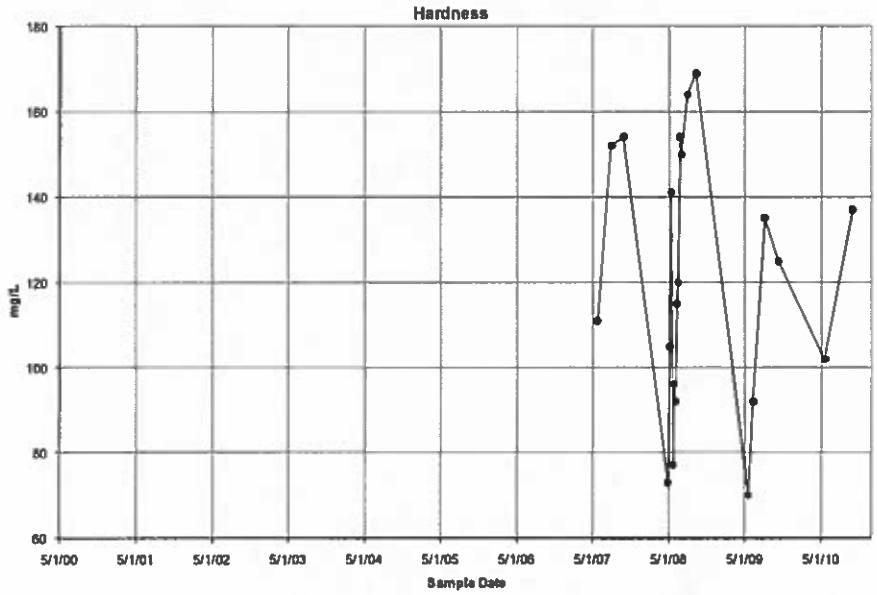


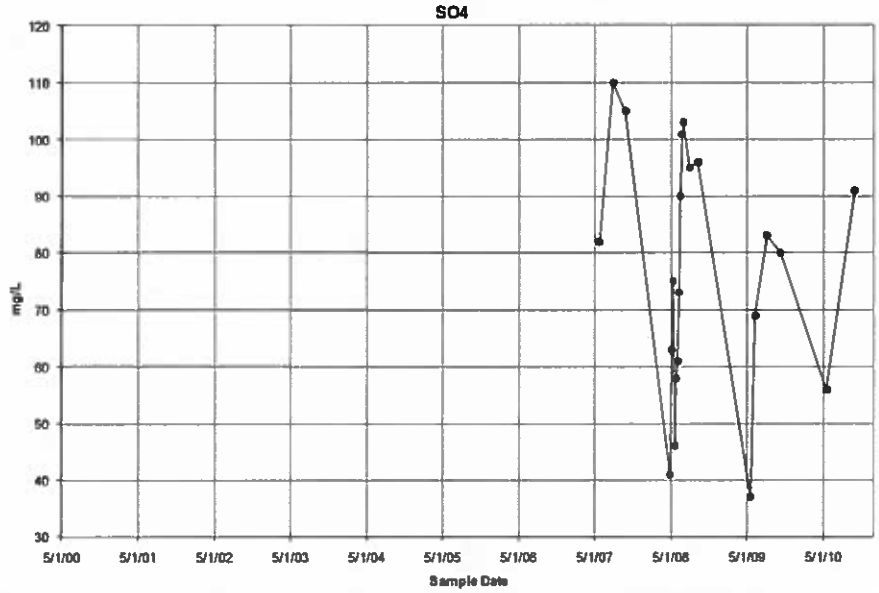
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

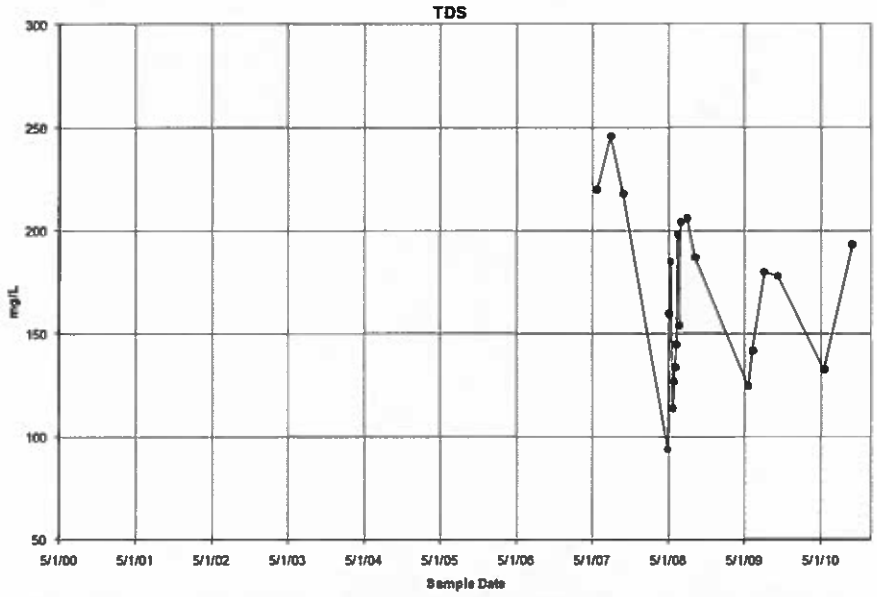
FIGURE 4-23b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-28

