California Regional Water Quality Control Board
Central Valley Region

Peter M. Rooney
Secretary for Environmental Protection

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Ed J. Schnabel
Chair

15 September 1998

To: Basin Plan Recipients

FOURTH EDITION OF THE WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS

The Third Edition of the Basin Plan was adopted by the Regional Water Board on 9 December 1994, approved by the State Water Board on 16 February 1995 and approved by the Office of Administrative Law on 9 May 1995. Since then, the Basin Plan has been amended twice. One amendment (Regional Water Board Resolution 95-142) dealt with compliance schedules in National Pollutant Discharge Elimination System permits and the other (Regional Water Board Resolution 96-147) addressed agricultural subsurface drainage discharges. The Basin Plan has now been reprinted, incorporating these amendments. This will be the **Fourth Edition - 1998.**

The Basin Plan is in a loose-leaf format to facilitate the addition of amendments. The Basin Plan can be kept up-to-date by inserting any updated pages that you receive in the future. The date subsequent amendments are adopted by the Regional Water Board will appear at the bottom of the page. Otherwise, all pages will be dated 1 September 1998.

Copies of the Basin Plan are also available on the Regional Water Board's internet web site at the following address: http://www.swrcb.ca.gov/~rwqcb5/home.html.

The Basin Plan refers to objectives in the State Water Board's May 1991 *Water Quality Control Plan for Salinity* (Salinity Plan). The objectives are also reproduced in Table III-5. In May 1995, the State Water Board adopted *the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* which supersedes the Salinity Plan. Therefore, the reader should refer to the May 1995 Plan rather than the Salinity Plan. Reference to State Water Board's May 1995 Plan will be reflected in a future Basin Plan amendment.

Appendix 38 of the Basin Plan is a Water Quality Limited Segment List that was in effect in 1994. In 1998, the Regional Water Board and State Water Board approved an updated list and submitted it to the US EPA for its consideration (as required by the Clean Water Act).

If you have any questions, please call me at (916)255-3093.

Jerrold A. Bruns

JERROLD A. BRUNS, Chief
Standards, Policies and Special Studies

or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Biological Habitats of Special Significance (BIOL) - Uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support aquatic habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL) - Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

Surface Waters

Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of any specifically identified water body generally apply to its tributary streams, except as provided below:

- MUN, COLD, MIGR and SPWN do not apply to Old Alamo Creek (Solano County) from its headwaters to the confluence with New Alamo Creek

- MUN and the human consumption of aquatic organisms do not apply to Sulphur Creek (Colusa County) from Schoolhouse Canyon to the confluence with Bear Creek

In some cases a beneficial use may not be applicable to the entire body of water. In these cases the Regional Water Board's judgment will be applied.

It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

United States
Environmental Protection
Agency

Office of Water
(4203)

EPA-833-B-96-003
December 1996

EPA

U.S. EPA NPDES Permit Writers' Manual

TINGER

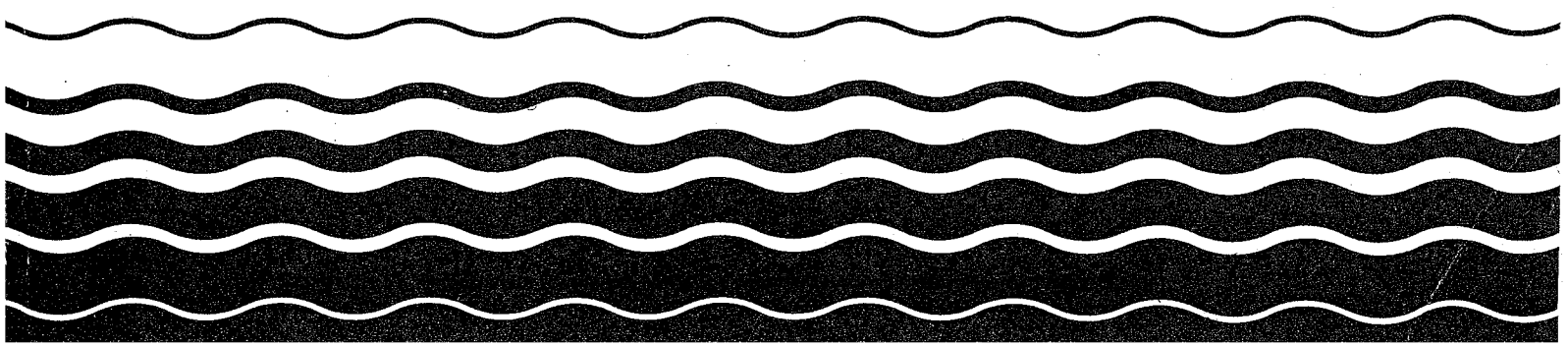
United States
Environmental Protection
Agency

Office Of Water
(EN-336)

EPA/505/2-90-001
PB91-127415
March 1991

EPA

Technical Support Document For Water Quality-based Toxics Control



MONK & ASSOCIATES
Environmental Consultants

BIOLOGICAL ASSESSMENT

BUENA VISTA RANCHERIA
OFF-SITE ROAD IMPROVEMENT AREAS
AMADOR & SAN JOAQUIN COUNTY, CALIFORNIA

USFWS Reference No. 81420-2008-I-1829-1
Corps File No. 2000-003-57

September 16, 2009

Prepared for

Buena Vista Rancheria of Me-Wuk Indians of California
P.O. Box 162283
Sacramento, California 95816

Attention: Rhonda L. Morningstar Pope, Tribal Chairwoman

Prepared by

Monk & Associates, Inc.
1136 Saranap Avenue, Suite Q
Walnut Creek, California 94595
Ph. (925) 947-4867
Fax (925) 947-1165

Attention: Isabelle de Geofroy

Memorandum

HydroScience Engineers, Inc.

To: John Tinger, U.S.E.P.A.
From: George Harris
Subject: Response to Technical NPDES Permit Comments for Buena Vista Rancheria
Date: 2/07/06
CC: Rhonda L. Morningstar Pope (Buena Vista Rancheria), Barry Scott (Jones & Stokes), Dennis Trzcinski (Wilmorite)

Thank you for the opportunity to respond on behalf of the Buena Vista Rancheria Me-Wuk Indians to technical comments received by the U.S.E.P.A. on the Tribe's application for an NPDES Permit for the Flying Cloud Casino in Amador County, California.

1. ***Comments from California Regional Water Quality Control Board, Central Valley Region, dated 12 January 2006, RE: NPDES PERMIT COMMENTS, BUENA VISTA RANCHERIA, FLYING CLOUD CASINO WASTEWATER TREATMENT PLANT, AMADOR COUNTY***

COMMENT NO. 1

Overview. The Board is correct in stating that the design of the Thunder Valley WWTP is very similar to the proposed design of the WWTP for the Buena Vista Rancheria. We further believe that the Board's conclusion that the historical performance of the Thunder Valley WWTP in complying with its NPDES Permit can serve as good indicator of the anticipated performance of the Buena Vista WWTP. The two facilities are very similar in design and both treat wastewater from a Casino. The Thunder Valley WWTP must comply with the discharge limitations of arguably the strictest NPDES Permit in Region 5. We believe that it can be stated with reasonable confidence that the Thunder Valley WWTP produces the highest quality effluent of any wastewater treatment plant in the Region. The effluent quality from the Thunder Valley Immersed Membrane Bioreactor (MBR) far exceeds the effluent quality of any existing WWTP in Amador County. Key water quality data for the Thunder Valley WWTP in 2005 are summarized in **Table 1** as evidence of the excellent performance of this plant. TSS and BOD levels in this plant are at Non-Detect levels and turbidities are consistently below 0.1 NTU. A copy of the 2005 annual report to the RWQCB is provided to further document the performance of the Thunder Valley MBR over the last 12 months.

The Thunder Valley WWTP (as well as the proposed Buena Vista WWTP) are model State-of-the-Art facilities whose effluent quality consistently exceeds drinking water standards for most (if not all) parameters. To expect the Tribe to provide a higher level of treatment beyond microfiltration would not be a reasonable request. The only higher level of treatment would be reverse osmosis (RO). And in fact, the effluent quality from a microfiltration plant such as that proposed for the Buena Vista Rancheria is of such good quality that the Tribe could actually go directly to RO at some time in the future should they be unable to comply with the discharge criteria of their NPDES Permit.

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San Francisco Bay Area • 221 Gateway Road West, Suite 403, Napa, CA 94558-6277 • T (707) 254-1900 • F (707) 254-1901

Table 1. 2005 Average Effluent water quality data for the Thunder Valley WWTP.

Month	TSS (mg/l)	BOD (mg/l)	Turbidity (NTU)	Ammonia (mg/l)
January	ND	ND	0.097	0.14
February	ND	ND	0.086	0.36
March	ND	ND	0.105	0.16
April	ND	ND	0.088	0.14
May	ND	ND	0.066	0.13
June	ND	ND	0.064	0.12
July	ND	ND	0.076	0.05
August	ND	ND	0.066	0.05
September	ND	ND	0.050	0.06
October	ND	ND	0.051	0.08
November	ND	ND	0.079	0.09
December	ND	ND	0.069	0.12
Annual Average	**ND**	**ND**	**0.075**	**0.13**

Membrane Pore Size. The proposed Buena Vista WWTP will utilize a nominal 0.3-micron flat plate membrane while the Thunder Valley WWTP uses a nominal 0.1-micron hollow fiber membrane. Other than that the two WWTP designs are essentially the same. The RWQCB has questioned whether the Buena Vista WWTP will perform less well than the Thunder Valley WWTP because of the larger membrane pore size. We have no reason to believe that this will be the case. The membranes in a MBR plant are not used for treatment, but are used for solids separation. Dissolved constituents will generally pass through both membranes. 0.3 microns is well within the range for effective microfiltration. Both membranes will strain solids at a molecular level and effluent solids will be essentially zero with both membranes. Any contaminants that bind to solids will be removed equally well by both membranes. The Buena Vista membranes will be manufactured by Kubota and serviced by Enviroquip in California. The Enviroquip membranes have a long established performance record and are approved by California Department of Health Services (DHS) for all Title 22 applications. The Enviroquip membranes also have a proven performance record with casino effluent. Enviroquip membranes are used at the Rolling Hills Casino WWTP in Corning (although not under an NPDES Permit). We have elected to change membrane manufacturers at Buena Vista because of maintenance issues that we have experienced with the hollow fiber membranes in the Thunder Valley WWTP. During maintenance of these membranes we experienced coliform bacteria breakthrough at Thunder Valley in 2004 that resulted in coliform violations. Our discussions with the operators at Rolling Hills and review of their performance records show that they have essentially zero coliforms passing through their membranes and have actually turned off their disinfection system. It would therefore appear that because of the membrane design, the Enviroquip membranes may actually be tighter than the Thunder Valley membranes. This is probably because the flat plate design offers fewer opportunities for joint leakage. We could switch back to the Thunder Valley membranes at the request of the U.S.E.P.A., but we believe that this would not be in the best interest of anyone.

Water Quality Limitations. The RWQCB states that "when it was discovered that the treatment system, similar to the one being proposed here, was incapable of meeting limitations, the Regional Water Board adopted a Cease and Desist Order requiring Thunder Valley Casino to comply with Effluent Limitations." This is an awkwardly worded statement that could suggest that Thunder Valley

was issued a C&D because it was not complying with the effluent limitations in its permit. C&D orders are routinely issued by the RWQCB after a Reasonable Potential Analysis (RPA) to provide the Board with an enforceable compliance schedule for dischargers to comply with limitations for constituents identified by the RPA as having a reasonable potential to exceed water quality standards. It does not mean that the discharger has necessarily exceeded limitations for the constituents identified in the RPA. The specific contaminants identified in the RPA at Thunder Valley are identified by the RWQCB in this comment letter and in fact Thunder Valley has never exceeded limitations on most of them. Thunder Valley was required by the C&D to begin monthly sampling of these constituents in April 2005. In May 2005 Thunder Valley connected to Placer County water to mitigate high levels of boron and electrical conductivity (EC) in local well water. The results of monthly effluent quality analyses since June 2005 are therefore considered representative of the WWTP's effluent quality. The results of this sampling are summarized in **Table 2** below:

Table 2. Regulated Contaminants for Thunder Valley WWTP in 2005 (Ref: Thunder Valley WWTP 2005 Annual Report).

Constituent	Limit	2005						
		Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bromoform, ug/l	21[a]/4.3[b]	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane, ug/l	87[a]/0.41[b]	ND	ND	ND	ND	ND	ND	ND
Dichlorobromomethane, ug/l	81[a]/0.56[b]	ND	ND	ND	ND	ND	ND	ND
Total Trihalomethanes, ug/l	80	ND	ND	ND	ND	ND	ND	0.37
Persistent Chlorinated Hydrocarbon Pesticides, ug/l	ND	ND	ND	ND	ND	ND	ND	ND
Atrazine, ug/l	1.0	ND	ND	ND	ND	ND	ND	ND
Boron, ug/l	700	60	ND	ND	160	7.7	ND	ND
Fluoride, ug/l	1,000	ND	ND	ND	ND	ND	ND	ND
Methylene Blue Active Substances (MBAS), ug/l	500	ND	ND	ND	ND	ND	ND	ND
Nitrate, ug/l	10,000	1,300	1,600	2,000	1,300	850	1,300	830
Ammonia, mg/l	0.42							
Sulfate, ug/l	250,000	20,000	17,000	18,000	18,000	16,000	17,000	2,200
Arsenic, ug/l	10	ND	ND	ND	ND	0.91	0.83	ND
Total Chlorine Residual, mg/l	0.01	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Electrical Conductivity, umhos/cm	700	412	399	401	399	389	406	395
Aluminum, ug/l	71	ND	33	54	**75**	27	ND	**118[a]**
Copper, ug/l	72[a]/1.6[b]	24	8.9	8.3	7.3	6.7	12	ND

[a]Interim effluent limitations until February 1, 2008.

[b]Effluent limitations after February 1, 2008

[a]118 is the average of three monthly samples collected in December: 240 ug/l (12/9/05), 58 ug/l (12/29/05), and 56 ug/l (12/31/05).

Table 2 clearly shows that the Thunder Valley WWTP is fully capable of complying with CTR effluent limitations. The only parameter that exceeded limitations was aluminum on two occasions and this is believed to be the result of the County's use of alum in the source water treatment plant. Aluminum was not detected in the effluent in April and May when the project was on well water (Please refer to 2005 annual report). Thunder Valley is exceeding copper limitations that will become effective in February 1, 2008, but this is believed to be caused by the County water leaching copper from casino piping. The

County's water will be treated by 2008 if necessary to come into compliance with copper limitations. **Table 2** clearly shows how incredibly strict Thunder Valley's discharge permit is. The effluent limitations for many parameters are much stricter than Federal drinking water standards. The fact of the matter is that the casino's wastewater is being polluted by the County's drinking water. Nevertheless, **Table 2** also clearly shows that Thunder Valley is fully capable of meeting the most stringent CTR limitations. There is no reason to believe that the Buena Vista WWTP will not perform equally well. The fact of the matter is that MBR technology may be the only practical technology available today to meet California discharge standards.

