extending to the bottom of the pond, could be seen. These clusters were not included in the concentration estimate. Water boatmen were seen throughout the pond with an average population density of 1 per 15 liters, down from 1 per 10 liters last month.

Pond 2

Gross appearance. Water was clear with an average Secchi disk reading > 300 cm, up from 60.1 cm last month. Small fragments of floating debris were noted throughout the pond. The average temperature was 31.0°C, up from 27.0°C last month. There was a strong flow of water into the pond which is receiving non-blowdown water (wastewater from the plant which does not include the circulating water system). The water level in the pond was 925' above sea level, identical to last month.

Algae. *Micromonas* was the predominant alga with a cell count of 1,700 c/ml. The total cell count for the water column was 4,200 c/ml. The floating debris sample was composed of *Nitzschia*, *Staurastrum* and *Chlorogonium*. See Table 2 for individual and total counts.

Animals. There were approximately 76 birds on the pond which consisted of 75 grebes and 1 seagull. *Artemia* brine shrimp were seen at an average concentration of 12 per liter with the greatest concentration at the southwest sampling site. Water boatmen were observed at each sampling site in this pond, but in very low concentrations which were difficult to estimate.

Water Receiving Facility

Gross appearance. The water column had a green tint and the liner bottom had a film of green algae. Many damselflies and dragonflies were observed around the pond. Water temperature at the north collection site was 29.0°C, the same as last month.

Algae. The predominant alga was *Kirchneriella* with a cell count of 15,000 c/ml. The wind accumulation sample consisted largely of green algae and aquatic insects, family Chironomidae. The total cell count for the water column was 28,000 c/ml. See Table 3 for individual and total counts.

Animals. There were approximately 44 birds on the pond which consisted of 7 grebes, 9 ruddies, 1 killdeer, 17 stilts, 8 coots and 2 mallards.

Edward Glenn | David Moore | Renee Tanner

Algae Counts, APS/PVNGS, 06/06/96

Algal Counts in Cells/ml

Table 1 Pond 1

Site	Nitzschia
Northwest	0
Southeast	1,250
Center	0
Average	417

Total Cell Count: 417

Table 2 Pond 2

Site	Nitzschia	Coccochloris	Micromonas	Staurastrum
Northeast	3,750	0	2,500	0
Southwest	0	1,250	0	1,250
Center	0	1,250	2,500	0
Average	1,250	833	1,667	417

Total Cell Count: 4,167

Table 3 Fresh Water Reservoir

Site	Synechocystis	Kirchneriella	Tetraedron	Chlorella	Scenedesmus	Pediastrum
North	0	15,000	1,250	0	0	0
South	0	12,500	0	13,750	0	0
East	2,500	18,750	0	18,750	0	0
West	3,750	15,000	1,250	5,000	1,250	2,500
Average	1,563	15,313	625	9,375	313	625

Total Cell Count: 27,813

PVNGS PONDS 06/06/96 Sampling

Table 4: Water Quality Data

Pond 1	Nitrate NO3- -N mg/L	Salinity ppt	Ammonia NH3-N mg/L	Phosphate P mg/L	pH	Nitrite NO2- mg/L
Central	540	62	3.65	0.23	8.76	4.30
NW	610	61	3.43	0.26	8.75	4.20
SE	580	62	3.53	0.25	8.72	4.40
Average	577	62	3.53	0.25	8.74	4.30

Pond 2	Nitrate NO3- -N mg/L	Salinity ppt	Ammonia NH3-N mg/L	Phosphate P mg/L	pH	Nitrite NO2- mg/L
Central	370	64	4.18	0.39	8.93	4.40
NE	320	66	4.75	0.42	8.95	3.50
SW	300	65	4.60	0.49	8.96	4.10
Average	330	65	4.51	0.43	8.95	4.00

Fresh Water	Nitrate NO3- -N mg/L	Salinity	Ammonia NH3-N mg/L	Phosphate P mg/L	pH	Nitrite NO2- mg/L
North	14.1	0	0.50	0.08	9.18	0.298
South	11.5	0	0.45	0.06	9.20	0.296
East	13.8	0	0.28	0.06	9.44	0.280
West	14.5	0	0.40	0.06	9.29	0.293
Average	13.5	0	0.41	0.06	9.28	0.292

THE UNIVERSITY OF
ARIZONA
TUCSON ARIZONA

Environmental Research Laboratory
Department of Soil, Water and Environmental Science
College of Agriculture

2601 E. Airport Drive
Tucson, Arizona 85706-6985 U.S.
Telephone: (520) 741-1990
FAX: (520) 573-0852

To: Tom Hillmer

Date: July 10, 1996

Re: Final Summary Report regarding the Biological Monitoring of the Palo Verde Evaporation and Receiving Ponds, 1995-1996.

1.0 Biology

Graphs of data on the biological components of the ponds are at the back of the report. The graphs show numbers of organisms encountered in Evaporation Ponds 1 and 2 and in the Receiving Pond by sampling date. The graphs show total algal counts, diatoms vrs blue-green algae, and summary graphs showing the relative abundance of algae, brine shrimp and water boatmen, illustrating the dynamics of the food chain described below.

1.1. Birds

All three ponds are visited by migratory birds and support resident populatons as well. On the Evaporation Ponds yellow-legged shorebirds, grebes, stilts, coots, buffleheads, avocets, Wilson's phalaropes, and seagulls were found. At the Fresh Water Reservoir yellow-legged shorebirds, grebes, stilts, coots, buffleheads, American Avocets, northern shovelers, ruddy ducks, cranes, mallards, sandpipers, and killdeers were observed. The total number of waterfowl observed on the evaporation ponds was approximately 500 during the study, much less than the concentration the previous year when bird deaths occured. The number of waterfowl observed on the Fresh Water Reservoir was approximately 2000 over the monitoring program.

As noted below, the evaporation ponds support a food chain which produces brine shrimp and water boatmen which birds can consume. We considered whether the food chain could represent a hazard to the birds through the incidental ingestion of salts and other elements in the evaportation pond water. Grebes and Wilson's phalaropes are two birds which visited the evaporation ponds and are known to consume brine shrimp. For grebes ingestion of salt while feeding on brine shrimp or other invertebrates is not a physiological problem even at the upper salinity limits for brine shrimp. Grebes apparently meet their water requirements with water obtained from their food, and swallow minimal amounts of saltwater while ingesting their food. They can consume up to 70,000 brine shrimp/day during August through October at Mono Lake, California (Mono Basin Ecosystem Study Committee, 1987).

Wilson's phalaropes also consume brine shrimp, but no quantitative information was available on their feeding habits in hypersaline waters. They avoid incurring a salt load by minimizing their ingestion of salt water, but show enlarged salt glands after intensive feeding, indicating some salt is taken in. Therefore, availability of freshwater is important and they are known to visit freshwater sources morning and evening for a 2 week period prior to migration from Mono Lake (Mono Basin Ecosystem Study Committee, 1987). Palo Verde does have a nearby freshwater source (the Receiving Facility). Hence, the ponds are not likely to present a hazard to birds from salt ingestion.

1.2 Brine Shrimp

Brine shrimp, *Artemia* are found in the Palo Verde evaporation ponds from May to August and are most abundant from May to July. Brine shrimp are obligate filter feeders and consume algae and bacteria. They can become abundant in hypersaline ponds because predators are reduced. However, they can typically over-populate and exceed the carrying capacity of such systems. This was evident in the evaporation ponds in summer, 1996, when the brine shrimp reduced the aglae counts to very low levels. When this occurs adult brine shrimp succumb to starvation but first produce over-wintering cysts which can lie dormant until conditions are right. The evaporation ponds contained numerous cysts in fall, 1995 and summer, 1996.

In 1996 we estimtated that brine shrimp produce a total of 1,100 metric tons of biomass, wet weight, in Pond 1 and 440 metric tons of biomass in Pond 2 during a 3 month period (May, June and July). Brine shrimp are food for waterfowl as well as waterboatmen, genus *Trichocorixa*, in the evaporation ponds.

1.3 Waterboatmen

Adult Waterboatmen genus *Trichocorixa* were observed in Pond 1 on all occasions except for March and April and were most abundant from August through October. For Pond 2, adult waterboatmen were observed during all months except January through May and were most abundant from September through

November.

Waterboatmen are aquatic insects from the family Corixidae. Most corixids are freshwater insects, but 12 genera thrive in saline water. Of these, the genus *Trichocorixa* is the most tolerant and can live in hypersaline pools (Aiken and Malatestinic, 1995). Therefore, the waterboatmen are likely to persist in these ponds. Waterboatmen genera can be herbivores, predators or both. The genus in the evaporation ponds is predaceous, however, feeding on artemia by piercing and eating its prey. These water bugs can be important biological control agents, feeding on mosquito larvae and adults. We observed *Trichocorixa* feeding on *Artemia*, and waterfowl consuming *Trichocorixa*.

1.4 Algae

Total algae numbers were high to moderate from July through April in both Evaporation Ponds but declined in May and June due to grazing by brine shrimp. *Chaetoceros*, *Nitzschia* (marine diatoms) and *Coccochloris* (a small blue-green algae typically found in warm, hypersaline ponds) were the most commonly found algae in the Evaporation Ponds while *Anacystis* (a blue-green), *Pediastrum* and *Staurastrum* (both colonial green algae) were most commonly found in the Fresh Water Reservoir.

Algal abundance was always greater in the Evaporation Ponds than in the Fresh Water Reservoir except during May and June, when the brine shrimp inhabited the Evaporation Ponds. Algal abundance ranged from 1,200 to 134,000 c/ml for the Fresh Water Reservoir and ranged from 400 to 654,000 c/ml in the evaporation ponds. The high algae population in the Evaporation Ponds was apparently due to the high nutrient levels, especially the high levels of nitrate (see latter section).

1.5 Food Chain

During our monitoring we have identified a food chain at work in the evaporation pond which consists of all the above biological components: birds, brine shrimp, waterboatmen and algae. Therefore, these ponds produce feeding habitat for waterfowl. This is a normal food chain, found in coastal and estuarine basins as well as inland saline lakes such as Mono Lake. The safety of this food chain at the Palo Verde facility has not been established, but the algae that were identified are not commonly toxic. Algal toxins that sometimes bioaccumulate and cause wildlife damage are produced mainly by dinoflagellate blooms, and this type of algae bloom was not encountered in these ponds. A concern with evaporation ponds is that heavy metals can transdfer up the food chain. That was not directly addressed in our monitoring program. However, except for selenium (discussed latter), heavy metals and other elements that are of concern elsewhere were below detection limits in these ponds.

2.0 Water Quality

At each sampling period, water quality parameters that could affect the growth of algae were measured. Graphs at the back of the report show levels of salinity, pH, ammonia, nitrite, nitrate and phosphate for each pond at each sampling date. Each data point is the average of several determinations on samples taken throughout each pond.

2.1 Salinity and pH

The Evaporation Ponds were hypersaline throughout the study. At the begining of the study Pond 2 had been receiving most of the incoming effluent and salinity levels in the two ponds were approximately equal. After Pond 1 began receiving most of the flow, Pond 2 gradually became more saline than Pond 1, as expected, due to evaporation losses and lack of dilution by incoming water. Near the end of the study the flow into the ponds became more equal, and the salinities began to converge. However, both ponds were more saline at the end of the study than at the beginning. Pond 1 rose from 58 ppt to 65 ppt and Pond 2 rose from 52 ppt to 62 ppt. This is expected, since there is continual salt loading from the incoming water and continual evaporation losses of water from the ponds. The ponds are 50-75% more saline than ocean water, hence are classified as hypersaline. However, the ponds are not yet so saline that they cannot support algae and higher organisms, as noted above. The Receiving Pond was non-saline throughout the study (under 2 ppt). All three ponds were alkaline (pH 8.5-9.8). The highest pH levels (above 9.0) were probably due to intense algae growth, raising the pH through uptake of carbon dioxide.

2.2 Nitrogen Levels

The Evaporation Ponds had moderate but non-toxic levels of ammonia in the surface water (1-5 ppm) and ammonia levels in the Receiving Pond were always under 1 ppm. The Evaporation Ponds had a spike of high nitrite levels at the beginning of the study but levels were typically under 5 ppm; levels were under 0.5 ppm in the Receiving Reservoir. The presence of ammonia and nitrite in the surface water of the Evaporation Ponds indicates that the water in the ponds is not completely aerobic. The bottom of the pond apparently is anaerobic and generates reduced nitrogen compounds which can be detected in the surface waters.

Nitrate levels in the Evaporation Ponds were consistently high (250-600 ppm). These high levels are related to the original water source: treated sewage plant effluent. The original nitrate (approximately 5 ppm in the Receiving Pond) becomes concentrated through operation of the cooling tower and further evaporation of water in the Evaporation Ponds. Even the highest levels are non-toxic for causal exposure to wildlife -- nitrate levels can accumulate to the same high levels in aquacualture systems. The main effect of the high nitrate levels is to support abundant algae blooms in the Evaporation Ponds and to create a food chain that attracts birds.

2.3 Phosphate Levels

Phosphate was present in all three ponds throughout the study but at relatively low levels (0.05-0.4 ppm). Phosphate can be a limiting nutrient in aquatic ecosystem, but these levels were high enough to support abundant algae growth in the ponds.

2.4 Water Quality Concerns Due to Biomagnification

Biomagnification is the process by which a chemical in an organism accumulates to levels higher than in an external source. For example, food organisms (algae, etc.) are consumed by a predator which digests and releases the readily available carbohydrates, proteins and fat, but accumulates the resistant contaminant chemicals. Repetitions of this process in the food chain can lead to progressive increases in the concentration of the contaminant chemical. Contaminants can be at safe levels in water, but appear at toxic levels in the top food chain, resulting in poisoning to top predators such as waterfowl.

An element of possible concern is selenium, which is present in the Evaporation Ponds at levels too low to cause direct damage (0.030 mg/liter in Pond 1 and 0.041 mg/liter in Pond 2 during the fourth quarter of 1994), but they exceed the levels that are considered potentially hazardous to waterfowl in evaporation ponds if bioconcentration occurs. Both waterboatmen and *Artemia* have the potential to bioaccumulate and transfer toxic elements (heavy metals among others). Experiments by Petrucci et al. show that for *Artemia*, the cysts have a greater capacity to bioaccumulate Se than the adults (Petrucci et al., 1995).

We sampled the *Artemia* populations in Ponds 1 and 2 during the summer, 1996 bloom and have submitted the samples to a laboratory for Se analysis. Results will be communicated to you as soon as they are received.

3.0 Conclusions and Recommendations

This monitoring program was initiated due to a previous (1994) episode in which large numbers of migratory waterfowl died in the vicinity of the Evaporation Ponds. Similar die-offs have occured elsewhere during the migration season; several tens of thousands of grebes died the same year at the Salton Sea, and similar to the Palo Verde incident, no definitive cause of death was identified at the time, nor subsequently (U.S. Fish & Wildlife Service, private communition). Our results at the Palo Verde facility have not discovered any acute toxic conditions which could explain the earlier bird mortalities. No large-scale mortalities occured during 1995-1996, nor did we find any toxic algae that could explain the earlier die-off. The ponds are dominated by marine diatoms and blue-green algae commonly found in coastal saline ponds in nature. The algae support a food chain of *Artemia* and waterboatmen that make the ponds an attraction to visiting and resident birds. 1995-1996 was different from 1994 in that the migration season was latter and large numbers of visiting birds did not visit the ponds.

The potential bioaccumulation of toxins may or may not become a hazard in these ponds. We suggest that organisms such as waterboatmen and brine shrimp be collected and assayed during periods when they are available to waterfowl. This would create a body of data that could establish the safety of these ponds. If the food chain is found to be safe, the ponds could be regarded as an asset to wildlife, because the very large biomass of artemia the ponds support make the ponds an important feeding station for birds, especially when the *Artemia* bloom persists into the migration season.

4.0 References

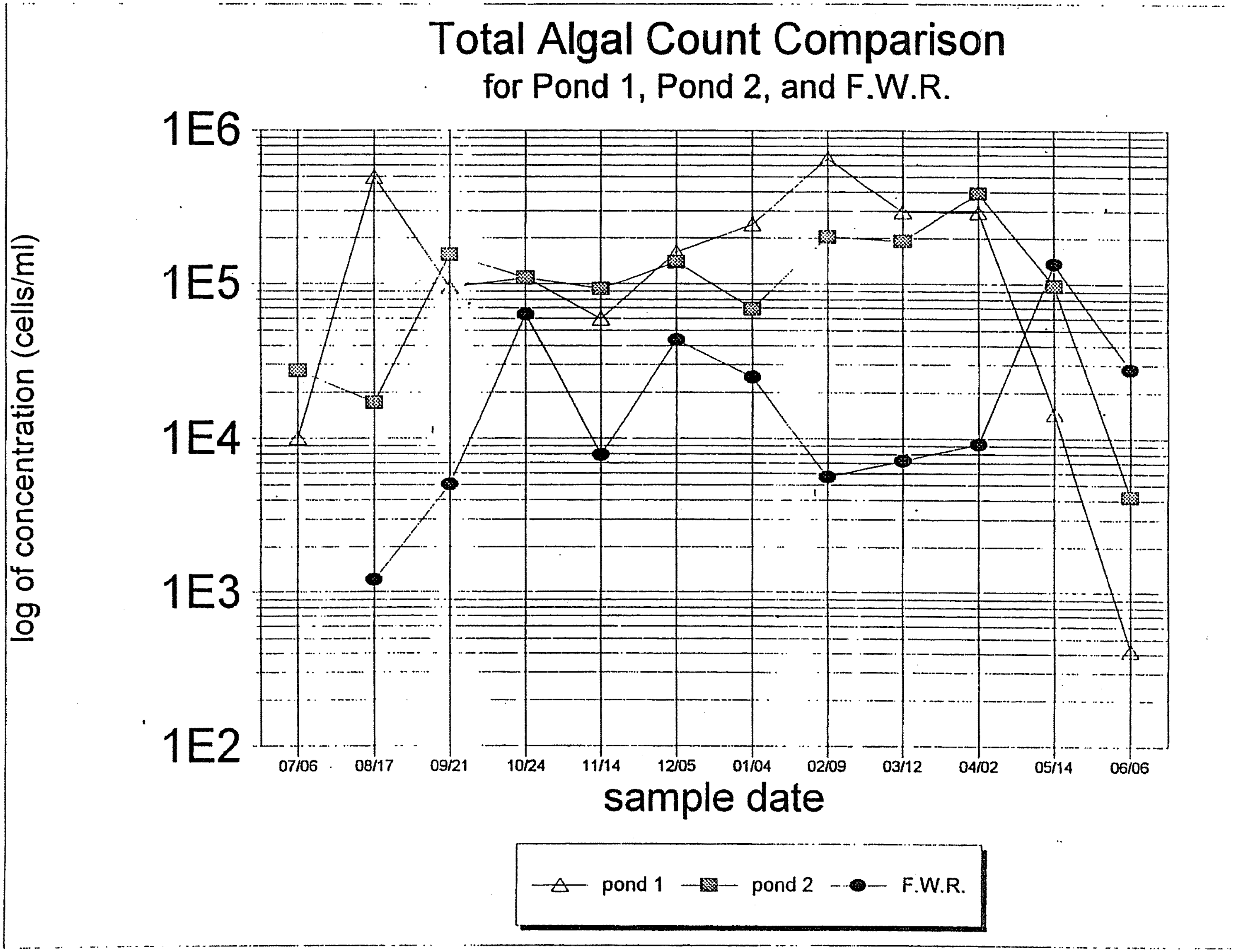
Mono Basin Ecosystem Study Committee. 1987. The Mono Basin Ecosystem; Effects of Changing Lake Levels. National Academy Press, Washington, 272 pp.

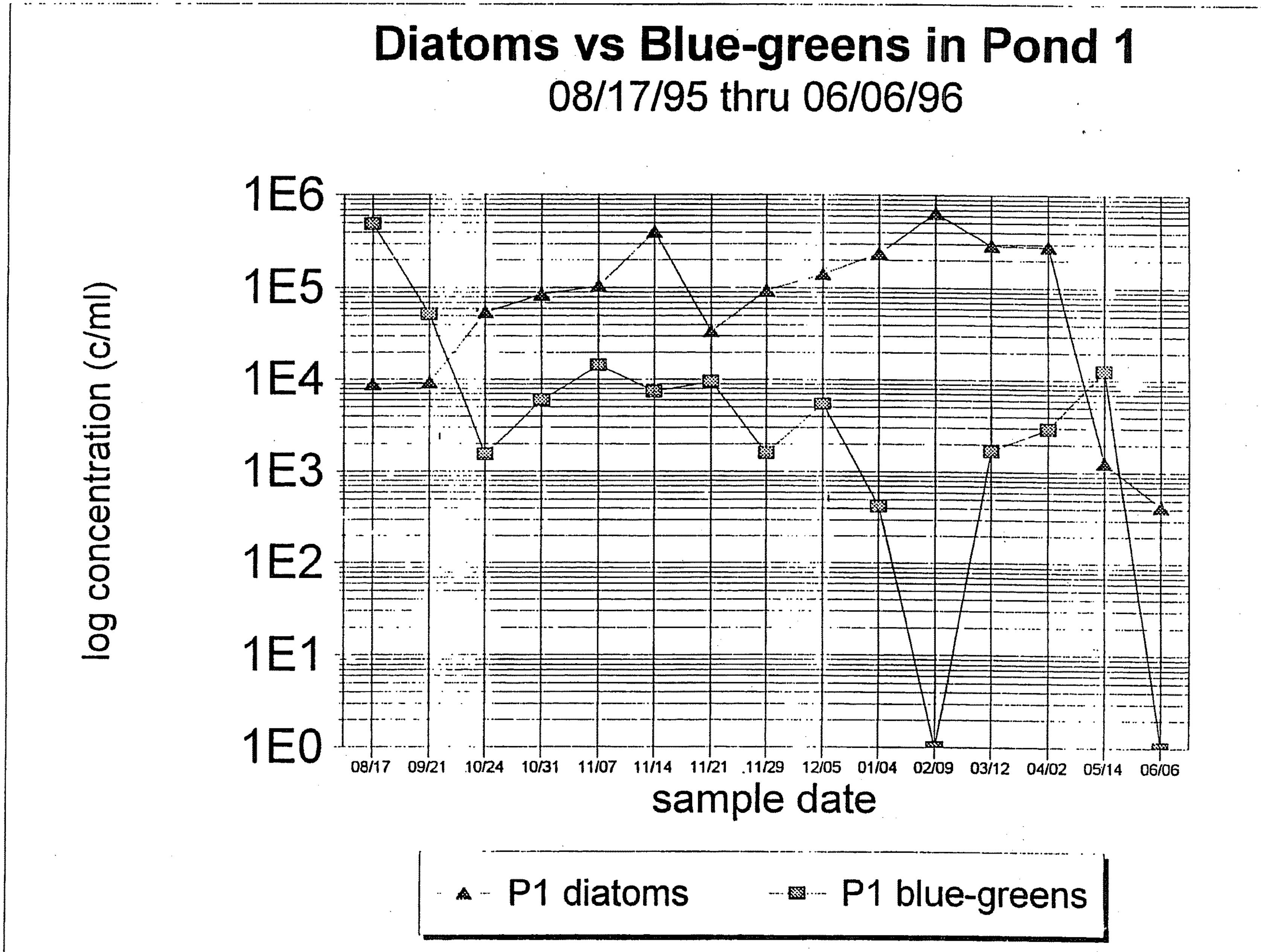
Petrucci, F., S. Caimi, G. Mura and S. Caroli. 1995. *Artemia* as a bioindicator of environmental contamination by trace elements. Microchem. J. 51: 181-186.

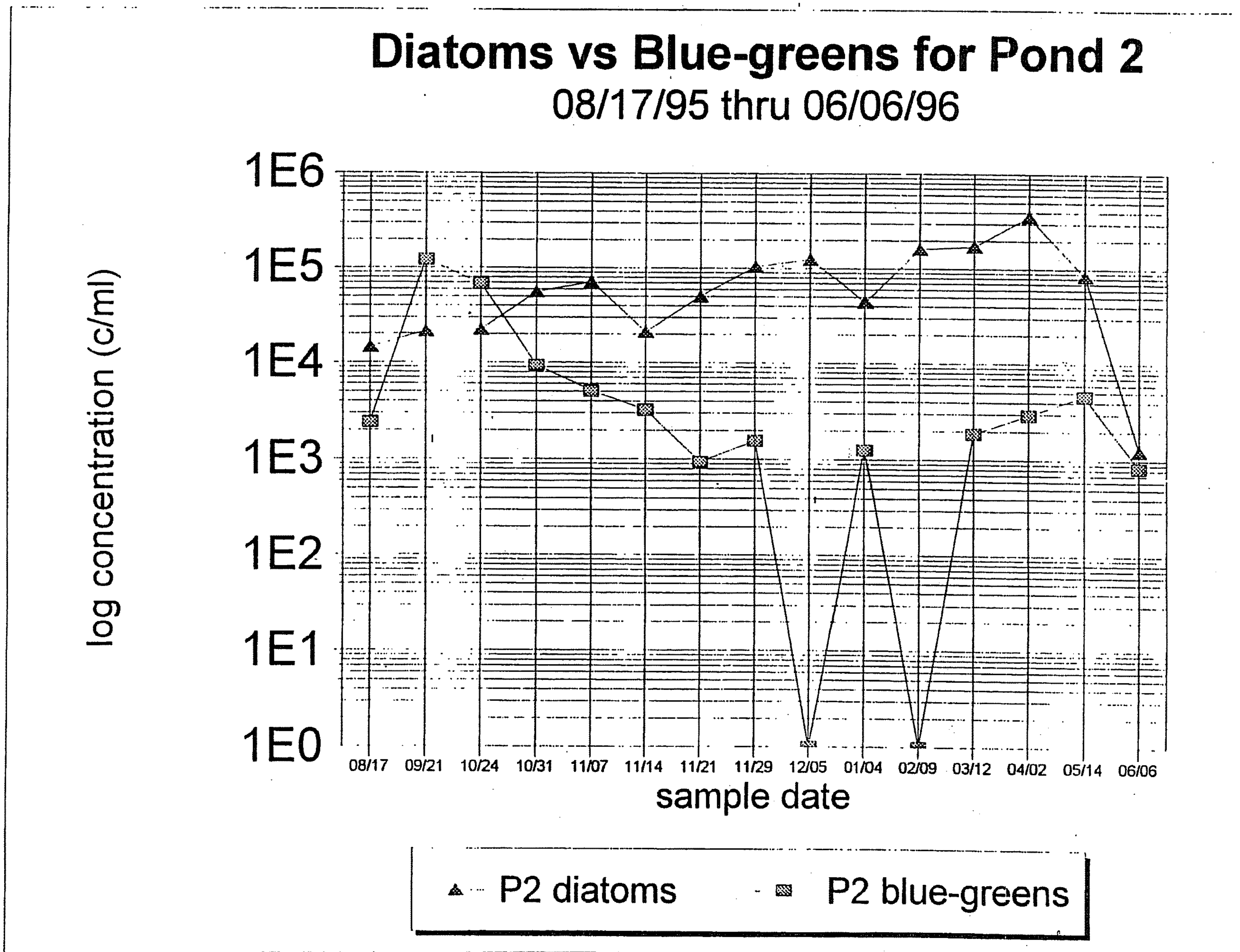
Aiken, R. B. and N. Malatestinic. 1995. Life history, gonad state and changes in functional sex ratio in the salt-marsh waterboatman, *Trichocorixa verticalis* (Fieber) (Heteroptera: Corixidae). Can. J. Zool. 73: 552-556.

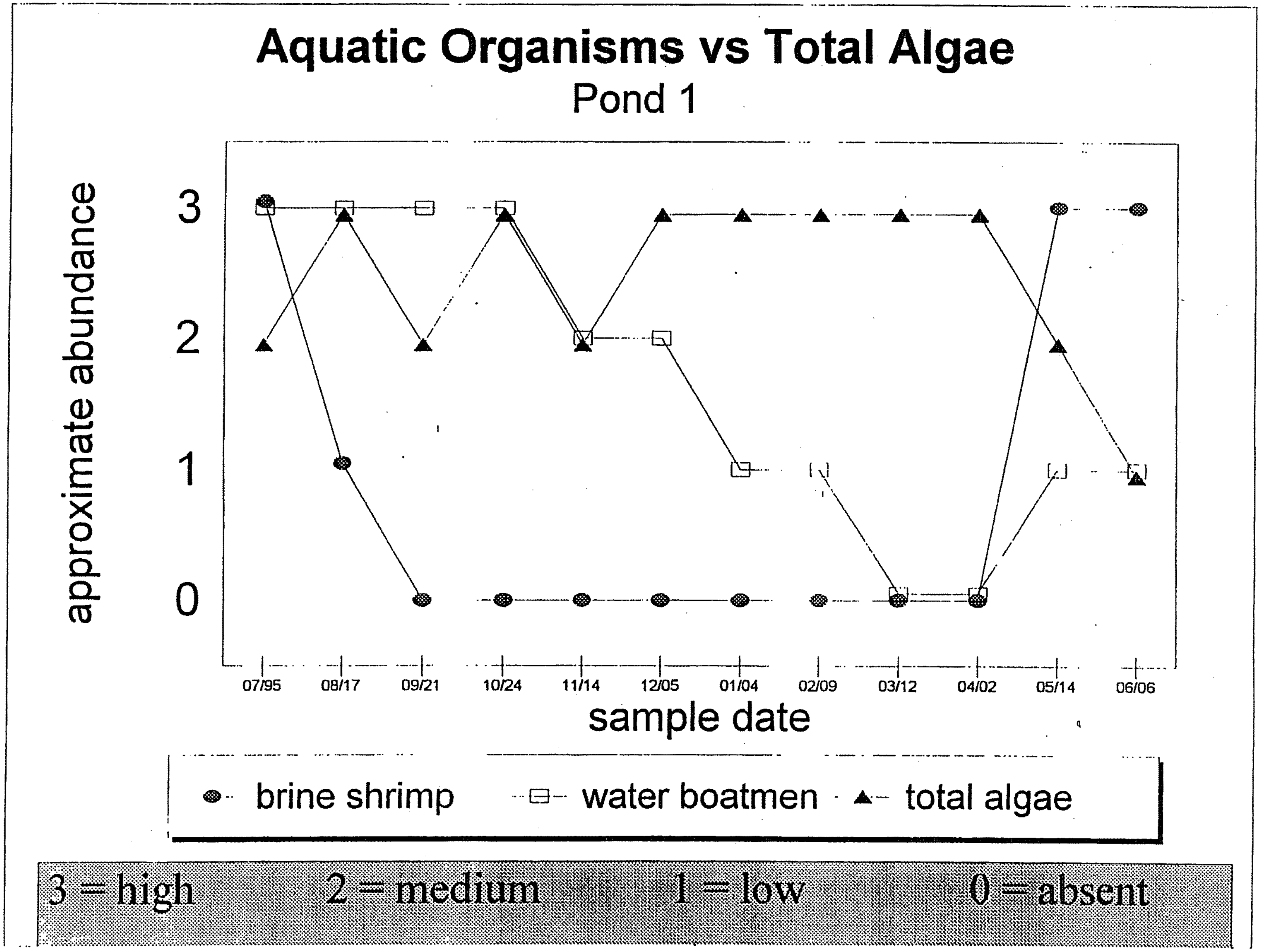
Connell, D. W. 1990. Bioaccumulation of Xenobiotic Compounds. CRC Press, Boca Raton, Florida.

