A Call for Water Sanity! Monitoring Group
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To Diane
Beardsley
SWRCB
DWQ

March 5, 2001

To whomever is also concerned about our water:

We all make our choices. Many of us have worked for years to buy our homes, and some of us—such as myself—took this money that I could have used in other ways and did a study on a local watershed. As if I was instructed by a divine source, I forsaked all personal needs and pursued this task. I have enclosed the five-year report for this project, and I feel that this fifty-thousand dollars was well spent and that the finding of chemicals that simply move toxic substances from one part of the water to another part of the water was a good way for these funds to be used.

The realization that our chemical technology has exceeded the scope of our laws, which are in place to protect our health, is startling. Education and knowledge of these chemicals, which are now being used on all our waterways, is becoming a necessity for any person who does water monitoring. Knowledge of how these substances work and how they can concentrate and harm both aquatic and human life are essential to know.

On the back of the table of contents is an introduction that will help you to understand the contents of the report and the best time to watch the video. I have enclosed a report made from each chapter of the five-year report, as I believe that breaking each chapter of the report into separate issues—such as sewage-treatment downstream, water-treatment issues, mining issues—will help to create an issue-focus so that a person who lives or uses the water downstream or is monitoring downstream can learn about the issues that might be pertinent to their situation. I would also like to point out that if a plant operator states that they are not using any chemicals upon discharge, either that person may not really know or they may be telling an untruth.

To know what to look for downstream and research from bio-assays, etc., will usually tell the real story. Chapters Nine and Ten are keys to pulling the report together and supplies a realization about what you are seeing in the video or reading about at each of the sites in the report. Chapters Nine and Ten came last and gave a name to the two chemicals we see in the video and read about in the report. "Special Sauce" is the alkaline foaming substance and then the orange-black or yellow-acidic semi-solid gelatinous substance is what they refer to as "acid mine-waste chemical."

W Will Doleman

Will Doleman
A Call for Water Sanity! Monitoring Group

Water Sanity

Introduction

This story is about the discovery of a serious environmental problem that causes disease and death. It has been created both for the professional aquatic scientist as well as for the lay person, as is the person who wrote it—Will Doleman. Although you may find the narratives to be slightly technical, there are M.C.L.s (Maximum Contaminant Levels) for drinking water and irrigation use, which will help you understand the toxicity levels in the back of each of the site narratives. If you glance at these first, then as you read you may have a clearer understanding of the level of toxicity present. Except areas of concentration, the body of water appears to be fine in most of the locations according to acceptable standards. Even as a lay person you need to understand the difference between p.p.m. (parts per million—the same as mg/L, as well as p.p.b. or parts per billion) if you are going to discuss these levels with a water regulator, since most of the regulator's M.C.L.'s are in p.p.b.

The summary of each of the eight sites discusses each site, the levels I've found, and the implications to public health. This is the part that a lay person can easily understand. To an expert it may justifiably be accepted as one group of peoples' opinions drawn from the narrative data. Such a person may want to read the narrative for each site, then the Appendix, then the ninth chapter (re: chemicals that appear to float, evaporate to the air, or temporarily coagulate—i.e., gelatinize—bacterial and heavy-metal substances out of the water body), and then read the summary of each site to see if the conclusion you have drawn concurs with the opinion of A Call for Water Sanity! Monitoring Group's opinion.

A lay person may find it easier to read the summaries, then proceed to the Appendix, reading the "W.D." notes and the letters (with Will Doleman's signature at the bottom), and quickly skim the rest, returning last to read chapter nine (re: the chemicals that appear to be the ones being used).

This whole document is generally about the surface and semi-solid sediment portion of waterways and lakes and not about the body of the water mid-stream, which has been documented by the regulators and appears to be in much better condition, the notes of which are not enclosed. The exception to the foregoing is the $KBr0_3$ potassium bromate, which is about the body of the water. If you received a video, it is suggested that you read this first and save the video for dessert.

This project was done in just one small part of the watershed (except $KBr0_3$) and does not necessarily reflect the condition of all watersheds. But other water areas have been analyzed as in the Wolf Creek site that appear to reflect the same general conditions regarding the foaming substance.

A Call for Water Sanity! Monitoring Group
Five Year Report 1995-2000

Other materials available: two-hour video; analysis book; site-log book; calls and letters to regulators book; chain-of-custody and laboratory narrative upon request; computer analytical database forthcoming; graphs; Wolf Creek video; chemical-manipulation video; condensed informative video.

Issue Index

A Call for Water Sanity! Monitoring Group's Analytical-Site Narrative Five-Year Report 1995-2000/Subject Description

CHAPTER ONE and A1

Mid-Ditch; 3000' elevation $10.00

This site, which is a slow spot in a waterway or a natural settling pond, also lies downstream from leaking landfills and two water-treatment plants.

It is documented over a five to six year period and reveals that concentrations of health-harmful substances are killing people, fish, and frogs that use the waterway. The site-narrative summary and video show a hands-on approach to documenting random concentrations of these substances. It also shows how chemicals that float, congeal, and evaporate toxic metals are poisoning the water and air that people are breathing and the food that people are eating.

The Mid-ditch site receives much of its water from the Loma Rica Water Treatment Plant's backwash pond and seeps from its 24-year-old discard pile; seeps from a mine-tailing arsenic-dump landfill by way of the Old Reservoir Pre-Ditch Puddle site and the Greenstream Ravine site, the bromate-source site, and the Cascade Water Treatment Plant located upstream.

CHAPTER TWO and A2 $5.00

The Old Yuba Reservoir and Its Pre-Ditch Puddle site; 3,200' elevation

This reservoir receives its waste, bromate, and heavy metals from: (1) Nevada County property that is on loan in part to the local water-treatment municipality; (2) the municipalities' 24-years of discarded-pond scrapings that were dumped into the old reservoir; (3) a massive landfill of arsenated mine tailings. This site demonstrates how solid-waste dumped out in the rain or in a wetland area seeps into the water, causing a water-pollution problem. The Old Yuba Reservoir Pre-Ditch Puddle is upstream from the Mid-Ditch site and the Chicago Park agricultural area. Additionally, it discharges into the public-water supply that is used in approximately 600 residencies downstream for showers, dishwashing, hand-washing, and bathing.

CHAPTER THREE

Greenstream Ravine $5.00

This site demonstrates: (1) how to locate deep-injection wells and trenches; (2) how a wetland can become totally overloaded with discarded toxins; (3) how to sample silver-gelatinous substances; and (4) how to show the origin of toxins by demonstrating high levels of constituents that are used in the nearby municipalities or industry. It also shows how sometimes local government chooses not to do anything that might create any financial liability, and how they often fence off or hose an area in order to cover up inadequacies. They may not have any consideration whatsoever for the public's health. Greenstream Ravine flows down to the Mid-Ditch site.

CHAPTER FOUR

Headwaters of the East Fork of Little Greenhorn Creek $5.00

This creek flows down to Rollins Reservoir and is joined by Clipper Creek from Lost Lake. This site demonstrates how municipal water- and sewage-treatment plants use deep-

injection trenches to discard their by-products, and how they intentionally avoid the testing of discharge water for water-treatment by-products. It also shows how the groundwater table is completely contaminated and how it kills a very old madrone forest and shows what effect the standard methods of alum disposal has on groundwater quality.

CHAPTER FIVE

The D.S. Ditch $5.00

This ditch demonstrates how inadequacies in the law have allowed private and public waterways to be used for wastewater-dump channels and how chemical-mining technology is being used to move toxins from one part of the water to another part of the water body so that the area normally tested under accepted water-testing protocols is temporarily cleaner than other untested parts of the waterway. The D.S. Ditch clearly demonstrates how engineering with chemicals and waterway design are separating undesirables to be discarded to the creek while the better water is to be used by the water purveyor to sell. It also shows how it's really important for the people of California to see that S.B. 649 is repealed. The D.S. Ditch enters the East fork of Little Greenhorn Creek and flows down to Rollins Reservoir and then into the Auburn Aqueduct, which is used for agricultural use. Also, it overflows to Bear River, which has fish advisories about not eating the fish from it.

CHAPTER SIX and A6

$KBrO_3$—Potassium Bromate $10.00

This chapter is about an issue more than about an individual site, and all the well- and municipal-metered water samples were taken according to acceptable water-testing protocols. It shows why cancer is accruing fourfold in watersheds located below water- and sewage-treatment facilities. Fourfold cancer levels of cancer were shown to be the case in a statistical study done in Toronto Canada by Dr. Mac Lach Lan, professor of statistical studies at the University of Toronto. It also shows how the waste products of water-treatment processes are not the subject of chlorine residual (i.e., by-product) research, and how they should be.

The amazing thing it reveals is how government-regulatory agencies got involved and how suddenly all the results were now incorrect. A quote from a state employee who wishes to remain anonymous: "Sometimes it's easier to fix the lab results than it is to fix the problem." This carcinogen that was found to be emitting from the water-treatment plant and its discharged solid waste has wide-area implications. Samples taken from other California counties show that the problem is accruing in probably many if not all locations where chlorine is being used or especially where it's made on-site in brine tanks.

This chapter touches on how this substance is being used in bakery goods, listing bakery names to avoid, and how $KBrO_3$ in permanent-hair curler solution and dyes have disfigured many people.

CHAPTER SEVEN and A7

Lost Lake $5.00

How a government superfund agency used or ignored the use of chemicals to move the toxics downstream just out of the site boundary so that they could say all is well and not take any action. Clearly this shows what chemical manipulation does and how it is being ignored. It centers around the contaminant arsenic and other mining wastes.

We still hope to convince and get the help of the federal E.P.A. or one of the state agencies to look at what we have found here. It's been four years now of ongoing effort. So far the only reply has been tongue wagging.

CHAPTER EIGHT and A8

Wolf Creek Site

This shows how chemical manipulation floats undesirable substances onto the water's surface, and how the municipality saves money by falsely representing its discharge to the creek. This chapter also addresses protective measures that any volunteer-water monitor should take to protect his or her health while gathering foam or coliform samples that could and often contain high levels of raw-sewage concentrations. This site addresses sewage-treatment discharge issues.

CHAPTER NINE

Chemical Mania

This chapter is about chemicals being used in our watersheds. Read and see and hear for yourself the claims of one manufacturer so you can understand that there is lots of money to be made in the chemical loopholes that allow the poisoning of our waterways. Understand the protocol issue and what we can do to remedy it. It touches on chemicals that are very likely being used on our waterways in all the preceding chapters.

CHAPTER TEN

Bacterial Mania

The concentrating surface scum not only contains high levels of heavy metals and occasionally bromate but, as discovered in this chapter, could be accurately considered be to a heavy-metal bacterial swarm. The swarming action of 900,000 M.P.N./100 mg/L total coliform in one sample could easily be understood as why there is foam there. Although the foam at Mid-Ditch is what's highlighted here, documentation of the Wolf Creek site shows that it is also accruing there.

Even though I took every precaution, I still got contaminated with the bacteria in the foam with a sinus infection. I took many months to figure out what was biting me, followed by weeks of treatment, as I was still hoping to be rid of the bacteria. I still hope that none of the pathogens that crowded my eyes, ears, nose, throat, and lungs were carrying any disease as they often do. Now with high doses of antibiotics, I hope finally to rid my body of these invaders. I thought they were water fleas that were crawling on me and biting me." Now I follow the strictest raw-sewage sampler's protocol.

Videos

The two-hour video: Presently the video encompasses mining and water-treatment discharge issues. Three of the videos are about water-treatment plant discharge issues to waterways and groundwater. Included is a pep-talk preview touching on local mine-tailing-issues and the effects of acid rain. Lost Lake, which is a half-hour video out of the four videos, centers on mine-waste issues and chemical manipulation of these substances.

At this time, all four videos are on one tape, but eventually three different tapes will be available: (1) water-treatment, wastewater, and sludge issues; (2) chemical and bacterial manipulation of our waterways; and (3) sewage-treatment discharge and sludge issues. (The next video will cover Wolf Creek and Gas Canyon Creek downstream from sewage-treatment facilities, and sewage-treament wastewater issues. Another video in progress will be about the chemicals being used to manipulate our waterways. This video will include bacteriological issues.)

Interrelation of Sites and Issues

The Mid-ditch site (Ch.1) is a receptor site and received effluent from the O.R.-P.D.P. (Ch.2) and the G.S.R. (Ch.3) sites. The original body of *Bacterial Mania* (Ch.10) was done on the Mid-ditch site (Ch.1). The chemical company that makes the chemicals mentioned in *Chemical Mania* (Ch.9) is located upstream, and it is thought that the water-plant ditch managers, who are very pro-chemical use, are probably using or holding stock in this chemical company. So Ch.1 and Ch.10 definitely go together and should be purchased together. Chapters 2, 3, 6, and 9, as one could guess, are also definitely interrelated with Chapter 1.

The Lost Lake site (Ch.7) is located in the next watershed to the east from the above-mentioned sites. The upstream portion is a federal-superfund site and is owned by a developer (I have no access to the Lava Cap Mine site). The H.E.F.L.G. Crk. (Ch.4) downstream portion joins Clipper Creek just downstream from Lost Lake as the D.S. Ditch (Ch.5) is in the H.E.F.L.G. Crk. watershed as well. It is believed that B.M. (Ch.10) is also occurring at the D.S. Ditch, which caused the bacteria swarm of 35 mg/L of arsenic just below the confluence of Little Greenhorn Creek and Clipper Creek of 35 mg/L of arsenic reported in Lost Lake (Ch.7). Bromate was found at Ch.1, Ch.2, Ch.3, Ch.4, Ch.6, and Ch.7 sites as well as area-residential wells and the metered-potable water supply. So when purchasing Lost Lake one should also purchase *Chemical Mania* (Ch.9). You might also want to consider the interrelationship of Ch.4, Ch.5, Ch.6, and Ch.10. More work on bacterial substances is now being done, but preliminary results show the D.S. Ditch (Ch.5) and H.E.F.L.G. Crk. (Ch.4) probably added the bacterial substances causing the bacterial swarm of 35 mg/L of arsenic downstream from Lost Lake, which was likely manipulated by Ch.9.

Wolf Creek (Ch.8), the sewage-treatment issue, should be purchased with *Bacterial Mania* (Ch.10).

The Ch.1 and Ch.6 reports are more due to the volume of the material. The individual reports are the same as the large report, which contains all of these ten chapters, except the individual chapters will have at least two 8½" x 11" color photos taken of the site. The larger report contains maps of the study area and two color photos as well. For those who wish to take a good look at these issues, it is recommended that they order the A.C.F.W.S. Monitoring Group's *Five Year Data Report*, which comes in an attractive photo-cover binder for $30.00, and also order the two-hour video, *Greenhorn Watershed*, for an additional $20.00.

For another $20.00 per year, the price of the group's support membership, a person will receive yearly updates to the data-report, chapters 1 through 10. Presently, purchases are not tax deductible, but this status is soon likely to change.

For a group with limited funds, if you purchase one of the $10.00 report chapters, we will let you exchange one for one until you have read all ten chapters, but you will have to provide a 9"x12" S.A.S.E. each time and pay all postage. The returned reports will have to be in like-new condition.

CH1

Mid-Ditch Site

Sampler's Data Sheet

The mid-ditch site is located downstream from the first siphon off Loma Rica Drive on the Chicago Park Rattlesnake Ditch and continuing until it enters the siphon at Liquid Amber Drive in Grass Valley, California, which is off the first half-mile of Greenhorn Road. Specific areas located here are referred to as the foam pit, Mrs. D's, and the culvert pipe.

June 21, 1995 The date the first sample is taken of the ditch water in a home where the water had been used for in-home use water for years. The laboratory that did the analytical work said not to use a filter and to look for another source of water. I obtained these results on the day of the funeral of my father, who lived in the home. They did not know what disease he had; he slowly lost his mind, so the doctors referred to his condition as Alzheimer's Disease. Both my mother and father, as well as the majority of their neighbors used and drank the filtered ditch water. Mr. and Mrs. Doleman used three carbon-filter tanks that were backwashed three to four times yearly, as well as an excellent cartridge pre-filter with carbon and reverse osmosis.

The following items are relevant for all this local ditch water. The water purveyor will not own up to drinking-water standards, even though more than 600 people use this water in their homes downstream. This water is used for agricultural use, but the agricultural water-quality goals are not enforced by the state agencies to which the county passes the buck! Then no one cares, and as you can see in this section, it is affecting agricultural use and the levels of agricultural undesirables are climbing as time passes.

The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are listed at the end. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

June 21, 1995 This sample taken was of silty water that I grabbed as I removed the silty sediments from the bottom of my parent's ditch-water holding tank. The highlights were: 5.6 lead, 34.0 barium, 1.5 arsenic, 3.0 chromium, 1.5 selenium, and .008 mercury.

October 13, 1995 This sample was entering the ditch from upstream, and not part of this site. Comparing the substances entering seemingly from the water-treatment facility upstream to the levels found downstream, one notices similarities such as aluminum is always the highest, then potassium, sulfate, barium, vanadium, lead, chromium, arsenic, and copper. The order of the constituents and the order in which they fall when listing the higher levels of toxicity first appears to have many similarities when comparing levels from one site to the next.

November 19, 1995 I collected some surface scum material that was blue, green, and amber in color as the water entered the ditch water pre-filter tank from the ditch. The highlights were 4.6 aluminum, and 1.0 copper.

June 2, 1996 Seasonal silt near the bottom of the ditch in mg/kg is not part of the water, so is not considered a harmful level as drinking-water criterion, but at 33 mg/kg it demonstrates that chromium is present.

On the ditch bank where foam and leaves are continually deposited by the water purveyor for the purpose of the foam-pit cleanout, the water tested at roughly 12% aluminum. There was copper present as well! Highlights are 12,000 mg/kg of aluminum and 34 mg/kg of copper.

July 10, 1996 Sediments again tested at the ditch bottom showed in mg/kg 110 lead and 77 vanadium.

July 11, 1996 Water off the bottom of the home water-heater appeared to be clear. The home has copper piping; the ditch water that was in the tank was neutral, in ph, testing at 7. Highlights were 1.3 mg/L of copper in clear water, 6.5 times the drinking-water M.C.L.

Dirty water from the bottom of the old ditch-use water heater in the home was found to be 1,100 times over the safe drinking-water level, highlighted at 220 mg/L of copper. Note also that, although most metals in water are not readily absorbed through the skin, potassium bromate is. Metals can be absorbed bodily as well in shower stream via the lungs. Recent medical research shows that copper feeds blood- vessel growth, which can cause the rapid spread of cancer.

September 2, 1996 Seasonal silt is found that has arrived here since 1992, when the previously deposited silts were then removed and dumped on the ditch bank. This is the water

purveyor's regular method of dealing with ditch silts. The Water Quality Board argues that silts and surface-water samples are not a general representative water sample. We disagree. We feel that an average of the three areas—(1) the water's surface; (2) 12" below the surface or mid-stream; and (3) the surface of the seasonal water-deposited silts—taken and averaged, provides a much more general representative sample than taking only one sample 12" below the water's surface.

September 28, 1996 Regarding a neighbor who obtains her water from the ditch: no copper piping is located in the water system upstream from this water heater. This is a six-month old water heater, and a bottle of light-brown water was collected from the unit's drain valve. Highlights are 6.4 mg/L of copper, which is 32 times the D.W. and agricultural use M.C.L. for copper.

