To: Stacey Gotham 1/20/10
Central Valley Region
Regional Water Quality Control Board
415 Knollcrest Drive
Redding, CA 96002

Re: City of Anderson WWTP
NPDES No. CA00077704
Order No. R5-2007-0167
Salinity Evaluation and Minimization Plan (SEMP)

Background: The City of Anderson WWTP is located in the northern Sacramento Valley, SWRCB Region 5. It has a design flow of 2 MGD, 6 MDG peak wet weather discharge flow and a 1.34 MGD average dry weather flow. It is a Class IV Tertiary Plant and discharges into the Sacramento River at latitude 40-28-25 / longitude 122-16-02

To address Salinity in the Central Basin and permit requirements for a Salinity Evaluation and Minimization Plan (SEMP) the City of Anderson began a sampling program in November 2008. Along with permit required testing, Additional samples were collected monthly and quarterly concurrently for electrical conductivity (EC), Total Dissolved Solids (TDS), chloride (cl) and sulfate (so4) on effluent discharge (EFF-001), up river 100 feet from discharge (R-001), down river1/4 mile from discharge (R-002) and the municipal water supply (SPL-001). This sampling schedule can be viewed in Appendix A, Table 1. Sampling concluded in November of 2009, some non permit samples were missed in December 2008, thus giving us a year's worth of evaluation data in Appendix A, Table 3.

Sampling program and analysis of data objectives:

- Establish new baselines and backgrounds for EC, TDS, chloride and sulfate on EFF-001, R-001, R-002 and SPL-001 for analysis and trend purposes.
- Compare results to the Salinity Water Quality Criteria/Objectives (Appendix A, Table 2)
- To determine effects of EFF-001 discharge by comparing upstream (R-001) and downstream (R-002) sample data
- Determine future sampling/monitoring required
- Identify sources of salinity
- Minimization strategies
- Determine if a Pollution Prevention Plan is required

Electrical Conductivity
Baselines, Trends & Water Quality Criteria Comparisons

Eff-001: Review of the Discharger's monitoring reports from January 2003 through May 2007 shows an average monthly effluent EC of 366 umhos/cm, a one-day maximum observed EC of 483 umhos/cm, and an average monthly range from 276 umhos/cm to 483 umhos/cm for 52 samples.

The data was collected over the past 12 months November 2008 through December 2009 (12 samples) shows an average monthly EC of 386 umhos/cm, and an annual range from 341 umhos/cm to 435 umhos/cm (Appendix A, Table No. 3 & Chart No. 1).

In comparing the two sampling periods, the average EC has increased 20 umhos/cm, the maximum has deceased 48 umhos/cm, and the minimum of the range has increased 65 umhos/cm.

The average increase can be attributed to a possibly the fact that inflow and infiltration (I&I) is down due to the drought the north state has been experiencing the past three years, increasing the concentrations. The high and low range difference between the two sampling periods may well be due to the length of the first sample period. More data will be required over the next few years to acquire more precise numbers to determine trends.

The average EC for the sampling period is in the typical range for domestic wastewater. When taking the source water EC average of 228 umhos/cm and adding the typical EC increase from domestic wastewater of 150 to 220 umhos/cm, Andersons EC should be in the range of 378 to 448 umhos/cm. Anderson average EC of 386 umhos/cm is on the low end of this spectrum, and with most of the industry in Anderson being on septic tanks, Based on general plan sewer densities for household equivalent (HE)/acre commercial discharge is at 20% (Chart No.5 & 6). Commercial business is having only a minor effect on the EC.

The Effluent EC is well below the agricultural water quality goal of 700 umhos/cm and the Basin Plan Salinity Water Quality Criteria/Objectives, set forth in Table 2 below;

Table 2 Salinity Water Quality Criteria/Obectives

	Agricultural	Secondary	Anderson Effluent	
Parameters	**WQ Goal**	**MCL**	**AVG**	**MAX**
EC umhos/cm	700	900, 1600, 2200	386	435
TDS mg/l	450	500, 1000, 1500	260	284
Sulfate mg/l	Varies	250, 500, 600	22	30
Chloride	Varies	250, 500, 600	32	44

SPL-001: Anderson's new WDR Permit effective January 25, 2008 requires quarterly sampling of the municipal water supply for EC. Three samples were collected prior to the SEMP sampling program. The results of these samples are 225, 229, and 231 umhos/cm, are not included in the data for the SEMP sampling program. Prior to the effective 2008 WDR order date; no data has been collected for SPL-001 EC.

