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SUMMARY OF RATIONALE

METRO WASTEWATER RECLAMATION DISTRICT

CDPS PERMIT NUMBER CO-0026638, ADAMS COUNTY

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I. *TYPE OF PERMIT* — *Fifth Renewal*

II. *FACILITY INFORMATION*

A. *Facility Type:* — *Domestic- Major Municipal, Mechanical Plant*

B. *Facility Classification:* — *Class A per Section 100.9.2 of the Regulations for Certification of Water Treatment Plant and Wastewater Treatment Plant Operators.*

C. *Fee Category:* — *Category 21, Subcategory 10*
Category Flow Range: — *Sewage from 100,000,000 gallons per day or over*
Annual Fee: — *$ 17,926*

D. *Legal Contact:*
Cathy Gerali, Interim District Manager
Metro Wastewater Reclamation District
6450 York Street
Denver, CO 80229-7499
303-286-3000

E. *Facility Contact:*
Steve Rogowski
Metro Wastewater Reclamation District
6450 York Street
Denver, CO 80229-7499
303-286-3000

F. *Facility Location:* — *NW ¼, Section 12, T3S, R68W, 6th P.M.*

G. *Discharge Point:*
001A, following disinfection, from the North Complex to the South Platte River
002A, following disinfection, from the South Complex to the South Platte River
001C, reporting point for the physical discharge points 001A, and 002A
003A, following disinfection, to the Burlington Canal

ISSUED: JANUARY 31, 2008 EFFECTIVE: MARCH 1, 2008 EXPIRATION:FEBRUARY 28, 2013

III. RECEIVING STREAM

Evaluation of the receiving stream for Outfall 001C and its assimilative capacities are included as Appendices A through E to this rationale. These Appendices were prepared by Dr. William Lewis and Dr. James McCutchan in cooperation with South Platte Coalition of Urban River Evaluation (South Platte CURE), and are listed here:

Appendix A – Exploratory Modeling of Hydraulic Capacity for Proposed Effluent Limits Affecting Dissolved Oxygen, Nitrate, and Ammonia on the South Platte River Below the Effluent Discharge of the Metro District – March 16, 2007.

Appendix B – Water-Quality Modeling in Support of Permitting for Effluent Discharge by the Metro Wastewater Reclamation District to the South Platte River with Emphasis on Dissolved Oxygen, Ammonia, and Nitrate – August 22, 2006, Revised: November 14, 2006.

Appendix C – Threshold Concentrations for Ammonia and CBOD Consistent with Chronic Oxygen Standards of the South Platte River Below the Metro District's Discharge, March 1, 2007

Appendix D – Total Maximum Daily Load – Modified Implementation Plan for Dissolved Oxygen on Segment 15 – South Platte River - Burlington Ditch to Big Dry Creek Confluence - Adams and Weld Counties, Colorado

Appendix E – Modeling and RP Analysis for Conservative Substances in Support of CDPS Permit Renewal for the Metro District's Effluent Discharge to Upper South Platte River, Segment 15 – July 19, 2007, Revised: August 7, 2007.

Appendix F – Review of RP Modeling conducted by CH2M Hill – July 13, 2007

Discharges from Outfall 003A are to the Burlington Canal, which is an unclassified water of the State.

IV. FACILITIES EVALUATION

A. Infiltration/Inflow (I/I)

No infiltration/inflow problems have been documented in the service area.

B. Lift Stations

The Metro District owns and operates four (4) lift stations. Capacity upgrades for the lift stations are planned that will meet growth demands for their respective service areas and includes upsizing a pump at the Thornton-North Washington Lift Station and peak flow basins at the Brantner Gulch Lift Station. The peak flow basins will only be constructed if capacity is reached before long-term improvements are in place.

Table IV-1 summarizes the information available on Metro Wastewater Reclamation District's lift stations.

Table IV-1 - Lift Station Summary

Lift Station	Storage (gallons)	Pump No.	Pump Capacity (gpm)	Pump Capacity (HP)	Average Daily Flow (MGD)	Peak Flow (MGD)	Firm Pump Capacity (MGD)	Forcemain Capacity (MGD)	% Pump Capacity (Peak/Firm)
Thornton	1,641,000	1	9000	250					
North		2	9000	250					
Washington		3	9000	250					
Lift Station		4	6940	150					
		Total:	33940		11	30.4	36	43.6	85
Brantner	401,000	1	4200	300					
Gulch		2	4200	300					
Lift Station		3	4200	300					
		4	4200	300					
		Total:	16800		3.5	11.38	18.2	13.3	63
Governors	42,047	1	840	40					
Ranch		2	840	40					
Lift Station		3	840	40					
		4	840	40					
		Total:	3360		0.27	1.28	3.6	4.8	36
Denargo	33,750	1	200	N/A					
Market		2	200	N/A					
Lift Station		Total:	400		N/A	N/A	0.3		N/A

C. Facility Modifications and Resulting Changes in Capacity

The facility consists of north and south treatment trains. Each of the treatment trains has its own barscreens, and grit removal. The North Facility includes 10 primary clarifiers, 12 aeration basins, 12 secondary clarifiers, chlorination, and dechlorination. The South Facility includes 4 primary clarifiers, 8 aeration basins, 10 secondary clarifiers, chlorination, and dechlorination. Primary and secondary sludge from the North and South treatment trains is blended and treated in 12 anaerobic digesters. Gas from this anaerobic digestion feeds a co-generation facility that provides for plant power needs. The facility was re-rated in May, 2004 to a hydraulic capacity of 220.0 MGD and carries an organic capacity of 212 tons BOD5/day. Numerous upgrades to this facility are planned and will generally focus on ammonia and nitrate removal efficiencies. Effluent flow is measured by continuous flow recorders and totalizers.

D. Biosolids Treatment and Disposal:

1. *EPA General Permit*

   EPA Region 8 issued a General Permit (effective October 19, 2007) for Colorado facilities whose operations generate, treat, and/or use/dispose of sewage sludge by means of land application, landfill, and surface disposal under the National Pollutant Discharge Elimination System. All Colorado facilities are required to apply for and to obtain coverage under the EPA General Permit.