October 18, 1996 Silver-coated leaves were found on the ground near the downwind side of the foam pit. More ditch-bank locations, which are located downwind, are covered with many little silver machine-cut looking silver specks. Seasonal silts that were sampled contained a high percentage of water, and the water portion of the sample was tested. Highlights here at the foam pit were reported in mg/L and are 4.4 of chromium and 7.0 of copper.

December 2, 1996 Consistently high levels of sulfate, surfactants, and lead are found as well in samples taken over a period of years.

December 29, 1996 Metals leak down on a person's property once they are deposited on the ditch road located on a person's property, and the rain washes them downhill onto their properties. The level of potassium bromate reported here on the water's surface is more than 66,000 times the safe drinking-water level. Although the water purveyor maintains that this is not drinking water, potassium bromate is also absorbed through the skin, and more than 600 people downstream use the water for bathing and dishwashing. Metal highlights here are 23.0 mg/L of lead, 240 mg/L of potassium, and 260 mg/L of bromate, and an estimated level of 480 mg/L of potassium bromate.

May 5, 1997 Foam and silts are found. The head purveyor of this ditch tells us that around four-percent of the water in the ditches is lost through seepages and leaks, and are lost from the dirt-bottom ditches. So can you imagine what these seepages are like after filtering through these toxic sediments? And there are hundreds of miles of these ditches, and over one dozen of these water-treatment facilities in Nevada County alone, and almost always located above large population areas so that they may feed water by gravity to the population that lies below. Highlights found here were 3.5 mg/L of lead, which is 233 times the safe drinking-water M.C.L., .078 mg/L of cyanide, and 8.3 mg/L of lead below the foam overhead at the water's surface but found in the orange alum on the sediment's surface below.

May 28, 1997 After the water-treatment facility upstream removes the undesirables and redeposits them back into the ditch upstream, the ditch becomes so high in these undesirables that it would be in violation of water-quality goals set by our government for uses downstream, including agricultural uses. So now to mitigate the situation, N.I.D. adds a substance—soap, surfactant, foaming agent—to clean the water body momentarily by floating the undesirables to the water's surface. Although this loophole satisfies the state agencies (i.e., the Regional Water Quality Control Board) that do only *selective* sampling of the water 12" below the surface, the foam concentrates here at the foam pit and goes into the water downstream causing medical harm and agricultural contamination there. The Water Board considers the water-treatment facility a necessary evil, so they refuse to regulate them at all with regards to this type of discharging. Highlights are in p.p.m. 24 of surfactants, 3.8 of barium, .14 of chromium, .75 of copper, and .56 of vanadium.

June 6, 1997 The water-treatment chemical was found at very high levels compared to other areas upstream from the water-treatment plant. The water purveyor's literature states that they use more than 150,000 pounds of the water-treatment chemical here on-site per year. I was told that up until 1996 nothing was taken away from the plant area.

June 9, 1997 Aluminum potassium sulfate, the water-treatment chemical. Highlights were 200 mg/L of aluminum, 56.0 mg/L of potassium, and 24.0 mg/L of sulfate. Other metals present were 2.8 mg/L of barium and .4 mg/L of lead.

August 21, 1997 Many homes now have reverse-osmosis filters due to the cancer-cluster that killed many area residents. The D.L. is the sample detection limit. This is the level down to which the laboratory is able to test. If there is "N.D." in the result column, that means there was none detected at or below the detection limit. Reverse osmosis "S" type of water filters have been shown

to filter out bromate. Many plants on the steep uphill side of the ditch were getting their leaves singed by something leaving the water and becoming airborne at the ditch exit siphon. A few of these burnt leaves contained 75.0 mg/kg of aluminum. Twice the human M.C.L. for D.W. of lead was found 12" below the water's surface downstream from the foam pit. This level is nearly twice the safe human D.W. water level, and wild life does not have our body weight.

October 29, 1997 4.9 times the safe D.W. level of vanadium was found in the old water heater, which used to be supplied with ditch water at Mrs. D's.

November 2, 1997 Ditch road soil is very high in the same materials found in the ditch. Highlights: 58 mg/kg of lead.

November 3, 1997 A water heater! It is obvious where this metal came from (see sulfate level). I was told by a chemist who worked with a doctor of medicine for 30 years that vanadium cuts off the flow of blood to the human brain, and a person who was poisoned by vanadium would probably be diagnosed as having Alzheimer's Disease, as was my father who used this water heater. We need to realize that our doctors don't want to point the finger at someone and end up in court, and the affected families generally don't want to know or think that their loved ones were poisoned. So, if you are 60, 70, or 80, watch out as it's virtually open-season on you in this culture. Also, astronomical levels of aluminum, barium, and lead are found here.

November 16, 1997 24 mg/L of sulfate is found again in the foam.

November 19, 1997 Consistent toxicity month-in and month-out. Silver bubbles are forming in the aluminum gelatinous substance at the ditch's bottom. These levels of these particular metals look familiar.

Soil levels at Mrs. D's are much higher. Another sample was 58.0 mg/kg, and the next one is 49.0 mg/kg.

November 20, 1997 Highlights on this day were in p.p.m. as follows: .38 m.b.a.s., .38 of lead, and 68.0 of sulfate. Consistent foaming agent and lead. Now in the year 2000, the lead is 2.5 times this previously found level on the water's surface.

Other non-bromate water-treatment by-products are very high here as well.

December 29, 1997 The vanadium level peaks in the foam at 15 times over the safe agricultural-use level!

January 5, 1998 Highlights in p.p.m. are 30 mg/L of potassium bromate, 68 of sulfate, .38 of m.b.a.s., 25 of potassium, .31 of chromium, .49 of copper, 170 of aluminum, and 3.8 of barium. Bromate first discovered as well as consistent levels of chromium, sulfate, and .68 of copper, .38 of lead, .0023 of mercury again. This is foam at the foam pit. All of these substances are known to occur in and around water treatment, and bromate is, for one thing, a water-treatment by-product of the water-treatment process. (See "Bromate" on the World Net.)

January 20, 1998 Total dissolved solids (T.D.S.) in mid-ditch water, basically chemically suspended dirty metals. Highlights are 25 p.p.m. T.D.S. The foaming-substance levels are 4.5 p.p.m. of manganese.

February 25, 1998 Incredible potassium and vanadium levels. Highlights in the foam at 37.0 of potassium, and .69 of vanadium.

February 26, 1998 Potassium bromate first found. Highlights here were 30 m/L of potassium bromate. Levels when combined, as potassium bromate, range from 60,000 to 120,000 times the Proposition 65 safe levels for drinking water. Also note that the substance is absorbed dermally according to the E.P.A., and is smaller atomically than 1/10,000th of a micron, which makes it very difficult to filter. It is not safe for showering or dishwashing, and more than 600 residents downstream are using this ditch water in their house for these purposes.

Downstream from the foam pit, the water is used to water fruit orchards. I went into the local supermarket and purchased a bottle of the apple juice made from these apples. I took it to an engineer, who broke the tamper-proof seal and put it into a sample container. 36 times the safe level for drinking water for manganese was found in the juice, and the juice was at the M.C.L. for copper. Also, it contained detectable levels of chromium and nickel. All of these metals were found many times over the safe level for agricultural use in the foaming substance upstream. Yet, as of June 6, 2000 these apples and juice are still being sold at local supermarkets.

February 27, 1998 Foaming agent (m.b.a.s.) is found in the ditch foam. Highlights in p.p.m. are .22 of chromium, .46 of m.b.a.s., 12.0 of manganese, 1.5 of vanadium, and .39 of lead.

March 20, 1998 Bugs get caught in the foam. Fish and frogs are seen eating them. The same constituents once in the foam are now in the fish. Note the same for potassium bromate as well. Highlights were 24 mg/L of potassium, .6 mg/L of vanadium, 290 mg/L of aluminum, and 15.0 mg/L of bromate in the surface foam.

Seasonal silts at the foam pit. Silt highlights are 95.0 mg/L of manganese, and 3.8 mg/L of vanadium.

Here a dead fish was at a level of 19.1 mg/L of bromate, which brings the level for toxicity for the fish up to 152,800 times the safe drinking-water level for this fish. This was a carp (gold fish), which are not good eating fish, but are used in actual tests of toxicity in actual scientifically accepted tests of water toxicity. They apparently die from similar water problems as humans do. A dead Widemouth Bass was also found here. This type of bass is a commonly eaten game fish, and this specimen contained many of the same undesirables found in the carp and in the foam-pit foam nearby.

May 11, 1998 I discovered the remains of a dead Yellow-legged Frog in the foam pit. Same metals in the frog as found in the foam nearby.

July 4, 1998 This sample was taken of the water 12" below the surface downstream from the foam pit. Note the sulfate level is .6 mg/L.

December 1, 1998 A leaf and debris-free foam sample was taken here. Note the escalating levels. Highlights are 1.16 mg/L of copper, 17.1 mg/L of potassium, 490 mg/L of aluminum, 3.32 mg/L of barium, 20.2 of mg/L of manganese, 2.04 mg/L of nickel, and 5.66 mg/L of sodium.

December 9, 1998 Sulfate persists. An air filter set up 15' away from the ditch collects the same metals again as found in the foam nearby. This demonstrates that the water purveyor's claim of burning the undesirable substances off into the air using a chemical (possibly potassium permangenate) is true. This is according to Les Nicholson, formerly in charge of operations for the water purveyor. The air filter was placed near the ditch road, and the same metals that were in the foam were now in the air filter or possibly in neighborhood resident's lungs.

Apparently questionable health water-treatment plant operations are now being performed in our backyards, without our permission, and it's not only affecting your fish and game but also your air quality and agricultural uses of the water. Also, toxic silts are being discharged onto your property on the ditch bottom and then being removed and dumped onto the ditch road. They are also depositing on your property whereas the toxicity is leaking via the rains down into your yard, your well, and so forth. You look out the window and find two dead gophers in the yard. They have a hole up above in the ditch bank, which is now suddenly under water due to the increase in the water level to move water downstream for the newly anticipated irrigation season.

October 1, 1999 Foam at the foam pit. The zinc level is high; sulfate and aluminum are consistently high, showing both the water-treatment chemical and high levels of metals and water-treatment by-products are coming from the water-treatment plant upstream.

Potassium and bromate most likely are combined and are at the M.C.L. of 48,000 times the safe level for drinking water. This is the third year this was found in the same location around the same level. Remember this substance is being absorbed dermally (see *Toxic Air Contaminant and Identification List Summaries*, A.R.B./SSD/SES, September 1997). Also, a study of this constituent performed by scientists employed by the E.P.A. has revealed that it attacks the thyroid gland first, followed by renal and stomach cancers. Both my mother, Mrs. D, and my brother—who lived there longer than any of the rest of us—lost their thyroids. Also, this study of mice and rats subjected to potassium bromate had much higher rates of death by cancers among males. The same can be said for the human population living in this neighborhood.

High aluminum, lead, and potassium were found. The lead is now more than twice the original 1995 level.

I sampled brown foam from the foam pit at mid-ditch; this foam was clean and free of oak leaves and pine needles. There are many small flies stuck in this foam. Fish, frogs, and many mammals drink from the water's surface. On this day, the water—blackish colored—that formed as

the foam rapidly dissolved in the sample bottle contained 100.0 mg/L of aluminum, 73 mg/L of potassium, and 3.8 mg/L of sulfate. This is obviously the water-treatment chemical aluminum potassium sulfate. Also, .055 mg/L of chromium, .39 mg/L of copper. 16 mg/L of manganese, .09 mg/L of nickel, and .96 mg/L of zinc were found, along with 12.0 mg/L of bromate. Another different sample grabbed of the foam around the same time period contained 260.0 mg/L of aluminum, 12.0 mg/L of potassium, and .9 mg/L of lead, a new record for the lead levels at this site, plus 8.2 mg/L of magnesium, a non-toxic substance by itself.

Around December 7, 1999 Bromate and high levels of potassium from 12 times over the safe drinking-water level to 880 times this level were found nearby. Residential water wells located downhill from mid-ditch site, and were drilled to an average of 270 ft. deep and, for the most part, the residents obtained their water below from a layer of lava rock (see *KBRO3 Potassium Bromate* paper for details).

December 17, 1999 #224: the highest level of potassium bromate found so far. The soil was extracted with distilled water (i.e., diluted). Nothing was multiplied due to the one-to-one dilution, which logically and scientifically would have doubled in level the results reported, around 960,000 times the M.C.L. for safe D.W.

Mrs. D's well: The clear well water was ran for more than 10 minutes, and then a clear water sample was taken after the laboratory-sealed container was rinsed out more than four times. 1.5 mg/L potassium was also found here making the potassium-bromate level here in this 300-ft. deep well 880 times over the M.C.L. for safe drinking water, and these analytical reports came from a creditable laboratory that continues to stand behind its analytical work. Highlights are .11 p.p.m. of bromate, and an estimated .44 p.p.m. of potassium bromate.

January 18, 2000 Mrs. D's well. More than four times the safe M.C.L. for drinking water of arsenic is now in this well as well as water-treatment constituents. Four out of five wells are thus contaminated, and wells from here all the way to the Cedar Ridge "Y" have been found contaminated with bromate. The problem was finally temporarily fixed after 4,800 times the safe drinking-water level of potassium bromate was found in drinking fountains at local schools. The laboratory phoned and declared that they have caved in on their results, and they claimed that their analytical machine was broken. However, more than one laboratory was used, and other samples revealed 11 to 880 times the M.C.L. for the safe drinking-water level of bromate and potassium bromate were found. The exact same level of bromate, the water-treatment by-product, was found in a well located in the treatment plant's immediate neighborhood, as well as in Mrs. D's well and a third well out near the Cedar Ridge "Y". This level, being the same in these samples taken by a local biologist, point to that, for a time, the entire water table from 100 to 300 ft. deep was uniformly contaminated. This laboratory has stood behind the results, which were financially sponsored by the local chapter of the Sierra Club and gathered by an individual other than myself. What is really upsetting is that the E.P.A. and our Water Quality Board might have requested another different laboratory to falsify its results. This possibility really points to a level of corruption in government that is extremely frightening to us fragile human beings in an era of chemical revolution.

Around February 3, 2000 I suited up with a respirator and sifted sludge that I had removed from the ditch bottom and that had been air drying since 1997-98—a dusty operation. I took the slightly larger particles, many identical in size, such as silver specks as well as pieces of what appeared to be steel wool, except that when you pinched it flat between two fingers it would hold its shape as lead would. I diluted this dust with distilled water so that I had one-half solids and one-half water. After it settled six months later, I poured the water (i.e., clear) half into another, different clean sample bottle that contained HNO3, the preservative used for most metals. Upon getting this tested, it contained 318.0 mg/L of aluminum, 3.7 mg/L of copper, 55.0 mg/L of potassium, and another sample of the same water that was not preserved contained 260.0 mg/L of bromate. Similar material gathered here previously contained 240.0 mg/L of potassium and 23.0 mg/L of lead. This gelatinous substance was gathered wet, half semi-solid and half water, and it was placed into a container that was preserved with nitric acid, then the liquid portion was tested. 480 mg/L of potassium bromate was found, which is 960,000 times the safe drinking-water level.

Maximum Contaminant Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call for Water Sanity! Monitoring Group

P.S. also See Bacterial Mania and the Appendix A1

Mid-Ditch Summary

I first moved to Grass Valley in 1991 to spend some time near my parents, who had lived there for almost 20 years. They had a house up on the end of a gravel road with an irrigation ditch in their backyard. There were a lot of older retired people in their neighborhood whom they knew and with whom they were friends. Everybody would walk for exercise on the ditch bank and would always stop and talk. By the time I moved there, however, things were starting to change. My father's best friend, a retired engineer, told me that something was really wrong, and that more than fifty-percent of their older friends had all contracted the same types of cancers and had died. Tom, the retired engineer, and I sat down and made a list of all the people who had passed on and what was their home-use source of water. The few survivors were either new to the neighborhood or they used well water in their homes, not agricultural-use ditch water. Also, there was a higher percentage of women who were surviving compared to men. Of course people get old and die, but not usually of the same types of cancers.

Slowly my own father started to lose his mental capacity and, being a retired metallurgist and a very bright person, this was immediately noticeable. I began to notice strange-looking foam on the ditch water's surface as well as in their home-use water-storage tank. Being a plumber, I became curious and sent some to a laboratory. The lab took a long time to finally send me the results. The water's surface and the silt in the tank's bottom was loaded with toxic metals. Upon investigating further, I realized that the irrigation ditch was the same way in certain places, but that in other areas, due to chemistry and physics, the levels of toxic elements were much higher than others.

Upon hiking upstream I could see that there was definitely a problem with the water in the upper watershed. There was a water plant and an old reservoir into which the water plant was dumping toxins for more than 23 years. Also, the irrigation ditch was regularly dosed every winter when the ditch-water flow was reduced and more was seeped into the waterway. High levels of carcinogenic metals, water-treatment by-products, and other chemicals and high levels of sodium were regular additions to the little irrigation ditch.

I went to the water purveyor, Nevada Irrigation District (N.I.D.), but their officials lied to me. One weekend a large quantity of mercury was hosed onto the ditch's surface via the compounding of the mercury with sulfate.

My mother installed a well in the hope of getting better and more reliable water. At first the water was good, but some of my friends from our local Sierra Club chapter and I discovered that the water plant was—and is still—injecting undesirable elements into the water table. Again, we were lied to both by the county and N.I.D. about this. Springs nearby were polluted, and I discovered that the county airpark, located adjacent to the N.I.D.'s water-treatment plant, has been and is still a quagmire of toxic substances because a few large reservoirs had been filled in with mine tailings in order to build the airpark. The county, which now operates the airpark, also has built a deep-injection system to try desperately to hide the fact that they have a very serious health-harmful situation at the county's airpark at 3,200 ft. elevation, above most of the county's residential wells. The whole reservoir-filled area drained into the irrigation ditch from 1972 to 1996, and now the old reservoir still does. In 1997 the county realized that the old reservoir was what was causing the embarrassing display of color seepages that were occurring in residential properties down-gradient from the old reservoir. All of a sudden the valve at the bottom of the old Yuba reservoir was broken. I went down there to discover that it had been hacksawed!

On Banner Lava Cap, above the airpark, there was a volcano thousands of years ago. The lava flowed down the mountain to form rivers of lava rock. Now these cooled layers of lava are about 20 ft. deep at the treatment plant, yet by the time they get down to my

parent's neighborhood, it is 250 to 300 ft. deep to the lava layer. Water wells there, including my mother's, receive their water from this porous layer of rock. Up the hill at the treatment plant, the lava is like a sponge receiving the treatment effluent and the airpark-tailing seepages down-gradient. Very little is filtered out by this porous lava rock. At the last sampling of my mom's 300 ft.-deep well, it contained 880 times the safe drinking-water level of KBR^{03}—the water-treatment by-product—and 4 1/2 times the safe-drinking water level of arsenic. For years the tailing-filled reservoirs have leaked and drained into the irrigation ditch, which is cement-lined up there near the plant and is a steeper gradient so that nothing settles there until it gets down to my parent's neighborhood, where the ditch slows and releases its sediments.

