ECO:LOGIC
ENGINEERS CONSULTANTS

3875 Atherton Road
Rocklin, CA 95765

916.773.8100 TEL
916.773.8448 FAX

September 30, 2008

Ken Landau, P.E.
Assistant Executive Officer
Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Drive, #200
Rancho Cordova, CA 95670-6114

RE: DONNER SUMMIT PUBLIC UTILITY DISTRICT NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT CA0077828 INFEASIBILITY REPORT AND COMMENTS ON PERMIT SUMMARY

Dear Mr. Landau,

Please accept these comments on the subject Permit Summary issued 15 September 2008. As requested, we have checked the effluent limitations proposed, and offer corrections where the District believes warranted. Where a time schedule is requested for compliance, the following sections present the justification for the following time schedule requirements:

Requirement 1: Documentation that diligent efforts have been made to quantify pollutant levels in the discharge and identify the sources of the pollutant in the waste stream;

Requirement 2: Documentation of source control and/or pollution minimization measures currently underway or completed;

Requirement 3: A schedule for additional or future source control measures, pollutant minimization actions, or waste treatment (e.g., facility upgrades, pollution prevention plans); and

Requirement 4: A demonstration that the proposed schedule is as short as practicable.

Prior to discussing each contaminant, we offer the following comments. We concur with your assumption that dilution credits may be granted by the Regional Water Board at this time for contaminants with governing human health water quality criteria such as nitrate, dibromochloromethane, dichlorobromomethane, carbon tetrachloride, manganese, etc., if it is demonstrated that the receiving water has assimilative capacity for these contaminants. We also request that the upcoming Tentative Order recognize that the District is proposing to undertake mixing zone and dilution studies to try to demonstrate that dilution credits for acute and chronic aquatic life criteria are also justified, since this is a component of the District's overall compliance strategy. The requested recognition would take the form of specific reopener language in the Provisions section of the Tentative Order.

In the following contaminant-specific sections, we calculate effluent limitations to protect aquatic life based on two approaches: 1) zero dilution credits (the correct approach until completely-mixed conditions are demonstrated by study), and 2) minimum anticipated dilution credits as described in the Report of Waste Discharge, specifically, a D_{acute} of 0.683 and a $D_{chronic}$ of 0.946. In addition, in our analyses you will notice that we have included recent data which was not available at the time of the Report of Waste Discharge over a year ago. We are trying to make the Tentative Order effluent limitations as up-to-date as possible.

AMMONIA

The District requests that limitations be set based on a maximum effluent and/or river pH of 7.5 and a maximum temperature of 21.1°C (70°F). This request is based on two arguments:

- As shown in the District's Report of Waste Discharge (Figure F-1, page F-21), high river temperatures are associated only with lower pHs, in the 7's or lower.
- Under critical low river flow and low effluent dilution conditions, effluent pH and effluent buffering capacity are expected to be the main determinants of the pH of the resulting effluent/river water mix.

Based on this approach, the associated effluent limitations will be presented, first. This section concludes with the time schedule request and justification.

Effluent Limitations

The most stringent regulatory criteria corresponding with a maximum pH of 7.5 and a maximum temperature of 21.1°C (70°F) are presented below:

Acute Criterion (CMC) = 13.28 mg/L
Chronic Criterion (30-day CCC) = 2.86 mg/L
Chronic Criterion (4-day CCC) = 7.15 mg/L

The highest recorded receiving water ammonia concentration is 0.07 mg/L.

The District submitted supporting documentation in the Report of Waste Discharge justifying dilution credits as follows once completely-mixed discharge conditions are demonstrated:

D_{acute} *= 0.683 (*D_{acute} *= 0, until completely-mixed conditions are demonstrated)*
$D_{chronic}$ *= 0.946 (* $D_{chronic}$ *= 0, until completely-mixed conditions are demonstrated)*

For effluent limitation calculations reflecting effluent variability, all of the effluent data from river discharge periods reported since recent plant nitrification improvements were completed (2005 through June 2008) were used to determine the mean and standard deviation characteristics of the current discharge during periods when river discharge is necessary. The arithmetic mean concentration was calculated at 3.74 mg/L and the corresponding standard deviation was calculated at 5.25 mg/L. The coefficient of variation (CV) is, thus, calculated at 1.40. All of the data used to calculate these statistics are provided in Appendix A of this report.