2. *Biosolids Regulation (Regulation No. 64, Colorado Water Quality Control Commission)*

   While the EPA is now the issuing agency for biosolids permits, Colorado facilities that land apply biosolids must comply with requirements of Regulation No. 64, such as the submission of annual reports as discussed later in this rationale.

Metro maintains the goal to land apply all of the Class B biosolids produced. During inclement weather Class B biosolids are diverted from land application for processing as a Class A Compost biosolids product for unrestricted use. In the event Class A or B pollutant criteria cannot be met, the biosolids will be landfilled.

V. PERFORMANCE HISTORY

A. Monitoring Data

1. *Table V-1 summarizes the effluent data reported on the monthly Discharge Monitoring Reports (DMR's) for the Metro Wastewater Reclamation District facility, Outfall 001C, from July 2005 through June 2007.*

Table V-1 - Self-Monitoring Results

Parameter	# Samples or Reporting Periods	Reported Concentrations Average/Minimum/Maximum			Previous Permit Limit	No. of Limit Excursions
Influent Flow, MGD	24	132	120	156	177.8 – 227*	NA
Effluent Flow, MGD	24	141	78	201	177.8 – 227	0
Influent BOD5, mg/l	24	257	221	323	NA	NA
Influent BOD5, lbs/day	24	282,684	241,017	363,948	339,000*	NA
Effluent CBOD5, mg/l	24	9.8	5	16	17/25	0
CBOD5 Removal, %	24	97	95	98	85	0
Influent TSS, mg/l	24	253	224	285	NA	NA
Effluent TSS, mg/l	24	22	12	43	30/45	0
TSS Removal, %	24	93	90	96	85	0
E. coli, #/100 ml	24	112	41	359	630/1,260	0
Total Residual Chlorine, mg/l	24	0	0	0	0.011/0.019	0
Oil & Grease, mg/l	24	0	0	0	10	0
pH, s.u.	48	6.7	6.3	7.3	6.0 – 9.0	0
Ammonia, Total, mg/l as N						
January	2	10.6	10.3	10.8	15/Report	0
February	2	14.7	14.6	14.7	15/Report	0
March	2	12.4	11.7	13.1	14/Report	0
April	2	9.9	9.6	10.3	14/Report	0
May	2	8.7	8.2	9.1	13/Report	0
June	2	9.4	8.3	10.4	13/Report	0
July	2	11.0	8.5	13.5	10.0/21.5	0
August	2	8.4	8.0	8.7	9.7/23.4	0
September	2	10.3	9.4	11.2	10/Report	0
October	2	11.4	10.2	12.5	10.0/23.4	0
November	2	11.1	10.1	12	14.0/24.1	0
December	2	11.9	11.2	12.7	15.0/Report	0
Total Nitrite plus Nitrate as N, mg/l	24	6.5	5	9.0	10/10.9-14.5	0

Continued On Next Page

Table V-1 - Self-Monitoring Results - Continued

Parameter	# Samples or Reporting Periods	Reported Concentrations Average/Minimum/Maximum			Previous Permit Limit	No. of Limit Excursions
Effluent DO, mg/l	24	6.1	5.2	7.2	5.0/3.0	0
Cyanide, WAD, ug/l	24	0	0	0	Report	NA
Total Arsenic, ug/l	24	0	0	0	Report	NA
Manganese, PD, ug/l	24	57.0	43.0	63.0	Report	NA
Selenium, PD, ug/l	24	0.53	0	5.0	4.6/18.4	0
Chromium, Hex Dissolved, ug/l	24	0	0	0	Report	NA
Zinc, PD, ug/l	24	61	33	125	Report	NA
Silver, PD, ug/l	24	0.01	0	0.26	1.1/7	0
Copper, PD, ug/l	24	13	6.4	21.1	38.9/60.7	0
Cadmium, PD, ug/l	24	0.13	0	1.0	Report	NA
Lead, PD, ug/l	24	0.13	0	1.0	Report	NA
Mercury, PD, ug/l	24	0	0	0	0.4/2.4	0
Nickel, PD, ug/l	24	0.63	0	5	Report	NA
Effluent Diazinon, ug/l	24	0.0025	0	0.06	Report	NA
Tetrachloroethene, ug/l	24	0.88	0	2.12	Report	0
WET, chronic						
Ceriodaphnia	24	-	Fail	Pass	Pass/Fail	1
Fathead Minnows	24	-	Pass	Pass	Pass/Fail	0

* - *This is a facility capacity and not a permit limit.*

2. *State sampling results for the Metro Wastewater Reclamation District treatment plant are summarized in Table V-2 for the previous 24 month period.*

Table V-2 - Summary of State Sampling Results

Date	Flow MGD	Temp oF	pH su	DO mg/l	TRC mg/l	Oil&Grease mg/l	E. coli #/100 ml	CBOD mg/l	TSS mg/l	NO3 + NO2 -N mg/l
1/31/06	NA	NA	6.7	6.5	0	<10.0	49	18.5	29.3	3.1

< - "less than"
NA Not available

B. Compliance With Terms and Conditions of Previous Permit

The data shown in the preceding tables indicates that the Metro Wastewater Reclamation District facility has maintained compliance with the previous permit with the exception of a single failure of the WET test requirements relative to ceriodaphnia The District followed up this event with accelerated testing in October of 2006 and demonstrated a result of "No Toxicity," in that follow-up. However, it is the Division's position that any result consisting of a statistically significant difference in lethality between the control and any effluent concentration less than or equal to the instream waste concentration shall constitute a failure of the facility's WET test.