COMMENT NO. 2

Chlorine will be used on-site for recycled water disinfection. We believe that there are adequate safeguards in the plant design to protect against chlorine residual in the effluent including continuous monitoring of effluent chlorine residual and automatic plant shutdown in the event of the presence of chlorine residual. We are therefore not opposed to continuous monitoring of chlorine residual, as we will be doing that anyway.

COMMENT NO. 3

We take no exception to the Regional Board's comment. We defer response to Comment No. 3 pertaining to Effluent BOD and TSS Limits to the EPA. BOD and TSS levels in our MBR plants are typically at non-detect levels (see **Table 1** above).

COMMENT NO. 4

We take no exception to the Regional Board's comment. We defer response to Comment No. 4 pertaining to Effluent Toxicity Testing Requirements to the EPA.

COMMENT NO. 5

We take no exception to the Regional Board's comment. We defer response to Comment No. 5 pertaining to Receiving Water Sampling to the EPA.

COMMENT NO. 6

We take no exception to the Regional Board's comment. We defer response to Comment No. 6 pertaining to increased Nitrate and Ammonia Sampling to the EPA.

COMMENT NO. 7

We take no exception to the Regional Board's comment. We defer response to Comment No. 7 pertaining to a 2.2 MPN/100 ml Coliform Limit to the EPA.

COMMENT NO. 8

We take no exception to the Regional Board's comment. We defer response to Comment No. 8 pertaining to Mass Limits for Ammonia, Nitrate, Oil and Grease, Settleable Solids, and Total Dissolved Solids to the EPA.

COMMENT NO. 9

We take no exception to the Regional Board's comment. We defer response to Comment to No. 9 on Settleable Solids to the EPA.

2. ***Comments from Amador County Administrative Agency, dated January 10, 2006***

COMMENT on Potential Violation of the Endangered Species Act Regulations

This issue will be addressed in the TEIR.

COMMENT on Inconsistency with Basin Plan Policies

The consolidation of wastewater collection and treatment facilities is not a viable option for the Tribe. There are no other local wastewater collection and treatment facilities. Connection to the nearest such facility would be cost prohibitive and pose significant regulatory hurdles for the Tribe.

COMMENT on Need for Drainage Analysis

Wastewater drainage is only a potential issue during major storm events. Wastewater flow contributions from the proposed project to local waterways during these events will contribute a very small and insignificant fraction to local storm water flows. Nevertheless, project wastewater flows will be included in the storm water flow analyses for this project in the TEIR.

COMMENT on On-Site Water Quality Degradation

This application is for a surface water discharge permit and does not include permitting of a spray irrigation field.

COMMENT on Inadequate Wastewater Treatment Design Capacity

The proposed wastewater treatment plant for the Buena Vista Rancheria will have adequate treatment capacity for the long-term peak requirements of the project. **Table 3** below is taken from the Water and Wastewater Feasibility Study for the project and provides a detailed description of how wastewater flows were calculated for the project. The projected weekday flow is **150,000** gallons per day (gpd), the projected weekend flow is **250,000** gpd, and the projected average flow is **170,000** gpd. It should be noted that each of these flows include a contingency (see **Table 3** below). These wastewater flow rates are consistent with wastewater flow rates observed at similar local gaming facilities such as Thunder Valley, Cache Creek, and Jackson Casino.

Table 3. Projected Wastewater Flows for the Buena Vista Rancheria Casino

	Quantity (each)	Units (each)	WEEKDAY Flows (gpd)	WEEKEND Flows (gpd)	Average Flows [a] (gpd)
Casino					
Slots	2000	seats	50,400	96,000	63,400
Tables	480	seats	12,100	23,000	15,200
Employees	1900	employees	15,900	21,200	12,400
Restaurants and Lounges					
Buffet	330	seats	6,300	13,900	8,500
Asian Restaurant	161	seats	3,100	6,800	4,100
24/7 Restaurant	220	seats	4,200	9,200	5,700
Steak House	122	seats	2,300	5,100	3,100
Blues Lounge	188	seats	3,600	7,900	4,800
Food Court	188	seats	3,600	7,900	4,800
MultiPurpose Showroom	2020	seats	1,500	2,300	1,700
Cooling Towers	1	LS	18,800	18,800	18,800
Subtotal Daily Flows			121,800	212,100	142,500
I&I			0	0	0
Daily Flows [b]			120,000	210,000	140,000
Contingency Flow			30,000	40,000	30,000
Contingency Capacity[c]			**150,000**	**250,000**	**170,000**

[a]Average Flow = 5/7 Weekday + 2/7 Weekend

[b]Wastewater flows are rounded to the nearest 10,000 gpd.

[c]Includes contingency capacity for the WWTP.

The wastewater treatment plant will have two fully redundant treatment process trains with a treatment capacity of 167,000 gpd each. The total combined treatment capacity of the wastewater treatment plant will be 333,000 gpd (hence the nominal treatment capacity of 350,000 gpd). This plant will therefore have a fully redundant process train capable of treating projected average day flow. This significantly exceeds the reliability and redundancy requirements of any typical municipal wastewater treatment plant. The plant's treatment capacity of 333,000 gpd is more than 30% greater than projected peak weekend flows of 250,000 gpd. This plant will have more than adequate treatment capacity for treating sustained weekend flows.

Mixed Liquor is a commonly used technical term in the wastewater industry for the mixed-liquor suspended solids (MLSS) portion of suspended activated sludge. Activated sludge is the living population of micro-organisms in a biological wastewater treatment facility that metabolize the carbonaceous and nitrogenous fraction of the wastewater.

The wastewater treatment plant will be designed and permitted for 350,000 gpd. It is not anticipated that flows through the plant will exceed this flow rate at any time. Diversions of effluent for landscape irrigation will be *after* the treatment process is complete, but *before* discharge to surface waters. Diversions for landscape irrigation will therefore *reduce* discharge rates to surface waters during the

summer. The cessation of diversions for landscape irrigation during the winter will therefore not increase surface water discharge rates during the winter.

Storm water from the wastewater treatment plant area will be collected and directed back to the plant. The curbed watershed for the wastewater treatment plant is 0.85 acres. Assuming a 2 inch storm event in a single day, this translates into an additional flow to the plant of approximately 46,000 gpd. There is sufficient contingency in the design capacity of the WWTP to handle this additional flow. In reality, storm water is very low in contaminants and places little burden on a plant's biological treatment capacity, but does impact its hydraulic capacity.

COMMENT on Cultural Resources and Section 106 Compliance

This issue will be addressed in the TEIR.

COMMENT on Technical Review by RBF Consulting (Appendix A)

Please refer to **Table 3** above for a description of how peak treatment capacity is calculated.

All treatment plant processes in the plant are properly sized for a peak flow of 333,000 gpd as discussed above. **Table 4** summarizes the key design parameters for calculating hydraulic retention time (HRT). The total HRT for this plant will be 14.9 hours at a peak flow of 333,000 gpd. This is a very typical HRT for an MBR wastewater treatment plant.

Table 4. Size Criteria for the Buena Vista WWTP

Basin	No. Trains	Width (ft)	Length (ft)	Depth (ft)	Volume (gal)	HRT (hr)
Anoxic	1	36.67	12	12	39,498	2.8
Pre-Aeration	2	11	36.67	20	120,688	8.7
MBR	2	11	15	19	46,900	3.4
Total					**207,086**	**14.9**

The wastewater treatment plant will be designed to California Department of Health Services (DHS) Title 22 standards for tertiary 2.2 recycled water. The proposed wastewater treatment process (Enviroquip/Kubota MBR) is approved for all Title 22 applications by DHS.

The baffling of recycled water storage tanks is a common practice in the industry. The Buena Vista tank will have a theoretical detention time of over 10 hours even when the tank is half full. The modal detention time is therefore anticipated to be well in excess of the 90 minute Title 22 requirement. Dye testing can be conducted at the request of the EPA to determine actual modal contact times after construction of the facility.

Our experience with casino biosolids is that they can be dewatered to greater than 15% solids and disposed of in lined Class II landfills. Buena Vista WWTP will produce a class B sludge. Prior to acceptance of this sludge landfills will typically require a CAM 17 analyses for heavy metals. Our experience with three local casino operations is that biosolids from these facilities are accepted by Class II lined landfills. In the unlikely event that the Buena Vista biosolids will have unacceptably high levels of metals, then our contingency would be to dispose of these solids in a Class III landfill.

Comments on the monitoring requirements in the Draft NPDES Permit are deferred to the EPA.

Comments on the 2.8 acre jurisdictional wetland will be addressed in the TEIR.

As previously stated, all recycled water facilities will be designed to comply with DHS Title 22 criteria. DHS does not have jurisdiction on this site and no engineering report will therefore be submitted to DHS for review and comment.

We will use the cross connection control test procedures contained in Appendix J of the Uniformed Plumbing Code. The test will be conducted by a AWWA cross Connection Control Specialist. This procedure is widely used on recycled water projects in California and is accepted by DHS.

This will be a very small wastewater collection system without combined sewer flows. The system will be properly maintained.

3. ***Comments from Jackson Valley Irrigation District, dated 9 January 2006***
4. ***Comments from Wes Sage, Attorney at Law, dated 11 January 2006***
5. ***Comments from Friends of Amador County, undated***
6. ***Comments from Amador County Board of Supervisors, dated 12 December 2005***
7. ***Comments from Dave Cox, Senator, California State Senate, dated 5 January 2006***

The Buena Vista NPDES permit will be under the jurisdiction of the U.S.E.P.A. and not the California Regional Water Quality Control Board.

The Buena Vista WWTP will have an emergency overflow basin capacity of 88,040 gallons. This basin will provide the following hours of emergency storage:

Weekday flow of 150,000 gpd – 14.1 hrs
Average flow of 170,000 gpd – 12.4 hrs
Peak Weekend flow of 250,000 gpd – 8.5 hrs
Plant capacity of 333,000 gpd – 6.4 hrs

As previously discussed, the plant is being designed with two completely redundant process trains so the probability of a complete plant failure is highly remote. MBR's are a highly reliable and proven wastewater treatment technology. In the event that both process trains should fail, the Tribe would therefore have at least 8 to 9 hours of emergency storage time in which to either repair one or both of the process trains or to provide for alternative temporary wastewater disposal (e.g. portable toilet facilities). In the highly unlikely event that all of these contingencies fail, then it should be recognized that unlike a municipal wastewater system where flows must be maintained, a casino can shut down operations (including wastewater flows) until such time as the wastewater treatment problems are resolved. The Tribe will not discharge untreated or partially treated wastewater to waters of the U.S. simply for the purpose of maintaining casino operations.

Comments regarding the requirement for an approved TEIR and public notice requirements are referred to the U.S.E.P.A.

HydroScience Operations, Inc.

10569 Old Placerville Road
Sacramento, CA 95827
(916) 364-1490 Tel • (916) 364-1491 Fax

January 27, 2006

Richard McHenry
California Regional Water Quality Control Board
Central Valley Region
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

SUBJECT: United Auburn Indian Community Casino NPDES Permit No. CA0084697

Dear Mr. McHenry:

Enclosed is the monthly report for the Thunder Valley Casino Wastewater Treatment Plant for December 2005. Also enclosed are the fourth quarter priority pollutants and the 2005 Annual Report.

The average influent flow treated in December was 151,250 gallons per day. All effluent discharge requirements were in compliance with the exception of aluminum, which is in our compliance plan. The aluminum sample collected was 240 µg/l on 12/9/05. We received the results on 12/27/05 and additional samples were collected on the 29th and 31st. The results of those samples were 58 µg/l and 56 µg/l respectively. It was too late to collect additional samples so the average for the month exceeded the limit of 71 µg/l and the first result exceeded the daily average limit of 143 µg/l. We suspect the source to be the potable water from PCWA. To verify this we will begin sampling the potable water each time we collect effluent samples to compare results.

The average effluent discharged to the receiving water was 137,699 gallons per day. Approximately 13,551 gallons per day was reclaimed for irrigation and use in the treatment plant. On November 9th the toilet flushing line was connected directly to the potable water system. Recycled water is used for irrigation and in plant uses only. Provisions to reconnect the recycled water to the toilets are available for future needs if required.

The belt filter press installation project began in November and was operational in mid December. This project also included re-plumbing the toilet flushing water to the potable water system, as well as removing the Pulsar UV units and replacing them with Aquionics UV equipment. The project also includes minor improvements to the chlorine analyzer sample pumping system.

HydroScience Operations, Inc. is a registered contract operator in California No. CO-0088. If you have any questions regarding this report please call me at (916) 364-1490.

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 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,
HydroScience Operations, Inc.