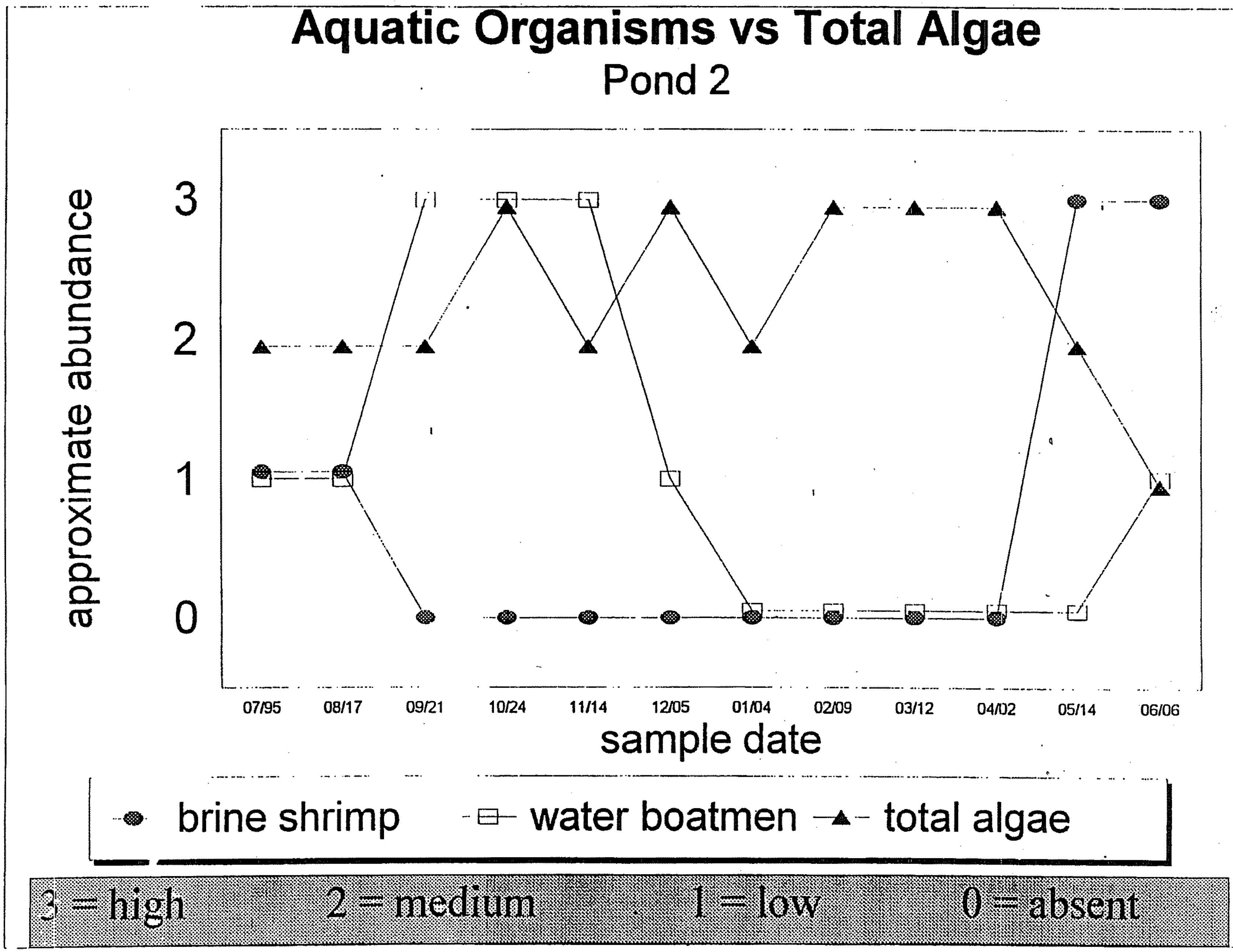
Renee Tanner | Ed Glenn | David Moore


Total Algal Count Comparison
for Pond 1, Pond 2, and F.W.R.
1E6
1E5
1E4
1E3
1E2
log of concentration (cells/ml)
07/06
08/17
09/21
10/24
11/14
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.

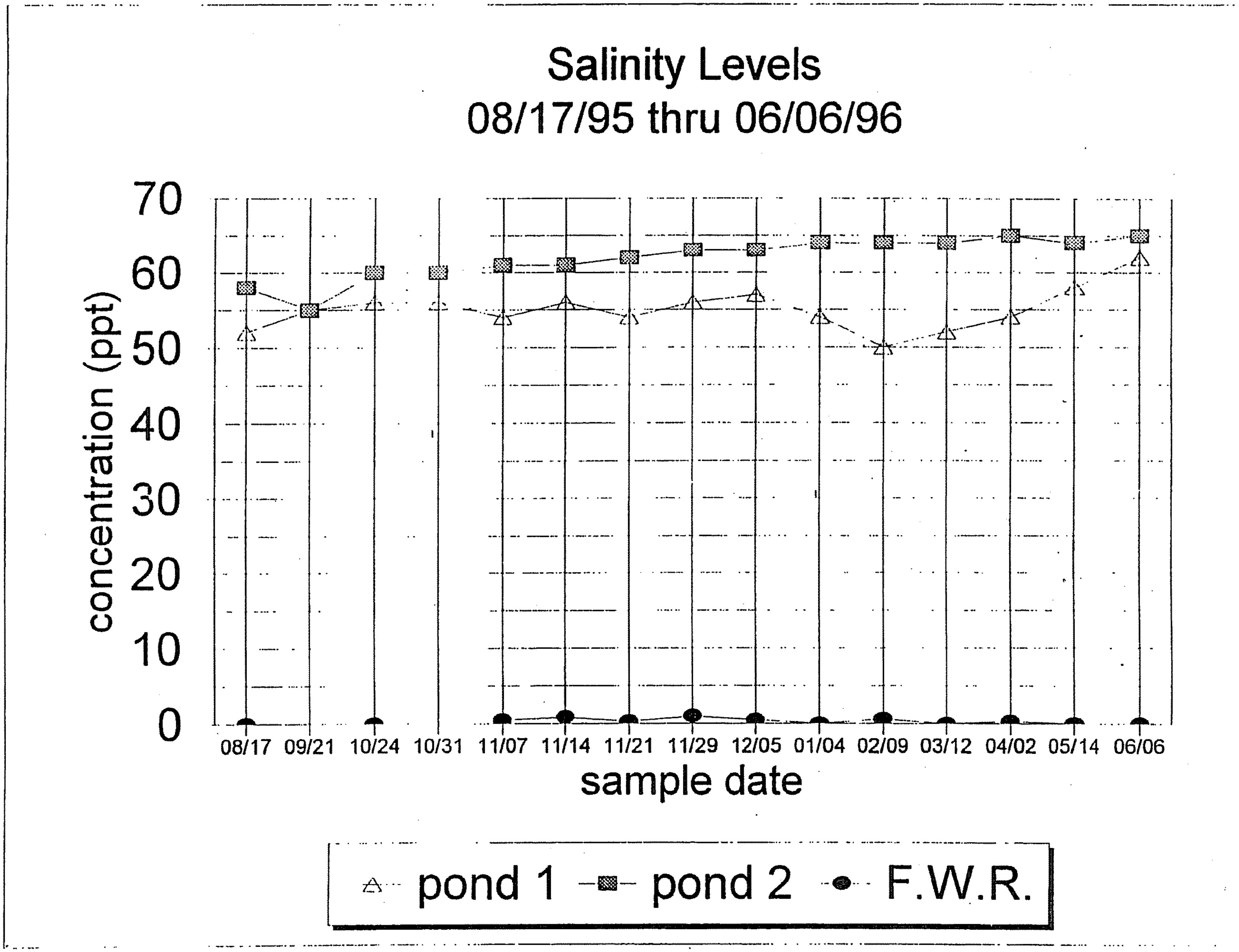

Diatoms vs Blue-greens in Pond 1
08/17/95 thru 06/06/96
log concentration (c/ml)
1E6
1E5
1E4
1E3
1E2
1E1
1E0
08/17
09/21
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
P1 diatoms
P1 blue-greens


Diatoms vs Blue-greens for Pond 2
08/17/95 thru 06/06/96
1E6
1E5
1E4
1E3
1E2
1E1
1E0
log concentration (c/ml)
08/17
09/21
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
P2 diatoms
P2 blue-greens

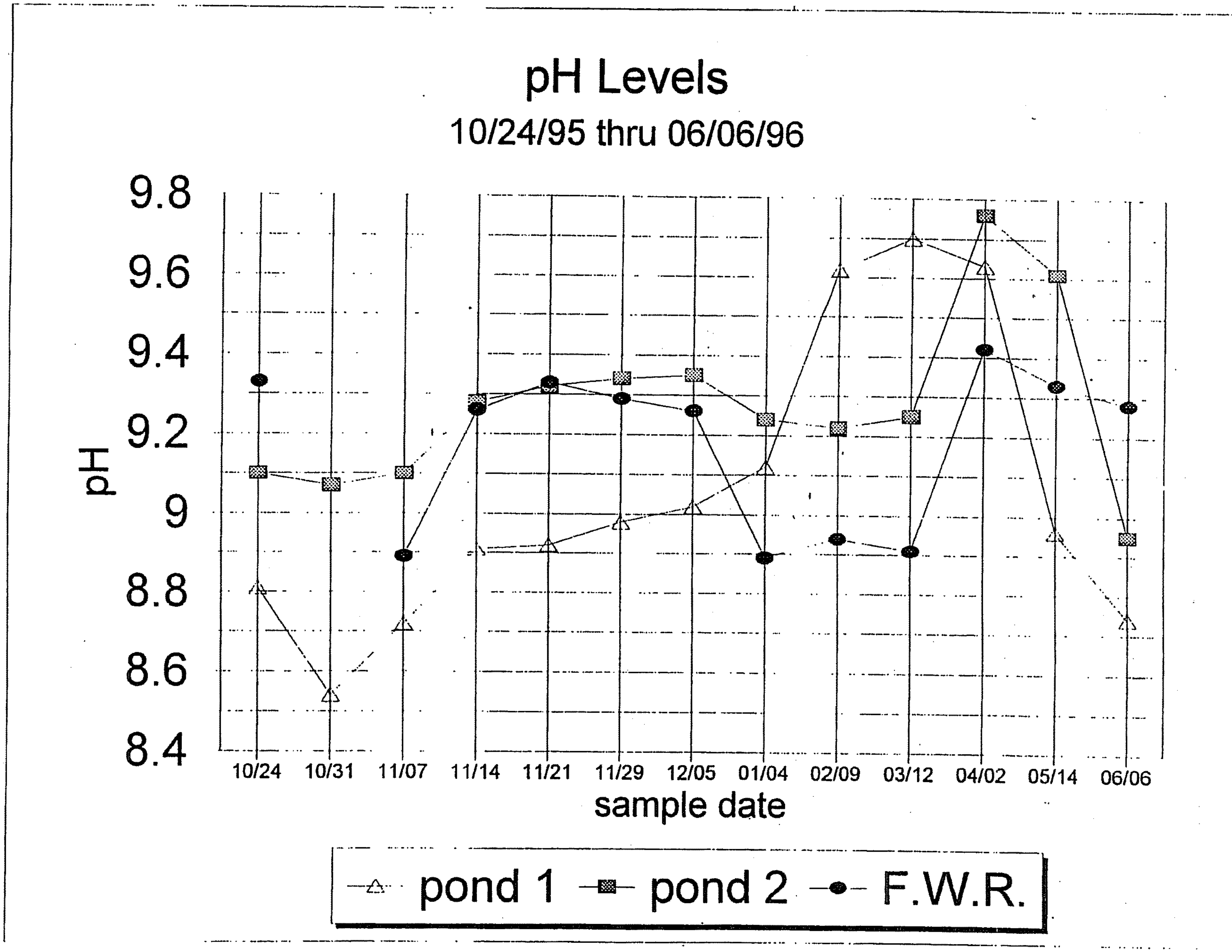

Aquatic Organisms vs Total Algae
Pond 1
approximate abundance
3
2
1
0
07/95
08/17
09/21
10/24
11/14
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
brine shrimp
water boatmen
total algae
3 = high
2 = medium
1 = low
0 = absent

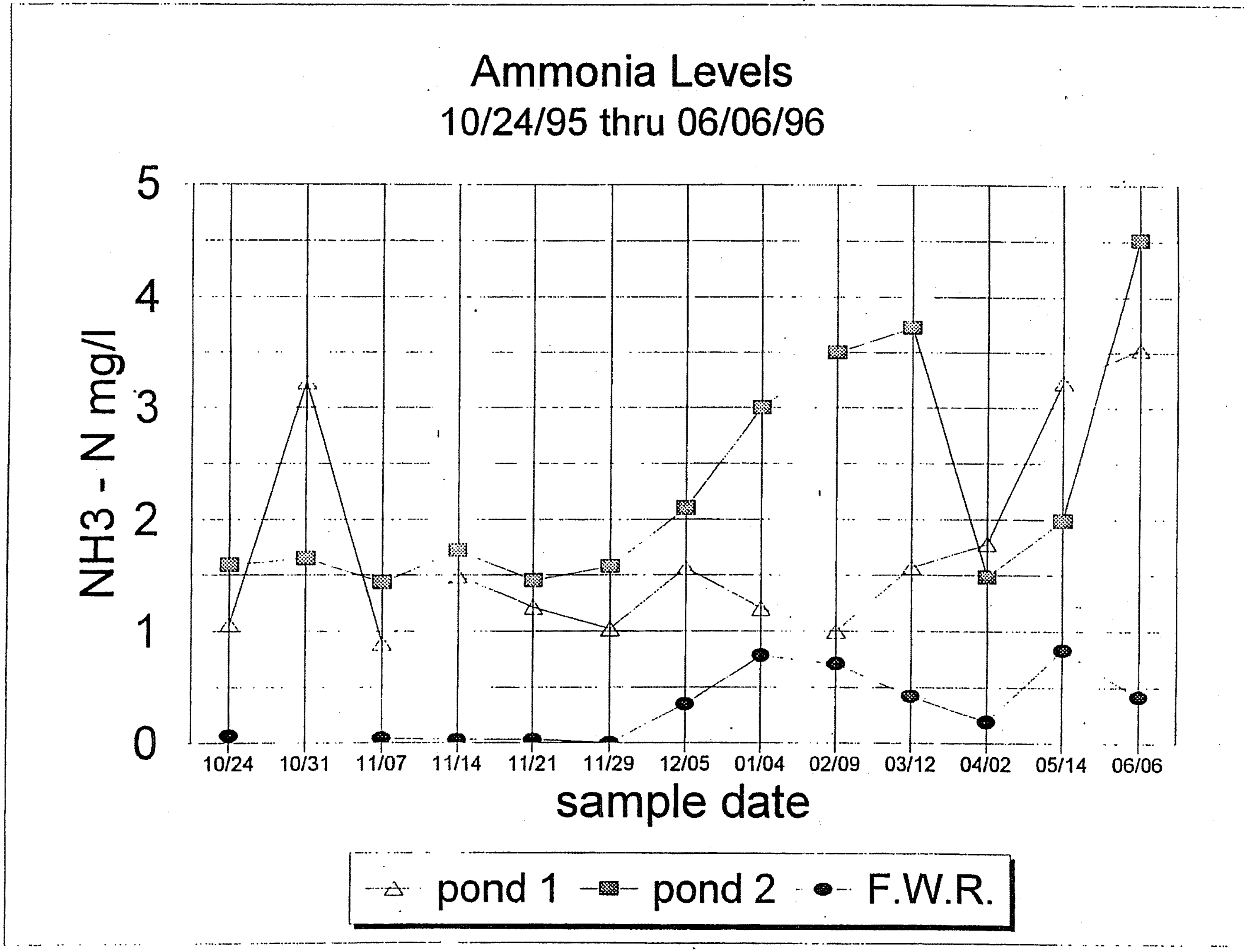


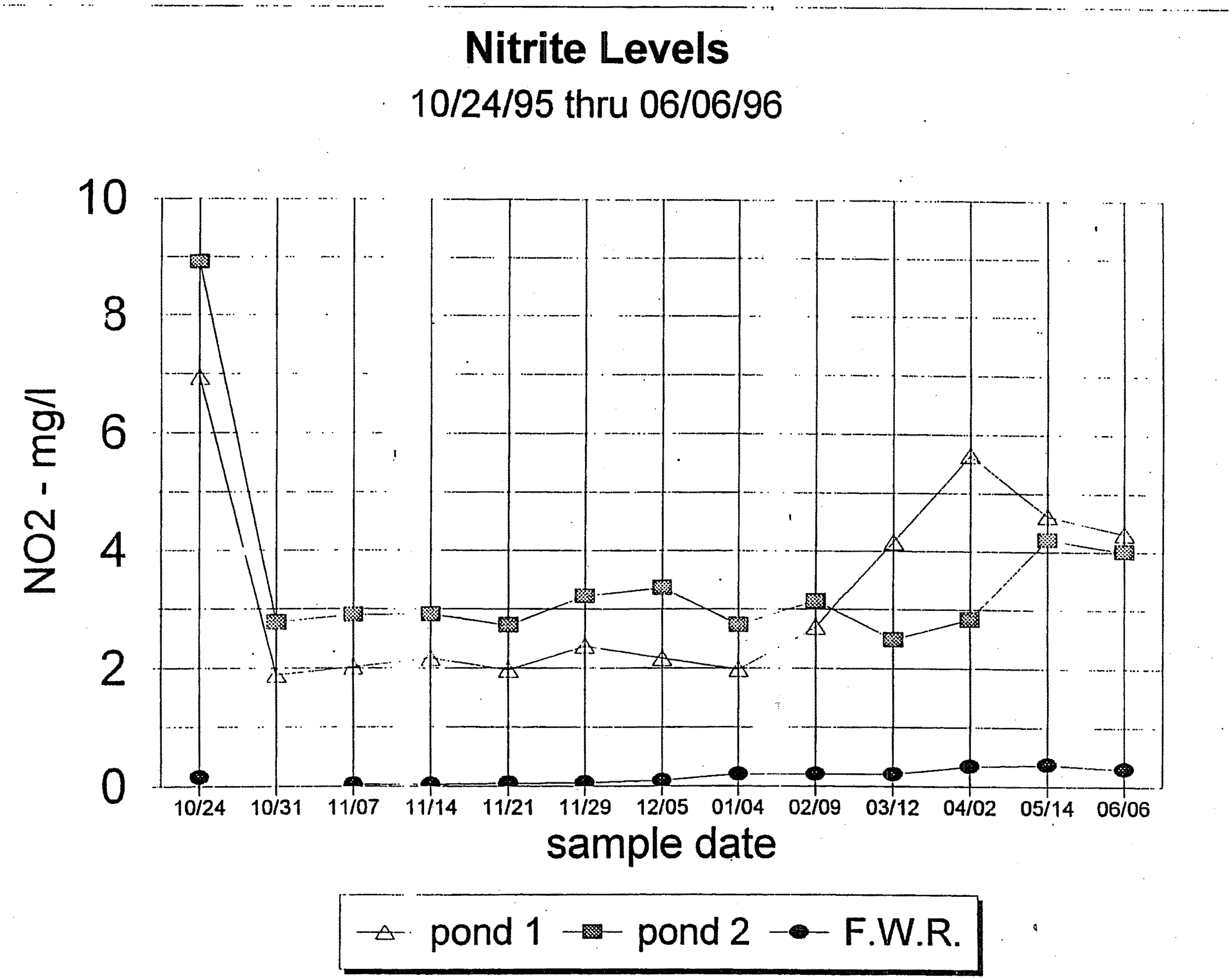
Aquatic Organisms vs Total Algae
Pond 2
approximate abundance
3
2
1
0
07/95
08/17
09/21
10/24
11/14
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
brine shrimp
water boatmen
total algae
3 = high
2 = medium
1 = low
0 = absent

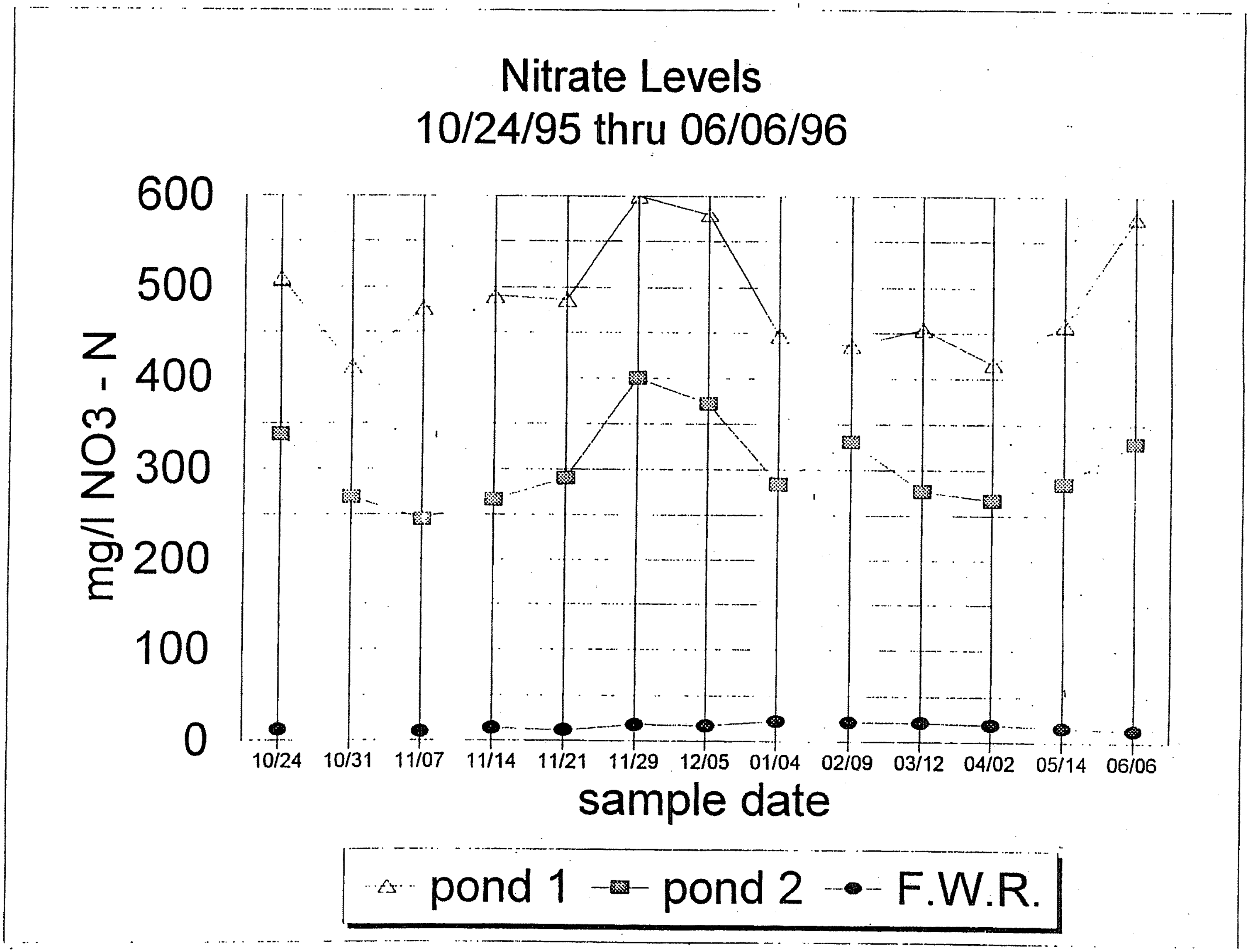


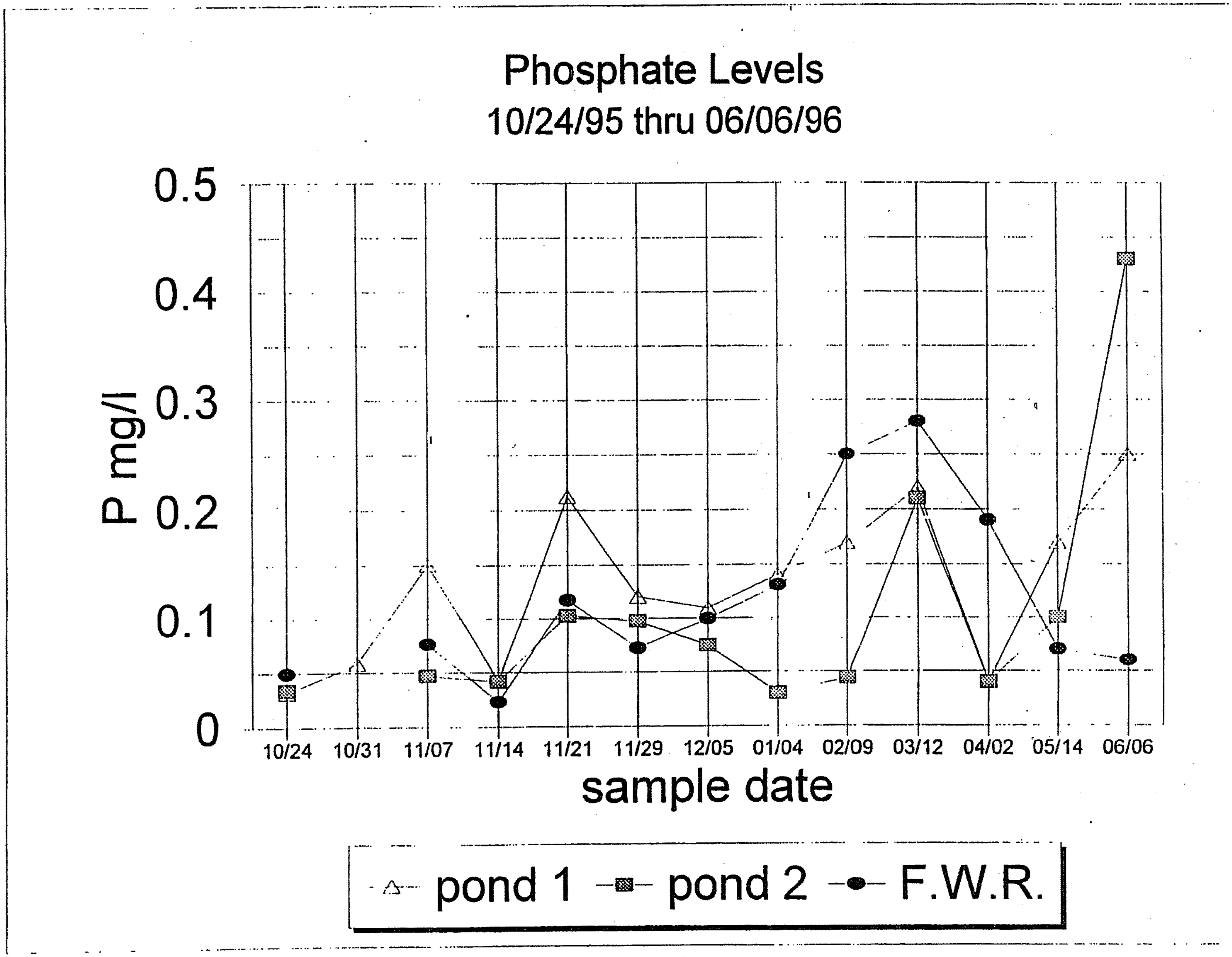
Salinity Levels
08/17/95 thru 06/06/96
concentration (ppt)
70
60
50
40
30
20
10
0
08/17
09/21
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.


pH Levels
10/24/95 thru 06/06/96
9.8
9.6
9.4
9.2
9
8.8
8.6
8.4
pH
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.


Ammonia Levels
10/24/95 thru 06/06/96
NH3 - N mg/l
5
4
3
2
1
0
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.


Nitrite Levels
10/24/95 thru 06/06/96
NO2 - mg/l
10
8
6
4
2
0
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.


Nitrate Levels
10/24/95 thru 06/06/96
mg/l NO3 - N
600
500
400
300
200
100
0
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.



Phosphate Levels
10/24/95 thru 06/06/96
P mg/l
0.5
0.4
0.3
0.2
0.1
0
10/24
10/31
11/07
11/14
11/21
11/29
12/05
01/04
02/09
03/12
04/02
05/14
06/06
sample date
pond 1
pond 2
F.W.R.

July 25, 1996

Memo to: Tom Hillmer

Re: Selenium analyses on water and brine shrimp from Evap. Ponds 1 & 2.

We received the following results from Laboratory Consultants, Ltd. (Tempe).

Water Samples	Selenium (mg/liter or ppm)
Pond 1 Center	<0.05
Pond 1 NW	<0.05
Pond 1 SE	<0.05
Pond 2 NE	<0.05
Pond 2 Center	<0.05
Pond 2 SW	<0.05

Brine Shrimp	Selenium (ug/g dry wt or ppm)
Pond 1 #1	1.51
Pond 1 #2	1.01
Pond 2	2.02

The water samples were filtered before analysis. The results are consistent with your previous analyses of 0.01-0.02 ppm which used a more sensitive method than Laboratory Consultants.

The brine shrimp did not have elevated levels of Se. Levels of 2-3 ug/g are considered normal for food chain organisms in uncontaminated western wetlands according to the following two sources and your levels were somewhat lower.

1. Ohlendorf, H., R. Hothem, C. Bunck and K. Marois. 1990. Bioaccumulation of selenium in birds at Kesterson Reservoir, California. Archives of Environmental Contamination and Toxicology 19: 495-507.

2. Presser, T., M. Sylvester and W. Low. 1994. Bioaccumulation of selenium from natural geologic sources in western states and its potential consequences. Environmental Management 18: 423-436.

Regards,

Ed Glenn

Ed Glenn

ARIZONA VETERINARY DIAGNOSTIC LABORATORY

FEE SCHEDULE - effective July 1, 1995

PATHOLOGY

A. Necropsy fees include gross evaluation, disposal, and routine histopathology. Additional fees will be charged for microbiologic and toxicologic studies according to this schedule. Special necropsy procedures and insurance cases will also require additional fees by arrangement.

1.	Aborted fetuses, puppies and kittens, rodents, small exotics or wildlife, avian, ratites under 4 wks	$30.00
	Ratites over 4 wks	60-90.00
2.	Feline, canine (over 6 months of age)	60-90.00
3.	Domestic livestock (bovine, caprine, porcine, ovine)	
	<100 lbs	30.00
	100-500 lbs	50.00
	>500 lbs	80.00
4.	Horses <200 lbs	60.00
	<500 lbs	100.00
	>500 lbs	200.00
5.	Other (large wildlife, zoo, research, etc.)	by arrangement

B. Histopathology

1.	1-2 tissues	15.00
2.	3-5 tissues	20.00
	Over 5 tissues	25.00
3.	Special stains (per slide)	5.00
4.	Extra slides only	4.00
5.	Cytology	15.00

C. Electron microscopy ..... by arrangement

MICROBIOLOGY

A. Bacteriology

1.	Culture (aerobic)	8.00
2.	Culture (anaerobic)	10.00
3.	Culture (necropsy), maximum	20.00
4.	Antibiotic sensitivity (Kirby-Bauer disc)	4.00
5.	Microscopic examination (smear)	5.00
6.	Fungal cultures	10.00
7.	Mycoplasma culture	8.00
8.	Chlamydia	
	Microscopic exam	5.00
	Isolation (Tissue culture or chicken embryo)	15.00
9.	Vibrio culture	5.00
10.	Trichomonas culture (Incl. culture pouch)	6.00
11.	Clostridium spp.	
	Fluorescent Ab procedure	5.00/species
12.	Biological test (Clostridial Toxins I.D. or other)	30-50.00

B. Virology

1.	Virus isolation (tissue culture/grp)	15.00
2.	" " (Necropsy, maximum)	20.00
3.	Virus identification (Electron microscopy, negative staining)	20.00
4.	Fluorescent Ab techniques on blood smears (FeLV)	10.00
5.	Fluorescent Ab technique (smears or frozen sections) (TGE, IBR, BVD, PRV etc.)	10.00

C. Serology

1.	PRV (serum neutralization)	4.00
2.	BVD " "	5.00/4.00

3.	IBR " "	5.00/4.00
4.	PI_3 " "	5.00/4.00
5.	BRSV " "	5.00/4.00
6.	Equine rhinopneumonitis (serum neutralization)	5.00
7.	Canine parvovirus (HI)	5.00
8.	<u>Leptospira</u> spp. (pomona, icterohemorrhagiae, hardjo gryppotyphosa, canicola (microscopic agglutination)	10.00/5.00
9.	Bovine abortion screen (<u>Leptospira</u> sp.,) <u>Vibrio</u> sp., IBR, BVD)	12.00/10.00
10.	<u>Brucella</u> <u>ovis</u> (ELISA)	5.00
11.	Avian Influenza (AGID)	7.00
12.	S. Pullorum (Aggl.)	7.00
13.	Blue Tongue (AGID)	4.50
14.	EHD (AGID)	4.50
15.	<u>Ehrlichia</u> <u>canis</u> and <u>Babesia</u> <u>canis</u> IFA combined (same sample)	Consult
	<u>Ehrlichia</u> <u>canis</u> IFA	Consult
	<u>Babesia</u> <u>canis</u> IFA	Consult
16.	Others	Co[illegible]

PARASITOLOGY

1.	Fecal flotation	7.00/5.00
2.	Skin scraping, maceration	8.00
3.	Blood cell parasites	8.00
4.	Giardia cysts, Cryptosporidia (FA)	15.00

TOXICOLOGY

TEST	SAMPLE	PRICE
AFLATOXINS	feeds	(by arrangement)
ALKALOIDS (TLC Screen)	urine, bait, serum, whole blood, stomach contents	$20
ALKALOIDS (GC/MS identification)	same as above	$40
AMMONIA	whole blood, rumen (Frozen)	$10
ANTICOAGULANTS	bait, stomach contents, liver	(by arrangement)
ARSENIC	liver, kidney, whole blood bait	$15
BARBITURATES	serum, urine, bait, stomach contents, tablet	$15
BUFOTENINE (TOAD POISONING)	stomach contents	$20
CADMIUM	whole blood, liver, kidney bait, stomach contents	$20
CALCIUM	serum, tissues, feeds	$10
CALCULI IDENTIFICATION	calculi	$15
CANTHARIDIN	alfalfa,urine, beetles rumen/stomach contents	(by arrangement)
CARBAMATE PESTICIDES	suspected source, brain, stomach contents, blood	$25
CARBON MONOXIDE	whole blood	$20
CHLORIDE	water, feed	$15
CHOLINESTERASE	whole blood, brain	$15
CHROMIUM	whole blood, suspect material, liver, kidney	$20
COPPER	[illegible]	$10/7
	liver, kidney, feed	$15
COPPER availability	feed [illegible]	$30

CYANIDE (qualitative)	water, bait, stomach contents, plants	$15
~~DRUG SCREEN (TLC)~~	~~stomach contents, urine, blood, suspect material~~	~~(by arrangement)~~
ETHYLENE GLYCOL	whole blood, urine, kidney, stomach contents, bait	$15
FLUORIDE	plants, water	$15
FORAGE MICROSCOPIC ANALYSIS	rumen contents, feces	(by arrangement)
FUMONISIN	feeds	(by arrangement)
GC/MS COMPOUND IDENTIFICATION	various (call)	$40-50
INDOLES	rumen contents	$15
IRON	serum, water, liver, kidney	$15
LEAD	plants, paints	$15
	liver, kidney, whole blood, H_2O	$25
MAGNESIUM	serum, plants, feeds	$15
MERCURY	liver, kidney, urine	$20
METALDEHYDE	bait, stomach contents	$10
MOLYBDENUM	feeds	$15
MYCOTOXINS	feeds	(by arrangement)
NITRATE (Qualitative)	plants, water, ocular fluid	$10
NITRATE (Quantitaive)	plants, water	$20
ORGANOCHLORINE PESTICIDES (Qualitative)	brain, rumen/stomach contents, suspect material	$30
ORGANOCHLORINE PESTICIDES (Quantitative)	same as above	$50
ORGANOPHOSPHORUS PESTICIDES (Qualitative)	brain, rumen/stomach contents, suspect material	$30
ORGANOPHOSPHORUS PESTICIDES (Quantitative)	same as above	$50
OXALATE	urine, kidney, plants	$25
pH	any fluid, rumen contents	$5
PHOSPHORUS	feeds, plants)	$15
	H_2O, serum	$10
PLANT IDENTIFICATION	fresh or dry pressed plant	$10
PLANT TOXINS	fresh plants	(by arrangement)
POTASSIUM	serum, water	$15
	feeds, plants	$20
SELENIUM	whole blood, serum, liver, plants	$15/10
SODIUM	brain, serum, feed	$10
STRYCHNINE	stomach contents, suspect material, urine	$25
SULFATE	water	$10
THALLIUM	whole blood, liver, kidney, suspect material	$20
UREA	serum, feeds	$15
VITAMIN A	serum	$10/7
VITAMIN E	serum	$10/7
ZINC PHOSPHIDE (qualitative)	suspect material, stomach contents	$15
ZINC	serum, plasma(heparinized), liver, kidney, liver	$15

(Fees are discounted for large numbers of samples. Consult laboratory)

<u>FIELD TRIPS, TRANSPORTATION</u>

Field trip consultation is made by special arrangement. A trip charge is billed by the university; lab fees are additional. Airport and bus station pickup charges will also be assessed at our costs.