TERMS AND CONDITIONS OF PERMIT

A. Determination of Effluent Limitations

1. Effluent Limitations - The following limits will apply and are discussed in Sections VI-A.2 and VI-A.3.

Table VI-1 - Effluent Limits (Outfall 001C only unless stated otherwise)

Parameter	Limit	Rationale
Flow, MGD, Outfall 001C	220.0 a	Design Capacity
Flow, MGD, Outfall 003A	Report	Design Capacity
CBOD5, mg/l, Outfall 001C	17/25 b	TMDL/Water Quality Standards
CBOD5, mg/l, Outfall 003A	25/40 b	State Effluent Regulations
TSS, mg/l, Outfall 001C	30/45 b	State Effluent Regulations
TSS, mg/l, Outfall 003A	30/45 b	State Effluent Regulations
E. Coli., no/100 ml	126/252 e	State Effluent Regulations
Total Residual Chlorine, mg/l	0.011/0.019 f	Water Quality Standards
pH, s.u, Outfall 001C	6.0 - 9.0 d	Water Quality Standards
pH, s.u, Outfall 003A	6.0 - 9.0 d	State Effluent Regulations
Oil and Grease, mg/l, Outfall 001C	10 c	State Effluent Regulations
Oil and Grease, mg/l, Outfall 003A	10 c	State Effluent Regulations
Cyanide, Weak Acid Dissociable, ug/l	Report a	Water Quality Standards
Total Ammonia (as N), mg/l – **Through 12/31/2014**		
January through February	15.0/30 f	TMDL/Water Quality Standards
March	14.0/26.6 f	TMDL/Water Quality Standards
April	14.0/25.6 f	TMDL/Water Quality Standards
May	13.0/25.9 f	TMDL/Water Quality Standards
June	13.0/27.0 f	Water Quality Standards
July	10.0/21.5 f	TMDL/Water Quality Standards
August	9.7/23.4 f	TMDL/Water Quality Standards
September	10.0/26.7 f	TMDL/Water Quality Standards
October	10.0/23.4 f	TMDL/Water Quality Standards
November	14.0/24.1 f	TMDL/Water Quality Standards
December	15.0/27.8 f	TMDL/Water Quality Standards
Beginning 1/1/2015		
January	4.60/6.31 f	Water Quality Standards
February	4.47/6.17 f	Water Quality Standards
March	4.22/8.29 f	Water Quality Standards
April	4.13/9.21 f	Water Quality Standards
May	3.08/11.21 f	Water Quality Standards
June	2.77/12.67 f	Water Quality Standards
July	2.37/10.37 f (2.00 h)	Water Quality Standards
August	2.04/10.13 f (1.75 h)	Water Quality Standards
September	2.72/9.14 f (2.23 h)	Water Quality Standards
October	3.34/9.18 f	Water Quality Standards
November	3.54/7.84 f	Water Quality Standards
December	4.64/7.97 f	Water Quality Standards
Nitrate Plus Nitrite, mg/l as N,	8.68 h	Water Quality Standards
Dissolved Oxygen (minimum), mg/l	5.0/3.0 g	TMDL/Water Quality Standards
Cadmium, PD, ug/l	Report f	Water Quality Standards
Copper, PD, ug/l	Report f	Water Quality Standards
Iron, PD, ug/l	Report a	Water Quality Standards

Mercury, PD, ug/l	Report f	Water Quality Standards
Selenium, PD, ug/l	Report f	Water Quality Standards
Tetrachloroethene (PERC), ug/l	5.06a	Water Quality Standards
Diazinon, ug/l	Report f	Toxicity Identification
WET, Chronic Lethality	Statistical Difference and IC25 < IWC = 98.7% c	State Permit Regulations

a 30-day average
b 30-day average/7-day average
c Daily Maximum
d Minimum-Maximum
e 30-day geometric mean/7-day geometric mean
f 30-day average/daily maximum
g 7-day average minimum/Instantaneous minimum
h 7-day Average

2. Discussion of Effluent Limitations

a. Outfall 003A - Discharges from Outfall 003A are to the Burlington Canal, where agricultural standards are applied to protect the uses of the canal and state effluent regulations apply. The agricultural standards are less stringent than the aquatic life based and water supply based limits at Metro's surface water outfall (001C). The limits based on state effluent regulations are the same as or less stringent than those for outfall 001C. The District cited operational flexibility when it requested relief from continued rigorous sampling and reporting at Outfall 003A, and pointed to the fact that the discharge at 003A is of the same quality as that discharged at 001C. According to Metro, this makes sampling and reporting at Outfall 003A redundant and economically wasteful. Statistical analysis, provided by Metro, supported this conclusion. As a result, it is the Division's determination that Metro shall be given the option of reporting results for 001C on the DMR for outfall 003A for all parameters except flow. Flow at Outfall 003A shall be monitored continuously throughout the term of this permit

b. Outfall 001C– Drs. William M. Lewis, Jr. and Jimmy McCutchan have made a preliminary determination of the assimilative capacity for parameters of concern for this facility and other dischargers to segment 15 of the South Platte River. This assessment can be found in Appendices A through E of the rationale. The Permits Section evaluated the assimilative capacity for each parameter and determined whether there is a reasonable potential for the facility discharge to cause or contribute to an exceedance of a stream standard. If there is a reasonable potential for the discharge to contribute to an exceedance, limits are included in the permit.

As listed in Appendix E of this rationale, assimilative capacities equal to the stream standards for coliform, chlorine, Tetrachloroethene (PERC), and metals were evaluated to determine if there is reasonable potential for this discharge to cause or contribute to an exceedance of the stream standards for each of these parameters. Limits for those parameters that have a reasonable potential will be included in the Metro permit. Because Metro is the predominant discharger in this segment, Metro's discharge of concentrations of coliform and metals at or below the stream standards will make additional assimilative capacity available.

CBOD5, TSS, and Oil and Grease - TSS, and Oil and Grease limits are taken from State Effluent Regulations. Limits for CBOD5 were derived from the final TMDL for Segment 15: COSPUS15; South Platte River, Burlington Ditch to Big Dry Creek, Dissolved Oxygen TMDL. That document outlines the Metro limit for CBOD5 as follows: "For all permitted discharges to Segment 15, except storm water, BOD5 and CBOD5will be limited to the secondary treatment maximum of 30 mg/L and 25 mg/L as a monthly average or the current permit limits where those are more stringent (the Metro District has more stringent CBOD5 permit limits of 17 mg/L due to acceptance of a federal construction grant in the 1970s). Current dischargers withBOD5 or CBOD5 concentrations below 10 mg/L do not need BOD5 or CBOD5 permit limits unless the permit issuing authority determines they have a significant potential to exceed this criteria."