The data collected over the SEMP sampling period (12 samples) shows an average monthly EC of 228 umhos/cm, a one day maximum of 241 umhos/cm and a range from 241 umhos/cm to 134 umhos/cm (Appendix A, Table No. 3 & Chart No. 1). This data gives Anderson a baseline number for monitoring any increases in EC from future lab results. The SPL-001 accounts for 59% of the EFF-001 EC discharge from the treatment plant (Chart No. 5).

The EC measurement indicate that the water from the cities wells are in the typical demographic range and do not appear to have major intrusion of salts or TDS other than through natural occurring. Continue sampling of the SPL-001 will give more data to establish both short and long term effects of the well water on the EFF-001 discharge for EC, TDS, chloride and sulfate.

R-001: Twelve samples were taken from the Sacramento River upstream sampling point (100 feet upstream from the plant outfall) and resulted in a monthly EC of 118 umhos/cm, a one umhos/cm day maximum of140 umhos/cm and a range from 140 umhos/cm to 73 umhos/cm (Appendix A, Table No. 3 & Chart No. 1).

R-002: The concurrent R-002 sampling point shows an average of 121 umhos/cm, a high of 138 umhos/cm and a low of 101 umhos/cm (Appendix A, Table 3 & Chart No. 1). The median change from the difference in the EC of R-001 and R-002 is 1 umhos/cm. The average increase from R-001 to R-002 is 3 umhos/cm, removing the questionable R-001 results in June this average in change from R-001 to R-002 is 1.7 umhos/cm.

The 2006 mixing zone study conducted by Kennedy/Jenks Consultants concludes that at 800 ft downstream of discharge the tracer dye was 90 ft from the south bank and had a dilution factor of 300 to 1 calculates to an increase of 1.29 umhos/cm. to background of river. Considering the R-002 sample point, the effects of the EC effluent discharge on the river background are accurately represented in the sampling results.

The lab results indicate the concentrations are well below the Salinity Water Quality Agricultural WQ Goals and Secondary MCL's (Table 2 Page 2). It does not appear that at this point in time Anderson should be required to implement a Pollution Prevention Plan. However, steps should be implemented to monitor, identify and minimize salt loadings. This will be addressed in the final summary.

Total Dissolved Solids (TDS)
Baselines, Trends & Water Quality Criteria Comparisons

EFF-001: Review of the Discharger's monitoring reports from January 2003 through May 2007 shows average TDS effluent concentration was 234 mg/L and ranged from 196 mg/L to 273 mg/L for 18 samples collected by the Discharger from January 2003 through May 2007. These concentrations do not exceed the applicable water quality objectives of 450 mg/l, or the secondary MCL for TDS (Table 2 Page 2).

The data collected over the SEMP sampling period (12 samples) shows an average monthly TDS of 260 mg/l, and an range from 214 mg/l to 284 mg/l (Appendix A, Table No. 3 & Chart No. 2). This data gives Anderson a baseline number for monitoring any increases in TDS from future lab results. The supply water accounts for 60% of the TDS. (Appendix A, Chart No. 7). The percentages are very similar to Appendix A Chart 5 for EC. The TDS loadings can be assumed to originate from the same source as EC, represented on Appendix A, Chart 6.

In comparing the two sample periods, the average TDS has increased 26 mg/l, maximum increase by 11 mg/l, the low increased by 18 mg/l.

The average increase can be attributed to possibly the fact that inflow and infiltration (I&I) is down due to the drought the north state has been experiencing the past three years, increasing the concentrations. The high and low range difference between the two sampling periods may well be due to the length of the first sample period. More data will be required over the next few years to acquire more precise numbers to determine trends.

Typically TDS in wastewater discharges ranges from 300 mg/l to 500 mg/l, with tap to wastewater increases of 150 mg/l to 380 mg/l. Andersons monthly TDS is slightly below the typical range at 260 mg/l monthly average. Andersons tap to wastewater average increase of TDS is 100 mg/l, is well below typical loadings and does not indicate anything other than normal domestic wastewater increases.

SPL-001: The data collected over the SEMP sampling period (12 samples) shows an average monthly TDS of 156 mg/l, an average monthly range from 147 mg/l to 169 mg/l (Appendix A, Table No. 3 & Chart No. 2). This data gives Anderson a baseline number for monitoring any increases in TDS from future lab results. The SPL-001 accounts for 60 % of the EFF-001 TDS discharge (Appendix A, Chart No. 7).

The TDS measurement indicate that the water from the cities wells are in the typical demographic range and do not appear to have major intrusion of salts or TDS other than through natural occurring. Continue sampling of the SPL-001 will give more data to establish both short and long term effects of the well water on the EFF-001 discharge for EC, TDS, chloride and sulfate.

R-001: The SEMP sampling period (12 samples) shows an average monthly TDS of 85 mg/l, and a low / high range from 70 mg/l to 95 mg/l (Appendix A, Table No. 3 & Chart No. 2).