The Effluent Concentration Allowance (ECA) for the three different regulatory criteria are calculated and presented below (all results shown in { } are based on D = 0):

$ECA_{acute} = C_{CMC} + D(C_{CMC} - B)$
$C_{CMC} = 13.28\ mg/L$
$D = 0.683\ \{D = 0\}$
$B = 0.07\ mg/L$
$ECA_{acute} = 13.28 + 0.683(13.28 – 0.07) = 22.30\ mg/L\ \{ECA_{acute} = 13.28\ mg/L\}$

$ECA_{chronic\ 30\text{-}day} = C_{chronic\ 30\text{-}day} + D(C_{chronic\ 30\text{-}day} – B)$
$C_{chronic\ 30\text{-}day} = 2.86\ mg/L$
$D = 0.946\ mg/L\ \{D = 0\}$
$B = 0.07\ mg/L$
$ECA_{chronic\ 30\text{-}day} = 2.86 + 0.946(2.86 – 0.07) = 5.50\ mg/L\ \{ECA_{chronic\ 30\text{-}day} = 2.86\ mg/L\}$

$ECA_{chronic\ 4\text{-}day} = C_{chronic\ 4\text{-}day} + D(C_{chronic\ 4\text{-}day} – B)$
$C_{chronic\ 4\text{-}day} = 7.15\ mg/L$
$D = 0.946\ mg/L\ \{D = 0\}$
$B = 0.07\ mg/L$
$ECA_{chronic\ 4\text{-}day} = 7.15 + 0.946(7.15 – 0.07) = 13.85\ mg/L\ \{ECA_{chronic\ 4\text{-}day} = 7.15\ mg/L\}$

The long term average (LTA) concentration corresponding with each ECA is presented below, based on a CV of 1.40.

$LTA_{acute} = (0.15)(22.30\ mg/L) = 3.35\ mg/L\ \{LTA_{acute} = (0.153)(13.2\ 8\ mg/L) = 2.03\ mg/L\}$
$LTA_{chronic\ 30\text{-}day} = (0.57)(5.50\ mg/L) = 3.13\ mg/L\ \{LTA_{chronic\ 30\text{-}day} = (0.57)(2.86\ mg/L) = 1.63\ mg/L\}$
$LTA_{chronic\ 4\text{-}day} = (0.28)(13.85\ mg/L) = 3.88\ mg/L\ \{LTA_{chronic\ 4\text{-}day} = (0.281)(7.15\ mg/L) = 2.01\ mg/L\}$

The most limiting LTA is 3.13 mg/L {1.63 mg/L}

Based on a weekly sampling frequency (n=4), the maximum day effluent limitation (MDEL) is calculated at:

MDEL = (6.57)(3.13 mg/L) = 21 mg/L {MDEL = (6.57)(1.63 mg/L) = 11 mg/L, based on D = 0}

The corresponding average monthly effluent limitation (AMEL) is calculated at:

AMEL = (2.32)(3.13 mg/L) = 7.3 mg/L {AMEL = (2.32)(1.63 mg/L) = 3.7 mg/L, based on D = 0}

Justification for the Request

This high Sierra wastewater naturally contains low alkalinity (i.e., naturally has a low pH). If the District were to attempt to nitrify (i.e., remove ammonia) without chemical addition, the lack of alkalinity would result in a further drop in pH and the biological treatment process would cease. The District must add chemicals to increase alkalinity to allow full wastewater treatment to even occur. Accordingly, the facility was designed and is operated to add alkalinity, which serves to raise pH.

Currently, the District adds soda ash to increase alkalinity (and increase pH). The District only has the ability to manually set the soda ash addition. Currently, there is no flow proportional control or secondary trim control based on aeration basin pH. Because of the lack of instrumentation control of soda ash addition (typical of the era in which the facility was built) and the absolute need to maintain a pH of 7 or higher to sustain the biological treatment process, it is operationally "safe" to overdose soda ash. This approach maintains the treatment process in the absence of automatic controls, but also results in the rare high pH events observed to date. The average effluent pH is 7.2, and that is where it should stay with automated chemical addition.

