ADDENDUM TO
CALCULATION OF AGRONOMIC RATES FOR LANDSCAPE IRRIGATION OF RECYCLED WATER AT LA CONTENTA GOLF COURSE

Prepared for
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June 25, 2012
Condor Project No. 4934A

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ATTACHMENTS

ADDENDUM TO
CALCULATION OF AGRONOMIC RATES FOR
LANDSCAPE IRRIGATION OF RECYCLED WATER
AT LA CONTENTA GOLF COURSE

1.0 INTRODUCTION

Condor Earth Technologies, Inc (Condor) prepared this Addendum Calculation of Agronomic Rates for Landscape Irrigation of Recycled Water (Addendum Report) at the request of Bill Perley, Director of Utility Services and Engineering of Calaveras County Water District (CCWD). This Addendum Report includes background information, a description of calculation methodology, and a revised table of monthly irrigation loading rates for recycled water.

2.0 BACKGROUND

The La Contenta Golf Course (Golf Course) is regulated as a land application area for wastewater treatment plant (WWTP) discharges under Waste Discharge Requirements (WDR) Order No. R5-2002-0222. Upgrades in facilities allow CCWD to increase treatment capacity, with resulting increases in discharge of tertiary treated (Title 22) water. To accommodate increased discharges, CCWD is submitting a Notice of Intent to comply with the *General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water* (General Permit) from the State Water Resources Control Board Order No. 2009-0006-DWQ. The General Permit requires Producers and Distributors of recycled water to apply recycled water at agronomic rates[1]. CCWD submitted a Notice of Intent (NOI) to comply with the General Permit in May of 2012. The State Water Resources Control Board requested a revision to the estimated nitrogen loading rate by email to CCWD on June 8, 2012. This Addendum Report presents new information on water chemistry not available at the time of the May NOI, and uses that information to revise the nitrogen loading rates as requested.

3.0 PREVIOUS WORK

In preparation of this report Condor reviewed the following reports:

1. *Calculation of Agronomic Rates for Landscape Irrigation of Recycled Water at La Contenta Golf Course*, May 10, 2012, prepared by Condor Earth Technologies, Inc.

4.0 REVISED NITROGEN CHARACTERIZATION DATA

In the May NOI report, data from 2 years of treatment plant effluent monitoring, shown in Table 2, were used to characterize the total nitrogen and TDS of future recycled water; however, those samples did not include the additional nitrogen treatment that occurs in the upper and lower effluent reservoirs. The total nitrogen content of future recycled water is better characterized by the water quality of the Lower Effluent Storage Pond (LESP) which flows directly to the Golf Course. Five samples of water from the LESP were collected by CCWD in June 2012 and tested for nitrate-N and/or nitrate+nitrite-N and Total Kjeldahl Nitrogen (TKN) at Sierra Foothill Laboratory. Data are shown on Table 3 and laboratory reports are included in Appendix 1. The nitrogen content of recycle water was revised downward from 21 mg/L to 9.1 mg/L based on this improved characterization.

[1] Agronomic Rate: The rate of application of recycled water to plants that is necessary to satisfy the plants' watering and nutritional requirements, considering supplemental water (e.g., precipitation) and supplemental nutrients (e.g., fertilizers), while preventing or strictly minimizing the amount of nutrients that pass beyond the plants' root zone. General Permit ORDER NO. 2009-0006-DWQ, Attachment A, item b.

In the May NOI report there were no data to characterize nitrogen in supplemental irrigation water from New Hogan reservoir, and a value of 5 mg/L was conservatively assumed. Five samples of New Hogan water were collected by CCWD in June 2012 and tested for nitrate+nitrite-N and Total Kjeldahl Nitrogen (TKN) at Sierra Foothill Laboratory. Data are shown on Table 3 and laboratory reports are included in Appendix 1. The nitrogen content of recycle water was revised downward from 5 mg/L to <1.05 mg/L based on this improved characterization. The value of 1.05 mg/L was used to calculate nitrogen loading from supplemental irrigation water in the Revised Table 1.

5.0 REVISED LA CONTENTA IRRIGATION PLAN

The La Contenta Irrigation Management Plan (Plan) is provided in Revised Table 1. The Plan takes into account the climate, turf evapotranspiration, and nutrients in recycled water. Revised Table 1 shows values for climatic and water quality parameters used to estimate agronomic rates for hydraulic and nutrient loading. In this Plan, the total annual agronomic irrigation volume is 283 af, of which 233 af (82 percent) is recycled water (Table 1b). A blend of 82 percent recycled water and 18 percent supplemental irrigation water was used in the loading calculations.