R-002: The concurrent R-002 sampling data shows an average TDS of 85 mg/l, a range of 64 mg/l to 97 mg/l (Appendix A, Table 3 & Chart No. 2). The average change from the difference in the TDS of R-001 and R-002 is 0 mg/l after EFF-001 discharge. The maximum one day increase from R-001 to R-002 is 2 mg/l.

The 300 to 1 dilution ratio calculates to an increase of 0.87 of TDS to background of river. Considering the R-002 sample point results, the effects TDS effluent discharge on the river background are accurately represented in the sampling results.

The lab results indicate the concentrations are well below the Salinity Water Quality Agricultural WQ Goals and Secondary MCL's (Table 2 Page 2). It does not appear that at this point in time Anderson should be required to implement a Pollution Prevention Plan. However, steps should be implemented to monitor, identify and minimize TDS loadings. This will be addressed in the final summary.

Sulfate (so4) & Chloride (cl)
Baselines, Trends & Water Quality Criteria Comparisons

EFF-001: The data collected over the SEMP sampling period (5 quarterly samples) shows an annual average for sulfate of 21 mg/l, range from 30 mg/l to 16 mg/l (Appendix A, Table No. 3 & Chart No. 3). The chloride average was 37 mg/l, with a range of 44 mg/l to 32 mg/l (Appendix A, Table No. 3 & Chart No. 4). With no previous lab data available, this new data gives Anderson a baseline number for monitoring any increases in salt from future lab results.

These concentrations are fairly low and do not exceed the applicable water quality objectives for secondary MCL for sulfate and chloride (Table 2 Page 2) and do not warrant any further sampling other than permit required. At this point in time it is apparent that a pollution prevention Plan is not required However, steps should be implemented to monitor, identify and minimize salt loadings. This will be addressed in the final summary.

SPL-001: The data collected over the SEMP sampling period (5 quarterly samples) shows an annual average for sulfate of 7 mg/l, with a high / low range from 8 mg/l to 5 mg/l (Appendix A, Table No. 3 & Chart No. 3). The chloride average was 5 mg/l, with a range of 7 mg/l to 3 mg/l (Appendix A, Table No. 3 & Chart No. 4). With no previous lab data available, this new data gives Anderson a baseline number for monitoring any increases in salt from future lab results. The results indicate that the municipal water supply is very low in both these concentrations.

R-001& R-002: The concurrent sampling results (Appendix A, Table No. 3 & Chart No. 3) show little or no evidence of effect from EFF-001 on the background of the river with averages on R-001 of 3.8 mg/l sulfate, 3.3 mg/l chloride and R-002 with 4.0 mg/l sulfate and 2.8 mg/l chloride.

FINAL SUMMARY
Future Sampling / Monitoring, Identifying Sources and Minimization

The Central Valley Regional Water Quality Control Boards "Overview of Salinity in the Central Basin" points out the growing concerns and problems the effects of salinity are having on the Central Basin. Although the City of Andersons WWTP contribution of TDS and other constituents is minimal, it is every City's responsibility to address the issue.

Anderson will continue its salinity evaluation sampling and monitoring program for EC, TDS quarterly as set forth in Appendix A. Table No. 1. Evaluate the data for any increase in EC, TDS and report the results with the annual report submitted in January 2011 and annually thereafter. It should be noted that the City is embarking on an Inflow and Infiltration (I&I) Program as part of the 2006 Sewer Master Plan and as flow decreases the constituent concentrations may increase. Appendix A. Chart 8 charts the total tonnage of the TDS (1.08 tons per million gallons) for the past year to be used as a reference to compare actual loadings on the river as the I&I Program is implemented.

Once enough data has been collected for trend purposes and taking in consideration of the I&I program results , ten year average 1.8% growth rate in conjunction with total river loading tonnage: if the constituents show an increasing trend, additional sampling in the sewer system will be conducted concentrating on the following areas to pinpoint sources of EC and TDS:

- Downtown commercial area
- General commercial area
- Mixed use area
- Residential

Using the information obtained by the collection system sampling, commercial businesses that are known contributors of TDS can be identified. Until then a Minimization Strategy and Outreach Program can implemented by the year end 2010 consisting of:

1). Information on the City web page educating the public of the effects of salinity on crops, the water supply in the central basin and what the public can do to reduce salinity.
2). Flyers in the mail to the public reflecting the information on the City's web page
3). Posters for encouraging Best Management Practices (BMP) for commercial dischargers
4). Document discharges of new commercial with a pre-permit survey to determine who and what is being discharged in an effort to pin point source pollution
5). Have commercial/industrial users currently on septic that in the future may tie into the sewer system fill out pre-permit survey or waste discharge permit applications to monitor dischargers and pin point source pollution
6). Revising section 13.76.080 in the Municipal Code to include a 700mg/l limit on TDS discharge.
7). Adhere to the provision set forth in the Municipal Code 13.80.020 Waste discharge permit requirements.