Dissolved Oxygen – The dissolved oxygen limits as listed in the TMDL, Appendix D, have been applied as permit limits. The TMDL stated that Metro Wastewater Reclamation District will be responsible for constructing all reaeration structures and other physical improvements in the channel that are necessary to meet the dissolved oxygen standards.

Metro District has completed three dissolved oxygen drop structures on the South Platte River since the stream channel improvements program was initiated during 1992.

Reaeration Structure No.1 is a horseshoe shaped facility with the boat chute located in the center of the structure. It is located approximately 4,000 feet upstream of the 88th Avenue Bridge. It became operational during December 1995. The project cost for this facility was $4.0 million. Once constructed, this first structure was field tested to confirm its performance in improving dissolved oxygen before the District proceeded with additional structures.

Reaeration Structure No. 2 is a curvilinear shaped structure with the boat chute located on the outside bend of the structure. This facility is located approximately 3,500 feet downstream of the 104th Avenue Bridge. This facility became operational during November 2000. The project cost for this facility was $4.4 million.

Reaeration Structure No. 3 is also a curvilinear shaped structure, which is located east of the Adams County Fairgrounds at 130th Avenue. This facility became operational during December 2001. The project cost for this facility was $3.5 million. This brings the total project cost for the three structures to $11.9 million.

In addition, the Metro District cooperated with Urban Drainage and Flood Control District on the construction of a grade control structure to stabilize the South Platte River in the vicinity of 124th Avenue. Urban Drainage added some reaeration improvements to its standard grade control design, and it is expected that these enhancements will be used on future grade control structures Urban Drainage builds in the river. While these modified grade control structures will not be as efficient for adding dissolved oxygen as the specifically designed drop structures, they will contribute to the improvement of dissolved oxygen in the river.

During the renewal phase of this permit in 2007, discussions were held concerning the ability of Metro to achieve attainment of the dissolved oxygen TMDL in Segment 15. Reports prepared by Dr. Lewis modeled various scenarios that manipulated CBOD and ammonia concentrations to determine effluent concentrations of either, or both in combination, that would achieved compliance of the DO standard at Fulton Pool. The Fulton Pool begins at River mile 306.2 – a little over a tenth of a mile downstream of South Adams County Water & Sanitation District (SACWD) outfall – and can extend nearly 0.5 miles to the diversion structure, dam and headgate at river mile 305.7. Results indicated that, "Compliance with the dissolved oxygen standard near the Fulton Pool in the month of July cannot be achieved by any feasible degree of treatment for ammonia, CBOD or combinations of these." As a result of these findings, further monitoring of the Fulton Pool shall be conducted in an effort to define a workable strategy for obtaining compliance with the dissolved oxygen standard in this portion of the river, including the possibility of a site-specific standard for the Fulton Pool.

<u>pH</u> - This parameter is limited by a qualifier in Regulation 38, that sets pH limits of 6.0-9.0 from 64th Avenue downstream 2 miles.

<u>Escherichia Coli</u> – The Water Quality Control Commission has adopted standards for both fecal coliform and E. coli and intends that dischargers will have the option of either parameter being used in establishing their effluent limits. For this facility, E. coli limits were selected.

Metro has requested that the E. coli standard be utilized in establishing their coliform permit limit. The 30-day geometric mean limit will be set at the stream standard of 126 organisms per 100 ml, and the 7-day geometric mean limit will be set equal to twice the 30-day limit.

<u>Chlorine</u> - The total residual chlorine limits will be set equal to the stream standards of 0.011 mg/l, chronic and 0.019 mg/l acute.

<u>Cyanide</u> - For cyanide, the standard for the receiving stream is based upon "free" cyanide concentrations. However, there is no analytical procedure for measuring the concentration of free cyanide in a complex effluent. Therefore, ASTM (American Society for Testing and Materials) analytical procedure D2036-81, Method C, will be used to measure weak acid dissociable (WAD) cyanide in the effluent. This analytical procedure will detect free cyanide plus those forms of complex cyanide that are most readily converted to free cyanide.

The cyanide effluent limitation is considered to be equal to the stream standard of 0.005 mg/l and less than the detection limit of 0.030 mg/l for WAD cyanide. Because self-monitoring data indicates that the Metro discharge does not represent a reasonable potential to cause or contribute to an exceedance of the stream standard. WAD cyanide monitoring only will be specified in the permit.

<u>Metals</u> - Calculated metals limits for the Metro facility, as listed in Appendix E to this rational, and metals self monitoring data were evaluated to establish what effluent metals presented a reasonable potential to cause or contribute to an exceedance of the streams standards. Upon completion of this analysis, it was determined that there are currently no metals that threaten to cause or contribute to a violation of stream standards. Because the

detection limit used for mercury monitoring was half of the chronic mercury limit and all of the data indicated concentrations below the detection limit, it could be determined that the facility had been meeting the permit limit, however reasonable potential to cause or contribute to an exceedance could not be determined. Monitoring will be included for cadmium, copper, mercury and selenium. The Metro District routinely monitors for all metals and should compile and retain this information for use at the next permit renewal in order for the Division to re-evaluate reasonable potential for metals.

For metals with dissolved standards, corresponding effluent limits are based upon the potentially dissolved method of analysis, except for hexavalent chromium, which must be analyzed by using the dissolved method. For standards based upon the total and total recoverable methods of analysis, the limits are based upon the same method as the standard, except for arsenic. For arsenic, the total recoverable analyses must be performed using a graphite furnace. This method may produce erroneous results and may not be available to the permittee. Therefore, the total method of analysis will be specified instead of the total recoverable method.

Ammonia - The calculated limits for chronic and acute total ammonia based on standards adopted by the WQCC in March 2007 will be set as permit limits. Because ammonia concentrations in domestic wastewater are not anticipated to exceed 35 mg/l, and because self-monitoring data indicates that maximum effluent total ammonia concentrations have not exceeded 15 mg/l, for those months where an ammonia limit is equal to or greater than 35 mg/l, reporting will be included in the permit, but no permit limit will be included. Three times per week monitoring of effluent ammonia concentration will be required in the permit. Interim limits are included in order to give Metro time to plan and complete construction of improved mechanical appurtenances that will facilitate improved nitrification/denitrification processes and allow Metro to meet effluent ammonia limits that will become enforceable in 2015. The interim limits are based on the previous permit which in turn, was based on the Dissolved Oxygen TMDL for Segment 15. Future limits are based on the underlying ammonia standards taking affect when the temporary modification for ammonia expires December 31, 2014.