<u>Referral to other Laboratories</u>

Actual charges plus $5.00 handling fee

...sual order of increasing abun-
...ntrations of NO_2^- are seldom
...ls are low The proportion of
...ssed later. Concentrations of
...rably, but are seldom great in
... woodland ponds in Alabama,
... mg/liter as N and NO_3^- aver-
... used for intensive fish culture,
...en are common. Fed catfish
...ia-nitrogen and 0.25 mg/liter
...ntrations of total ammonia-N
...plications of fertilizer (Zeller,
..., 1975).[5]
...pounds and as a constituent of
...entrations of organic nitrogen
... natural waters. In fish ponds,
...ntrations of organic nitrogen

...o Ponds

...eral ... oncentrations
...decline ... 32). In fed
...rogen ... the water in
...d in particulate matter (Boyd,
...bviously assimilated by plants
...osited in bottom muds as a
... of inorganic nitrogen are also
...din *et al.*, 1974; Isirimah *et al.*,
...ation of NH_3 during periods of
...robably a major nitrogen loss
...igh. Muds also adsorb NH_4^+ on
...ve been few studies of the
... ponds.

...uilibrium

...fluence of pH on un-ionized
...nce When NH_3 is dissolved in

OH^-.

... decreases and decrease as pH
...lar pH may be calculated from
... for pH 8:

...r, NO_3^--N, means that the nitrate
...itrogen concentration. The molec-
... N is ..., so 0.5 mg/liter of NO_3^-
...0 + ...) = 2.21 mg/liter]. Other
...$O_4^=$-S, NO_2^--N, etc.

Post-it® Fax Note 7671

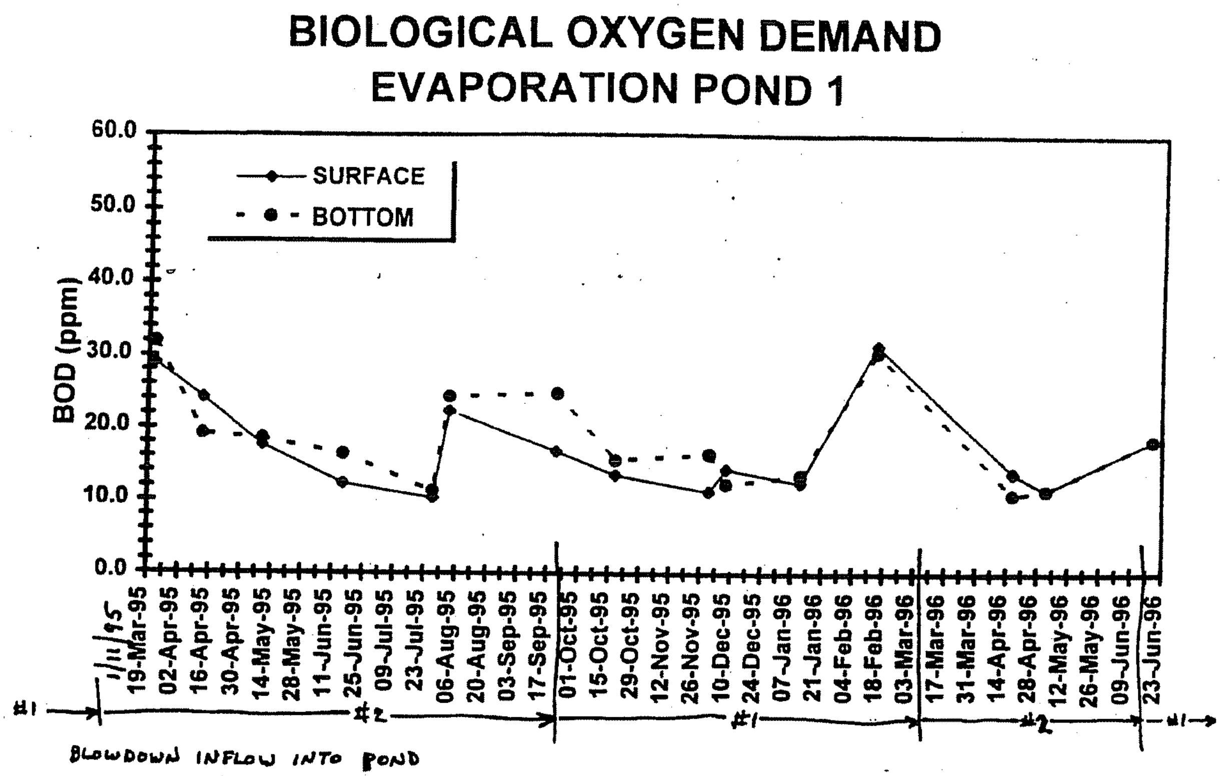
To Tom Hillner		Date	# of pages ▶ 1
Co./Dept APS-PUNGS		From Kevin Fitz	
Phone #		Co.	
Fax # 602-393-5879		Phone #	
		Fax #	

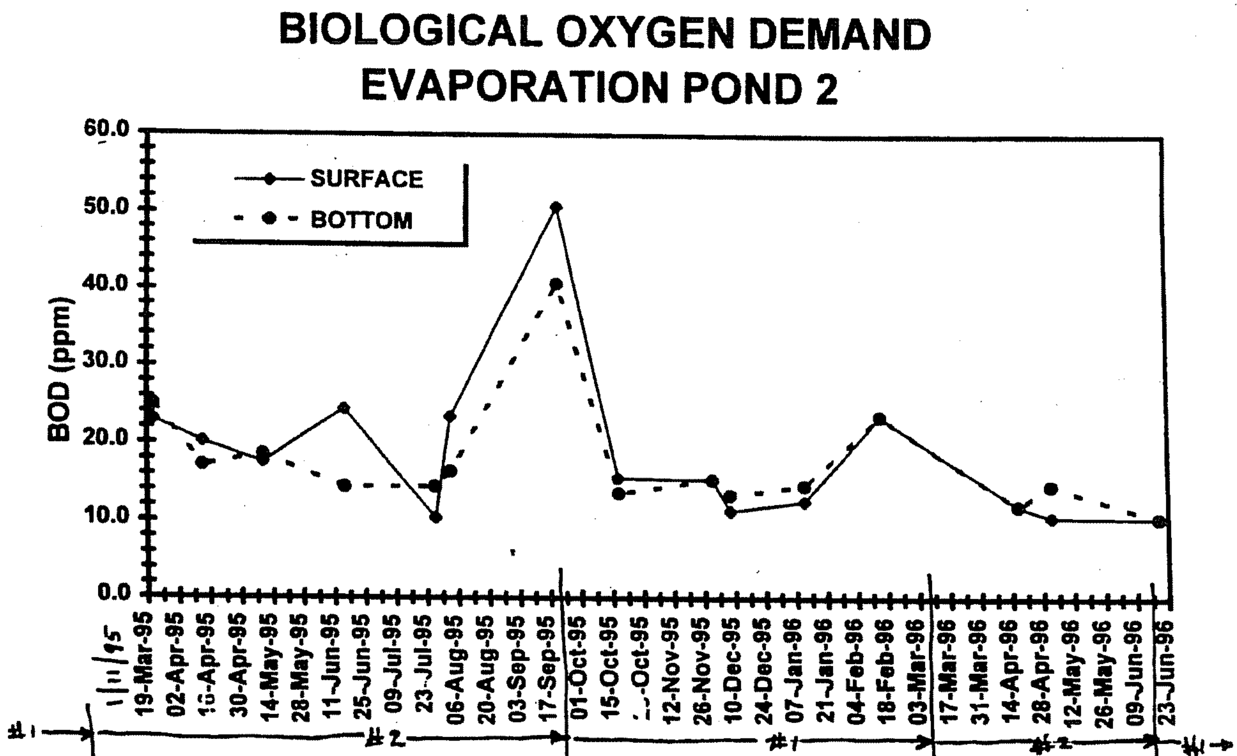
TABLE 2.9. PERCENTAGE UN-IONIZED AMMONIA IN AQUEOUS SOLUTION AT DIFFERENT pH VALUES AND TEMPERATURES

pH	Temperature °C								
	16	18	20	22	24	26	28	30	32
7.0	0.30	0.34	0.40	0.46	0.52	0.60	0.70	0.81	0.95
7.2	0.47	0.54	0.63	0.72	0.82	0.95	1.10	1.27	1.50
7.4	0.74	0.86	0.99	1.14	1.30	1.50	1.73	2.00	2.36
7.6	1.17	1.35	1.56	1.79	2.05	2.35	2.72	3.13	3.69
7.8	1.84	2.12	2.45	2.80	3.21	3.68	4.24	4.88	5.72
8.0	2.88	3.32	3.83	4.37	4.99	5.71	6.55	7.52	8.77
8.2	4.49	5.16	5.94	6.76	7.68	8.75	10.00	11.41	13.22
8.4	6.93	7.94	9.09	10.30	11.65	13.20	14.98	16.98	19.46
8.6	10.56	12.03	13.68	15.40	17.28	19.42	21.83	24.45	27.68
8.8	15.76	17.82	20.08	22.38	24.88	27.04	30.68	33.90	37.76
9.0	22.87	25.57	28.47	31.37	34.42	37.71	41.23	44.84	49.02
9.2	31.97	35.25	38.69	42.01	45.41	48.96	52.65	56.30	60.38
9.4	[illegible]	48.32	50.00	53.45	56.86	60.33	63.79	67.12	70.72
9.6	[illegible]	57.77	61.31	64.54	67.63	70.67	73.63	76.30	79.29
9.8	[illegible]	68.43	71.53	74.25	76.81	79.25	81.57	83.65	85.65
10.0	74.76	77.46	79.92	82.05	84.00	85.82	87.52	89.05	90.58
10.2	82.45	84.48	86.32	87.67	89.27	90.56	91.75	92.80	93.84

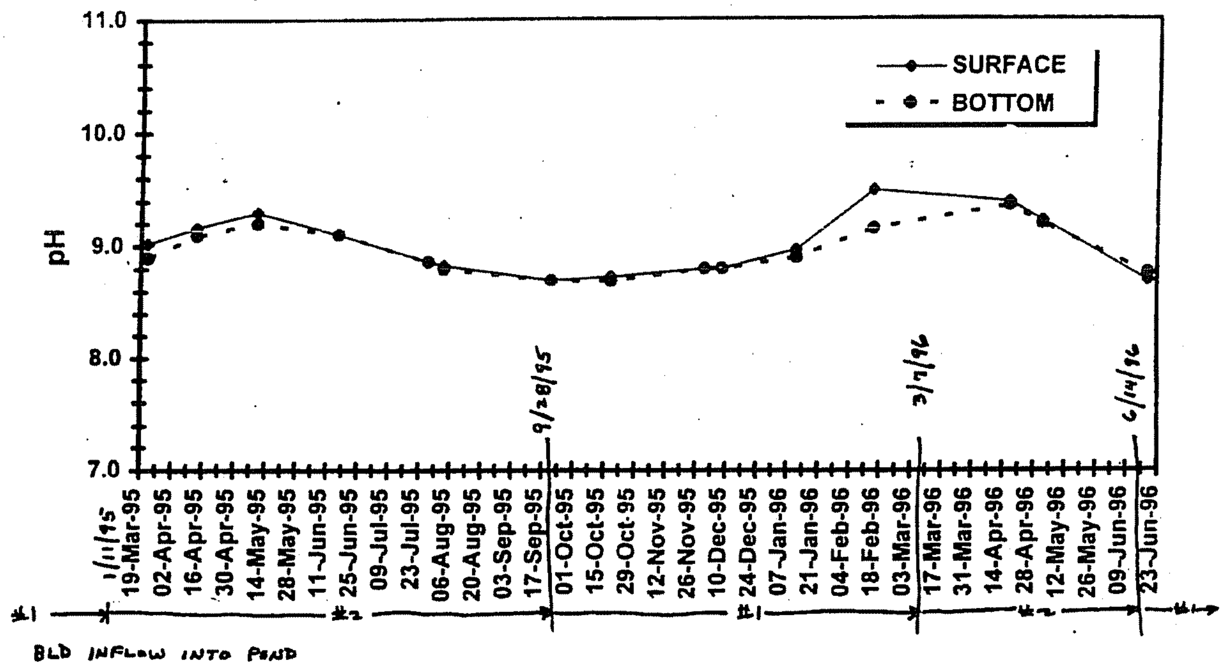
CHEMISTRY

TRENDS AND GRAPHS

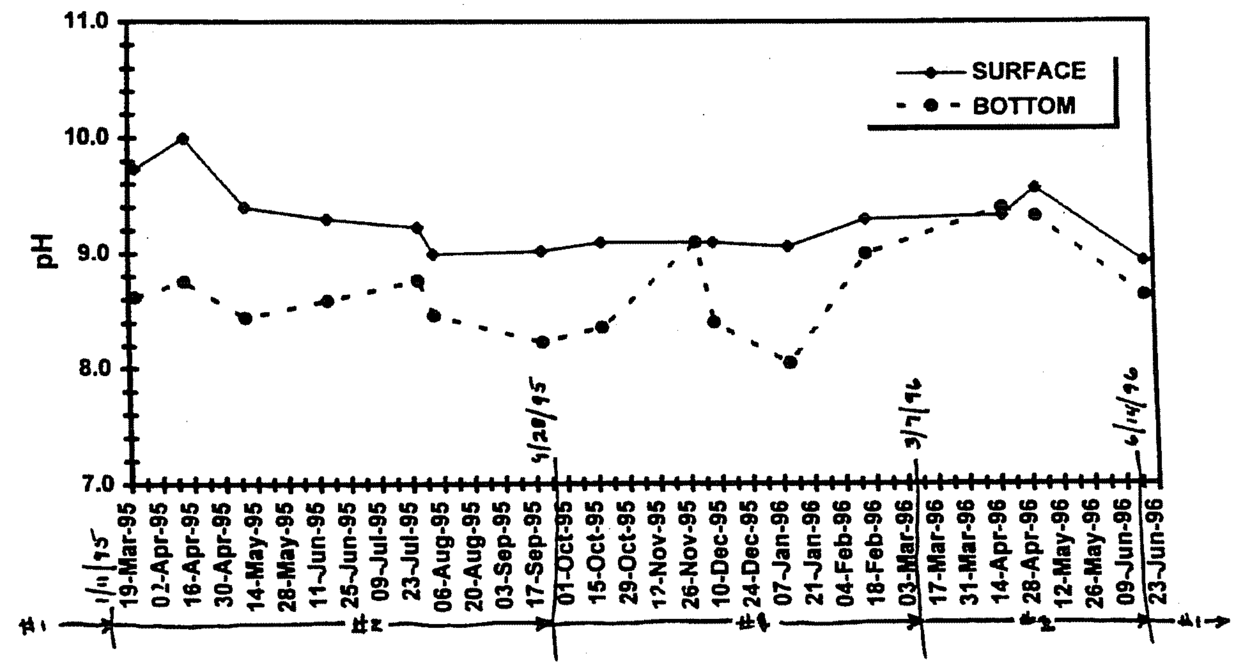

BIOLOGICAL OXYGEN DEMAND
EVAPORATION POND 1
SURFACE
BOTTOM
BOD (ppm)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1/11/95
19-Mar-95
02-Apr-95
16-Apr-95
30-Apr-95
14-May-95
28-May-95
11-Jun-95
25-Jun-95
09-Jul-95
23-Jul-95
06-Aug-95
20-Aug-95
03-Sep-95
17-Sep-95
01-Oct-95
15-Oct-95
29-Oct-95
12-Nov-95
26-Nov-95
10-Dec-95
24-Dec-95
07-Jan-96
21-Jan-96
04-Feb-96
18-Feb-96
03-Mar-96
17-Mar-96
31-Mar-96
14-Apr-96
28-Apr-96
12-May-96
26-May-96
09-Jun-96
23-Jun-96
#1
#2
#1
#2
#1
BLOWDOWN INFLOW INTO POND


BIOLOGICAL OXYGEN DEMAND
EVAPORATION POND 2
SURFACE
BOTTOM
BOD (ppm)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1/11/95
19-Mar-95
02-Apr-95
30-Apr-95
14-May-95
28-May-95
11-Jun-95
25-Jun-95
09-Jul-95
23-Jul-95
06-Aug-95
20-Aug-95
03-Sep-95
17-Sep-95
01-Oct-95
15-Oct-95
12-Nov-95
26-Nov-95
10-Dec-95
24-Dec-95
07-Jan-96
21-Jan-96
04-Feb-96
18-Feb-96
03-Mar-96
17-Mar-96
31-Mar-96
14-Apr-96
28-Apr-96
12-May-96
26-May-96
09-Jun-96
23-Jun-96
#1
#2
#1
#2
#1