PREPARED FOR: Formation





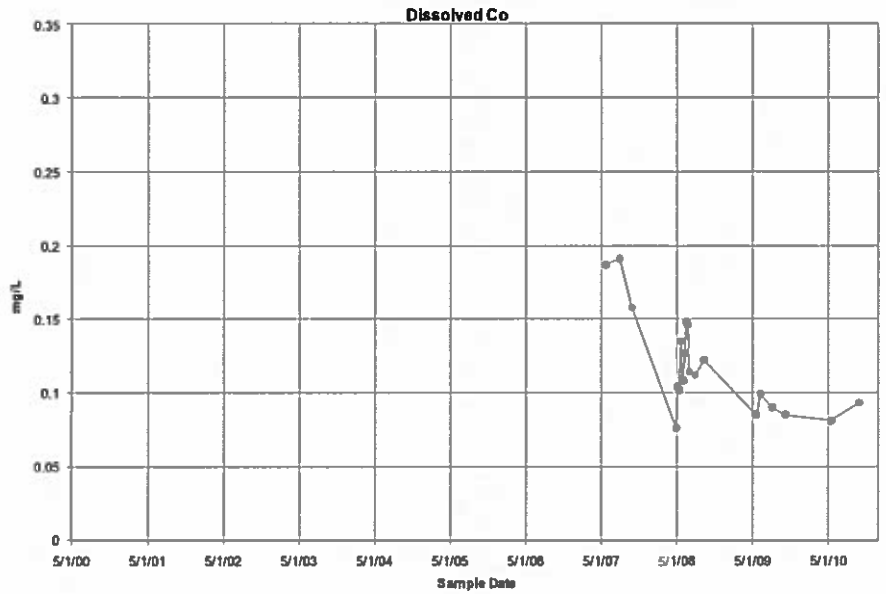


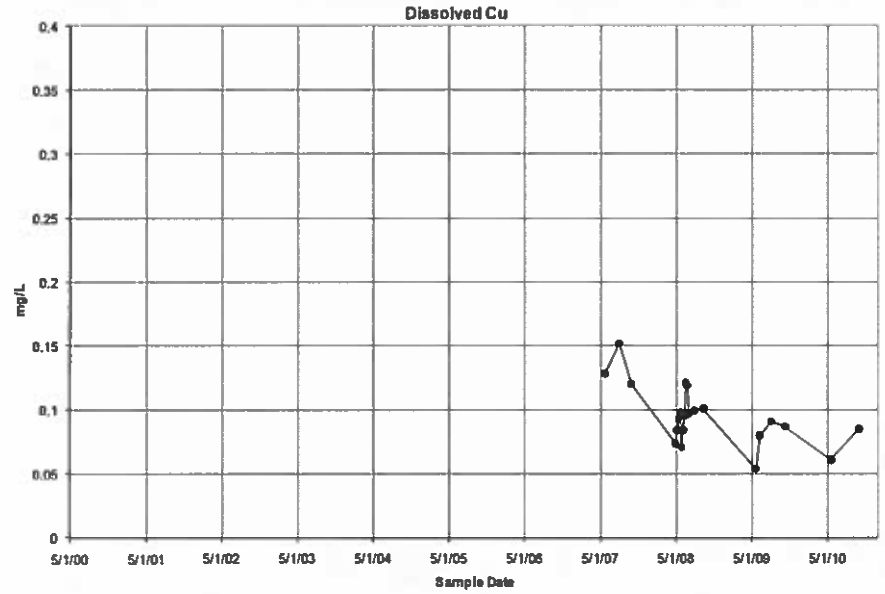


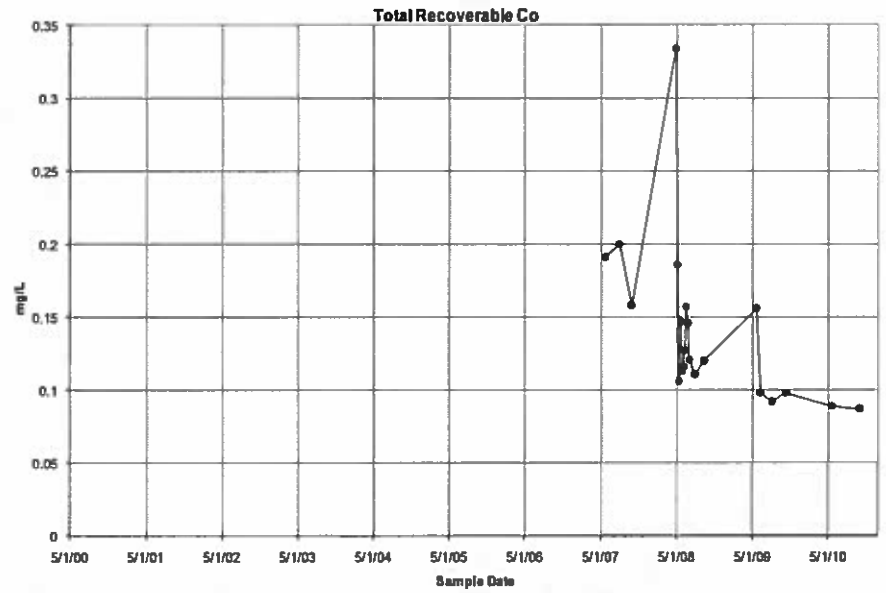
PROJECT 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

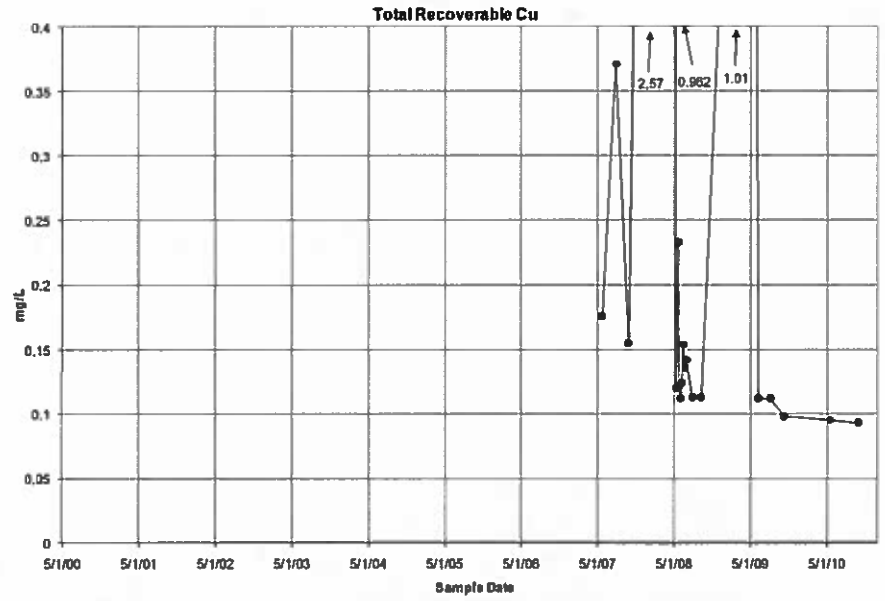
FIGURE 4-24a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-29

PREPARED FOR: Formation







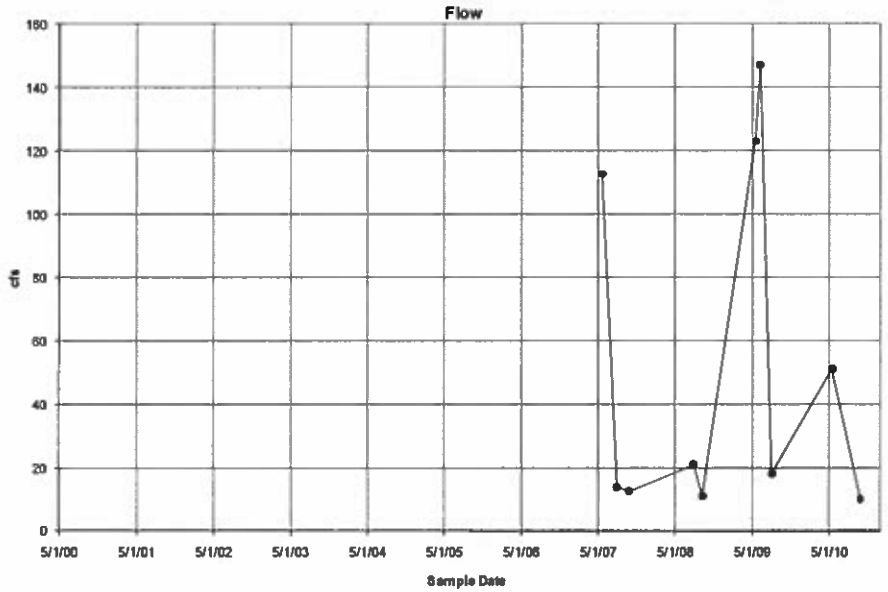


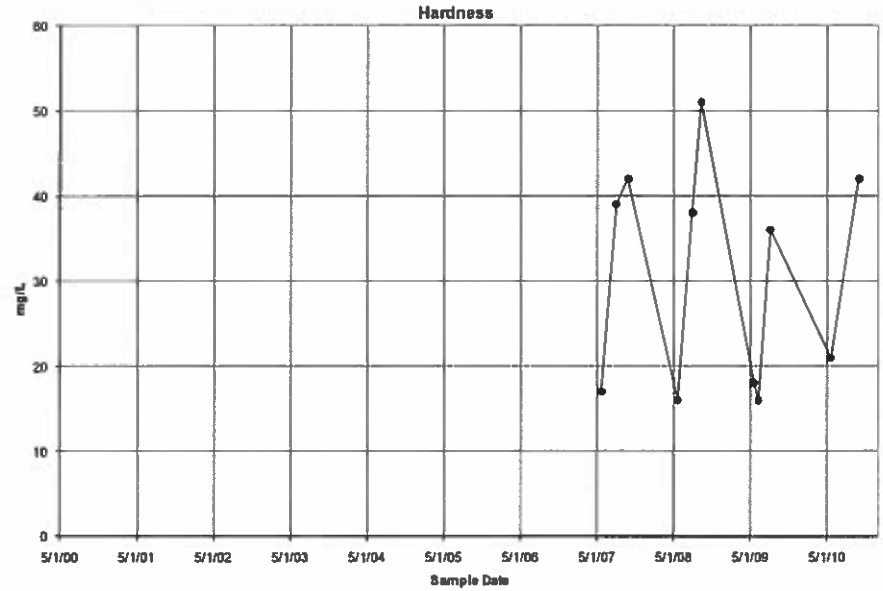
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

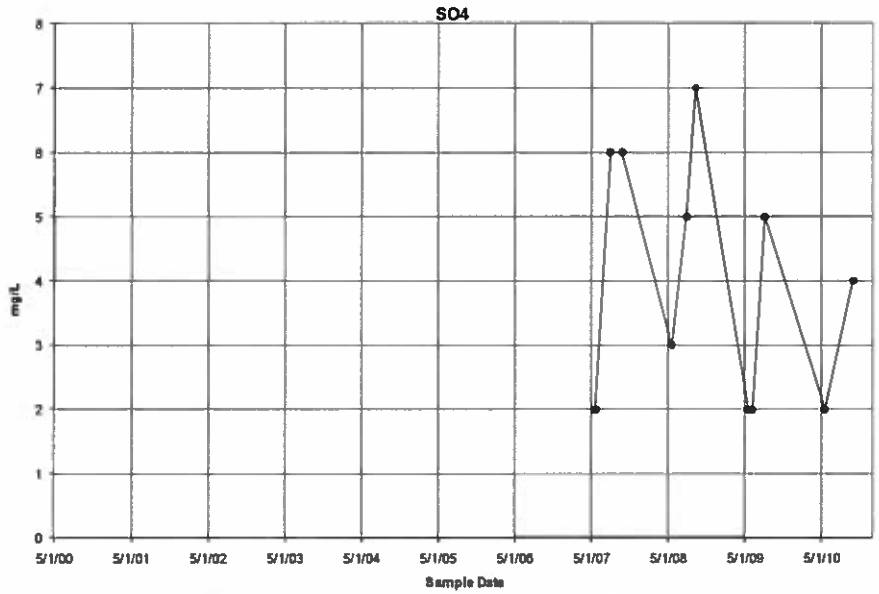
FIGURE 4-24b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-29