During the development of this permit renewal, the Metro District requested the establishment of weekly average effluent limits for ammonia instead of daily maximum effluent limits for implementation of the acute standard. Regulation 61.8(2)(g)(ii) requires effluent limits for POTWs to be expressed as weekly average and monthly average, unless impracticable. EPA's Technical Support Document (TSD) for Water Quality Based Toxics Control (EPA, 1991) provides a method for converting effluent limits to longer averaging periods, using a coefficient of variation calculated from data representative of the effluent. If the expected variability of the effluent holds true, implementation of weekly average effluent limit should be protective of an acute standard in that the daily maximum value would not be exceeded. In the TSD "EPA recommends establishing a maximum daily limit (in lieu of an average weekly limit)... for toxic pollutants and pollutant parameters... because a 7-day average which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharger's potential for causing acute toxic effects would be missed." In evaluating EPA's recommendation as it relates to ammonia, the Division considered the potential risks to aquatic life to determine whether a daily maximum limit was necessary to provide the appropriate level of protection. The Division determined that for a pollutant like ammonia, which can cause lethality over a short duration in fish, and for which the exposure occurs immediately downstream of the discharge, an average weekly limit is impracticable. Therefore the Division implemented daily maximum limits for ammonia based on AMMTOX for the protection of aquatic life. For the months of July, August and September, a 7-day average ammonia effluent limit was also included to ensure compliance with downstream nitrate standards to protect water supply uses.

Nitrate - During the development of this permit renewal, the Metro District also requested the establishment of weekly average effluent limits for nitrate instead of daily maximum effluent limits for implementation of the acute standard. EPA's Technical Support Document for Water Quality Based Toxics Control (EPA, 1991) provides a method for converting effluent limits to longer averaging periods, using a coefficient of variation calculated from data representative of the effluent. If the expected variability of the effluent holds true, implementation of weekly average effluent limits should be protective of an acute standard in that the daily maximum value would not be exceeded. In evaluating EPA's recommendation as it relates to nitrate the Division considered the potential risks to downstream water supplies to determine if a daily maximum limit was necessary to provide the appropriate level of protection. Because river-bank filtration provides additional treatment prior to the point at which the standard applies, the Division had an additional level of confidence that implementation of a weekly average effluent limit would be protective of the acute (daily maximum) standard at the point in which the standard applies. In this case, there was an additional level of confidence that a weekly average limit would not present an unacceptable risk to downstream water supplies because projections of future effluent variability are fully supported by the quality of the Districts' pretreatment program, the District's excellent performance history, and the fact that the District incorporates safety factors into the facility design. The result was a Division determination that implementation of

a 7-day limit was not "impracticable". The result of this effort was to allow Metro the 7-day averaging period in this renewal. It must be noted that this decision will be reviewed at the next renewal when an abundance of data will be available to evaluate the appropriateness of this decision.

To assure compliance with the drinking water nitrate standards that are in effect at the Thornton Well Fields the nitrate limits established in Appendix E will be included in the permit as limitations of nitrate plus nitrite

Additional construction is needed at the facility to meet the nitrate limit contained in this permit in all operating situations. The previous permit contained a compliance schedule to allow the facility time to meet the nitrate limits that went into effect on October 1, 2007. As of that date, Metro had fully implemented operational strategies to allow the facility to meet the limits while construction is still ongoing. For this renewal, the calculated 7-day average limit is imposed immediately on the basis that the facility can continue the operational strategies utilized under the previous permit to meet the new limit. A compliance schedule is also included to ensure the completion of the construction to allow the facility to meet the nitrate limits in all operating situations, and in conjunction with more stringent ammonia limits.

Organics - Two parameters were evaluated for this permit renewal on the basis that there had been previous findings of reasonable potential for this facility. For tetrachloroethene a limit was initially included in 1995 based on monitoring for organics that demonstrated reasonable potential. The facility has continued monitoring for this parameter since that time and the analysis included in Appendix F made a finding of reasonable potential for this renewal. Diazanon was identified as a toxicant for the facility in the late 1990s based on WET failure and routine monitoring has been required since 2000. There is no water quality standard for diazanon. Based on the WET failure noted in the self-monitoring data, monitoring for diazanon will continue to be required.

Antidegradation - Since the receiving water is Use Protected, an antidegradation review is not required pursuant to section 31.8(2)(b) of The Basic Standards and Methodologies for Surface Water.

d. *Economic Reasonableness Evaluation - The Water Quality Control Commission, during their proceedings to adopt the Classification and Numeric Standards for the South Platte River Basin, considered the economic reasonableness of imposing the classification and standards listed in section VI.A. of this rationale. Since this is not a new discharger and no new information has been presented regarding the classifications and standards, the water quality standard-based effluent limitations of this permit are determined to be reasonably related to the economic, environmental, public health and energy impacts to the public and affected persons in accordance with Section 61.11 of the Colorado Discharge Permit System Regulations. If the permittee disagrees with this finding, pursuant to 61.11(b) (ii), the permittee should submit all pertinent information to the Division during the public notice period.*

B. *Monitoring*

1. *Influent and Effluent Monitoring - Influent and effluent monitoring will be required as shown in Tables VI-2 and VI-3. Refer to the permit for locations of monitoring points.*

Table VI-2 - Influent Monitoring Requirements –Monitoring Point 3001

Parameter	*Measurement Frequency*	*Sample Type*
Influent Flow, MGD	*Continuous*	*Recorder ***
Influent BOD5, mg/l (lb/day)	*Daily*	*24-Hour Composite*
Influent Total Suspended Solids, mg/l	*Daily*	*24-Hour Composite*

* *If more than one source is being utilized, a composite sample proportioned to flow shall be prepared from individual grab samples.*

** *Report both influent and effluent flow, even if only one flow measuring device is installed.*

Table VI-3 - Effluent Monitoring Requirements (Outfall 001C only, unless stated otherwise)