For perhaps 50 years the sediments from this ditch have been removed and deposited on the downhill side of the ditch. This metallic-laden sludge has accumulated there, and the ditch water and rain water migrates the water-soluble toxins into the ground water, the well water, and the spring water, and the rains erode it into peoples' yards. The wind blows the fine-powdered tailings into the air and into the lungs of joggers and hikers. These health-harmful substances concentrate in some areas more than others, but the mid-ditch site is definitely one of the areas of concentration. To understand and to educate ourselves about these issues will help us understand and help us deal with the penny-pinchers who dump upstream and who try to weasel their way out of the responsibility of their actions. It has become obvious that a lawsuit is the only thing that these people will understand, and the mid-ditch site is probably the best place to begin. Perhaps after they spend a quarter-million dollars or so cleaning up this area they will understand that a temporary chemical fix is just that, and if they choose that method of cleanup all the time, then sooner or later they will have to pay.

I deeply regret that we rate-payers and tax-payers are the ones in the end who have to pay for repairing the damage done by these local officials displaying an obstinate attitude and low intellect. People have a right to live in a location without having toxics dumped into their yards and water. In conclusion, it is only by making an example of the stubborn wrongdoing by these elected officials that the public will become aware that these individuals should not be re-elected, and that their attitudes and ways of dealing with our water and waterways have actually caused our rates to climb outlandishly. Hopefully we will elect candidates for N.I.D. directors and county supervisors who will figure out that going into the hospital costs us and our county a lot more, and these costs should be included in the formula as far as estimating the cheapest scenario of dealing with these treatment undesirables.

-Will Doleman—A Call for Water Sanity! Monitoring Group

P.S. also see CH. 10 Bacterial Mania and CH 9 and A1

Several very important discoveries have been made by our monitoring group in the last six years. A foaming substance on the agricultural-ditch water is laden with heavy metals. This foam is being caused by the accumulation and concentration of a clear scum upon the water's surface. The scum seems to originate from a semi-solid gelatinous material at the ditch's bottom. The gelatinous substance is acidic, while the surface-scum foam is alkaline.

We believe that anaerobic bacteriologic oxidation is accruing as bubbles form in the gelatinous substance and rise to the water's surface forming the silverish semi-clear surface scum that, when concentrated on a surface snag or in an eddy, becomes a bacterial swarm of total coliform. To the extent that this substance contains sewage, this coliform-foaming substance appears. The coliform detected as total is suspected to be feeding on heavy metals including potassium permanganate, which is in actuality potassium and manganese bound with oxygen. As demonstrated in the air filter, the heavy metals are present in the air 15 ft. away from the ditch-water's edge. The same heavy metals that were found in the foam were found caught on the surface of the air filter. Bacteria moves from the water's surface on tiny water droplets caused by evaporation. This bacteria feeds on heavy metal in the foam.

It is believed that potassium in the water-treatment process used in the water-treatment process upstream is present with manganese, which is in the sludge material that was dumped into the old Yuba reservoir for 24 years. This sludge and leachings from this sludge now move freely in the rainy season into the Chicago Park ditch, which has been designated as a public-water supply by the Safe Drinking Water Act enacted in August of 1998. This water is used in more than 600 homes downstream. Apparently this bacteria got sucked onto the air-filter cartridge. These bacteria are fed by iron and aluminum, which cause a bacterial population explosion. Oftentimes just by providing food or desirable living conditions to bacteria, which performs a desirable action, is a way, in a chemical-manipulator's opinion, that a manipulator can accomplish their manipulation goals.

As the heavy-metal toxic slurry comes down off Loma Rica Drive into a siphon pipe, it drops sharply down the hill to a residential area located at the end of Glenn Pines Road and enters another siphon at Liquid Amber Road. The potassium and manganese is compressed with air that sharply increases the dissolved oxygen in the water at this point due to the siphon. So as the heavy-metal toxic slurry enters this section of the Chicago Park Rattlesnake ditch, designated by us as Mid-ditch, it slows for its first time since its conception. Both settling of the heavy metal-laden water and the oxidation of these metals via bacteria occurs as the water slows here. We believe that the bacterial swarm is a part of this potassium-permanganate oxidation process that is oxidizing these heavy metals to the air. Being accelerated by their interrelation with iron and aluminum, which is bacteria super food.

1.4 mg/L of potassium permanganate was also found as the water leaves the old Yuba reservoir sludge dump and enters the ditch near the Nevada County Airpark. We were told by Les Nicolson, an employee of N.I.D., that they were using a chemical substance in the Loma Rica Water Treatment Plan's discard pond that causes oxidation of heavy metals into the air. It appears this chemical may be potassium permanganate, and it appears as well it may be present and leaking out of N.I.D.'s 24-year-old sludge dump into the old Yuba reservoir.

The presence of such a high level of total coliform bacteria reflects that the sludge contains both a high percentage of heavy metals and rotting organic material that is tending to nourish the total coliform into a dense population. The next step might be to do more analysis on potassium permanganate and a bacterial count on the air-filter cartridge at the Mid-ditch site to determine more conclusively the chemical reaction and to scientifically show if the heavy metals are being atmospherically dispersed by bacterial carriers or by actual evaporation or a combination of the two.

I write this in the hope to spark an interest in this matter so that this project might possibly either be managed or financed by someone else who would enhance its credibility as a scientific-research venture. After all, I have spent a small fortune to get the research work

this far. My fear is that the chemical manipulators who work at N.I.D. might catch wind of this and use yet more chemicals to further complicate the remediation of the Mid-ditch area as well as further poisoning its residents.

Recently the federal geological-survey team did a study on how the metal mercury was becoming bio-available to fish and how it was poisoning them, then us. The discovery of bacterial mania, which is accruing as well at numerous sites throughout the county, is very similar in relationship to how methanization is making mercury available to fish. Bacterial swarms are making harmful metals available to us for absorption and are also causing various diseases from one biological organism to another, including human. Mining, water-plant and sewage wastes are all food for bacteria, which make these toxins available through the air we breath in its humidity and dust.

Since many of these bacterial organisms feed on heavy metals and aluminum and they are able to catch a ride on droplets of moisture that occurs during evaporation on fog or on dust when the wind should blow, then heavy metals as well are being transmitted to us in a form where it might enter our bloodstream directly via these blood-born pathogens.

Let me leave the world of fact for just a minute and talk about some theoretical possibilities. Some of the people who died in the Mid-ditch area died possibly of Alzheimer's disease. It's difficult to say for sure since there isn't a positive diagnosis for the disease. Most persons with Alzheimer's have a high level of aluminum in their blood and so probably in their brain as well. So what happens when a bacteria that loves aluminum enters the blood? Could it be that dementia is caused by a blood-born pathogen?

This pathway of disease reception is so totally hideous yet is so evasive from discovery, because it allows the transmission of so many different varieties of cancers and other diseases that a large cluster is not likely. I ask you: Are we now moving into an era of non-value for life, both animal and human? Let me ask this of you: If there is no longer any value in life, then where can value be found?

-Will Doleman—A Call for Water Sanity! Monitoring Group

CH 2

The Old Yuba Reservoir and Its Drain's Pre-Ditch Puddle ("P.D.P.")

Water Sampler's Narrative

The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are listed at the end. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

In mid-1995, I walked around upstream on the Chicago Park Rattlesnake Ditch both for exercise and for the purpose of surveying the watershed, which at the time my mother and father were using in their home out of the ditch. I saw a lot of weird things in the area of: the old reservoir, the Nevada Irrigation District ("N.I.D.") sludge-dump site, and the old reservoir's drainage P.D.P. I have done a fair amount of hiking in the Sierra Nevada range, and I had never seen colored seepages, scum, and gelatinous material quite like this anywhere else.

Since it was obviously a problem with the water-treatment plant, the first place I went to was N.I.D. Their officials lied to me and hosed down the toxics into the ditch. Every time they found out that I discovered something somewhere, they did a quick temporary cover-up and have never to my knowledge changed their procedures except for what has been required by the state-regulatory agencies, which are also very lax. No, I don't think it's fair to me that I should have to spend my own private funds in order to regulate N.I.D., while the E.P.A. fat-cats and the Regional Water Quality Resources Board simply refuse to come out and do their jobs. I feel that checks and balances are really important with regards to regulating the handling of these water-treatment plant concentrated waste products. So I have proceeded now for nearly six years to sample and provide this water-quality data.

November 10, 1995 I gathered a sludge sample off the bottom of the old Yuba reservoir that contained 1,700 mg/kg of aluminum, 5.0 mg/kg of arsenic, 20.0 mg/kg of barium, .3 mg/kg of mercury, and 5.4 mg/kg of vanadium. The mg/kg listing is a measurement of soil, and in this area down-gradient and alongside of and in the immediate downstream watershed of the N.I.D. sludge-dump site, these figures reflect basically what exists there rather than incredibly harmful levels. If I had known then what I now know, I would have sampled the lime-green gelatin 15 ft. away.

Samples of water out of the bottom of the old reservoir contained constituents reported in mg/L, as follows: 4.5 of barium, .4 of chromium, and .6 of lead.

January 26, 1996 A surface-water sample was taken as the water leaves the old reservoir and goes into the ditch. Again, in mg/L, this silver scum contained 4.2 of aluminum, and .1 of mercury. There was no copper detected here at the water's surface.

During this same sampling, a sample of one-square-foot of a very light gelatinous substance was carefully removed from directly below the sulfated floating mercury and placed into a sample bottle with about fifty-percent water and fifty-percent of a semi-solid gelatin (alum). Again, in mg/L, the levels were: 1.0 of arsenic, 5.2 of barium, .08 of cadmium, .6 of chromium, .9 of cobalt, 1.2 of copper, 1.9 of lead, .005 of mercury, .4 of nickel, 2.1 of vanadium, 3.4 of zinc, and 800 mg/L of aluminum as well. The clear water ph here was 6.5 and about ph 5 for the gelatinous substance (alum).

April 5, 1996 I sampled clear water as it dropped out of the drainpipe from the old reservoir and discovered incredible levels of coliform and e. coli bacteria there.

December 14, 1996 Again at P.D.P., a foaming substance was found, yielding 3.0 mg/L of potassium. At this time, I did not know about the bromate, which when combined with this substance turns the otherwise harmless potassium into a carcinogen.

May 26, 1997 .44 mg/L of aluminum on the water's surface was found again leaving the old reservoir for the ditch (P.D.P.).

December 21, 1997 At the P.D.P. water's surface was found 2.5 mg/L of sulfate, .06 mg/L of lead, 2.6 mg/L of manganese, .0009 mg/L of mercury, and .2 mg/L of vanadium.

January 5, 1998 I found my first potassium bromate downstream in identical-looking foam. It was at the mid-ditch site. (See the Potassium Bromate survey for potassium bromate found in the old reservoir and at the P.D.P areas.)

December 2, 1998 At P.D.P., I skimmed the water's surface to find 1.7 mg/L of aluminum, 1.28 mg/L of potassium, and .32 mg/L of manganese.

December 22, 1998 Three weeks later, I again skimmed the surface for a clean-foam sample containing 2.5 mg/L of sulfate, .06 mg/L of lead, .0009 mg/L of mercury, and .2 .mg/L of vanadium.

According to the Regional Water Quality Resources Board's previous area engineer, both the Nevada County Airpark Authority, which owns the land, and N.I.D. were dumping substances into this area, so that to determine which entity did what dumping would be difficult to ascertain.

Maximum Contaminant Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call For Water Sanity! Monitoring Group

The Old Yuba Reservoir and Its Pre-Ditch Puddle Site Summary

You can see much material that is definitely not an ingredient to good health down at the Mid-Ditch site, so a person wonders, where is it coming from? Samples taken at the new reservoir just uphill from the old Yuba reservoir did not indicate it was the source of the problem as far as aluminum or bromate were concerned, so since bromate and aluminum are water-treatment by-products, it would seem logical that somehow these high levels of metals are coming at least in part from the Loma Rica Water Treatment Plant, which is located slightly downhill from the new reservoir and adjacent to the old reservoir. In actuality, the Loma Rica plant has more than one way of injecting its waste products into the surrounding area, and we will discuss some of these areas that have received the most documentation:
1) The Greenstream deep-injection trench that passes the unwanted backwash water directly into the water table;
2) The landfill that has been dumped from the plant's backwash pond into the old reservoir from 1972 through 1996;
3) The dump trenches, which Larry Parkinson—the now-retired Fish and Game official—told me about that are located on the banks of the east fork of Little Greenhorn Creek;
4) The green and silver streams that pass liquid metals directly from the plant into the Chicago Park Rattlesnake irrigation ditch;
5) The 8" asbestos cement pipe (now P.V.C.) that comes out from under the plant's fence and dumps directly into the ditch;
6) The new backwash-pond sludge pile directly on top of the east fork of Little Greenhorn Creek's uppermost drainage (since 1996);
7) The old Yuba reservoir's pre-ditch puddle that passes materials from the landfill at the Nevada County Airpark via the old reservoir out its drain into the very bottom of the reservoir and into the puddle, then directly into the ditch. This puddle also receives wastes from the N.I.D. landfill, referenced in #2 above.

The entire airpark area is also filled with tailings that were deposited there many years ago from nearby mines in order to make the original airpark that was at that time owned by the mining company. In mid-1996, toxics were removed from the Department of Transportation's yard adjacent to the airpark that were then mixed with soil that had been scraped off the middle of the runway during the airpark remodeling in the summer of 1996. The existing runway was actually shaped like a gently sloping hill and was 10' higher in the middle, so all the pavement was removed and the center 10' of soil depth was removed from where the runway was covering it. It was scraped, as mentioned before, and it was shaded with toxic waste from the Department of Transportation's yard and dumped into the old Yuba reservoir in order to lengthen the runway. This incident was referred to as "The Whistle Blower's Incident," as the residents along the runway edge forced the county of Nevada to spend more than $135,000 to haul away all of this newly deposited fill, as it was saturated with diesel fuel, oil, mercury, arsenic, and lead.

So where did the arsenic originate? This constituent is not a Department of Transportation by-product. Because of the arsenated tailings having been covered with pavement for many years under the original airpark runway, they had never been soaked by rains and were still loaded with mining waste-products. Once they were removed and redeposited at the ends of the runway outside of the paved areas, they would then be hit by rain for the first time since they were brought up there in the early- to mid-1900s. Nowadays this arsenic is leaching out of this soil and leaching down the surface, through to the subsurface, and finally now into the deep aquifers located below 3,200' in elevation. During the Whistle Blower's Incident, it is very likely that the state-regulatory agencies knew

all about this problem, but since they did not wish to open a can of worms they have kept it quiet. Instead there has been a deluge of chemicals deposited in the watershed to supposedly remedy the situation.

White foam from N.I.D.'s landfill, which is high in potassium bromate according to Columbia Inspection Laboratory, drains out the bottom of the old reservoir and into the ditch, along with other undesirable effluents such as coliform bacteria and heavy metals. On the other hand tailing constituents, largely arsenic, leach off the newly deposited tailings into the bottom of the Yuba Reservoir as well.

In late 1996, after the Whistle Blower's Incident, the old reservoir was full of alum, a gelatin-like substance that was stocked with undesirable constituents that have been removed from the water-treatment process at the nearby Loma Rica water-treatment facility. The rains were imminent, and I had discussed the problem with Caren Gozzi, the then-lead person with Nevada County Environmental Health two weeks previously, and although she admitted there was seven to eight or more semi-tanker loads of alum there, nothing had been done and no one would return my calls regarding this matter. So I phoned KXTV (channel 10), Sacramento's ABC-TV affiliate. Although they would not come out to cover this story, they phoned N.I.D. Soon after this, the alum disappeared from the bottom of the old reservoir. There was newly deposited alum in the old-reservoir pre-ditch puddle, and water leaked on the ground at N.I.D.'s front gate, as if a tank truck that had been filled inside the plant from the large storage tank had been stopped there momentarily to leak as the driver locked the gate.

My guess is that the tanker truck convoyed out toward a part of the dam near the drain valve. Could it be that someone broke into the water plant, filled up a tanker truck full of water, and as they relocked the gate, water leaked from the tanker? Could they then have driven to the old reservoir, drain and hosed all the massive amounts of alum down into the pre-ditch puddle and then into the Chicago Park Rattlesnake ditch all without the county and N.I.D. knowing about it?

It was immediately after this that I tested a silver-floating substance at the pre-ditch puddle and found incredibly high levels of mercury. The indication was that an astronomical amount of mercury had combined with the sulfate from the aluminum sulfate that I had both previously and on this occasion documented as existing there. Since sulfate is easily aerated, it appears that close to 1,600 p.p.m. of mercury sulfate floated down the irrigation ditch during this two-week period. .002 p.p.m. of mercury is the maximum-contaminant level (M.C.L.) for drinking water. This water is used almost exclusively in more than 600 homes downstream from here during the time of year that this hosing incident occurred.

In summer 2000, the foam at the ditch at the Mid-Ditch site had increased in lead content by 100-percent. Upon going upstream to the pre-ditch puddle, I encountered loads of colored seeps. I had tested these colored seeps before and struck out. Now, since I had been reading about cyanide and other chemicals that are used to separate metals from the water, I had decided to examine things a little further. With some new rubber knee boots I had purchased, I was able to examine a black gelatin that filled the puddle and was surrounded by the seeps. I took a sample or two of this. It was distinctly different than soil, as it was very smooth in consistency and it jiggled like gelatin. So what I found was the toxic chemical potassium permanganate. Potassium permanganate is a chemical used by water-treatment plants as an oxidizer. I also found coliform, and other undesirable substances here. The process of oxidation passes metals or possibly other substances into gaseous form. Whether or not these substances remain whole and continue to be harmful is a subject of debate.

The bio-engineers working for N.I.D. and the county perhaps have gelatinized these toxins and allowed them to go into the ditch. The gelatin contained 6,000 mg/L of aluminum, 15 p.p.m. of arsenic, 1.4 p.p.m. of potassium permanganate, 17.6 p.p.m. of

lead, 10.0 p.p.m. of copper, along with very high levels of vanadium, zinc, barium, manganese, potassium, sodium, and mercury. This sludge eventually dissolves into the water so it should therefore be compared with agricultural-use M.C.L.s, and since it is used in more than 600 homes downstream, these levels should be regulated by drinking-water criteria. After I spent more than $2,000 phoning various agencies in Sacramento and encountering one cover-up after another and continued hosings of toxics into the waterway, I concluded that it is a waste of time trying to get any official agency to address this problem. The only alternative is to rouse public opinion in order to pressure N.I.D. and the county to deal with this pollution, or else file a lawsuit. Unless it hits their pocketbooks, they simply don't care. This is the sad truth of the matter.

In the spring of 2000, I discovered that the valve at the bottom of the old reservoir had been hacksawed so that it would no longer close. I believe this was due to my video, *The Headwaters of the East Fork of Little Greenhorn Creek*. I documented that this material was coming out of the ground as a spring directly below the bottom of the old reservoir. Bromate and heavy metals were also permeating the shallow aquifers because of this.

A good friend looked at a photo I had taken of some funny-looking bubbles at the puddle there from the old reservoir. She asked me what I saw. I said, "Bubbles." But she pointed out a woman with hair curlers in her hair. I never really thought anything about it until one day I received a package of court cases from an attorney that pertained to potassium bromate. The substance is used to make permanent hair-curler solution. There are various court cases about how the substance had passed through latex gloves that came with the curler solution, and how this carcinogen was absorbed through the skin. These women were permanently disfigured! It then struck me what my friend had mentioned about the bubbles that resemble a woman in curlers there as the water and sludge entered the agricultural ditch.