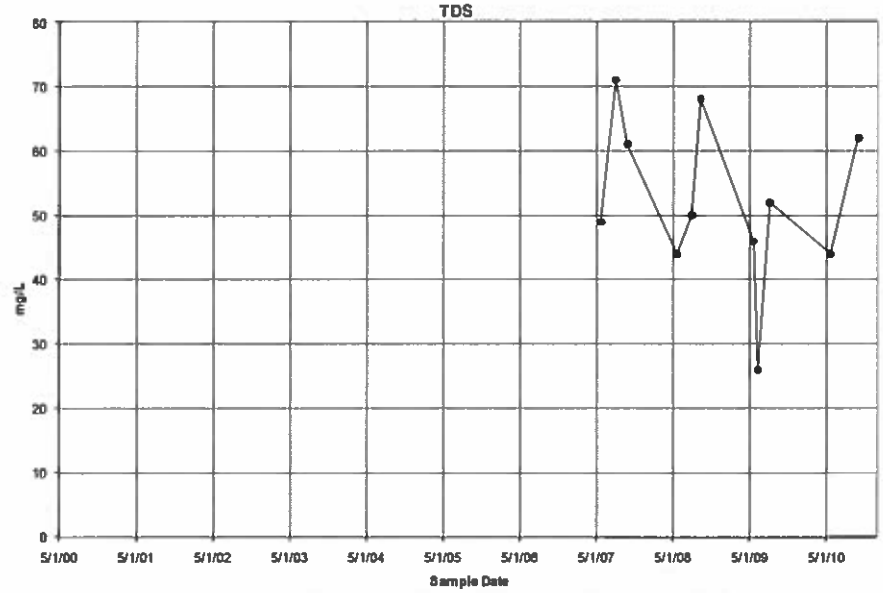
PREPARED FOR: Formation

R:\IdahoCobaltProject\Water_Quality\Products\Reports\2010DataSummary\PPT_Graphs\WQ_graphs_2010.ppt





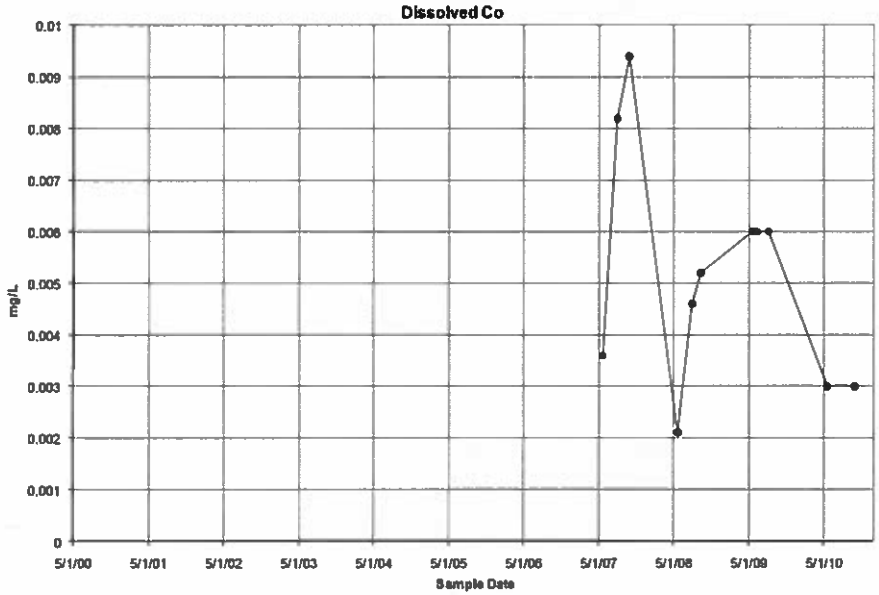


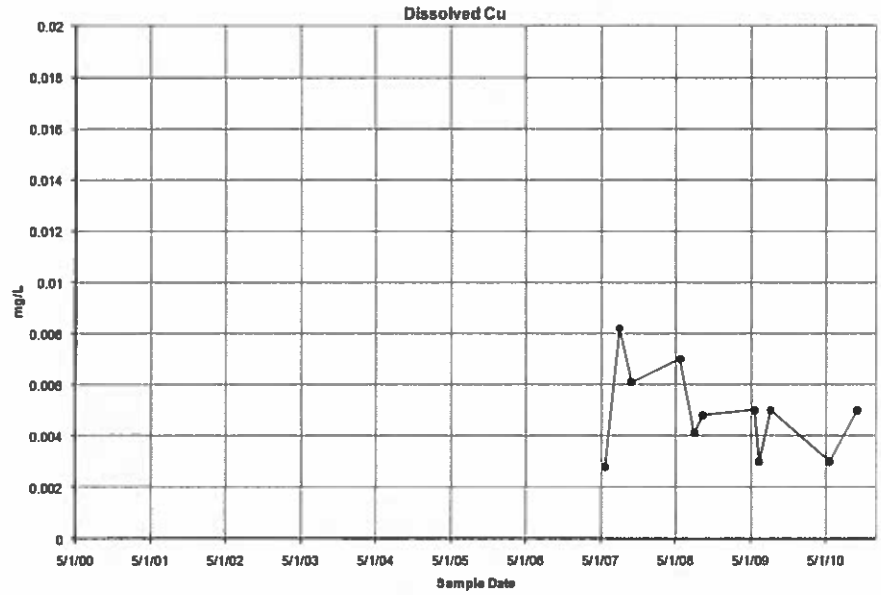


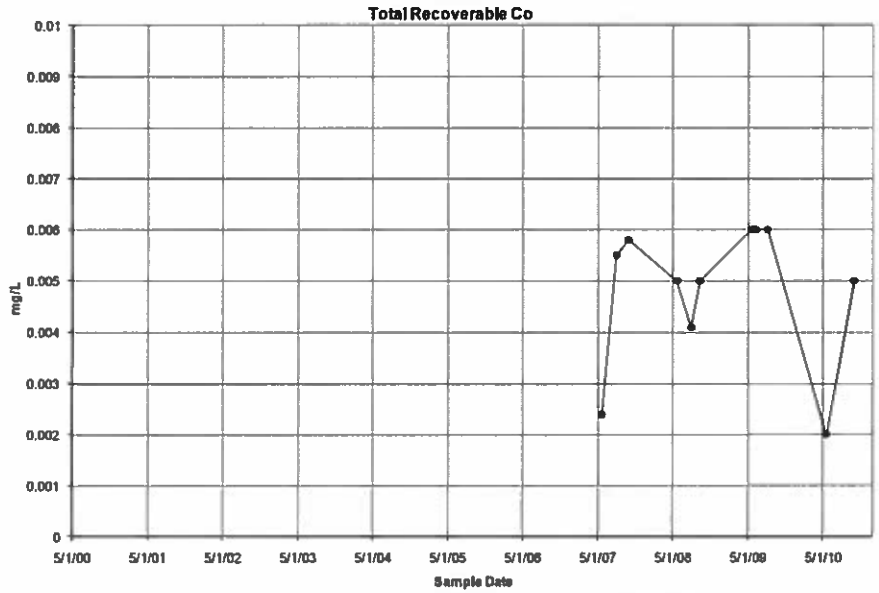
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

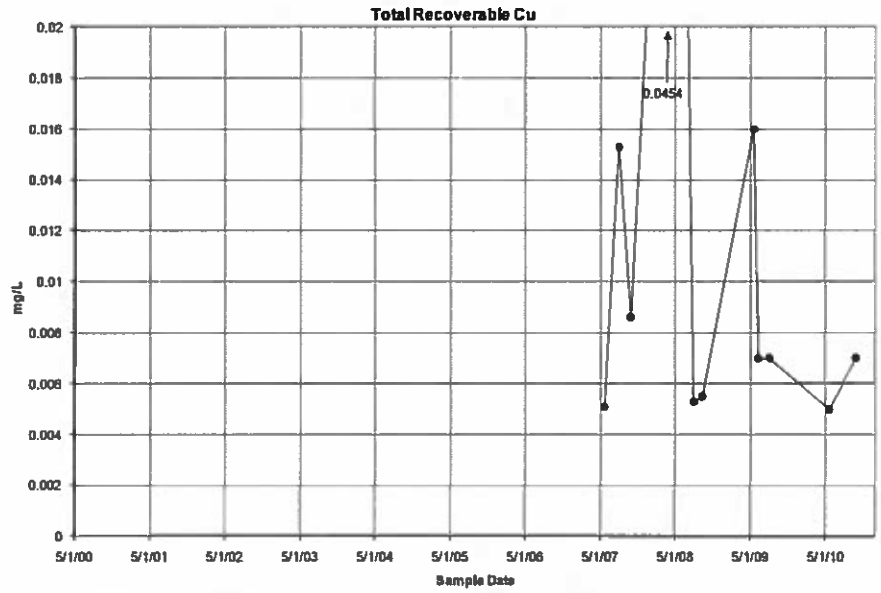
FIGURE 4-25a
2000 – 2010 DATA FOR SAMPLING LOCATION WQ-30