Parameter	Measurement Frequency	Sample Type
Effluent Flow, MGD		
Outfall 001C	Continuous	Recorder **
Outfall 003A	Continuous	Recorder
Effluent CBOD5, mg/l		
Outfall 001C	Daily	24-Hour Composite
Outfall 003A	Daily****	24-Hour Composite
Effluent Total Suspended Solids, mg/l,		
Outfall 001C	Daily	24-Hour Composite
Outfall 003A	Daily****	24-Hour Composite
Effluent E. Coli., no./100 ml,	Daily	Grab
Effluent Total Residual Chlorine, mg/l		
DPD method	4X/Day	Grab
Amperometric titration	Daily	Grab
Effluent pH, s.u.		
Outfall 001C	Daily	Grab
Outfall 003A	Daily****	Grab
Effluent Oil & Grease, mg/l		
Outfall 001C	Daily	Visual ***
Outfall 003A	Daily****	Visual ***
Effluent Cyanide, Weak Acid Dissociable, ug/l	Weekly	Grab
Effluent Total Ammonia as N, mg/l	3X/Week	24-Hour Composite
Effluent Nitrate plus Nitrite, mg/l as N	Daily	24-Hour Composite
Effluent Dissolved Oxygen (minimum), mg/l	Daily	Grab
Effluent Cadmium, PD, ug/l	Quarterly	24-Hour Composite
Effluent Copper, PD, ug/l	Weekly	24-Hour Composite
Effluent Iron, PD, ug/l	Weekly	24-Hour Composite
Effluent Mercury, PD, ug/l	Weekly	24-Hour Composite
Effluent Selenium, PD, ug/l	Weekly	24-Hour Composite
Effluent Tetrachloroethene, ug/l	Monthly	Grab
Effluent Diazinon, ug/l	Monthly	24-Hour Composite
Effluent Whole Effluent Toxicity, Chronic	Monthly	3 Composites/Test

* *If more than one source is being utilized, a composite sample proportioned to flow shall be prepared from individual grab samples.*

** *Report both influent and effluent flow, even if only one flow measuring device is installed.*

*** *If a visible sheen is noted, a grab sample shall be collected and analyzed for oil and grease. The results are to be reported on the DMR under parameter 03582.*

**** *The facility has the option of monitoring/reporting data from Outfall 001C for these parameters*

2. *Pretreatment Program - The permittee has been delegated primary responsibility for enforcing against discharges prohibited by 40 CFR 403.5, and applying and enforcing any National Pretreatment Standards established by the Environmental Protection Agency in accordance with Section 307(b) and (c) of the Act.*

   As part of the pretreatment program, the permittee is responsible for an annual report describing their pretreatment activities over the previous calendar year. As part of the annual report, the permittee is responsible for influent and effluent sampling.

3. *Whole Effluent Toxicity (WET) Testing - Biomonitoring*

   a. *Purpose of WET Testing: The Water Quality Control Division has established the use of WET testing as a method for identifying and controlling toxic discharges from wastewater treatment facilities. WET testing is being utilized as a means to ensure that there are no discharges of pollutants "in amounts, concentrations or combinations which are harmful to the beneficial uses or toxic to humans, animals, plants, or aquatic life" as required by Section 31.11 (1) of the Basic Standards and Methodologies for Surface Waters.*

   b. *Instream Waste Concentration (IWC): Where monitoring or limitations for WET are deemed appropriate by the Division, chronic instream dilution as represented by the chronic IWC is critical in determining whether acute or chronic conditions shall apply. According to the Colorado Water Quality Control Division Biomonitoring Guidance Document, dated July 1, 1993, for those discharges where the chronic IWC is greater than (>) 9.1% and the receiving stream has a Class 1 Aquatic Life use or Class 2 Aquatic Life use with all of the appropriate aquatic life numeric standards, chronic conditions apply. Where the chronic IWC is less than or equal to (<) 9.1, or the stream is not classified as described above, acute conditions apply. The chronic IWC is determined using the following equation:*

   IWC = [Facility Flow (FF)/(Stream Chronic Low Flow (annual) + FF)] X 100%

   The flows and corresponding IWC for the appropriate discharge point are:

Discharge Point	*Chronic Low Flow, 30E3, (cfs)*	*Facility Design Flow, (cfs)*	*IWC, (%)*
001	*4.4*	*341.0*	*98.7*

   The IWC for this permit is 98.7%, which represents a wastewater concentration of 98.7% effluent to 1.3% receiving stream.

   c. *Chronic WET Limitations: The Metro Wastewater Reclamation District WWTF is a major wastewater treatment facility which has numerous commercial and industrial contributors.* ***It is Division's practice to include WET limits in permits for all major domestic facilities. Due to the large number of taps in all major facilities service areas, the likelihood that one or more dischargers to the collection system contributes toxic substances in toxic amounts is significant,*** *for this reason the Division believes there is reasonable potential for the discharge to cause or contribute to an exceedance of the narrative standard. Because of this condition, the chronic limit has been incorporated into the permit and becomes effective* ***on the effective date of the permit.*** *The results of the testing are to be reported on Division approved forms. The permittee will be required to conduct two types of statistical derivations on the data, one looking for any statistically significant difference in toxicity between the control and the effluent concentrations and the second identifying the IC_{25}, should one exist. Both sets of calculations will look at the full range of toxicity (lethality, growth and reproduction). If a level of chronic toxicity occurs, such that there is a statistically significant difference in the lethality (at the 95% confidence level) between the control and any effluent concentration less than or equal to the Instream Waste Concentration (IWC) and if the lethality IC_{25} < the IWC, the permittee will be required to follow the automatic compliance schedule identified in Part I.B of the permit, if the observed toxicity is due to organism lethality. Once the chronic lethality limitation becomes effective, only exceedance of the limitation specified in Part I.A.5. will trigger the requirement for conducting the automatic compliance schedule identified in Part I.B. of the permit. Prior to and after the limitation becomes effective, if the toxicity is due to differences in the growth of the fathead minnows or the reproduction of the Ceriodaphnia, no immediate action on the part of the permittee will be required. However, this incident, along with other WET data, will be evaluated by the Division and may form the basis for reopening the permit and including additional WET*

limits or other requirements.