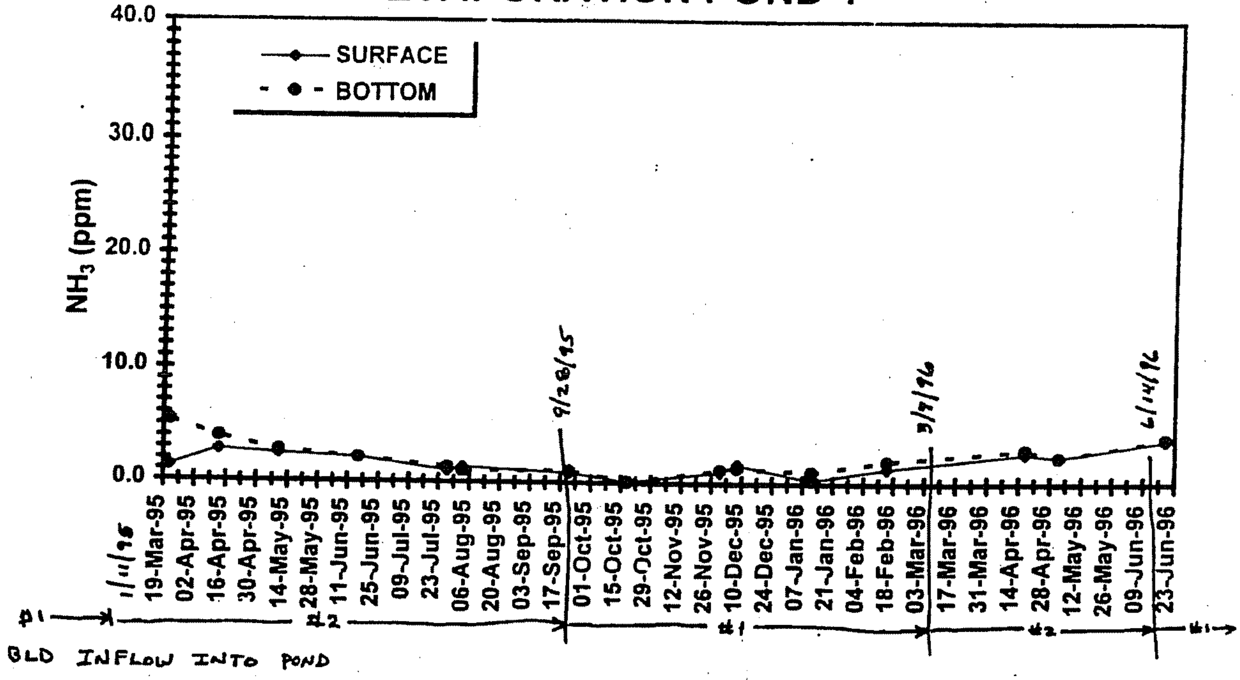
AVERAGE pH
EVAPORATION POND 1



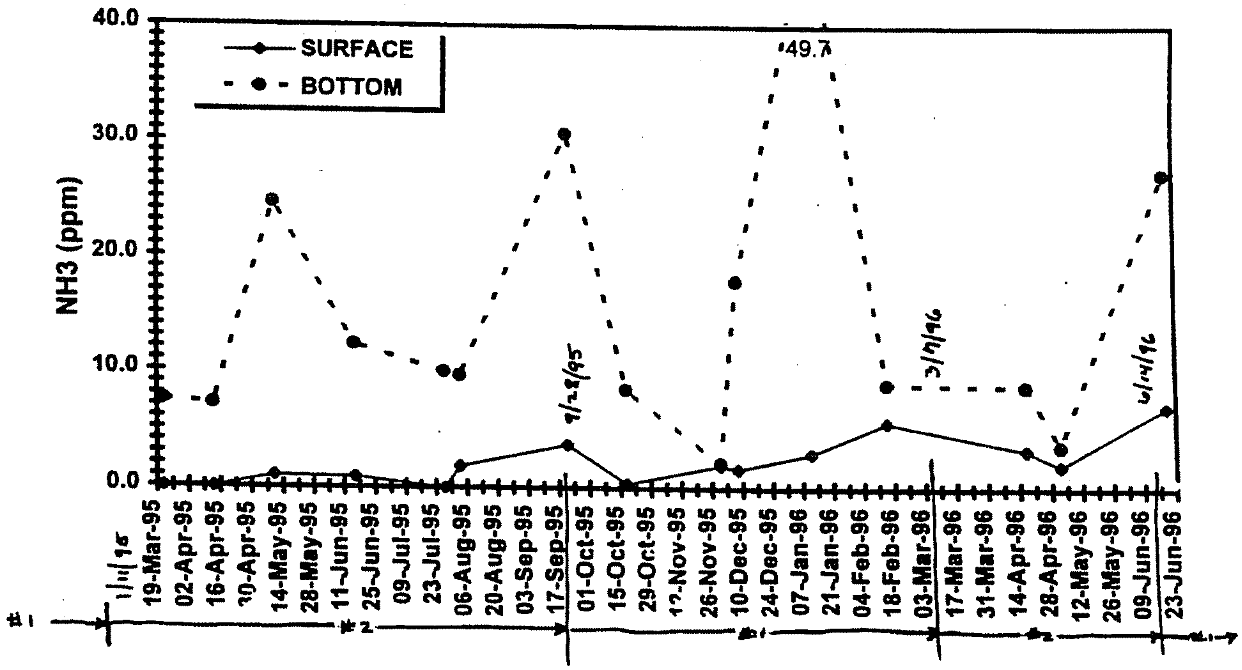
AVERAGE pH
EVAPORATION POND 2



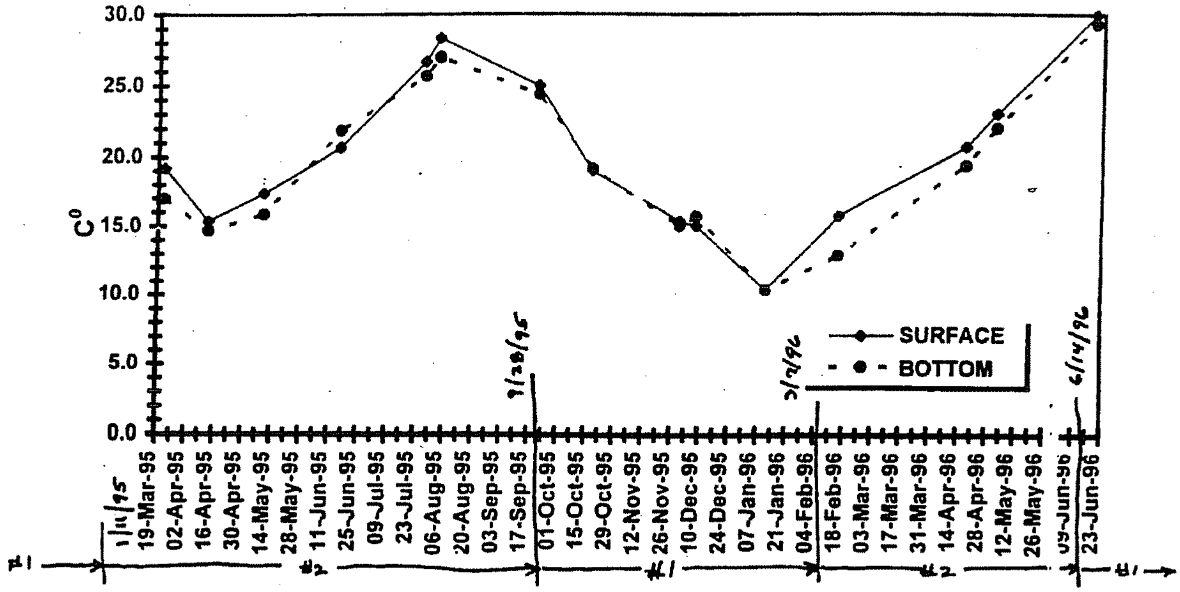
AVERAGE AMMONIA
EVAPORATION POND 1



AVERAGE AMMONIA
EVAPORATION POND 2

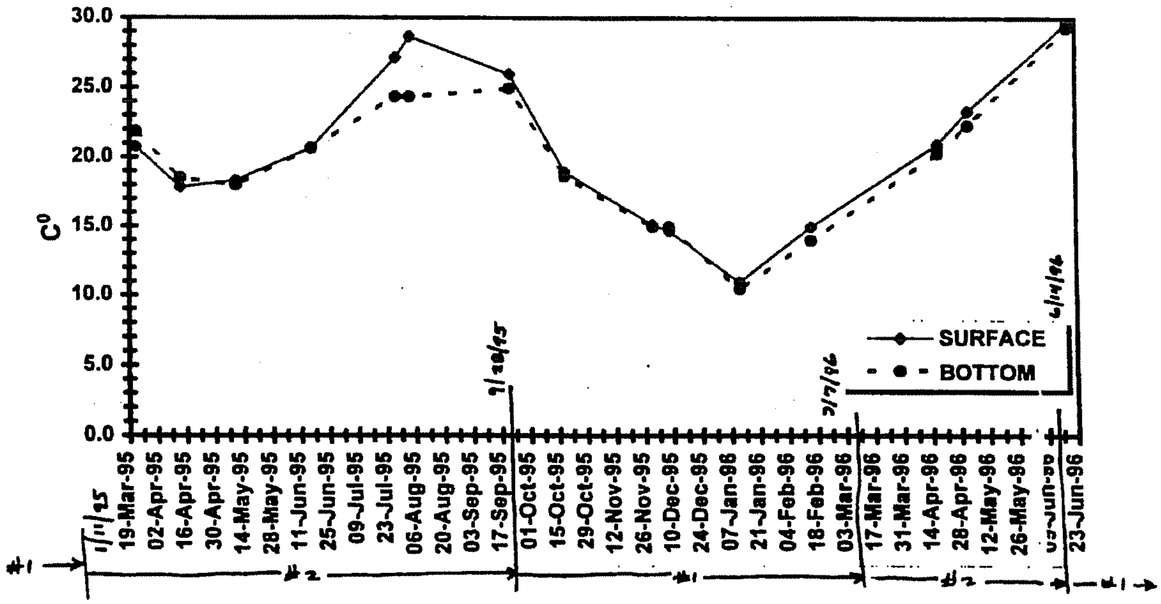


AVERAGE TEMPERATURE
EVAPORATION POND 1

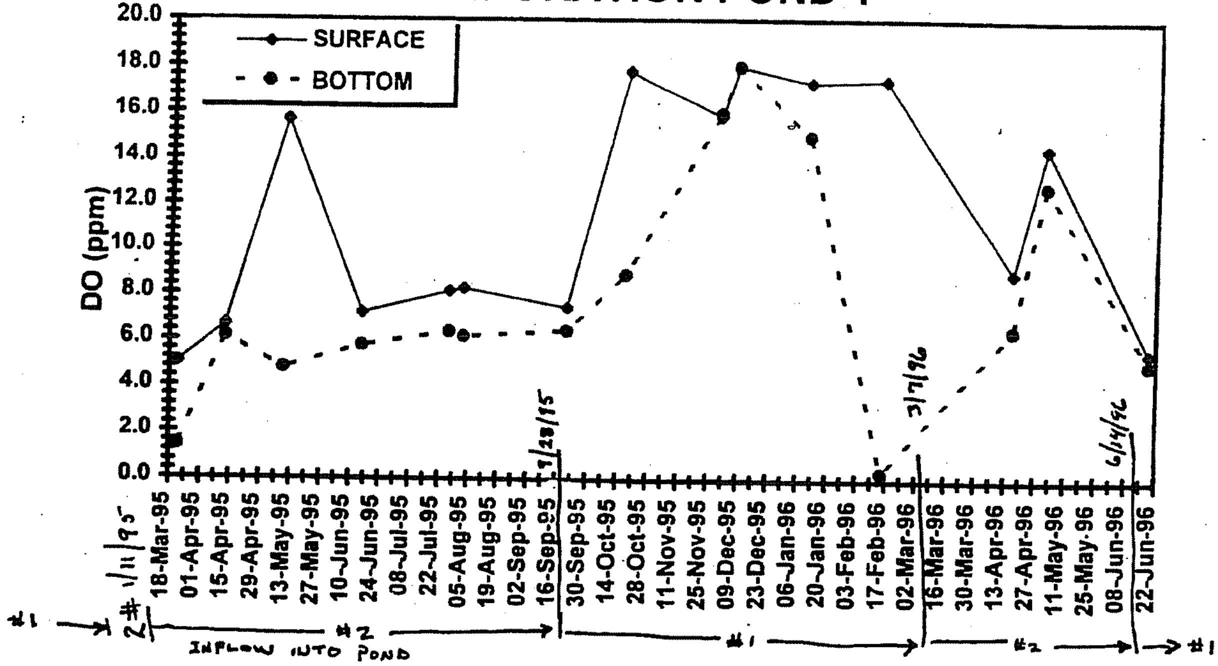


BLD INFLOW INTO POND

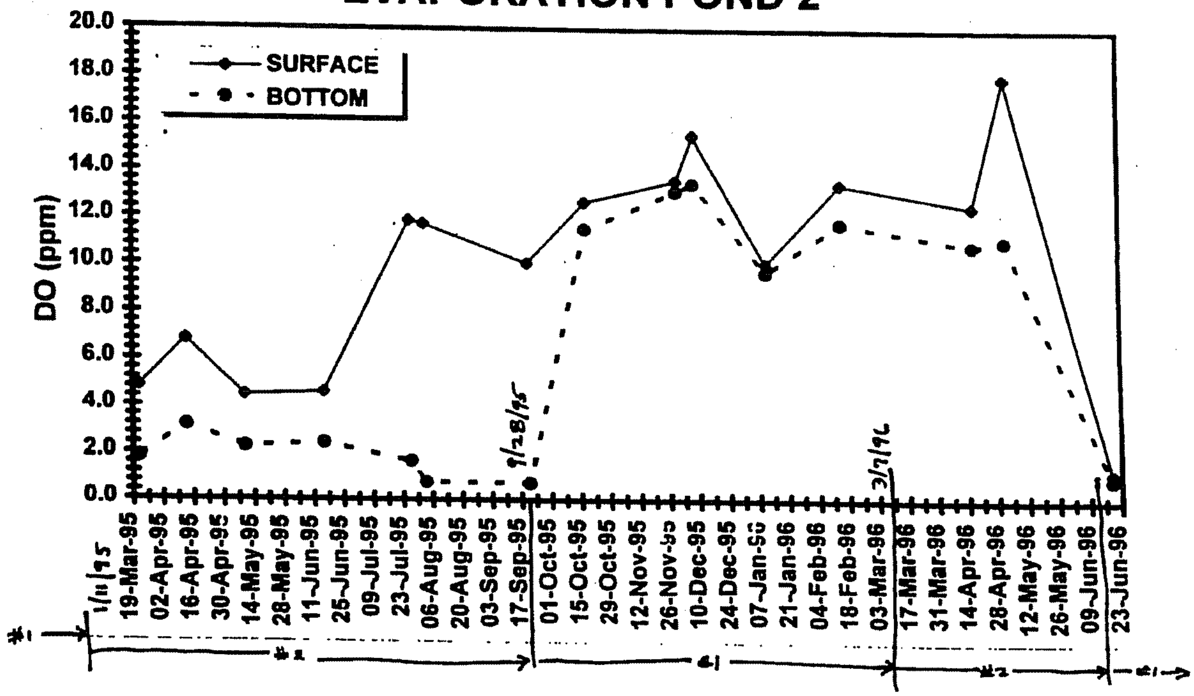
AVERAGE TEMPERATURE
EVAPORATION POND 2



AVERAGE DISSOLVED OXYGEN EVAPORATION POND 1



AVERAGE DISSOLVED OXYGEN EVAPORATION POND 2



PVNGS EVAPORATION POND CHEMISTRY DATA

POND 1 DATA

PARAMETER	LOCATION		DATE														
			3/22/95	4/13/95	5/10/95	6/16/95	7/27/95	8/3/95	9/21/95	10/18/95	11/30/95	12/8/95	1/11/96	2/15/96	4/17/96	5/2/96	6/19/96
LEVEL (ft)			931	930	930	929	930	927	925	925	926	926.5	927	928	927.5	929	930
TIME	SE	Top	9:51	9.30	9:54	9.45	11.32	14.02	9:50	8:50	9:10	9:40	9:26	9:20	9:26	8:36	9:00
		Bottom	9:44	9:32	9.46	9:50	11:35	14:03	.53	8:52	9.07	9:42	9:24	9:21	9:22	8:42	9:05
	MIDDLE	Top	10:20	9:55	10:00	9:05	11 37	14.16	10:14	9:00	9:28	9:47	9:45	9:26	9:36	8:47	9:10
		Bottom	10:16	9:58	10:10	9:10	11:38	14:18	10:19	9:05	9:19	9:48	9:40	9:28	9:32	8:52	9:12
	NW	Top	10:35	10:06	10.21	9:30	12:00	14:32	10:36	9:14	9:41	10:02	9:53	9:40	9:40	8:56	9:15
		Bottom	10:39	10:09	10:15	9:35	12:04	14.35	10:39	9:17	9:36	10:04	9:50	9:43	9:46	9:02	9:17
DO (PPM)	SE	Top	8 6	7.0	16.0	7.4	7 4	8.0	7.6	17.0	15.2	18.0	16.0	17.2	8.0	13.6	4.6
		Bottom	0.8	6.0	7.2	6 8	6.0	4.0	6.0	5.8	15.0	17.0	16.0	0.3	6.8	13.4	5.0
	MIDDLE	Top	2.5	7.0	16.5	7.2	8.2	7.9	7.0	17.8	16.2	19.0	17.0	17.3	9.6	13.8	6.0
		Bottom	2.0	5.5	2.0	6.4	8.8	6.0	5.8	5.8	17.0	18.0	12.0	0.3	6.8	13.0	4.1
	NW	Top	4.0	6.0	14.6	7.0	8.9	9.0	7.8	18.6	16.2	17.0	19.0	17.8	9.4	16 0	6.1
		Bottom	1.5	7.0	5.2	4.2	4 4	8.6	7.6	15.2	16.0	19.0	17.0	0.5	6.0	12.0	6.1
TEMP (°C)	SE	Top	19.0	16.0	17.5	20.0	27.0	29.0	25.0	19.0	16.0	15.0	11.0	16.0	20.0	23.0	30.0
		Bottom	15.0	14.5	18.0	22.0	25.0	27.0	25.0	19.5	15.0	16.0	11.0	13.0	20.0	22.0	30.0
	MIDDLE	Top	20.8	15.0	16.5	21 0	26.0	28 0	25.0	19.0	15.0	15.0	10.0	15.5	21.0	23.0	30.0
		Bottom	18.0	15.0	15.5	22.0	26.0	26.0	24.2	19.0	15.0	16.0	10.0	12.5	19.0	22.0	29.0
	NW	Top	18 0	15 0	18 0	21.0	27.0	28.0	25.0	19.0	15.0	15.0	10.0	15.5	21.0	23.0	30.0
		Bottom	18.0	14.5	16.0	21.5	26.0	28.0	24.0	19.0	15.0	15.0	10.0	13.0	19.0	22.0	29.0
AMMONIA (PPM)	SE	Top	1.5	3.0	2.5	1.5	1.5	2.0	0.1	0.1	1.0	1.0	N/A	1.5	3.0	2.5	4.0
		Bottom	7.0	4.0	3 0	2.0	1.5	1.5	0.1	0.1	2.0	2.0	1.5	3.0	3.0	2.5	4.0
	MIDDLE	Top	1.0	2.5	3.0	2.0	1.0	1.0	1.5	0.1	1.0	2.0	0.1	1.0	2.5	2.5	4.0
		Bottom	7.5	5 0	2.5	2.5	0.5	1.0	1.5	0.1	0.5	1.0	1.0	2.0	3.0	2.0	4.0
	NW	Top	1.5	3.0	2.0	3.0	0.5	1.0	1.0	0 1	1.0	2.0	0.5	1.5	2.5	2.0	3.5
		Bottom	1 5	3 0	3.0	2.0	2.0	0.5	1.5	0.1	1.0	1.0	0.5	1.0	3.0	2.5	4 0
pH	SE	Top	9.2	9.2	9.3	9 1	8.9	8.9	8.7	8.7	8.8	8.8	8.9	9.4	9.4	9.2	8.7
		Bottom	8.8	9 1	9.2	9.1	8.8	8.8	8.7	8.6	8.8	8.8	8.9	9.0	9.3	9.2	8.7
	MIDDLE	Top	8.8	9.2	9.3	9.1	8.8	8.8	8.7	8.7	8 8	8.8	9.0	9.6	9.4	9.2	8.7
		Bottom	8 8	9.0	9.2	9 1	8 9	8.8	8 7	8.7	8 8	8.8	8.9	9.1	9.4	9.2	8.8
	NW	Top	9.2	9 1	9 3	9 1	8.9	8 8	8 7	8.8	8.8	8.8	9 0	9.5	9.4	9.3	8 7
		Bottom	9.2	9.2	9.2	9.1	8.9	8 8	8.7	8.8	8.8	8.8	8.9	9.5	9.4	9.2	8.8
COND (umho)	SE	Top	46,430	49,300	46,300	50,100	51,900	56,800	59,100	54,900	64,490	64,600	58,050	50,800	46,030	57,600	60,960
		Bottom	49,330	49,580	46,100	51,200	55,600	56,500	59,500	57,900	63,120	64,910	58,810	51,630	46,330	58,300	59,500
	MIDDLE	Top	45,800	49,600	46,500	50,300	54,930	57,600	50,100	55,700	62,580	64,110	57,750	49,030	48,100	56,800	62,880
		Bottom	48,800	49,700	46,200	52,750	52,300	67,000	60,500	55,730	61,220	64,540	58,210	50,680	47,000	59,200	58,010
	NW	Top	46,400	49,700	46,400	50,600	53,100	57,100	61,000	52,700	61,460	64,710	57,810	49,360	48,500	57,700	62,920
		Bottom	46,600	49,600	46,700	51,000	53,700	57,300	59,320	52,500	62,490	64,820	56,000	49,490	40,300	57,700	61,500
TDS (PPM)	SE	Top	44,773	47,585	48,654	52,179	57,482	58,631	62,677	64,798	64,671	63,432	62,364	59,278	N/A	64,194	71,642
		Bottom	47,534	47,816	49,064	52,694	58,546	54,352	63,438	66,183	65,088	65,644	63,441	61,827	N/A	64,868	71,112
	MIDDLE	Top	43,355	46,320	48,775	52,374	60,033	57,513	62,325	65,023	64,678	64,160	63,384	60,026	N/A	65,916	69,050
		Bottom	47,587	51,310	48,428	51,911	59,487	58,081	63,448	64,305	64,318	64,656	64,380	64,834	N/A	66,150	69,082
	NW	Top	43,885	46,279	49,015	52,442	59,299	56,981	64,349	63,859	64,384	64,355	62,680	62,738	N/A	67,060	70,046
		Bottom	32,588	51,444	48,190	51,921	58,756	56,082	63,103	63,638	64,481	62,898	63,607	60,964	N/A	63,492	72,442
BOD (PPM)	SE	Top	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	MIDDLE	Top	29.0	24.2	17.6	12.4	10.4	22.4	16.8	13.6	11.4	14.4	12.6	31.6	14.0	11.6	18.4
		Bottom	32.0	19.2	18 6	16.4	11.4	24.4	24.8	15.6	16 4	12.4	13.6	30.6	11.0	11.6	18.4
	NW	Top	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE (PPM)	SE	Top	N/A	N/A	N/A	N/A	350.0	400.0	200.0	900.0	121 0	80.0	600.0	500.0	500.0	400.0	N/A
		Bottom	N/A	N/A	N/A	N/A	300.0	275.0	200.0	800.0	120.0	120.0	700.0	500.0	400.0	700.0	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	200.0	150.0	150.0	700.0	160.0	300.0	700.0	500.0	400.0	300.0	N/A
		Bottom	N/A	N/A	N/A	N/A	200.0	150.0	200.0	800.0	200.0	120.0	600.0	500.0	360.0	600.0	N/A
	NW	Top	N/A	N/A	N/A	N/A	200.0	150.0	300.0	800 0	120.0	80.0	700.0	500.0	350.0	500.0	N/A
		Bottom	N/A	N/A	N/A	N/A	200.0	200 0	260.0	800.0	80 0	200.0	800.0	400.0	600.0	500.0	N/A
NITRITE (PPM)	SE	Top	N/A	N/A	N/A	N/A	6.5	6.0	3.0	2.5	2.0	1.5	2.0	2.5	7.0	4.5	N/A
		Bottom	N/A	N/A	N/A	N/A	5.5	6.5	3.0	3.0	2.0	1.5	2.0	3.0	7.5	4.0	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	5.0	5.0	2 0	2.5	2.0	1.5	2.0	2.5	6.0	3.0	N/A
		Bottom	N/A	N/A	N/A	N/A	5 0	5 0	4.0	2.5	1 5	1.3	1.5	2.5	6.0	4.0	N/A
	NW	Top	N/A	N/A	N/A	N/A	5 0	6 0	3 0	2.5	1.5	1.5	2.0	3.0	7.0	4.0	N/A
		Bottom	N/A	N/A	N/A	N/A	5.0	5 5	2 0	2.0	1 5	1.5	1.5	3.0	7.0	4.0	N/A
TOTAL N (PPM)	SE	Top	N/A	N/A	N/A	N/A	358.0	408.0	203.1	903.0	123.8	82.3	602.0	504 0	508.2	406.6	N/A
		Bottom	N/A	N/A	N/A	N/A	307.0	283.0	203 1	803.0	123.6	123.1	703.2	506.0	410.0	706 1	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	206.0	156.0	153.2	703 0	162.8	303.1	702 1	503.0	406.8	305.1	N/A
		Bottom	N/A	N/A	N/A	N/A	206.0	156.0	205.2	803.0	201.9	122.1	602.3	504.0	367.6	606.0	N/A
	NW	Top	N/A	N/A	N/A	N/A	206.0	157 0	303 8	803.0	122 3	83.1	702.4	504.0	368.2	506 0	N/A
		Bottom	N/A	N/A	N/A	N/A	207.0	206 0	253 2	802 0	82 3	202.3	801.9	404 0	607 6	506 1	N/A

PVNGS EVAPORATION POND CHEMISTRY DATA

POND 2 DATA

PARAMETER	LOCATION		DATE 3/22/95	4/13/95	5/10/95	6/16/95	7/27/95	8/3/95	9/21/95	10/18/95	11/30/95	12/8/95	1/11/96	2/15/96	4/17/96	5/2/96	6/19/96
LEVEL (ft)			923	924	923	925	925	925	925	925	925	925	925	925	925	925	925
TIME	SW	Top	11:00	10:58	11:20	11:00	9:39	8:55	11:35	9:40	10:15	10:35	10:25	10:10	10:25	9:40	9:43
		Bottom	11:05	11:01	11:25	10:57	9:44	8:50	11:39	9:45	10:13	10:37	10:29	10:15	10:22	9:45	9:44
	MIDDLE	Top	11:10	11:13	11:30	10:25	10:08	9:15	11:50	10:00	10:22	10:43	10:34	10:20	10:30	9:50	9:51
		Bottom	11:15	11:16	11:35	10:28	10:03	9:09	11:55	10:05	10:19	10:46	10:37	10:24	10:32	9:55	9:52
	NE	Top	11:25	11:30	11:40	10:31	10:23	9:28	12:20	10:20	10:30	10:52	10:48	10:30	10:37	10:15	10:10
		Bottom	11:30	11:34	11:42	10:36	10:25	9:24	12:25	10:25	10:38	10:55	10:51	10:33	10:40	10:20	10:11
DO (PPM)	SW	Top	4.0	7.0	4.0	4.0	11.4	14.0	10.0	12.0	14.6	15.8	10.1	13.0	12.6	18.2	1.5
		Bottom	1.5	3.0	1.0	0.8	1.4	1.0	0.6	11.4	13.4	13.8	10.0	11.4	10.4	17.8	1.0
	MIDDLE	Top	4.0	7.0	4.4	4.6	11.2	12.0	9.0	13.0	13.0	14.8	10.1	13.4	12.4	18.4	1.1
		Bottom	2.0	3.0	0.9	0.9	1.4	0.8	0.8	12.0	13.0	12.8	10.1	12.0	11.8	8.8	0.9
	NE	Top	6.5	6.5	5.0	5.2	13.0	9.2	11.2	13.0	13.2	16.0	10.0	14.0	12.6	17.4	1.1
		Bottom	2.0	3.5	4.9	5.6	2.2	0.5	1.0	11.2	13.0	13.8	9.0	12.0	10.4	6.6	1.0
TEMP (°C)	SW	Top	21.1	18.5	20.0	20.0	27.5	28.0	25.0	19.0	15.5	15.0	11.0	15.0	21.0	23.0	29.0
		Bottom	22.2	19.0	19.0	20.0	24.0	23.0	24.8	18.0	15.0	15.0	10.5	14.0	20.0	23.0	29.0
	MIDDLE	Top	20.6	18.5	18.0	21.0	27.0	29.0	26.0	19.0	15.0	15.0	11.0	15.0	21.0	24.0	31.0
		Bottom	21.7	18.5	19.0	21.0	24.0	23.0	25.0	19.0	15.0	15.0	11.0	14.0	21.0	23.0	29.0
	NE	Top	20.6	16.5	17.0	21.0	27.0	29.0	27.0	19.0	15.0	14.0	11.0	15.0	21.0	23.0	29.0
		Bottom	21.7	18.0	16.0	21.0	25.0	27.0	25.0	19.0	15.0	15.0	10.0	14.0	20.0	21.0	30.0
AMMONIA (PPM)	SW	Top	<LLD	<LLD	1.0	1.5	<LLD	2.0	0.1	0.1	2.5	2.0	3.0	5.0	4.0	1.5	7.0
		Bottom	10.0	9.0	35.0	15.0	8.0	10.0	70.0	12.0	3.0	50.0	125.0	15.0	20.0	2.5	50.0
	MIDDLE	Top	<LLD	<LLD	<LLD	<LLD	<LLD	2.0	10.0	0.1	2.0	2.0	3.0	6.0	3.0	2.0	7.0
		Bottom	6.5	7.0	25.0	20.0	12.0	15.0	20.0	12.5	2.0	3.0	20.0	6.0	2.5	5.0	25.0
	NE	Top	<LLD	<LLD	<LLD	0.3	<LLD	1.5	1.0	1.0	1.5	1.0	3.0	6.0	3.0	2.5	7.0
		Bottom	6.0	5.5	14.0	2.0	<LLD	4.0	2.0	1.0	1.5	1.0	4.0	6.0	4.0	3.5	7.0
pH	SW	Top	9.8	10.0	9.4	9.3	9.3	9.0	9.1	9.1	9.1	9.1	9.1	9.3	9.3	9.6	8.9
		Bottom	8.5	8.7	8.3	8.4	8.7	8.3	7.9	8.6	9.1	8.0	7.7	8.7	9.7	9.4	8.4
	MIDDLE	Top	9.7	10.0	9.4	9.3	9.2	9.0	8.9	9.1	9.1	9.1	9.0	9.3	9.3	9.6	8.9
		Bottom	8.7	8.7	8.5	8.5	8.8	8.4	8.4	8.6	9.1	9.0	8.2	9.3	9.3	9.2	8.7
	NE	Top	9.7	10.0	9.4	9.3	9.2	9.0	9.1	9.1	9.1	9.1	9.1	9.3	9.4	9.5	9.0
		Bottom	8.7	8.9	8.6	9.3	9.2	8.9	9.0	8.1	9.1	9.1	9.1	9.3	9.3	9.4	9.0
COND (umho)	SW	Top	58,000	60,700	57,500	62,800	59,960	66,600	62,300	67,400	70,930	71,450	66,490	59,030	56,200	65,500	68,240
		Bottom	82,700	77,500	81,100	82,080	66,800	81,130	81,700	71,720	68,950	87,400	82,900	62,010	49,580	57,700	73,600
	MIDDLE	Top	58,600	61,300	57,400	62,500	61,430	67,500	67,200	64,800	68,680	70,830	68,020	59,030	50,600	68,600	67,700
		Bottom	78,400	79,900	77,400	77,400	71,100	74,500	61,000	67,100	68,940	71,010	73,750	61,550	50,430	67,030	68,880
	NE	Top	59,000	61,500	58,800	61,100	60,950	67,600	63,300	68,200	69,840	70,730	65,900	60,600	52,500	57,000	66,430
		Bottom	74,250	75,600	74,700	62,000	62,330	67,200	64,900	63,830	70,730	71,000	65,910	61,900	53,900	57,000	64,670
TDS (PPM)	SW	Top	58,918	58,312	61,135	63,324	69,368	65,905	63,883	68,254	70,711	69,905	71,066	74,940	N/A	78,462	78,394
		Bottom	91,220	79,560	118,183	89,241	76,602	88,563	88,693	75,148	71,090	84,500	88,496	80,934	N/A	77,242	85,068
	MIDDLE	Top	57,617	62,567	61,182	63,603	64,553	66,633	67,347	67,618	69,531	70,247	68,812	77,021	N/A	77,252	75,932
		Bottom	83,772	81,212	89,732	80,268	80,480	99,750	83,308	68,476	69,881	69,894	82,326	74,688	N/A	77,136	77,548
	NE	Top	62,892	60,299	62,152	62,932	66,848	66,780	66,245	75,564	69,522	68,595	70,938	76,020	N/A	77,914	75,568
		Bottom	81,837	76,971	85,554	86,335	69,478	66,262	66,634	69,197	69,827	69,940	71,070	75,754	N/A	75,622	74,884
BOD (PPM)	SW	Top	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	MIDDLE	Top	23.0	20.2	17.6	24.4	10.4	23.4	50.8	15.6	15.4	11.4	12.6	23.6	12.0	10.6	10.4
		Bottom	25.0	17.2	18.6	14.4	14.4	16.4	40.8	13.8	15.4	13.4	14.6	23.6	12.0	14.6	10.4
	NE	Top	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		Bottom	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NITRATE (PPM)	SW	Top	N/A	N/A	N/A	N/A	150.0	125.0	150.0	400.0	120.0	300.0	300.0	260.0	300.0	300.0	N/A
		Bottom	N/A	N/A	N/A	N/A	100.0	30.0	20.0	300.0	78.0	20.0	40.0	160.0	120.0	200.0	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	80.0	125.0	80.0	440.0	80.0	200.0	600.0	200.0	160.0	200.0	N/A
		Bottom	N/A	N/A	N/A	N/A	150.0	30.0	40.0	240.0	40.0	200.0	60.0	160.0	200.0	300.0	N/A
	NE	Top	N/A	N/A	N/A	N/A	150.0	125.0	130.0	400.0	80.0	200.0	400.0	200.0	400.0	400.0	N/A
		Bottom	N/A	N/A	N/A	N/A	150.0	150.0	130.0	400.0	80.0	120.0	200.0	200.0	400.0	300.0	N/A
NITRITE (PPM)	SW	Top	N/A	N/A	N/A	N/A	4.0	6.0	3.0	3.0	3.0	3.0	3.0	4.0	5.0	3.0	N/A
		Bottom	N/A	N/A	N/A	N/A	2.0	1.0	10.0	2.5	3.0	1.0	17.0	1.5	5.0	3.0	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	4.0	6.0	2.0	4.0	3.0	2.5	3.0	3.0	4.0	3.0	N/A
		Bottom	N/A	N/A	N/A	N/A	1.0	1.0	12.0	2.0	3.0	2.3	2.0	3.0	4.0	2.5	N/A
		Top	N/A	N/A	N/A	N/A	4.0	6.5	2.0	4.0	3.0	2.3	3.0	3.0	5.0	4.0	N/A
	NE	Bottom	N/A	N/A	N/A	N/A	4.0	6.0	3.0	3.0	3.0	2.5	3.0	2.0	5.0	4.0	N/A
TOTAL N (PPM)	SW	Top	N/A	N/A	N/A	N/A	154.0	132.0	153.1	403.0	125.1	304.6	305.5	268.0	309.1	304.2	N/A
		Bottom	N/A	N/A	N/A	N/A	110.0	41.0	87.6	312.4	83.5	62.2	159.9	174.0	137.4	205.1	N/A
	MIDDLE	Top	N/A	N/A	N/A	N/A	84.0	133.0	90.2	444.0	85.0	204.1	305.5	208.0	168.9	205.0	N/A
		Bottom	N/A	N/A	N/A	N/A	163.0	46.0	68.5	252.3	44.6	204.6	78.5	168.0	208.9	307.0	N/A
	NE	Top	N/A	N/A	N/A	N/A	154.0	133.0	132.8	405.0	84.2	203.1	405.5	208.0	409.9	406.1	N/A
		Bottom	N/A	N/A	N/A	N/A	154.0	160.0	134.6	404.0	84.2	123.3	206.3	207.0	409.9	307.0	N/A

PVNGS EVAPORATION POND CHEMISTRY DATA

AVERAGED DATA FOR POND 1

PARAMETER	LOCATION		DATE 3/22/95	4/13/95	5/10/95	6/16/95	7/27/95	8/3/95	9/21/95	10/18/95	11/30/95	12/8/95	1/11/96	2/15/96	4/17/96	5/2/96	6/19/96
LEVEL (ft)			931	930	930	929	930	927	925	925	926	926.5	927	928	927.5	929	930
DO (PPM)	SURFACE	+	3.6	0.3	0.8	0.2	0.7	0.7	0.3	0.8	0.3	1.0	1.7	0.4	0.6	1.5	0.5
		Avg	5.0	6.7	15.7	7.2	8.2	8.3	7.5	17.8	15.9	18.0	17.3	17.4	9.0	14.5	5.6
		-	2.5	0.7	1.1	0.2	0.8	0.4	0.5	0.8	0.7	1.0	1.3	0.2	1.0	0.9	1.0
	BOTTOM	+	0.6	0.8	2.4	1.0	2.4	2.4	1.1	6.3	1.0	1.0	2.0	0.1	0.3	0.6	1.0
		Avg	1.4	6.2	4.8	5.8	6.4	6.2	6.5	8.9	16.0	18.0	15.0	0.4	6.5	12.8	5.1
		-	0.6	0.7	2.8	1.6	2.0	2.2	0.7	3.1	1.0	1.0	3.0	0.1	0.5	0.8	1.0
TEMP (°C)	SURFACE	+	1.4	0.7	0.7	0.3	0.3	0.7	0.0	0.0	0.7	0.0	0.7	0.3	0.3	0.0	0.0
		Avg	19.2	15.3	17.3	20.7	26.7	28.3	25.0	19.0	15.3	15.0	10.3	15.7	20.7	23.0	30.0
		-	1.2	0.3	0.8	0.7	0.7	0.3	0.0	0.0	0.3	0.0	0.3	0.2	0.7	0.0	0.0
	BOTTOM	+	1.0	0.3	0.2	0.2	0.3	1.0	0.6	0.3	0.0	0.3	0.7	0.2	0.7	0.0	0.7
		Avg	17.0	14.7	15.8	21.8	25.7	27.0	24.4	19.2	15.0	15.7	10.3	12.8	19.3	22.0	29.3
		-	2.0	0.2	0.3	0.3	0.7	1.0	0.4	0.2	0.0	0.7	0.3	0.3	0.3	0.0	0.3
AMMONIA (PPM)	SURFACE	+	0.2	0.2	0.5	0.8	0.5	0.7	0.6	0.0	0.0	0.3	0.2	0.2	0.3	0.2	0.2
		Avg	1.3	2.8	2.5	2.2	1.0	1.3	0.9	0.1	1.0	1.7	0.3	1.3	2.7	2.3	3.8
		-	0.3	0.3	0.5	0.7	0.5	0.3	0.8	0.0	0.0	0.7	0.2	0.3	0.2	0.3	0.3
	BOTTOM	+	2.2	1.0	0.2	0.3	0.7	0.5	0.5	0.0	0.8	0.7	0.5	1.0	0.0	0.2	0.0
		Avg	5.3	4.0	2.8	2.2	1.3	1.0	1.0	0.1	1.2	1.3	1.0	2.0	3.0	2.3	4.0
		-	3.8	1.0	0.3	0.2	0.8	0.5	0.9	0.0	0.7	0.3	0.5	1.0	0.0	0.3	0.0
pH	SURFACE	+	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0
		Avg	9.0	9.2	9.3	9.1	8.9	8.8	8.7	8.7	8.8	8.8	9.0	9.5	9.4	9.2	8.7
		-	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
	BOTTOM	+	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0
		Avg	8.9	9.1	9.2	9.1	8.9	8.8	8.7	8.7	8.8	8.8	8.9	9.2	9.4	9.2	8.8
		-	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.1
COND (umho)	SURFACE	+	220	167	100	267	1,620	433	4,267	1,267	1,647	237	180	1,070	957	333	667
		Avg	46,210	49,533	48,400	50,333	53,310	57,167	56,733	54,433	62,843	64,473	57,870	49,730	47,543	57,367	62,253
		-	410	233	100	233	1,410	367	6,633	1,733	1,383	363	120	700	1,513	567	1,293
	BOTTOM	+	1,087	73	367	1,100	1,733	6,733	727	2,523	843	153	1,137	1,030	2,457	800	1,830
		Avg	48,243	49,627	46,333	51,650	53,867	60,267	59,773	55,377	62,277	64,757	57,673	50,600	44,543	58,400	59,670
		-	1,643	47	233	650	1,567	3,767	453	2,877	1,057	217	1,673	1,110	4,243	700	1,660
TDS (PPM)	SURFACE	+	769	857	200	110	1,095	923	1,232	463	100	373	575	2,057	N/A	1,337	1,396
		Avg	44,004	46,728	48,815	52,332	58,938	57,708	63,117	64,560	64,578	63,982	62,809	60,681	N/A	65,723	70,246
		-	649	449	161	153	1,456	727	792	701	194	550	445	1,403	N/A	1,529	1,196
	BOTTOM	+	5,017	1,254	503	519	557	1,909	117	1,474	446	1,245	571	2,292	N/A	1,313	1,563
		Avg	42,570	50,190	48,561	52,175	58,930	56,172	63,329	64,709	64,622	64,399	63,809	62,542	N/A	64,837	70,879
		-	9,982	2,374	371	264	384	1,820	226	1,071	304	1,501	368	1,578	N/A	1,345	1,797
BOD (PPM)	SURFACE	value	28.0	24.2	17.6	12.4	10.4	22.4	16.8	13.6	11.4	14.4	12.6	31.6	14.0	11.6	18.4
	BOTTOM	value	32.0	19.2	18.6	16.4	11.4	24.4	24.8	15.6	18.4	12.4	13.6	30.6	11.0	11.6	18.4
NITRATE (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	100.0	166.7	83.3	100.0	26.3	146.7	33.3	0.0	80.0	100.0	N/A
		Avg	N/A	N/A	N/A	N/A	250.0	233.3	216.7	800.0	133.7	153.3	866.7	500.0	420.0	400.0	N/A
		-	N/A	N/A	N/A	N/A	50.0	83.3	66.7	100.0	13.7	73.3	66.7	0.0	60.0	100.0	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	66.7	66.7	33.3	0.0	66.7	53.3	100.0	33.3	146.7	100.0	N/A
		Avg	N/A	N/A	N/A	N/A	233.3	208.3	216.7	800.0	133.3	146.7	700.0	466.7	453.3	600.0	N/A
		-	N/A	N/A	N/A	N/A	33.3	58.3	16.7	0.0	53.3	26.7	100.0	66.7	93.3	100.0	N/A
NITRITE (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	1.0	0.3	0.3	0.0	0.2	0.0	0.0	0.3	0.3	0.7	N/A
		Avg	N/A	N/A	N/A	N/A	5.5	5.7	2.7	2.5	1.8	1.5	2.0	2.7	6.7	3.8	N/A
		-	N/A	N/A	N/A	N/A	0.5	0.7	0.7	0.0	0.3	0.0	0.0	0.2	0.7	0.8	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	0.3	0.8	1.0	0.5	0.3	0.1	0.3	0.2	0.7	0.0	N/A
		Avg	N/A	N/A	N/A	N/A	5.2	5.7	3.0	2.5	1.7	1.4	1.7	2.8	6.8	4.0	N/A
		-	N/A	N/A	N/A	N/A	0.2	0.7	1.0	0.5	0.2	0.1	0.2	0.3	0.8	0.0	N/A
TOTAL N (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	101.3	167.7	83.8	100.0	26.5	146.9	33.6	0.3	80.5	100.1	N/A
		Avg	N/A	N/A	N/A	N/A	256.7	240.3	220.0	803.0	136.3	156.2	668.8	503.7	427.7	405.9	N/A
		-	N/A	N/A	N/A	N/A	50.7	84.3	66.8	100.0	14.0	73.9	66.8	0.7	59.5	100.8	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	67.0	68.0	32.7	0.3	66.0	53.1	99.4	34.7	146.0	100.0	N/A
		Avg	N/A	N/A	N/A	N/A	240.0	215.0	220.5	802.7	135.9	149.2	702.5	471.3	461.8	606.1	N/A
		-	N/A	N/A	N/A	N/A	34.0	59.0	17.4	0.7	53.6	27.1	100.2	87.3	94.2	100.0	N/A