PREPARED FOR: Formation





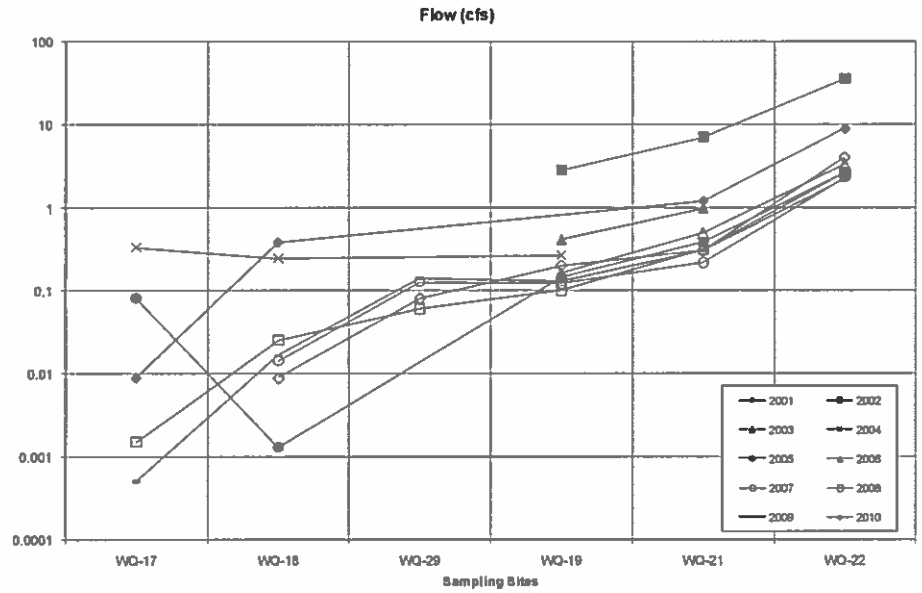


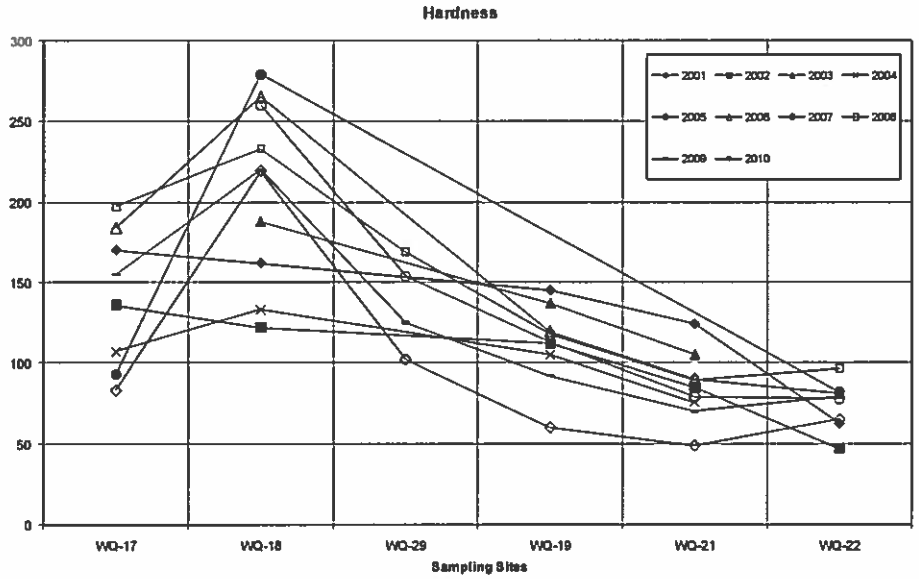


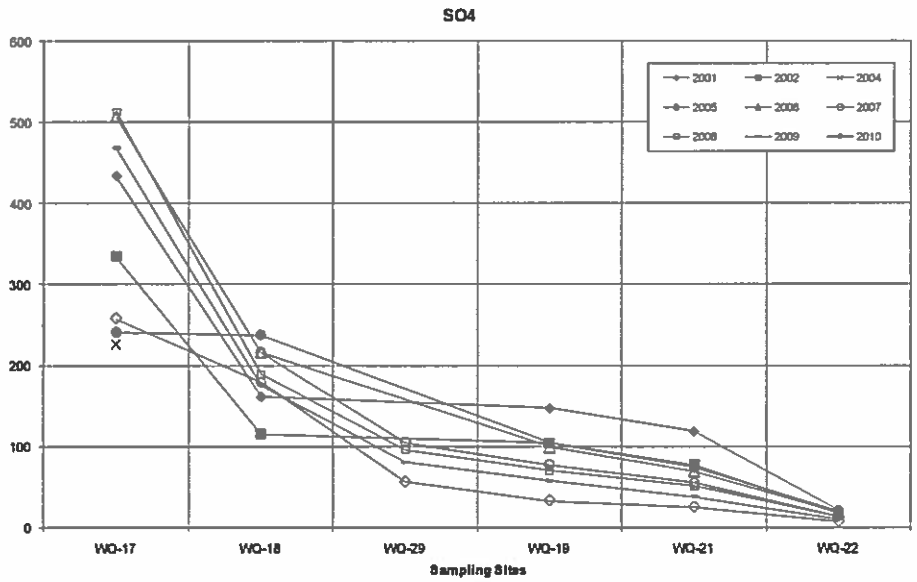
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

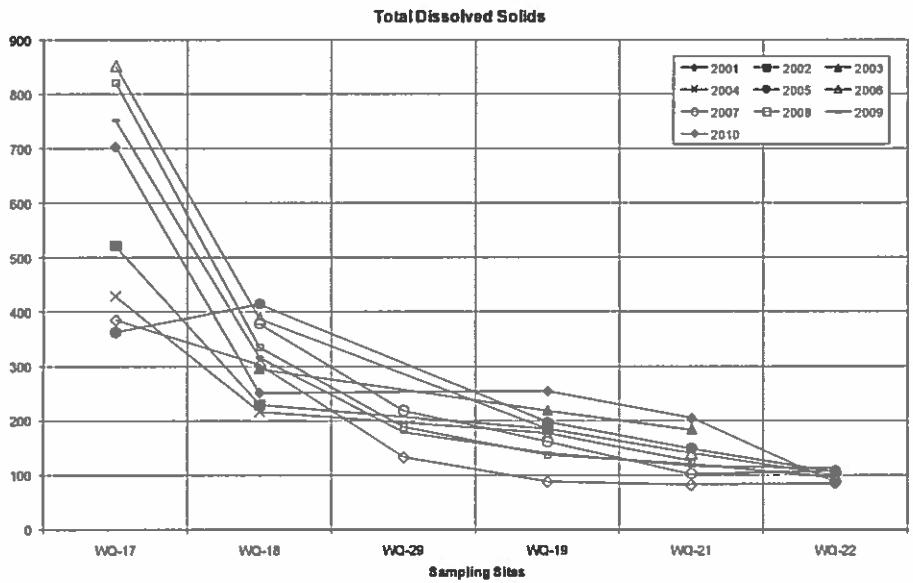
FIGURE 4-25b
2000 - 2010 DATA FOR SAMPLING LOCATION WQ-30