d. General Information: The permittee should read the WET testing section of Part I.B.3 of the permit carefully. The permit outlines the test requirements and the required follow-up actions the permittee must take to resolve a toxicity incident. The permittee should read, along with the documents listed in Part I.B.3 of the permit, the Colorado Water Quality Control Division Biomonitoring Guidance Document, dated July 1, 1993. This document outlines the criteria used by the Division in such areas as granting relief from WET testing, modifying test methods and changing test species. The permittee should be aware that some of the conditions outlined above may be subject to change if the facility experiences a change in discharge, as outlined in Part I.D.4(e) of the permit. Such changes shall be reported to the Division immediately.

e. WET Test Method Modifications: The permittee has requested and will be allowed to make the following modifications to the WET test procedures:

1) Use of testing in a CO2 atmosphere for control of pH creep;

f. WET Test Results Certification: The permittee has requested and the Division has agreed that the meaning of the term "accurate" as applied to whole effluent toxicity test results has the meaning as set forth in the U.S. Environment Protection Agency's memorandum, dated March 3, 2000, from Charles S. Sutfin et al. to Regional Water Management Division Directors, EPA Regions I-X and Regional Enforcement Division Directors, EPA Regions I-X, on the subject of Certification of "Accuracy" of Information Submissions of Test Results Measuring Whole Effluent Toxicity.

4. Stormwater Evaluation: In some cases stormwater from wastewater treatment facilities is required to be covered by a Colorado Discharge Permit System (CDPS) permit or a No Exposure Certification in order to be discharged to Waters of the State.

Division records indicate that Metro Wastewater Reclamation District applied for and obtained coverage under a general permit for stormwater discharges associated with light industries for the Central Treatment Plant. The CDPS certification number is COR-00824. Stormwater permitting issues for this facility will be handled separately by the Division's Stormwater Unit.

C. Reporting

1. Discharge Monitoring Report - The permittee must submit a Discharge Monitoring Report (DMR) monthly to the Division. This report will contain the test results for parameters shown in Tables VI-2 and VI-3 and Part I, Section B of the permit. The DMR form shall be completed and submitted in accordance with Part I, Section D.2 of the permit.

2. Special Reports - Special reports are required in the event of a spill, bypass, or other noncompliance. Please refer to Part I, Section D.4 of the permit for reporting requirements.

D. Additional Terms and Conditions

1. Signatory Requirements - Signatory requirements for reports and submittals are discussed in Part I, Section D.1 of the permit.

2. Compliance Schedules:

a. Activities to Meet Nitrate and Ammonia Final Limits: This schedule outlines the time line for completion of construction and implementation of processes to meet nitrate and ammonia limits at the **North Secondary Facility**.

Code	Event	Permit Citation	Due Date
03099	The facility shall have commenced the construction of the carbon addition facilities, mixed liquor return (MLR) pumping facilities, and Centrate and RAS Re-aeration Basins (CaRRB) for the purpose of nitrate plus nitrite removal in the North Complex.		07/01/08
03599	Submit a report describing the progress of the construction of the carbon addition facilities, mixed liquor return (MLR) pumping facilities and Centrate and RAS Re-aeration Basins (CaRRB) in the North Complex		1/1/09

03699	Submit a report describing the progress of the construction of CaRRB facilities in the North Complex.	01/01/10
03799	Submit a report documenting completion of CaRRB facilities in the North Complex and provide a commencement date for construction improvements to the twelve existing aeration basins and twelve secondary clarifiers in the North Complex.	07/01/10
03899	Submit a report describing the progress of the construction of improvements to the twelve existing aeration basins and twelve secondary clarifiers in the North Complex.	01/01/11
03999	Submit a report describing the progress of the construction of improvements to existing clarifiers and aeration basin facilities in the North Complex.	01/01/12
04599	Submit a report documenting that the facility improvements to achieve needed nitrate plus nitrite removal requirements (North Secondary Facility improvements) are substantially complete and that operation of said facility improvements has begun.	07/01/12

b. Activities to Meet Nitrate and Ammonia Final Limits: This schedule outlines the time line for completion of construction and implementation of processes to meet nitrate and ammonia limits at the **South Secondary Facility**.

Code	Event	Permit Citation	Due Date
00199	Submit a report describing its progress to complete the Process Design Report (PDR) of facility improvements, meeting Division design criteria, or to seek appropriate variances to achieve nitrate and ammonia removal requirements in the South Secondary Facility Complex.		1/1/09
00299	Submit for approval a completed PDR that meets Division design criteria or requirements of approved variances, for achieving nitrate and ammonia removal requirements in the South Secondary Facility Complex.		10/1/09
00399	Submit a report describing progress to complete final design and specifications, in accordance with Division design criteria or approved variances, for facility improvements to achieve nitrate and ammonia removal requirements in the South Complex.		1/1/10
00499	Submit final design, plans and specifications, in accordance with Division design criteria or approved variances, for facility improvements to achieve nitrate and ammonia removal requirements in the South Complex.		10/1/10
01099	Submit a report documenting that the final design and plans for facility improvements to achieve nitrate and ammonia removal requirements in the South Complex is complete, submitted and approved and a construction contract has been awarded.		1/1/11
03599	Submit a report describing the progress of the construction of nitrate and ammonia removal facilities in the South Complex.		01/01/12
03699	Submit a report describing the progress of the construction of nitrate and ammonia removal facilities in the South Complex..		01/01/13
03799	Submit a report describing the progress of the construction of nitrate and ammonia removal facilities in the South Complex..		01/01/14
03899	Submit a report documenting that construction of nitrate and ammonia removal facilities in the South Complex is substantially complete and that operation of said facility improvements has begun..		08/01/14
03999	Submit a report documenting that the South Secondary Complex nitrate and ammonia removal facilities are substantially complete, fully operational and that performance testing of said facilities is complete.		01/01/15

E. Reopener, Permit Renewal and Fee Information

1. The permit may be modified, suspended, or revoked in whole or in part during its term for reasons outlined in Part II, Section B.8 of the permit.