Later I was saddened when I heard that my friend, who used ditch water in her home, had contracted a rare stomach cancer and had herself passed on. Incidents such as this are often difficult to explain to another person, but when you're surrounded with cancers, illness, and death, you know there is a serious problem. It may even be possible that those who have died want to help stop this insanity and inspire those that can help. So I and others in our group continue to wage a campaign of truth against a huge faceless utility with no conscience to try and stop the useless slaughter of all that lives downstream.

-A Call For Water Sanity! Monitoring Group

B.S.K. Laboratory Fresno

O.R.- Pdp. site

Case Number : Ch960252
Lab ID Number : 0252-2
Project Number : None
Sample Description: Puddle. Pre-ditch from bottom of old res.

Date Sampled : 01/26/96
Time Sampled : NA
Date Received : 01/29/96
Report Issue Date: 02/01/96

Analyses for Selected Inorganic Constituents

Method No.	Analyte Sample Type: LIQUID	Results	Units	DLR
EPA 6010	Aluminum (Al).....	4.2	mg/L	0.1
EPA 7061	Arsenic (As).....	ND	mg/L	0.02
EPA 6010	Barium (Ba).....	ND	mg/L	0.1
EPA 6010	Chromium, Total (Cr).....	ND	mg/L	0.1
EPA 6010	Copper (Cu).....	ND	mg/L	0.1
EPA 6010	Lead (Pb).....	ND	mg/L	0.1
EPA 7470	Mercury (Hg).....	0.1	mg/L	0.01
EPA 6010	Vanadium (V).....	ND	mg/L	0.02

Will Doleman

A Call for Water Sanity! Monitoring Group

About the Mercury Sulfate

Top report is off the water's surface. This surface scum is 50 times the safe level for drinking water. Floating is due to aluminum sulfate having been dumped into this locale.

Water off of sludge

Method No.	Constituent	Results	DLR
EPA 6010	Antimony (Sb).....	ND	2
EPA 7061	Arsenic (As).....	1.0	0.1
EPA 6010	Barium (Ba).....	5.2	0.1
EPA 6010	Beryllium (Be).....	ND	0.02
EPA 6010	Cadmium (Cd).....	0.06	0.02
EPA 6010	Chromium (Cr).....	0.6	0.1
EPA 6010	Cobalt (Co).....	0.9	0.1
EPA 6010	Copper (Cu).....	1.2	0.1
EPA 6010	Lead (Pb).....	1.9	0.1
EPA 7470	Mercury (Hg).....	0.005	0.001
EPA 6010	Molybdenum (Mo).....	ND	0.1
EPA 6010	Nickel (Ni).....	0.4	0.1
EPA 7741	Selenium (Se).....	ND	0.02
EPA 6010	Silver (Ag).....	ND	0.02
EPA 6010	Thallium (Tl).....	ND	2
EPA 6010	Vanadium (V).....	2.1	0.02
EPA 6010	Zinc (Zn).....	3.4	0.1
EPA 6010	Aluminum (Al).....	800	0.1

CH 3

The Green Stream Ravine and Area Down-Gradient from the Loma Rica Water-Treatment Plant

Sample Collector's Narrative

The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are listed at the end. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

October 21, 1995 A gelatinous material comprised of about 50-percent water as it leaves a chain- drain pipe that surrounds the flocculation pond and comes out from under the Loma Rica Water Treatment Plant's fence to discharge into the Chicago Park Rattlesnake Ditch contained 880 p.p.m. of aluminum and 2.4 p.p.m. of barium. Later, the bromate survey was performed, showing that large quantities of this water-treatment by-product were being discarded here as well.

November 6, 1995 Again at the Green Stream Ravine, which is the portion of the stream that flows most directly to the Chicago Park Rattlesnake Ditch. This waterway is what earned the little stream its name. A bright-green color was seen on an orange alum background. I was told by a professional Nevada Irrigation Ditch employee that this bright-green color usually means a high level of aluminum. Indeed, 820 mg/L of aluminum was found in this gelatinous substance.

November 11, 1995 A puddle at the bottom of the Green Stream Ravine was tested and contained 3.0 mg/L of manmade hydrocarbon oil and grease on its surface. From here on we will be referring to this puddle as the silver puddle, as it's the puddle that makes up the silver stream as the Green Stream Ravine swamp area overflows into the Chicago Park Rattlesnake Ditch.

January 8, 1996 A silver-gelatinous substance was collected off the cement-ditch bank with a qualified collection device. 4.0 mg/L of lead was found. Wow! This is very high. This area is known as the silver stream.

February 2, 1996 Back at the silver-stream's surface, .0003 mg/L of mercury was found. Although this is only one-seventh the M.C.L. level for safe D.W., it's an amazing scientific phenomenon to find mercury, a very heavy metal, floating on the water's surface.

February 5, 1996 The water here was sampled from groundwater directly below the water plant. 4,590 mg/L of aluminum was found in this water sample taken from the bottom of an electrical-conduit box on Loma Rica Drive. Levels of .079 mg/L of lead and 13.3 mg/L of potassium was found here as well. The water-treatment chemical used nearby uphill at the Loma Rica Water Treatment Plant is aluminum sulfate.

March 29, 1996 This sample was taken at the new reservoir's dam weir. This surface scum had 21.0 mg/L of aluminum, .02 mg/L of chromium, and .74 mg/L of vanadium.

This sample was taken at the silver-stream pre-ditch puddle—the silver puddle. 3,500 mg/L of aluminum, 1.5 mg/L of chromium, and .007 mg/L of mercury was found as well in the alum (not soil) at the bottom of the silver puddle.

April 26, 1996 Again at the electrical-conduit box sampled the previous day. 1.1 mg/L of sulfate was found. Although SO4 sulfate is not a toxic substance in itself, it points to the probable origin of the very high levels of aluminum that are detrimental to health. This substance is aluminum sulfate, the water-treatment chemical. A ph sample also taken here shows a very low ph for this area. The ph sample taken at the conduit box was 5.7 ph. Aluminum sulfate is known to have a low ph as well.

June 22, 1996 Off the surface of the silver puddle, a sample was skimmed that showed 1.2 mg/L of chromium. This sample material adhered to the plastic in the water-

sample container, just as it might if it was used in a plastic dishwasher. Six-hundred homes use this water in their homes downstream.

August 12, 1996 From the silver puddle, this sample was taken from the water's surface showing 3,800 mg/L of aluminum and 2.1 mg/L of copper.

August 16, 1996 A sample of the surface at the dam weir box revealed .4 mg/L of copper and 2.0 mg/L of potassium.

September 7, 1996 A leak was found at the Loma Rica Water Treatment Plant's fence by a water purveyor and then investigated by a licensed plumber. This was dug up and exposed as a deep-injection trench by a team of people. Clay was removed from the surface of the large rock drainfield as it left from under the fence and flowed down toward the Green Stream Ravine spring. Levels tested varied from 110,000 mg/kg of aluminum to 130 mg/kg of vanadium. Also found were high levels of lead, barium, chromium, and arsenic in the same order of intensity as found elsewhere downstream.

September 28, 1996 Alum near the silver spring was found at the surface of the water that contained 26,000 mg/L of aluminum and 11.0 mg/L of chromium. This marks this project's record high level for aluminum.

Off the surface of the silver spring, which is located at the head of the Green Stream Ravine but down gradient from the Loma Rica Water Treatment Plant's deep-injection trench. 48.0 mg/L of aluminum was found, down to .07 mg/L of vanadium, again with the same order quantitatively of the different metals.

October 16, 1996 Alum from the bottom of the silver spring three-feet down contained 4.0 mg/L of potassium and 6.0 mg/L of SO4 sulfate here as well.

A sample of foam was gathered from the weir box's surface that contained 640 mg/L of aluminum.

December 14, 1996 This sample was taken from the same sample as the one with 4.0 mg/L of lead. 23.0 mg/L of potassium was found here.

Basically, distilled water is added with one of the same plastic scrubbers used to collect the lead in order to determine that the plastic scrubber used for the lead-sample collection contained no lead. This was conductivity tested in order to qualify the plastic scrubber used to collect the silver-stream bank sample. Very little conductivity was found, thus showing that the plastic scrubber used to collect the high-lead sample had very little conductance and therefore contained no appreciable amount of lead in the scrubber pad itself as it comes from the market.

February 26, 1998 Alum near the silver spring was tested at 160 mg/L of aluminum.

August 18, 1998 An area located in the headwaters of the East Fork of Little Greenhorn Creek right below the water-treatment facility. One observes the same recurring phenomena. High levels of aluminum are followed by high levels of the same metals found coming out from under the plant's fence and seeping out from the plant in many other directions as well. It's interesting that, even though the levels of metals vary some, they are almost always in the same order of intensity in their relationship to each other.

April 14, 1999 The same findings as August 18, 1998 except very high levels of cyanide are detected. Cyanide is used to separate metals from water. To dump a poison such as this into random waterways is definitely frightening. Many people associate cyanide with mining, but cyanide will decompose within a couple of days when exposed to sunlight and aeration in a waterway. Thus, this chemical is not from the old-mining days.

This site really shows the origin of at least part of the lower watershed's water-quality problem due to the indicator of the material origin, the aluminum-potassium sulfate—the water-treatment chemical. Even though this plant is operating by means of a totally unhealthful, unethical disposal system, there is so much corruption between the county and Nevada Irrigation District, which is seeping incredibly high levels of health-harmful substances into the water table, that it seems unlikely that they will do anything except

continue to cover up and pretend that the disposal system does not exist. See the Appendix for my letter ("Tailing Filled Reservoirs Now County Airpark"). Also, my letter to the Department of Health Services details the plight of the ditch-water users downstream. The Bromate Survey also documents the plight of well-owners downstream and properties immediately adjacent to this overtaxed and mismanaged urban sprawl water-treatment plant.

Maximum Contaminant Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.1 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1.0 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call For Water Sanity! Monitoring Group

The Root of the Problem
soft Money Politics

Study: Clean water laws inadequately enforced

6/Vr
6/25/99 Union

The Associated Press

SACRAMENTO — Only a handful of the thousands of water quality violations reported to state officials actually result in fines or other penalties, according to a public advocacy group's study.

The report, released Thursday by the California Public Interest Research Group, was based in part on the records of the state's regional water quality control boards, the agencies that track water quality and punish polluters.

The study focused on Los Angeles and San Diego areas and the San Joaquin Valley and covers 1997 through March 1999. It looked at figures compiled by the Legislature's fiscal analyst and at water quality enforcement and compliance records, which are among documents the state submits regularly to the federal Environmental Protection Agency.

"This report shows that the Clean Water Act is broken," said Dan Jacobson of CalPIRG. He called for "mandatory minimum penalties for serious and repeat violators."

The act is intended to protect water quality, and gives California's nine Regional Water Quality Control Boards authority to ensure clean water and to allocate its use. People unhappy with the regional boards' decisions can appeal the rulings to a statewide board based in Sacramento.

According to the study, there were 6,783 reported violations of the state's Clean Water Act in the three areas. Of those, enforcement actions in some form were taken by the regional boards in 238 cases, or 3.6 percent of the reported violations. Fines were ordered in 44 cases, or 0.6 percent of cases.

The report suggested that the enforcement pattern was similar in other regions of the state.

The violations included discharge and water-quality violations, but the magnitude of the violations was not disclosed, or whether health hazards were involved.

But a spokesperson for the statewide board said enforcement had improved.

Let's cut
State Government
Fat and take
These millions of
Dollars from this
Agency yearly
And give it to some
Of the existing 900
Volunteer water
Monitoring groups
In California
In the form
Of Grants for
Testing and
Litigation of
Offenders.

The Green Stream Ravine and Area Down-Gradient from the Loma Rica Water Treatment Plant

Sampler's Narrative Summary

Incredible record-breaking levels of aluminum and chromium in alum water were found at the base of the treatment plant's large rock drainfield, which emerges out from under their fence from their undesirable discard pond. Aluminum and chromium are both known to be high in settling ponds of this nature.

Water-treatment constituents were found at the water's surface in the deep-injection trench as the water visually enters from the backwash pond. Other health-harmful metals were found here at the water-treatment plant's fence as well.

The swampy area below reflects the same types of water-treatment chemical and metals as found above. Nevada Irrigation District (N.I.D.) is told about the problem, so soon after, regular doses of rusty iron are applied to temporarily cover-up the surface visual (i.e., colored seeps). Incredible levels of lead, bromate, and potassium pour in from the area into the Chicago Park Rattlesnake Ditch. The shallow water-table reflects incredible levels of constituents of the water-treatment chemical and substances known to the state of California to cause cancer.

A plant that treats the water for use below in the Brunswick Basin area is treating three to four or more times the water that it is designed to filter, and it has developed serious problems with the disposal of unwanted effluent. The state and regulatory agencies are constantly put off by N.I.D. with the phrase, "We are building another plant, and it will be completed in 2002 or 2003." The plant's previous water-treatment operator told me, "We can't recycle the water from the backwash pond back into the system because it will contaminate the treated water. This backwash pond is a good one because the water goes into the ground here rapidly."

So, are we to believe that our wells below must be contaminated in order to accommodate a water municipality that presently holds a $42 million surplus of funds? Pesticides, chlorine, liquid metals, and a variety of other chemicals are being put into our water because it's the quickest, cheapest, and easiest way for N.I.D. to deal with it.

If any of us dump or seep something into our neighbor's water that is harmful to them, then we are held accountable. If the county or the municipality does this on our publicly owned properties, we can't even gain permission to enter and research the matter. If we manage to get them into court, we still can't hold the individuals accomplishing the wrongdoing personally responsible. Even if we win in court, the fines will be minimal because the county judge is not going to severely fine the entity that pays his or her paycheck, are they? The statute of limitations on filing a lawsuit is 16 times shorter against a public entity than it is for an individual, thus making any lawsuit difficult. Even if you win against the public agency, the fine will come out of your tax dollars. History has shown that the individuals responsible for the dumping will go unpunished, and their employment record will probably remain unblemished. Sometimes it takes public education followed by public rage as well as a lot of patience to change things in our government.

-A Call For Water Sanity! Monitoring Group

The root of the problem
Soft Money Politics

Ask your senator to Repeal S.B. 649! To Stop chemical ↓ compounding of Metals

Polluted Water Coming Your Way?

From "Bonanza", The Sacramento based Sierra Club newspaper. Summer 1996

A bill that dramatically weakens the enforcement of a tried and true water pollution law will be making a second run at passage in the State Assembly this month. Backed by major oil companies and other business interests, S.B. 649 amends section 5650 of the Fish and Game code, which regulates dumping pollutants into state waters. For over 100 years the law has made it a crime to place pollutants, such as oil or chemical waste, into areas where they may discharge into state waters. This law has served as an effective deterrent to careless handling of waste and provided citizens with some recourse should pollution occur.

S.B.649s amendments to section 5650 raise the burden of proof that prosecutors must meet to a level that would make it impractical for many district attorneys to enforce the law even when they know about the violations. Currently, polluters who introduce substances harmful to fish plant and bird life in state waters are strictly liable for their actions. S.B 649 replaces this clear and proven standard with a nebulous array of hurdles designed to deter enforcement. Prosecutors would be required to demonstrate that the offender "knew or should have known" that the discharge would cause damage and "significant harm" resulted. These standards would be difficult to prove and would delay any enforcement until after.

The bill also adds and exemption for discharges that are permitted or authorized by sate or regional water quality boards or public water treatment facilities. However, discharges that would be immune from section 5650 under this provision, such as releases from water treatment plants, are a significant source of pollution with a major impact on environment and public health.

The defeat of S.B. 649 was among our highest priorities last summer. In the face of widespread opposition from law enforcement, fisheries and environmental groups, as well as the media, the bill narrowly failed in the Assembly's Water, Parks and Wildlife committee last July. However, the bills author, Senator Jim Costa(D-fresno) sought reconsideration for the bill, which is scheduled for another hearing on June 4.

Unfortunately, the committee is now dominated by legislators not ordinarily sympathetic to our causes. Intense public pressure gained us some unexpected "NO" votes last year, and we will need to double our effort to derail this terrible bill.

WHAT YOU CAN DO: Contact your assembly member and urge him or her to vote no on S.B. 649. also consider writing a letter to the editor of you local newspaper conveying your opposition of S.B. 649. **S.B. 649 passed last year must be repealed!**

The Headwaters of the East Fork of Little Greenhorn Creek

Sample Collector's Narrative

This creek starts on Nevada Irrigation District (N.I.D.) property. Other tributaries are from the weir box, Loma Rica Drive easement, and Greenhorn Springs private properties to the southwest of Loma Rica Drive.

The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are listed at the end. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

On February 5, 1996, a sample was taken out of an electrical conduit box that lay downhill from the Loma Rica Water Treatment Plant at the Loma Rica Drive easement on the treatment plant's side of the road. This was a clean water sample. The level for aluminum was at the level of 4,590.0 mg/L here. It was originally suspected of receiving wastes from the unlined water-treatment plant's backwash pond, because it continued to have color seepages discharging from it at a time when the new reservoir, the only other water body uphill, was drained. This finding set the stage for inspection of the springs across the road as well, which also run into the east fork of Little Greenhorn Creek.

On March 6, 1996, a gelatinous material, believed to be alum (i.e., aluminum sulfate waste), was tested for aluminum at one of the headwater springs. It contained 32.5 mg/L of aluminum. Five mg/L is the maximum contaminant level (M.C.L.) for agricultural-use water.

On April 4, 1996, another spring tested at 68.9 mg/L. From the water's surface at the weir box, the aluminum tested at .1 mg/L on April 10, 1996. On April 15, 1996, another surface sample was taken at another spring that had a level of .1 mg/L of copper, and on September 7, 1996, .1 mg/L of chromium was also found here as well. The recommended M.C.L. for agricultural-use water is .2 for copper and .1 for chromium VI.

On April 4, 1996, 91.2 mg/L of aluminum was found at one of the springs at the water's surface. A clear, debris-free sample was taken. Along with that, 31.6 mg/L of aluminum was found, as well as .56 mg/L of chromium and .19 mg/L of copper.

On June 11, 1996, more aluminum was sampled at one of these springs, all located down gradient from the water-treatment plant. This aluminum was so thick that it was analyzed with results in milligrams per kilogram (mg/kg), as a soil sample would be. Roughly, 8,100 mg/kg was found, which is 8.1-percent aluminum. The following day a surface sample was taken here at this plant down-gradient spring, and .2 mg/L chromium and .3 mg/L copper were found. A noted chemist who worked 30 years with medical doctors as well as a toxicologist said that these two combined were twice as toxic than they would be if they were separate, milligram per milligram. The safe limit for agricultural use of copper is .2 mg/L and .1 mg/L for chromium VI.

On July 29, 1996, 110.0 mg/L of aluminum was found on the weir box's surface. Aluminum sulfate is used in the water-treatment process. The 16.0 mg/L of sulfate found here is much higher than found in areas up gradient from the plant. The same day, down across Loma Rica Drive at one of the springs, 2.2 mg/L of chromium was sampled in the water. A skimmer baited with iron was placed downstream one mile where the east fork of Little Greenhorn Creek crosses Greenhorn Road, and clear water was tested after it was in position there on the water's surface for two weeks. One-twentieth of the water's surface would pass through this metal compounded by sulfate trap. Clean water from within was tested two weeks later, and it contained 1,500.0 mg/L of aluminum and 2.7 mg/L of copper at Greenhorn Road on September 28, 1996. 1,500.0 mg/L multiplied by 20 equals 30,000 mg/L. This is the amount floating on the surface of Little Greenhorn Creek in a two-week period.