The Monitoring and Reporting Program for the General Permit specifically requires calculation of nitrogen and salt loading, shown in the last four columns of Revised Table 1. The monthly nitrogen and salt loading were based on water quality data shown in Table 1a. Irrigation Water Quality, to the lower left of Revised Table 1. Revised Table 1 shows that total nitrogen loading from irrigation is 87 pounds per acre per year (lb/ac/yr), which is below loading recommended for turf grasses[2,3]. It is likely that nitrogen fertilizer amendments will be recommended by the turf managers. To avoid nitrogen application exceeding agronomic rates, any additional fertilization should account for the dissolved nutrient loading shown in Revised Table 1.

6.0 DISCUSSION OF TDS LOADING

TDS data was not changed from Table 1, previously submitted. Total TDS loading shown on Revised Table 1 is 4,479 lb/ac/yr. If only New Hogan water were used for irrigation (283 af of 313 mg/L TDS), TDS loading would be 3,556 lb/ac/yr. The additional TDS loading from recycled water is 918 lb/ac/yr.

It was previously pointed out that TDS loading in the Plan may be overstated because new UV (ultraviolet) tertiary treatment will not require the addition of chemicals; however, the earlier data did not include the offsetting evaporative effects of storage in the effluent reservoirs. To complicate the TDS loading estimate, the consumption of nitrate and volatile dissolved solids from treatment in the reservoirs may assert downward influence on TDS. Whatever the counterbalancing effects on final TDS loading are, they could make only a small percentage change in the final additional loading from recycle water. TDS loading affects the agronomy of turf. To avoid plant stress, a leaching requirement of 10 percent of the adjusted irrigation need was used in Revised Table 1 as part of the agronomic requirement. This required leaching will transport salt to the water table. Salt loading by recycled water use at this site is below 10 percent of the assimilative capacity of the basin and is consistent with State Antidegradation Policy as shown by the Approval of Anti-Degradation Analysis (Attachment 1).

7.0 QUALIFICATIONS OF PREPARER

This Addendum Report was prepared under the supervision of John H. Kramer, a California Certified Hydrogeologist with experience in agronomic calculations for waste discharges to land. Dr. Kramer received training in soil hydrology at the University of California Santa Barbara where he obtained a PhD

[2] California Fertilizer Association. 1995. Western Fertilizer Handbook. Interstate Publishers, Danville, IL, 337 pp.
[3] California League of Food Processors, 2007. *Manual of Good Practice for Land Application of Food Processing/Rinse Water*

in soil moisture measurements in 1994. Since then he has worked on numerous agronomic discharge projects for Public Owned Treatment Works throughout California. These include the California Department of Corrections and Rehabilitation at Susanville, Blythe, Jamestown, and Ione. Dr. Kramer has calculated site-specific water budgets and agronomic loading rates for complete Reports of Waste Discharge and for compliance reporting at many locations in the Central Valley, including Lathrop, Moncrieff, Livingston, Waterford, Angels Camp, and Chinese Camp.

8.0 LIMITATIONS AND SIGNATURE

Condor developed the interpretations and conclusions of this work in accordance with generally accepted principles and practice at the time the work was performed. Condor has endeavored to determine as much as practical about the site using conventional practices given our scope of services, which was to provide an irrigation plan reflecting the seasonal hydraulic requirements of the use area.

This Addendum Report is specifically limited to estimating agronomic hydraulic and nutrient loading rates at the Golf Course resulting from irrigation of turf by recycled water from the CCWD La Contenta WWTP. The hydraulic and nutrient loading rates calculated in this Addendum Report are intended to demonstrate the feasibility of irrigation by recycled water. Actual hydraulic loading rates will differ from year to year, depending on climatic conditions that cannot be predicted. The Plan should be implemented in conjunction with a comprehensive operations and maintenance plan that allows for subjective decisions by the distributor to maintain the course in a playable condition. Local "hot spots" may require additional irrigations or treatments beyond those generalized in Revised Table 1.

The results were based on historic irrigation rates and water quality information provided by CCWD. The data appeared to be within an expected range of variability based on our experience, but Condor performed no sampling, flow monitoring, or chemical analysis. Condor is not responsible for the accuracy and completeness of information collected and developed by others. If any changes are made or errors found in the information used for this Addendum Report, the interpretations and conclusions contained herein shall not be considered valid unless the changes or errors are reviewed by Condor and either appropriately modified or re-approved in writing.