Donald R. Brown
General Manager

CC: David Zweig, AES
John McCormick, Thunder Valley Casino

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

Influent Monitoring

Date	Flow gallons	TSS mg/l	TSS lbs.	BOD mg/l	BOD lbs.
1	112023	200	187	2100	1962
2	143609	160	192	90	108
3	191242	220	351	260	415
4	164227	340	466	480	657
5	111211	280	260	370	343
6	105828	220	194	370	327
7	108469	280	253	270	244
8	125531	210	220	540	565
9	152344	140	178	840	1067
10	195305	100	163	400	652
11	158742	240	318	380	503
12	110297	240	221	360	331
13	95063	190	151	310	246
14	121672	160	162	310	315
15	150820	170	214	330	415
16	157117	160	210	330	432
17	172453	230	331	410	590
18	159250	220	292	370	491
19	139039	290	336	390	452
20	112938	250	235	200	188
21	135078	190	214	280	315
22	121977	190	193	290	295
23	173875	190	276	420	609
24	181086	250	378	320	483
25	223641	210	392	270	504
26	183219	250	382	350	535
27	123297	270	278	420	432
28	157422	270	354	320	420
29	174586	250	364	350	510
30	193070	150	242	340	547
31	234305	190	371	340	664
Total	**4688736**				
Maximum	**234305**	**340**	**466**	**2100**	**1962**
Minimum	**95063**	**100**	**151**	**90**	**108**
Average	**151250**	**216**	**270**	**413**	**504**

nd = non detect

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

Effluent Monitoring Report

Date	TSS mg/l	TSS lbs	% Removal	BOD mg/l	BOD lbs	% Removal	Turbidity ave. NTU	Turbidity NTU % > 2.0	Turbidity max. NTU	Settleable Solids ml/l	Total Dissolved Solids	Spec. Cond. µmhos	Ammonia mg/l	Ammonia Unionized	Temp. °F	pH	Cl2 res. mg/l	Coliform MPN	Coliform median 7 samples	Effluent Flow gallons
1	nd	nd	>99	nd	nd	>99	0.080	0	0.10				nd	nd	76.7	7.09	0	< 2.0	<2	104609
2	nd	nd	>99	nd	nd	>99	0.050	0	0.07	nd		400	0.12	nd	77.7	7.07	0	< 2.0	<2	139445
3	nd	nd	>99	nd	nd	>99	0.060	0	0.08				nd	nd	75.8	6.98	0	< 2.0	<2	178445
4	nd	nd	>99	nd	nd	>99	0.050	0	0.06				0.13	nd	75.9	7.18	0	< 2.0	<2	152242
5	nd	nd	>99	nd	nd	>99	0.050	0	0.06	nd		380	0.10	nd	75.7	7.19	0	< 2.0	<2	106742
6	nd	nd	>99	nd	nd	>99	0.060	0	0.23				0.12	nd	75.4	7.15	0	< 2.0	<2	85719
7	nd	nd	>99	nd	nd	>99	0.050	0	0.06	nd	230	400	nd	nd	74.8	7.24	0	< 2.0	<2	101258
8	nd	nd	>99	nd	nd	>99	0.050	0	0.18				0.12	nd	76.4	7.38	0	< 2.0	<2	125227
9	nd	nd	>99	nd	nd	>99	0.050	0	0.11	nd		440	0.10	nd	75.0	7.15	0	< 2.0	<2	150820
10	nd	nd	>99	nd	nd	>99	0.060	0	0.11				nd	nd	76.5	7.11	0	< 2.0	<2	187586
11	nd	nd	>99	nd	nd	>99	0.060	0	0.12				nd	nd	75.7	7.11	0	< 2.0	<2	149500
12	nd	nd	>99	nd	nd	>99	0.060	0	0.10	nd		390	nd	nd	76.8	7.13	0	< 2.0	<2	101664
13	nd	nd	>99	nd	nd	>99	0.070	0	0.14				0.12	nd	76.7	7.23	0	< 2.0	<2	77594
14	nd	nd	>99	nd	nd	>99	0.070	0	0.12	nd	240	400	nd	nd	75.2	7.14	0	< 2.0	<2	114563
15	nd	nd	>99	nd	nd	>99	0.060	0	0.07				0.11	nd	74.8	7.32	0	< 2.0	<2	109078
16	nd	nd	>99	nd	nd	>99	0.070	0	0.09	nd		420	nd	nd	74.3	7.13	0	< 2.0	<2	141578
17	nd	nd	>99	nd	nd	>99	0.070	0	0.09				nd	nd	72.1	7.16	0	< 2.0	<2	167375
18	nd	nd	>99	nd	nd	>99	0.070	0	0.09				nd	nd	74.0	7.25	0	< 2.0	<2	157320
19	nd	nd	>99	nd	nd	>99	0.080	0	0.09	nd		380	nd	nd	75.1	7.12	0	< 2.0	<2	124414
20	nd	nd	>99	nd	nd	>99	0.080	0	0.09				0.11	nd	75.1	7.24	0	< 2.0	<2	101156
21	nd	nd	>99	nd	nd	>99	0.080	0	0.10	nd	210	370	nd	nd	75.2	7.22	0	< 2.0	<2	136094
22	nd	nd	>99	nd	nd	>99	0.100	0	0.22				0.12	nd	74.7	7.14	0	< 2.0	<2	65508
23	nd	nd	>99	nd	nd	>99	0.080	0	0.11	nd		390	0.13	nd	75.5	7.09	0	< 2.0	<2	169914
24	nd	nd	>99	nd	nd	>99	0.090	0	0.09				0.12	nd	78.0	6.98	0	< 2.0	<2	173672
25	nd	nd	>99	nd	nd	>99	0.090	0	0.09				0.14	nd	76.1	7.00	0	< 2.0	<2	218359
26	nd	nd	>99	nd	nd	>99	0.090	0	0.11	nd		390	0.15	nd	75.0	6.98	0	< 2.0	<2	166664
27	nd	nd	>99	nd	nd	>99	0.080	0	0.10				0.12	nd	74.1	7.11	0	< 2.0	<2	45500
28	nd	nd	>99	nd	nd	>99	0.090	0	0.17	nd	220	390	nd	nd	72.1	7.06	0	< 2.0	<2	153156
29	nd	nd	>99	nd	nd	>99	0.080	0	0.09				0.10	nd	74.2	6.98	0	< 2.0	<2	170930
30	nd	nd	>99	nd	nd	>99	0.070	0	0.21	nd		380	0.14	nd	72.7	7.01	0	< 2.0	<2	170828
31	nd	nd	>99	nd	nd	>99	0.050	0	0.06				0.14	nd	73.4	7.04	0	< 2.0	<2	221711
Total																				**4268671**
Maximum	**nd**	**nd**	**>99**	**nd**	**nd**	**>99**	**0.100**	**0**	**0.23**	**nd**	**240**	**440**	**0.15**	**nd**	**78.0**	**7.38**	**0**	**< 2**		**221711**
Minimum	**nd**	**nd**	**>99**	**nd**	**nd**	**>99**	**0.050**	**0**	**0.06**	**nd**	**210**	**370**	**0.10**	**nd**	**72.1**	**6.98**	**0**	**< 2**		**45500**
Average	**nd**	**nd**	**>99**	**nd**	**nd**	**>99**	**0.069**	**0**	**0.11**	**nd**	**225**	**395**	**0.12**	**nd**	**75.2**	**7.13**	**0**			**137699**

nd = non detect

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

Receiving Water Monitoring (weekly observations)

	R1							R2						
Date	A	B	C	D	E	F	G	A	B	C	D	E	F	G
12/6/2005	A	A	A	P	A	A	A	A	A	A	P	A	A	A
12/13/2005	A	A	A	P	A	A	A	A	A	A	P	A	A	A
12/20/2005	A	A	A	P	A	A	A	A	A	A	P	A	A	A
12/27/2005	A	A	A	P	A	A	A	A	A	A	P	A	A	A

A. Floating or suspended matter
B. Discoloration
C. Bottom deposits
D. Aquatic life
E. Visible films, sheen or coatings
F. Fungi, slimes or objectional growths
G. Potential nuisance conditions

Record A if not present, record P if present. Note on log what you observed when presest.

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

Receiving Water Monitoring (weekly sampling)

	R1						R2					
Date	D.O. mg/l	pH	Turbidity NTU	Temp. °F	Specific Conductivity µmhos	Fecal Coliform MPN/100 ml	D.O. mg/l	pH	Turbidity NTU	Temp. °F	Specific Conductivity µmhos	Fecal Coliform MPN/100 ml
12/6/2005	11.30	7.52	3.40	42.0	150	30	10.90	7.50	3.20	42.9	150	22
12/13/2005	10.60	7.42	1.90	45.5	150	11	10.40	7.44	1.90	46.1	150	17
12/20/2005	8.80	7.40	10.00	51.3	180	1600	8.80	7.40	10.00	51.4	180	1600
12/27/2005	8.40	7.30	14.00	52.4	170	900	8.40	7.30	14.00	53.3	170	500

Note: Also record obsevations at time of sampling on observation report.

	Water Depth R1	R2
12/6/2005	40"	18"
12/13/2005	40"	24"
12/20/2005	48"	36"
12/27/2005	54"	36"

HydroScience Operations, Inc.

Thunder Valley Casino Wastewater Treatment Plant

Effluent Monitoring Report

2005 Month	Acute Toxicity % survival	Chronic Toxicity	Hardness mg/l	Nitrate µg/l	Nitrate lbs/day	Copper µg/l	Copper lbs/day	Arsenic µg/l	Arsenic lbs/day	Aluminum µg/l	Aluminum lbs/day	Atrazine µg/l	Atrazine lbs/day	Boron µg/l	Boron lbs/day
Jan.		1/31/2005	56												
Feb.	100		120												
March		3/14/2005	130												
April	100	4/22/2005	120	2400	3.12	nd	nd	nd	nd	nd	nd	nd	nd	2500	2.59
May			120	900	0.86	nd	nd	3.1	0.003	nd	nd	nd	nd	2000	1.91
June			34	1300	1.5	24	0.03	nd	nd	nd	nd	nd	nd	60	0.07
July	100	7/18/2005		1600	1.93	8.9	0.01	nd	nd	33	0.04	nd	nd	nd	nd
Aug.			25	2000	2.35	8.3	0.009	nd	nd	54	0.06	nd	nd	nd	nd
Sept.			30	1300	1.54	7.3	0.009	nd	nd	75	0.09	nd	nd	160	0.19
Oct.	100	10/24/2005	21	850	1.14	6.7	0.007	0.91	0.001	27	0.03	nd	nd	7.7	0.009
Nov.			40	1300	1.49	12	0.0137	0.83	0.001	nd	nd	nd	nd	nd	nd
Dec.			29	830	0.95	nd	nd	nd	nd	118*	0.136	nd	nd	nd	nd

2005 Month	Fluoride µg/l	Fluoride lbs/day	MBAS µg/l	Persistent Pesticedes µg/l	Sulfate µg/l	Sulfate lbs/day	Total Trihalomethanes µg/l	Total Trihalomethanes lbs/day	Bromoform µg/l	Bromoform lbs/day	Dibromochloromethane µg/l	Dibromochloromethane lbs/day	Dichlorobromomethane µg/l	Dichlorobromomethane lbs/day
Jan.														
Feb.														
March														
April	340	0.44	nd	nd	61000	79.23	nd	nd	nd	nd	nd	nd	nd	nd
May	280	0.27	nd	nd	44000	42.07	1.8	0.002	nd	nd	1.8	0.002	nd	nd
June	nd	nd	nd	nd	20000	23.01	nd	nd	nd	nd	nd	nd	nd	nd
July	nd	nd	nd	nd	17000	20.56	nd	nd	nd	nd	nd	nd	nd	nd
Aug.	nd	nd	nd	nd	18000	21.17	nd	nd	nd	nd	nd	nd	nd	nd
Sept.	nd	nd	nd	nd	18000	21.32	nd	nd	nd	nd	nd	nd	nd	nd
Oct.	nd	nd	nd	nd	16000	18.28	nd	nd	nd	nd	nd	nd	nd	nd
Nov.	nd	nd	nd	nd	17000	19.42	nd	nd	nd	nd	nd	nd	nd	nd
Dec.	nd	nd	nd	nd	2200	2.53	0.37	0.0004	nd	nd	nd	nd	nd	nd

* Average of three samples for Aluminum for the month of December: 12-9-05 240 µg/l , 12-29-05 58 µg/l, and 12-31-05 56 µg/l.

Thunder Valley Casino Wastewater Treatment Plant
Annual Discharge Report for 2005
NPDES No. CA0084697

During 2005 the plant treated a total of 59.045 million gallons of raw sewage and discharged 49.836 million gallons of tertiary treated effluent. Approximately 9.2 million gallons of reclaimed water was utilized for irrigation and toilet flushing in the casino. The average dry weather flow (ADWF) of the discharge was 132,493 gallons per day.

A new NPDES permit was issued in March containing new and revised limits for the plant effluent. A cease and Desist Order was also issued establishing a compliance timetable for achieving the new limits and establishing interim limits on certain parameters.

The plant performed very well, BOD and TSS removal was >99% at all times. Most effluent samples were non-detect for both. Turbidity was less than 0.10 NTU on over 95% of all samples collected.

Staffing

The following personnel are assigned to operate the facility on a full time basis:

Joshua Brown, Plant Supervisor	Passed SWRCB Grade II exam
Michael Miller, Plant Operator	SWRCB III-9557
Rick Thomas, Plant Operator	SWRCB II-8862
Robert Alves, Plant Operator	SWRCB II-501
Juan Cardenas, Plant Operator	Passed SWRCB Grade I exam

In addition the following personnel support them on a part-time basis:

Donald Brown, General Manager	SWRCB V-2895
Daniel Dunsford, Regional Manager	SWRCB V-6590

The Supervisor is responsible for the day-to-day operation of the plant; he establishes operation parameters and oversees the sample collection and data reporting. The Operators are responsible for maintaining the parameters, collecting samples, completing logs and conducting process control analysis. All analysis used for compliance reporting are done by an ELAP Certified contract laboratory.

As you are aware the SWRCB does not recognize the wastewater treatment facilities operated on tribal lands for Operator certification. As a result they will not issue Operator Certificates to the OITs working at the plant. The OITs employed at the plant have

completed the Sacramento State University correspondence course on wastewater plant operation and have received on the job training in accordance with industry standards. In addition, Juan Cardenas has successfully passed the SWRCB Grade I examination and Joshua. Brown has successfully passed the SWRCB Grade II examination.

The contact number for the plant is (916) 408-8350. The plant is manned seven days per week. In case of emergencies the contact number is (916) 364-1490 0r (209) 483-4118.

Summary of Violations

The plant violations are summarized in a table included in this report. The plant effluent exceeded the aluminum limit in September and December. We believe that this is coming from the source water to the casino. PCWA may be overdosing alum to their filtration system resulting in periodic spikes. We have begun collecting potable water samples on the same dates as effluent samples for comparison purposes to confirm or eliminate this speculation. Copper has also exceeded the new limit, but not the interim limit since the water source was changed to PCWA. The surface water provided by PCWA is very low in minerals and although they add caustic to control the Langlier index the water may still be too aggressive on the copper plumbing in the casino. We are exploring additional methods to reduce the corrosiveness of the potable water.

The plant also experienced Coliform violations late in 2004 that carried into the first week of 2005. These were determined to be caused by small leaks in the membrane cassettes that occurred after maintenance was performed on the cassettes. The maintenance, which required removing the cassettes from the process tanks, disturbed the seal of o-rings on the piping that connects the cassettes to the pumping system. This resulted in higher than normal amounts of Coliform bacteria being present in the permeate. The membranes serve as a barrier to Coliform getting into the permeate under normal conditions. Typically we see MPN less than 200 in the permeate. After the maintenance tasks the Coliform was greater than 1600 MPN. The UV disinfection equipment should have been capable of destroying the Coliform but didn't. Thunder Valley replaced both of the Pulsar UV units with a larger more efficient Aquionics UV system to remedy this problem. This problem as well as others was detailed in our response to the NOV issued by the Board in June

There were two dates that the daily maximum limitation was exceeded after the new UV system was installed. Both of these dates additional samples collected immediately upstream of the UV unit were <2 which indicates that the data may be invalid. These were detailed to the board in previous reports.