Alum: At one of the springs along Loma Rica Drive, 1.7 mg/L of sulfate and 380.0 p.p.m. of aluminum (the water-treatment chemical) was found. Parts per million (p.p.m.) is equal to the measure of milligrams per liter (mg/L). Thirty-five p.p.m. of sodium (2.0 p.p.m. of sodium is the safe M.C.L. for drinking water, or D.W.) and 1.1 p.p.m. of arsenic (.1 mg/L is the M.C.L. for agricultural use) was also found nearby, as well as 81.0 for barium, .6 for copper, 2,000.0 for manganese, and .8 for vanadium. These samples were collected on January 26, 1999. On March 14, 1999, the weir box again contained 1.6 mg/L of sulfate. Again at the springs on April 14, 1999, potassium was found at 7.2 mg/L, along with 3.9 mg/L of sodium, .5 mg/L of sulfate, 100.0 mg/L of aluminum, 2.3 mg/L of barium, .06 mg/L of chromium, .27 mg/L of copper, as well as .14 mg/L of cyanide was found in water all immediately downstream from the plant.

On March 27, 1999, see my KBRO3 Bromate paper for the incredibly high levels of bromate that were detected here from 150.0 mg/L of bromate to 2.1 mg/L of bromate found downstream near Greenhorn Road. Bromate is, for one thing, a water-treatment by-product, and potassium bromate has a M.C.L. to D.W. of .0005 p.p.m.

There is a house that obtains its in-home use water from the east fork of Little Greenhorn Creek. The previous owner as well as his neighbor downstream died of cancer. The present owner has five children, and they use this water in their home. Once again, even though they only bathe in it, bromate is absorbed through the skin. Both here and off the Chicago Park Rattlesnake ditch, Nevada Irrigation District is targeting the Bear River watershed for delivery of toxic or undesirable sodiumized effluent that they manage for disposal to the creek and down to Rollins Reservoir. It is one of the few watersheds that they are not using for Nevada County irrigation purposes. It leaves their area of jurisdiction readily, and it is already a known conduit of undesirable metals from the Lava Cap Mine Superfund site. So it seems N.I.D. feels this limits their liability for dumping there!

The previous and now retired Fish and Game officer told me that when the plant was remodeled some years back, the fish were dying downstream. Upon his investigation it was found that there has been alum dump trenches installed on the banks of the Little Greenhorn in the vicinity of these springs. It is really hard to see a small creek such as this being dumped into at its conception at 3,000 ft. elevation in the Sierra Nevada mountain range.

Maximum Contaminent Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call for Water Sanity! Monitoring Group

Highlights of the Analytical Survey of The Headwaters of the East Fork of Little Greenhorn Creek 1995 to 2000 and Beyond

March 31, 1996 Chromey day, the day that the springs turned silver, blue, and metallic at their surface was definitely an impressive sight. The 4,590 mg/L of aluminum being found in the shallow water-table just upstream from the springs was also like a finger being pointed at the water-treatment plant as to the metal's origin. The urban-sprawl Brunswick Basin, to which this plant is delivering water to down-gradient, continues to sprawl unchecked, forcing many other services as well to be overtaxed. There are incredible levels of metals present in the orange-alum materials emerging from the plants still in use, deep-injection trenches. The Nevada Irrigation District's constant admission of guilt by its immediate cover-ups, such as digging up dump trenches to temporarily cap them off. Hosing toxic metals into the waterways, cutting the valve in the bottom of the old Yuba Reservoir. Our group spends the money to discover various environmental health problems that N.I.D. is causing by seeping bromate, its water-treatment by-product, into the creek, into the water table, and into neighborhood wells, not to mention the treated water that it is selling.

So, do we get a heartfelt thanks? No! Just a quick, temporary cover-up, a hosing, and/or more "Yellow Boy" concentrated-mining waste, metal-floating chemical soaps, sulfides, sodium hydroxides, potassium pronaganate, and/or a dozen other chemicals dumped into our water instead. It has become obvious to those who live in the neighborhood that you had better be careful about what water you use in your home to safeguard your family's health. Secondly, that you have the choice to move or to stay and fight a municipality that obviously does not care so much about your well, ditch, or water quality as it does about its own bottom line.

You have to duel for your life with a group of attitude-problem Directors who have been re-elected too many times, who are going to do exactly what they want regardless, and who continue to flaunt their financial power to all countywide.

An employee of N.I.D. told us that he would rather see these undesirable water-treatment waste by-products go into Little Greenhorn Creek rather than N.I.D.'s irrigation ditch. So their policy used on this site and the D.S. Ditch site show their intent also to target the Bear River Rollins Reservoir watershed.

-A Call for Water Sanity! Monitoring Group

New research on Effects of Foaming Agents

The Next Big, Bad Thing

New research on an industrial chemical we've all been ignoring

BY MICHAEL A. RIVLIN

WHENEVER SHIPPING LANES ARE dredged, the sediment that comes up must be checked for contamination before being dumped at sea. This job falls to technicians at the Environmental Protection Agency (EPA), who mix small, shrimplike invertebrates called *Ampelisca* into the mud. In New York, it turns out, *Ampelisca* are cannon fodder. None of the mud dredged out of New York Harbor ever makes it to the ocean, because most *Ampelisca* immersed in it die.

Scientists long assumed the organisms were being killed by PCBs (polychlorinated biphenyls), dioxin, or PAHs (polycyclic aromatic hydrocarbons). But early results of a study by Anne McElroy, an aquatic toxicologist at the State University of New York, show that the *Ampelisca* aren't absorbing enough of these substances to kill them. Instead, McElroy theorizes, the culprit may be a class of chemicals called nonylphenols (NPs)—recently found in the harbor in concentrations ten to a hundred times higher than those of the PCBs and PAHs that have attracted more attention.

NPs are lethal at very high levels. But it is the lower levels that are causing concern. McElroy's discoveries are part of a torrent of new research showing that NPs are abundant in aquatic ecosystems and that even at very low concentrations they can cause endocrine-disrupting, estrogenic—"feminizing"—responses in many organisms. Among recent findings:

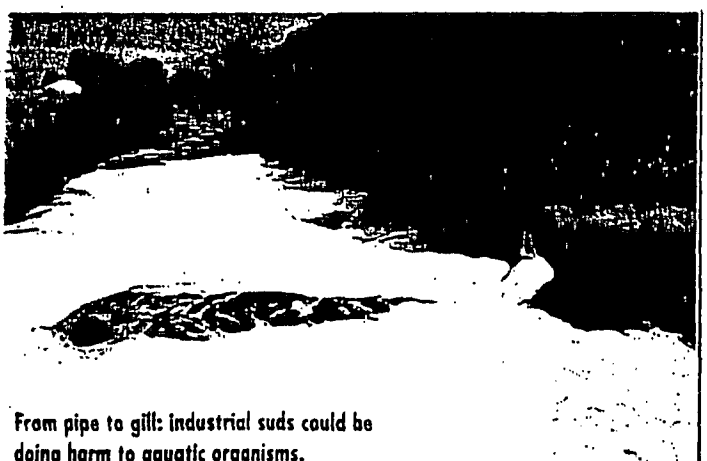
- NPs cause males of several species of fish to produce vitellogenin, a protein made by female fish before egg-yolk formation.
- Male fish exposed to NPs have smaller testicles—as well as ovarian tissue growing in their testicles.
- NPs lead to developmental abnormalities and impaired larval growth in estuarine killifish embryos.
- Atlantic salmon exposed to a pesticide with NPs fail to develop the ability to regulate salt in their blood when leaving freshwater rivers for the open ocean.

Nonylphenols are formed by the breakdown of alkylphenol ethoxylates, chemicals used for more than forty years in industrial detergents, as well as in paints, resins, and protective coatings. The biggest users are the textile, pulp, and paper industries. The chemicals are also in a wide range of consumer products, including cosmetics and plastics.

The European Union is likely to restrict the use of NPs severely. Canada has proposed that the chemicals be considered toxic under the Canadian Environmental Protection Act. The U.S. EPA has drafted water quality criteria for NPs and should finalize them this year. But Peter Howe, a biologist at EPA's Chicago office, where NPs have been studied for several years, questions whether the standard is strong enough. It was drafted, he points out, without taking endocrine disruption into account.

Although people are exposed to a wide variety of products containing NPs, and the scientific jury is still out on health effects in mammals, exposure levels for humans are believed to be too low to do harm. The chemical is primarily a problem for aquatic species, which absorb NPs from polluted water directly through their gills or skin or by eating contaminated sediments or organisms.

But at least one scientist fears that's not the end of the story. Rutgers University researcher Steven J. Eisenreich has found that NP levels are so high in New York Harbor and elsewhere in the Hudson River that they are actually evaporating into the air. Eisenreich concludes that NPs are probably ubiquitous in the atmosphere over urban, industrial, and coastal regions—making them a potential health concern for people who breathe them in.



TOM SIACK/TOM SIACK & ASSOCIATES

From pipe to gill: industrial suds could be doing harm to aquatic organisms.

Observes Tufts University School of Medicine professor Ana Soto, who published a paper in 1991 on the chemicals' estrogenic effects: "If something is bad for fish, probably it's bad for humans as well."

Michael Rivlin is currently working on River of Lies, *a book about PCB contamination in the Hudson River.*

CH 5

The D.S. Ditch

Sample Collector's Narrative—Analytical Data

This particular D.S. Ditch flows from the Loma Rica ditch *past the Empire Gold Mine at Idaho-Maryland and Brunswick roads.* It also flows past the northeast side of the Nevada County airpark. This ditch finally connects with a pump station located on Little Hill Drive. A portion of the water is not pumped but is skimmed from the D.S. Ditch's surface and piped over to the west fork of Little Greenhorn Creek.

The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are as follows. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

The maximum contaminant level (M.C.L.) for drinking water (D.W.) for mercury is .002 mg/L. It is .05 mg/L for arsenic, 1.0 mg.L for aluminum, .5 mg/L for cyanide, .049 mg/L for vanadium, .05 mg/L for lead, 1.0 mg/L for nickel, .05 mg/L for manganese, .05 mg/L for chromium, 1.0 mg/L for barium, and .1 mg/L for copper. The M.C.L. for bromate is .01, and the M.C.L. for potassium bromate is .0005 mg/L. The M.C.L. for surfactants detectable by methyl blue active substance (M.B.A.S.) is .5 mg/L.

The M.C.L.'s for agricultural-use water is as follows: arsenic .1 mg/L, chromium VI .1 mg/L, aluminum 5.0 mg/L, vanadium .1 mg/L, lead 5.0 mg/L, nickel .2 mg/L, manganese .1 mg/L, and copper .1 mg/L. Milligrams per liter (mg/L) is equal to parts per million (p.p.m.). Maximum Contaminant Level is abbreviated as "M.C.L.", and Drinking Water is abbreviated as "D.W."

November 13, 1997 Foam tested on the D.S. Ditch contained .2 p.p.m. of vanadium. On July 6, 1998, foam was sampled and contained .3 p.p.m. of copper, and 2.4 p.p.m. of manganese. On August 18, 1998, foam collected once again contained, in p.p.m., 4.8 potassium, 4.7 sulfate, 160 aluminum, .33 arsenic, 1.6 barium, .1 chromium, .16 copper, 19 manganese, .0048 mercury, and .45 vanadium. This next sample was taken near the Loma Rica Drive crossing. This foam was brown with visible silver specks in it.

November 20, 1997 A foam sample was taken from the D.S. Ditch's surface, and it contained .24 p.p.m. of lead and .0023 p.p.m. of mercury. The white foam that was sampled would turn to black water as it would naturally defoam in the sample bottle. It was this black water that was sent to the laboratory for analysis.

November 25, 1997 A D.S. Ditch sample of foam was collected that contained .031 p.p.m. of cyanide, 14 p.p.m. of sulfate, 78 p.p.m. of aluminum, .1 p.p.m. of arsenic, .58 p.p.m. of copper, .11 p.p.m. of lead, 13.0 p.p.m. of manganese, and .19 p.p.m. of nickel. This site is where the D.S. Ditch overflow from the pump station on Little Hill Drive is piped to the west fork of Little Greenhorn Creek, and where it is released from Nevada Irrigation District's (N.I.D.) ditch to the creek (state waters).

December 18, 1998 Foam reported in p.p.m. gathered near the Loma Rica Drive crossing contained .16 arsenic, .42 copper, .1 lead, .57 vanadium, 8.19 manganese, 203 aluminum, and 24.2 potassium. I sat on a piece of cardboard in the snow by my untreated 2-4 skimmer to gather this one. Now they dump later in the year, I believe, because they realize that the cold weather and water tends to preserve the metals they are dumping, thus allowing me to find higher levels!

December 21, 1998 A foaming substance reported in p.p.m. contained .005 cyanide and .006 cyanide when the same material was electroplated positive. This demonstrates that my electroplater is not that efficient at this point, and that *negatively charged ferro-cyanide is barely detectable.* (See Professor Eastman's text chemistry experiment and theory regarding subject matter on cyanide). Perhaps cyanide is intentionally being used in our waterways to separate dumped metals from water as a means of cleanup. The cyanide is being negatively

charged by the chemical company that is selling it to hide its detection as cyanide and use in our water.

June 6, 2000 Again the foam reported in p.p.m. at the outfall from N.I.D.'s discharge pipe to state waters, which is the west fork of Little Greenhorn Creek, contained the following: .145 arsenic, 13.0 sodium, 34.0 potassium, and .037 chromium. From May 19 through May 26, 2000, foam reported in p.p.m. at the location mentioned above was as follows: 18.0 sodium, 5.4 potassium, .52 manganese, and 5.4 aluminum. The water here was whitish or murky in appearance and, looking through the water as it fell into the creek, it was black in color as well. It contained a white suspended solid. The solid was settling in a hole in the rock a short distance down from the discharge pipe. This white and very water-soluble clay was sampled on May 25, 2000, and was reported in p.p.m. The sample contained a ratio of 75-percent clay to 25-percent water. The items detected in p.p.m. were .34 arsenic, .88 vanadium, .423 lead, and 550 aluminum. These results were derived from the liquid portion of the sample. Water temperature here varied from 52° to 56°F. I was told by the neighbor near the discharge point, a retired N.I.D. employee, that this discharge is from N.I.D.'s ditch system and lakes down into the Bear River watershed.

We see the treachery of the water municipality and its chemical-company suppliers bent on skirting the law through the loophole of (it's not part of the water), which is being achieved by chemical manipulation of our waterways now being allowed by the passage of S.B. 649 (which needs to be repealed), and the state E.P.A.'s interpretation of water-testing protocol, which is that a water-quality sample can only be gathered 12" below the surface. But then there is us: the boater, the swimmer, the fisherman, the farmer, and the rancher that say the intent of the law is to protect our uses of the water as well.

-A Call for Water Sanity! Monitoring Group

Maximum Contaminant Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.05 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call for Water Sanity! Monitoring Group

The D.S. Ditch (Loma Rica Drive)

Sampler's Analytical Summary

In late 1996, while out riding my trail bike, I noticed this seasonal ditch that was so turbid and green that you could not see the bottom of it. I took a couple of water samples and did not find anything, but later when I learned of the chemicals being used to float the stuff to the water's surface, I took another look and noticed foam and bubbles occasionally. There was not enough to be obvious, but when I put up a skimmer I realized that here as well, surfactant was being used. The levels of metals on the surface were hideously high. Later I followed the ditch to where it discharged the surface into the west fork of Little Greenhorn Creek. The below-surface portion was being cleaned up and pumped by Nevada Irrigation District (N.I.D.) elsewhere. It's interesting how the N.I.D. engineers know how to chemically separate the good from the bad and reuse the good and pipe the undesirable substances into the creek.

The D.S. Ditch flows past the Idaho-Maryland Mine's mine shaft, which is being pumped. This gold mine has contracted to pump its water from its mine's de-watering project into N.I.D. ditches from what I have heard. Arsenic is the substance that the mine water is known to contain, and it is also the metal that is found at particularly high levels in the D.S. Ditch.

Also, according to a retired N.I.D. employee who lives near the D.S. Ditch discharge point into the creek, "The water is coming down from N.I.D.'s lakes above." It's true that there are lakes way up, such as Spaulding Reservoir, but there are also a couple of lakes up off Lava Cap Road that are used by N.I.D. for both potable and possibly wastewater uses from the Elizabeth George Water Treatment Plant and that supply the Banner Lava Cap residential area with treated water. Another water and sewage plant is also located upstream at Cascade Shores.

Upon looking through a book that explains the use of water-treatment chemicals, the water-treatment process, and water-treatment waste by-products, I noticed that many of the chemicals used contain high levels of sodium or potassium and also levels of aluminum and sulfate as well as phosphorous and calcium, which are common discharge effluents. All of these substances, as well as other metals found at levels exceeding the safe level for safe-agricultural uses of water, were found here where N.I.D.'s pipe discharges into the creek. I'm sure there are many instances of this occurring in the United States, and even though this is against the law, our regulators ignore these and tell us that we must make sacrifices for beneficial uses of the water, such as water and sewage treatment, even though it obviously means the degradation of the water we also use for swimming, fishing, wildlife, and agriculture uses, as well as for other uses.

-A Call For Water Sanity! Monitoring Group

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GENETICS AND PUBLIC POL
INFORMATION SERVICES IN STATE GOVERNMENT

TIM LESLIE
SENATOR, FIRST DISTRICT

December 6, 1996

Mr. Will Doleman
P.O. Box 3544
Grass Valley, CA 95945

Dear Will:

During the 1995-96 legislative session, you contacted my office to express your opposition to Senate Bill 649 (Costa) relating to water pollution. Now that the legislative session has ended, I would like to take this opportunity to provide you with the final status of this measure.

On August 31, SB 649 passed both the Senate and Assembly by votes of 21-17 and 44-29, respectively. The bill was subsequently signed into law by Governor Wilson (Chapter 1122, Statutes of 1996). I share the Governor's views in support of this measure and, therefore, supported SB 649 on the Senate floor. A copy of the Governor's message on this bill is enclosed for your information.

Again, Will, thank you for taking the time to share your position on this measure. Please don't hesitate to contact my office in the future on any state-related matters of concern.

Sincerely,

TIM LESLIE
Senator, First District

TL:tw
enclosure

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CH 6

$KBrO_3$ Potassium Bromate

Sample Collector's Narrative

On January 5, 1998, a sample of foam was taken from the surface of the Chicago Park Rattlesnake Ditch at Mid-ditch site. This foaming substance, which de-aerated back to black water, contained 16.0 mg/L of bromate and 15.0 mg/L of potassium, an estimated total of 30.0 mg/L of potassium bromate. The analysis was performed by Sierra Environmental Monitoring, which is both E.P.A. and California accredited to perform analytical work.

On or around March 20, 1998, a dead goldfish or carp was found at the bottom of the irrigation ditch near the mid-ditch foam pit. It was digested and contained 19.1 mg/L of bromate and 110 mg/kg of potassium, an estimated 38.2 mg/L of KBR^{03}. It was concluded that the fish may have been feeding on contaminated aquatic organisms at the foam pit. This analysis was performed by Coffey Laboratories of Portland, Oregon, which is federally accredited to perform analytical work.