This Addendum Report was prepared by Condor under the direct supervision of a Registered Geologist in the State of California. This Report was prepared for CCWD at the request of Bill Perley. It is for the sole use of CCWD. The contents of this Addendum Report may not be used or relied upon by any other person(s) without the express written consent and authorization of CCWD and Condor. Any unauthorized use or reliance on this Addendum Report by a third party is at such party's sole risk. Any questions regarding the content of this document should be addressed to Mr. Bill Perley at 209.754.3543.

Respectfully submitted,

CONDOR EARTH TECHNOLOGIES, INC.

John H. Kramer
California Certified Hydrogeologist No. 182

Reviewed by,

Marc R. Crum
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TABLES

Revised Table 1 - La Contenta Irrigation Management Plan - Agronomic Loading Rates

Month		Precip	Eff. Rainfall	ETo	ETt	IN	IN/IE	LR	Total Irrig	Area	Tot Irrig	Nutrient Loading			
		in/month	in/month	in/month	in/month	in/month	in/month	in/month	in/month	acres	af/month	lbs/ac/month			
	Days	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Nitrogen	TDS	Na	Cl
Oct	31	1.2	0.6	3.1	2.7	2.0	2.7	0.3	3.0	70	17.4	5.2	266	37	35
Nov	30	2.6	1.5	1.4	1.2	0	0.0	0.0	0.0	70	0.0	0.0	0	0	0
Dec	31	3.5	2.3	0.8	0.7	0.0	0.0	0.0	0.0	70	0.0	0.0	0	0	0
Jan	31	4.0	2.8	0.8	0.7	0.0	0.0	0.0	0.0	70	0.0	0.0	0	0	0
Feb	28	3.6	2.3	1.7	1.5	0.0	0.0	0.0	0.0	70	0.0	0.0	0	0	0
Mar	31	3.4	0.9	3.2	2.8	1.9	2.5	0.3	2.8	70	16.1	4.8	246	34	32
Apr	30	1.9	0.0	4.2	3.6	3.6	4.8	0.5	5.3	70	30.9	9.2	472	66	61
May	31	0.9	0.0	6.2	5.3	5.3	7.1	0.7	7.8	70	45.6	13.5	697	97	90
Jun	30	0.3	0.0	6.7	5.8	5.8	7.7	0.8	8.5	70	49.3	14.6	753	105	98
Jul	31	0.0	0.0	7.2	6.2	6.2	8.3	0.8	9.1	70	53.0	15.7	809	113	105
Aug	31	0.1	0.0	6.3	5.4	5.4	7.2	0.7	7.9	70	46.4	13.8	708	99	92
Sep	30	0.3	0.0	4.7	4.0	4.0	5.4	0.5	5.9	70	34.6	10.3	528	74	69
Totals/yr	**365**	**21.5**	**10.4**	**46.3**	**39.8**	**34.3**	**45.7**	**4.6**	**50.3**	**70**	**283**	**87**	**4,479**	**624**	**582**

Table 1a. Irrigation Water Quality (mg/L)

	New Hogan (11)	WWTP (12)	Blend (13)
TN	1.05	9.1	8
TDS	313	412	394
Na	NA	55	55
Cl	NA	51	51

Table 1b. Historic and Projected Use (af)

	New Hogan	Recycle Water	Total	Data source
Pre 2011	129	148	276	CCWD water use data table
Projected	63	233	305	Water Balance HDR, 2011
Projected	50	233	283	Agronomic Rates

Notes

(1) Camp Pardee California Data 1926-2012 Monthly Averages

(2) Effective rainfall is precipitation available to plants (subtracts, runoff, evaporation and deep percolation water)
monthly conversion factors for effective rainfall were taken from an approved Nutrient Management Plan for Waterford, California

(3) ETo= reference evapotranspiration, modified from CIMIS Sation 166(Lodi) after Blankinship & Associates, Inc., 2007

(4) ETt= Turf Water Requirement, ETt = ETo x Kc; where 0.86 (Kc value for California from *U of A Extension, Turf Irrig. Mgt. Series No.2, Table 1)*

(5) IN = Irrigation need for plant transpiration = ETt-Eff. Rainfall
IE = Irrigation efficency= 75%

(6) IN/IE = Irrigation need adjusted for efficiency; IN not adjusted when no irrigation used

(7) LR = leaching requirement = 10% of adjusted IN

(8) Total irrig = Total irrigation demand, IN/IE+LR

(9) Total landscped acreage includes greens, surrounds, tees, fairways, roughs, and irrigated landscape

(10) Total irrigation volume at agronomic application rate

(11) Avg. TDS from Blankinship, 2007, Table 6; Avg TN from six samples of New Hogan water (Table 3).