It is important to notice that out of over 6,400 samples collected for compliance in 2005 only 11 potential violations are reported. This represents greater than 99.8% compliance with a very strict permit. Although perfect compliance is always our goal, this is still an exceptional record.

Instrumentation

Telstar recalibrated all instrumentation in October. A new amperimetric chlorine residual analyzer was installed on the effluent to demonstrate compliance with the effluent limits.

Operation and Maintenance Manuals

The O&M Manuals provided upon completion are complete and cover all equipment presently in operation, The manual was revised by deleting the Pulsar section and replacing it with the Aquionics O&M. An O&M Manual for the Belt Filter Press was also added.The Contingency Plan is also current.

Biosolids

The biosolids produced by the treatment plant are stored in the Sludge Stabilization Basin until they are ready to be dewatered and disposed of. Solids harvesting from the SSB removed and dewatered 58.32 dry tons of solids utilizing a silt bag process. Sludge at approximately 2.5% solids were injected with polymer and pumped into a synthetic fabric bag. The liquor released by the polymer drained back into the SSB. The solids captured in the bag were air dried until the solids were greater than 16% by weight then hauled to the WPWMA landfill for disposal in accordance with regulations.

A Belt Filter Press was installed in December to dewater solids from the SSB or aerobically digested solids directly from the MBR, Sludge cake from the belt press will be hauled to the landfill for disposal in accordance with their waste acceptance criteria. A table showing the quantity of solids removed each month is included in this report. Solids harvesting was suspended during the months of March through June.

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

2005 Annual Influent Monitoring Report

Date	Flow gallons	TSS mg/l	TSS lbs.	BOD mg/l	BOD lbs.	pH	Spec. Cond. µmhos
January	**169940**	**312**	**480**	**470**	**696**	**6.82**	**1984**
February	**191866**	**420**	**654**	**491**	**781**	**7.13**	**1493**
March	**184369**	**192**	**299**	**349**	**540**	**7.17**	**1542**
April	**192066**	**200**	**314**	**368**	**595**		
May	**153179**	**309**	**391**	**517**	**675**		
June	**149727**	**281**	**351**	**525**	**659**		
July	**153887**	**255**	**326**	**459**	**598**		
August	**154713**	**276**	**332**	**425**	**528**		
September	**151690**	**261**	**331**	**460**	**583**		
October	**145343**	**241**	**292**	**369**	**450**		
November	**143176**	**239**	**288**	**409**	**494**		
December	**151250**	**216**	**270**	**413**	**504**		
Average	**161767**	**267**	**361**	**438**	**592**	**7.04**	**1673**

nd = non detect

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

NPDES No. CA0084697

2005 Annual Effluent Monitoring Report

2005 Date	TSS mg/l	TSS lbs	% Removal	BOD mg/l	BOD lbs	% Removal	Turbidity ave. NTU	Settleable Solids ml/l	Total Dissolved Solids	Spec. Cond. µmhos	Ammonia mg/l	Ammonia Unionized	Temp. °F	pH	Effluent Flow gallons
January	nd	nd	>99	nd	nd	>99	0.097	nd	855	1369	0.14		25.1	7.37	136610
February	nd	nd	>99	nd	nd	>99	0.086	nd	803	1317	0.36		27.3	7.46	125774
March	nd	nd	>99	nd	nd	>99	0.105	nd	866	1346	0.16		27.3	7.48	128147
April	nd	nd	>99	nd	nd	>99	0.088	nd	820	1323	0.14	nd	26.0	7.40	155794
May	nd	nd	>99	nd	nd	>99	0.066	nd	510	774	0.13	nd	27.8	7.51	114661
June	nd	nd	>99	nd	nd	>99	0.064	nd	266	412	0.12	nd	30.0	7.51	138362
July	nd	nd	>99	nd	nd	>99	0.076	nd	260	399	0.05	nd	32.1	7.46	144455
August	nd	nd	>99	nd	nd	>99	0.066	nd	228	401	0.05	nd	32.1	7.43	141172
September	nd	nd	>99	nd	nd	>99	0.050	nd	240	399	0.06	nd	30.5	7.45	142221
October	nd	nd	>99	nd	nd	>99	0.051	nd	218	389	0.08	nd	84.5	7.46	136880
November	nd	nd	>99	nd	nd	>99	0.079	nd	220	406	0.09	nd	79.5	7.33	136686
December	nd	nd	>99	nd	nd	>99	0.069	nd	225	395	0.12	nd	75.2	7.13	137699
Annual Average	nd	nd	>99	nd	nd	>99	0.075	nd	459	744	0.13	nd	41.5	7.42	136538

HydroScience Operations, Inc.

Thunder Valley Casino Wastewater Treatment Plant

Effluent Monitoring Report

2005 Month	Acute Toxicity % survival	Chronic Toxicity	Hardness mg/l	Nitrate		Copper		Arsenic		Aluminum		Atrazine		Boron	
				µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day
Jan.		1/31/2005	56												
Feb.	100		120												
March		3/14/2005	130												
April	100	4/22/2005	120	2400	3.12	nd	nd	nd	nd	nd	nd	nd	nd	2500	2.59
May			120	900	0.86	nd	nd	3.1	0.003	nd	nd	nd	nd	2000	1.91
June			34	1300	1.5	24	0.03	nd	nd	nd	nd	nd	nd	60	0.07
July	100	7/18/2005		1600	1.93	8.9	0.01	nd	nd	33	0.04	nd	nd	nd	nd
Aug.			25	2000	2.35	8.3	0.009	nd	nd	54	0.06	nd	nd	nd	nd
Sept.			30	1300	1.54	7.3	0.009	nd	nd	75	0.09	nd	nd	160	0.19
Oct.	100	10/24/2005	21	850	1.14	6.7	0.007	0.91	0.001	27	0.03	nd	nd	7.7	0.009
Nov.			40	1300	1.49	12	0.0137	0.83	0.001	nd	nd	nd	nd	nd	nd
Dec.			29	830	0.95	nd	nd	nd	nd	118*	0.136	nd	nd	nd	nd

2005 Month	Fluoride		MBAS	Persistent Pesticedes	Sulfate		Total Trihalomethanes		Bromoform		Dibromochloromethane		Dichlorobromomethane	
	µg/l	lbs/day	µg/l	µg/l	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day	µg/l	lbs/day
Jan.														
Feb.														
March														
April	340	0.44	nd	nd	61000	79.23	nd	nd	nd	nd	nd	nd	nd	nd
May	280	0.27	nd	nd	44000	42.07	1.8	0.002	nd	nd	1.8	0.002	nd	nd
June	nd	nd	nd	nd	20000	23.01	nd	nd	nd	nd	nd	nd	nd	nd
July	nd	nd	nd	nd	17000	20.56	nd	nd	nd	nd	nd	nd	nd	nd
Aug.	nd	nd	nd	nd	18000	21.17	nd	nd	nd	nd	nd	nd	nd	nd
Sept.	nd	nd	nd	nd	18000	21.32	nd	nd	nd	nd	nd	nd	nd	nd
Oct.	nd	nd	nd	nd	16000	18.28	nd	nd	nd	nd	nd	nd	nd	nd
Nov.	nd	nd	nd	nd	17000	19.42	nd	nd	nd	nd	nd	nd	nd	nd
Dec.	nd	nd	nd	nd	2200	2.53	0.37	0.0004	nd	nd	nd	nd	nd	nd

* Average of three samples for Aluminum for the month of December: 12-9-05 240 µg/l , 12-29-05 58 µg/l, and 12-31-05 56 µg/l.

HydroScience Operations, Inc.

Thunder Valley Casino Wastewater Treatment Plant

NPDES No. CA0084697

Annual Sludge Monitoring Report

Sample Date	Cadmium	Chromium	Copper	Lead	Nickel	Zinc
7/8/2005	nd	nd	17 mg/kg	nd	nd	17 mg/kg

Annual Water Supply Monitoring

Sample Date	Specific Conductivity µmhos	Total Dissolved Solids mg/l
11/23/2005	55	36

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

Annual Biosolids Production

NPDES No. 0084697

Date	Weight Total in Tons	Average % Solids	Dry Tons
January	19.95	15	2.99
February	29.3	16.33	4.78
March	0	0	0.00
April	0	0	0.00
May	0	0	0.00
June	0	0	0.00
July	32.5	16.96	5.51
August	90.04	20.46	18.42
Septemeber	59.04	15.36	9.07
October	51.79	15.53	8.04
November	27.66	15.2	4.20
December	31.12	17	5.29
Total	341.4		58.32
Average	28.45	16.48	4.86

HydroScience Operations, Inc.

Thunder Valley Wastewater Treatment Plant

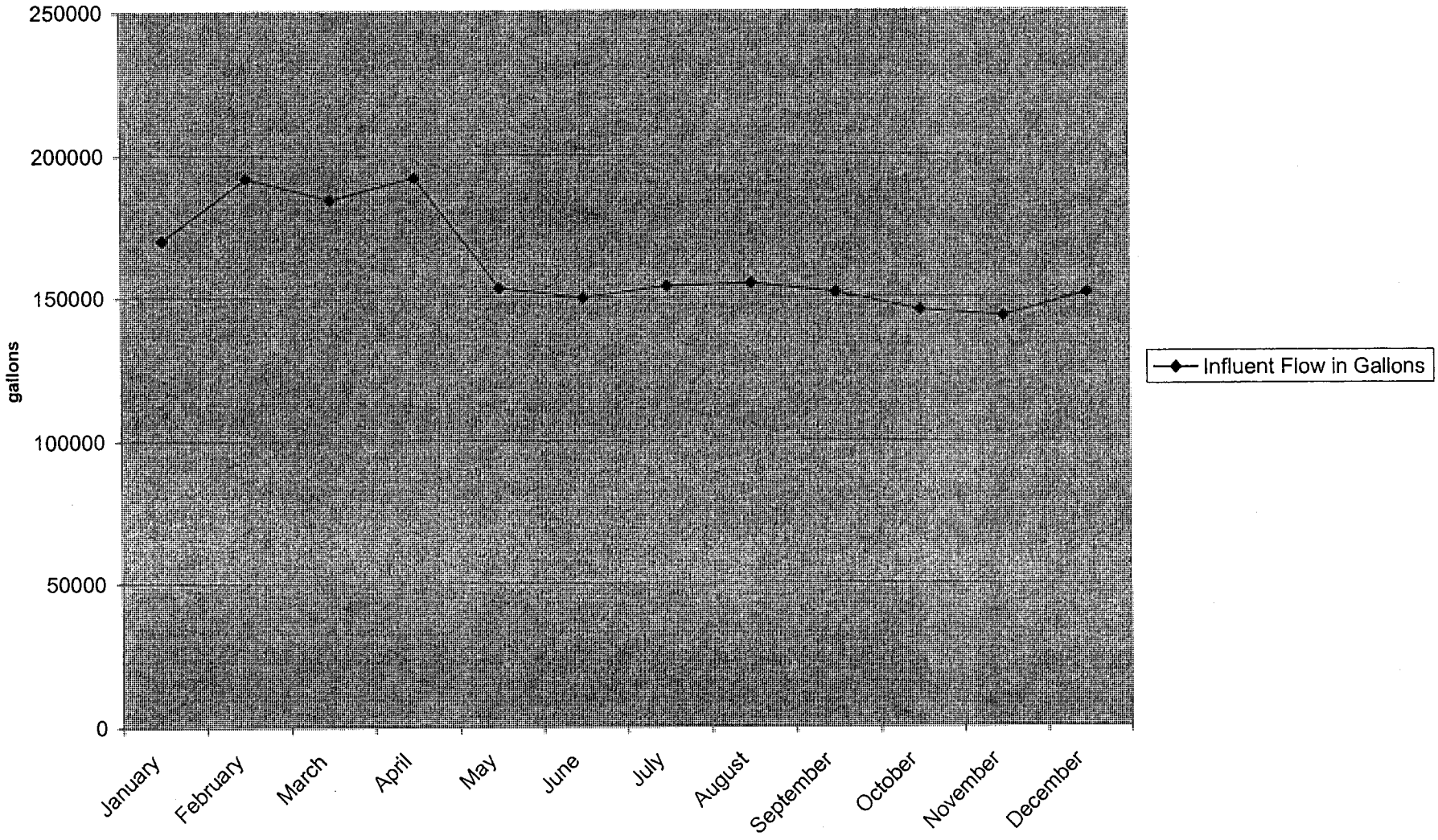
NPDES No. 0086497

2005 Annual Violations Summary

Month	Quantity	Parameter	Comments
January	6	Coliform	1 max, 5 medians (first week) Carry over of 2004 MBR problems
February	0		
March	0		
April	0		
May	0		
June	0		
July	0		
August	1	Coliform	1 max. Additional samples make data validity questionable
September	1	Aluminum	Suspect source is PCWA water
October	1	Coliform	1 max. Additional samples make data validity questionable
November	0		
December	2	Aluminum	1 daily ave., 1 monthly ave.Suspect source is PCWA water. Additional samples collected.
Total	11		Details included in monthly and incident reports.