PREPARED FOR: Formation





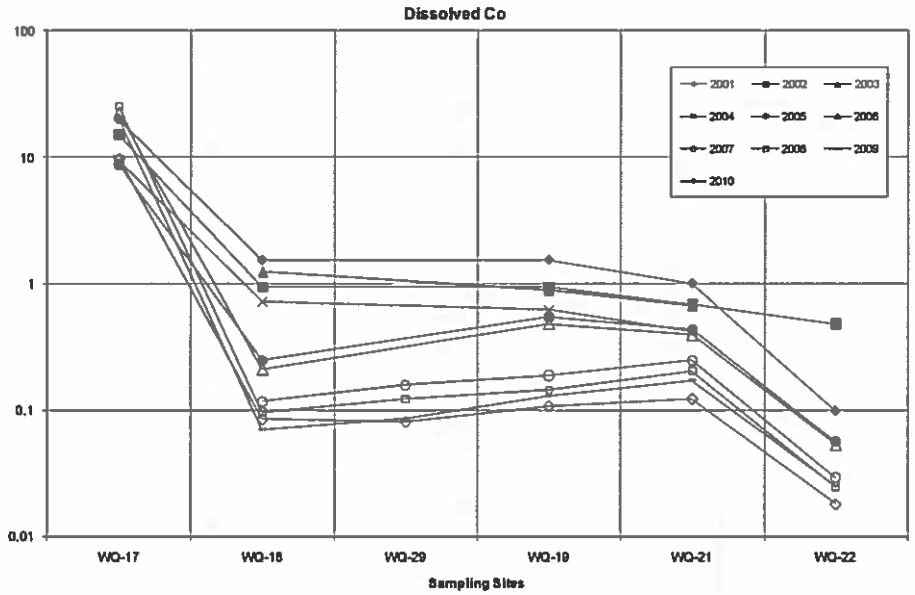


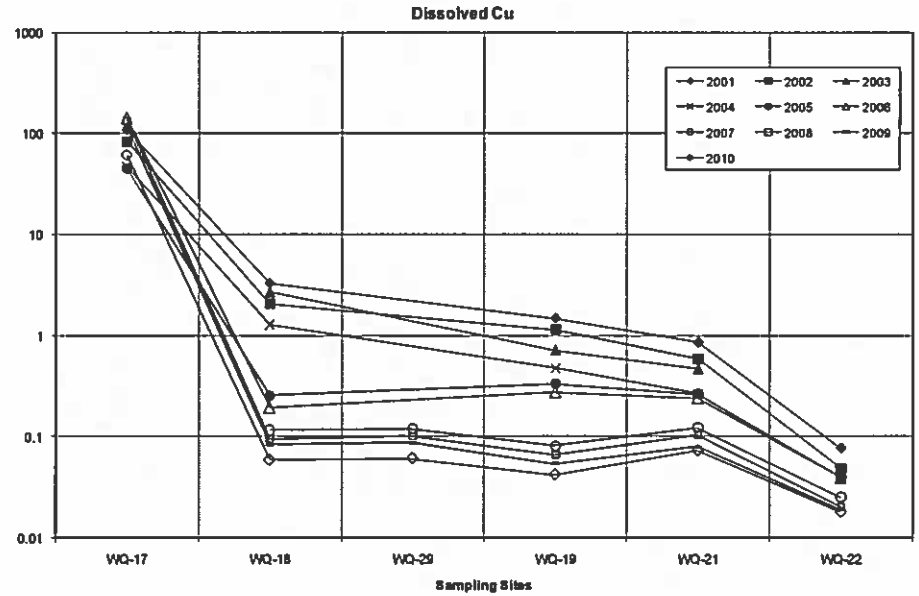


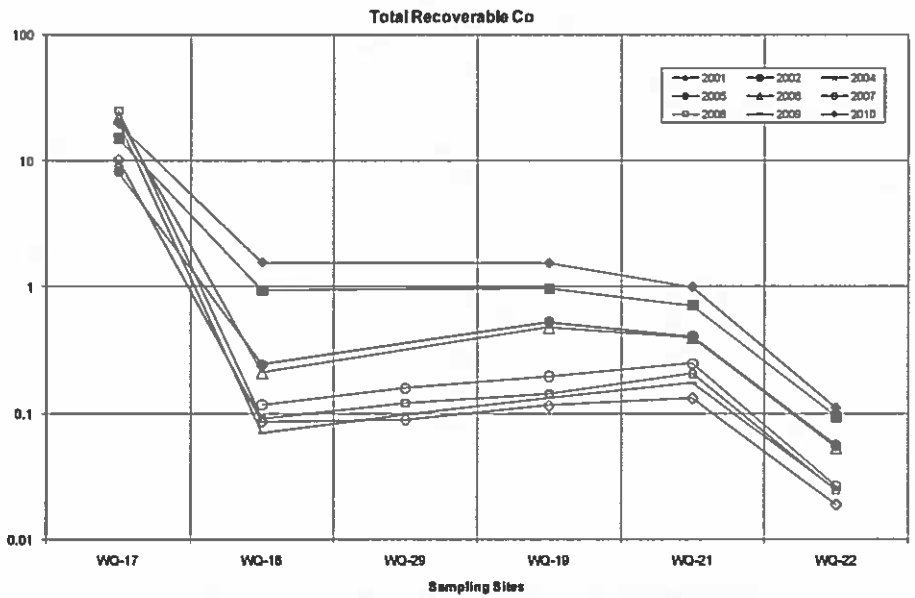
PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

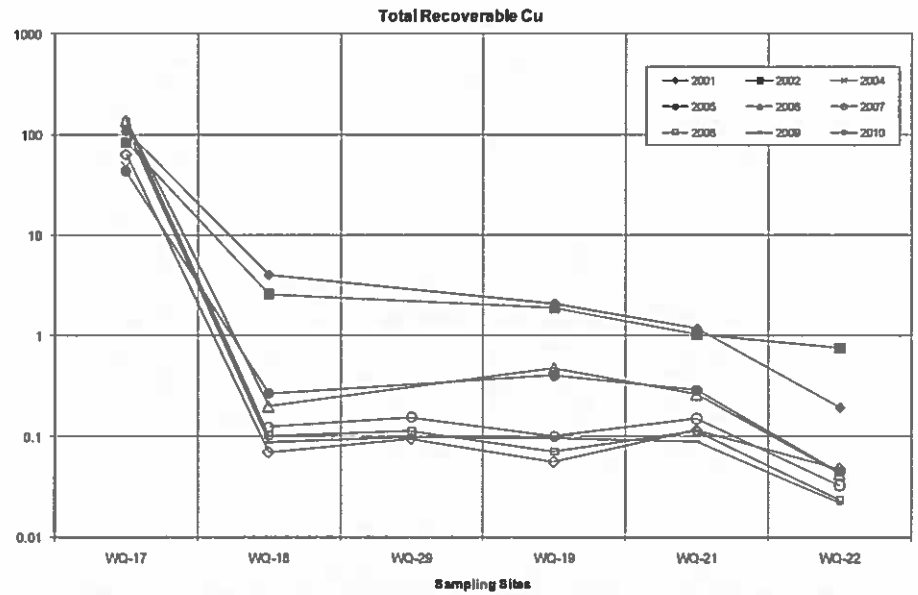
FIGURE 4-26a
2000 – 2010 Bucktail Creek/South Fork Big Deer Creek Downstream Water Quality

PREPARED FOR: Formation









PROJECT: 222100	TASK 66
PREPARED BY: TELESTO SOLUTIONS INCORPORATED	

FIGURE 4-26b
2000 – 2010 Bucktail Creek/South Fork Big Deer Creek Downstream Water Quality