PVNGS EVAPORATION POND CHEMISTRY DATA

AVERAGED DATA FOR POND 2

PARAMETER	LOCATION		DATE 3/22/95	4/13/95	5/10/95	6/15/95	7/27/95	8/3/95	9/21/95	10/18/95	11/30/95	12/8/95	1/11/96	2/15/96	4/17/96	5/2/96	6/19/96
LEVEL (ft)			923	924	923	925	925	925	925	925	925	925	925	925	925	925	925
DO (PPM)	SURFACE	+	1.7	0.2	0.5	0.6	1.1	2.3	1.1	0.3	1.0	0.5	0.0	0.5	0.1	0.4	0.3
		Avg	4.8	5.8	4.5	4.6	11.9	11.7	10.1	12.7	13.6	15.5	10.1	13.5	12.5	18.0	1.2
		-	0.8	0.3	0.5	0.6	0.7	2.5	1.1	0.7	0.6	0.7	0.1	0.5	0.1	0.6	0.1
	BOTTOM	+	0.2	0.3	2.6	3.2	0.5	0.2	0.3	0.5	0.3	0.3	0.4	0.2	0.9	6.7	0.0
		Avg	1.8	3.2	2.3	2.4	1.7	0.8	0.7	11.5	13.1	13.5	9.7	11.8	10.9	11.1	1.0
		-	0.3	0.2	1.4	1.6	0.3	0.3	0.1	0.3	0.1	0.7	0.7	0.4	0.5	4.5	0.1
TEMP (°C)	SURFACE	+	0.3	0.7	1.7	0.3	0.3	0.3	1.0	0.0	0.3	0.3	0.0	0.0	0.0	0.7	1.3
		Avg	20.8	17.8	18.3	20.7	27.2	28.7	26.0	19.0	15.2	14.7	11.0	15.0	21.0	23.3	29.7
		-	0.2	1.3	1.3	0.7	0.2	0.7	1.0	0.0	0.2	0.7	0.0	0.0	0.0	0.3	0.7
	BOTTOM	+	0.3	0.5	1.0	0.3	0.7	2.7	0.1	0.3	0.0	0.0	0.5	0.0	0.7	0.7	0.7
		Avg	21.9	18.5	18.0	20.7	24.3	24.3	24.9	18.7	15.0	15.0	10.5	14.0	20.3	22.3	29.3
		-	0.2	0.5	2.0	0.7	0.3	1.3	0.1	0.7	0.0	0.0	0.5	0.0	0.3	1.3	0.3
AMMONIA (PPM)	SURFACE	+	N/A	N/A	0.0	0.6	N/A	0.2	6.3	0.6	0.5	0.3	0.0	0.3	0.7	0.5	0.0
		Avg	N/A	N/A	1.0	0.9	N/A	1.8	3.7	0.4	2.0	1.7	3.0	5.7	3.3	2.0	7.0
		-	N/A	N/A	0.0	0.6	N/A	0.3	3.6	0.3	0.5	0.7	0.0	0.7	0.3	0.5	0.0
	BOTTOM	+	2.5	1.8	10.3	7.7	2.0	5.3	39.3	4.0	0.8	32.0	75.3	6.0	11.2	1.3	22.7
		Avg	7.5	7.2	24.7	12.3	10.0	9.7	30.7	8.5	2.2	18.0	49.7	9.0	8.8	3.7	27.3
		-	1.5	1.7	10.7	10.3	2.0	5.7	28.7	7.5	0.7	17.0	45.7	3.0	6.3	1.2	20.3
pH	SURFACE	+	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
		Avg	9.7	10.0	9.4	9.3	9.2	9.0	9.0	9.1	9.1	9.1	9.1	9.3	9.3	9.6	8.9
		-	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
	BOTTOM	+	0.1	0.1	0.2	0.7	0.4	0.4	0.8	0.2	0.0	0.7	1.1	0.3	0.3	0.1	0.4
		Avg	8.6	8.8	8.4	8.6	8.8	8.5	8.2	8.4	9.1	8.4	8.0	9.0	9.4	9.3	8.6
		-	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.0	0.4	0.3	0.3	0.1	0.1	0.2
COND (umho)	SURFACE	+	467	333	900	667	643	367	2,933	1,267	1,113	447	353	1,047	3,100	4,900	783
		Avg	58,533	61,167	57,900	62,133	60,787	67,233	64,267	66,133	69,817	71,003	66,137	59,553	53,100	63,700	67,457
		-	533	467	500	1,033	807	633	1,967	1,333	1,137	273	237	523	2,500	6,700	1,027
	BOTTOM	+	4,250	2,233	3,367	8,253	4,357	6,853	12,500	4,237	1,190	10,930	8,713	190	2,597	6,453	4,550
		Avg	78,450	77,667	77,733	73,827	66,743	74,277	69,200	[illegible]7,483	69,540	78,470	74,187	61,820	51,303	60,577	69,050
		-	4,200	2,067	3,033	11,827	4,413	7,077	8,200	3,853	600	5,470	8,277	270	1,723	3,577	4,380
TDS (PPM)	SURFACE	+	3,083	2,174	662	317	2,445	341	1,522	5,086	790	665	794	1,027	N/A	586	1,763
		Avg	59,809	60,393	61,490	63,286	66,923	66,439	65,825	70,478	69,921	69,582	70,272	75,994	N/A	77,876	76,631
		-	2,192	2,081	355	354	2,370	534	1,942	2,862	399	987	1,460	1,054	N/A	624	1,063
	BOTTOM	+	5,610	1,964	20,360	10,626	4,960	14,892	9,148	4,208	824	9,722	7,865	3,809	N/A	575	5,902
		Avg	85,610	79,248	97,823	78,615	75,520	84,858	79,545	70,940	70,266	74,778	80,631	77,125	N/A	76,667	79,166
		-	3,773	2,277	12,269	12,280	6,042	18,596	12,911	2,464	439	4,884	9,561	2,437	N/A	1,045	4,282
BOD (PPM)	SURFACE	value	23.0	20.2	17.6	24.4	10.4	23.4	50.8	15.6	15.4	11.4	12.6	23.6	12.0	10.6	10.4
	BOTTOM	value	25.0	17.2	18.6	14.4	14.4	16.4	40.8	13.6	15.4	13.4	14.6	23.6	12.0	14.6	10.4
NITRATE (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	23.3	0.0	30.0	26.7	26.7	66.7	166.7	40.0	113.3	100.0	N/A
		Avg	N/A	N/A	N/A	N/A	126.7	125.0	120.0	413.3	93.3	233.3	433.3	220.0	286.7	300.0	N/A
		-	N/A	N/A	N/A	N/A	46.7	0.0	40.0	13.3	13.3	33.3	133.3	20.0	126.7	100.0	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	16.7	80.0	66.7	86.7	14.0	86.7	100.0	26.7	160.0	33.3	N/A
		Avg	N/A	N/A	N/A	N/A	133.3	70.0	63.3	313.3	66.0	113.3	100.0	173.3	240.0	266.7	N/A
		-	N/A	N/A	N/A	N/A	33.3	40.0	43.3	73.3	26.0	93.3	60.0	13.3	120.0	66.7	N/A
NITRITE (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	0.0	0.7	0.7	0.3	0.0	0.4	0.0	0.7	0.3	0.7	N/A
		Avg	N/A	N/A	N/A	N/A	4.0	5.8	2.3	3.7	3.0	2.6	3.0	3.3	4.7	3.3	N/A
		-	N/A	N/A	N/A	N/A	0.0	0.8	0.3	0.7	0.0	0.3	0.0	0.3	0.7	0.3	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	1.7	3.3	3.7	0.5	0.0	0.8	9.7	0.8	0.3	0.8	N/A
		Avg	N/A	N/A	N/A	N/A	2.3	2.7	8.3	2.5	3.0	1.9	7.3	2.2	4.7	3.2	N/A
		-	N/A	N/A	N/A	N/A	1.3	1.7	5.3	0.5	0.0	0.9	5.3	0.7	0.7	0.7	N/A
TOTAL N (PPM)	SURFACE	+	N/A	N/A	N/A	N/A	23.3	0.3	27.7	26.7	27.0	67.3	66.7	40.0	113.9	101.0	N/A
		Avg	N/A	N/A	N/A	N/A	130.7	132.7	125.4	417.3	96.1	237.3	338.8	228.0	296.0	305.1	N/A
		-	N/A	N/A	N/A	N/A	46.7	0.7	35.2	14.3	13.9	34.2	33.3	20.0	127.1	100.1	N/A
	BOTTOM	+	N/A	N/A	N/A	N/A	20.7	77.7	37.7	81.1	13.4	74.7	58.1	24.0	157.8	34.0	N/A
		Avg	N/A	N/A	N/A	N/A	142.3	82.3	96.9	322.9	70.8	130.1	148.2	163.0	252.1	273.0	N/A
		-	N/A	N/A	N/A	N/A	32.3	41.3	28.4	70.6	26.2	67.9	69.7	15.0	114.7	67.9	N/A

APPENDIX F
TABLE 1

MONTHLY EVAPORATION POND ANALYSES 47.7

EVAP POND 1	LEVEL	LOCATION		* DO	°C TEMP	PPM NH_3	pH	COND	PPT PPM TDS	PPM BOD	NO_3 as N	TIME
DATE 3-22-95	931'	SE	TOP	8.6PPM	19°C	1.5	9.2	46,430	44,773	N/A		0951
			BOTTOM	0.8 ↓	15.0	7.0	8.8	49,330	47,543	N/A		0944
	931'	MIDDLE	TOP	2.5 ↓	20.6	1.0	8.8	45,800	43,355	29. PPM		1020
			BOTTOM	2.0PPM	18.0	7.5	8.8	48,800	47,587	32PPM		1016
	931'	NW	TOP	4.0PPM	18.0	1.5	9.2	46,400	43,885	N/A		1035
			BOTTOM	1.5 ↓	18.0	1.5	9.2	46,600	32,588	N/A		1039

EVAP POND 2	LEVEL	LOCATION		* PPM DO	°C TEMP	PPM NH_3	pH	COND	PPM TDS	BOD	NO_3 as N	TIME
DATE 3-22-95	923'	SW	TOP	4.0	21.1	<.001*	9.8	58,000	58,918	N/A		1100
			BOTTOM	1.5	22.2	10.0	8.5	82,700	91,220	N/A		1105
	923'	MIDDLE	TOP	4.0	20.6	<.001*	9.7	58,600	57,617	23.0		1110
			BOTTOM	2.0	21.7	6.5	8.7	78,400	83,772	25.0		1115
	923'	NE	TOP	6.5	20.6	<.001*	9.7	59,000	62,892	N/A		1125
			BOTTOM	2.0	21.7	6.0	8.7	74,250	81,837	N/A		1130

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: * D.O. Meter failed to measure in field. Brought samples back to Lab. and measured D.O. by Chemetrics, Inc., test kit. (Results could be slight off). We are working on the D.O. issue. 4/25/95

* Please consider these results <.1 ppm (WM 4/25)

APPENDIX F
TABLE

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		*DO (PPM)	TEMP (°C)	NH_3 (PPM)	pH	COND	TDS (PPM)	BOD (PPM)	NO_3 as N	TIME
DATE 4-13-95	930'	SE	TOP	7.0	16.8	3.0	9.2	49,300	47,585	N/A		0930
			BOTTOM	6.0	14.5	4.0	9.1	49,580	47,816	N/A		0932
	930'	MIDDLE	TOP	7.0	15	2.5	9.2	49,600	46,320	24.2		0955
			BOTTOM	5.5	15	5.0	9.0	49,700	51,310	19.2		0958
	930'	NW	TOP	6.0	15	3.0	9.1	49,700	46,279	N/A		1006
			BOTTOM	7.0	14.5	3.0	9.2	49,600	51,444	N/A		1009

EVAP POND 2	LEVEL	LOCATION		*DO (PPM)	TEMP (°C)	NH_3 (PPM)	pH	COND	TDS (PPM)	BOD (PPM)	NO_3 as N	TIME
DATE 4-13-95	924'	SW	TOP	7.0	18.5	<.001 ⊛	10.0	60,700	58,312	N/A		1058
			BOTTOM	3.0	19.0	9.0	8.7	77,500	79,560	N/A		1101
	924'	MIDDLE	TOP	7.0	18.5	<.001 ⊛	10.0	61,300	62,567	20.2		1113
			BOTTOM	3.0	18.5	7.0	8.7	79,900	81,212	17.2		1116
	924'	NE	TOP	6.5	16.5	<.001 ⊛	10.0	61,500	60,299	N/A		1130
			BOTTOM	3.5	18.0	5.5	8.9	75,603	76,971	N/A		1134

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: * D.O. Meter failed to measure D.O^s, maybe because of high salt. Meter is being checked out + manufacturer will be called for suggestions, in dealing with high salt. Measured D.O. in Lab in bottle with same Probe after some maint. (Results maybe slight off).

We are working on the D.O. issue 4/25/95

⊛ Please consider these results <.1 ppm (VM) 4/25/95

#3

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	NO_3 as N	TIME
DATE May 10, 1995	930	SE	TOP	16	17.5°C	2.5	9.3	46,300	48,654			0954
			BOTTOM	7.2@21'	16.0°C	3.0	9.2	46,160	49,064			0946
	930	MIDDLE	TOP	16.5	16.5°C	3.0	9.3	46,500	48,775	17.6		1000
			BOTTOM	2@ 13'	15.5°C	2.5	9.2	46,200	48,428	18.6		1010
	930	NW	TOP	14.6	18°C	2.0	9.3	46,400	49,015			1021
			BOTTOM	5.2@11'	16°C	3.0	9.2	46,700	48,190			1015

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	NO_3 as N	TIME
DATE May 10, 1995	923	SW	TOP	4.0	20°C	1.0	9.4	57,500	61,135			1120
			BOTTOM	1.0@17'	19°C	35.0	8.3	81,100	118,183			1125
	923	MIDDLE	TOP	4.4	18°C	<0.1	9.4	57,400	61,182	17.6		1130
			BOTTOM	0.9@17'	19°C	25.0	8.5	77,400	89,732	18.6		1135
	923	NE	TOP	5.0	17°C	<0.1	9.4	58,800	62,152			1140
			BOTTOM	4.9@14'	16°C	14.0	8.6	74,700	85,554			1142

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

Pond I
Bottom Sample Depth.
SE Corner = 21'
Middle = 13'
NW corner = 11'

Pond II
Bottom Sample Depth.
SW Corner = 17'
Middle = 17'
NE Corner = 14'

Inlet onto
(Top) Temp = 19°C (D.O = 8.4) (Bottom) Temp = 16°C (D.O. = 14.0)

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	NO_3 as N	TIME
DATE 6-16-95	929'	* SE	TOP	7.4	20 °C	1.5	9.1	50,100	52,179	N-A		0945
			BOTTOM	6.8	22	2.0	9.1	51,200	52,694	N-A		0950
	929'	* MIDDLE	TOP	7.2	21	2.0	9.1	50,300	52,374	12.4		0905
			BOTTOM	6.4	22	2.5	9.1	52,758	51,911	16.4		0910
	929'	** NW	TOP	7.0	21	3.0	9.1	50,600	52,442	N-A		0930
			BOTTOM	4.2	21.5°C	2.0	9.1	51,000	51,921	N-A		0935

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	NO_3 as N	TIME
DATE 6-16-95	925'	* SW	TOP	4.0	20 °C	1.5	9.3	62,800	63,324	N-A		1100
			BOTTOM	0.8	20	15	8.4	82,080	89,241	N-A		1057
	925'	** MIDDLE	TOP	4.6	21	<0.1	9.3	62,500	63,603	24.4		1025
			BOTTOM	0.9	21	20.0	8.5	77,400	80,268	14.4		1028
	925'	*** NE	TOP	5.2	21	0.3	9.3	61,100	62,932	N-A		1031
			BOTTOM	5.6	21	2.0	9.3	62,000	66,335	N-A		1036

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

Pond I
Bottom Sample Depth.
* SE Corner = 13 ft
* Middle = 13 ft.
** NW Corner = 11 ft.

Pond II
Bottom Sample Depth.
* SW Corner = 14 ft.
** Middle = 16 ft.
*** NE Corner = 9 ft.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE July-27-1995	930	SE	TOP	7.4	27	1.5	8.9	51,900	57,482		350	1132
			BOTTOM	60	25	1.5	8.8	55,600	58,546		300	1135
	930	MIDDLE	TOP	8.2	26	1.0	8.8	54,930	60,033	10.4	200	1137
			BOTTOM	8.8	26	0.5	8.9	52,300	59,487	11.4	200	1138
	930	NW	TOP	8.9	27	0.5	8.9	53,100	59,229		200	1200
			BOTTOM	4.4	26	2.0	8.9	53,700	58,756		200	1204

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE July-27,1995	925	SW	TOP	11.4	27.5	<0.1	9.3	59,980	69,368		150	939
			BOTTOM	1.4	24.0	8.0	8.7	66,800	76,602		100	944
	926	MIDDLE	TOP	11.2	27	<0.1	9.2	61,430	64,553	10.4	80	1008
			BOTTOM	1.4	24	12.0	8.6	71,100	80,480	14.4	150	1003
	925	NE	TOP	13	27	<0.1	9.2	60,950	66,848		150	1023
			BOTTOM	2.2	25	<0.1	9.2	62,330	69,478		150	1025

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

Pond I Bottom Depth
S/E = 16 ft.
Middle = 14 ft.
N/W = 17 ft.

Pond II - Bottom Depth
S/W = 13½ ft.
Middle = 17 ft.
N/E = 12 ft.

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MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE July-27,1995	930	SE	TOP								6.5	358
			BOTTOM								5.5	307
	930	MIDDLE	TOP								5.0	206
			BOTTOM								5.0	206
	930	NW	TOP								5.0	206
			BOTTOM								5.0	207

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE July-27, 1995	925	SW	TOP								4.0	154
			BOTTOM								2.0	110
	925	MIDDLE	TOP								4.0	84
			BOTTOM								1.0	163
	925	NE	TOP								4.0	154
			BOTTOM								4.0	154

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

(*) NOTE: Total Nitrogen numbers should be slightly lower, (≈ .3 mg/l per result), this due to reported NH_3 values not converted/reported as N. In the future this conversion will take place.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Aug. 3, 1995	927	SE	TOP	8.0	29	2.0	8.9	56,800	58,631		400	1402
			BOTTOM	4.0	27	1.5	8.8	56,500	54,352		275	1403
	927	MIDDLE	TOP	7.9	28	1.0	8.8	57,600	57,513	22.4	150	1416
			BOTTOM	6.0	26	1.0	8.8	67,000	58,081	24.4	150	1418
	927	NW	TOP	9.0	28	1.0	8.8	57,100	56,981		150	1432
			BOTTOM	8.6	28	0.5	8.8	57,300	56,082		200	1435

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Aug. 3, 1995	925	SW	TOP	14.0	28	2.0	9.0	66,600	65,905		125	0855
			BOTTOM	1.0	23	10.0	8.3	81,130	88,563		30	0850
	925	MIDDLE	TOP	12.0	29	2.0	9.0	67,500	66,633	23.4	125	0915
			BOTTOM	0.8	23	15.0	8.4	74,500	79,750	16.4	30	0909
	925	NE	TOP	9.2	29	1.5	9.0	67,600	66,780		125	0928
			BOTTOM	0.5	27	4.0	8.9	67,200	66,262		150	0924

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Bottom Depth.

Pond I		Pond II	
S/E	= 14 ft.	S/W	= 15.5 ft.
Middle	= 14 ft.	Middle	= 15.5 ft.
N/W	= 13 ft.	N/E	= 10.0 ft.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE Aug. 3, 1995	927	SE	TOP								6.0	408
			BOTTOM								6.5	283
	927	MIDDLE	TOP.								5.0	156
			BOTTOM								5.0	156
	927	NW	TOP								6.0	157
			BOTTOM								5.5	206

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE Aug. 3, 1995	925	SW	TOP								5.0	132
			BOTTOM								1.0	41
	925	MIDDLE	TOP								6.0	133
			BOTTOM								1.0	46
	925	NE	TOP								6.5	133
			BOTTOM								6.0	160

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Sept. 21, 1995	925	SE	TOP	7.6	25	0.09	8.1	59,100	62,677	—	200	0950
			BOTTOM	6.0	25	0.09	8.1	59,500	63,438	—	200	0953
	925	MIDDLE	TOP	7.0	25	1.5	8.1	50,100	62,325	16.8	150	1014
			BOTTOM	5.8	24.2	1.5	8.1	60,500	63446	24.8	200	1019
	925	NW	TOP	7.8	25	1.0	8.1	61,000	64349	—	300	1036
			BOTTOM	7.6	24	1.5	8.1	59,320	63,103	—	250	1039
			T	7.5	25	.86	8.7					
			B	6.5	24.4	1.03	8.7					

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Sept. 21, 1995	925	SW	TOP	10	25	0.09	9.1	62,300	63,883	—	150	1135
			BOTTOM	0.6	24.8	70*	7.9	81,700	88,693	—	20	1139
	925	MIDDLE	TOP	9.0	26	10*	8.9	67,200	67,347	50.8*	80	1150
			BOTTOM	0.6	25	20*	8.4	61,000	83,308	40.8*	40	1155
	925	NE	TOP	11.2	27	1.0	9.1	63,300	66,245		130	1220
			BOTTOM	1.0	25	2.0	9.0	64,900	66,634		130	1225
				10.07	26	3.7	9.3					
				.73	24.9	30.7	8.4					

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: * These samples Contained H_2S. The H_2S was highly Concentrated according to odor, in the SW Corner area. The H_2S Covered the SW Corner and moved across the Pond into the middle.

Bottom Depth

Pond I - SE = 14'
Middle = 5'
NW = 9.5'

Pond II - SW = 17.5'
Middle = 16.0'
NE = 10.0'

MONTHLY EVAPORATION/POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 as N	pH	COND	TDS	BOD	Nitrite NO_3 as N	~~TIME~~ Total Nitrogen
DATE Sept. 21, 1995	925	SE	TOP			0.0741					3.0	203.0741
			BOTTOM			0.0741					3.0	203.0741
	925	MIDDLE	TOP			1.2353					2.0	153.2353
			BOTTOM			1.2353					4.0	205.2353
	925	NW	TOP			0.8235					3.0	303.8235
			BOTTOM			1.2353					2.0	253.2353

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 as N	pH	COND	TDS	BOD	Nitrite NO_3 as N	TIME Total Nitrogen
DATE Sept. 21, 1995	925	SW	TOP			0.0741					3.0	153.0741
			BOTTOM			57.6471					10.0	87.6471
	925	MIDDLE	TOP			8.2353					2.0	90.2353
			BOTTOM			16.4706					12.0	68.4706
	925	NE	TOP			0.8235					2.0	132.8235
			BOTTOM			1.6471					3.0	134.6471

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Oct. 18, 1995	925	SE	TOP	17	19	<0.1	8.7	54,900	64,798	—	900	0850
			BOTTOM	5.8	19.5	<0.1	8.6	57,900	66,183	—	800	0852
	925	MIDDLE	TOP	17.8	19	<0.1	8.7	55,700	65,023	13.6	700	0900
			BOTTOM	5.8	19	<0.1	8.7	55,730	64,306	15.6	800	0905
	925	NW	TOP	18.6	19	<0.1	8.8	52,700	63,859	—	800	0914
			BOTTOM	15.2	19	<0.1	8.8	52,500	63,638	—	800	0917

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3	pH	COND	TDS	BOD	Nitrate NO_3 as N	TIME
DATE Oct. 18, 1995	925	SW	TOP	12.0	19	<0.1	9.1	67,400	68,254	—	400	0940
			BOTTOM	11.4	18	12.0	8.6	71,720	75,148	—	300	0945
	925	MIDDLE	TOP	13.0	19	<0.1	9.1	64,800	67,616	15.6	440	1000
			BOTTOM	12.0	19	12.5	8.6	67,100	68,476	13.6	240	1005
	925	NE	TOP	13.0	19	1.0	9.1	66,200	75,564	—	400	1020
			BOTTOM	11.2	19	1.0	8.1	63,630	69,197	—	400	1025

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Matt + Trash in SW Corner of Pond II

Bottom Depth

Pond I - SE = 14'
Middle = 7'
NW = 7'

Pond II SW = 13'
Middle = 15'
NE = 12'

Page 2 of 2

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	as N NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen TIME
DATE Oct. 18, 1995	925	SE	TOP			0.0471					2.5	903
			BOTTOM			0.0471					3.0	803
	925	MIDDLE	TOP			0.0471					2.5	703
			BOTTOM			0.0471					2.5	803
	925	NW	TOP			0.0471					2.5	803
			BOTTOM			0.0471					2.0	802

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	as N NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen TIME
DATE Oct. 18, 1995	925	SW	TOP			0.0471					3.0	403
			BOTTOM			9.8824					2.5	312.4
	925	MIDDLE	TOP			0.0471					4.0	444.0
			BOTTOM			10.2941					2.0	252.3
	925	NE	TOP			0.8235					4.0	405.0
			BOTTOM			0.8235					3.0	404.0

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO (2)	TEMP (3)	NH_3 (4) Ammonia	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME (1)
DATE 11-30-95	926	SE	TOP	15.2	16.0	1.0	8.8	64,490	64,671	—	121	0910
			BOTTOM	15.0	15.0	2.0	8.8	63,120	65,068	—	120	0907
	926	MIDDLE	TOP	16.2	15.0	1.0	8.8	62,580	64,678	11.4	160	0928
			BOTTOM	17.0	15.0	0.5	8.8	61,220	64,318	16.4	200	0919
	926	NW	TOP	16.2	15.0	1.0	8.8	61,460	64,384	—	120	0941
			BOTTOM	16.0	15.0	1.0	8.8	62,490	64,481	—	80	0936

EVAP POND 2	LEVEL	LOCATION		DO (2)	TEMP	NH_3 Ammonia	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME (1)
DATE 11-30-95	925	SW	TOP	14.6	15.5	2.5	9.1	70,930	70,711	—	120	1015
			BOTTOM	13.4	15.0	3.0	9.1	68,950	71,090	—	78	1013
	925	MIDDLE	TOP	13.0	15.0	2.0	9.1	68,680	69,531	15.4	80	1022
			BOTTOM	13.0	15.0	2.0	9.1	68,940	69,881	15.4	40	1019
	925	NE	TOP	13.2	15.0	1.5	9.1	69,840	69,522	—	80	1030
			BOTTOM	13.0	15.0	1.5	9.1	70,730	69,827	—	80	1038

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

Bottom Depth

Pond I - S/E = 13'
Middle = 9'
N/W = 7'

Pond II - S/W = 13.5'
Middle = 13.0'
N/E = 8.5'

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH$_3$ as N	pH	COND	TDS	BOD	Nitrite NO$_2$ as N	~~TIME~~ Total Nitrogen
DATE 11/30/95	926	SE	TOP			0.8					2.0	123.8
			BOTTOM			1.6					2.0	123.6
	926	MIDDLE	TOP			0.8					2.0	162.8
			BOTTOM			0.4					1.5	201.9
	926	NW	TOP			0.8					1.5	122.3
			BOTTOM			0.8					1.5	82.3

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH$_3$ as N	pH	COND	TDS	BOD	Nitrite NO$_2$ as N	~~TIME~~ Total Nitrogen
DATE 11/30/95	925	SW	TOP			2.1					3.0	125.1
			BOTTOM			2.5					3.0	83.5
	925	MIDDLE	TOP			1.6					3.0	85.0
			BOTTOM			1.6					3.0	44.6
	925	NE	TOP			1.2					3.0	84.2
			BOTTOM			1.2					3.0	84.2

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

(2) (0)

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 12-8-95	926.5'	SE	TOP	18	15	1.0	8.8	64,600	63,432	—	80	0940
			*BOTTOM	17	16	2.0	8.8	64,910	65,644	—	120	0942
	926.5'	MIDDLE	TOP	19	15	2.0	8.8	64,110	64,160	14.4	300	0947
			*BOTTOM	18	16	1.0	8.8	64,540	64,656	12.4	120	0948
	926.5'	NW	TOP	17	15	2.0	8.8	64,710	64,355	—	80	1002
			*BOTTOM	19	15	1.0	8.8	64,820	62,898	—	200	1004

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 12-8-95	925'	SW	TOP	15.8	15	2.0	9.1	71,450	69,905	—	300	1035
			*BOTTOM	13.8	15	50.0	8.0	77,400	84,500	—	20	1037
	925'	MIDDLE	TOP	14.8	15	2.0	9.1	70,830	70,247	11.4	200	1043
			*BOTTOM	12.8	15	3.0	9.0	71,010	69,894	13.4	200	1046
	925'	NE	TOP	16	14	1.0	9.1	70,730	68,595	—	200	1052
			*BOTTOM	13.8	15	1.0	9.1	71,000	69,940	—	120	1055

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond I - Middle - small white (pin worm type Parasites)
Birds Present - (50 Sea Gulls) (2 Grebes)

Pond II - Birds Present (15 Grebes).
Strong H_2S odor in S/W Corner.

* see Page 2 for Ponds Depth for Bottom Samples.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	Ammonia as N NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE 12-8-95	926.5'	SE	TOP			0.8					1.5	82.3
			BOTTOM			1.6					1.5	123.1
	926.5'	MIDDLE	TOP			1.6					1.5	303.1
			BOTTOM			0.8					1.3	122.1
	926.5'	NW	TOP			1.6					1.5	83.1
			BOTTOM			0.8					1.5	202.3

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	Ammonia as N NH_3	pH	COND	TDS	BOD	Nitrite NO_2 as N	Total Nitrogen ~~TIME~~
DATE 12-8-95	925'	SW	TOP			1.6					3.0	304.6
			BOTTOM			41.2					1.0	62.2
	925'	MIDDLE	TOP			1.6					2.5	204.1
			BOTTOM			2.5					2.3	204.8
	925'	NE	TOP			0.8					2.3	203.1
			BOTTOM			0.8					2.5	123.3

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

* Bottom Depth.

Pond I - S/E = 9.5 ft.
Middle = 8 ft.
N/W = 5 ft.

Pond II - S/W = 12 ft.
Middle = 12.5 ft.
N/E = ~~12~~ 9 ft.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE Jan. 11, 1996	927'	SE	TOP	16	11	N/A	8.9	58,050	62,364	—	600	0926
			BOTTOM*	16	11	1.5	8.9	58,810	63,441	—	700	0924
	927'	MIDDLE	TOP	17	10	0.1	9.0	57,750	63,384	12.6	700	0945
			BOTTOM*	12	10	1.0	8.9	58,210	64,380	13.6	600	0940
	927'	NW	TOP	19	10	0.5	9.0	57,810	62,680	—	700	0953
			BOTTOM*	17	10	0.5	8.9	56,000	63,607	—	800	0950

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE Jan. 11, 1996	925'	SW	TOP	10.1	11.0	3.0	9.1	66,490	71,066	—	300	1025
			BOTTOM*	10.0	10.5	125	7.7	82,900	88,496	—	40	1029
	925'	MIDDLE	TOP	10.1	11.0	3.0	9.0	66,020	68,812	12.6	300	1034
			BOTTOM*	10.1	11.0	20	8.2	73,750	82,326	14.6	60	1037
	925'	NE	TOP	10.0	11.0	3.0	9.1	65,900	70,938	—	400	1048
			BOTTOM*	9.0	10.0	4.0	9.1	65,910	71,070	—	200	1051

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond II - S/W Corner, @ bottom of Pond was high in H_2S. after Sample sat in refrig. for 5 days, the odor left and the turbidity changed to a milk color. The color change was of clear milk color.