FINAL SUMMARY (cont.)

A majority of cities throughout the state are focusing on water softeners and certain industry and commercial businesses that contribute to the salinity in receiving waters, Anderson municipal water supply is in the mid-moderate range in hardness at 100 mg/l, and therefore the public does not rely on water softeners and there is no significant industry to target. There may be some commercial / residential where the concentrations of salts can be reduced with public outreach, new municipal codes and BMP. Considering the Household Equivalent (HE) obtained from the Master Sewer Plan's, General Plan Sewer Densities (Appendix A, Table No. 4) Anderson 907 commercial HE out of 4,537 total HE, puts the percentage of commercial users at 20% (Appendix A. Chart No. 6). In comparison the City of Redding commercial/industrial HE's at 42%. Even with implementing strategies and enforcement, it would prove to be very challenging to achieve real positive results. Studies have shown that liquid detergent have as much as 38% less salt. Anderson will be focusing on this by persuading the public to switch to liquid detergents and reducing quantities with its outreach program. Considering the below average results obtain during the sampling period in comparison with the limits set forth in the Salinity Water Quality Criteria/ Objectives, a realistic goal would be to closely monitor and maintain current levels and implement the strategies listed above and develop new strategies as future sample and results indicate more than a 20% increase in TDS tons per million gallons. New strategies being considered to reduce TDS are the switching over to UV disinfection and installing reverse osmosis effluent filtration instead of media filtration during the plants future upgrades and expansions.

If you have any questions please call me at (530) 378-6665.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,

_____ _____

Jeff Kiser
Public Works Director

Phil DeBlasio
Wastewater Division Manager

CC: Bruce Crom Pace Engineering
Facility File

Appendix A
Tables 1-4
Charts 1-8

TABLE 1

CITY OF ANDERSON

2008 -2009 SALINITY SAMPLING SCHEDULE

Location	Sample Code	Monthly					Quarterly*		
Treatment Plant		EC	TDS	Chloride	Sulfate		EC	TDS	Chloride
			(mg/l)	(mg/l)	(mg/l)		(umhos/cm)	(mg/l)	(mg/l)
Influent	(INF-001)								
Effluent	(EFF-001)	X	N					X	N
River Upstream	(R-001)	X	N					X	N
River Downstream	(R-002)	N	N						N
City Well Water**	(SPL-001)	N	N				X		N

X - Sampled currently.

N - New sample.

EC - Electrical Conductivity

TDS - Total Dissolved Solids

Note: Sulfate and Chloride are part of the annual sampling in Jul

* Quarterly samples taken every three months. Samples should be taken on the same day.

** City well sample water is to be a combined sample taken from a single sample tap within the City's distribution system.

Table 2 Salinity Water Quality Criteria/Obectives

	Agricultural	Secondary	Anderson Effluent	
Parameters	**WQ Goal**	**MCL**	**AVG**	**MAX**
EC umhos/cm	700	900, 1600, 2200	386	435
TDS mg/l	450	500, 1000, 1500	260	284
Sulfate mg/l	Varies	250, 500, 600	22	30
Chloride	Varies	250, 500, 600	32	44

AWPCP SEMP LAB RESULTS TABLE 3

EC umhos/cm

Date	EFF-001	R-001	R-002	SPL-001
Nov-08	395	120	124	236
Dec-08	385	140		
Jan-09	395	136	138	134
Feb-09	435	137	138	236
Mar-09	341	100	101	241
Apr-09	401	124	126	231
May-09	356	108	109	223
Jun-09	364	73	118	238
Jul-09	367	116	117	247
Aug-09	399	122	122	238
Sep-09	391	118	119	233
Oct-09	378	118	118	237
Nov-09	407	125	126	237

TDS mg/L

	EFF-001	R-001	R-002	SPL-001
Nov-08	265	82	81	151
Dec-08				
Jan-09	277	95	97	152
Feb-09	284	86	97	153
Mar-09	214	70	68	151
Apr-09	260	81	83	147
May-09	262	91	89	169
Jun-09	241	91	90	161
Jul-09	258	83	86	166
Aug-09	261	94	90	159
Sep-09	268	81	64	149
Oct-09	262	81	86	172
Nov-09	262	76	72	142