From October 1, 1999 to October 13, 1999, I took samples for bromate at a spring on the Loma Rica Drive side of the Chicago Park Ditch directly across from the old reservoir, on the surface of the ditch, one mile downstream from the Loma Rica Water Treatment Plant on my mother's neighbor's property, from my mother's well-filter housing and from Lost Lake. Also on this day I tested for potassium in the ditch at the foam pit (at my mother's neighbor's) and the area going into the ditch near the plant. Levels ranged from 6.1 to 12 milligrams per liter (mg/L) for the bromate and 12 to 73 mg/L for the potassium. The maximum contaminant levels (M.C.L.) for agricultural-use water (A.G.) and for drinking water (D.W.) are listed. All of the following analytical results are in parts per million (p.p.m.) or milligrams per liter (mg/L), which is the same measurement as p.p.m.

.01 mg/L is the maximum contaminant level for drinking water according to the federal E.P.A. primary level for bromate, and .0005 mg/L is the Proposition 65 M.C.L. for D.W. for potassium bromate. When they both are found in the same water, then the combined levels of potassium bromate run two to four times the bromate level depending on the potassium level. All the above-mentioned areas are in the watershed below the Loma Rica Water Treatment Plant, and the higher levels were found at the point closest to the plant. Bromate is a noted water-treatment by-product (see www.bromate).

On November 13, 1999, I took more water samples in the vicinity of the new reservoir upstream from the water-treatment plant. These samples were tested for bromate and bromide, and none was found of either. Also, some were taken of clear-water samples leaving the old reservoir with similar results. I ran bromide as well in these upstream samples because bromide can become oxidated in the water-treatment process and transformed into bromate (see Section G, *Appendix*). Also, samples were taken in the old reservoir and south of Loma Rica Drive at a spring at the entrance end of Loma Rica Drive, and no bromate was found. Note that the seasonal rains had not yet begun.

From January 1, 1999 to January 30, 2000, upon realizing that there was a serious problem with the surface water and the shallow aquifers, I did an extensive study of the area wells located to the south of the water-treatment plant and those located down-gradient. The wells ran from .85 mg/L of bromate to 15.0 mg/L of bromate, with the highest potassium-bromate level being 7.4 mg/L. The highest level of bromate in wells were 260 to 300 ft. deep, and all lined up near the Chicago Park Ditch and downstream from the Loma Rica Water Treatment Plant above. These wells were also all located within 100 yards of the ditch where high levels of bromate have been found. The higher levels of bromate were in wells closer to the plant. Also during this period of time, gelatinous substances that had been found to contain astronomically high levels of aluminum on previous occasions and that came out of the plant from under the fence contained 160 mg/L of bromate, and what the Water Resources Board calls a general-representative sample of water contained 2.9 mg/L.

Soil that had been removed from the plant's backwash pond and was placed into the Little Greenhorn Creek watershed was taken and diluted with distilled water. A sample was taken after the soil solids had settled that contained 160 mg/L of bromate. Immediately downstream entering the creek from the pile of wastes after the first seasonal rains was found, in a clear sample, 2.9 to 4.8 mg/L of bromate. I found a foaming substance on the water's surface as the creek breaks down the hill off Loma Rica Drive that yielded 5.0 mg/L of bromate. I was told by the E.P.A. that potassium bromate combusts at 110°F. As a plumber, I kept running into situations of overheating water heaters. I finally tested one that I had just replaced and was having a continuing problem. It was on municipal-treated water. 7.9 mg/L of bromate was found. Well water had been tested as far away as the Cedar Ridge "Y" at a level of 4.3 mg/L of bromate. As more water was tested, the levels kept climbing.

Twice I checked with the laboratory that I was using about the very high levels of bromate that they were reporting, and they reported back that they had completely checked their equipment and methods and that the results were correct. Finally we hired a geologist, and he took six samples and sent them in. He insisted for the first time on putting the sample locations on the sample bottles and also on the chain-of-custody forms as we had been using sample-site numbers only up until then. Soon after, and once the E.P.A. was notified, I had received some results from another laboratory of the same site that said that none was detected. The first laboratory contacted us and told us that the results were now incorrect, which they then claimed for the last six months of results! Politics as usual. So now, Columbia Laboratory has "revised" their earlier reports and now are saying that all detected samples from October 1, 1999 to March 26, 2000 are all false, and that they refuse to refund me anything so far. Furthermore, they are now claiming that I still owe them money.

On January 9, 2000, Alan Stahler, a local biologist, took seven water samples: four of wells, and three of metered-water sources (i.e., potable). Three of the wells located in the water plant's immediate neighborhood at Mrs. D.'s and near the Cedar Ridge "Y," approximately two miles away, all contained .11 mg/L of bromate. The wells were from 100 to 300 ft. deep.

Some additional interesting points: One laboratory claimed that they saw chloride-type substances that are very close atomically to bromate. Chloramine and chlorite both have a fairly low threshold for toxicity to drinking water, at 1.0 to 4.0 mg/L. Many of the treated-water samples were running in the 20 and 30 mg/L range (of bromate as originally reported), so your guess of what was actually there is as good as mine.

One laboratory other than the now-defunct Columbia Laboratory, Umpqua Laboratory of Oregon, said they found 2.6 mg/L of bromate in one sample and none in another sample that was taken from the same site as the other one on the same day and time, and they did the chemistry work on both samples for bromate. Another laboratory, Coffee of Oregon, reported .11 mg/L of bromate as well from the water out of three wells. Yet, the defunct lab sent its samples to Coffee Laboratory, which were taken approximately two-and-a-half months later from two of those same wells; Coffee Labs analyzed it and found nothing. So, had the well been cleansed of potassium bromate in this two-and-a-half month period, or are governmental political powers at work here?

Because of these variances in levels and due to the circumstances surrounding the events, I hold the personal opinion that our government is attempting to squelch the outflow of information about polluted potable water in our children's school due to the obvious social and political implications.

To date I have spent nearly $6,000 in regards to this potassium-bromate survey, and I'm expecting legal costs as well in retrieving these funds from this, in my opinion, now-dishonest laboratory. Twenty-five to thirty percent of the samples were of others' water sources in which they had paid for the analytical work. Now I must see this work performed again at a greater cost than before, but out of my own pocket.

Furthermore, on February 26, 1998, our monitoring group took a sample of the foam on the surface of the agricultural ditch, the Chicago Park Rattlesnake Ditch, at the foam pit and found 16 mg/L of bromate, 15 mg/L of potassium, 1.7 mg/L of S04 sulfate, .31 mg/L of chromium, and .49 mg/L of copper in this same foam. This analysis was performed by a laboratory in Reno, Nevada.

On March 20, 1998, another sample of a dead Widemouth Bass and a carp was found a short distance away in the same ditch. (In other waterways as well as this one, fish and frogs were seen eating small flies and other insects that get caught in the foam.) The bass contained some of the same constituents as did the bug-snagging foam at the foam pit. The carp was sent to Coffee Laboratory in Portland, Oregon, which analyzed the fish as total potassium bromate and reported 19.1 mg/L of bromate in the fish as well as 110 mg/kg of potassium. There were high levels of the same metals found in the foam found in a dead Widemouth bass, which is normally a fish that is caught to eat.

Columbia Laboratory of Portland, Oregon analyzed a sample for bromate and for potassium from the Mid-Ditch foam taken using the same method at the same spot on October 1, 1999. This lab reported results of 12 mg/L of potassium and 12 mg/L of bromate, which levels are doubled or quadrupled when found in the same water together (i.e., thus making the levels 24 to 48 mg/L of potassium bromate). .0005 mg/L is the M.C.L. of safe drinking water.

In late May 2000, this lab said that its machine was broken, and it nullified the results it had previously reported! The carcinogen potassium bromate, found downstream from a water-treatment plant, coming out from under their fence and present in scrapings removed and placed into our watershed, was then sold to area residents as clean agricultural bottom soil (clean fill?) since 1972. This soil is coming from a plant owned by the Nevada Irrigation District (N.I.D.), the second-largest utility in California. N.I.D. recently reported having a $42 million surplus in funds. To identify this fill, look for numerous specks of silver flakes that are similar in size. This, indeed, is *not good earth*!

Samples taken by Alan Stahler, a local professional biologist who writes a weekly column for the Grass Valley *Union* and hosts a science talk-show on the local KVMR community-radio station, reported three local wells having .11 mg/L of bromate. However, two of these same wells that had the samples taken from them in the same fashion had no bromate in them in samples collected by a professional geologist two-and-a-half months later. Both analytical projects were performed by Coffee Inspection Laboratory of Portland, Oregon. However, now Columbia Laboratory states that its reports for the last six-month period to our group on high levels of bromate being found in these two wells were false. The highest levels at 15.0 mg/L of bromate were found in a residential well located fairly close to the Loma Rica Water Treatment Plant in comparison to levels reported in other wells down-gradient from the water-treatment plant.

If Coffee Laboratory's analytical results are correct and, noting the levels of potassium found in some of these 100 to 300 ft.-deep wells located down-gradient and as far away as the Cedar Ridge "Y", then the potassium bromate levels may be as high as .44 mg/L or 880 times higher than the safe Proposition 65 D.W. level.

Will Doleman, a local licensed plumber who first noticed problems with the water back in 1995, has spent every penny he could muster to determine conclusively if Dr. C. MacLachlan's statistical toxicology survey in Toronto, Canada is occurring here. We have heard that Dr. MacLachlan's studies show that if you live in the population below, or down-gradient from sewage or water-treatment plants, that you stand four times the chance of dying from cancer compared to populations living uphill, or up-gradient from these plants. This survey on bromate, the water-treatment by-product, may be showing us why these down-gradient locations are experiencing a sharp rise per capita of cancer.

E.P.A. tests done on mice and rats regarding the ingestion of potassium bromate in water indicate that the substances cause a definite increase in thyroid, colon, and renal cancers, and Mr. Doleman says that he would be inclined to add leukemia and lymph cancers to the list. Doleman saw a cancer-cluster of fifty-percent in an area where the substance was normally concentrating to possibly as high as 60,000 times over the M.C.L. for D.W. in the Chicago Park Rattlesnake Ditch, where this dermally absorbed carcinogen is being used for showering in more than 600 homes downstream. An E.P.A. document states that this substance is absorbed through the skin, which would make this toxic water-treatment by-product bromate, which is smaller than a 10,000th of a micron, almost impossible to filter, and definitely not a good choice for *dishwashing* or *bathing* as well, as in ditch water. Doleman told us of one fellow who refused to stop drinking the ditch water saying that his arm hadn't yet fallen off, and how within a year he got cancer and died along with half of the other residents who drank the home-filtered ditch water.

Because the bromate levels were all the same in wells down-gradient from the plant, this may indicate a complete and uniform contamination of the water table. Uphill in 1997, Doleman, Alan Stahler and G.B. Tucker (all of the local Sierra Club) had dug a ditch with Peter Van Zant and found a deep-injection trench leaving the Loma Rica Plant onto county property and into the water table that feeds downward into the wells below. Doleman quotes Caren Gozzi, the previous lead person of the Nevada County Health Unit: "Most of Nevada County is classified as an aquifer-recharge zone. This being the case means that toxins dumped on or in the ground in an unlined pond or area will pollute the water. This is why we cannot have a dump here in our county."

Doleman also says that possible problems regarding bromate in treated water, wells, and ditch water can be indicated by the premature discharge of water via the pressure-relief valve on a water heater, which is fixed temporarily by blowing out the bottom of the water-heater tank. Yellow and orange water in the bottom of the water-heater tank and/or an abundance of oxygen that forms to the side of a bottle or glass container in time can all indicate the presence of bromate.

Closeup, also, a scum that forms at the water's surface when sitting in a dog or cat dish that oftentimes is silver in color can indicate water-quality problems. Brownish-red calcium-bromate stains around a bath tub, a toilet rim, or in the back of a toilet tank, as well as acid water or a high level of iron are not always caused by bromate but can be a good indication of it. They may mean that you need to filter your water via a reverse-osmosis and carbon-filter system or at least test the water. Currently it is very difficult to find a laboratory or to get dependable results for the substance, and due to political or financial water-plant sales concerns, assistance from political entities is unlikely. Thus, according to Doleman, it's quite possible that cover-ups occur.

Our monitoring group has been trying since 1995 to obtain permission to test waters on the Nevada County N.I.D. property and to be able to complete the excavation project that was only begun by Alan Stahler, G.B. Tucker, and Will Doleman three years ago. This project was then shut down immediately as soon as it became obvious that there was a deep-injection trench. Doleman says that the county calls their dump trench out of the plant on Loma Rica—which is designed to filter three-million gallons a day and is, in fact, filtering more than ten-million gallons a day—a "chain drain." He phoned several local civil engineers, and they all said the same thing—that an evaporation pond is just for that purpose, and that there should not be any chain drain located anywhere in, under, or around the pond's perimeter. Many efforts have been made, but it is apparent that the county has a lot to hide, and the indication is that so does the state. At the least, so far our county supervisors are willing to make ongoing allowances for the County and for N.I.D.

-A Call For Water Sanity! Monitoring Group

$KBrO_3$ Potassium Bromate Summary

This project demonstrates two points. First, there are very serious problems regarding water-treatment processes that are not being addressed by the government agencies that once regulated these systems. Second, laboratory results possibly, and most certainly analytical-laboratory attitudes and public service, are being influenced sharply by political and financial pressures.

For three years I tested for bromate in the Greenhorn Road watershed and obtained much non-detect results, yet seasonally this substance would occur at very high levels. I used three different laboratories, and all three times results showed potassium bromate with the numbers in the teens. Just because one of the labs—Columbia Inspection—suddenly discredited its own results, this came as no big surprise to me because of my last five years experience with analytical labs. On the other hand, we know that the substance was and possibly is still there.

The first laboratory I used back in 1995 was very good at first, providing excellent service, and I became friends with its director. I would put the site locations on the sample bottles and on the chain-of-custody forms. My customer-service representative took a personal interest in the science involving waterway manipulation of chemically defying gravity by floating metals. I told the local Water Quality Board everything, but as time progressed they became increasingly hostile toward me and my work. Eventually my director friend was forced to resign, and the lab I had used for two to three years refused to perform analysis on a very critical batch of my samples. Their officials told me that they had been offered a quarter-million-dollar contract to perform work for the Regional Water Quality Board, and that my project was a conflict of interest. I attempted to get my samples from them, but they dragged their feet. When I finally got the samples to another laboratory, constituents that were previously reported were no longer there! Since then I have moved from lab to lab. Once the agency to which I was reporting my results contacted the laboratory, my project would be stonewalled or else their customer service would suddenly become terrible; the results took twice as long to get back to me, and ordered sample containers would never arrive, or when they did arrive they were wrong.

Another commonplace occurrence I encountered was that their prices would skyrocket, or their detection limits would suddenly be raised. With Columbia Inspection, I removed all indications of the lab name, batch numbers, and lab information of any kind that would lead the agency to the laboratory conducting the report. In this way I was able to protect the lab from political pressures so that I could really discover what actually exists in the water I tested. After all, that's what you pay all your money for, isn't it? However, once I took on project partners, they turned over the lab's name, and the same thing occurred.

I concluded that the bromate was not in the water upstream from the water plant, but it was at incredible levels coming out from under the plant's fence. There was all kinds of information on the worldwide net about bromate being a water-treatment by-product. Not only were incredible levels coming out from under the fence, but similar levels were detected in sludge being removed from the water-treatment plant's backwash pond and dumped in the vicinity, not only currently but since 1972. The clear-water waterways in the vicinity were contaminated; the ditch into which they seep was trashed with bromate.

Also, when rain hit their backwash-pond sludge, it would seep the poison into the water table and into a chain-drain to the weir box and into the creek. Springs nearby were poisoned, and wells in the neighborhood showed the highest levels, as was the case down-gradient. The water table was uniformly polluted with this carcinogen to the tune of 11 to 880 times over the maximum-contaminant level for drinking water. This last information came from a laboratory other than Columbia Inspection.

We ask ourselves how this is happening. It took me a number of years to find out, but I finally feel that now, as of November 2000, I have finally found the last piece to the puzzle. Two or three years ago you would hear a very loud noise in the Loma Rica Water Treatment Plant as a supply truck would pass chlorine gas into its storage tank there. Now this doesn't occur and they have installed a large tall tank that I believe is a brine tank. In order to save money, they now make their own chlorine on site. As the sodium chloride is converted to chlorine, the process also forms bromate. The bromate is separated from the chlorine using hydrolysis, then the chlorine is used in the treated water. But the bromate is used in the plant's undesirable backwash pond to disinfect it.

The problem lies in the fact that this pond, which is too small to evaporate its water, is being rapidly seeped into the water table and the volcanic rock that feeds into wells down-gradient. The whole system is run by a machine in order, once again, to save money. One of the items used in water-treatment processes is aluminum-potassium sulfate. So now the ingredients for potassium bromate are all there in the backwash pond and in the water table.

In this scenario, the machine malfunctions, as no one is there monitoring it. So now not all the bromate is being removed from the chlorine, going into the treated water. By the time they notice the problem two to three months have gone by, but they did save a little money by not having a full-time operator. Potassium bromate is also noted for kidney problems and is used at very high levels to stop the human heart, as in lethal injections used by the Texas Department of Corrections. Potassium bromate in the treated water and down-gradient is a very serious public-health problem.

The water plant is located upstream on the old lava flow from the volcano that existed thousands of years ago. The 100- to 300-ft.-deep wells that were affected were fed by water through volcanic rock. The three wells lined up like a pointing finger to the water-treatment plant above, and the furthest well was located near the Cedar Ridge "Y" nearly two miles away and downhill from the Loma Rica treatment facility. Once the report came out with samples having been gathered by a licensed geologist at a local-school drinking fountain, the political system finally moved. But, what a coincidence that the laboratory's machine was suddenly malfunctioning for the last six months even after they checked it twice before and reported that the results were correct! Studies on rats and mice that were fed this carcinogenic substance—100 times more toxic than arsenic per volume and weight—show that the male rats were affected sooner and more severely than female rodents. The $KBrO_3$ would first attack the thyroid gland and then the stomach with stomach cancers and finally renal cancer would develop.

I guess that perhaps it's just a coincidence that my mother and brother, who lived down-gradient longer than other family members, each lost their thyroid gland. Another "coincidence" was that half of their neighbors died of mostly stomach cancer after having drunk ditch water for many years. The few individuals that did survive were, in the majority, women.

We first documented this substance in the ditch after people nearby were dying. Now it's in the wells, and this reminds me of another coincidence: There is a 260-ft.-deep well polluted with potassium bromate that belongs to a heroic fellow who has fought the poisoning of the water here for more than ten years, and he is about to lose his wife to cancer. But, as a Regional Water Quality Board engineer told me, he is a hero because he is figuratively laying down his life so that others can have treated water. Of course, now that it's in the water table, he's not the only one affected.