(12) Avg of six samples from Lower Effluet Storage Pond, TDS of future water could be less due to UV disinfecti

(13) Blend based on projected volume of applied WWTP recycled water / Total irrigation wa 82%

af= acre feet
mg/L= milligrams per liter
lbs/mgxL/af= 2.71 Conversion factor
TN= total nitrogen
TDS= total dissolved solids

Table 2 - La Contenta WWTP Effluent Nutrients and TDS

2010	Sodium	Chloride	Nitrate as Nitrogen	TKN	TN	TDS
Jan	54	52	22	<1	22	411
Feb	48	46	17	<1	17	383
Mar	44	42	13	<1	13	372
Apr	47	44	16	<1	16	397
May	52	44	20	<1	20	392
Jun	51	44	18	<1	18	416
Jul	55	52	20	<1	20	424
Aug	56	50	24	<1	24	393
Sep	39	58	22	1.4	23.4	391
Oct	57	87	30	1	31	390
Nov	67	90	26	1.4	27.4	509
Dec	58	52	20	<1	20	456
Average	52	55	21	<1	21	411
Std Dev	7	16	5		5	38
CV	14%	30%	22%		24%	9%
2011	Sodium	Chloride	Nitrate as Nitrogen	TKN	TN	TDS
Jan	46	40	10	<1	10	337
Feb	49	41	16	<1	16	366
Mar	47	44	17	1.1	18.1	380
Apr	48	40	19	<1	19	387
May	54	42	19	<1	19	380
Jun	54	46	23	<1	23	457
Jul	62	55	30	<1	30	461
Aug	58	48	24	<1	24	455
Sep	64	50	22	<1	22	399
Oct	63	56	19	2	21	442
Nov	63	46	28	<1	28	411
Dec	82	60	22	<1	22	469
Average	58	47	21	<1	21	412
Std Dev	10	7	5	1	5	44
CV	18%	14%	26%		25%	11%
Overall Avg	55	51	21	<1	21	412

Data from Bill Perley CCWD March 2012

Table 3 -Nitrogen (mg/L) in La Contenta LESP and New Hogan Water

Lower Effluent Storage Pond (LESP)

Day	Nitrate as Nitrogen	TKN	Nitrate + Nitrite as N Calc	TN
6/11/2012	13	NA	NA	13
6/12/2012	6.0	2.2	NA	8.2
6/13/2012	6.0	2.5	NA	8.5
6/14/2012	5.8	2.2	6.2	8.4
6/15/2012	NA	1.8	5.5	7.3
Average				9.1

New Hogan

Day	Nitrate as Nitrogen	TKN	Nitrate + Nitrite as N Calc	TN
6/11/2012	<0.050			
6/12/2012	<0.050	<1.0		<1.05
6/13/2012	<0.050	<1.0		<1.05
6/14/2012	<0.050	<1.0	<0.050	<1.05
6/15/2012	<0.050			
Average	<0.050	<1.0		1.05

NA= not analyzed

TKN=Total Kjeldahl Nitrogen

TN= sum of nitrate as nitrogen or nitrate+nitrite as nitrogen and TKN

APPENDIX 1
Laboratory Reports

Sierra Foothill Laboratory, Inc.

255 Scottsville Blvd
PO Box 1268
Jackson, CA 95642

Phone 209/223-2800
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Email info@sierralab.com

Client: **CCWD**

Calaveras Co Water District
423 E St. Charles St
P O Box 846
San Andreas, CA 95249

Project Report: **211755**

Results for Project 211755

746810 La Contenta WW-EFFLUENT D16753 GRAB Liquid Taken: 06/11/2012 0830 By: JC Rec:06/11/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Total Coliform Bacteria, 15 t	4.5	MPN/100		1.8	SM9221B	06/11/2012 1245	DS	

746811 La Contenta WW-HOGAN DAM GRAB Liquid Taken: 06/11/2012 0830 By: JC Rec:06/11/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/12/2012 1028	KL	

746812 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/11/2012 0830 By: JC Rec:06/11/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	13	mg/L		0.050	EPA300.0/SM4110B	06/12/2012 1028	KL	

SET Quality Control/Quality Assurance for Project 211755

Nitrogen, Nitrate as N (Analyzed: 06/12/2012 1028 KL Verified: 06/13/2012 13:41 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
IPC-02	Standard	0.20	0.20	mg/L	100.0	
IPC-50	Standard	0.21	0.20	mg/L	105.0	
	LCS	0.39	0.40	mg/L	97.5	
	Blank	<0.050		mg/L		
746748	Duplicate	5.5	5.5	mg/L		0.0
746752	Duplicate	7.7	7.7	mg/L		0.0
746832	Duplicate	<0.050	<0.050	mg/L		0.0
746748	Matrix SPK	4.08	4.0	mg/L	102	
746752	Matrix SPK	4.32	4.0	mg/L	108	
746832	Matrix SPK	0.400	0.40	mg/L	100	