Any time chemicals are added to a wastewater, there is a corresponding increase in effluent salinity. As described in the Report of Waste Discharge, the overall compliance plan includes the conversion from soda ash (sodium carbonate) to lime (calcium oxide) for alkalinity control. This conversion replaces the more problematic sodium ion with the less problematic calcium ion. This conversion will also include flow proportional lime dosing control as well as automated trim capability to maintain pH at the desired target value. Adding sufficient chemicals to cause pH values in excess of 7.5 is wasteful, needlessly adds salt to the aquatic environment, and serves no benefit to the treatment process. Therefore, it is proposed that applying an upper limit for effluent pH concurrently minimizes salinity addition to the discharge, and results in a more technically feasible effluent limitation on ammonia for this specific highly variable resort-driven wastewater collection and treatment facility. The District is not proposing to add acid to the effluent for pH control, which would further increase the concentration of effluent salts. The District is proposing to optimize the current chemical addition beyond what has been practiced in the past to prevent excess pH and excess salt addition. This practice is in the best interests of the environment and constitutes Best Practical Treatment and Control for this discharge.

Time Schedule Justification and Infeasibility Report

The proposed "fixed" limitations on ammonia are a change from the current "variable" effluent limitations. The District requests a time schedule to allow for facility improvements to assure compliance with the new effluent limitations. Justification is as follows:

- The District currently monitors and reports ammonia concentrations weekly. This monitoring is sufficient to document that diligent efforts have been made to quantify pollutant levels in the discharge. The sources of ammonia are a combination of 1) naturally occurring ammonia in domestic wastewater, and 2) ammonia feed currently being practiced at the facility. Ammonia is fed into the influent wastewater in an effort to maintain sufficient biology to allow for nitrification during the river discharge period under the wide range of influent flow, load, and temperature conditions experienced at this facility resulting from its largely weekend ski resort service area. Because the sources of ammonia and their levels are known and quantified, the District has complied with Requirement 1.

- The District does not believe it is possible to reduce influent ammonia concentrations materially by source control because ammonia is 1) characteristic of domestic wastewater, and 2) is added to the treatment process during periods of low concentration to maintain an adequate microbial inventory to allow for nitrification. The District has installed and is currently operating an activated sludge treatment process, supplemented with an attached growth medium, for ammonia removal. This is believed sufficient to comply with Requirement 2.

- The District will be converting from soda ash to lime for alkalinity control. This conversion will include the necessary controls and automation to allow for flow-proportional control with secondary trimming based on real time aeration basin pH. The District continues its efforts to develop and maintain an adequate biology to allow for robust nitrification.

- Upon permit adoption, numerous additional treatment process improvements are expected to be necessary to allow for compliance with all of the additional limitations, including the nitrogen and pH limitations. In addition to treatment facility improvements, if a modified outfall structure is required to allow for the use of dilution credits, that too must be designed, permitted, and constructed. Five years is required to allow for the planning, CEQA, design, permitting, financing, construction, and start-up of the new facilities. Insofar as there are numerous examples of treatment facilities that were unable to undergo treatment facility improvements within a 5-year time period (often because of CEQA issues and/or financing), the District believes that a five-year compliance schedule is as short as practicable. The District believes that documentation of scheduled facility upgrades and the demonstration that the proposed schedule is as short as practicable is sufficient to fulfill Requirements 3 and 4.

ALUMINUM - Time Schedule Justification and Infeasibility Report

The District requests a five year compliance schedule for aluminum compliance. Justification follows.

- The concentrations of aluminum have been monitored and reported to the Regional Board. Thus, Requirement 1 has been fulfilled.
- The primary source of aluminum appears to be from water supply treatment and wastewater treatment (specifically, the use of alum [aluminum sulfate] as a coagulant prior to filtration at both plants). The District is working to phase out the use of alum for treatment at both the water and wastewater treatment plants. This conversion is underway, and thus, Requirement 2 has been fulfilled.
- Once phase-out of alum is complete, monitoring must be conducted to determine the resulting reliable reduction in effluent aluminum concentrations. If the reduction is not sufficient to achieve compliance, then additional filtration and/or a water effect ratio will be required. The chemical replacement process, effluent monitoring, planning, design, financing, construction, start-up testing, and/or conduct of a water effect ratio are expected to take five-years. These process improvements and associated schedule are believed to fulfill Requirements 3 and 4.