* See Page 2 for Ponds Depth for bottom samples.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	AMMONIA as N NH_3	pH	COND	TDS	BOD	Nitrite NO_3 as N	Total Nitrogen ~~TIME~~
DATE Jan. 11, 1996	927'	SE	TOP			N/A					2.0	602
			BOTTOM*			1.2					2.0	703.2
	927'	MIDDLE	TOP			0.08					2.0	702.08
			BOTTOM*			0.82					1.5	602.32
	927'	NW	TOP			0.41					2.0	702.41
			BOTTOM*			0.41					1.5	801.91

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	AMMONIA as N NH_3	pH	COND	TDS	BOD	Nitrite NO_3 as N	Total Nitrogen ~~TIME~~
DATE Jan. 11, 1996	925'	SW	TOP			2.5					3.0	305.5
			BOTTOM*			102.9					17.0	159.9
	925'	MIDDLE	TOP			2.5					3.0	305.5
			BOTTOM*			16.5					2.0	78.5
	925'	NE	TOP			2.5					3.0	405.5
			BOTTOM*			3.3					3.0	206.3

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: *Bottom Depth

Pond I - S/E = 9 ft
Middle = 7 ft
N/W = 5 ft

Pond II
S/W = 14 ft
Middle = 13 ft
N/E = 10 ft

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH₃ (Ammonia)	pH	COND	TDS	BOD	NO₃ as N (Nitrate)	TIME
DATE 2/15/96	928'	SE	TOP	17.2	16	1.5	9.4	50,800	59,278	—	500	0920
			BOTTOM	0.3	13	3.0	9.0	51,630	61,827	—	500	0921
	928'	MIDDLE	TOP	17.3	15.5	1.0	9.6	49,030	60,026	31.6	500	0926
			BOTTOM	0.3	12.5	2.0	9.1	50,680	64,834	30.6	500	0928
	928'	NW	TOP	17.8	15.5	1.5	9.5	49,360	62,738	—	500	0940
			BOTTOM	0.5	13.0	1.0	9.5	49,490	60,964	—	400	0943

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH₃ (Ammonia)	pH	COND	TDS	BOD	NO₃ as N (Nitrate)	TIME
DATE 2/15/96	925'	SW	TOP	13	15	5.0	9.3	59,030	74,940	—	260	1010
			BOTTOM	11.4	14	15.0	8.7	62,010	80,934	—	160	1015
	925'	MIDDLE	TOP	13.4	15	6.0	9.3	59,030	77,021	23.6	200	1020
			BOTTOM	12.8	14	6.0	9.3	61,550	74,688	23.6	160	1024
	925'	NE	TOP	14.0	15	6.0	9.3	60,600	76,020	—	200	1030
			BOTTOM	12.0	14	6.0	9.3	61,900	75,754	—	200	1033

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond Depth:

Pond I - S/E Corner = 13'
Middle = 6'
N/W Corner = 4'

Pond II - S/W Corner = 10'
Middle = 10'
N/E Corner = 7'

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 Ammonia as N	pH	COND	TDS	BOD	NO_2 as N Nitrite	~~TIME~~ Total Nitrogen
DATE 2/15/96		SE	TOP			1.2					2.5	504
			BOTTOM			2.5					3.0	506
		MIDDLE	TOP			0.82					2.5	503
			BOTTOM			1.6					2.5	504
		NW	TOP			1.2					3.0	504
			BOTTOM			0.82					3.0	404

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 Ammonia as N	pH	COND	TDS	BOD	NO_2 as N Nitrite	~~TIME~~ Total Nitrogen
DATE 2/15/96		SW	TOP			4.1					4.0	268
			BOTTOM			12.4					1.5	174
		MIDDLE	TOP			4.9					3.0	208
			BOTTOM			4.9					3.0	168
		NE	TOP			4.9					3.0	208
			BOTTOM			4.9					2.0	207

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 4-17-96	927.5	SE	TOP	8.0	20	3.0	9.4	46,030	63,810	—	500	9:26
			BOTTOM	6.8	20	3.0	9.3	46,330	63855	—	400	0922
	927.5	MIDDLE	TOP	9.6	21	2.5	9.4	48,100	63,731	14	400	0936
			BOTTOM	6.8	19	3.0	9.4	47,000	64,048	11	360	0932
	927.5	NW	TOP	9.4	21	2.5	9.4	48,500	65,921	—	360	0940
			BOTTOM	6.8	19	3.8	9.4	40,300	66,375	—	600	0946

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 4-17-96	925	SW	TOP	12.6	21	4.0	9.3	56,200	72,241	—	300	1025
			BOTTOM	10.4	20	20	9.1	49,580	78,619	—	120	1022
	925	MIDDLE	TOP	12.4	21	3.0	9.3	50,600	75,627	12	160	1030
			BOTTOM	11.8	21	2.5	9.3	50,430	75,066	12	200	1032
	925	NE	TOP	12.6	21	3.0	9.4	52,500	74,344	—	400	1037
			BOTTOM	10.4	20	4.0	9.3	53,900	77,510	—	400	1040

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond Depth:

Pond I - S/E Corner = 13'
Middle = 6'
N/W Corner = 7'

Pond II - S/W Corner = 12'
Middle = 12'
N/E Corner = 9'

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 Ammonia as N	pH	COND	TDS	BOD	NO_2 as N Nitrite	Total Nitrogen
DATE 4-17-96		SE	TOP			1.2					7.0	508.2
			BOTTOM			2.5					7.5	410.0
		MIDDLE	TOP			0.82					6.0	406.82
			BOTTOM			1.6					6.0	367.6
		NW	TOP			1.2					7.0	368.2
			BOTTOM			0.82					7.0	607.82

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 Ammonia as N	pH	COND	TDS	BOD	NO_2 as N Nitrite	Total Nitrogen
DATE 4-17-96		SW	TOP			4.1					5.0	309.1
			BOTTOM			12.4					5.0	137.4
		MIDDLE	TOP			4.9					4.0	168.9
			BOTTOM			4.9					4.0	208.9
		NE	TOP			4.9					5.0	409.9
			BOTTOM			4.9					5.0	409.9

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 5/2/96	929	SE	TOP	13.6	23	2.5	9.2	57,600	64,194	—	400	0836
			BOTTOM	13.4	22	2.5	9.2	58,300	64,868	—	700	0842
	929	MIDDLE	TOP	13.8	23	2.5	9.2	56,800	65,916	11.6	300	0847
			BOTTOM	13.8	22	2.0	9.2	59,200	66,150	11.6	600	0852
	929	NW	TOP	16.0	23	2.0	9.3	57,700	67,060	—	500	0856
			BOTTOM	12.0	22	2.5	9.2	57,700	63,492	—	500	0902

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 5/2/96	925	SW	TOP	18.2	23	1.5	9.6	65500	78,462	—	300	0940
			BOTTOM	17.8	23	2.5	9.4	57,700	77,242	—	200	0945
	925	MIDDLE	TOP	18.4	24	2.0	9.6	68,600	77,252	10.6	200	0960 → 9:5[illegible]
			BOTTOM	8.8	23	5.0	9.2	67,030	77,136	14.6	300	0955
	925	NE	TOP	17.4	23	2.5	9.5	57,000	77,914	—	400	1015
			BOTTOM	6.6	21	3.5	9.4	57,000	75,622	—	300	1020

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond Depth

Pond I - S/E Corner - 15'
Middle - 9'
N/W Corner - 11'

Pond II - S/W Corner - 10'
Middle - 12'
N/E Corner - 10'

Pond I - N/W Corner (large Brine Shrimp) alive in patches.
Population thinner in S/E Corner and across Pond.
Pond II [illegible] the Pond.

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia as N)	pH	COND	TDS	BOD	NO_2 as N (Nitrite)	~~TIME~~ Total nitrogen
DATE 5/2/96	929	SE	TOP			2.1					4.5	406.6
			BOTTOM			2.1					4.0	706.1
	929	MIDDLE	TOP			2.1					3.0	305.1
			BOTTOM			1.6					4.0	606.0
	929	NW	TOP			1.6					4.0	506.0
			BOTTOM			2.1					4.0	506.1

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia as N)	pH	COND	TDS	BOD	NO_2 as N (Nitrite)	~~TIME~~ Total nitrogen
DATE 5/2/96	925	SW	TOP			1.2					3.0	304.2
			BOTTOM			2.1					3.0	205.1
	925	MIDDLE	TOP			1.6					3.0	205.0
			BOTTOM			4.1					2.5	307.0
	925	NE	TOP			2.1					4.0	406.1
			BOTTOM			2.9					4.0	307.0

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes:

MONTHLY EVAPORATION POND ANALYSES

EVAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 6/19/96	930	11' SE	TOP	4.6	30	4.0	8.7	60,960	71,642	—		0900
			BOTTOM	5.0	30	4.0	8.7	59,500	71,112	—		0905
	11'	MIDDLE	TOP	6.0	30	4.0	8.7	62,880	69,050	18.4		0910
			BOTTOM	4.1	29	4.0	8.8	58,010	69,092	18.4		0912
	6'	NW	TOP	6.1	30	3.5	8.7	62,920	70,046	—		0915
			BOTTOM	6.1	29	4.0	8.8	61,500	72,442	—		0917

EVAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia)	pH	COND	TDS	BOD	NO_3 as N (Nitrate)	TIME
DATE 6/19/96	925	15' SW	TOP	1.5	29	7.0	8.9	68,240	78,394	—		0943
			BOTTOM	1.0	29	50.0	8.4	73,600	75,068	—		0944
	14'	MIDDLE	TOP	1.1	31	7.0	8.9	67,700	75,932	10.4		0951
			BOTTOM	0.9	29	25	8.7	68,880	77,546	10.4		0952
	925	11' NE	TOP	1.1	29	7.0	9.0	66,430	75,568	—		1010
			BOTTOM	1.0	30	7.0	9.0	64,670	74,884	—		1011

Depth - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Field Notes: Pond II

*Pond I - Lots of large Brine Shrimp.

MONTHLY EVAPORATION POND ANALYSES

VAP POND 1	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia as N)	pH	COND	TDS	BOD	NO_2 as N (Nitrite)	TIME (Total Nitrogen)
TE /19/96	930	SE	TOP			3.3						
			BOTTOM			3.3						
	930	MIDDLE	TOP			3.3						
			BOTTOM			3.3						
	930	NW	TOP			2.9						
			BOTTOM			3.8						

VAP POND 2	LEVEL	LOCATION		DO	TEMP	NH_3 (Ammonia as N)	pH	COND	TDS	BOD	NO_2 as N (Nitrite)	TIME (Total Nitrogen)
TE /19/96	925	SW	TOP			5.8						
			BOTTOM			41.2						
	925	MIDDLE	TOP			5.8						
			BOTTOM			20.6						
	925	NE	TOP			5.8						
			BOTTOM			5.8						

1 - All top samples taken 1 ft. below top of pond surface.
All bottom samples taken 1 ft. from above pond bottom.

Notes:

Tom, 6-14-95

RECEIVED
JUN 16 1995

Hg/R_4N) can be obtained either electrolytically or by reduction of R_4NX with Hg/Na in media where the resulting NaX is insoluble.

Hydrazine. Hydrazine (N_2H_4) may be thought of as derived from ammonia by replacement of a hydrogen atom by the $—NH_2$ group. It might therefore be expected to be a base, but somewhat weaker than NH_3, which is the case. It is a bifunctional base:

$$N_2H_4(aq) + H_2O = N_2H_5^+ + OH^- \qquad K_{25°} = 8.5 \times 10^{-7}$$
$$N_2H_5^+(aq) + H_2O = N_2H_6^{2+} + OH^- \qquad K_{25°} = 8.9 \times 10^{-16}$$

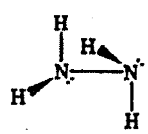
and two series of hydrazinium salts are obtainable. Those of $N_2H_5^+$ are stable in water, and those of $N_2H_6^{2+}$ are, as expected from the foregoing equilibrium constant, extensively hydrolyzed. Salts of $N_2H_6^{2+}$ can be obtained by crystallization from aqueous solution containing a large excess of the acid, since they are usually less soluble than the monoacid salts.

As another consequence of its basicity, hydrazine, like NH_3, can form coordination complexes with both Lewis acids and metal ions (Section 4-13). Just as with respect to the proton, electrostatic considerations (and, in these cases, also steric considerations) militate against bifunctional behavior.

Anhydrous N_2H_4 (m.p. 2°, b.p. 114°), a fuming colorless liquid with a high dielectric constant ($\epsilon = 52$ at 25°), is surprisingly stable in view of its endothermic nature ($\Delta H_f^0 = 50$ kJ mol^{-1}). It will burn in air, however, with considerable evolution of heat, which accounts for interest in it and certain of its alkylated derivatives as potential rocket fuels.

$$N_2H_4(l) + O_2(g) = N_2(g) + 2H_2O(l) \qquad \Delta H^0 = 622 \text{ kJ mol}^{-1}$$

At 25°C N_2H_4 is 100% in the *gauche* form 13-VII (cf. N_2F_4, below).



(13-VII)

Aqueous hydrazine is a powerful reducing agent in basic solution; in many of such reactions, diimine (see below) is an intermediate. One reaction, which is quantitative with some oxidants (e.g., I_2), is

$$N_2 + 4H_2O + 4e = 4OH^- + N_2H_4(aq) \qquad E^0 = -1.16 \text{ V}$$

However NH_3 and HN_3 are also obtained under various conditions. Air and oxygen, especially when catalyzed by multivalent metal ions in basic solution, produce hydrogen peroxide:

$$2O_2 + N_2H_4(aq) \rightarrow 2H_2O_2(aq) + N_2$$

but further reaction occurs in presence of metal ions:

In acid solution, h
The preparation
produce it in small
However none of th
there are competing
The last three reacti
N_2 on nitrogen chem
The only practica
synthesis, discovered
overall reaction, car
The reaction proceed
However there is a c
hydrazine has been f
To obtain appreciabl
serves two essential
the parasitic reaction
almost completely pr
simple sequestering a
is assumed to have a p
under optimum cond
over NaOH or by pre
to precipitate (NH_4)
the use of a ketone tc
A recent, potential
require a lot of ene
quence:

Substitute oxydizers for X (example)

In acid solution, hydrazine can reduce halogens:

$$N_2H_4(aq) + 2X_2 \rightarrow 4HX + N_2$$

The preparation of hydrazine has been the subject of much study. Many reactions produce it in small amounts under certain conditions, for example:

$$N_2 + 2H_2 \rightarrow N_2H_4$$
$$N_2O + 2NH_3 \rightarrow N_2H_4 + H_2O + N_2$$
$$2NH_3(g) + \tfrac{1}{2}O_2 \rightarrow N_2H_4 + H_2O$$
$$N_2O + 3H_2 \rightarrow N_2H_4 + H_2O$$

However none of these has ever been developed into a practical method because there are competing, and thermodynamically more favorable, reactions, such as

$$2NH_3 + \tfrac{3}{2}O_2 = N_2 + 3H_2O$$
$$3N_2O + 2NH_3 = 4N_2 + 3H_2O$$
$$N_2O + H_2 = N_2 + H_2O$$

The last three reactions are good illustrations of the effect of the great stability of N_2 on nitrogen chemistry.

The only practical methods for preparing hydrazine in quantity are the Raschig synthesis, discovered in the first decade of this century, and a variant thereof. The overall reaction, carried out in aqueous solution, is

$$2NH_3 + NaOCl \rightarrow N_2H_4 + NaCl + H_2O$$

The reaction proceeds in two steps:

$$NH_3 + NaOCl \rightarrow NaOH + NH_2Cl \quad \text{(fast)}$$
$$NH_3 + NH_2Cl + NaOH \rightarrow N_2H_4 + NaCl + H_2O$$

However there is a competing and parasitic reaction that is rather fast once some hydrazine has been formed:

$$2NH_2Cl + N_2H_4 \rightarrow 2NH_4Cl + N_2$$

To obtain appreciable yields, it is necessary to add some gelatinous material, which serves two essential purposes. First, it sequesters heavy metal ions that catalyze the parasitic reaction: even the part per million or so of Cu^{2+} in ordinary water will almost completely prevent the formation of hydrazine if no catalyst is used. Since simple sequestering agents such as EDTA are not as beneficial as gelatin, the latter is assumed to have a positive catalytic effect as well. Yields of 60 to 70% are obtained under optimum conditions. Anhydrous hydrazine may be obtained by distillation over NaOH or by precipitating $N_2H_6SO_4$, which is then treated with liquid NH_3 to precipitate $(NH_4)_2SO_4$. A more recent variant of the Raschig process involves the use of a ketone to catalyze the reaction of Cl_2 with NH_3.

A recent, potentially viable process[12] avoids the use of chlorine compounds that require a lot of energy and provide disposal problems. This involves the sequence:

ction of R_4NX with
ived from ammonia
might therefore be
h is the case. It is a
10^{-7}
10^{-16}
$N_2H_5^+$ are stable in
quilibrium constant,
rystallization from
hey are usually less
3, can form coordi-
1 4-13). Just as with
se cases, also steric
quid with a high di-
of i... ndothermic
h considerable evo-
lkylated derivatives
mol^{-1}
F_4, below).
olution; in many of
reaction, which is
5 V
ons. Air and oxygen,
solution, produce

Hydrazoic Acid and Azides.[17a] Although hydrazoic acid (HN_3), is a hydride of nitrogen in a formal sense, it has no essential relationship to NH_3 and N_2H_4. The sodium salt is prepared by the reactions

$$3NaNH_2 + NaNO_3 \xrightarrow{175^\circ} NaN_3 + 3NaOH + NH_3$$

$$2NaNH_2 + N_2O(g) \xrightarrow{190^\circ} NaN_3 + NaOH + NH_3$$

and the free acid can be obtained in solution by the reaction

$$N_2H_5^+ + HNO_2 \xrightarrow{\text{aq soln.}} HN_3 + H^+ + 2H_2O$$

Many other oxidizing agents attack hydrazine to form small amounts of HN_3 or azides. Hydrazoic acid ($pK_a^{25} = 4.75$), obtainable pure by distillation from aqueous solutions, is a colorless liquid (b.p. 37°) and dangerously explosive. Azides of many metals are known: those of heavy metals are generally explosive; lead, mercury, and barium azides explode on being struck sharply and are used in detonation caps.

Azides of electropositive metals are not explosive and, in fact, decompose smoothly and quantitatively when heated to 300° or higher, for example,

$$2NaN_3(s) = 2Na(l) + 3N_2(g)$$

Azide ion also functions as a ligand in complexes of transition metals.[17b] In general, N_3^- behaves rather like a halide ion and is commonly considered to be a pseudohalide, although the corresponding pseudohalogen $(N_3)_2$ is not known.

The azide ion itself is symmetrical and linear (N—N, 1.16 Å), and its electronic structure may be represented in valence bond theory as

$$:\overset{-}{\ddot{N}}=\overset{+}{N}=\overset{-}{\ddot{N}}: \longleftrightarrow :N\equiv\overset{+}{N}-\overset{2-}{\ddot{\underset{..}{N}}}: \longleftrightarrow :\overset{2-}{\ddot{\underset{..}{N}}}-\overset{+}{N}\equiv N:$$

In covalent azides, on the other hand, the symmetry is lost, as is evident in HN_3 and CH_3N_3 (Fig. 13-3). In such covalent azides the electronic structure is a resonance hybrid:

$$R:\ddot{N}=\overset{+}{N}=\overset{-}{\ddot{N}}: \longleftrightarrow R:\overset{-}{\ddot{\underset{..}{N}}}:\overset{+}{N}\equiv N:$$

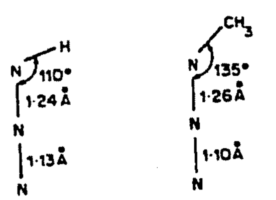


Fig. 13-3. Structures of HN_3 and CH_3N_3.

[17a] H. D. Fair and R. F. Walker, Eds., *Energetic Materials*, Vols. 1, 2, Plenum Press, 1977.
[17b] Z. Dori and R. F. Ziolo, *Chem. Rev.*, 1973, 73, 247.

Palo Verde Groundwater Monitoring Program
Water Quality Data for 1994 Annual Report
Table 1 - Major Cations and Anions

Location	Sample Type	Quarter & Year	Date Sampled	Na	K	Ca	Mg	Cl	Alk	CO3	HCO3	OH	SO4	NO3 as N	F	TDS	EC	pH
ERA SPIKE	S	1 92	920226	9100	36.00	1100.0	320.0	17000	-5	-5.0	-5	-5.0	1300	220.00	-0.10	30000	45000.0	6.2
EVPPND #1	A	3 92	920809	16000	680.00	590.0	44.0	16000	310	88.0	222	-5.0	14000	320.00	33.00	49000	59400.0	8.9
EVPPND #1	A	4 92	921120	9900	420.00	590.0	50.0	10000	250	108.0	142	-5.0	8200	300.00	2.60	39000	39852.0	9.0
EVPPND #1	A	1 93	930330	10000	530.00	540.0	35.0	9100	240	166.0	130	-5.0	7900	330.00	24.00	31000	39400.0	9.4
EVPPND #1	A	2 93	930624	12000	590.00	650.0	40.0	12000	320	264.0	56	-5.0	13000	360.00	31.00	38000	47800.0	9.3
EVPPND #1	A	3 93	930823	13000	820.00	730.0	45.0	15000	400	238.0	160	-5.0	12000	440.00	36.00	43000	52832.0	9.0
EVPPND #1	A	4 93	931203	13000	670.00	640.0	42.0	12000	270	176.0	94	-5.0	12000	380.00	32.00	42000	43200.0	9.2
EVPPND #1	A	1 94	940323	13000	610.00	710.0	44.0	13000	310	260.0	50	-5.0	14000	370.00	31.00	40000	44100.0	9.6
EVPPND #1	A	2 94	940608	14000	850.00	590.0	47.0	14000	200	66.0	130	-5.0	7500	490.00	30.00	47000	43200.0	8.6
EVPPND #1	A	3 94	940914	15000	830.00	640.0	52.0	16000	220	96.0	120	-5.0	14000	400.00	22.00	48000	52500.0	8.7
EVPPND #1	A	4 94	941026	17000	520.00	650.0	55.0	15000	280	190.0	90	-5.0	14000	580.00	22.00	48000	54750.0	9.1
EVPPND #2	A	1 92	920224	12000	680.00	390.0	50.0	13000	190	26.0	180	-5.0	7200	210.00	20.00	42000	49750.0	8.7
EVPPND #2	A	2 92	920424	13000	410.00	440.0	48.0	13000	190	164.0	-5	26.0	9100	220.00	20.00	40000	46534.0	9.6
EVPPND #2	A	3 92	920809	16000	610.00	480.0	55.0	16000	370	214.0	156	-5.0	16000	180.00	30.00	49000	56922.0	9.2
EVPPND #2	A	4 92	921120	17000	840.00	570.0	64.0	20000	500	188.0	312	-5.0	15000	190.00	29.00	55000	60264.0	8.8
EVPPND #2	A	1 93	930330	16000	820.00	510.0	59.0	17000	490	230.0	370	-5.0	12000	180.00	29.00	49000	60200.0	9.1
EVPPND #2	A	2 93	930624	17000	860.00	450.0	67.0	19000	310	64.0	246	-5.0	18000	160.00	26.00	58000	67400.0	8.6
EVPPND #2	A	3 93	930823	18000	1200.00	480.0	76.0	20000	300	62.0	240	-5.0	17000	240.00	25.00	64000	70720.0	8.3
EVPPND #2	A	4 93	931203	27000	970.00	500.0	81.0	23000	330	120.0	210	-5.0	20000	190.00	24.00	69000	66550.0	8.7
EVPPND #2	A	1 94	940323	30000	950.00	540.0	83.0	25000	400	180.0	220	-5.0	23000	180.00	23.00	65000	70650.0	8.6
EVPPND #2	A	2 94	940608	28000	1700.00	510.0	95.0	50000	330	130.0	200	-5.0	25000	200.00	23.00	36000	70700.0	8.6
EVPPND #2	A	3 94	940914	36000	1700.00	560.0	120.0	40000	360	300.0	60	-5.0	33000	190.00	24.00	96000	97600.0	8.9
EVPPND #2	A	4 94	941026	31000	880.00	490.0	100.0	30000	360	220.0	140	-5.0	28000	210.00	24.00	88000	92000.0	8.7
PV-14H	A	1 92	920217	2400	3.80	72.0	40.0	2200	410	-5.0	500	-5.0	1600	70.00	8.00	6900	10752.0	7.8
PV-14H	A	2 92	920505	2300	1.40	73.0	37.0	2300	420	18.0	494	-5.0	1600	65.00	7.60	7100	10648.8	7.8
PV-14H	A	3 92	920811	2500	0.82	69.0	35.0	2100	440	26.0	414	-5.0	2000	63.00	8.00	7100	11370.0	7.8
PV-14H	A	4 92	921130	2500	0.78	69.0	35.0	2000	430	-5.0	525	-5.0	1800	62.00	8.20	7200	10399.0	7.8
PV-14H	A	1 93	930326	2600	-0.50	69.0	34.0	2100	460	-5.0	560	-5.0	1500	70.00	9.00	7100	10318.0	7.8
PV-14H	A	2 94	940615	2400	1.30	66.0	36.0	2200	450	-5.0	550	-5.0	1700	67.00	8.40	6700	9690.0	7.7
PV-14HB	A	1 92	920217	2400	3.20	70.0	35.0	1900	430	-5.0	525	-5.0	1500	65.00	8.00	6600	10080.0	7.8
PV-14HB	A	2 92	920505	2200	1.20	67.0	32.0	2100	430	22.0	503	-5.0	1700	62.00	7.20	6600	9988.0	7.8
PV-14HB	A	3 92	920811	2300	0.84	66.0	32.0	2000	440	20.0	420	-5.0	1200	54.00	8.40	6600	10430.0	7.8
PV-14HB	A	4 92	921130	2400	1.60	66.0	30.0	2000	440	-5.0	537	-5.0	1900	58.00	8.00	6700	9890.4	7.8
PV-14HB	A	1 93	930326	2500	0.66	68.0	32.0	1900	460	-5.0	560	-5.0	1600	66.00	8.60	6900	10065.0	7.8
PV-14HB	A	2 94	940615	2500	1.10	66.0	36.0	2200	450	-5.0	550	-5.0	1800	60.00	8.20	6400	9155.0	7.7
PV-192A	A	1 92	920214	1500	4.80	490.0	180.0	3200	64	-5.0	78	-5.0	1400	60.00	2.90	7800	11956.8	7.5
PV-192A	A	2 92	920501	2200	2.50	530.0	190.0	3400	60	7.0	65	-5.0	1600	64.00	3.00	7800	12288.0	7.5
PV-192A	A	3 92	920822	2000	4.10	530.0	170.0	3300	97	-5.0	118	-5.0	1300	59.00	2.60	8400	12862.2	7.2
PV-192A	A	4 92	921213	2200	5.00	570.0	200.0	3400	86	-5.0	105	-5.0	1500	64.00	2.60	8400	12459.2	7.4
PV-192A	A	1 93	930328	2400	0.79	580.0	200.0	3300	79	-5.0	96	-5.0	1700	71.00	2.80	8400	12650.0	7.3
PV-192A	A	2 94	940613	2400	3.60	580.0	210.0	3800	83	-5.0	100	-5.0	1100	90.00	2.40	8600	11140.0	7.4
PV-192B	A	1 92	920213	2300	4.40	560.0	200.0	3400	60	-5.0	73	-5.0	1300	74.00	3.00	8100	12847.2	7.4
PV-192B	A	2 92	920501	2200	2.20	560.0	200.0	3500	40	-5.0	49	-5.0	1700	72.00	2.80	8200	12812.8	7.4
PV-192B	A	3 92	920822	2200	2.80	580.0	180.0	3600	80	-5.0	98	-5.0	1500	69.00	2.60	8300	13096.8	7.2
PV-192B	A	4 92	921213	2200	3.70	590.0	190.0	3600	79	-5.0	96	-5.0	1400	72.00	2.80	8700	12864.8	7.3
PV-192B	A	1 93	930328	2500	2.00	600.0	210.0	3500	70	-5.0	85	-5.0	1800	75.00	2.70	8800	12900.0	7.3
PV-192B	A	2 94	940613	2500	3.40	600.0	220.0	4000	75	-5.0	92	-5.0	1400	110.00	2.50	8500	11490.0	7.7
PV-193A	A	1 92	920214	3300	6.80	1300.0	520.0	6200	46	-5.0	56	-5.0	2100	240.00	1.80	15000	20800.0	7.3
PV-193A	A	2 92	920423	3700	3.10	1300.0	520.0	6200	49	-5.0	60	-5.0	2500	240.00	2.00	15000	21200.0	7.3
PV-193A	A	3 92	920807	2700	1.80	910.0	280.0	6100	58	-5.0	71	-5.0	2600	210.00	2.00	16000	21076.0	7.2
PV-193A	A	4 92	921118	3400	10.00	1300.0	520.0	6400	62	-5.0	76	-5.0	2000	230.00	2.10	15000	20671.2	7.1
PV-193A	A	1 93	930328	3500	3.30	1300.0	500.0	6300	60	-5.0	73	-5.0	3000	220.00	1.90	15000	20900.0	7.2
PV-193A	A	2 94	940613	3400	6.70	1200.0	500.0	5300	79	-5.0	96	-5.0	2000	280.00	1.80	14000	17350.0	6.3

Negative values are below specified method detection limits.