Continued

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Client: **CCWD**
Project Report: **211755**

ELAP #2784, #1113A, #1881

Sandy Nurse

Sandy Nurse, Lab Director

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Report Date: 06/18/2012

Client: **CCWD**

Calaveras Co Water District
423 E St. Charles St
P O Box 846
San Andreas, CA 95249

Project Report: **211805**

Results for Project 211805

746903 La Contenta WW-EFFLUENT E03441 GRAB Liquid Taken: 06/12/2012 0820 By: BS Rec:06/12/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Biochem Oxygen Demand,5 day	<2.0	mg/L		2.0	SM5210B	06/12/2012 1615	N&T	
Total Coliform Bacteria, 15 t	2.0	MPN/100		1.8	SM9221B	06/12/2012 1240	DS	

746904 La Contenta WW-LOWER RES. GRAB Liquid Taken: 06/12/2012 0745 By: BS Rec:06/12/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	6.0	mg/L		0.050	EPA300.0/SM4110B	06/12/2012 1028	KL	
Nitrogen, Total Kjeldahl-N	2.2	mg/L		1.0	SM4500NH3C	06/15/2012 1215	NCC	

746905 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/12/2012 0755 By: BS Rec:06/12/2012
LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/12/2012 1028	KL	
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	SM4500NH3C	06/15/2012 1215	NCC	

Sample Preparation Steps for Project 211805

746903 La Contenta WW-EFFLUENT E03441 GRAB Liquid Taken: 06/12/2012 0820 By: BS Rec:06/12/2012

Parameter	Result	Unit	Method	Analyzed	By
BOD Start Date	06/12/2012	Date		06/12/2012 1615	N&T

746904 La Contenta WW-LOWER RES. GRAB Liquid Taken: 06/12/2012 0745 By: BS Rec:06/12/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/14/12	Date	SM4500NH3C	06/14/2012 1100	RK

746905 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/12/2012 0755 By: BS Rec:06/12/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/14/12	Date	SM4500NH3C	06/14/2012 1100	RK

Continued

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Client: **CCWD**
Project Report: **211805**

SET Quality Control/Quality Assurance for Project 211805

Biochem Oxygen Demand,5 day

(Analyzed: 06/12/2012 1615 N&T Verified: 06/18/2012 12:40 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	188	198	mg/L	94.9	
	Blank	<0.1		mg/L		
	Blank	<0.1		mg/L		
	Seed Drop	0.8		mg/L		
746850	Duplicate	340	350	mg/L		2.9

Nitrogen, Nitrate as N

(Analyzed: 06/12/2012 1028 KL Verified: 06/13/2012 13:41 DEG)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
IPC-02	Standard	0.20	0.20	mg/L	100.0	
IPC-50	Standard	0.21	0.20	mg/L	105.0	
	LCS	0.39	0.40	mg/L	97.5	
	Blank	<0.050		mg/L		
746748	Duplicate	5.5	5.5	mg/L		0.0
746752	Duplicate	7.7	7.7	mg/L		0.0
746832	Duplicate	<0.050	<0.050	mg/L		0.0
746748	Matrix SPK	4.08	4.0	mg/L	102	
746752	Matrix SPK	4.32	4.0	mg/L	108	
746832	Matrix SPK	0.400	0.40	mg/L	100	

Nitrogen, Total Kjeldahl-N

(Analyzed: 06/15/2012 1215 NCC Verified: 06/15/2012 14:04 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
6544	Standard	854	1000	mg/L	85.4	
	Blank	<1.0		mg/L		
746904	Duplicate	2.2	2.1	mg/L		4.7
746904	Matrix SPK	17.4	20	mg/L	87%	

ELAP #2784, #1113A, #1881

Sandy Nurse

Sandy Nurse, Lab Director

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San Andreas, CA 95249

Project Report: **211868**

Results for Project 211868

747037 La Contenta WW-EFFLUENT E03442 GRAB Liquid Taken: 06/13/2012 0810 By: BS Rec:06/13/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Total Coliform Bacteria, 15 t	<1.8	MPN/100		1.8	SM9221B	06/13/2012 1350	DS	

747038 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/13/2012 0750 By: BS Rec:06/13/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	6.0	mg/L		0.050	EPA300.0/SM4110B	06/13/2012 1050	RK	
Nitrogen, Total Kjeldahl-N	2.5	mg/L		1.0	SM4500NH3C	06/19/2012 1030	NCC	