PREPARED FOR: Formation

Appendix A

APPENDIX A
2010 WATER QUALITY/QUANTITY SUMMARY

Analyte	BFMW-1	BFMW-3	BFMW-4d	BFMW-5d	BFMW-6	RMW-1	RMW-2	RMW-3	RMW-6	RMW-7	SS-5	
	6/3/2010	6/2/2010	6/3/2010	6/3/2010	6/2/2010	6/2/2010	6/1/2010	6/2/2010	6/1/2010	6/1/2010	5/20/2010	9/30/2010
Air Temperature (Field- Degrees Celsius)		12.47	7.8	7.48	10.52	14.44	13.9	12.73	15.3	13.83	8.89	16.77
Ammonia-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	0.7	0.6	0.8	0.7	<0.5	1.1	2	2.2	1.4	3.7	<0.5	0.7
Conductivity (Field-mS/cm)	0.023	0.026	0.031	0.041	0.015	0.042	0.258	0.084	0.082	0.121	0.02	0.028
Conductivity (mS/cm)	0.03	0.029	0.04	0.053	0.018	0.042	0.274	0.09	0.083	0.129	0.027	0.035
Depth To Water (Field-feet)	11.15	29.48	19.08	45.85	20.15	331.85	87.17	195	166.33	246.12		
Dissolved Aluminum	<0.08	<0.08	0.08	2.15	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.15	
Dissolved Antimony	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Dissolved Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.01
Dissolved Barium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Dissolved Beryllium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Dissolved Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Calcium	1.61	1.61	2.34	1.21	0.82	2.04	28	3.73	3.8	5.79	1.46	1.87
Dissolved Cobalt	<0.006	0.032	<0.006	0.007	<0.006	0.053	<0.006	0.163	0.225	0.079	<0.006	<0.006
Dissolved Copper	0.038	0.01	0.011	<0.001	0.004	0.006	<0.001	0.081	0.032	0.039	0.003	0.001
Dissolved Iron	0.07	0.28	0.06	0.66	<0.03	<0.03	<0.03	<0.03	1.36	<0.03	0.18	0.08
Dissolved Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Magnesium	0.8	1	1.3	1.5	0.6	1.7	13.6	2.7	2.9	4.7	0.7	0.9
Dissolved Manganese	<0.005	<0.005	0.019	0.036	<0.005	<0.005	0.067	<0.005	0.064	<0.005	<0.005	
Dissolved Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Dissolved Nickel	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	0.003	0.001	0.002	<0.001	<0.001
Dissolved Oxygen (Field)	7.94	8.91	1.23	7.51	9.85	7.72	0.6	7.68	7.28	8.33	11.42	10.54
Dissolved Potassium	<2	<2	<2	<2	<2	2	6	6	5	7	<2	2
Dissolved Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	
Dissolved Silver	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Sodium	<2	<2	2	6	<2	2	3	3	2	5	<2	<2
Dissolved Thallium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Dissolved Zinc	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.019	0.025	<0.005	<0.005
Flow (Field)	2	6.4	1.2	0.6	4	4		2	2	3.25	0.081	
Fluoride	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.4	0.3	0.3	<0.05	<0.1
Gage Height (Field)												
Hardness	7	8	11	9	5	12	126	21	21	34	7	8
Nitrate + Nitrite as N	0.11	0.13	0.17	<0.05	0.16	0.24	<0.05	0.28	0.07	0.76	<0.05	<0.05
pH (Field-Standard Units)	4.21	5.33	5.04	5.09	4.99	5.78	6.8	5.27	5.36	6.01	6.42	7.32
pH (Standard Units)	5.89	6.25	5.83	5.9	6.28	6.58	7.43	5.94	5.73	6.28	6.5	6.98
Sulfate	1	1	<1	<1	<1	3	24	17	19	24	1	2
Total Alkalinity	8	11	13	23	5	14	101	7	<4	10	8	10
Total Dissolved Solids	25	26	18	48	19	32	144	59	58	78	27	28
Total Mercury												
Total Recoverable Aluminum	0.5	0.33	0.41	0.95	0.1	<0.08	<0.08	<0.08	<0.08	<0.08	0.2	
Total Recoverable Antimony	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Total Recoverable Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.65	<0.01	<0.01	
Total Recoverable Barium	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Total Recoverable Beryllium	<0.001	<0.001	<0.001	0.008	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Total Recoverable Cadmium	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Recoverable Cobalt	<0.006	0.032	<0.006	<0.006	<0.006	0.052	<0.006	0.162	0.235	0.078	<0.002	
Total Recoverable Copper	0.044	0.015	0.016	0.118	0.005	0.006	<0.001	0.082	0.095	0.04	0.004	
Total Recoverable Iron	0.49	0.54	0.37	3.75	0.12	<0.03	<0.03	<0.03	26.7	<0.03	0.33	
Total Recoverable Lead	0.001	<0.001	<0.001	0.079	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	
Total Recoverable Manganese	<0.005	<0.005	0.02	0.729	<0.005	<0.005	0.07	<0.005	0.062	<0.005	<0.005	
Total Recoverable Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001	<0.001	<0.0002	
Total Recoverable Nickel	<0.001	<0.001	<0.001	0.013	<0.001	<0.001	0.001	0.003	0.001	0.003	<0.001	
Total Recoverable Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	0.001	<0.001	
Total Recoverable Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Recoverable Thallium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Total Recoverable Zinc	<0.005	<0.005	<0.005	0.135	<0.005	<0.005	<0.005	<0.005	0.021	0.026	<0.005	
Total Suspended Solids	3	<3	<3	11600	<3	<3	<3	<3	71	<3	<3	4
Turbidity (Field)	11	14.9	5.43	1000	4.77	0.64	0.17	0.76	108	1.94	3.51	0.0312
Water Temperature (Field-Degrees Celsius)	5.55	4.95	6.8	8.24	5.26	7.51	10.15	8.99	8.3	8.48	5.1	7.29

Analyte	SS-7	SS-9	SS-11		WQ-1	WQ-2	WQ-3	WQ-4		WQ-5	WQ-6	WQ-7	
	5/11/2010	5/20/2010	5/11/2010	9/29/2010	5/18/2010	5/18/2010	5/18/2010	5/18/2010	9/27/2010	5/18/2010	5/18/2010	5/20/2010	9/30/2010
Air Temperature (Field- Degrees Celsius)	5.47	2.54	3.54		15.8	19.44	14.63	13.88	23.21	13.21	10.51	4.9	7.42
Ammonia-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	<0.5	<0.5	1.5	1.7	0.6	0.8	0.6	0.6	1	0.8	0.7	0.5	0.7
Conductivity (Field-mS/cm)	0.024	0.02	0.071						0.092			0.02	0.026
Conductivity (mS/cm)	0.03	0.027	0.08	0.093	0.065	0.045	0.064	0.064	0.101	0.048	0.064	0.027	0.033
Depth To Water (Field-feet)													
Dissolved Aluminum	<0.08	0.26	<0.08		0.17	0.23	0.22	0.17	<0.08	0.19	0.19	0.11	
Dissolved Antimony													
Dissolved Arsenic	<0.01	<0.01	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Barium													
Dissolved Beryllium													
Dissolved Cadmium	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Calcium	1.79	1.89	3.88	4.84	6.57	3.4	6.61	6.71	10.9	3.49	6.39	1.5	1.96
Dissolved Cobalt	<0.006	<0.006	0.156	0.198	0.01	<0.006	0.009	0.009	<0.006	0.01	0.009	0.013	0.02
Dissolved Copper	0.003	0.006	0.036	0.012	<0.001	0.004	0.004	0.002	0.001	0.009	0.002	0.005	0.001
Dissolved Iron	0.06	0.24	0.09	<0.03	0.18	0.14	0.22	0.16	0.04	0.18	0.2	0.16	0.07
Dissolved Lead	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Magnesium	0.6	0.7	2.6	2.9	1.4	1.6	1.4	1.4	2.1	1.2	1.4	0.8	1
Dissolved Manganese	<0.005	0.009	<0.005		0.011	<0.005	0.01	0.01	<0.005	<0.005	0.01	0.007	
Dissolved Mercury	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Dissolved Nickel	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	0.001	<0.001	0.001	0.001	<0.001	<0.001
Dissolved Oxygen (Field)	13.87	10.53	18.9		11.42	13.25	11.1	10.95	10.36	11.26	10.91	12.9	10.66
Dissolved Potassium	<2	<2	5	5	<2	<2	<2	<2	<2	3	<2	<2	<2
Dissolved Selenium	<0.001	<0.001	0.001		<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Dissolved Silver	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Dissolved Sodium	<2	<2	3	3	3	<2	2	3	5	2	3	<2	<2
Dissolved Thallium													
Dissolved Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Flow (Field)		0.046	0.003		330	0.51	330	320	60	8.5	360	0.51	0.02
Fluoride	0.06	<0.05	0.18	0.2	0.16	0.09	0.16	0.16	0.2	0.16	0.16	<0.05	<0.1
Gage Height (Field)											2		
Hardness	7	7	20	24	22	15	22	23	36	14	22	7	9
Nitrate + Nitrite as N	0.11	<0.05	0.28	0.28	0.27	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06
pH (Field-Standard Units)		6.43	8.68		7.16	6.57	7.16	7.04	8.32	6.57	7.11	6.39	7.19
pH (Standard Units)	6.19	6.33	7.15	6.84	7.59	7.41	7.58	7.6	7.96	7.41	7.58	6.82	6.93
Sulfate	<1	<1	15	21	4	2	4	4	6	2	4	1	1
Total Alkalinity	11	8	10	9	24	15	24	24	35	15	23	8	10
Total Dissolved Solids	34	44	58	65	70	33	45	46	54	34	48	24	22
Total Mercury													
Total Recoverable Aluminum	<0.08	1.57	<0.08		0.72	0.29	0.95	1.04	<0.08	0.83	1.12	0.13	
Total Recoverable Antimony													
Total Recoverable Arsenic	<0.01	<0.01	0.03		0.01	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	
Total Recoverable Barium													
Total Recoverable Beryllium													
Total Recoverable Cadmium	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Recoverable Cobalt	<0.002	0.005	0.173		0.02	0.003	0.019	0.019	0.011	0.015	0.019	0.013	
Total Recoverable Copper	0.004	0.012	0.039		0.013	0.006	0.013	0.013	0.002	0.021	0.012	0.006	
Total Recoverable Iron	0.08	2	0.05		1.72	0.34	1.83	1.87	0.1	1.43	1.88	0.17	
Total Recoverable Lead	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Recoverable Manganese	<0.005	0.029	<0.005		0.039	<0.005	0.036	0.036	0.006	0.009	0.037	0.007	
Total Recoverable Mercury	<0.001	<0.0002	<0.001		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Total Recoverable Nickel	<0.001	0.002	<0.001		0.002	<0.001	0.002	0.002	<0.001	0.002	0.002	<0.001	
Total Recoverable Selenium	0.002	<0.001	0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Total Recoverable Silver	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Total Recoverable Thallium													
Total Recoverable Zinc	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
Total Suspended Solids	19	6	<3	4	36	<3	28	26	<3	16	29	<3	<3
Turbidity (Field)	2.7	29	0.9		38.5	2.8	36.4	23.6	2.6	8.1	28.4	1.64	2.37
Water Temperature (Field-Degrees Celsius)	2.3	5.99	4.15		7.46	3.19	8.28	8.37	12.31	7.31	8.54	3.52	4.64