Sample Type Codes: A = Normal, D = Duplicate, R = Repeat, N = No Sample

McKenzie ID	PVNGS No.	Date Sampled	Specific Conductance at 25 C	Total Alk mg/L CaCO3	mg/L OH	mg/L CO3	mg/L HCO3	mg/L Arsenic (diss)	mg/L Barium (diss)	mg/L Boron (diss)	mg/L Cadmium (diss)	mg/L Calcium (diss)	mg/L Chloride	mg/L Chromium (diss)	mg/L Copper (diss)	mg/L Fluoride	mg/L Iron (diss)
[redacted]	1	10/26/94	1792	96	5.0*	40	56	0.005*	0.01*	0.31	0.010*	27	310	0.015*	0.020*	1.4	0.010*
[redacted]	2	10/26/94	54750	280	5.0*	190	90	0.025	0.036	3.9	0.010*	650	15000	0.015*	0.020*	22	0.010*
[redacted]											0.010*	490	[illegible]	0.015*	0.020*	24	0.010*
E94-9756	4	11/02/94	13140	490	5.0*	5.0*	600	0.044	0.040	4.7	0.010*	150	2500	0.093	0.020*	12	0.010*
E94-9757	5	11/02/94	21100	310	5.0*	5.0*	380	0.045	0.015	6.8	0.010*	210	5500	0.062	0.020*	6.2	0.020
E94-9758	6	11/02/94	10190	190	5.0*	5.0*	230	0.016	0.029	2.2	0.010*	230	2500	0.015*	0.020*	5.0	0.018
E94-9759	7	11/02/94	21300	210	5.0*	5.0*	260	0.015	0.036	2.9	0.010*	780	5800	0.015*	0.020*	2.6	0.024
E94-9760	8	11/02/94	6250	560	5.0*	90	470	0.100	0.035	3.9	0.010*	5.6	1100	0.015*	0.020*	20	0.010*
E94-9761	9	11/02/94	8510	640	5.0*	5.0*	780	0.055	0.033	5.8	0.010*	10	1500	0.015*	0.020*	19	0.010*
E94-9762	10	11/03/94	41000	110	5.0*	5.0*	130	0.009	0.014	7.4	0.016	1100	14000	0.019	0.020*	2.1	0.010*
E94-9763	11	11/03/94	10530	400	5.0*	5.0*	490	0.029	0.070	5.1	0.010*	99	2300	0.015*	0.020*	7.4	0.010*
E94-10543	12	11/21/94	2215	190	5.0*	10	180	0.042	0.077	1.4	0.010*	9.8	430	0.10	0.020*	5.4	0.010*
E94-11073	16	12/06/94	633	170	5.0*	5.0*	210	0.005	0.094	0.60	0.010*	38	84	0.015*	0.020*	1.6	0.010*

9386 = WRF Reservoir
9387 = Evap Pond #1
9388 = Evap Pond #2
11073 = J Hook

* = Detection Limit

Date Reported 05 Jan 95

McKenzie ID	PVNGS No.	Date Sampled	mg/L Lead (diss)	mg/L Magnesium (diss)	mg/L Manganese (diss)	mg/L Mercury (diss)	mg/L Nitrate	pH	mg/L Potassium (diss)	mg/L Selenium (diss)	mg/L Silver (diss)	mg/L Sodium (diss)	mg/L TDS@180C	mg/L Sulfate	mg/L Zinc (diss)	% Cation/ Anion
E94-9386	1	10/26/94	0.050*	2.6	0.005*	0.0002*	12	8.8	18	0.005*	0.010*	360	1000	180	0.010	114
E94-9387	2	10/26/94	0.050*	55	0.005*	0.0002*	580	9.1	520	0.030	0.010*	17000	48000	14000	0.010*	103
[redacted]	3	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
E94-9756	4	11/02/94	0.050*	91	0.005*	0.0002*	54	8.1	6.4	0.021	0.010*	3100	9000	1600	0.012	128
E94-9757	5	11/02/94	0.050*	160	0.007	0.0002*	89	8.0	4.5	0.031	0.010*	5000	15000	3100	0.010*	104
E94-9758	6	11/02/94	0.050*	130	0.005*	0.0002*	53	8.0	3.3	0.024	0.010*	2100	7000	1200	0.010*	110
E94-9759	7	11/02/94	0.050*	430	0.005*	0.0002*	140	7.5	2.4	0.058	0.010*	4100	16000	3100	0.010*	104
E94-9760	8	11/02/94	0.050*	5.2	0.005*	0.0002*	37	8.7	1.0*	0.012	0.010*	1500	4000	790	0.010*	109
E94-9761	9	11/02/94	0.050*	6.0	0.005*	0.0002*	66	8.4	1.0*	0.020	0.010*	2200	5700	1100	0.010*	117
E94-9762	10	11/03/94	0.050*	640	0.005*	0.0002*	290	7.4	7.8	0.060	0.010*	9400	32000	4000	0.010*	103
E94-9763	11	11/03/94	0.050*	45	0.029	0.0002*	88	8.4	1.0*	0.005	0.010*	2600	6900	1200	0.010*	117
E94-10543	12	11/21/94	0.050*	5.1	0.005*	0.0002*	18	8.4	1.4	0.005*	0.010*	530	1300	150	0.010*	122
E94-11073	16	12/06/94	0.050*	5.9	0.005*	0.0002*	1.1	8.1	2.7	0.005*	0.010*	96	360	24	0.022	105

* = Detection Limit

Date Reported 05 Jan 95

MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVENUE, SUITE 1
PHOENIX, ARIZONA 85040
602-470-0288

PVNGS GROUNDWATER MONITORING PROGRAM
PERMIT NO. G-0077 07
FIRST QUARTER 1995

DATE REPORTED: 05/..
PAGE 1 OF 2

MCKENZIE I.D.	PVNGS NO.	SAMPLE LOCATION	DATE SAMPLED	ALKALINITY (as CaCO3 to pH 4.5)	HYDROXIDE (as OH)	BICARBONATE (as HCO3)	CARBONATE (as CO3)	ARSENIC diss	BARIUM diss	BORON diss	CADMIUM diss	CALCIUM diss	CHLORIDE	CHROMIUM diss	COPPER diss	FLUORIDE	IRON diss
E95-1598	35	PV-14H	2/23/95	430	-5	524.6	-5	0.028	0.014	5.4	-0.01	66	1900	-0.015	-0.02	8.4	0.0
E95-1597	34	PV-14HB	2/23/95	430	-5	524.6	-5	0.038	0.014	5.3	-0.01	60	1800	-0.015	-0.02	8.8	-0.1
E95-1299	26	PV-192A	2/15/95	78	5	95.16	-5	-0.005	0.031	6.2	-0.01	570	3700	-0.015	-0.02	2.6	1
E95-1298	25	PV-192B	2/15/95	66	-5	80.52	56	-0.005	0.026	6.2	-0.01	630	4100	-0.015	-0.02	2.4	0.
E95-1297	24	PV-193A	2/15/95	62	-5	75.64	-5	-0.005	0.04	4	-0.01	1200	6000	0.029	-0.02	1.9	-0.1
E95-1296	23	PV-193B	2/15/95	82	-5	100.04	-5	-0.005	0.038	4.2	-0.01	1100	5500	0.021	-0.02	2.1	2
E95-1765	43	PV-195A	3/3/95	260	-5	317.2	-5	0.008	0.028	14	-0.01	850	11000	-0.015	-0.02	2.6	0.0
E95-1764	42	PV-195B	3/2/95	200	-5	244	16	-0.005	0.053	10	-0.01	1300	14000	-0.015	-0.02	1.9	0.0
E95-1373	29	PV-196B	2/17/95	140	-5	170.8	-5	0.015	0.032	2.8	-0.01	650	4600	0.015	-0.02	2.8	0.0
E95-1372	28	PV-196B	2/17/95	230	-5	280.6	-5	0.012	0.033	2.5	-0.01	220	2300	-0.015	-0.02	5.2	0.0
E95-1111	18	PV-197A	2/10/95	200	-5	244	-5	-0.005	0.061	4.6	0.01	540	3300	0.02	-0.02	2.8	0.0
E95-1110	17	PV-197B	2/10/95	190	5	231.8	-5	0.005	0.044	4.7	-0.01	570	3500	0.019	-0.02	3	0.0
E95-0818	12	PV-198A	1/31/95	240	-5	292.8	-5	0.011	0.011	3.4	-0.01	41	610	-0.015	-0.02	7.6	-0.0
E95-0819	11	PV-198B	1/31/95	240	-5	292.8	-5	0.017	0.012	3.6	-0.01	38	560	-0.015	-0.02	8.6	-0.0
E95-1295	22	PV-201A	2/15/95	440	-5	536.8	-5	0.025	0.01	10	-0.01	170	1600	-0.015	-0.02	9	0.0
E95-1294	21	PV-201B	2/15/95	440	-5	536.8	-5	0.025	0.011	11	-0.01	210	1800	-0.015	-0.02	8.2	-0.0
E95-0823	16	PV-202A	2/1/95	410	-5	500.2	130	0.015	0.035	5.5	-0.01	210	3800	-0.015	-0.02	6.8	0.08
E95-0822	15	PV-202B	2/1/95	460	5	561.2	66	0.011	0.016	5.5	0.01	140	3100	-0.015	-0.02	6.6	0.02
E95-0821	14	PV-203A	2/1/95	500	5	610	5	0.011	[illegible]	9.5	0.01	160	6300	-0.015	0.02	6.2	0.08
E95-0820	13	PV-203B	2/1/95	490	5	597.8	5	0.009	[illegible]	8.4	0.01	93	6500	-0.015	-0.02	8	-0.0
E95-0780	2	PV-204A	1/11/95	120	-5	146.4	-5	0.01	[illegible]	16	-0.01	940	7200	-0.015	0.02	2.4	0.08
E95-0279	1	PV-204B	1/11/95	89	5	108.58	-5	0.016	[illegible]	13	0.01	1200	9600	-0.015	0.02	2	0.07
E95-1600	37	PV-205A	2/23/95	260	5	317.2	-5	0.019	0.014	6.9	0.01	320	6500	0.025	-0.02	5.2	0.05
E95-1599	36	PV-205B	2/23/95	470	5	573.4	-5	0.025	0.038	4.9	0.01	150	3200	0.00[illegible]	-0.02	12	0.0
E95-1763	41	PV-206A	3/2/95	360	5	439.2	16	0.011	[illegible]	19	0.01	340	5200	-0.015	-0.02	6	0.04
E95-1762	40	PV-206B	3/2/95	70	5	85.4	-5	0.005	0.076	2.6	0.01	1400	7100	-0.015	-0.02	1.7	-0.0
E95-1371	27	PV-216R	2/17/95	210	-5	200	12	0.066	0.18	1.4	0.01	8.7	380	0.11	-0.02	7	-0.0
E95-1596	33	PV-24HA	2/22/95	330	5	310	24	0.12	[illegible]	1.9	0.01	9.7	290	0.016	-0.02	22	0.03
E95-1595	32	PV-24HB	2/22/95	320	5	390.4	-5	0.009	0.017	17	0.01	620	5600	0.016	-0.02	3.5	-0.0
E95-0634	10	PV-28HA	1/25/95	370	5	451.4	-5	0.015	0.056	5.1	0.01	91	2300	-0.015	-0.02	8	-0.0
E95-0633	9	PV-28HB	1/25/95	120	5	146.4	5	0.005	[illegible]	13	0.01	1200	14000	0.02	0.02	2.[illegible]	-0.0
E95-0632	8	PV-33H	1/24/95	58	5	70.76	80	0.005	0.015	3.9	0.01	1100	5100	0.026	-0.02	2	-0.0
E95-0631	7	PV-33HB	1/24/95	75	5	91.5	40	0.005	0.013	6.6	0.01	810	3500	0.02	0.02	2.3	0.02
E95-1113	20	PV-34H	2/10/95	590	5	719.8	5	0.066	0.031	6.6	0.01	9.9	1400	-0.015	-0.02	20	-0.0
E95-1112	19	PV-34HB	2/10/95	560	5	420	140	0.15	[illegible]	4.4	0.01	7	1200	-0.015	-0.02	24	0.02
E95-1766	44	PV-05	3/3/95	230	5	280.6	5	0.01	0.012	8.6	-0.01	94	600	-0.015	-0.02	7.6	-0.0
E95-1767	45	PV-05B	3/3/95	200	-5	244	-5	0.008	-0.01	7.3	-0.01	150	780	-0.015	-0.02	7.4	-0.0
E95-1602	39	PV-R2A	2/23/95	110	5	96	14	0.044	0.19	0.6	-0.01	4.5	100	0.03	-0.02	18	0.06
E95-1601	38	PV-R2B	2/23/95	94	-5	62	32	0.048	0.01	0.55	-0.01	4.1	120	0.016	0.02	17	-0.0
E95-0283	5	[redacted]	[redacted]	230	20	-5	200	0.014	0.12	10	-0.01	600	11000	[redacted]	[redacted]	27	[redacted]
E95-0284	6	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
E95-0282	4	[redacted]	1/12/95	110	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	29	290	-0.015	-0.02	1.1	-0.0
E95-0281	3	SEDBAS2W	1/12/95	88	-5	107.36	-5	-0.005	0.088	0.19	-0.01	22	40	-0.015	-0.02	0.76	-0.0
E95-1594	31	US-PTWA	2/22/95	330	-5	402.6	-5	0.013	0.016	7.6	-0.01	190	1200	-0.015	-0.02	6.4	0.02
E95-1593	30	US-PTWB	2/22/95	370	5	451.4	-5	0.02	0.019	7.6	-0.01	140	1200	-0.015	-0.02	8.4	-0.0

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN THE DETECTION LIMIT

MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVENUE, SUITE 1
PHOENIX, ARIZONA 85040
602-470-0288

PVNGS GROUNDWATER MONITORING PROGRAM
PERMIT NO. G-0077-07
FIRST QUARTER 1995

DATE REPORTED: 03/28/95

PVNGS NO.	SAMPLE LOCATION	DATE SAMPLED	LEAD diss	MAGNESIUM diss	MANGANESE diss	MERCURY diss	NITRATE (AS N)	pH	POTASSIUM diss	SELENIUM diss	SILVER diss	SODIUM diss	TDS (@ 180C)	SPECIFIC CONDUCTANCE (uMHOS/CM)	SULFATE (as SO4)	ZINC diss	%CATION/ANION BALANCE
35	PV-14H	2/23/95	-0.05	33	-0.005	0.0002	70	8	1.5	0.022	0.01	2500	6700	9330	1600	-0.01	114
34	PV-14HB	2/23/95	-0.05	29	-0.005	0.0002	62	8	1.8	0.018	-0.01	2300	6600	8780	1500	-0.01	111
26	PV-192A	2/15/95	-0.05	200	0.09	-0.0002	74	7.1	1.2	0.016	-0.01	2300	8800	12570	1600	-0.01	100
25	PV-192B	2/15/95	-0.05	220	0.03	-0.0002	150	7	2.6	0.021	-0.01	2400	10000	14020	1900	0.014	92
24	PV-193A	2/15/95	-0.05	480	-0.005	-0.0002	230	7.2	4.7	0.021	-0.01	3300	15000	19340	2800	-0.01	99
23	PV-193B	2/15/95	-0.05	450	0.12	-0.0002	210	7	2.6	0.026	-0.01	3200	14000	18620	2700	0.012	101
43	PV-195A	3/3/95	-0.05	370	-0.005	-0.0002	180	7.2	12	0.085	-0.01	9100	29000	34700	5600	-0.01	105
42	PV-195B	3/2/95	-0.05	460	-0.005	-0.0002	170	7	19	0.061	-0.01	9200	31000	39900	3400	0.013	105
29	PV-196B	2/17/95	-0.05	340	0.01	-0.0002	93	6.6	4.9	0.043	0.01	3100	12000	16165	2300	0.017	104
28	PV-196B	2/17/95	-0.05	120	-0.005	-0.0002	46	7.4	3.8	0.018	0.01	1900	6100	8480	900	0.012	113
18	PV-197A	2/10/95	-0.05	170	-0.005	-0.0002	94	7	3.8	0.011	0.01	2200	8100	11830	1400	0.01	103
17	PV-197B	2/10/95	-0.05	190	-0.005	-0.0002	130	7	4.1	0.015	0.01	[illegible]	8900	12640	1800	0.013	102
12	PV-198A	1/31/95	-0.05	13	-0.005	-0.0002	16	7.7	-1	-0.005	0.01	740	2100	3400	540	-0.01	103
11	PV-198B	1/31/95	-0.05	12	-0.005	-0.0002	17	7.7	-1	-0.005	0.01	720	2000	3210	520	-0.01	105
22	PV-201A	2/15/95	-0.05	92	0.007	-0.0002	38	7.6	-1	0.009	-0.01	2700	8600	10810	3500	-0.01	103
21	PV-201B	2/15/95	-0.05	100	-0.005	-0.0002	32	7.3	1.2	0.007	0.01	2900	9400	11630	3700	-0.01	104
16	PV-202A	2/1/95	-0.05	140	0.023	-0.0002	110	7.4	2.5	0.028	0.01	3400	10000	15180	2600	0.012	96
15	PV-202B	2/1/95	-0.05	110	0.074	0.0002	77	7.5	1.6	0.019	0.01	3300	9200	13800	2500	0.01	104
14	PV-203A	2/1/95	-0.05	140	0.017	0.0002	[illegible]	7.5	4.6	0.021	[illegible]	6600	16000	24800	4100	0.021	102
13	PV-203B	2/1/95	-0.05	130	0.033	0.0002	[illegible]	7.7	7.6	0.052	[illegible]	6700	19000	26000	4800	0.015	98
2	PV 204A	1/11/95	-0.05	390	0.024	0.0002	240	7.4	5.4	0.02	0.01	5200	18000	25600	3600	0.024	103
1	PV-204B	1/11/95	-0.05	500	0.014	0.0002	290	7.2	10	0.022	[illegible]	5700	23000	30400	3300	0.01	97
37	PV-205A	2/23/95	0.05	220	0.01	0.0002	130	7.6	5.3	0.037	0.01	6100	19000	23700	3700	0.01	104
36	PV-205B	2/23/95	-0.05	91	0.036	0.0002	58	7.6	5.5	0.02	0.01	3000	8200	12060	1800	0.01	103
41	PV-206A	3/2/95	-0.05	180	0.041	0.0002	26	7.5	7.9	0.02	0.01	5500	17000	20700	4300	-0.01	111
40	PV-206B	3/2/95	-0.05	420	-0.005	0.0002	30	6.5	15	0.024	0.01	3700	15000	21300	1200	-0.01	116
27	PV-216R	2/17/95	-0.05	4.1	-0.005	0.0002	15	8.4	1.7	0.005	0.01	420	980	1923	120	0.027	103
33	PV-24HA	2/22/95	-0.05	5.6	0.007	0.0002	2	8.3	-1	0.005	0.01	630	1600	2400	420	-0.01	120
32	PV-24HB	2/22/95	-0.05	410	-0.005	0.0002	170	7.3	4.7	0.021	0.01	5600	19000	22300	5400	0.01	107
10	PV-28HA	1/25/95	-0.05	39	0.019	0.0002	88	7.9	1	0.005	0.01	2300	6600	9570	1400	-0.01	100
9	PV-28HB	1/25/95	-0.05	660	-0.005	0.0002	260	7.3	9.4	0.062	0.01	9200	30000	40100	4600	-0.01	101
8	PV-33H	1/24/95	-0.05	370	-0.005	-0.0002	160	7.5	10	0.016	0.01	3300	14000	18450	2700	-0.01	108
7	PV-33HB	1/24/95	-0.05	280	-0.005	-0.0002	95	7.7	7.3	-0.005	0.01	3000	12000	15050	3700	-0.01	106
20	PV-34H	2/10/95	-0.05	5.2	-0.005	0.0004	64	7.2	-1	0.008	0.01	2100	5400	8025	1400	-0.01	109
19	PV-34HB	2/10/[illegible]	-0.05	4.7	-0.005	0.0002	53	8.7	-1	0.007	0.01	1500	3700	5730	790	-0.01	101
44	PV-Q5	3/3/95	-0.05	36	0.006	-0.0002	15	7.7	-1	0.005	0.01	1700	5500	6650	2500	0.017	109
45	PV-Q5B	3/3/95	-0.05	62	-0.005	-0.0002	[illegible]	7.9	1.9	-0.005	0.01	2500	8200	9185	3800	-0.01	114
39	PV-R2A	2/23/95	-0.05	0.35	0.007	-0.0002	[illegible]	8.7	1.2	-0.005	0.01	190	540	866	70	0.012	126
38	PV-R2B	2/23/95	-0.05	0.32	-0.005	-0.0002	[redacted]								110	-0.01	104
5	[redacted]																
6	[redacted]						210	8.8	1300	0.016	0.01	29000	76000	82200	19000	0.035	122
4	[redacted]	1/12/95	-0.05	2.3	-0.005	-0.0002	22	8.8	21	-0.005	-0.01	380	1100	1875	270	-0.01	106
3	[redacted]	1/12/95	-0.05	3.1	-0.005	-0.0002	20	8.1	4.1	-0.005	-0.01	79	280	464	82	0.038	81
31	US-PTWA	2/22/95	-0.05	49	-0.005	-0.0002	41	7.7	-1	0.007	-0.01	1600	5400	6810	1700	-0.01	106
30	US-PTWB	2/22/95	-0.05	40	-0.005	-0.0002	46	7.7	-1	0.008	-0.01	1600	5000	6570	1400	0.01	108

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
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MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVENUE, SUITE 1
PHOENIX, ARIZONA 85040
602-470-0288

PVNGS GROUNDWATER MONITORING PROGRAM
PERMIT NO. G-0077-07
SECOND QUARTER 1995

DATE REPORTED: 07/05/95

MCKENZIE I.D.	PVNGS NO.	SAMPLE LOCATION	DATE SAMPLED	ALKALINITY (as CaCO3 to pH 4.5)	HYDROXIDE (as OH)	BICARBONATE (as HCO3)	CARBONATE (as CO3)	ARSENIC diss	BARIUM diss	BORON diss	CADMIUM diss	CALCIUM diss	CHLORIDE	CHROMIUM diss	COPPER diss	FLUORIDE	IRON diss
E95-5271	6	PV-196A	06/01/95	180	-5	220	-5	0.012	0.04	3.6	-0.01	830	5500	-0.015	-0.02	2.5	-0.02
E95-5270	5	PV-196B	06/01/95	190	-5	230	-5	0.011	0.033	2.5	-0.01	250	2600	-0.015	-0.02	4.8	-0.02
E95-5516	12	PV-205A	06/19/95	260	-5	240	28	0.033	0.016	8.3	-0.01	270	6900	0.03	-0.02	5	-0.02
E95-5515	11	PV-205B	06/09/95	470	-5	450	12	0.027	0.039	5.1	-0.01	140	3400	0.081	-0.02	11	-0.02
E95-5267	2	PV-28HA	05/31/95	400	-5	490	-5	0.019	0.073	5.6	-0.01	130	2900	-0.015	-0.02	6	-0.02
E95-5266	1	PV-28HB	05/31/95	130	-5	160	-5	0.006	0.02	14	-0.01	1000	12000	0.018	-0.02	2.4	-0.02
E95-5269	4	PV-34H	06/01/95	650	-5	790	-5	0.055	0.036	6.7	-0.01	9.9	1700	-0.015	-0.02	18	-0.02
E95-5268	3	PV-34HB	06/01/95	580	-5	500	80	0.12	0.022	4.5	-0.01	5	1000	-0.015	-0.02	19	0.042
E95-5513	9	[redacted]	06/08/95	370	-5	[redacted]	[redacted]	0.026	0.12	15	-0.01	[redacted]	15000	0.016	-0.02	24	[redacted]
E95-5514	10	[redacted]	06/08/95	240	-5	[redacted]	[redacted]	0.023	0.087	21	-0.01	[redacted]	20000	-0.015	-0.02	21	[redacted]
E95-5511	7	[redacted]	06/08/95	100	-5	[redacted]	[redacted]	-0.005	-0.01	0.44	-0.01	[redacted]	380	-0.015	-0.02	1.2	[redacted]
E95-5512	8	SEDBASZW	06/08/95	140	-5	18	120	0.008	0.2	5	-0.01	330	3900	-0.015	0.03	9.4	-0.02

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN THE DETECTION LIMIT

MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVENUE, SUITE 1
PHOENIX, ARIZONA 85040
602-470-0238

PVNGS GROUNDWATER MONITORING PROGRAM
PERMIT NO. G-0077-07
SECOND QUARTER 1995

DATE REPORTED: 07/05/95

PVNGS NO.	SAMPLE LOCATION	DATE SAMPLED	LEAD diss	MAGNESIUM diss	MANGANESE diss	MERCURY diss	NITRATE (AS N)	pH	POTASSIUM diss	SELENIUM diss	SILVER diss	SODIUM diss	TDS (@ 180C)	SPECIFIC CONDUCTANCE (uMHOS/CM)	SULFATE (as SO4)	ZINC diss	%CATION/ ANION BALANCE
6	PV-196A	06/01/95	-0.05	410	-0.005	-0.0002	110	7.3	5.2	0.056	-0.01	4500	15000	16600	2900	-0.01	119
5	PV-196B	06/01/95	-0.05	140	0.005	-0.0002	53	7.8	4.5	0.023	-0.01	2100	6800	8570	1100	0.011	111
12	PV-205A	06/09/95	-0.05	200	0.014	-0.0002	84	7.6	7.6	0.04	-0.01	7100	18000	20400	4100	0.061	116
11	PV-205B	06/09/95	-0.05	88	0.005	-0.0002	54	7.7	7.5	0.02	-0.01	3500	9100	11610	1800	0.045	114
2	PV-28HA	05/31/95	-0.05	57	0.03	-0.0002	110	7.9	1.5	0.008	-0.01	3400	8600	10830	1700	-0.01	120
1	PV-28HB	05/31/95	-0.05	580	-0.005	-0.0002	300	7.3	13	0.066	-0.01	10000	30000	33800	4600	0.021	116
4	PV-34H	06/01/95	-0.05	5.8	-0.005	-0.0002	63	8.1	-1	0.021	-0.01	2200	5900	7630	1400	-0.01	132
3	PV-34HB	06/01/95	-0.05	3.1	0.005	-0.0002	35	8.8	-1	0.011	-0.01	1400	3800	5160	670	-0.01	109
9	EVPPND #1	06/08/95	-0.05	50	-0.005	-0.0002	350	8.8	870	0.027	-0.01	19000	52000	48600	15000	0.014	116
10	EVPPND #2	06/08/95	-0.05	57	-0.005	-0.0002	250	9.1	1100	0.02	-0.01	25000	64000	58900	19000	0.012	117
7	RESERVOIR	06/08/95	-0.05	2	-0.005	-0.0002	20	9.3	26	-0.005	-0.01	450	1400	1874	390	-0.01	99
8	SEDBASZW	06/08/95	-0.05	2.1	-0.005	-0.0002	170	10.1	200	0.011	-0.01	5700	14000	15530	3700	0.028	134

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN THE DETECTION LIMIT

MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVE., SUITE 1
PHOENIX, ARIZONA 85040
602-470-0288

PVNGS GROUNDWATER PROGRAM
PERMIT NO. G-0077-07
THIRD QUARTER 1995

DATE REPORTED: 10/03/95

SAMPLE LOCATION	DATE SAMPLED	MCKENZIE I.D.	PVNGS NO.	ALKALINITY (as CaCO3 to pH 4.5)	HYDROXIDE (as OH)	BICARBONATE (as HCO3)	CARBONATE (as CO3)	ARSENIC diss	BARIUM diss	BORON diss	CADMIUM diss	CALCIUM diss	CHLORIDE	CHROMIUM diss	COPPER diss	FLUORIDE
PV-196A	08/31/95	E95-8926	7	140	-5	140	-5	0.011	-0.05	3.6	-0.02	870	5800	-0.05	-0.05	2.9
PV-196B	08/31/95	E95-8925	6	220	-5	220	-5	0.013	-0.05	2.5	-0.02	210	2400	-0.05	-0.05	6
PV-205A	09/05/95	E95-8979	9	270	-5	270	-5	0.037	-0.05	7.7	-0.02	270	6000	0.05	-0.05	6.8
PV-205B	09/05/95	E95-8978	8	470	-5	420	48	0.028	-0.05	5	-0.02	160	3100	0.08	-0.05	13
PV-28HA	08/29/95	E95-8921	2	400	-5	400	-5	0.02	0.07	6	-0.02	180	3100	-0.05	-0.05	6.6
PV-28HB	08/29/95	E95-8920	1	130	-5	130	-5	0.007	-0.05	14	-0.02	1200	14000	-0.05	-0.05	2.5
PV-34H	08/30/95	E95-8924	5	620	-5	580	40	0.067	-0.05	6.8	-0.02	13	1700	-0.05	-0.05	18
PV-34HB	08/30/95	E95-8923	4	620	-5	570	56	0.31	-0.05	4.5	-0.02	5.9	1000	-0.05	-0.05	22
EVPPND #1	09/06/95	E95-8980	10	410	-5	300	110	0.018	0.14	18	-0.02	780	18000	-0.05	-0.05	27
EVPPND #2	09/06/95	E95-8981	11	300	-5	110	190	0.017	0.12	22	-0.02	690	19000	-0.05	-0.05	24
RESERVOIR	08/29/95	E95-8922	3	49	-5	15	34	-0.005	-0.05	0.47	-0.02	31	420	-0.05	-0.05	1.1
SEDBAS2W	09/07/95	E95-9107	12	140	-5	140	-5	0.024	0.19	0.69	-0.02	50	250	-0.05	-0.05	2.7

NOTE:ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN THE DETECTION LIMIT

MCKENZIE LABORATORIES (ADHS LIC. #0053)
3725 E. ATLANTA AVE., SUITE 1
PHOENIX, ARIZONA 85040
602-470-0288

PVNGS GROUNDWATER PROGRAM
PERMIT NO. G-0077-07
THIRD QUARTER 1995

DATE REPORTED: 10/03/95

SAMPLE LOCATION	DATE SAMPLED	IRON diss	LEAD diss	MAGNESIUM diss	MANGANESE diss	MERCURY diss	NITRATE (AS N)	pH	POTASSIUM diss	SELENIUM diss	SILVER diss	SODIUM diss	TDS (@ 180C)	SPECIFIC CONDUCTANCE (uMHOS/CM)	SULFATE (as SO4)	ZINC diss	%CATION/ ANION BALANCE
PV-196A	08/31/95	-0.05	-0.1	410	-0.05	-0.0002	160	6.8	6.2	0.028	-0.05	3900	15000	20000	3600	-0.05	98
PV-196B	08/31/95	-0.05	-0.1	110	-0.05	-0.0002	53	7.3	3.9	0.008	-0.05	1900	4800	8590	1000	-0.05	106
PV-205A	09/05/95	-0.05	-0.1	160	-0.05	-0.0002	120	7.4	5.5	0.023	-0.05	5200	16000	20500	4000	-0.05	95
PV-205B	09/05/95	-0.05	-0.1	88	-0.05	-0.0002	50	7.4	6.1	0.01	-0.05	2900	8900	12220	1900	-0.05	101
PV-28HA	08/29/95	-0.05	-0.1	69	0.05	-0.0002	120	7.5	1.6	0.007	-0.05	3000	9400	12245	2600	-0.05	92
PV-28HB	08/29/95	-0.05	-0.1	560	-0.05	-0.0002	300	7	10	0.054	-0.05	8800	32000	37800	6200	-0.05	89
PV-34H	08/30/95	-0.05	-0.1	6.5	-0.05	-0.0002	84	7.8	-1	0.006	-0.05	2300	5700	8560	1400	-0.05	106
PV-34HB	08/30/95	-0.05	-0.1	3	-0.05	-0.0002	42	8.6	-1	0.01	-0.05	1400	3900	5550	800	-0.05	102
EVPPND #1	09/06/95	-0.05	-0.1	55	-0.05	-0.0002	590	8.6	1100	0.011	-0.05	20000	60000	62600	20000	-0.05	97
EVPPND #2	09/06/95	-0.05	-0.1	60	-0.05	-0.0002	350	9	1100	0.023	-0.05	23000	68000	68400	23000	-0.05	102
RESERVOIR	08/29/95	-0.05	-0.1	0.87	-0.05	-0.0002	12	9.4	23	-0.005	-0.05	430	1600	2000	320	-0.05	103
SEDBAS2W	09/07/95	0.07	-0.1	6.1	-0.05	-0.0002	5.2	7.6	27	0.007	-0.05	430	1500	2060	310	0.07	134

NOTE:AlL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN THE DETECTION LIMIT

McKENZIE LABORATORIES (ADHS LIC. #0034)
3725 E. ATLANTA AVE.
SUITE 1
PHOENIX, AZ 85040
602-470-289

PVNGS GROUNDWATER PROGRAM
PERMIT NO. G-0077-07
FOURTH QUARTER 1995

SAMPLE LOCATION	DATE SAMPLED	MCKENZIE I.D.	PVNGS NO.	ALKALINITY (as CaCO3 to pH 4.5)	HYDROXIDE (as OH)	BICARBONATE (as HCO3)	CARBONATE (as CO3)	ARSENIC diss	BARIUM diss	BORON diss	CADMIUM diss	CALCIUM diss	CHLORIDE	CHROMIUM diss	COPPER diss	FLUORIDE
PV-196A	12/12/95	E95-12921	5	150	-5	180	-5	0.017	-0.05	3.6	-0.02	790	5700	-0.05	-0.05	3.1
PV-196B	12/12/95	E95-12920	4	190	-5	230	-5	0.019	-0.05	2.5	-0.02	290	3000	-0.05	-0.05	4.8
PV-205A	12/13/95	E95-12924	8	270	-5	320	-5	0.034	-0.05	8.9	-0.02	310	7300	-0.05	-0.05	4.4
PV-205B	12/13/95	E95-12923	7	470	-5	570	-5	0.039	-0.05	5.3	-0.02	160	2600	0.07	-0.05	12
PV-28HA	12/11/95	E95-12922	6	410	-5	510	-5	0.021	0.06	6.0	-0.02	140	2800	-0.05	-0.05	8.8
PV-28HB	12/13/95	E95-12917	1	160	-5	200	-5	0.005	-0.10	16	-0.04	1100	13000	-0.10	-0.10	2.4
PV-34H	12/11/95	E95-12919	3	630	-5	770	-5	0.059	-0.05	7.2	-0.02	13	2200	-0.05	-0.05	18
PV-34HB	12/11/95	E95-12918	2	590	-5	620	48	0.10	-0.05	5.0	-0.02	6.0	1100	-0.05	-0.05	22
EVPPND #1	12/14/95	E95-12926	10	370	-5	190	130	0.032	0.13	19	-0.04	650	19000	-0.10	-0.10	28
EVPPND #2	12/14/95	E95-12927	11	400	-5	140	170	0.029	0.12	25	-0.04	710	24000	-0.10	-0.10	28
RESERVOIR	12/14/95	E95-12925	9	71	-5	57	14	-0.005	-0.05	0.51	-0.02	31	460	-0.05	-0.05	1.1

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN DETECTION LIMIT

McKENZIE LABORATORIES (ADHS LIC. #0034)
3725 E. ATLANTA AVE.
SUITE 1
PHOENIX, AZ 85040
602-470-289

PVNGS GROUNDWATER PROGRAM
PERMIT NO. G-0077-07
FOURTH QUARTER 1995

DATE REPORTED: 01/08/96

AMMENDED: 01/24/96

SAMPLE LOCATION	DATE SAMPLED	IRON diss	LEAD diss	MAGNESIUM diss	MANGANESE diss	MERCURY diss	NITRATE (AS N)	pH	POTASSIUM diss	SELENIUM diss	SILVER diss	SODIUM diss	TDS (@ 180c)	SPECIFIC CONDUCTANCE (uMHOS/CM)	SULFATE (as SO4)	ZINC diss	%CATION/ ANION BALANCE
PV-196A	12/12/95	0.05	-0.10	400	-0.05	-0.0002	150	7.1	3.8	0.021	-0.05	3900	15000	18730	3100	-0.05	101
PV-196B	12/12/95	0.09	-0.10	150	-0.05	-0.0002	66	7.6	4.0	0.019	-0.05	2200	7300	10120	1400	-0.05	100
PV-205A	12/13/95	0.10	-0.10	210	-0.05	-0.0002	140	7.8	4.8	0.032	-0.05	6200	20000	23800	4500	-0.05	96
PV-205B	12/13/95	0.12	-0.10	88	-0.05	-0.0002	60	7.8	5.8	0.022	-0.05	3100	8400	12260	1900	-0.05	119
PV-28HA	12/11/95	-0.05	-0.10	57	0.07	-0.0002	120	7.7	-1.0	0.009	-0.05	3000	8200	11440	1900	-0.05	105
PV-28HB	12/13/95	-0.10	-0.20	610	-0.10	-0.0002	280	7.5	5.9	0.066	-0.10	9100	31000	36750	4900	-0.10	102
PV-34H	12/11/95	-0.05	-0.10	7.0	-0.05	-0.0002	84	8.2	-1.0	0.017	-0.05	2500	6600	9220	1400	-0.05	100
PV-34HB	12/11/95	0.07	-0.10	3.6	-0.05	-0.0002	41	8.7	-1.0	0.014	-0.05	1600	4100	5890	820	-0.05	112
EVPPND #1	12/14/95	-0.10	-0.20	58	-0.10	-0.0004	660	8.9	1100	0.027	-0.10	21000	82000	64400	23000	-0.10	92
EVPPND #2	12/14/95	-0.10	-0.20	65	-0.10	-0.0004	330	9.2	1200	0.016	-0.10	26000	86000	71050	25000	-0.10	98
RESERVOIR	12/14/95	0.05	-0.10	3.2	-0.05	-0.0002	25	8.9	28	-0.005	-0.05	550	1600	2520	420	-0.05	108