747039 La Contenta WW-HOGAN DAM GRAB Liquid Taken: 06/13/2012 0755 By: BS Rec:06/13/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrogen, Nitrate as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/13/2012 1050	RK	
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	SM4500NH3C	06/19/2012 1030	NCC	

Sample Preparation Steps for Project 211868

747038 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/13/2012 0750 By: BS Rec:06/13/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/19/12	Date	SM4500NH3C	06/18/2012 1100	L&A

747039 La Contenta WW-HOGAN DAM GRAB Liquid Taken: 06/13/2012 0755 By: BS Rec:06/13/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/19/12	Date	SM4500NH3C	06/18/2012 1100	L&A

SET Quality Control/Quality Assurance for Project 211868

Nitrogen, Nitrate as N (Analyzed: 06/13/2012 1050 RK Verified: 06/15/2012 11:03 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
IPC002	Standard	0.20	0.20	mg/L	100.0	
IPC073	Standard	0.20	0.20	mg/L	100.0	

Sierra Foothill Laboratory certifies that test results meet all applicable ELAP requirements unless stated otherwise.
Results are specific to the sample(s) as submitted and only to the parameter(s) reported.

Continued

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Client: **CCWD**
Project Report: **211868**

SET Quality Control/Quality Assurance for Project 211868

Nitrogen, Nitrate as N

(Analyzed: 06/13/2012 1050 RK Verified: 06/15/2012 11:03 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	LCS	0.41	0.40	mg/L	102.5	
	Blank	<0.050		mg/L		
746979	Duplicate	3.0	3.1	mg/L		3.3
746984	Duplicate	12	12	mg/L		0.0
746991	Duplicate	12	12	mg/L		0.0
747065	Duplicate	0.094	0.094	mg/L		0.0
746979	Matrix SPK	4.20	4.0	mg/L	105	
746979	MS Dup	4.08	4.0	mg/L	102	2.90
746984	Matrix SPK	7.84	8.0	mg/L	98	
746984	MS Dup	7.84	8.0	mg/L	98	0
746991	Matrix SPK	7.60	8.0	mg/L	95	
746991	MS Dup	7.60	8.0	mg/L	95	0

Nitrogen, Total Kjeldahl-N

(Analyzed: 06/19/2012 1030 NCC Verified: 06/19/2012 15:08 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
6544	Standard	882	1000	mg/L	88.2	
	Blank	<1.0		mg/L		
747041	Duplicate	4.9	5.0	mg/L		2.0
747039	Matrix SPK	18.0	20	mg/L	90%	

ELAP #2784, #1113A, #1881

Sandy Nurse

Sandy Nurse, Lab Director

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Project Report: **211938**

Results for Project 211938

747141 La Contenta WW-EFFLUENT E03434 GRAB Liquid Taken: 06/14/2012 0845 By: BS Rec:06/14/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Total Coliform Bacteria, 15 t	<1.8	MPN/100		1.8	SM9221B	06/14/2012 1245	DS	

747142 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/14/2012 0800 By: BS Rec:06/14/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrate + Nitrite as N, Calc.	6.2	mg/L		0.050	EPA300.0/SM4110B	06/15/2012	KL	
Nitrogen, Nitrate as N	5.8	mg/L		0.050	EPA300.0/SM4110B	06/14/2012 1527	RK	
Nitrogen, Nitrate as NO3	26	mg/L		0.22	EPA300.0/SM4110B	06/15/2012	KL	
Nitrogen, Nitrite as N	0.37	mg/L		0.050	SM4500-NO2B	06/14/2012 1310	RK	
Nitrogen, Total Kjeldahl-N	2.2	mg/L		1.0	SM4500NH3C	06/19/2012 1030	NCC	

747143 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/14/2012 0815 By: BS Rec:06/14/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrate + Nitrite as N, Calc.	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/15/2012	KL	
Nitrogen, Nitrate as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/14/2012 1527	RK	
Nitrogen, Nitrate as NO3	<0.22	mg/L		0.22	EPA300.0/SM4110B	06/15/2012	KL	
Nitrogen, Nitrite as N	<0.050	mg/L		0.050	SM4500-NO2B	06/14/2012 1310	RK	
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	SM4500NH3C	06/19/2012 1030	NCC	

Sample Preparation Steps for Project 211938

747142 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/14/2012 0800 By: BS Rec:06/14/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/19/12	Date	SM4500NH3C	06/18/2012 1100	L&A

747143 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/14/2012 0815 By: BS Rec:06/14/2012