CARBON TETRACHLORIDE

There was only a single detected effluent concentration of carbon tetrachloride. That detected value was a “j” flag. We are of the understanding that a single “j” flag value is typically used to require additional monitoring rather than assigning an effluent limitation.

If an effluent limitation is required, the District requests it be assigned with regards to additional monitoring data that were submitted to the Regional Board via email on August 6, 2008. In that submittal, there was no detectable carbon tetrachloride in the South Yuba River at a detection limit of 0.04 µg/L. The proposed effluent limitations, considering available dilution for this human health criterion, are as follows:

$C_{human\ health} = 0.25\ \mu g/L$
$D_{human\ health} = 24.5$
$B = 0.04\ \mu g/L$
$ECA = C_{human\ health} + D_{human\ health}(C_{human\ health} - B)$
$ECA = 0.25\ \mu g/L + 24.5\ (0.25\ \mu g/L - 0.04\ \mu g/L) = 5.4\ \mu g/L$
$AMEL = 5.4\ \mu g/L$
$MDEL = 11\ \mu g/L$

The District does not need a time schedule for compliance with these limitations.

CYANIDE - Time Schedule Justification and Infeasibility Report

The maximum river concentration was reported by the laboratory at 24 µg/L (June 2001). This is essentially the same concentration reported for the effluent (23 µg/L) that day. There is no known source of cyanide for the South Yuba River (the watershed is above the mining district), and other monitoring data indicate that the river has assimilative capacity for cyanide. It is expected that the reported 24 µg/L value is due to sampling error or laboratory error in this very early, first, monitoring effort by the District for CTR constituents. If there is in fact an error in the data, it is not possible to develop a compliance plan because the concentration in the receiving water is erroneous. The City requests time to complete additional monitoring of the receiving water to determine the appropriate background concentration for this human health carcinogen.

The District has attempted to document cyanide concentrations in both the effluent and receiving stream. The data submitted in the Report of Waste Discharge fulfill Requirement 1.

It is believed that the source of wastewater cyanide is pelletized rodent poison flushed down toilets. Such poisons often contain cyanide, and are commonly used in homes that are unoccupied much of the year. The District will initiate a public education effort to try to eliminate the practice of flushing poisons down toilets. This is believed sufficient to fulfill Requirement 2.

If cyanide cannot be eliminated via source control, very advanced treatment would be required (e.g., activated carbon). The District will be implementing the public education outreach program, and further investigating background cyanide concentrations in the South Yuba River. Because public outreach is difficult to implement effectively, the District requires at least two years to fully realize the success of the program and further monitor cyanide in the receiving water. If cyanide remains present, at least three years are necessary to plan, permit, finance, construct, and initiate operation of any additional treatment process improvements. This compliance schedule and associated timeline are believed sufficient to fulfill Requirements 3 and 4.

DICHLOROBROMOMETHANE

The Report of Waste Discharge requested dilution credits for this contaminant. The calculated effluent limitations, considering the availability of dilution credits, is as follows:

$C_{human\ health} = 0.56\ \mu g/L$
$D_{human\ health} = 24.5$
$B = 0.1\ \mu g/L$
$ECA = C_{human\ health} + D_{human\ health}(C_{human\ health} - B)$
$ECA = 0.56\ \mu g/L + 24.5\ (0.56\ \mu g/L - 0.1\ \mu g/L) = 12\ \mu g/L$
$AMEL = 12\ \mu g/L$
$MDEL = 24\ \mu g/L$

The District does not need a time schedule for compliance with these limitations.