NOTE: ALL VALUES IN MG/L EXCEPT SPECIFIC CONDUCTANCE AND pH
"-" INDICATES THE VALUE IS LESS THAN DETECTION LIMIT

REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577
Section A Page 1

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
ADDRESS: 3725 E. ATLANTA
PHOENIX, AZ 85040-
ATTENTION: SCOTT JORDAN

SAMPLE ID: 13 WRE RESERVOIR
SAMPLE NO: H288165

LIMS CLIENT: 0819 0001
PACE PROJECT: H30981
PACE CLIENT: 620723
P.O. NO: N05440 ORG

DATE SAMPLED: 29-NOV-94
DATE RECEIVED: 01-DEC-94
PROJECT MANAGER: Debbie Proctor

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPW	Volatiles in Water		
		1,1,1-Trichloroethane	< 5	ug/L
		1,1,2,2-Tetrachloroethane	< 5	ug/L
		1,1,2-Trichloroethane	< 5	ug/L
		1,1-Dichloroethane	< 5	ug/L
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		1,2-Dichloroethene(total)	< 5	ug/L
		1,2-Dichloropropane	< 5	ug/L
		2-Chloroethylvinylether	< 10	ug/L
		Acrolein	< 50	ug/L
		Acrylonitrile	< 50	ug/L
		Benzene	< 5	ug/L
		Bromoform	< 5	ug/L
		Bromomethane	< 10	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chlorodibromomethane	< 5	ug/L
		Chloroethane	< 10	ug/L
		Chloroform 5 ug/l	< 5	ug/L
		Chloromethane	< 10	ug/L
		Dichlorobromomethane	< 5	ug/L
		Ethylbenzene	< 5	ug/L
		Methylene chloride	5	ug/L <5 ug/l
		Tetrachloroethene	< 5	ug/L
		Toluene	< 5	ug/L
		Trichloroethene	< 5	ug/L
		Vinyl chloride	< 10	ug/L
		cis-1,3-Dichloropropene	< 5	ug/L
		trans-1,3-Dichloropropene	< 5	ug/L
3	OSVPPW	Semi-volatile Extractables in Water		
		1,2,4-Trichlorobenzene	< 10	ug/L
		1,2-Dichlorobenzene	< 10	ug/L
		1,2-Diphenylhydrazine(as Azobenzene)	< 10	ug/L
		1,3-Dichlorobenzene	< 10	ug/L
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dichlorophenol	< 10	ug/L

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REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577
Section A Page 2

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 13 WRE RESERVOIR
SAMPLE NO: H288165

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		2,4-Dimethylphenol	< 10	ug/L
		2,4-Dinitrophenol	< 50	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		2,6-Dinitrotoluene	< 10	ug/L
		2-Chloronaphthalene	< 10	ug/L
		2-Chlorophenol	< 10	ug/L
		2-Nitrophenol	< 10	ug/L
		3,3'-Dichlorobenzidine	< 20	ug/L
		4,6-Dinitro-o-cresol	< 50	ug/L
		4-Bromophenylphenylether	< 10	ug/L
		4-Chlorophenylphenylether	< 10	ug/L
		4-Nitrophenol	< 50	ug/L
		Acenaphthene	< 10	ug/L
		Acenaphthylene	< 10	ug/L
		Anthracene	< 10	ug/L
		Benzidine	< 50	ug/L
		Benzo(a)anthracene	< 10	ug/L
		Benzo(a)pyrene	< 10	ug/L
		Benzo(b)fluoranthene	< 10	ug/L
		Benzo(g,h,i)perylene	< 10	ug/L
		Benzo(k)fluoranthene	< 10	ug/L
		Butylbenzylphthalate	< 10	ug/L
		Chrysene	< 10	ug/L
		Di-n-butylphthalate	< 10	ug/L
		Di-n-octylphthalate	< 10	ug/L
		Dibenzo(a,h)anthracene	< 10	ug/L
		Diethylphthalate	< 10	ug/L
		Dimethylphthalate	< 10	ug/L
		Fluoranthene	< 10	ug/L
		Fluorene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachlorocyclopentadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Indeno(1,2,3-cd)pyrene	< 10	ug/L
		Isophorone	< 10	ug/L
		N-Nitrosodi-n-propylamine	< 10	ug/L
		N-Nitrosodimethylamine	< 10	ug/L
		N-Nitrosodiphenylamine	< 10	ug/L
		Naphthalene	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Phenanthrene	< 10	ug/L

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REPORT OF LABORATORY ANALYSIS

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 13 WRE RESERVOIR
SAMPLE NO: H288165

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		Phenol	< 10	ug/L
		Pyrene	< 10	ug/L
		bis(2-Chloroethyl)ether	< 10	ug/L
		bis(2-Chloroisopropyl)ether	< 10	ug/L
		bis(2-Ethylhexyl)phthalate	< 10	ug/L
		p-Chloro-m-cresol	< 10	ug/L

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REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577
Section A Page 4

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
ADDRESS: 3725 E. ATLANTA
PHOENIX, AZ 85040-
ATTENTION: SCOTT JORDAN

SAMPLE ID: 14 EVAP POND 2
SAMPLE NO: H288166

LIMS CLIENT: 0819 0001
PACE PROJECT: H30981
PACE CLIENT: 620723
P.O. NO: MO5440 ORG

DATE SAMPLED: 29-NOV-94
DATE RECEIVED: 01-DEC-94
PROJECT MANAGER: Debbie Proctor

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPW	Volatiles in Water		
		1,1,1-Trichloroethane	< 5	ug/L
		1,1,2,2-Tetrachloroethane	< 5	ug/L
		1,1,2-Trichloroethane	< 5	ug/L
		1,1-Dichloroethane	< 5	ug/L
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		1,2-Dichloroethene(total)	< 5	ug/L
		1,2-Dichloropropane	< 5	ug/L
		2-Chloroethylvinylether	< 10	ug/L
		Acrolein	< 50	ug/L
		Acrylonitrile	< 50	ug/L
		Benzene	< 5	ug/L
		Bromoform	29	ug/L
		Bromomethane	< 10	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chlorodibromomethane	21	ug/L
		Chloroethane	< 10	ug/L
		Chloroform	26	ug/L
		Chloromethane	< 10	ug/L
		Dichlorobromomethane	12	ug/L
		Ethylbenzene	< 5	ug/L
		Methylene chloride	< 5	ug/L
		Tetrachloroethene	< 5	ug/L
		Toluene	< 5	ug/L
		Trichloroethene	< 5	ug/L
		Vinyl chloride	< 10	ug/L
		cis-1,3-Dichloropropene	< 5	ug/L
		trans-1,3-Dichloropropene	< 5	ug/L
3	OSVPPW	Semi-volatile Extractables in Water		
		1,2,4-Trichlorobenzene	< 10	ug/L
		1,2-Dichlorobenzene	< 10	ug/L
		1,2-Diphenylhydrazine(as Azobenzene)	< 10	ug/L
		1,3-Dichlorobenzene	< 10	ug/L
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dichlorophenol	< 10	ug/L

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REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 14 EVAP POND 2
SAMPLE NO: H288166

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		2,4-Dimethylphenol	< 10	ug/L
		2,4-Dinitrophenol	< 50	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		2,6-Dinitrotoluene	< 10	ug/L
		2-Chloronaphthalene	< 10	ug/L
		2-Chlorophenol	< 10	ug/L
		2-Nitrophenol	< 10	ug/L
		3,3'-Dichlorobenzidine	< 20	ug/L
		4,6-Dinitro-o-cresol	< 50	ug/L
		4-Bromophenylphenylether	< 10	ug/L
		4-Chlorophenylphenylether	< 10	ug/L
		4-Nitrophenol	< 50	ug/L
		Acenaphthene	< 10	ug/L
		Acenaphthylene	< 10	ug/L
		Anthracene	< 10	ug/L
		Benzidine	< 50	ug/L
		Benzo(a)anthracene	< 10	ug/L
		Benzo(a)pyrene	< 10	ug/L
		Benzo(b)fluoranthene	< 10	ug/L
		Benzo(g,h,i)perylene	< 10	ug/L
		Benzo(k)fluoranthene	< 10	ug/L
		Butylbenzylphthalate	< 10	ug/L
		Chrysene	< 10	ug/L
		Di-n-butylphthalate	< 10	ug/L
		Di-n-octylphthalate	< 10	ug/L
		Dibenzo(a,h)anthracene	< 10	ug/L
		Diethylphthalate	< 10	ug/L
		Dimethylphthalate	< 10	ug/L
		Fluoranthene	< 10	ug/L
		Fluorene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachlorocyclopentadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Indeno(1,2,3-cd)pyrene	< 10	ug/L
		Isophorone	< 10	ug/L
		N-Nitrosodi-n-propylamine	< 10	ug/L
		N-Nitrosodimethylamine	< 10	ug/L
		N-Nitrosodiphenylamine	< 10	ug/L
		Naphthalene	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Phenanthrene	< 10	ug/L

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REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577
Section A Page 6

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 14 EVAP POND 2
SAMPLE NO: H288166

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		Phenol	< 10	ug/L
		Pyrene	< 10	ug/L
		bis(2-Chloroethyl)ether	< 10	ug/L
		bis(2-Chloroisopropyl)ether	< 10	ug/L
		bis(2-Ethylhexyl)phthalate	< 10	ug/L
		p-Chloro-m-cresol	< 10	ug/L

REPORT OF LABORATORY ANALYSIS

pace INCORPORATED THE ASSURANCE OF QUALITY

December 13, 1994
Report No.: 00036577
Section A Page 7

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
ADDRESS: 3725 E. ATLANTA
PHOENIX, AZ 85040-
ATTENTION: SCOTT JORDAN

SAMPLE ID: 15 EVAP POND 1
SAMPLE NO: H288167

LIMS CLIENT: 0819 0001
PACE PROJECT: H30981
PACE CLIENT: 620723
P.O. NO: M05440 ORG

DATE SAMPLED: 29-NOV-94
DATE RECEIVED: 01-DEC-94
PROJECT MANAGER: Debbie Proctor

LN	TEST CODE	DETERMINATION	RESULT	UNITS
1	OVPPW	Volatiles in Water	< 5	ug/L
		1,1,1-Trichloroethane	< 5	ug/L
		1,1,2,2-Tetrachloroethane	< 5	ug/L
		1,1,2-Trichloroethane	< 5	ug/L
		1,1-Dichloroethane	< 5	ug/L
		1,1-Dichloroethene	< 5	ug/L
		1,2-Dichloroethane	< 5	ug/L
		1,2-Dichloroethene(total)	< 5	ug/L
		1,2-Dichloropropane	< 10	ug/L
		2-Chloroethylvinylether	< 50	ug/L
		Acrolein	< 50	ug/L
		Acrylonitrile	< 5	ug/L
		Benzene	< 5	ug/L
		Bromoform	< 10	ug/L
		Bromomethane	< 5	ug/L
		Carbon tetrachloride	< 5	ug/L
		Chlorobenzene	< 5	ug/L
		Chlorodibromomethane	< 10	ug/L
		Chloroethane	< 5	ug/L
		Chloroform	< 10	ug/L
		Chloromethane	< 5	ug/L
		Dichlorobromomethane	< 5	ug/L
		Ethylbenzene	< 5	ug/L
		Methylene chloride	< 5	ug/L
		Tetrachloroethene	< 5	ug/L
		Toluene	< 5	ug/L
		Trichloroethene	< 10	ug/L
		Vinyl chloride	< 5	ug/L
		cis-1,3-Dichloropropene	< 5	ug/L
		trans-1,3-Dichloropropene		
3	OSVPPW	Semi-volatile Extractables in Water	< 10	ug/L
		1,2,4-Trichlorobenzene	< 10	ug/L
		1,2-Dichlorobenzene	< 10	ug/L
		1,2-Diphenylhydrazine(as Azobenzene)	< 10	ug/L
		1,3-Dichlorobenzene	< 10	ug/L
		1,4-Dichlorobenzene	< 10	ug/L
		2,4,6-Trichlorophenol	< 10	ug/L
		2,4-Dichlorophenol	< 10	ug/L

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LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 15 EVAP POND 1
SAMPLE NO: H288167

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		2,4-Dimethylphenol	< 10	ug/L
		2,4-Dinitrophenol	< 50	ug/L
		2,4-Dinitrotoluene	< 10	ug/L
		2,6-Dinitrotoluene	< 10	ug/L
		2-Chloronaphthalene	< 10	ug/L
		2-Chlorophenol	< 10	ug/L
		2-Nitrophenol	< 10	ug/L
		3,3'-Dichlorobenzidine	< 20	ug/L
		4,6-Dinitro-o-cresol	< 50	ug/L
		4-Bromophenylphenylether	< 10	ug/L
		4-Chlorophenylphenylether	< 10	ug/L
		4-Nitrophenol	< 50	ug/L
		Acenaphthene	< 10	ug/L
		Acenaphthylene	< 10	ug/L
		Anthracene	< 10	ug/L
		Benzidine	< 50	ug/L
		Benzo(a)anthracene	< 10	ug/L
		Benzo(a)pyrene	< 10	ug/L
		Benzo(b)fluoranthene	< 10	ug/L
		Benzo(g,h,i)perylene	< 10	ug/L
		Benzo(k)fluoranthene	< 10	ug/L
		Butylbenzylphthalate	< 10	ug/L
		Chrysene	< 10	ug/L
		Di-n-butylphthalate	< 10	ug/L
		Di-n-octylphthalate	< 10	ug/L
		Dibenzo(a,h)anthracene	< 10	ug/L
		Diethylphthalate	< 10	ug/L
		Dimethylphthalate	< 10	ug/L
		Fluoranthene	< 10	ug/L
		Fluorene	< 10	ug/L
		Hexachlorobenzene	< 10	ug/L
		Hexachlorobutadiene	< 10	ug/L
		Hexachlorocyclopentadiene	< 10	ug/L
		Hexachloroethane	< 10	ug/L
		Indeno(1,2,3-cd)pyrene	< 10	ug/L
		Isophorone	< 10	ug/L
		N-Nitrosodi-n-propylamine	< 10	ug/L
		N-Nitrosodimethylamine	< 10	ug/L
		N-Nitrosodiphenylamine	< 10	ug/L
		Naphthalene	< 10	ug/L
		Nitrobenzene	< 10	ug/L
		Pentachlorophenol	< 50	ug/L
		Phenanthrene	< 10	ug/L

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

December 13, 1994
Report No.: 00036577
Section A Page 9

LABORATORY ANALYSIS REPORT

CLIENT NAME: MCKENZIE LABORATORIES
SAMPLE ID: 15 EVAP POND 1
SAMPLE NO: H288167

LN	TEST CODE	DETERMINATION	RESULT	UNITS
		Phenol	< 10	ug/L
		Pyrene	< 10	ug/L
		bis(2-Chloroethyl)ether	< 10	ug/L
		bis(2-Chloroisopropyl)ether	< 10	ug/L
		bis(2-Ethylhexyl)phthalate	< 10	ug/L
		p-Chloro-m-cresol	< 10	ug/L

900 Gemini Avenue
Houston, TX 77058
TEL: 713-488-1810
FAX: 713-488-4661

McKENZIE LABORATORIES

FAX

McKenzie Laboratories, Inc.
Professional Analytical Services

3725 East Atlanta Avenue, Suite 1
Phoenix, Arizona 85040-2960

Phone: (602) 470-0288
Fax: (602) 470-0756

From:
- ✓ Maja Chadwick
- Elizabeth Cohoon
- Vicki Collins
- Kathleen Lacey
- Scott Jordan
- Kati Koktavy
- Tracy Wardell

Number of pages being sent: 2 (Including this page)

Date: 14 Mar 95
Time:

To:
Name: Howard Doyle
Company: APS
Phone:
Fax: 393-5879

Comments:

Results have not been thru QA yet.
Let me know if you need any further information.
Thanks
Maja

Note: If any of these FAX copies are illegible or, if you do not receive the same number of copies as stated above, please contact us immediately.

sample ID	3 Sedimentation Basin	4 WRF Reservoir	5 EVAP Pond #1	6 EVAP Pond #2
Alk	88	110	230	300
As	<0.005	<0.005	0.014	0.028
Ba	0.088	<0.01	0.12	0.099
B	0.19	0.36	10	22
Cd	<0.01	<0.01	<0.01	<0.01
Ca	22	29	600	530
Cl	40	290	11,000	24,000
Cr	<0.015	<0.015	<0.015	<0.015
Cu	<0.02	<0.02	<0.02	<0.02
F	0.76	1.1	27	26
Fe	<0.02	<0.02	<0.02	<0.02
Pb	<0.05	<0.05	<0.05	<0.05
Mg	3.1	2.3	47	96
Mn	<0.005	<0.005	<0.005	<0.005
Hg	<0.0002	<0.0002	<0.0002	<0.0002
NO_3	20	22	400	210
pH	8.1	8.8	9.7	8.8
K	4.1	21	710	1300
Se	<0.005	<0.005	0.018	<0.005
Ag	<0.01	<0.01	<0.01	<0.01
Na	79	380	13,000	29,000
TDS	280	1100	39,000	76,000
EC	464	1875	46,700	82,200
SO_4	82	270	13,000	19 000
Zn	0.038	<0.01	<0.01	0.035

Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 09 Dec 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11065

Client Identification: EP#2 NE

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Physicals					
pH	S.U.	8.5	N/A	150.1	13 Dec 94
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.07	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94
Non-Metals					
Ammonia-Nitrogen	mg/L	3.1	0.05	350.3	22 Dec 94
Nitrate/Nitrite as N	mg/L	160	0.10	353.2	29 Dec 94

MRL = Minimum Reporting Limit

JAN 13 1995

Maja Chadwick
Maja Chadwick, Inorganic Lab Manager

APS11065.DOC sl

Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 09 Dec 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11066

Client Identification: EP#2 SW

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Physicals					
pH	S.U.	8.6	N/A	150.1	13 Dec 94
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.06	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94
Non-Metals					
Ammonia-Nitrogen	mg/L	4.5	0.05	350.3	22 Dec 94
Nitrate/Nitrite as N	mg/L	160	0.10	353.2	29 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick
Maja Chadwick, Inorganic Lab Manager

APS11065.DOC sl

Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 09 Dec 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11067

Client Identification: EP#2 CE

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Physicals					
pH	S.U.	8.6	N/A	150.1	13 Dec 94
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.06	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94
Non-Metals					
Ammonia-Nitrogen	mg/L	2.6	0.05	350.3	22 Dec 94
Nitrate/Nitrite as N	mg/L	170	0.10	353.2	29 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick
Maja Chadwick, Inorganic Lab Manager

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Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 09 Dec 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11068

Client Identification: EP#2 CW

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Physicals					
pH	S.U.	8.6	N/A	150.1	13 Dec 94
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.06	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94
Non-Metals					
Ammonia-Nitrogen	mg/L	3.3	0.05	350.3	22 Dec 94
Nitrate/Nitrite as N	mg/L	180	0.10	353.2	29 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick
Maja Chadwick, Inorganic Lab Manager

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Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 30 Nov 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11069

Client Identification: EP1A

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.10	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick

Maja Chadwick, Inorganic Lab Manager

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Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 30 Nov 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11070

Client Identification: EP2A

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.06	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	0.20	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick

Maja Chadwick, Inorganic Lab Manager

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Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P.O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 30 Nov 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11071

Client Identification: EP1B

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.10	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	0.11	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick

Maja Chadwick, Inorganic Lab Manager

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Arizona Public Service Company-PVNGS
Attn: T. Hillmer
P. O. Box 52034, M/S 7626
Phoenix, AZ 85072-2034

Date Sampled: 30 Nov 94
Date Received: 09 Dec 94
Date Reported: 03 Jan 95
McKenzie I.D.: E94-11072

Client Identification: EP2B

Parameter	Units	Result	MRL	EPA Method	Date Analyzed
Metals					
Arsenic	mg/L	<0.10	0.10	200.7	20 Dec 94
Barium	mg/L	0.06	0.05	200.7	20 Dec 94
Cadmium	mg/L	<0.02	0.02	200.7	20 Dec 94
Chromium	mg/L	<0.05	0.05	200.7	20 Dec 94
Lead	mg/L	<0.05	0.05	200.7	20 Dec 94
Mercury	mg/L	<0.0002	0.0002	245.1	15 Dec 94
Selenium	mg/L	<0.10	0.10	200.7	20 Dec 94
Silver	mg/L	<0.05	0.05	200.7	20 Dec 94

MRL = Minimum Reporting Limit

Maja Chadwick
Maja Chadwick, Inorganic Lab Manager

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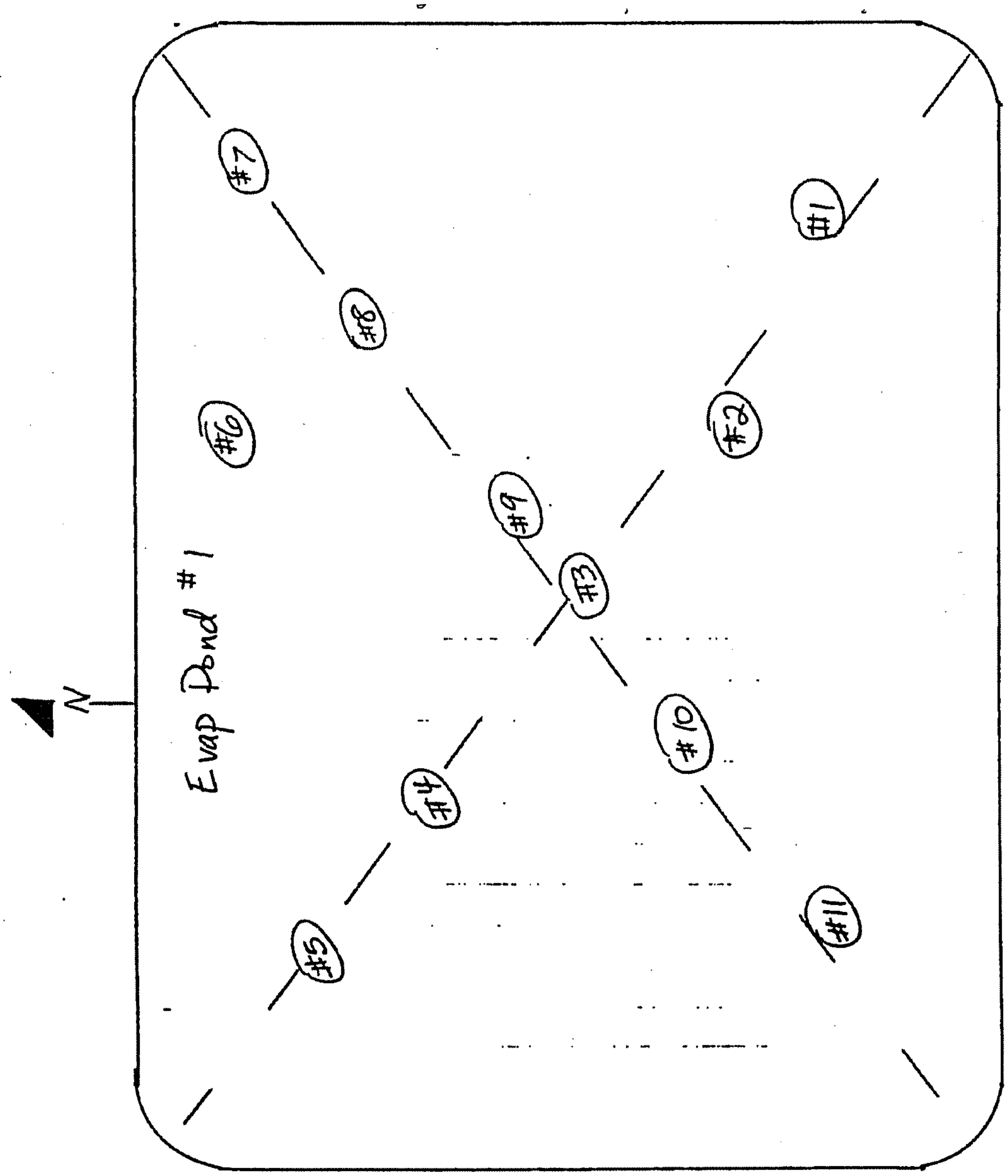
SLUDGE/SEDIMENT

ODCM required samples denoted by *
units are pCi/kg

SAMPLE LOCATION	DATE COLLECTED	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
Evap Pond 2 (#1)	17-Feb-95	<16	<15	<31	<21	<31	<17	<26	<15	<20	33 +/- 14	<49	<17
Evap Pond 2 (#2)	17-Feb-95	<17	<15	<21	<17	<32	<14	<24	<13	<15	22 +/- 17	<44	<10
Evap Pond 2 (#3)	17-Feb-95	<15	<15	<28	<19	<25	<14	<24	<19	<14	<19	<56	<13
Evap Pond 2 (#4)	17-Feb-95	<16	<11	<31	<17	<34	<11	<24	<18	<13	15 +/- 13	<56	<15
Evap Pond 2 (#5)	17-Feb-95	<14	<14	<27	<18	<33	<13	<23	<18	<14	<19	<55	<13
Evap Pond 2 (#6)	17-Feb-95	<15	<14	<29	23 +/- 17	<33	<17	<23	<20	<15	23 +/- 15	<50	<19
Evap Pond 2 (#7)	17-Feb-95	<14	<14	<30	<24	<34	<16	<26	<21	<14	<19	<65	<15
Evap Pond 2 (#8)	17-Feb-95	<15	<14	<32	<20	<34	<16	<22	<20	<13	<19	<53	<17
Evap Pond 2 (#9)	17-Feb-95	<16	<12	<28	<20	<31	<16	<25	<22	<14	20 +/- 13	<71	<14
Evap Pond 2 (#10)	17-Feb-95	<16	<12	<36	25 +/- 13	<29	<16	<30	<24	<17	29 +/- 18	<66	<20
Evap Pond 1 (#1)	16-Mar-95	<16	<13	<30	<18	<33	<17	<29	<24	<13	<15	<65	<11
Evap Pond 1 (#2)	16-Mar-95	<12	<15	<26	<15	<28	<18	<25	<21	<13	<14	<65	<18
Evap Pond 1 (#3)	16-Mar-95	<14	<13	<33	<17	<29	<16	<28	<26	<12	<16	<63	<14
Evap Pond 1 (#4)	16-Mar-95	<13	<14	<31	<17	<30	<14	<24	<23	<12	<15	<61	<20
Evap Pond 1 (#5)	16-Mar-95	<11	<14	<36	<14	<28	<16	<24	<21	<14	<14	<62	<11
Evap Pond 1 (#6)	16-Mar-95	<15	<14	<25	<16	<27	<17	<24	<24	<13	<14	<70	<15
Evap Pond 1 (#7)	16-Mar-95	<14	<12	<28	<11	<28	<16	<26	<31	<11	<16	<77	<23
Evap Pond 1 (#8)	16-Mar-95	<15	<14	<37	<16	<38	<20	<28	<39	<14	<15	<73	<31
Evap Pond 1 (#9)	16-Mar-95	<16	<16	<42	<17	<38	<19	<23	<42	<15	<18	<97	<28
Evap Pond 1 (#10)	16-Mar-95	<14	<20	<45	<19	<45	<23	<33	<43	<17	<20	<106	<31
Evap Pond 1 (#11)	16-Mar-95	<13	<17	<32	<15	<30	<16	<26	<41	<14	<15	<112	<15

aps. WE CARE HOW YOU LIVE

BY	DATE	SUBJECT	SHEET NO.
Louis Drinovsky	3-30-95	Evap Pond 1 Sludge samples	1 of 1
CHECKED BY	DATE	(taken 3-16-95)	JOB NO.



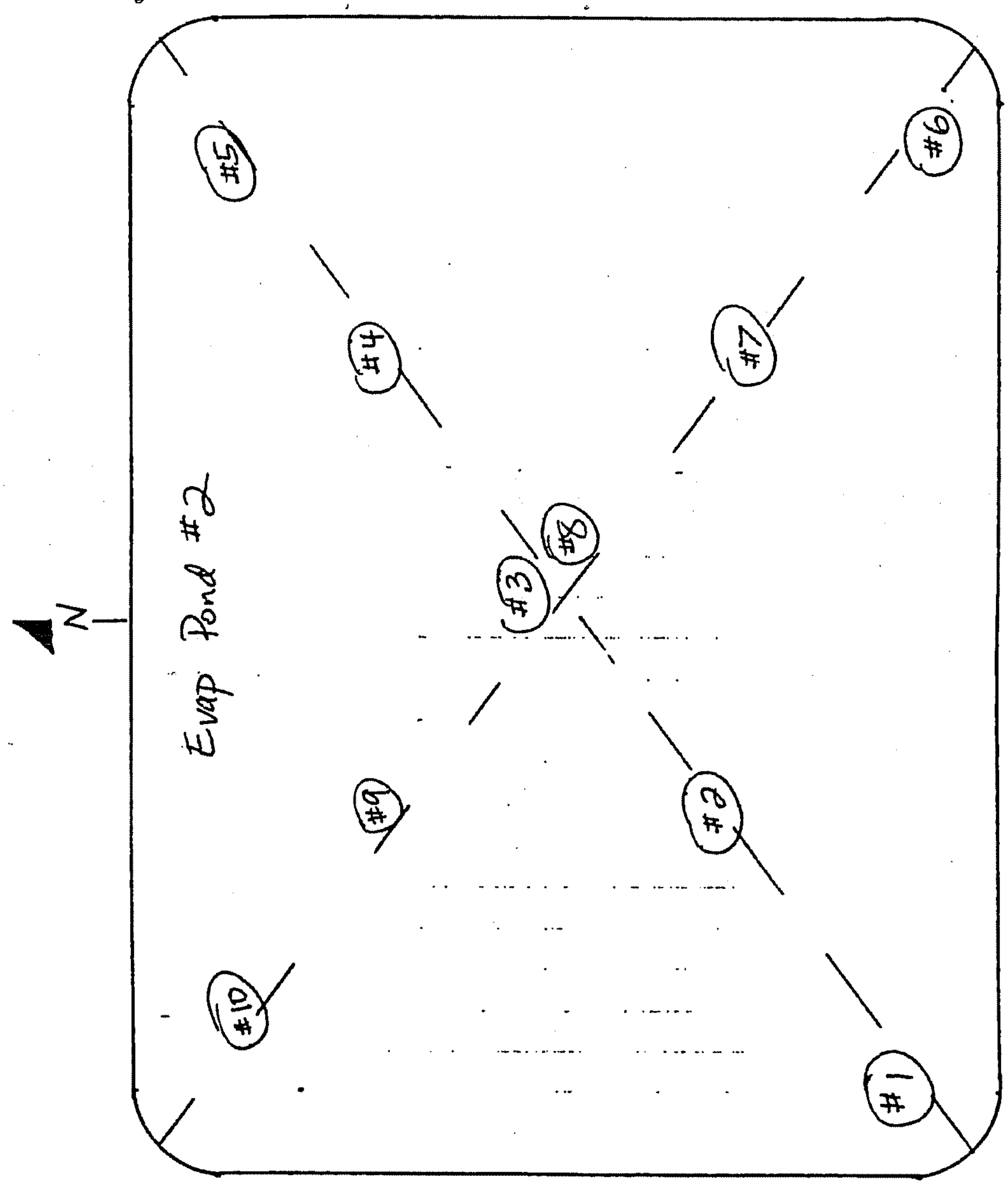
Evap Pond #1 bottom sludge samples collected at indicated locations on 3-16-95 between 1020 and 1210.

410.00V (3-

aps.

WE CARE HOW YOU LIVE

BY	DATE	SUBJECT	SHEET NO.
Louis Drinovsky	2-21-95	Evap Pond 2 sludge samples	1 of 1
CHECKED BY	**DATE**	(taken 2-17-95)	**JOB NO.**



Evap Pond #2 bottom sludge samples collected at indicated locations on 2-17-95 between 0900 and 1145.

410-00V (3-