Parameter	Result	Unit	Method	Analyzed	By
Nitrogen, Total Kjeldahl-N, D	06/19/12	Date	SM4500NH3C	06/18/2012 1100	L&A

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Client: **CCWD**
Project Report: **211938**

SET Quality Control/Quality Assurance for Project 211938

Nitrogen, Nitrite as N

(Analyzed: 06/14/2012 1310 RK Verified: 06/15/2012 11:41 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
	Standard	0.10	0.10	mg/L	100.0	
	Blank	<0.050		mg/L		
747076	Duplicate	0.21	0.21	mg/L		0.0
747143	Matrix SPK	0.100	0.10	mg/L	100	

Nitrogen, Nitrate as N

(Analyzed: 06/14/2012 1527 RK Verified: 06/15/2012 11:03 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
IPC002	Standard	0.21	0.20	mg/L	105.0	
IPC032	Standard	0.20	0.20	mg/L	100.0	
	LCS	0.41	0.40	mg/L	102.5	
	Blank	<0.050		mg/L		
747065	Duplicate	0.095	0.095	mg/L		0.0
747143	Duplicate	<0.050	<0.050	mg/L		0.0
747065	Matrix SPK	0.384	0.40	mg/L	96	
747143	Matrix SPK	0.400	0.40	mg/L	100	

Nitrogen, Total Kjeldahl-N

(Analyzed: 06/19/2012 1030 NCC Verified: 06/19/2012 15:08 KL)

Sample	Type	Result	Value	Unit	Recovery (%)	RPD
6544	Standard	882	1000	mg/L	88.2	
	Blank	<1.0		mg/L		
747041	Duplicate	4.9	5.0	mg/L		2.0
747039	Matrix SPK	18.0	20	mg/L	90%	

ELAP #2784, #1113A, #1881

Sandy Nurse

Sandy Nurse, Lab Director

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Report Date: 06/21/2012

Client: **CCWD**

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423 E St. Charles St
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Project Report: **211962**

Results for Project 211962

747190 La Contenta WW-EFFLUENT D16565 GRAB Liquid Taken: 06/15/2012 0750 By: BS Rec:06/15/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Total Coliform Bacteria, 15 t	<1.8	MPN/100		1.8	SM9221B	06/15/2012 1035	DS	

747191 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/15/2012 0800 By: BS Rec:06/15/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrate + Nitrite as N	5.5	mg/L		0.050	EPA300.0/SM4110B	06/18/2012 1034	RK	preserved
Nitrate + Nitrite as N, Calc.	5.5	mg/L		0.050	EPA300.0/SM4110B	06/20/2012	KL	
Nitrogen, Nitrate as NO3	24	mg/L		0.22	EPA300.0/SM4110B	06/20/2012	KL	
Nitrogen, Nitrite as N	0.38	mg/L		0.050	SM4500-NO2B	06/15/2012 1050	R&L	
Nitrogen, Total Kjeldahl-N	1.8	mg/L		1.0	SM4500NH3C	06/20/2012 1310	NCC	

Nitrate analyzed within 28 day hold from H2SO4 preserved aliquot.

747192 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/15/2012 0820 By: BS Rec:06/15/2012

LaContenta WW, StateR5-2002-0222, CCWD #56

Parameter	Result	Unit	Flag	RL	Method	Analyzed	By	MDL
Nitrate + Nitrite as N	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/18/2012 1034	RK	preserved
Nitrate + Nitrite as N, Calc.	<0.050	mg/L		0.050	EPA300.0/SM4110B	06/20/2012	KL	
Nitrogen, Nitrate as NO3	<0.22	mg/L		0.22	EPA300.0/SM4110B	06/20/2012	KL	
Nitrogen, Nitrite as N	<0.050	mg/L		0.050	SM4500-NO2B	06/15/2012 1050	R&L	
Nitrogen, Total Kjeldahl-N	<1.0	mg/L		1.0	SM4500NH3C	06/20/2012 1310	NCC	

Nitrate analyzed within 28 day hold from H2SO4 preserved aliquot.