SULFATE mg/l

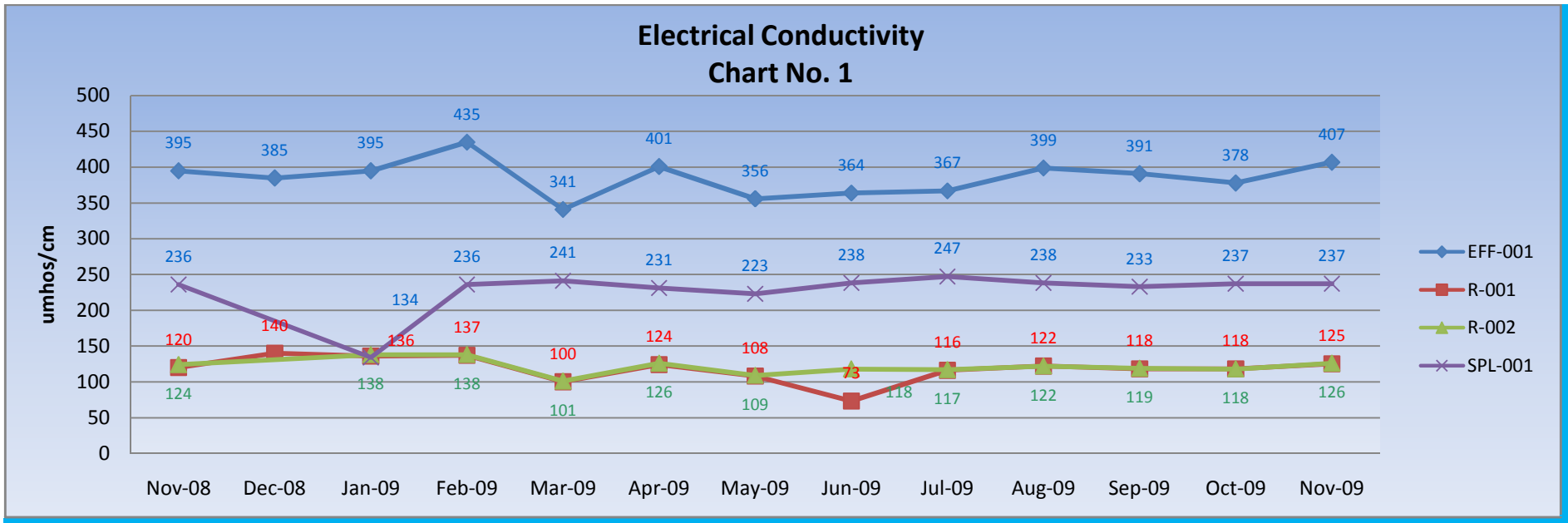
	EFF-001	R-001	R-002	SPL-001
Nov-08	19.6	3.3	3.9	8.2
Jan-09	29.6	3.9	4.1	5.3
Apr-09	25.2	4.4	4.5	8.0
Jul-09	15.8	3.5	3.6	7.3
Oct-09	19.5	3.9	3.9	7.6

CHLORIDE mg/l

	EFF-001	R-001	R-002	SPL-001
Nov-08	38	6.0	2.7	7.4
Jan-09	44.1	3.4	3.7	3.8
Apr-09	37.5	3.1	3.2	6.1
Jul-09	32.3	2.0	2.0	3.9
Oct-09	34.7	2.1	2.2	3.9

Averages	EFF-001	R-001	R-002	SPL-001
EC	386	118	121	228
TDS	260	84	84	156
SULFATE	21.9	3.8	4.0	7.3
CHLORIDE	37.3	3.3	2.8	5.0
High				
EC	435	140	138	247
TDS	284	95	97	172
SULFATE	29.6	4.4	4.5	8.2
CHLORIDE	44.1	6.0	3.7	7.4
Low				
EC	341	73	101	134
TDS	214	70	64	142
SULFATE	15.8	3.3	3.6	5.3
CHLORIDE	32.3	2.0	2.0	3.8

Table 4					
General Plan Sewer Densites					
GENERAL PLAN LAND	DESCRIPTION	ANDERSON	RED BLUFF	YREKA	SHASTA LAKE
USE CATEGORY		HE"s	HE"s	HE"s	HE"s
RH	RURAL HOLDING	0(1)	-	-	-
RE	RURAL ESTATES	1	-	-	-
LDR/H	LOW DENSITY RESIDENTIAL HILLSIDE	2	-	-	-
LDR	LOW DENSITY RESIDENTIAL	4	3.4	2	4
MDR	MEDIUM DENSITY RESIDENTIAL	6	8	4	-
HDR	HIGH DENSITY RESIDENTIAL	8	10	8	8
SPA	SPECIAL PLANNING AREA	(2)	-	-	-
MU	MIXED USE	4	-	-	4
C	DOWNTOWN COMMERCIAL (3)	8	8	8	8
GC	GENERAL COMMERCIAL(3)	4	5	5	8
I	INDUSTRIAL	2	0.5-3	2	3-4
P	PUBLIC FACILITY PARKS	0	1	0	0
P	PUBLIC FACILITY SCHOOLS/CITY	0.2	1	-	0.2