COPPER AND ZINC - Time Schedule Justification and Infeasibility Report

The District reported in the Report of Waste Discharge a planned conversion from soda ash to lime for alkalinity adjustment. This chemical addition is necessary to sustain the nitrification treatment process (ammonia removal). As reported in the Report of Waste Discharge, once the conversion to lime is complete, it is expected that there will be sufficient hardness in the effluent to assure compliance with regulatory objectives. As reported above for the pH limitation, it will not be possible to overdose lime. If an overdose were to occur, the pH would be elevated above the requested upper maximum limit of 7.5 and a violation would result. Thus, the requested conversion to lime does not allow for the District to purposefully overdose lime until compliance with the metals regulatory objectives is assured. Only enough lime for alkalinity maintenance will be added, and the resulting hardness documented. If the hardness is sufficient for compliance, the District requests a reopener that allows for recalculation of effluent limitations on copper and zinc.

If it is found that even after conversion to lime there is insufficient hardness for compliance with either the copper or zinc objective, the District will undertake further source control (in the form of further corrosion control efforts within the potable water supply, without use of zinc orthophosphate) and a water effects ratio study to adjust the regulatory criteria to reflect site-specific conditions. Complete corrosion control within this water supply distribution system is virtually impossible because of the limited occupancy of many homes. In these homes, there is limited flushing action; thus, pipe corrosion byproducts like copper and zinc can build up for weeks to relatively high concentrations. It is expected that a water effect ratio study will be successful because the District currently passes the three tier bioassay.

Time Schedule Justification and Infeasibility Report

The District reported concentrations of copper and zinc in the waste stream. The source of copper and zinc appears to be the potable water supply and home plumbing, as there is no industry in the District. This quantification fulfills Requirement 1.

There is no means for changing the plumbing within the existing homes for compliance via source control. The District has proposed a means of compliance – conversion to lime for alkalinity control followed by conduct of a water effect ratio, if necessary. These efforts are believed sufficient to satisfy Requirements 2 and 3.

Conversion to lime is expected to run through a single discharge season. After conversion, at least one year of data must be collected to demonstrate compliance with the regulatory objectives. If a water effect ratio is required, three years are left to develop a water effect ratio plan, implement the plan, and prepare the report to allow for renewal of the next permit. Thus, five years is as short as practicable to implement the compliance plan. This demonstration is believed sufficient to comply with Requirement 4.

Please feel free to call to discuss any single item or if additional clarification is needed.

Sincerely,

ECO:LOGIC ENGINEERING

Richard E. Stowell, Ph.D., P.E.
Principal

cc: Tom Skjelstadt, Donner Summit PUD
Robert Emerick, ECO:LGOIC Engineering

Attachments:
A: Ammonia Monitoring Data

Attachment A

Effluent Ammonia and pH Data from Periods of Discharge to South Yuba River: January 2005 – June 2008

Attachment A
Effluent Ammonia and pH Data from Periods of Discharge to South Yuba River: January 2005 – June 2008

Summary of All Data:

Effluent Parameter	Average	Standard Deviation	Coefficient of Variation
NH_3, mg/L	3.742	5.247	1.40
pH, s.u.	7.223	0.343	0.048

Data by Water Year:

Water Year 2005 Data*

	Jan 05		Feb 05		Mar 05		Apr 05		May 05		June 05	
Day	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH
1		7.1		7.1		7.1		7.3		7.1	0.2	6.8
2		7.2	14.8	7.3	14.4	7.2		7.2		7		6.6
3		7.1		7.2		7.2		7.3		7		6.8
4		7.1		7.2		7.3		7.1	0.7	6.9		6.9
5	16.4	7.1		7.3		7.5		7.1		7		6.9
6		7.2		7.1		7.2	1.8	7.1		7		6.8
7		7.2		7.4		7.3		7		7		6.6
8		7.1		7.3		7.2		7		7.1		6.6
9		7.3	9.2	7.2	12.4	7.1		7.1		7.1		7
10		7.4		7.3		7.2		7		7.1		6.7
11		7.3		7.2		7.1		7	0.7	7.1		6.8
12	7.9	7.2		7		7.2		7.1		7		7.3
13		7		7.3		7.3	0.4	7.1		6.8		6.9
14		7		7.3		7.1		6.9		7		6.6
15		7.1		7.1		7.1		7		7	0.1	6.8
16		7.5	11.1	7	8.2	7		7		6.8		7.2
17		7.5		6.9		7		7.1		7		6.8
18		7.3		7.1		7		7.2	ND	7		6.9
19	22.7	7.2		7.2		7.1		7		7.2		6.8
20		7.3		7.1		7	0.9	6.9		6.8		6.6
21		7.2		7.2		7		6.9		6.7		6.8
22		7.3		7.3		6.9		6.9		6.7	0.3	6.9
23		7.4	25.8	7.1	0.1	7		7.1		6.8		6.6
24		7.3		7.2		6.9		6.8		6.9		6.6
25		7.2		7.2		6.9		6.9	.04	6.8		6.9
26	10.1	7.2		7.2		7.1		7.2		6.6		6.6
27		7		7.1		7	0.414	6.9		6.9		6.6
28		7		7.2		7.1		7		6.7		7
29		7				7		6.9		6.8	0.3	7
30		7			7.9	7.1		6.9		6.9		6.9
31		7.1				7.2				6.6		