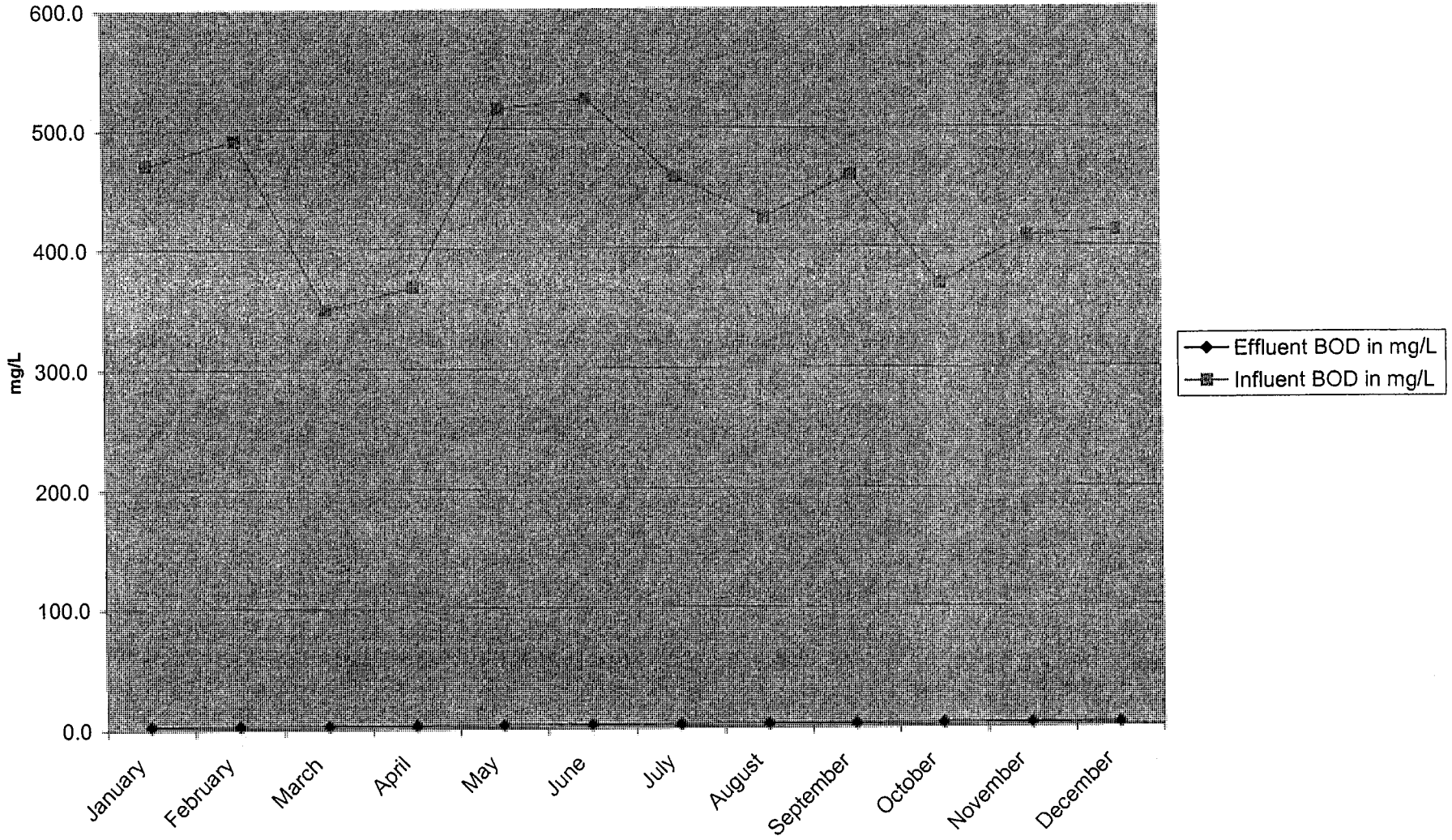
Thunder Valley WWTP Influent Flow 2005

HydroScience Operations, Inc.



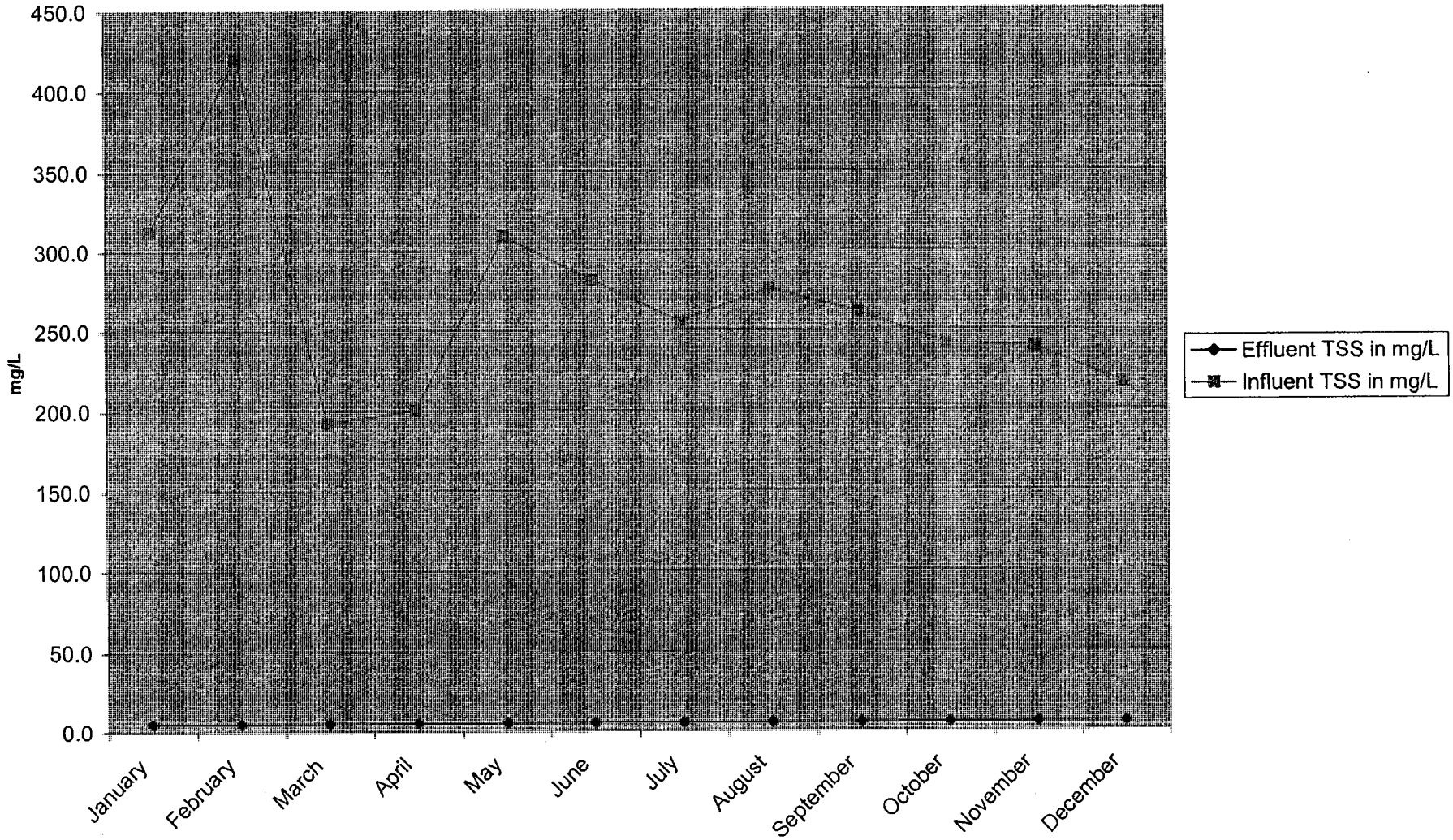
Thunder Valley WWTP BOD 2005

HydroScience Operations, Inc.



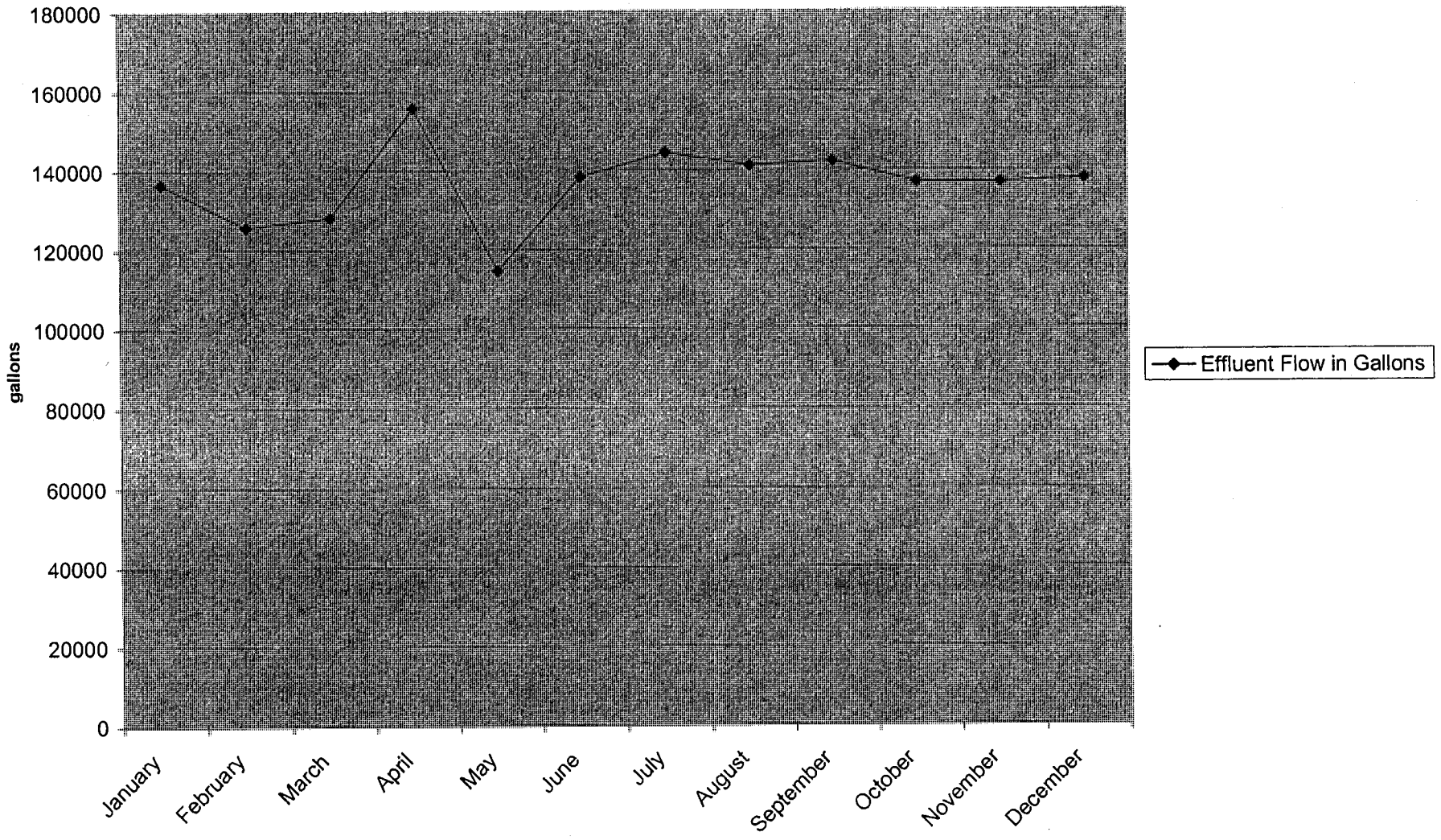
Thunder Valley WWTP TSS 2005

HydroScience Operations, Inc.



Thunder Valley WWTP Effluent Flow 2005

HydroScience Operations, Inc.



HydroScience Operations, Inc.

Position Paper on the Notice of Violation Issued by the Regional Water Quality Control Board, Central Valley Region, on June 17, 2005 to the United Auburn Indian Community

(Auburn Rancheria Casino, NPDES Permit No. CA0084697)

Introduction

On behalf of the United Auburn Indian Community (UAIC), HydroScience Operations, Inc. (HSo), the treatment plant contract operator, has been authorized to submit this Position Paper in regards to the Notice of Violation and Inspection Report (NOV) dated June 7, 2005 respecting Wastewater Treatment Plant (WWTP) Waste Discharge Requirements (WDRs) Order No. R5-2005-032 (NPDES No. CA0084697) and the preceding Order, No. 5-01-068.

Background

The UAIC owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the Auburn Rancheria ("Thunder Valley") Casino, a gaming and entertainment facility, in accordance with NPDES Permit No. CA0084697. The WWTP utilizes an immersed-membrane bioreactor (MBR) and ultraviolet (UV) disinfection system to produce a high quality effluent. The treated effluent is discharged to an unnamed tributary of Orchard Creek. Treated effluent is also used on-site to irrigate the landscaping surrounding the gaming facility.

The MBR process utilized by the WWTP is the most advanced tertiary treatment technology currently available. Only reverse osmosis, which is only used in rare circumstances (such as desalinization), can produce a higher quality effluent. The MBR effluent is extremely high quality and not only meets the requirements of the NPDES permit but also meets the more stringent Title 22 standards for tertiary recycled water.

The process incorporates a biological process to reduce BOD similar to conventional activated sludge, although at much higher MLSS concentrations and extremely long MCRT. The main difference is in the solids/liquid separation process which occurs within the biological treatment unit. There are only about a dozen of these plants currently in operation in California. HSo operates three of the above-mentioned facilities and participated in the start-up of a fourth facility. As with any new technology, there is little published operational information on the process due to limited operations experience. Our experience is amongst the most extensive available in California, but is still on a steep learning curve. We must apply and modify conventional activated sludge wisdom to a very different technology. The experience we gain will lead to further development of the MBR process as well as provide a foundation for future operators of this type of facility.

The WWTP began operation in June of 2003 and has been operating continuously since that time pursuant to an NPDES discharge permit. The permit was renewed and more stringent permit conditions were applied in March 17, 2005. The permit conditions that the WWTP operates under, particularly numerical limitations for constituents such as metals, coliforms, and chlorine residual, are among the most stringent limits placed on any discharger in the Central Valley Region. The WWTP has successfully produced effluent which meets these limitations for long periods of time and is currently doing so. Even throughout periods of upset, such as the foaming situation and membrane failures, it produced excellent effluent quality.

WDRs Compliance Efforts and Problem Resolution

It is HSo's position that we at all times acted in good faith, prudently, with due diligence, and to the best of our ability to promptly resolve the compliance issues and maintain compliance with the WDRs. Our June 17, 2005 Letter Report included a detailed explanation of each issue raised by the NOV, the circumstances surrounding each issue, and our actions to address these issues. The following is a summary of our key points from that letter:

- HSo at all times acted in good faith in reporting problems and violations encountered at the WWTP to the RWQCB.
- The EPA-certified laboratory test procedure for coliform is a lengthy process which significantly limits our ability to detect and respond to coliform excursions in our effluent. Due to the inherent and unavoidable delays in this test, we do not become aware of a coliform result until at least 14 days after the sample is taken. Standard turnaround for our laboratory is 10 days after completion of the analysis.
- HSo responded promptly and responsibly to the problems encountered by immediately adding personnel to evaluate and address the problems at the highest possible priority.
- The cause of the coliform violations was not immediately apparent and only after recurring upsets were we able to determine the precise problem.
- The coliform violations could not have had a significant impact on the receiving water due to high ambient coliform concentrations in that water.
- A significant portion of the 166 violations are of the 7-day Median coliform limit, which is a calculated value derived from the instantaneous coliform limit. Therefore, the actual number of days that WWTP effluent contained excessive coliforms was significantly less than 166.
- HSo has implemented new policies to assure compliance with all reporting requirements.
- The UAIC has made significant expenditures to utilize the latest high quality treatment technology (the membrane bioreactor, or MBR) to provide the best quality effluent possible.
- The UAIC has made significant additional expenditures in equipment upgrades to address the compliance issues stated in the NOV and increase the reliability of treatment.

As documented in our self-monitoring reports and as discussed further below, most of the 166 numerical violations were confined to three clusters between August 2004 and January 2005, during which we were experiencing upsets of our MBR process. The WWTP has otherwise been in full compliance with the WDR effluent limitations. The WWTP has had no verifiable violations of the effluent limitations during the last 9 months[1].