I confess that, in this particular instance, I'm not very patriotic as I don't believe it is correct for so many to die just because the second-largest utility in California does not want to be inconvenienced with doing things differently. I'm considered by some to be an "enemy of the public" because I think that municipalities should charge and spend a few more dollars to respect and protect life instead of writing off their customers as a necessary evil. But I

firmly believe in the course I'm following, and I think they are wrong. So, as you read my reports of what's actually and factually contained in the water downstream, I can only hope that you will open your eyes and begin noticing these facts that I am presenting. Some people never get the point, and to them it's just a matter of throwing another chemical to fix the problem, and then another, and then even another. So let's not pretend anymore that the water was not pure before we polluted it! Let's simply choose to cease polluting it.

w.p. Surface, well, and treated Municipal Water survey 10-99 thru 1-0

Potassium Bromate ($KBrO_3$) Results

w.p. Analitical Lab work provided By Columbia Inspection Laboratory see notes as well in Apendix about controversy

Maximum Contaminant Level (M.C.L.) for Drinking Water (D.W.).

Sample Type	Sample Number	$KBrO_3$ Level (ppm)	Number of Times Greater than MCL
Surface Water			
Many more samples were reported as containing bromate. But only these were tested due to financial restraints, and had potassium. w.p.	207	6.27	12,538
	219A	4.84	9,677
	219B	2.74	5,485
	222	1.50	2,997
	228	6.53	13,060
	254	3.79	7,575
	255	5.22	10,448
			8,826
Treated Water [The average surface-water sample was 8,826 times over the M.C.L. for safe D.W.] w.p.			
	227	3.85	7,708
Still, if you divide the average number of times that $KBrO_3$	233	5.14	10,277
	244	2.48	4,967
exceeded the M.C.L. for safe-	246	4.28	8,564
drinking water by 8, you're still at a very high level.	256	2.78	5,567
[The average treated municipal water was 7,416 times the M.C.L. for safe D.W.] →			7,416 +
Well Water			
Why would Columbia Inspection Laboratory of Portland,	211	4.57	9,142
Oregon be so quick to discredit its	212	1.57	3,134
own analytical results of the previous six months so	213	4.83	9,664
since it had no way of retesting these	216	1.70	3,396
samples unless it was being pressured by the regulators	225	1.11	2,220
to do so after the first non-numbered		Will Doleman was	5,511 times
high-school drinking-fountain sample?		A Call for Water Sanity! Monitoring Group	

[The average well-water sample was 5,511 times over the M.C.L. for safe D.W.]

Notes: 1) According to California's Proposition 65 (Safe Drinking Water Act) the Maximum Contaminant Level (MCL) for Potassium Bromate is 0.0005 ppm, which is 100 times lower than Arsenic. 2) The above samples were taken in Nevada and Placer counties from 11/1/99-1/30/00. 3) Reverse Osmosis filters seem to be effective at eliminating Potassium Bromate. 4) According to EPA, Potassium Bromate can be absorbed through the skin.

Potassium Bromate ($KBrO_3$) Results

Sample Type	Sample Location	Sample Number	$KBrO_3$ Level (ppm)	MCL (ppm)	$KBrO_3$/MCL
Surface Water					
	Old Yuba Reservoir, NC Airpark, GV	207	6.27	.0005	12,538
	DS Ditch	219A	4.84	.0005	9,677
	DS Pond	219B	2.74	.0005	5,485
	Loma Rica Dr., GV	222	1.50	.0005	2,997
	Old Reservoir, NC Airpark, GV	226	208.96	.0005	417,920
	Loma Rica Dr., GV	228	6.53	.0005	13,060
	Rough & Ready Ditch	254	3.79	.0005	7,575
	Clipper Creek, GV	255	5.22	.0005	10,448
Treated Water					
	Lake of the Pines	227	3.85	.0005	7,708
	Empire Shoes, Sutton Way, GV	233	5.14	.0005	10,277
	Sunset Subdivision, R & R Hwy., GV	244	2.48	.0005	4,967
	Alta Sierra Inn	246	4.28	.0005	8,564
	Pine St., NC	256	2.78	.0005	5,567
Well Water					
	Buckman, Glenn Pines Dr., GV	211	4.57	.0005	9,142
	Glenn Pines Dr., GV	212	1.57	.0005	3,134
	Little Hill Dr., GV	213	4.83	.0005	9,664
	Glenn Pines Dr. , GV	216	1.70	.0005	3,396
	Doleman, Glenn Pines Dr., GV	225	1.11	.0005	2,220

CH 7

Lost Lake
The Residential End of
The Lava Cap Mine Federal Superfund Sites

Sampler's Narrative

On March 14, 1997, the state E.P.A. collected a sample of water from site LCW-2 at the Lava Cap Mine. The sample was taken by their employee Daniel Ziarkowski. This arsenic sample contained .738 parts per million (p.p.m.) of arsenic. The sample was actually split before it was preserved, and another identical sample was filtered through a .14 micron filter before the nitric-acid preservative-extraction agent was added. The result of this second sample was .706 p.p.m. This demonstrates both how water soluble and how difficult to filter arsenic is at this particular site, and also how this filter only removed 4.34-percent of the arsenic, and also how 95.66-percent of the arsenic was in the water, not the tailings. Their sample was taken of water mid-stream.

On March 26, 1997, our monitoring group took a sample of surface foam about one half to one mile downstream from Lost Lake on the main artery of Little Greenhorn Creek downstream from the mine and Lost Lake. These samples, taken downstream from Clipper Creek's confluence with Little Greenhorn Creek, contained 29.0 mg/L of potassium.

On April 14, 1997, more surface foam was sampled, and the laboratory assistant removed as best she could with an eye dropper a metallic layer off the bottom of the foaming material and found 1.1 mg/L of lead. Two days later another sample of foam was taken and analyzed as total lead when it condensed to a dark-colored water, and it contained .6 mg/L of lead. This little experiment demonstrates that the metallic substance that is seen on the water side of the foam by the underwater camera is what it looks like: very high in levels of metals.

On April 22, 1997, the following was found in brown water that formed out of de-aerated foam. These metals and compounds were analyzed as total metals and compounds, and were found at levels as follows: 1.3 mg/L of cyanide, .5 mg/L of sulfate, .06 mg/L of foaming agent (detectable by m.b.a.s.), 1,200 mg/L of aluminum, 35.0 mg/L of arsenic, .001 mg/L of mercury, and .6 mg/L of lead.

On May 28, 1997, a sample of foam was taken from the upper end of Bob's Lake, which is located upstream from Clipper Creek's junction, but on the Little Greenhorn. The following levels were found: 5.4 mg/L of sulfate, less than .2 mg/L of foaming agent (detectable by m.b.a.s.), 1.7 mg/L of aluminum, .017 mg/L of arsenic, and less than .005 mg/L of lead. This demonstrates that most of the high levels of metals were coming from Lost Lake rather than the upper reaches of the Little Greenhorn.

As the foaming agent got pushed up against the 2"x4" skimmer by the current and more and more piled up, a 3" to 4" by 3/4"-wide band of silver metal emerged from the foaming agent's surface and formed a large silver spring.

The following year, on March 18, 1998, we went upstream to see if we could find where white foam with an orange tint might be originating. Upon our stream walk we discovered an orange-gelatin material concentrating out of a leak from the bottom of Lost Lake. This substance contained 31.0 mg/L of arsenic, and 12.0 mg/L of manganese. The federal E.P.A. also tested this substance and said it contained a very high level of iron and manganese, which we believe caused the reddish-orange color of the gelatin substance.

Again on March 18, 1998, another sample of seasonal orange gelatin contained 13.0 mg/L of sulfate, .34 mg/L of cyanide, 1.5 mg/L of ammonia nitrogen. On the same day, a skimmer was placed where Lost Lake discharges down to the Little Greenhorn, and foam found there contained .36 mg/L of arsenic in a sample filtered before analysis. This sample was split, and the other half that was not filtered contained 1.0 mg/L of arsenic, 1.1 mg/L of foaming agent, and 16.0 mg/L of sulfate.

On January 28, 2000, samples taken of the creek's surface, which contained no foam below Lost Lake and its leak, and this sample contained less than .12 mg/L of arsenic, less than .08 mg/L of lead, and .84 mg/L of potassium. Also here in the gelatinous substance at the base of the Lost Lake dam was found .08 mg/L of cyanide in an electroplated sample. .05 mg/L of arsenic was found in the split sample, which was not electroplated. Also, 3.9 mg/L of bromate was found below the Lost Lake Dam in the "Yellow Boy" gelatinous substance, as well as 30.0 mg/L of arsenic, .46 mg/L of lead, and 3.8 mg/L of potassium. Note how close the level of potassium is to the level of bromate. The potassium and bromate is most likely combined here as KBr^{03} (potassium bromate) and at a level of 15,000 times over the California Proposition 65 safe level for the drinking-water maximum-contaminant level (M.C.L.).

Also on January 28, 2000, we simulated a rain because we had noticed how, for the third-year running, the mass deposit of iron-manganese, toxic-arsenic lead gelatin would wash away after the first hard rains. This rain simulation of stirring just the very surface of the water with a stick found on-site turned the water downstream orange in color. 4 mg/L of bromate was found. We had ordered arsenic and lead on this sample, but this laboratory, as I have stated before, confiscated these samples and refused to analyze them as we had instructed them to do. But we believe that the arsenic and lead levels were also high here as well in this orange water rushing downstream to Rollins Reservoir.

On January 28, 2000, downstream below the confluence of Lost Lake's overflow and its dam leak, but upstream from the confluence with the Little Greenhorn was found .59 mg/L of arsenic in clear water off the water's surface; there was none detected (N.D.) for lead. No arsenic was found here before the time we simulated rain. There was some orange-gelatin substrate on the silty bottom.

Again on January 28, 2000, two samples were taken of the orange gelatin commonly referred to as "Yellow Boy" at the base of Lost Lake Dam. The one cyanide sample was preserved with "Naoh" and split into two samples. One was electroplated positive, and the other one was not. The electroplated sample, which was electroplated positive to demonstrate that it had been possibly previously electroplated negative to make the cyanide barely detectable to undetectable as cyanide (see Professor Eastman's book listed in the Appendix) contained .08 mg/L of cyanide while the other sample contained .05 mg/L of cyanide, thus showing that the sample that had the manmade negative charge contained 60-percent more cyanide once the negative ferro-iron charge was removed. Again, gelatin at the base of the dam contained 3.9 mg/L of bromate.

Cyanide and bromate are being used now in modern-day mining to float gold out of mine-slurry ponds, but the last time the Lava Cap Mine was operating, bromate was an unknown substance and not used in mining. Both the bromate and cyanide decompose quickly once loose in the environment, so something's suspicious. Was the owner of the mine performing gold mining even though the county, having jurisdiction, had denied his permit? Or is there another mine dumping into this area? Or is a new toxic-cleanup chemical being used that contains cyanide, which has been made undetectable, and bromate? Or is the Nevada Irrigation District (N.I.D.), the water-treatment municipality that owns another different water-treatment facility upstream from the Lava Cap mine and Lost Lake dumping into the watershed? I speculate the answer is number three: the toxic-cleanup chemical.

Once again on January 28, 2000, the gelatin at the base of the dam showed results of 30.0 mg/L of arsenic, .46 mg/L of lead, and 3.8 mg/L of potassium. One sample was taken at a time when the rains had diminished the orange gelatin. At the base of Lost Lake Dam in this sample taken on around September 20, 1999 was a level of 2.3 mg/L of arsenic, .03 mg/L of copper, and 1.4 mg/L of aluminum. Again, bromate was tested and found here at a level of 1.6 mg/L. This demonstrates that it's the "Yellow Boy," which is very high in these substances.

On around September 20, 1999, a "Yellow Boy" sample did however show an especially high level of cyanide in a sample that was not electroplated at all. This result

showed .18 mg/L of cyanide. All this in our view indicates that the health-harmful substances that were once at the Lava Cap Mine have now washed into the watershed downstream from the mine, and even to some extent downstream from Lost Lake. The federal E.P.A., which once claimed that they were going to fix the problem, has been cut along with the Superfund budget as industry takes over the government that was once "by and for the people," which might now be considered a partial dictatorship of the rich. Deregulation of industry, municipalities, and mining now means fighting a difficult fight against the mining and chemical companies and toxic dumpers upstream. It's becoming more and more difficult to stop them, so one must consider the other viable alternative, which is to run for your life.

Maximum Contaminant Levels for Constituents Listed in Narrative

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chloride	106.0 mg/L	250.0 mg/L			
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call For Water Sanity! Monitoring Group

Lost Lake

To: The Editor, The Union - 11464 Sutton Way, Grass Valley, CA.

Drinkable Arsenic?

The E.P.A. posted low levels two years ago, as well! This doesn't surprise our volunteer water monitoring group, who found chemicals that clean the main water body by floculating the arsenic to the bottom, via a gelatinous substance--or floating it to the water's surface via a foaming substance.

The E.P.A. takes samples 1-4 feet below the water's surface (so deer should drink with a 12-inch straw?) They reported finding arsenic 130% the safe drinking water level and lower. We sampled the water's surface foam (that rapidly turned to water) and orange gelatin, as well, and found 70,000 to 62,000% the safe level for drinking water downstream from the Lava Cap Mine!

When the Lava Cap dam was rebuilt by the Feds., an eyewitness saw trucks deposit a substance which caused little Clipper Creek to foam. E.P.A. told us they would be sampling air, water, and sediments. At the last meeting, they talked generally about water and sediments, but did not mention levels at the water's surface or in the air. Although they mentioned the orange gelatinous substance at the base of Lost Lake dam containing high levels of iron and manganese, when asked about the arsenic level they didn't reply. They indicated their attorney advised they could only tell us the levels they were told to reveal by their superiors!

Elsewhere, the same chemical was used, and the same metals found in the water were then found in the air. Their document, "Arsenic and Your Health" told how arsenic can be deadly when airborne.

A lot can be done by our group if we can get more donations and volunteers.

Will Doleman
"Water Sanity!"
Monitoring Group
P.O. Box 3544
Grass Valley, CA 95945
272-6421

Lost Lake
Downstream from the Lava Cap Mine Superfund Site
Sampler's Narrative Summary

A friend who was living on Raccoon Hallow Road off Greenhorn Road told me that Little Clipper Creek near his house was running dark grey in color. I told him he needed to follow the creek and determine where the turbidity was originating. His neighbor stayed on the phone and finally reached someone from the Nevada County Environmental Health Unit who came out to investigate. They followed the creek upstream and determined that a log-tailings restraining dam at the Lava Cap Mine site had broken and released arsenic, lead, and other mining by-products into Little Clipper Creek where they were being washed down across Greenhorn Road and Raccoon Hallow Road and into Lost Lake and thus into Little Greenhorn Creek, which runs down into Rollins Reservoir.

In the last week of March 1997, I was called down to a house on Little Greenhorn Creek downstream from Lost Lake. There I saw foaming agent identical to the substance I had been seeing on the surface of the agricultural ditch just down Greenhorn Road. I set up a 2"x4" skimmer, and before I knew it, I had collected some foaming agent (m.b.a.s.). 35.0 mg/L of arsenic in this foam was found, and also lead, aluminum, and some sulfate. The metallic layer hanging off the bottom of the foam contained a concentration of twice the concentration of lead compared to a total analysis of lead in the foam. My witness and I saw bugs caught in the foam struggling to get loose. There was a trout trying to eat these bugs that were caught in the foaming agent.

As the foam became more concentrated, it turned darker and darker. There was black with a metallic valance until finally a solid metal ban similar to a spring emerged from the foam's surface. I followed the foam upstream to the base of the Lost Lake dam. There was an orange stream entering Clipper Creek just downstream from the base of the dam.

Almost a year later I took a sample of the orange semi-solid from the dam's base. It contained high levels again just below the level found the year before. I also tested upstream on Little Greenhorn Creek above where Little Clipper entered Little Greenhorn Creek. very little arsenic was found there, demonstrating again that Lost Lake was the area that bore the contamination.

During mid-March 1997, the California E.P.A. took samples of the water upstream from Lost Lake at the Lava Cap Mine, and they divided some of the samples into two groups. One group was filtered before being sampled. This sample was only about four-percent lower in arsenic than the other sample that was not filtered, indicating that the arsenic is very water soluble. High levels of potassium, sulfate, and cyanide were found in the orange gelatin, and when a magnetic positive charge was dropped onto a parallel sample of the cyanide, the level of cyanide found there was now 60-percent higher.

This little experiment demonstrates that the cyanide was charged negatively to begin with in order to make it undetectable as cyanide! This process was most probably performed by some chemical company so that cyanide could be used without being detected as cyanide.

At the point where the water cascaded over the dam at Lost Lake, the foam contained more than seven times the acceptable drinking-water level of arsenic. Again, on the lake's surface we obtained results of more than twice the safe drinking-water level.

Around the end of 1999 and the first part of 2000, bromate was detected, and lots of bromate was found together with potassium indicating the presence of potassium bromate. By 2000, the arsenic had now dropped to 30 mg/L. The potassium bromate levels in the orange-gelatin substance ranged from 40,000 times to 10,000 times the safe drinking-water level.

Recently I learned about a local chemical company that is making a two-part toxic-cleanup chemical. One is a foaming substance, and the other is a gelatinous substance. The foaming substance is a high ph, and the gelatinous substance is a low ph. This company claims they have been testing this chemical locally. They also claim that their toxic-cleanup chemical has been shown to work.

An eyewitness told me that they saw two trucks pull up to Little Clipper Creek right after my first sample-event downstream on Lower Greenhorn Creek. This was right before the U.S. E.P.A. arrived at the Lava Cap Mine site. The eyewitness reported that the two trucks dumped chemicals into Little Clipper Creek at the Lava Cap Mine site, and that the creek immediately began to foam. Was this the E.P.A. or an opportunist chemical company that wanted to get its toxic-cleanup chemical tested for free by the federal E.P.A. to see if it cleaned up the arsenic?

Whenever it rained hard, the orange gelatin would dispense into the water all at once. The orange water was also tested and contained a level comparable to the solid regarding arsenic. Since the arsenic, manganese, iron, lead, and bromate substance is at the bottom of Lost Lake, and because it is highly soluble, and because of metals in the "Yellow Boy" gelatinous substance, neighborhoods in the Highway 174-You Bet areas are being adversely affected.

The Federal E.P.A. continues to stall, and the arsenic continues to migrate down Little Greenhorn Creek toward Rollins Reservoir. The only thing the E.P.A. has really offered the neighbors is promises and some well-water testing in areas upstream where the arsenic no longer resides in the water at toxic levels.

The orange iron-colored substance in your well-water filter might possibly be more than just iron. Potassium bromate is smaller than 1/10,000th of a micron, and most cartridge-type filters remove only particles down to one micron. Also, this aqueous salt can be readily absorbed through the skin, unlike metals such as lead. Health in the Little Greenhorn Creek area has already been impacted, and we are hoping to warn users of wells in the creek area about the problem before they, too, become a statistic.

-A Call For Water Sanity! Monitoring Group

An Uncompromized Version of Our Wastewater Effluent WO

CH & wolf creek

Orange water from Wolf Creek in an eddy downstream from the Grass Valley Wastewater Plant

Food-grade, plastic-wrapped skimmer collects foaming substance that was seen leaving the Grass Valley Plant's Pond!