Electrical Conductivity
Chart No. 1
umhos/cm
500
450
400
350
300
250
200
150
100
50
0
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
395 385 395 435 341 401 356 364 367 399 391 378 407
236 140 134 236 241 231 223 238 247 238 233 237 237
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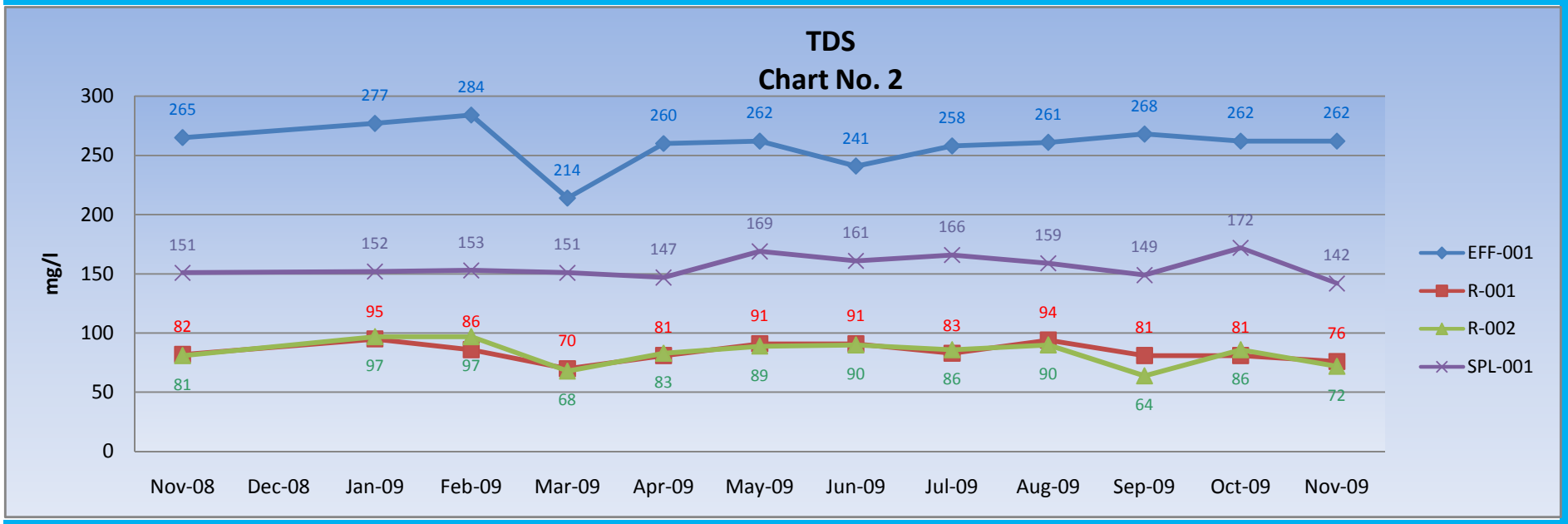
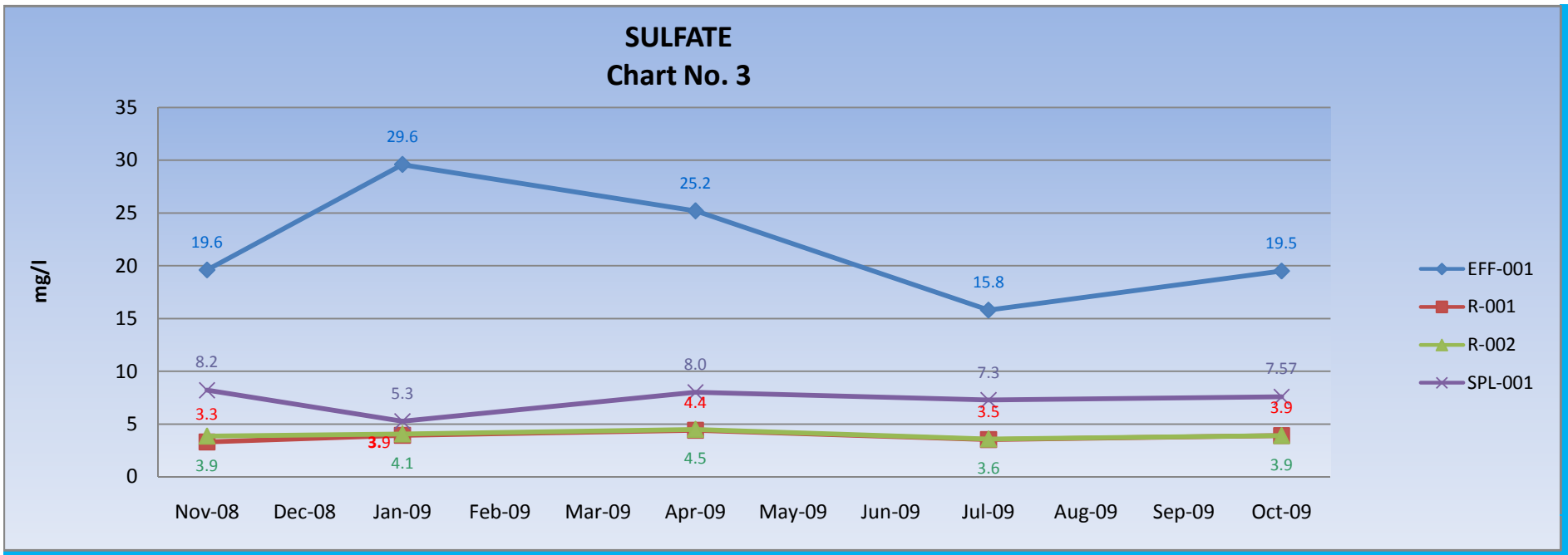
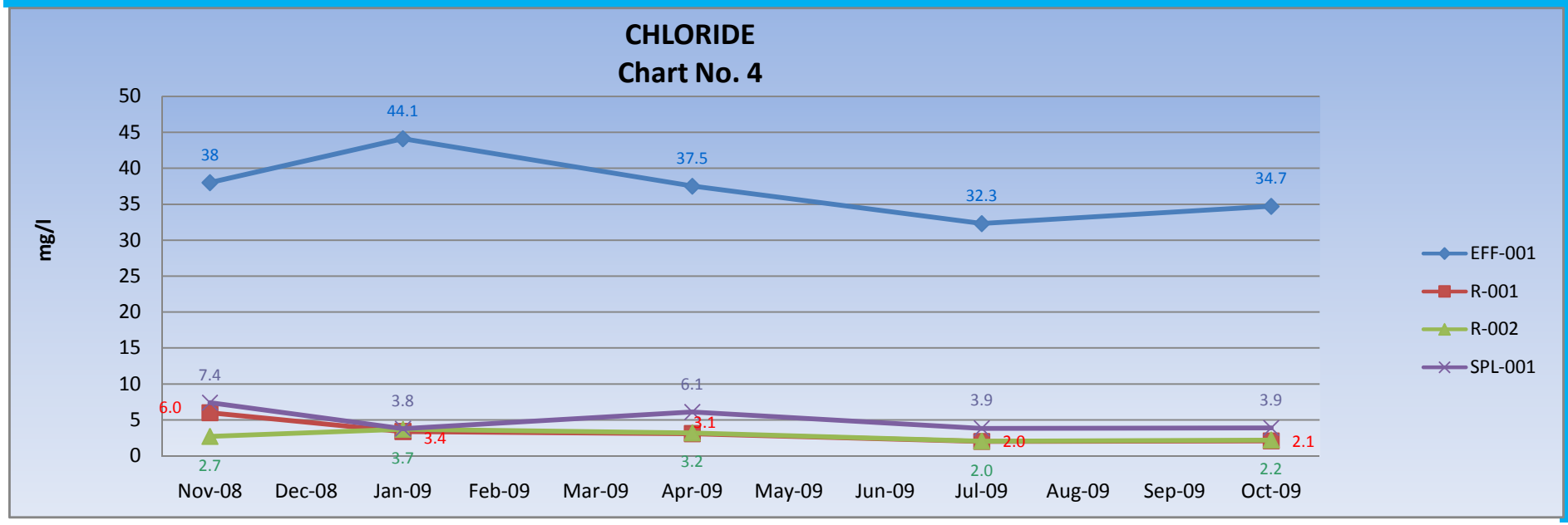
EFF-001
R-001
R-002
SPL-001