Exclusion of Violations from MMPs

It is HSo's position that, in accordance with applicable provisions of the CWC and the NPDES permit, the MMPs are not applicable to all 166 violations. A significant portion of these violations should be excluded from MMPs for various reasons. The following addresses, in detail the reason for each category of exclusion and provides appropriate substantiation. Also refer to Exhibits A and B, which provide annotated charts of instantaneous effluent coliform for the entire operating history of the WWTP[2], and Exhibit C, which provides a detailed list of the coliform violations.

[1] A single exceedence of the instantaneous coliform limitation was recorded on August 3, 2005 and included in our monthly report. This letter will include additional sample data which will show that this one exceedence may be an erroneous data point.

[2] The charts show instantaneous effluent coliform results only. 7-day median results, which are mathematically derived from these instantaneous results, are not shown for clarity.

Table 3: Potentially Invalid Coliform Results

Date	Coliform Results (MPN/100mL)			Comments
	E1C	UV1	UV2	
9/25/03	240	<2	ND	
10/31/03	110	2	ND	
1/7/2004	170	ND	<2	
7/25/2004	14	ND	2	Note 1
8/3/2005	350	8	ND	

Notes

1. The 7-day median violation on 7/30/2004 would not have occurred if the instantaneous result on 7/25/2004 was 2 instead of 14 MPN/100mL.

It is HSo's position that coliform results on these dates should be excluded from the application of MMPs for the following reasons:

1. Samples taken upstream show less coliform concentration, or none detected at all. In two instances, the upstream sample was collected at UV2, which is located upstream of the second UV disinfection unit which provides additional disinfection.
2. The measurement of Coliform is inherently sensitive to contamination during the sample collection process. The conflicting data obtained for these dates is an indication that contamination occurred or the sample data is otherwise unreliable.

Table 4, below, lists the quantities of coliform violations that should be excluded from MMPs as a result of the comparison above.

Table 3: Potentially Invalid Data

Parameter	Quantity of Violations Potentially Due to Invalid Data
Total Coliform – Instantaneous	4
Total Coliform – 7-Day Median	1
Total:	5

3. MMPs do not apply to the first three coliform and ammonia violations:

CWC Section 13385(i) provides:

> (i) (1) Notwithstanding any other provision of this division, and except as provided in subdivisions (j), (k), and (l), a mandatory minimum penalty of three thousand dollars ($3,000) shall be assessed for each violation whenever the person does any of the following four or more times in any period of six consecutive months, except that the requirement to assess the mandatory minimum penalty shall not be applicable to the first three violations:
>
> (A) Violates a waste discharge requirement effluent limitation.
>
> ...
>
> (2) For the purposes of this section, a "period of six consecutive months" means the period commencing on the date that one of the violations described in this subdivision occurs and ending 180 days after that date.

The NOV identified a total of 4 ammonia violations (see Table 1). These violations all occurred during the month of August, 2004. The first three coliform violations that occurred after the startup period and that are not questionable due to conflicting data occurred between June 24, 2004 and August 1, 2004. In accordance with the CWC, MMPs do not apply to the first three violations of each constituent.

It is HSo's position that, in accordance with CWC Section 13385(i), 6 of the 166 violations (3 coliform and 3 ammonia violations) must be excluded from application of MMPs.

violations of more than one effluent limitation and the violations continue for a period of more than one day, if all of the following apply:

(i) The discharger demonstrates all of the following:

(I) The upset was not caused by wastewater treatment operator error and was not due to discharger negligence.

(II) But for the operational upset of the biological treatment process, the violations would not have occurred nor would they have continued for more than one day.

(III) The discharger carried out all reasonable and immediately feasible actions to reduce noncompliance with the applicable effluent limitations. (ii) The discharger is implementing an approved pretreatment program, if so required by federal or state law.

(B) Subparagraph (A) only applies to violations that occur during a period for which the regional board has determined that violations are unavoidable, but in no case may that period exceed 30 days.

The Standard Provisions and Reporting Requirements for Waste Discharge Requirements (Standard Provisions), provide:

14. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, failure to implement an appropriate pretreatment program, or careless or improper action. A Discharger that wishes to establish the affirmative defense of an upset in an action brought for noncompliance shall demonstrate, through properly signed, contemporaneous operating logs, or other evidence, that:

a. an upset occurred due to identifiable cause(s);
b. the permitted facility was being properly operated at the time of the upset;
c. notice of the upset was submitted as required in paragraph B. 1.; and
d. remedial measures were implemented as required under paragraph A. 17.

In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof.

The State Water Resources Control Board Water Quality Enforcement Policy (Enforcement Policy) provides:

'A single operational upset which leads to simultaneous violations of one or more pollutant parameters shall be treated as a single violation. EPA defines "single operational upset" as "an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one CWA effluent discharge pollutant parameter. Single operational upset does not include... noncompliance to the extent caused by improperly designed or inadequate treatment facilities"... The EPA Guidance further defines an "exceptional" incident as a "non-routine malfunctioning of an otherwise generally compliant facility." Single operational upsets include such things as upset caused by a sudden violent storm, a bursting tank, or other exceptional event and may result in violations of multiple pollutant parameters. The discharger has the burden of demonstrating a single operational upset occurred. The RWQCB shall apply the above EPA Guidance in determining if a single operational upset occurred. A finding that a single operational upset has occurred is not a defense to liability, but may affect the number of violations.'

Based on our review of the events surrounding the coliform violations between August 2004 and January 2005 and a review of the applicable sections of the CWC, Standard Provisions, and Enforcement Policy, as referenced above, it is HSo's position that these coliform violations should be treated as three operational upsets (corresponding to repairs of the MBR process by Zenon) when applying the MMPs. We substantiate this position as follows:

- The upset occurred due to identifiable causes:membrane cassette failures.
- The permitted facility was being properly operated at the time of the upset, as evidenced by the nature of the system failure (which was not due to any operator error) and by the period of 356 continuous days of full permit compliance preceding the failure[4].
- HSo carried out all reasonable and immediately feasible actions to reduce noncompliance with the applicable effluent limitations, as evidenced by the extensive records of actions taken as discussed herein and as provided in the Letter Report.

[4] Excluding the three coliform exceedences during this period that are potentially invalid data points, as previously discussed.

EXHIBIT A
Effluent Instantaneous Colifor
Startup - Present

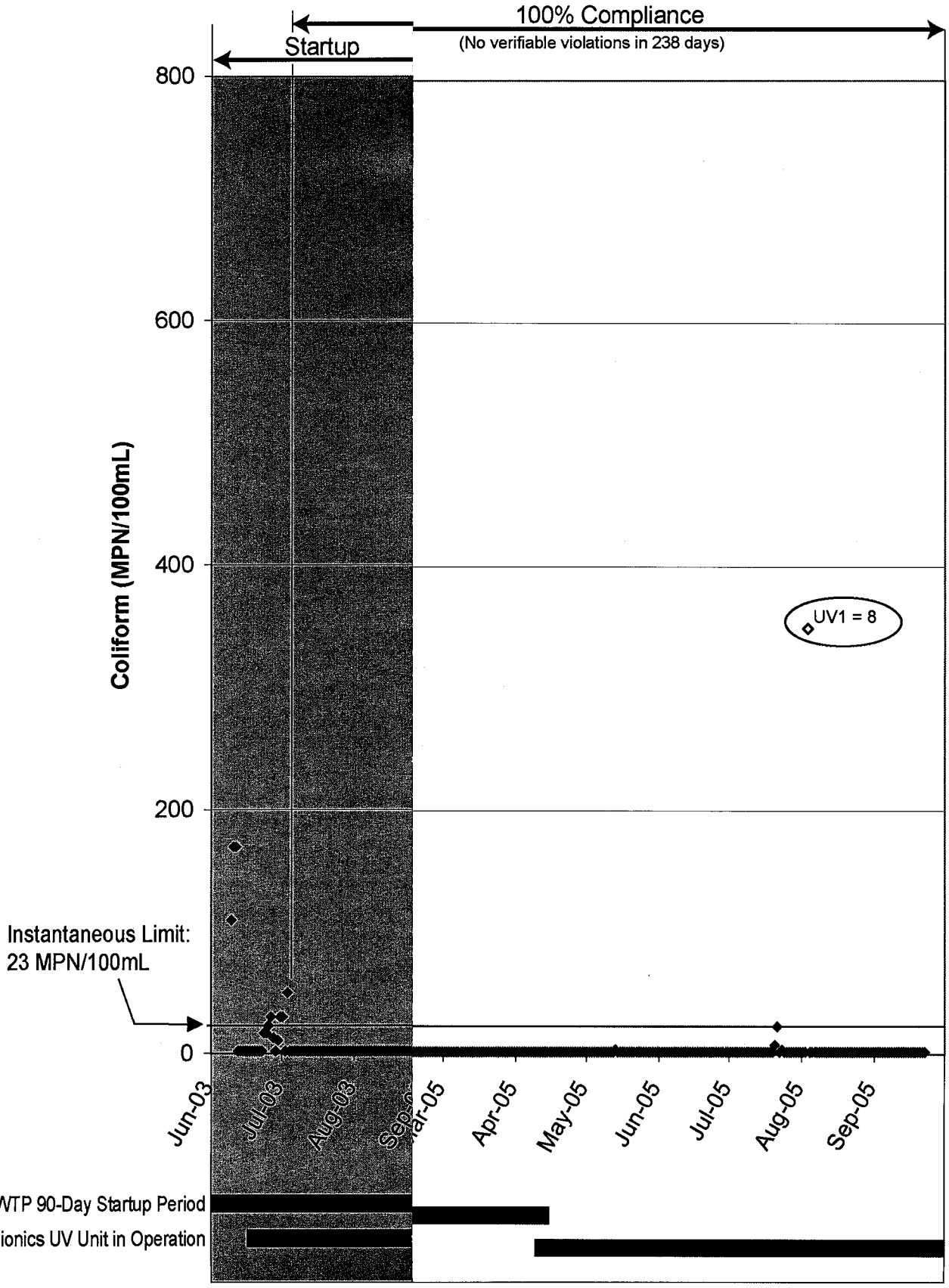
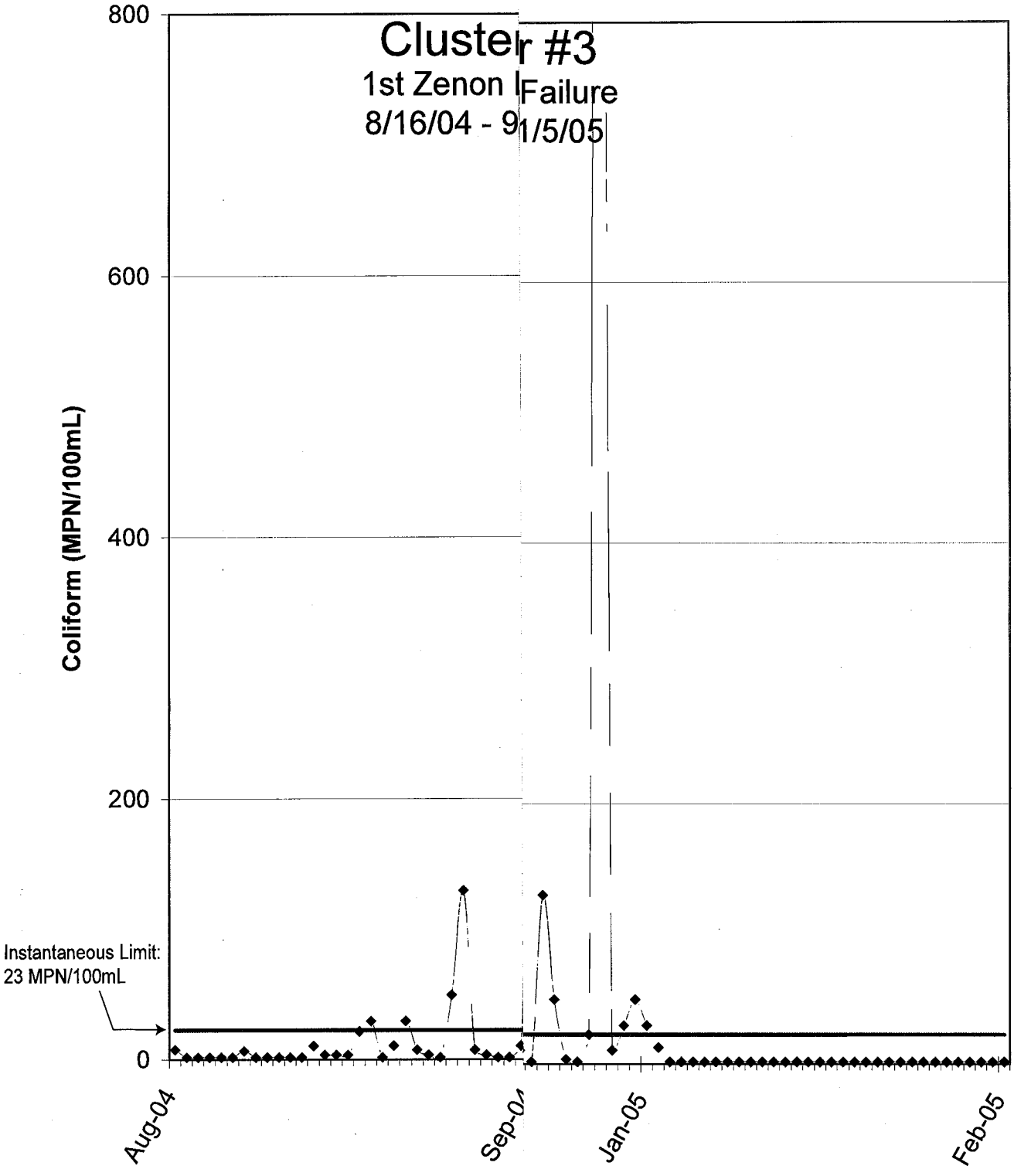