Sample Preparation Steps for Project 211962

747191 La Contenta WW-LOWER RESERVOIR GRAB Liquid Taken: 06/15/2012 0800 By: BS Rec:06/15/2012

Parameter	Result	Unit	Method	Analyzed	By
+H2SO4 @ lab to extend hold	06/15/2012	Date	Nitrate Preservation	06/15/2012 1600	SFL
Nitrogen, Total Kjeldahl-N, D	06/20/12	Date	SM4500NH3C	06/19/2012 1100	T&A

Continued

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Client: **CCWD**
Project Report: **211962**

Sample Preparation Steps for Project 211962

747192 La Contenta WW-NEW HOGAN GRAB Liquid Taken: 06/15/2012 0820 By: BS Rec:06/15/2012

Parameter	*Result*	*Unit*	*Method*	*Analyzed*	*By*
+H2SO4 @ lab to extend hold	06/15/2012	Date	Nitrate Preservation	06/15/2012 1600	SFL
Nitrogen, Total Kjeldahl-N, D	06/20/12	Date	SM4500NH3C	06/19/2012 1100	T&A

SET Quality Control/Quality Assurance for Project 211962

Nitrogen, Nitrite as N (Analyzed: 06/15/2012 1050 R&L Verified: 06/18/2012 10:36 KL)

Sample	*Type*	*Result*	*Value*	*Unit*	*Recovery (%)*	*RPD*
	Standard	100	100	mg/L	100.0	
	Blank	<0.050		mg/L		
747191	Duplicate	0.38	0.38	mg/L		0.0
747192	Matrix SPK	0.100	0.10	mg/L	100	

Nitrogen, Total Kjeldahl-N (Analyzed: 06/20/2012 1310 NCC Verified: 06/20/2012 16:20 KL)

Sample	*Type*	*Result*	*Value*	*Unit*	*Recovery (%)*	*RPD*
	Standard	917	1000	mg/L	91.7	
	Blank	<1.0		mg/L		
747290	Duplicate	37	37	mg/L		0.0
747192	Matrix SPK	18.6	20	mg/L	93	

ELAP #2784, #1113A, #1881

Sandy Nurse

Sandy Nurse, Lab Director

ATTACHMENT 1
Approval of Antidegradation Analysis

TO: Gordon Innes, P.E.
Senior Water Resource Control Engineer
State Water Resources Control Board
Division of Water Quality

FROM: Anne Olson, P.E.
Senior Water Resource Control Engineer
CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD
SACRAMENTO OFFICE

DATE: 14 June 2012

SUBJECT: **APPROVAL OF ANTIDEGRADATION ANALYSIS**
CALAVERAS COUNTY WATER DISTRICT
LA CONTENTA WASTEWATER TREATMENT FACILITY
CALAVERAS COUNTY

I have reviewed the report titled *Antidegradation Analysis Demonstrating Use of Less Than 10 Percent of Sub-Basin Assimilative Capacity*, which we received from you on 8 June 2012. The report was submitted to the State Water Resources Control Board (State Water Board) as part of Calaveras County Water District's Notice of Intent to apply for coverage under the General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water (Water Quality Order No. 2009-0006-DWQ, General Permit).

Water Quality Order 2009-0006-DWQ implements the State Water Board's Recycled Water Policy, which was adopted on 3 February 2009 under State Water Board Resolution 2009-0011, and specifically requires that discharges regulated under the General Permit comply with applicable provisions of the Recycled Water Policy (Specification B.2).

Paragraph 9 of the Recycled Water Policy states, in part:

> Landscape irrigation with recycled water in accordance with this Policy is to the benefit of the people of the State of California. Nonetheless, the State Water Board finds that the use of water for irrigation may, regardless of its source, collectively affect groundwater quality over time. The State Water Board intends to address these impacts in part through the development of salt/nutrient management plans described in paragraph 6.
> …
>
> (2) A project that meets the criteria for a streamlined irrigation permit and is within a basin where a salt/nutrient management plan satisfying the provisions of paragraph 6(b) is being prepared may be approved by the Regional Water Board by demonstrating through a salt/nutrient mass balance or similar analysis that the project uses less than 10 percent of the available assimilative capacity as estimated by the project proponent in a basin/sub-basin (or multiple projects using less than 20 percent of the available assimilative capacity as estimated by the project proponent in a groundwater basin).

Based on the report submitted by Calaveras County Water District, I concur with the determination that the project will not use more than 10 percent of the available assimilative capacity of the affected sub-basin for salinity. The report did not specifically address plant nutrients such as nitrogen. However, based on my professional experience and judgment, the project is not likely to use more than 10 percent of the available assimilative capacity of the affected sub-basin for nutrients if the discharge is managed in compliance with:

a) the General Permit; and
b) the Irrigation Management Plan that is required to be submitted to the State Water Board prior to commencement of the discharge pursuant to Provision C.5.b of the General Permit.

Please contact me at (916) 464-4740 if you have any questions.

cc: Diana Messina, CVRWQCB
Jim Marshall, CVRWQCB
Wendy Wyels, CVRWQCB
Lixin Fu, CVRWQCB
Bill Perley, Calaveras County Water District
John Kramer, Condor Earth Technologies, Inc.