* NH_3 in mg/L, pH in std. units.

Water Year 2006 Data*

Day	Nov 05		Dec 05		Jan 06		Feb 06		Mar 06		Apr 06		May 06		June 06	
	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH
1		6.7	1.1	6.6		6.6		7.2		6.8		6.9		7	1.7	6.7
2		7.1		6.9		7	0.4	6.9	3.3	7.2		7		6.9		7.2
3		6.6		6.9		6.9		7.5		7.4		7.1		7.6		7.1
4	5	6.6		6.7		6.8		7.1		7		7.2	0.7	7.1		7.3
5		6.5		6.9	3.4	7.1		7		7.5		7.1		7.1		6.9
6		6.6		6.8		7		6.7		7.3	1.3	6.5		7.3		6.8
7		6.7		6.9		7		6.8		7.3		6.5		7.1		7.2
8		6.5	0.3	6.7		7.4		7.3		7		6.7	0.3	7.4	1.2	6.5
9		6.9		6.5		7	0.2	6.9	2.1	6.8		6.8		7.1		7.1
10	0.1	7.1		6.5		6.7		7.1		6.9		7	2.4	6.9		7.3
11		6.8		6.6		6.9		7		7		6.8	2.6	6.5		7.4
12		6.8		6.5	1.8	7.4		6.9		7.2		7.3		7		7.2
13		6.7		6.7		7.1		7.1		7.3	3.1	7		7		6.9
14		6.8		6.8		6.9		6.8		6.8		7.1		7.2		6.9
15		7	0.3	6.9		7		7.4		7.3		6.9		7	5.4	7.4
16		7.1		6.8		7.2	2.2	6.8	1.5	6.9		6.9		7		7.2
17	1.8	6.5		7		7.1		7.4		7		6.5				7.2
18		6.5		6.9		7		7		7		7.1	1.1	7		7.2
19		6.6		6.9	5.3	6.9		7.3		6.9		7.2		6.8		7.1
20		6.9		7		7.1		7.3		7.3	1.6	7.3		6.9		6.9
21		6.8		6.9		7.2		7.1		6.7		7.2		7.1		7.2
22		7.1	5.6	7		7.4		7		6.9		7		7.1	2.5	7.4
23		7		6.8		7.2	16.3	7.3	0.5	7.3		7.2		7.3		7.1
24	ND	6.9		6.9		7		7.3		7.8		7.1		8		7.2
25		6.8		6.9		7.1		6.9		6.8		7.1	0.1	7.6		7.1
26		6.8		6.9	3.5	6.7		6.8		6.7		7.4		7.1		7.3
27		6.8		6.9		7.4		7.1		7.1	0.7	7.4		7.2		7.3
28		6.8		6.7		6.8		7.2		6.9		6.8		7.1	0.6	7.1
29		6.6	14.8	6.6		7				6.9		7.1		7		6.8
30		6.6		7		7.3			6	7.1		6.7		7.3		7
31		6.5		7		6.9				6.9				7.1		

* NH_3 in mg/L, pH in std units.