EXHIBIT B
Effluent Instantaneous Colifor



Lab processing of Coliform samples

First knowledge of extent of problem

Zenon membrane failures detected

Zenon technician performs repairs

Exhibit C:
Detailed List of Coliform Violations

	Effluent Limitation						
Date	Description	Value	Units	Measured Result	Comments	Qty Subject to MMP	Notes
6/9/2003	Total Coliform - Instantaneous	23	MPN/100mL	110	90 day startup period	0	Startup period excluded
6/10/2003	Total Coliform - Instantaneous	23	MPN/100mL	170	90 day startup period		
6/11/2003	Total Coliform - Instantaneous	23	MPN/100mL	170	90 day startup period		
6/26/2003	Total Coliform - Instantaneous	23	MPN/100mL	30	90 day startup period		
6/26/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	30	90 day startup period		
6/27/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	23	90 day startup period		
6/28/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	13	90 day startup period		
6/29/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	90 day startup period		
6/30/2003	Total Coliform - Instantaneous	23	MPN/100mL	30	90 day startup period		
6/30/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	90 day startup period		
7/1/2003	Total Coliform - Instantaneous	23	MPN/100mL	30	90 day startup period		
7/1/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	23	90 day startup period		
7/2/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	13	90 day startup period		
7/3/2003	Total Coliform - Instantaneous	23	MPN/100mL	50	90 day startup period		
7/3/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	13	90 day startup period		
7/4/2003	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	90 day startup period		
9/25/2003	Total Coliform - Instantaneous	23	MPN/100mL	240	Other sample data conflicts		
10/31/2003	Total Coliform - Instantaneous	23	MPN/100mL	110	Other sample data conflicts		
1/7/2004	Total Coliform - Instantaneous	23	MPN/100mL	170	Other sample data conflicts		
6/24/2004	Total Coliform - Instantaneous	23	MPN/100mL	40	Exclude first 3 from MMP		
7/30/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	14	Due to conflicting sample data for 7/25/2004		
7/31/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Exclude first 3 from MMP		
8/1/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Exclude first 3 from MMP		
8/2/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	MMP Applicable	1	
8/3/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	MMP Applicable	1	
8/16/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1	1	One violation for Upset
8/17/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/18/2004	Total Coliform - Instantaneous	23	MPN/100mL	30	Process Upset #1		
8/18/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/19/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/20/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/21/2004	Total Coliform - Instantaneous	23	MPN/100mL	30	Process Upset #1		
8/21/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
8/22/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
8/23/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
8/24/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/25/2004	Total Coliform - Instantaneous	23	MPN/100mL	50	Process Upset #1		
8/25/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
8/26/2004	Total Coliform - Instantaneous	23	MPN/100mL	130	Process Upset #1		
8/26/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
8/27/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
8/28/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/29/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/30/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
8/31/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
9/1/2004	Total Coliform - Instantaneous	23	MPN/100mL	220	Process Upset #1		
9/1/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
9/2/2004	Total Coliform - Instantaneous	23	MPN/100mL	80	Process Upset #1		
9/2/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
9/3/2004	Total Coliform - Instantaneous	23	MPN/100mL	60	Process Upset #1		
9/3/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
9/4/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
9/5/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #1		
9/6/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #1		
9/7/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #1		
9/8/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	11	Process Upset #1		
9/9/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #1		
9/10/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	4	Process Upset #1		
9/17/2004	Total Coliform - Instantaneous	23	MPN/100mL	500	Process Upset #2	1	One violation for Upset
9/18/2004	Total Coliform - Instantaneous	23	MPN/100mL	300	Process Upset #2		
9/19/2004	Total Coliform - Instantaneous	23	MPN/100mL	300	Process Upset #2		
9/19/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #2		
9/20/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #2		
9/21/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	17	Process Upset #2		
9/22/2004	Total Coliform - Instantaneous	23	MPN/100mL	900	Process Upset #2		
9/22/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	300	Process Upset #2		
9/23/2004	Total Coliform - Instantaneous	23	MPN/100mL	240	Process Upset #2		
9/23/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	300	Process Upset #2		
9/24/2004	Total Coliform - Instantaneous	23	MPN/100mL	130	Process Upset #2		
9/24/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	240	Process Upset #2		
9/25/2004	Total Coliform - Instantaneous	23	MPN/100mL	240	Process Upset #2		
9/25/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	240	Process Upset #2		
9/26/2004	Total Coliform - Instantaneous	23	MPN/100mL	130	Process Upset #2		
9/26/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	130	Process Upset #2		
9/27/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	130	Process Upset #2		
9/28/2004	Total Coliform - Instantaneous	23	MPN/100mL	50	Process Upset #2		
9/28/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	130	Process Upset #2		
9/29/2004	Total Coliform - Instantaneous	23	MPN/100mL	50	Process Upset #2		
9/29/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	130	Process Upset #2		
9/30/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	50	Process Upset #2		
10/1/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	50	Process Upset #2		
10/2/2004	Total Coliform - Instantaneous	23	MPN/100mL	30	Process Upset #2		
10/2/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	30	Process Upset #2		
10/3/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	23	Process Upset #2		
10/4/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #2		
10/6/2004	Total Coliform - Instantaneous	23	MPN/100mL	300	Process Upset #2		
10/7/2004	Total Coliform - Instantaneous	23	MPN/100mL	50	Process Upset #2		
10/7/2004	Total Coliform - 7 Day Median	2.2	MPN/100mL	8	Process Upset #2		

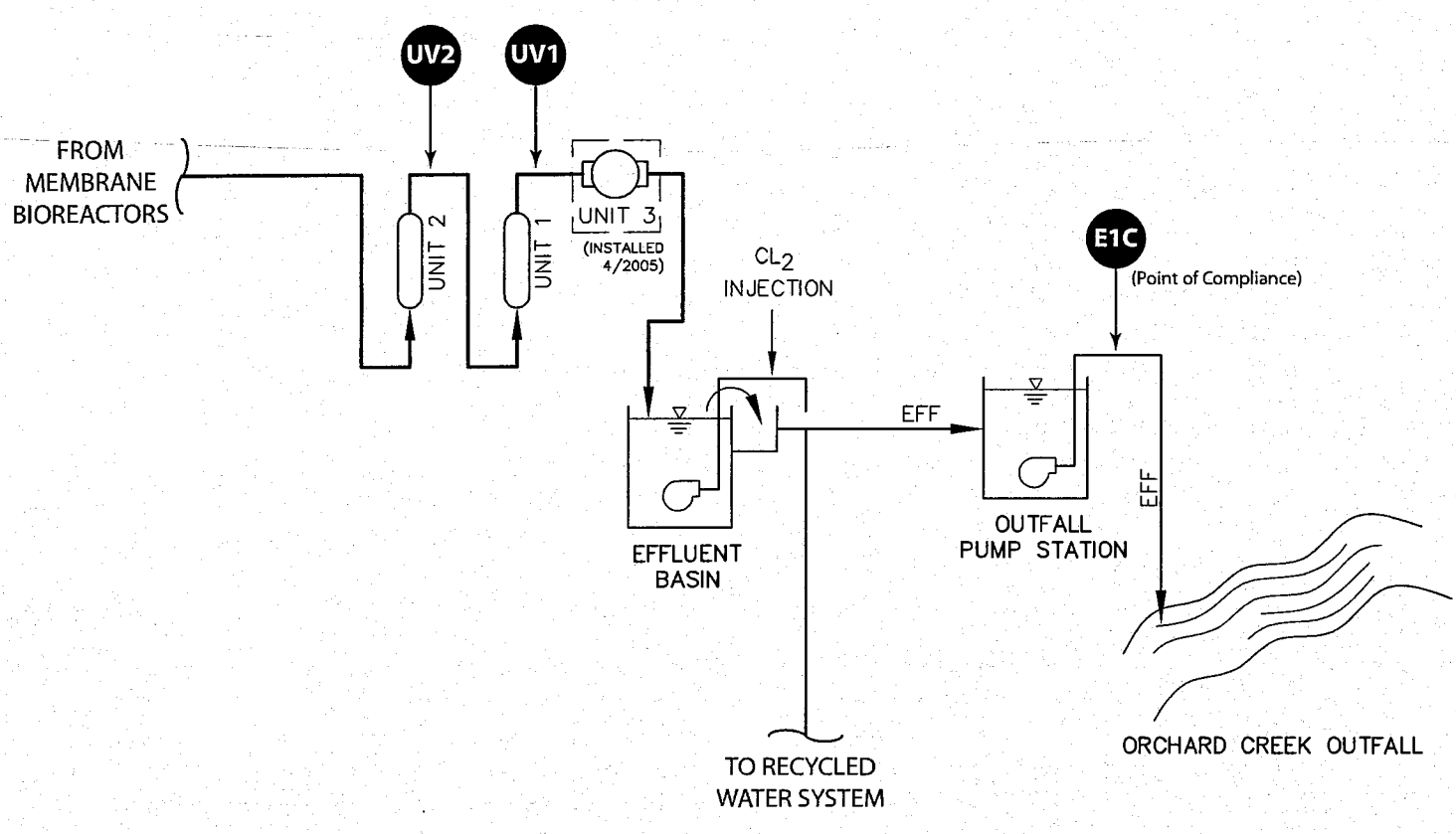


Exhibit D

Coliform Sampling Locaitons

EPA
United States
Environmental Protection
Agency

Wastewater Management Fact Sheet

Membrane Bioreactors

INTRODUCTION

The technologies most commonly used for performing secondary treatment of municipal wastewater rely on microorganisms suspended in the wastewater to treat it. Although these technologies work well in many situations, they have several drawbacks, including the difficulty of growing the right types of microorganisms and the physical requirement of a large site. The use of microfiltration membrane bioreactors (MBRs), a technology that has become increasingly used in the past 10 years, overcomes many of the limitations of conventional systems. These systems have the advantage of combining a suspended growth biological reactor with solids removal via filtration. The membranes can be designed for and operated in small spaces and with high removal efficiency of contaminants such as nitrogen, phosphorus, bacteria, biochemical oxygen demand, and total suspended solids. The membrane filtration system in effect can replace the secondary clarifier and sand filters in a typical activated sludge treatment system. Membrane filtration allows a higher biomass concentration to be maintained, thereby allowing smaller bioreactors to be used.

APPLICABILITY

For new installations, the use of MBR systems allows for higher wastewater flow or improved treatment performance in a smaller space than a conventional design, i.e., a facility using secondary clarifiers and sand filters. Historically, membranes have been used for smaller-flow systems due to the high capital cost of the equipment and high operation and maintenance (O&M) costs. Today however, they are receiving increased use in larger systems. MBR systems are also well suited for some industrial and commercial applications. The high-quality effluent produced by MBRs makes them particularly applicable to reuse applications and for surface water discharge applications requiring extensive nutrient (nitrogen and phosphorus) removal.

ADVANTAGES AND DISADVANTAGES

The advantages of MBR systems over conventional biological systems include better effluent quality, smaller space requirements, and ease of automation. Specifically, MBRs operate at higher volumetric loading rates which result in lower hydraulic retention times. The low retention times mean that less space is required compared to a conventional system. MBRs have often been operated with longer solids residence times (SRTs), which results in lower sludge production; but this is not a requirement, and more conventional SRTs have been used (Crawford et al. 2000). The effluent from MBRs contains low concentrations of bacteria, total suspended solids (TSS), biochemical oxygen demand (BOD), and phosphorus. This facilitates high-level disinfection. Effluents are readily discharged to surface streams or can be sold for reuse, such as irrigation.

The primary disadvantage of MBR systems is the typically higher capital and operating costs than conventional systems for the same throughput. O&M costs include membrane cleaning and fouling control, and eventual membrane replacement. Energy costs are also higher because of the need for air scouring to control bacterial growth on the membranes. In addition, the waste sludge from such a system might have a low settling rate, resulting in the need for chemicals to produce biosolids acceptable for disposal (Hermanowicz et al. 2006). Fleischer et al. 2005 have demonstrated that waste sludges from MBRs can be processed using standard technologies used for activated sludge processes.

wastewater routed around (or bypassed) during maintenance periods.

However, MBR systems are now often used in full-treatment applications. In these instances, it is recommended that the installation include one additional membrane tank/unit beyond what the design would nominally call for. This "N plus 1" concept is a blend between conventional activated sludge and membrane process design. It is especially important to consider both operations and maintenance requirements when selecting the number of units for MBRs. The inclusion of an extra unit gives operators flexibility and ensures that sufficient operating capacity will be available (Wallis-Lage et al. 2006). For example, bioreactor sizing is often limited by oxygen transfer, rather than the volume required to achieve the required SRT—a factor that significantly affects bioreactor numbers and sizing (Crawford et al. 2000).

Although MBR systems provide operational flexibility with respect to flow rates, as well as the ability to readily add or subtract units as conditions dictate, that flexibility has limits. Membranes typically require that the water surface be maintained above a minimum elevation so that the membranes remain wet during operation. Throughput limitations are dictated by the physical properties of the membrane, and the result is that peak design flows should be no more than 1.5 to 2 times the average design flow. If peak flows exceed that limit, either additional membranes are needed simply to process the peak flow, or equalization should be included in the overall design. The equalization is done by including a separate basin (external equalization) or by maintaining water in the aeration and membrane tanks at depths higher than those required and then removing that water to accommodate higher flows when necessary (internal equalization).

Design Features

Pretreatment

To reduce the chances of membrane damage, wastewater should undergo a high level of debris removal prior to the MBR. Primary treatment is often provided in larger installations, although not in most small to medium sized installations, and is not a requirement. In addition, all MBR systems require 1- to 3-mm-cutoff fine screens immediately before the membranes, depending on the MBR manufacturer. These screens require frequent cleaning. Alternatives for reducing the amount of material reaching the screens include using two stages of screening and locating the screens after primary settling.

Membrane Location

MBR systems are configured with the mem-

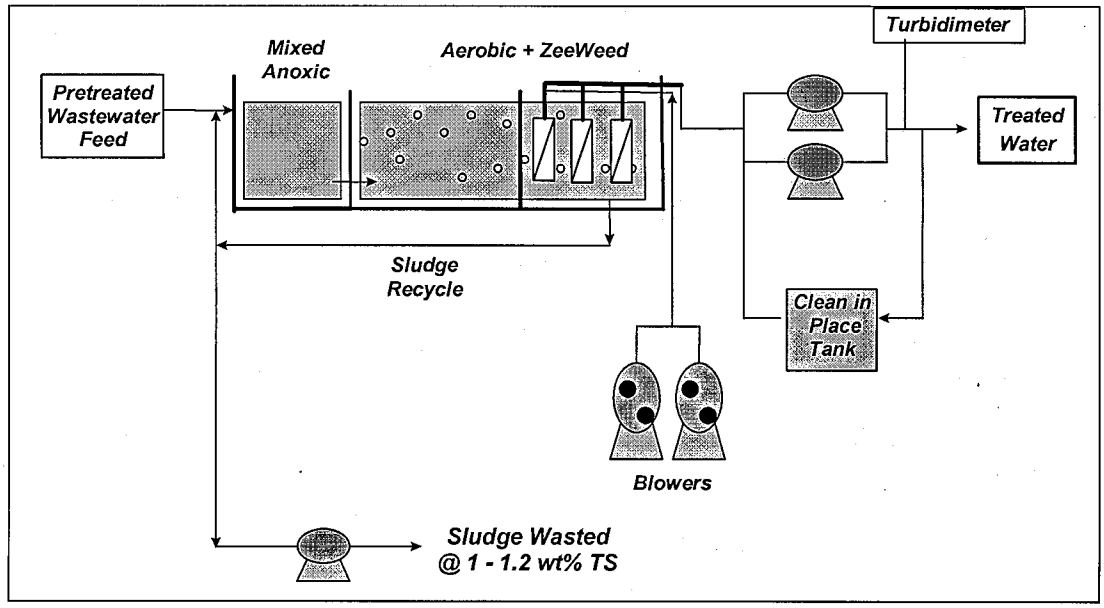


Figure 3. Immersed membrane system configuration (Image from GE/Zenon)

into the membranes to keep the pores cleared out. Back-pulsing is typically done on a timer, with the time of pulsing accounting for 1 to 5 percent of the total operating time.