Analyte	WQ-10		WQ-11	WQ-13	WQ-14		WQ-15		WQ-16	WQ-17		WQ-18	
	5/18/2010	9/29/2010	5/18/2010	5/18/2010	5/20/2010	9/30/2010	5/20/2010	9/30/2010	5/18/2010	5/18/2010	9/29/2010	5/18/2010	9/29/2010
Air Temperature (Field- Degrees Celsius)	13.17	15.07	13.81	9.61	5.9	18.09	5.56	24.4	9.86	9.71		11.83	18.87
Ammonia-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	0.09	<0.05	<0.05
Chloride	1.9	2.4	0.9	1.6	<0.5	0.6	<0.5	0.7	<0.5	2.6	4.8	1.4	1.5
Conductivity (Field-mS/cm)		0.099			0.015	0.028	0.02	0.036			0.713		0.442
Conductivity (mS/cm)	0.088	0.112	0.045	0.077	0.024	0.037	0.027	0.039	0.078	0.521	0.765	0.48	0.482
Depth To Water (Field-feet)													
Dissolved Aluminum	<0.08		0.11	<0.08	<0.08		0.18		<0.08	4.2	6.4	<0.08	<0.08
Dissolved Antimony													
Dissolved Arsenic	0.03	0.03	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Dissolved Barium													
Dissolved Beryllium													
Dissolved Cadmium	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001		<0.0001	0.0004	0.0006	<0.0001	<0.0001
Dissolved Calcium	4.98	6.71	2.68	3.78	1.58	2.54	1.44	2.31	7.49	14.5	26.8	68.8	75.1
Dissolved Cobalt	0.119	0.147	<0.006	0.144	<0.006	<0.006	<0.006	<0.006	0.117	9.71	17.4	0.085	0.075
Dissolved Copper	0.018	0.03	<0.001	0.032	0.003	0.002	0.003	0.002	0.194	60.8	83.9	0.059	0.088
Dissolved Iron	0.05	<0.03	0.13	0.07	0.11	0.13	0.22	0.12	0.28	0.09	<0.03	<0.03	<0.03
Dissolved Lead	<0.001		<0.001	<0.001	<0.001		<0.001		<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Magnesium	2.9	3.6	1.7	2.4	0.5	0.8	0.7	1.2	1.8	11.4	19.3	11.5	10.8
Dissolved Manganese	<0.005		<0.005	<0.005	0.005		<0.005		0.099	1.3	2.2	<0.005	<0.005
Dissolved Mercury	<0.0002		<0.0002	<0.0002	<0.0002		<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Dissolved Nickel	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.179	0.307	<0.001	0.001
Dissolved Oxygen (Field)	11.72	9.44	11.51	11.68	10.33	7.85	11.88	8.13	13.19	11.7	9.76	10.57	9.95
Dissolved Potassium	5	5	2	4	<2	<2	<2	2	3	17	25	4	4
Dissolved Selenium	<0.001		<0.001	0.001	<0.001		<0.001		<0.001	0.003	0.005	0.002	0.001
Dissolved Silver	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium	3	3	<2	3	<2	2	<2	2	<2	<2	<2	3	3
Dissolved Thallium													
Dissolved Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.157	0.188	<0.005	<0.005
Flow (Field)	0.09	0.04		0.0276	0.23	0.0023	0.0887	0.0002			0.0005	0.0088	0.02
Fluoride	0.23	0.2	0.13	0.17	<0.05	<0.1	<0.05	<0.1	0.07	0.39	0.6	0.14	0.1
Gage Height (Field)	0.1			1.23	0.37								
Hardness	24	31	14	20	6	10	7	11	26	83	146	219	232
Nitrate + Nitrite as N	0.22	0.31	0.14	0.24	<0.05	<0.05	<0.05	<0.05	0.11	0.93	1.28	0.43	0.4
pH (Field-Standard Units)	7.74	7.56	7.99	7.51	6.8	7.35	6.94	7.04	6.5	4.25	4.35	7.76	7.68
pH (Standard Units)	7.1	6.97	7.37	7.11	6.82	7.3	6.98	7.07	6.35	4.28	4.34	7.91	7.73
Sulfate	14	23	2	13	<1	<1	1	2	21	258	383	179	181
Total Alkalinity	17	14	14	11	8	12	12	12	<4			51	56
Total Dissolved Solids	50	78	23	51	23	34	34	39	40	385	657	302	329
Total Mercury													
Total Recoverable Aluminum	<0.08		0.32	0.35	0.1		0.34		33.4	5.13	6.9	<0.08	<0.08
Total Recoverable Antimony													
Total Recoverable Arsenic	0.03		<0.01	0.04	<0.01		<0.01		0.21	0.02	0.01	0.01	<0.01
Total Recoverable Barium													
Total Recoverable Beryllium													
Total Recoverable Cadmium	<0.0001		<0.0001	<0.0001	<0.0001		<0.0001		0.0001	0.0004	0.0006	<0.0001	<0.0001
Total Recoverable Cobalt	0.134		0.006	0.174	<0.002		<0.002		0.252	10.2	16.7	0.086	0.073
Total Recoverable Copper	0.038		0.002	0.138	0.004		0.004		3.09	62.8	90.6	0.07	0.091
Total Recoverable Iron	0.1		0.41	0.42	0.2		0.45		74.2	1.43	<0.03	0.15	0.03
Total Recoverable Lead	<0.001		<0.001	<0.001	<0.001		<0.001		0.003	<0.001	<0.001	<0.001	<0.001
Total Recoverable Manganese	<0.005		<0.005	0.007	<0.005		<0.005		0.395	1.32	2.21	<0.005	<0.005
Total Recoverable Mercury	<0.0002		<0.0002	<0.0002	<0.0002		<0.0002		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Total Recoverable Nickel	0.002		<0.001	0.002	<0.001		<0.001		0.024	0.198	0.314	<0.001	0.001
Total Recoverable Selenium	<0.001		<0.001	0.001	<0.001		<0.001		<0.001	0.003	0.005	0.002	0.001
Total Recoverable Silver	<0.0001		0.0001	<0.0001	<0.0001		<0.0001		0.0004	<0.0001	<0.0001	<0.0001	<0.0001
Total Recoverable Thallium													
Total Recoverable Zinc	<0.005		<0.005	<0.005	<0.005		<0.005		0.019	0.16	0.147	<0.005	<0.005
Total Suspended Solids	4	<3	8	15	<3	9	5	3	996	9	<3	<3	<3
Turbidity (Field)	3.9	0.32	4.1	2.29	1.16	9.99	5.46	6.24	347	3.7	0.68	2.3	0.92
Water Temperature (Field-Degrees Celsius)	4.85	7.4	5.73	5.27	7.51	10.67	4.08	9.6	1.28	3.96	6.04	6.98	6.74