Water Year 2007 Data*

Day	Nov 06		Dec 06		Jan 07		Feb 07		Mar 07		Apr 07		May 07		June 07		July 07	
	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	NH_3	pH	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH
1				[illegible]		[illegible]	10.2		7.1	7	8.8	7.6		7.2		7.7		7.4
2				[illegible]					7.4	7.1		7.6		7.5		7.6		7.7
3				7.4					7.1	7.2		7.7		7.8	1.1	7.7		7.5
4			2	7.2	15.3				7.6	7		7.7		7.6		7.6		7.4
5				7		[illegible]			7.7	7		7.2	3.3	7.2		7.6	0.1	7.1
6			1.5	7.1		7.4	15.8		7.1	7.1		7.3		7.6		7.3		7.1
7			0.5	7.1		7.2		1.3	7.3	7.1		7.2		7.5	0.8	7.7		7.4
8				[illegible]		7.1	10.3		7.6	7.4	10	7.4		7.8		7.5		7.5
9						6.9			7.2	7.2		7.5		7.6	4	7.5		7.3
10				[illegible]		[illegible]			7.2	7.5		7.3		7.7	1.4	7.4		7.4
11				[illegible]	[illegible]	[illegible]			7.5	7.5		7.2		7.2		7.4	7.57.27.2	7.2
12																		

Water Year 2008 Data*

Day	Oct 2007		Nov 2007		Dec 2007		Jan 08		Feb 08		Mar 08		Apr 08		May 08		June 08	
	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH	NH_3	pH
1			0.1	7.7		7.6		7.6		7.9		7.1		7.5	1	8		7.1
2				7.5		7.8		7.8		7.5		7.3		7.8		7.8		7.2
3				7.5		7.7	0.6	8		7.4		7	1.7	8.2		7.7		7.1
4				7.3		7.7		7.8		7.1		7.6		8		7.7		7
5			0.1	7.7		7.3		7.7		7.2		7.4		7.6	0.6	7.3	0.2	6.8
6				7.6	0.2	8		7.5		7.3	3.4	7		7.6		7.2		6.8
7			0.1	7.8		7.5		7.6	0.8	7.9		7.2		7.4	0.6	6.9		6.5
8			0.1	7.7		7.7		7.8		7.9		7.6		8	0.3	6.8		6.7
9				7.4		7.9		7.9		7.5		7.1		8.1		7.1		6.8
10				7.6		7.4	1.5	7.8		7.5		7.3	4.3	7.1		7		7
11				7.6		7.8		7.7		7.4		7.3		8.2		6.9		7.1
12				7.5		7.7		7.6		7.3		7.4		7.7		6.9	0.2	7.2
13				7.6	0.2	7.8		7.7		7.2	1.4	7		7.8		7		6.8
14				7.5		7.8		7.7	2.2	7.9		7		7.5		7.1		6.9
15			0.1	7.6		7.6		7.5		8.2		7.6		7.9	0.2	7		6.5
16				7.9		7.7		8		7.6		7.4		7.7		6.7		6.7
17	0.2	7.3		7.4		7.8	0.1	7.1		7.4		7.7	0.1	8		6.5		6.8
18	0.6	7.7		7.7		7.7		7.9		7.6		7.2		8.3		6.6		6.98
19		7.6		7.2		7.6		7.6		7.4		7.5		7.6		6.7	0.2	7
20		7.5		7	0.2	7.7		7.6		7.5	7.5	7.3		7.4		6.6		7
21		7.3	0.1	7.8		7.7		7.6	2.8	7.8		7.2		7.4		6.6		7
22		7.6		7.5		7.2		7.5		7.4		7.4		7.4	0.7	7		6.9
23		7.5		7.6		7.4		7.3		7.1		7.3		7.4		7		7
24		7.6		7.5		7.6	6.4	7.6		7.8		7.3	3.8	8		6.9		7
25	0.2	7.7		7.7		7.6		8	7.3	7.2		7.6		8.3		7		7.2
26		7.9		7.5		7.7		7.7		7.7		7.2		7.9		6.9	0.2	7.4
27		7.5		7.6	10.2	7.9		7.7		7.2	6.9	7.8		7.9		7		7.2
28		7.5		7.6		7.5		7.8	4.9	7.8		7.8		8		7.2		7.2
29		7.5	0.1	7.8		7.7		7.3		7.9		7.6		7.5	0.1	7.2		7.2
30	0.3	7.4		7.9		7.6		7.3				7.3		7.5		7.2	0.3	7.2
31		7.8				7.8	0.2	7.9				7.3				7.2		

* NH_3 in mg/L, pH in std units.