Downstream Treatment

The permeate from an MBR has low levels of suspended solids, meaning the levels of bacteria, BOD, nitrogen, and phosphorus are also low. Disinfection is easy and might not be required, depending on permit requirements..

The solids retained by the membrane are recycled to the biological reactor and build up in the system. As in conventional biological systems, periodic sludge wasting eliminates sludge buildup and controls the SRT within the MBR system. The waste sludge from MBRs goes through standard solids-handling technologies for thickening, dewatering, and ultimate disposal. Hermanowicz et al. (2006) reported a decreased ability to settle in waste MBR sludges due to increased amounts of colloidal-size particles and filamentous bacteria. Chemical addition increased the ability of the sludges to settle. As more MBR facilities are built and operated, a more definitive understanding of the characteristics of the resulting biosolids will be achieved. However, experience to date indicates that conventional biosolids processing unit operations are also applicable to the waste sludge from MBRs.

Membrane Care

The key to the cost-effectiveness of an MBR system is membrane life. If membrane life is curtailed such that frequent replacement is required, costs will significantly increase. Membrane life can be increased in the following ways:

- Good screening of larger solids before the membranes to protect the membranes from physical damage.

- Throughput rates that are not excessive, i.e., that do not push the system to the limits of the design. Such rates reduce the amount of material that is forced into the membrane and thereby reduce the amount that has to be removed by cleaners or that will cause eventual membrane deterioration.

- Regular use of mild cleaners. Cleaning solutions most often used with MBRs include regular bleach (sodium) and citric acid. The cleaning should be in accord with manufacturer-recommended maintenance protocols.

Membrane Guarantees

The length of the guarantee provided by the membrane system provider is also important in determining the cost-effectiveness of the system. For municipal wastewater treatment, longer guarantees might be more readily available compared to those available for industrial systems. Zenon offers a 10-year guarantee; others range from 3 to 5 years. Some guarantees include cost prorating if replacement is needed after a certain service time. Guarantees are typically negotiated during the purchasing process. Some manufacturers' guarantees are tied directly to screen size: longer membrane warranties are granted when smaller screens are used (Wallis-Lage et al. 2006). Appropriate membrane life guarantees can be secured using appropriate membrane procurement strategies (Crawford et al. 2002).

System Performance

Siemens/U.S. Filter Systems

Siemens/U.S.Filter offers MBR systems under the Memcor and Memjet brands. Data provided by U.S. Filter for its Calls Creek (Georgia) facility are summarized below. The system, as Calls Creek retrofitted it, is shown in Figure 5. In essence, the membrane filters were used to replace secondary clarifiers downstream of an Orbal oxidation ditch. The system includes a fine screen (2-mm cutoff) for inert solids removal just before the membranes.

The facility has an average flow of 0.35 million gallons per day (mgd) and a design flow of 0.67 mgd. The system has 2 modules, each containing 400 units, and each unit consists of a cassette with manifold-connected membranes. As shown in Table 1, removal of BOD, TSS, and ammonia-nitrogen is excellent; BOD and TSS in the effluent are around the detection limit. Phosphorus is also removed well in the system, and the effluent

Table 2.
Cauley Creek, Georgia, system performance

Parameter	Influent	Effluent		
	Average	Average	Max Month	Min Month
Flow (mgd)	4.27	--	4.66	3.72
BOD (mg/L)	182	2.0	2.0	2.0
COD (mg/L)	398	12	22	5
TSS (mg/L)	174	3.2	5	3
TKN (mg/L)	33.0	1.9	2.9	1.4
Ammonia-N (mg/L)	24.8	0.21	0.29	0.10
TP (mg/L)	5.0	0.1	0.13	0.06
Fecal coliforms (#/100 mL)	--	2	2	2
NO3-N (mg/L)	--	2.8		

ters is over 90 percent. The effluent meets all permit limits, and is reused for irrigation and lawn watering.

Traverse City, Michigan. The Traverse City Wastewater Treatment Plant (WWTP) went through an upgrade to increase plant capacity and produce a higher-quality effluent, all within the facility's existing plant footprint (Crawford et al. 2005). With the ZeeWeed system, the facility was able to achieve those goals. As of 2006, the plant is the largest-capacity MBR facility in North America. It has a design average annual flow of 7.1 mgd, maximum monthly flow of 8.5 mgd, and peak hourly flow of 17 mgd. The membrane system consists of a 450,000-gallon tank with eight compartments of equal size. Secondary sludge is distributed evenly to the compartments. Blowers for air scouring, as well as permeate and back-pulse pumps, are housed in a nearby building.

Table 3 presents a summary of plant results over a 12-month period. The facility provides excellent removal of BOD, TSS, ammonia-nitrogen, and phosphorus. Figure 6 shows the influent, effluent, and flow data for the year.

Operating data for the Traverse City WWTP were obtained for the same period. The mixed liquor suspended solids over the period January to August averaged 6,400 mg/L, while the mixed liquor volatile suspended solids averaged 4,400 mg/L. The energy use for the air-scouring blowers averaged 1,800 kW-hr/million gallons (MG) treated.

Costs

Capital Costs

Capital costs for MBR systems historically have tended to be higher than those for conventional systems with comparable throughput because of the initial costs of the membranes. In certain situations, however, including retrofits, MBR systems can have lower or competitive capital costs compared with alternatives because MBRs have lower land requirements and use smaller tanks, which can reduce the costs for concrete. U.S. Filter/Siemen's Memcor package plants have installed costs of $7–$20/gallon treated.

Fleischer et al. (2005) reported on a cost comparison of technologies for a 12-MGD design in Loudoun County, Virginia. Because of a chemical oxygen demand limit, activated carbon adsorption was included with the MBR system. It was found that the capital cost for MBR plus granular activated carbon at $12/gallon treated was on the same order of magnitude as alternative processes, including multiple-point alum addition, high lime treatment, and post-secondary membrane filtration.

Operating Costs

Operating costs for MBR systems are typically higher than those for comparable conventional systems. This is because of the higher energy

reviewers Pat Brooks, Alan Cooper, and Glenn Daigger for their contribution.

PRODUCT LITERATURE USED

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September 2007

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

TILLIE HARDWICK, et al., Plaintiffs, vs. UNITED STATES OF AMERICA, et al., Defendants.	NO. C-79-1710 SW ORDER FOR ENTRY OF JUDGMENT AS TO MADERA AND AMADOR COUNTIES

Having reviewed the Stipulations for Entry of Judgment (Madera and Amador Counties), filed June 16, 1987 and May 28, 1987, respectively, and Plaintiffs' Report of Class Resposnes Re: Notice of Settlement for Madera and Amador Counties, dated December 16, 1987, the Court finds that:

1. Notice was duly given to affected class members as ordered by this Court.

2. The Stipulations for Entry of Judgment will result in a judgment that is fair, just and equitable to affected class members.

3. There is no just reason to delay entry of a final judgment against Madera and Amador Counties.

Accordingly, IT IS HEREBY ORDERED that judgment be entered

or plaintiffs, accordi to the ter
Y of Judgment as described herein.

DATED: DEC 22 1987

UNITED STATES DISTRICT
COURT JUDGE

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

TILLIE HARDWICK, et al.

Plaintiffs,

vs.

UNITED STATES OF AMERICA, et al.

Defendants.

NO. C-79-1710 SW

STIPULATION FOR ENTRY OF JUDGMENT (AMADOR COUNTY)

Plaintiffs on their own behalf and on behalf of class members from the Buena Vista Rancheria (hereafter, "plaintiff Rancheria") and defendants Elmer G. Evans, the Tax Collector for Amador County, Raymond Olivarria, the Assessor for Amador County, and the Board of Supervisors of Amador County, subject to approval of the Court agree as follows:

1. DEFINITIONS - The following definitions shall govern the construction of the stipulation.

A. "PLAINTIFFS" - means all plaintiffs in the

above-captioned case, the plaintiff Rancheria, and all those class members from the plaintiff Rancheria.

B. "DEFENDANTS" - means Elmer G. Evans/Tax Collector for Amador County, Raymond Oliverria/Assessor for Amador County and the Board of Supervisors of Amador County, and their successors in office.

C. "PLAINTIFF RANCHERIA" - means all lands within the exterior boundaries of the Buena Vista Rancheria as described in paragraph 2B.1.)

D. "RANCHERIA PARCELS" - means all parcels of real property within the boundaries of the plaintiff Rancheria which were distributed or sold by the United States of America pursuant to the Plan for the Distribution of the Assets of the Plaintiff Rancheria, approved by the Secretary of the Interior, under the authority of the California Rancheria Act.

E. "INDIAN PARCELS" - means all those parcels of real property or interests in said parcels within the boundaries of the Plaintiff Rancheria currently owned by Indians entitled to return said parcels or interests thereof to the United States of America in accordance with the Judgment of the United States District Court, Northern District of California, in the above-entitled case.

F. "THE PARTIES" - means the Plaintiffs and Defendants as defined above.

G. "INDIAN COUNTRY" - means "Indian Country" as defined by 18 USC §1151.

H. "ELECTION TO RETURN TO TRUST STATUS" - means the filing of a deed in the Amador County Recorder's Office which had

been duly accepted by the United States of America which returns Indian Parcels to trust status with the United States of America.

I. "INDIANS" - means any Indian who owns any interest in a plaintiff Rancheria parcel.

J. "COUNTY MAINTAINED ROAD" - means those roads which are listed as part of the Amador County maintained road system, including roadside easements, located on the plaintiff Rancheria that were conveyed to Amador County as part of the termination of the Rancheria, if any.

K. "UNPAID PROPERTY TAXES" - means real property taxes due on Indian parcels.

L. "ASSESSMENT" - means an exaction of money imposed on the owner of real property located within the county the payment of which is secured by a lien on the property, including, but not limited to, benefit assessments, assessments imposed under the authority of the Improvement Acts of 1911 and 1913 and the Special Assessment, Investigation, Limitation and Majority Protest Act of 1931, the Revenue Bond Law of 1941, or any similar law.

2. The Parties, subject to approval of the Court pursuant to Federal Rules of Civil Procedure 23(c), stipulate that the Court may enter judgment as follows:

A. The Court shall certify a sub-class consisting of those members of the class previously certified herein from the plaintiff Rancheria in Amador County.

B. The Court shall declare that:

1) The Buena Vista Rancheria is described as shown on Exhibit A to the Stipulation for Entry of Judgment filed herein

on August 2, 1983, and made the judgment of this Court on December 22, 1983, in Order Approving Entry of Final Judgment in action.

2) The plaintiff Rancheria and the Plaintiffs were never and are not now lawfully terminated under the California Rancheria Act ("Rancheria Act"), of August 18, 1958, Pub. L. 85-671, 72 Stat. 69, as amended by the Act of August 11, 1964, 78 Stat. 390; in that the requirements of section 3 of that Act were not fulfilled prior to the conveyance of the deeds to the Rancheria Parcels.

3) As a consequence this Court has authority as a court of equity to remedy the effects of the premature and unlawful termination of the plaintiff Rancheria and the Plaintiffs to the extent that it can do so without adversely affecting the interests of third party purchasers for value of Rancheria parcels.

C. The original boundaries of the plaintiff Rancheria, as described in paragraph 2B.1) above are hereby restored, and all land within these restored boundaries of the plaintiff Rancheria is declared to be "Indian Country".

D. The plaintiff Rancheria shall be treated by the County of Amador and the United States of America, as any other federally recognized Indian Reservation, and all of the laws of the United States that pertain to federally recognized Indian Tribes and Indians shall apply to the Plaintiff Rancheria and the Plaintiffs.

E. All real property taxes heretofore paid to the County of Amador by Plaintiffs for the tax year 1979 and any

subsequent tax year for Indian parcels shall be refunded in full to Plaintiff or the estate of the Plaintiff, if the plaintiff makes an election to return said parcel to trust status no later than December 31, 1988. Within ninety (90) days after the deed for said parcel is recorded in the county recorder's office, defendants shall mail to the plaintiff a claim form showing the total refund and the amount to be refunded for each tax year. The defendants shall refund the total amount shown on the form within thirty (30) days after the defendants receive a claim form signed by the plaintiff claiming a tax refund. No prejudgment interest shall be added to the amounts refunded under this paragraph. Defendants shall be entitled to keep all real property taxes collected on all property located on the plaintiff Rancheria except as specifically set forth above.

F. Defendants shall not collect or recover any Unpaid Property Taxes, assessments or fees on Indian Parcels within the boundaries of the Plaintiff Rancheria as restored; any liens to secure the payment of such assessments, fees or taxes shall be cancelled; and, except as provided in Paragraphs G, defendants shall not have jurisdiction to tax or assess Indian Parcels on said rancheria.

G. The County may impose real property taxes on Indian owned parcels that are not owned in trust by the United States of America, if the Indian property owner has not filed within the tax year an exemption form with the county assessor establishing the property owner's status as an Indian. The county in consultation with plaintiffs shall develop an exemption application form for this purpose. "Indian" for purposes of this paragraph

shall mean a member of a federally recognized Indian tribe, a person eligible for membership in a federally recognized Indian tribe or a person who is at least 1/4 Indian ancestry as established by the records of the Bureau of Indian Affairs ("BIA") or the property owner's tribe.

H. County maintained roads which service the plaintiff Rancheria shall be deemed to have been and now are lawfully owned and maintained by the County of Amador.

I. All claims whatsoever for money damages, other than the tax refunds under Paragraph E, against the Defendants resulting from the distribution of the assets of the plaintiff Rancheria under the Rancheria Act, which were or could have been made in this action shall be dismissed with prejudice.

K. Each party shall bear their own costs and attorneys' fees in prosecuting or defending this action.

DATED: April 3, 1987

CALIFORNIA INDIAN LEGAL SERVICES

By: _____
DAVID J. RAPPORT
Attorneys for Plaintiffs

DATED: April 21, 1987

MARY ANN MCNITT
Counsel for Amador County

By: _____
MARY ANN MCNITT
Attorneys for Amador County
Defendants

IT IS SO ORDERED

SPENCER WILLIAMS

SPENCER WILLIAMS
U.S. DISTRICT JUDGE