TDS
Chart No. 2
mg/l
300
250
200
150
100
50
0
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
265 277 284 214 260 262 241 258 261 268 262 262
151 152 153 151 147 169 161 166 159 149 172 142
82 95 86 70 81 91 91 83 94 81 81 76
81 97 97 68 83 89 90 86 90 64 86 72
EFF-001
R-001
R-002
SPL-001

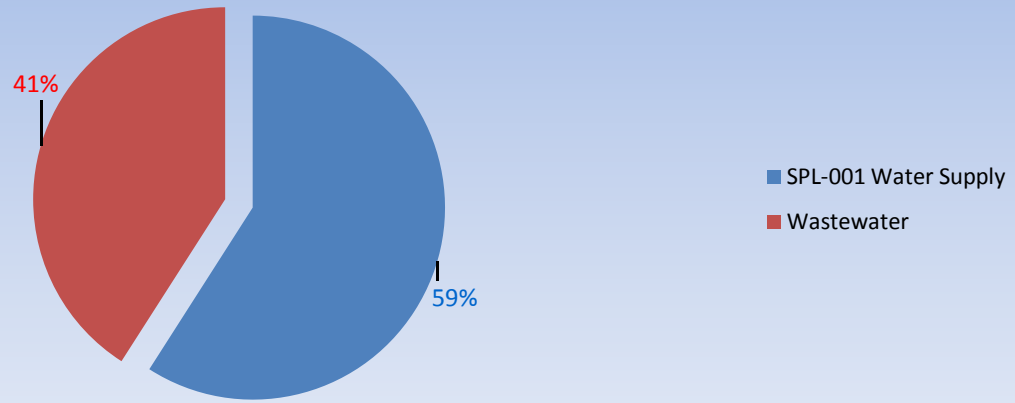
SULFATE
Chart No. 3



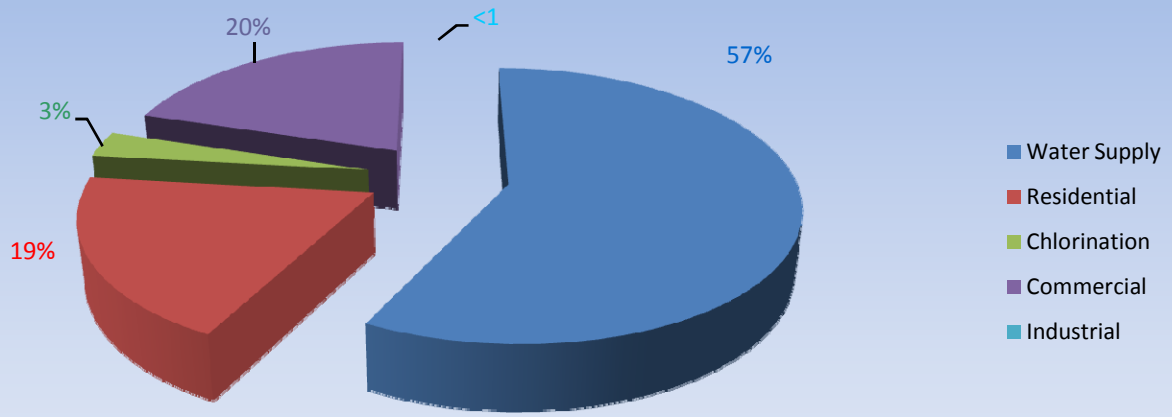
CHLORIDE
Chart No. 4



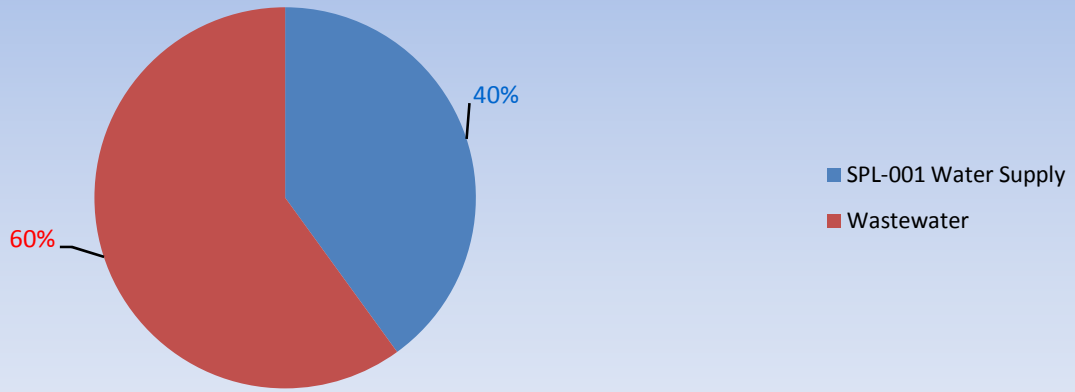
Anderson WWTP EFF-001 EC
Chart No. 5



Anderson WWTP EFF-001 HE EC
Chart No. 6



Anderson WWTP EFF-001 TDS
Chart No. 7



Anderson WWTP EFF-001 TDS/Tons
Chart No. 8