Analyte	WQ-19		WQ-20	WQ-21		WQ-22	WQ-23	WQ-24a		WQ-25	WQ-25a	
	5/18/2010	9/29/2010	5/17/2010	5/17/2010	9/29/2010	5/17/2010	5/17/2010	5/17/2010	9/28/2010	5/18/2010	5/18/2010	9/27/2010
Air Temperature (Field- Degrees Celsius)	17.83	16.84	13.47	15.75	12.28	12.88	12.88		23.43	11.81	9.1	
Ammonia-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	1.7	2	0.6	1.5	2	0.8	<0.5	<0.5	0.7	0.7	0.6	1
Conductivity (Field-mS/cm)		0.229	0.124	0.116	0.168	0.128	0.038	0.048	0.094			0.091
Conductivity (mS/cm)	0.162	0.251	0.145	0.137	0.187	0.149	0.045	0.056	0.108	0.065	0.064	0.107
Depth To Water (Field-feet)												
Dissolved Aluminum	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.12	0.12	<0.02	0.18	0.17	<0.08
Dissolved Antimony												
Dissolved Arsenic	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002	<0.002	<0.01	<0.01	<0.01
Dissolved Barium												
Dissolved Beryllium												
Dissolved Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Calcium	17.2	30.7	22.6	13	19.8	22.8	5.03	6.78	14.4	6.61	6.53	11.7
Dissolved Cobalt	0.108	0.129	<0.006	0.123	0.172	0.018	<0.006	0.003	0.004	0.011	0.012	0.008
Dissolved Copper	0.042	0.056	<0.001	0.073	0.077	0.018	<0.001	0.002	0.006	0.004	0.004	0.002
Dissolved Iron	0.04	<0.03	0.04	0.04	<0.03	0.05	0.05	0.09	<0.03	0.22	0.22	0.04
Dissolved Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0002	<0.0001	<0.001	<0.001	<0.001
Dissolved Magnesium	4.2	5.7	1.6	4	4.9	2	0.6	0.8	1.5	1.4	1.4	2.1
Dissolved Manganese	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	0.012	<0.005
Dissolved Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002			<0.0002	<0.0002	<0.0002
Dissolved Nickel	0.002	0.001	<0.001	0.002	0.003	<0.001	<0.001	<0.001	<0.001	0.001	0.001	<0.001
Dissolved Oxygen (Field)	11.08	89.4	9.83	8.6	11.02	9.65	9.45	9.9	9.77	11.35	11.39	10.57
Dissolved Potassium	4	4	<2	4	4	<2	<2	<1	1	<2	<2	<2
Dissolved Selenium	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium	3	4	2	3	3	2	3	3	4	3	3	5
Dissolved Thallium												
Dissolved Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Flow (Field)	0.2	0.08	4	0.3	0.2	4	50	52	11	370		63
Fluoride	0.2	0.2	0.17	0.22	0.2	0.19	1.07	0.7	0.6	0.16	0.22	0.3
Gage Height (Field)		0.24	0.72	2.18	0.62	1.05	1.31		0.91	1.2	8.72	7.77
Hardness	60	100	63	49	70	65	15	20	42	22	22	38
Nitrate + Nitrite as N	0.1	0.13	0.14	0.11	0.09	0.12	<0.05	0.02	0.03	0.05	0.05	<0.05
pH (Field-Standard Units)	7.97	7.86	8.25	8.1	7.63	8.08	7.64	7.75	7.83	7.08	7.09	7.95
pH (Standard Units)	7.76	7.7	8.07	7.78	7.62	8.06	7.39	7.55	7.8	7.51	7.52	7.41
Sulfate	33	69	4	25	43	7	1	2	4	4	4	5
Total Alkalinity	29	41	63	27	32	61	16	22	55	24	24	40
Total Dissolved Solids	88	150	78	82	116	85	36	35	62	56	45	63
Total Mercury								0.00000289	0.00000021			
Total Recoverable Aluminum	<0.08	<0.08	0.18	0.1	<0.08	0.09	0.27	0.28	<0.02	1.22	1.55	0.08
Total Recoverable Antimony												
Total Recoverable Arsenic	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002	<0.002	0.01	0.01	<0.01
Total Recoverable Barium												
Total Recoverable Beryllium												
Total Recoverable Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Recoverable Cobalt	0.115	0.126	<0.002	0.131	0.168	0.019	<0.002	<0.002	0.005	0.023	0.024	0.012
Total Recoverable Copper	0.056	0.063	<0.001	0.115	0.082	0.048	<0.001	0.003	0.007	0.016	0.019	0.003
Total Recoverable Iron	0.19	<0.03	0.3	0.24	<0.03	0.2	0.17	0.17	<0.03	2.49	2.9	0.11
Total Recoverable Lead	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0003	<0.0001	<0.001	0.001	<0.001
Total Recoverable Manganese	<0.005	<0.005	0.009	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.045	0.049	0.007
Total Recoverable Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002
Total Recoverable Nickel	0.002	0.001	0.001	0.003	0.002	0.001	<0.001	<0.001	<0.001	0.002	0.002	<0.001
Total Recoverable Selenium	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Recoverable Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Recoverable Thallium								<0.0003	<0.0003			
Total Recoverable Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	<3	<3	17	4	<3	9	5	5	<3	37	43	<3
Turbidity (Field)	3.88	1.03	2.9	3.9	0.54	2.4	3.1	5.6	0.87	50.3	32.1	3.33
Water Temperature (Field-Degrees Celsius)	6.96	6.25	7.57	10.67	6.57	8.51	8.71	8.28	10.8	6.73	6.66	8.52

Analyte	WQ-28		WQ-29		WQ-30	
	5/18/2010	9/27/2010	5/18/2010	9/29/2010	5/17/2010	9/28/2010
Air Temperature (Field- Degrees Celsius)	12.46	14.5	14.71	14.67	22.75	22.33
Ammonia-N	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloride	<0.5	0.8	1.5	1.8	<0.5	0.7
Conductivity (Field-mS/cm)		0.098		0.29	0.047	0.096
Conductivity (mS/cm)	0.052	0.112	0.243	0.316	0.057	0.109
Depth To Water (Field-feet)						
Dissolved Aluminum	0.11	<0.08	<0.08	<0.08	0.1	<0.02
Dissolved Antimony						
Dissolved Arsenic	<0.002	<0.01	<0.01	<0.01	<0.002	<0.002
Dissolved Barium						
Dissolved Beryllium						
Dissolved Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Dissolved Calcium	6.11	14.7	31.8	43.4	6.86	14.3
Dissolved Cobalt	<0.002	<0.006	0.081	0.093	0.003	0.003
Dissolved Copper	0.007	0.006	0.061	0.085	0.003	0.005
Dissolved Iron	0.07	<0.03	0.03	<0.03	0.08	<0.03
Dissolved Lead	<0.001	<0.001	<0.001	<0.001	0.0002	<0.0001
Dissolved Magnesium	0.8	1.6	5.6	6.9	0.8	1.5
Dissolved Manganese	<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Dissolved Mercury	<0.0002	<0.0002	<0.0002	<0.0002		
Dissolved Nickel	<0.001	<0.001	0.003	0.002	<0.001	<0.001
Dissolved Oxygen (Field)	11.82	10.74	10.09	9.82	10.38	9.83
Dissolved Potassium	<2	<2	3	3	<1	1
Dissolved Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dissolved Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Sodium	2	4	3	4	3	4
Dissolved Thallium						
Dissolved Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Flow (Field)	70	12	0.08	0.06	51	10
Fluoride	0.92	0.8	0.16	0.2	0.7	0.6
Gage Height (Field)	3.04	0.12		0.13	1.47	1.62
Hardness	18	43	102	137	21	42
Nitrate + Nitrite as N	<0.01	<0.05	0.09	0.13	<0.01	0.03
pH (Field-Standard Units)	7.1	8.01	7.91	8.11	7.88	7.7
pH (Standard Units)	7.5	7.49	7.94	7.76	7.56	7.8
Sulfate	2	4	56	91	2	4
Total Alkalinity	20	41	48	54	39	41
Total Dissolved Solids	45	56	133	193	44	62
Total Mercury					0.00000249	0.00000073
Total Recoverable Aluminum	0.48	<0.08	0.16	<0.08	0.27	<0.02
Total Recoverable Antimony						
Total Recoverable Arsenic	<0.002	<0.01	0.01	<0.01	<0.002	<0.002
Total Recoverable Barium						
Total Recoverable Beryllium						
Total Recoverable Cadmium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Total Recoverable Cobalt	0.004	0.004	0.089	0.087	<0.002	0.005
Total Recoverable Copper	0.019	0.007	0.095	0.093	0.005	0.007
Total Recoverable Iron	0.49	<0.03	0.4	0.03	0.18	<0.03
Total Recoverable Lead	<0.001	<0.001	<0.001	<0.001	0.0003	<0.0001
Total Recoverable Manganese	0.011	<0.005	<0.005	<0.005	<0.005	<0.005
Total Recoverable Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
Total Recoverable Nickel	<0.001	<0.001	0.003	0.001	<0.001	<0.001
Total Recoverable Selenium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Total Recoverable Silver	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001
Total Recoverable Thallium					<0.0003	<0.0003
Total Recoverable Zinc	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	16	<3	4	<3	5	<3
Turbidity (Field)	5.9	2.34	8.18	1.16	3.4	0.61
Water Temperature (Field-Degrees Celsius)	6.2	8.4	9.45	7.93	7.66	10.92