2. Requirements for permit renewal are discussed in Part II, Section B.9 of the permit.

3. Permit fee requirements are outlined in Part II, Section B.11 of the permit. An annual fee must be paid to the Water Quality Control Division to maintain the status of your permit.

VI. REFERENCES

A. Colorado Department of Public Health and Environment, Water Quality Control Division Files.

B. "Design Criteria for Wastewater Treatment Works", Colorado Water Quality Control Commission, December 1994.

C. "Basic Standards and Methodologies for Surface Water", Regulation No. 31, Colorado Water Quality Control Commission, effective December 31, 2007.

D. "Classification and Numeric Standards South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin", Regulation No. 38, Colorado Water Quality Control Commission, effective September 30, 2007.

E. Colorado Discharge Permit System Regulations", Regulation No. 61, Colorado Water Quality Control Commission, effective December 30, 2007.

F. "Regulations for Effluent Limitations", Regulation No. 62, Colorado Water Quality Control Commission, effective December 30, 1998.

G. "Pretreatment Regulations", Regulation No. 63, Colorado Water Quality Control Commission, effective April 1, 2007.

H. "Biosolids Regulation", Regulation No. 64, Colorado Water Quality Control Commission, effective April 1, 2007.

I. "Future Effluent Limits Study, Parts I and II", Metro Wastewater Reclamations District and CH2MHill, September, 2007.

J. COSPUS15; South Platte River, Burlington Ditch to Big Dry Creek, Dissolved Oxygen TMDL

K. Technical Support Document for Water Quality-based Toxics Control, USEPA, March 1991.

VIII. PUBLIC NOTICE COMMENTS

Comments were submitted by the Metro Wastewater Reclamation District. Four of the comments pointed out editorial errors. These will be summarized together first. The remaining comments concerned language in the permit and will be addressed individually.

Comment 1:

- Metro pointed out inconsistencies between the rationale document and the permit document with regard to ammonia discharge limitations that will become effective January 1, 2015. Values for the 7-day averages were correctly listed in the rationale and incorrectly listed in the permit for the months of August and September.

- The Instream Waste Concentration (IWC) was incorrectly listed in the permit as 98.6%.

- The treatment facility map provided to the Division inadvertently included Outfall 004A.

- The Table of Contents incorrectly listed the page number for the Public Notice section in the rationale.

- Missing footnotes for April and June Ammonia in the rationale.

Response 1:

- The Division has corrected editorial errors in the permit and rationale documents. Ammonia values were changed in the permit to be consistent with the correct values listed in the rationale (August: 2.42 changed to 1.75; September: 3.09 changed to 2.23).

- The value of the IWC has been corrected from 98.6% to 98.7% in the permit.

- The updated map has been incorporated into the permit document.

- The Table of Contents has been corrected in the rationale.

- Footnotes were added to April and June where they had been inadvertently omitted.

Comment 2: *The Metro District requested a language change to two compliance items due for the North Secondary Facility that would more closely coincide with the District's working definition regarding "completed" construction. "The Metro District does not consider construction to be complete until all aspects of a contract are complete and the project is officially closed out... The proposed language is intended to meet the Division's intent that construction be complete and facilities operational while recognizing that projects may need to remain open for other related purposes."*

Response 2: *The requested language changes in the permit, for the July 1, 2010 compliance item and the July 1, 2012 compliance item at the North Secondary Facility, have been incorporated into the permit and satisfy the Division's intent while providing room for the District's purposes.*

Comment 3: *The Metro District felt that the word, "violation," with regard to WET testing in the Compliance with Terms and Conditions of Previous Permit section of the rationale was an unfair indictment in light of the fact that follow-up testing returned a finding of "no toxicity" in the effluent. They have recommended the use of, "failure," or, "excursion," as replacements.*

Response 3: *The wording was changed to, "failure."*

Comment 4: *The Metro District requested the reuse of language that was negotiated during their previous permit renewal in lieu of current boilerplate language (Part I.D.4.b.ii.(C)). The purpose of the negotiations was to remove, "impermissibly ambiguous," language regarding noncompliance notifications to the Division and centered around the use of the phrases, "suspected discharge," as well as, "above the detection limit," in instances where there is no limit.. They further request that the boilerplate language used by the Division be permanently changed based on their comments and those of other permittees.*

Response 4: *Following a review of Regulation 61 and a determination that the suggested revision was not inconsistent with the regulation, the District's suggested revision was included. The Division will further evaluate whether the change should be made to the boilerplate language.*

Comment 5: *The Metro District submitted two related comments concerning spill language and discharge points in the permit boilerplate. The first comment refers to Part II, Section A.6 (Discharge Point) and the second refers to Part I.D.4.a.iii (Spill Notification). The District has suggested the addition of language that more specifically defines the terms, "Discharge Point," and, "Spill." The suggested language reads as follows: "...unless the discharge is incidental to the normal operation of wastewater treatment and transmission facilities and managed consistently with the permittee's operation and maintenance BMPs. Documentation must be maintained and made available to the Division upon request."*

Response 5: *The Division did not make any changes to either section on the basis that these issues would be further discussed with the Spill Workgroup. Based on the outcome of the workgroup process, Metro may request an amendment to their permit.*

Comment 6: *The Metro District commented that the final compliance item for the South Secondary Complex ("...submit a report documenting the final completion of the South Secondary Complex construction.") be removed from the permit, citing as redundant the requirement to submit what is, in essence, a second final completion notification due to the fact that they will have been operational and performance tested by the close of the preceding compliance item that is due on January 1, 2015.*

Response 6: *The Division concurs with the District's position and the final compliance report has been removed.*

EPA provided one comment on the Metro District permit.

Comment 7: *EPA commented that monitoring for nitrate should be done on a daily basis. By so doing, the District will have informational data that can be shared with the Division in the event downstream water users measure nitrate exceeding the 10 mg/l limit at the point of intake. Having such data will help the Division determine relative sources of nitrate and determine if the 7-day average is in fact protective of drinking water standards.*

Response 7: *The Division concurs with the EPA analysis and will require daily monitoring for nitrate.*

John Nieland
January 28, 2008