Wolf Creek Site Downstream from the Grass Valley Sewage Treatment Plant Sampler's Narrative

On December 29, 1997, a witness and I set up an untreated 2"x4" skimmer at the Allison Ranch Road bridge on Wolf Creek just south of Grass Valley, California. There were visible white suds on the water's surface in the eddy downstream from this bridge, which is located a couple of miles downstream from the Grass Valley Sewage Treatment Facility. The skimmer stayed up 2 1/2 hours while we went a short ways down the road to do a work-related job. Upon returning, we skimmed up 75% of what was there and placed it in a one-quart container provided by the lab. Only about 3/8th of it was used for the following analysis. 0.46 mg/L of M.B.A.S. surfacants was found, as well as 0.22 mg/L of chromium in this surface foam, which rapidly changed to thick-black water in the lab-provided sample container. The only other thing we had funds for was bromate, which was reported as N.D. with a 1.0 mg/L detection limit.

On July 8, 2000, a property owner and I took a sample of orange water a short distance downstream from the Grass Valley Sewage Treatment Plant. This orange water was stranded in a small wetland from a time when the city of Grass Valley had pumped water out of an old-mine shaft at the plant when they were digging to add a basin to the plant. This sample, which was gathered under stricter-than-required sterile technique protocol of the puddle's water, was analyzed and reported to contain no organic lead down to the 0.2 mg/L detection limit. It also contained .062 mg/L of lead, **3460 mg/L of iron**, 20.0 mg/L of manganese, **29 mg/L of arsenic**, 0.12 mg/L of chromium, as well as 47 mg/L of calcium. More samples taken here in the same manner on the same day contained 6.1 mg/L of S04 sulfate, and 3.1 mg/L of potassium.

On July 12, 2000 at 8:00 p.m., we set up another skimmer, which was double wrapped with food-grade Saran wrap a ways upstream from the Allison Ranch Road bridge. Using sterile gloves, we gathered more white foam, which was accumulating faster than we could collect it. We put the foam into a bacterial-sterilized lab-provided container, then rushed it up to the laboratory, which reported more than 160,000 of total coliform M.P.N. per 100 ml, and the same findings were reported for fecal coliform.

Again on July 12, 2000, another sample of foam on the surface of the purple water on Wolf Creek, upstream from Allison Ranch Road was taken, and it contained in mg/L the following: **0.14 arsenic**, 0.247 lead, **.05 chromium**, 0.48 barium, 38.0 calcium, 102.0 iron, 1.47 nickel, 3.1 phosphorus, 4.9 manganese, .007 selenium, 16.0 sodium, 0.1 vanadium, and 4.42 of zinc. The lab-quality assurance profile noted interference between the chromium and the zinc in this sample, which lead to poor recoveries for these two metals so that you can expect there was in actuality a much higher level than what was reported. The 0.14 mg/L of arsenic is significant because we have been told by the plant operator that they are now treating the arsenic-mine waste, so now we find this on the surface with their other wastes!

On July 27, 2000, a protocol mid-stream water—not foam—sample was taken of purple water, and it contained 12 mg/L of potassium. Again this was taken upstream from the Allison Ranch Road crossing on Wolf Creek.

On August 7, 2000, the outer layer of Saran wrap was carefully removed from the skimmer and was placed in a lab bottle with creek water and nitric acid (HN03) from the Wolf Creek site above Allison Ranch Road. This extract was reported in mg/kg and contained 2.1 mg/kg of arsenic, and 2,640 mg/kg of iron.

On October 3, 2000, more foam was collected on Wolf Creek above Allison Ranch Road. It contained .035 mg/L of Penolics. This foam, as with all other foam samples gathered here, rapidly condensed down into dark-brown water.

Again on October 3, 2000, more foam as above was sampled, and it contained 41.0 mg/L of nitrogen, 1.3 mg/L of ammonia, and 1.8 mg/L of phosphorus.

I was told by the laboratory that other samples taken on two other sampling sessions at the creek were accidentally thrown out! One was a once-white air-filter cartridge that was operating for two weeks at 10' above the creek bed and was black when it was removed, placed in a sterile bag with gloved hands, custody sealed, and then refrigerated until it was taken to the lab.

-A Call For Water Sanity! Monitoring Group

EXCELCHEM

ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 9
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

W 11

ANALYSIS REPORT

Attention: Will Doleman
Will's Plumbing
P.O. Box 3544
Grass Valley, CA 95945

Date Analyzed: 08,04,07,08,09,10/00
Matrix: Water

QA/QC %RECOVERY				
	LCS	LCSD	MS	MSD
Arsenic	110	N/A	102	102
Lead*	87	89	80*	79*
Chromium*	93	101	*	*
Barium	110	N/A	116	116
Nickel*	117	106	*	*
Phosphorus	98	N/A	90	90
Selenium	99	N/A	96	96
Sodium	100	N/A	100	101
Mercury	104	N/A	95	90
Vanadium	100	N/A	106	106
Zinc*	117	106	*	*

*Due to high amounts of zinc and chromium in the sample, the spike valued did not render good recoveries.

W 2

Lab's quality-assurance profile points to that, because of interference, from the levels of nickel and zinc that the chromium is much higher than they reported.

Laboratory Representative

09/15/00
Date Reported

January 2, 2001

To summarize:
High levels of arsenic and iron were found in the "Yellow Boy" mining waste after it was pumped by the Grass Valley Sewage Treatment Facility into Wolf Creek. This is what caused the orange water in Wolf Creek. High levels of fecal coliform, arsenic, and other metals were found in the foaming substance on the surface of Wolf Creek near Allison Ranch Road. Another sample taken in an identical fashion off the water's surface in downtown Grass Valley, California, on Wolf Creek showed contamination from fecal coliform at 16,000 MPN per 100mL; this amount is less than 1/10th the amount that was found in surface foam downstream from the Grass Valley Water Treatment Plant. High levels of phosphorus, calcium, ammonia-nitrogen, sodium, and chromium were also found downstream from the sewage-treatment plant. These items are known sewage-treatment effluent constituents, and at such high levels they must be coming from the plant.

As discussed at the end of the narrative, two more batches of samples were accidentally thrown out by the laboratory, one of which was a white air filter that became black after two short weeks of operation. The air filter was installed at a creek site where two children used to swim. Both of these children died of cancer. Their father, who volunteered to assist and did assist with our project, also got cancer and died making our efforts to complete or continue the project even more difficult. I also got a serious sinus infection while sampling down there, and since then I discovered I was hosting a population of pathogens. Under a doctor's care, I am hoping to recover. Now I follow a much stricter protocol regarding my own safety, and I observe the following suggestions listed on the next page about working around high concentrations of raw sewage.

Will Doleman
A Call for Water Sanity! Monitoring Group

P.S. Here is information that will help you to understand the levels I found on Wolf Creek. Also, I was told by the California State Sewage Treatment Plant engineer that 6 or 7 MPNs per hundred milliliter of total fecal coliform is the M.C.L. for wastewater discharge. Yet our results indicated over 160,000 units of this on the creek's surface. Please share this information with your neighbors. Also, the foam contained a very high level of chromium. Chromium VI evaporates and is common from sewage treatment. I had blood in my nose after sampling the foam (as in *Erin Brokovich*)! Chromium VI gasifies.

The high levels of chromium, calcium, phosphorus and coliform point to that this definitely came from the Grass Valley sewage-treatment facility upstream.

Maximum Contaminant Levels (M.C.L.) for Constituents Listed

CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER	CONSTITUENT	MAXIMUM CONTAMINANT LEVEL FOR AGRICULTURAL USE	MG/L LEVEL FOR SAFE DRINKING WATER
Aluminum	5.0 mg/L	1.0 mg/L	Lead	5.0 mg/L	.015 mg/L
Arsenic	.1 mg/L	.01 mg/L	Manganese	.2 mg/L	.05 mg/L
Barium	unknown	1.0 mg/L	Mercury	unknown	.002 mg/L
Bromate	unknown	.01 mg/L	Nickel	.2 mg/L	.1 mg/L
Chloramine	unknown	4.0 mg/L	Phenols	unknown	.001 mg/L
Chloride	106.0 mg/L	250.0 mg/L	Potassium-Bromate	unknown	.0005 mg/L
Chromium	.1 mg/L for VI	.05 mg/L total	Selenium	.02 mg/L	.05 mg/L
Copper	.2 mg/L	.2 mg/L	Sodium	bad for soil	2.0 mg/L
Cyanide	unknown	.2 mg/L	Vanadium	.1 mg/L	.049 mg/L
Foaming Agent (m.b.a.s. soap)	unknown	.5 mg/L	Zinc	2.0 mg/L	2.0 mg/L
			Total Dissolved Solids	450.0 mg/L	unknown

-A Call For Water Sanity! Monitoring Group

March 12, 2001

My name is Will Doleman from A Call for Water Sanity! Monitoring Group. Our group consists of a handful of volunteers and a number of supporters. We have no affiliation with any other group. We receive no grants or funding from any governmental organization. We have no tax-deductible status, so we have nothing that anyone or any organization can take away. We work on a contribution basis and do sample collections throughout Nevada County and some throughout Northern California. We use a number of certified laboratories to perform our analytical work. Our group has nothing, and so there is nothing that anybody can take away from us. This allows us the freedom to sample water and report what we find without the usual political pressures that might be placed on a monitoring group working under grant funding.

Our present project is to expose corruption in the way our waterways are being manipulated and how chemicals and bacteria are being used to float and momentarily gelatinize toxic substances and move them downstream away from discharge points in such a manner as to fool water monitors by dumping these toxics into our waterways in a way that they won't be detected by normal water monitoring protocols.

Re: Bromate results: I was promised a detection limit of .01 mg/L, but you can see what I got. I was also promised that the total nitrogen would be started before the required analytical testing time was exceeded, but this was not provided either. See W16. Level for Total Nitrogen exceeds that of average for raw untreated sewage.

Analytical Data

Will Doleman

Job Number: A01031W
Page Number: 3 of 10

Lab Sample ID: A01031W-1
Field ID: #401
Date/Time: 10/03/00 1400
Matrix: Water

EPA Category: Conventional Parameters

Parameter	Method	Detection Limit	Analytical Result	Units
Bromate	EPA 300.0B	5000.	ND*	µg/L
Total Kjeldahl Nitrogen	SM 4500-Norg-B	0.7	41.*	mg/L

ND means none detected at or above the detection limit listed.

*The sample was analyzed past the recommended hold time by chemist.

Method: EPA 6010 Date Analyzed: 08/16/00

Client Sample I.D.	#352	
LAB. NO.	W0700168	
ANALYTE	R/L	Results
Iron	0.10	3460
Manganese	0.050	20
Arsenic	0.005	29
Lead	0.005	0.062
Chromium	0.003	0.12
Calcium	0.10	47

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
R/L = Reporting Limit

Arsenic levels here were 2,900 times the M.C.L. (maximum contaminant level) for drinking water, and 290 times the agriculture water-quality goal. This sample was taken of orange water in a land-locked eddy on Wolf Creek downstream from the plant. The sample was taken mid-stream. -W.D.

Laboratory Representative

09/15/00
Date Reported

Cranmer Analytical Laboratory

1188 East Main Street, Grass Valley, CA 95945-5710 (530) 273-7284, FAX (530) 273-9507 E.L.A.P. Certification No. 1936

Wolf Creek Site Downstream from the Grass Valley Urban Sprawl Area Sewage Treatment Plant

Bacteria Report

Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1006602
Date Reported: 07/17/00
Date / Time Received: 07/13/00 10:51

Site Description: #356
Collected By: Will Doleman
Source Type: Suspected Sewage
Treatment: Raw
Chlorine Residual: Could not determine

Sample Number: 1006602-1
Date Collected: 07/12/00 20:00
Set Up Time: 07/13/00 15:20
Elapsed Time: 19.3 Hours
Analysis: Dil. 5x3 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	>160000	SM(18) 9221	MPN per 100mL
Fecal Coliform	>160000	SM(18) 9221	MPN per 100mL

NOTES FROM WILL E. DOLEMAN

Foam on the surface of a waterway downstream is quite common in conjunction with sewage-treatment facilities. Analyses are now being done regarding the ditch foam, and preliminary results indicate bacteriological organisms and their by-products play a big part as far as being some of the substances that are being chemically surfaced to avoid monitoring protocols and then being floated off-site.

Seven to eight units is the M.C.L. for wastewater discharges for industry and municipalities.

> means greater than 160,000 units.

Approved By: Rudolph C. Darling

Cranmer
Analytical
Laboratory

W2

July 17, 2000

1188 E. Main Street / Grass Valley, CA 95945-5710 / (530) 273-7284 / FAX (530) 273-9507 / ELAP Certification No. 1936

ASSESSING WATER FOR SEWAGE CONTENT

Water surfacing downhill from a sewage disposal system or other concentrated source of animal waste may originate from a failing leachfield, a cracked septic tank, leaking sewer lines, or sub-surface run-off from feedlots, kennels, etc. The further away from the source of the waste, the more difficult it is to pinpoint whether the surfacing water is from sewage (including concentrated animal wastes) or from natural springs, leaking water lines, irrigation run-off, etc.

One way to check for sewage is to test for fecal coliform bacteria. These bacteria are found primarily in the feces of warm-blooded animals (birds and mammals, including humans). Fresh sewage can contain up to 1 million or more fecal coliform bacteria per 100 milliliters (MPN/100 mL). However, fecal coliforms may die off once they leave the fecal matter from which they came. After enough distance traveled through the soil, sewage may eventually become diluted and cleaned up enough that it more resembles natural springs. A natural spring may have no fecal coliform, and usually not more than ten or so, depending on the concentration of wild animals in the area and the source of the water feeding the spring. Drinking water has no fecal coliform in the pipes, but may pick up a few while traveling through the ground. Surface water may have anywhere from no fecal coliform (Lake Tahoe, mountain streams) to several hundreds or even thousands (farm ponds with water fowl, creeks in populated areas, etc.).

There are no hard and fast rules as to what fecal coliform result indicates sewage. It is more of a continuum – the higher the result, the more likely that the water is sewage-related. Distance from the potential source must always be taken into consideration in evaluating the results. The most relevent State regulation is that which governs water contact sports, such as swimming. Beaches are posted (No Swimming) if the fecal coliform result exceeds 400 MPN/100 mL From a practical level, then, it is a good policy to avoid contact with water that contains more than 400 MPN/100 mL of fecal coliform.

W4

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

October 4, 2000

Crystal Escarda

Regional Water Quality Control Board

Dear Crystal Escarda:

See last two-years ago data, and some on this year's water-sampling event. This bacterial sample was gathered of surface water on Wolf Creek downstream from the Grass Valley Sewage Treatment Facility. A fresh sample bottle was obtained from Crammer Laboratory of Grass Valley, and the sample was taken by myself. I took the extra precaution of wearing cuff brand-new rubber gloves. I put on the gloves and washed them thoroughly downstream from the sample site in the (water only) to be sampled. If you wish to sample here, you will have to contact me so that I can arrange for permission from the property owner. Also, the property owner wishes to remain anonymous.

Sincerely,

Will Doleman

A Call for Water Sanity! Monitoring Group

cc: Alan Bevin, Sportfishing Protection Alliance

cc: Alan Stahler, Biologist

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

November 15, 2000

Dear Mr. McHenry:

On the back of this sheet is listed some of the chemicals that are and were used in water- and sewage-treatment plants.

If you really think that all a sewage-treatment plant uses is chlorine to disinfect, then I suggest that you study these processes. This list is old; there are many more chemicals on the market nowadays. I believe that it would benefit you to be informed about these things as municipalities cause some of the largest discharges into public waters.

Will Doleman

P.S. I also would like to point out what is obvious, which is that there is a lot of dumping going on here.

(see over)

TABLE 10-1

COMMON CHEMICALS IN WATER AND WASTEWATER PROCESSING

Name	Formula	Common Application	Molecular Weight	Equivalent Weight
Activated carbon	C	Taste and odor control	12.0	n.a.[a]
Aluminum sulfate	$Al_2(SO_4)_3 \cdot 14 \cdot 3H_2O$	Coagulation	600	100
Ammonia	NH_3	Chloramine disinfection	17.0	n.a.
Ammonium sulfate	$(NH_4)_2SO_4$	Coagulation	132	66.1
Calcium hydroxide	$Ca(OH)_2$	Softening	74.1	37.0
Calcium hypochlorite	$Ca(ClO)_2 \cdot 2H_2O$	Disinfection	179	n.a.
Calcium oxide	CaO	Softening	56.1	28.0
Carbon dioxide	CO_2	Recarbonation	44.0	22.0
Chlorine	Cl_2	Disinfection	71.0	n.a.
Chlorine dioxide	ClO_2	Taste and odor control	67.0	n.a.
Copper sulfate	$CuSO_4$	Algae control	160	79.8
Ferric chloride	$FeCl_3$	Coagulation	162	54.1
Ferric sulfate	$Fe_2(SO_4)_3$	Coagulation	400	66.7
Ferrous sulfate	$FeSO_4 \cdot 7H_2O$	Coagulation	278	139
Fluosilicic acid	H_2SiF_6	Fluoridation	144	n.a.
Magnesium hydroxide	$Mg(OH)_2$	Defluoridation	58.3	29.2
Oxygen	O_2	Aeration	32.0	16.0
Potassium permanganate	$KMnO_4$	Oxidation	158	n.a.
Sodium aluminate	$NaAlO_2$	Coagulation	82.0	n.a.
Sodium bicarbonate	$NaHCO_3$	pH adjustment	84.0	84.0
Sodium carbonate	Na_2CO_3	Softening	106	53.0
Sodium chloride	NaCl	Ion-exchanger regeneration	58.4	58.4
Sodium fluoride	NaF	Fluoridation	42.0	n.a.
Sodium fluosilicate	Na_2SiF_6	Fluoridation	188	n.a.
Sodium hexametaphosphate	$(NaPO_3)_n$	Corrosion control	n.a.	n.a.
Sodium hydroxide	NaOH	pH adjustment	40.0	40.0
Sodium hypochlorite	NaClO	Disinfection	74.4	n.a.
Sodium silicate	Na_4SiO_4	Coagulation aid	184	n.a.
Sodium thiosulfate	$Na_2S_2O_3$	Dechlorination	158	n.a.
Sulfur dioxide	SO_2	Dechlorination	64.1	n.a.
Sulfuric acid	H_2SO_4	pH adjustment	98.1	49.0

[a] n.a., not applicable

If these chemicals were used, then you might see high levels of sodium, potassium, calcium, iron, or ammonia in the effluent-discharge water. (See recent analytical.)

See W2, W3 (CR), W5, W6, W7, W9, W10, W11 (CR)

W15

RAW-SURFACE-WATER CRITERIA FOR PUBLIC WATER SUPPLIES

Substance	Surface-Water Criteria	
	Permissive Criteria	Desirable Criteria
Coliforms (MPN)	10,000	<100
Fecal coliforms (MPN)	2,000	<20
Inorganic chemicals (mg/l)		
Ammonia-N	0.5	<0.01
Arsenic*	0.05	Absent
Barium*	1.0	Absent
Boron*	1.0	Absent
Cadmium*	0.01	Absent
Chloride*	250	250
Chromium* (hexavalent)	0.05	Absent
Copper*	1.0	Virtually absent
Dissolved oxygen	≥4	Near saturation
Iron	0.3	Virtually absent
Lead*	0.05	Absent
Manganese*	0.05	Absent
Nitrate*-N	10	Virtually absent
Selenium*	0.01	Absent
Silver*	0.05	Absent
Sulfate*	250	<50
Total dissolved solids*	500	<200
Urany ion*	5	Absent
Zinc*	5	Virtually absent
Organic chemicals (mg/l)		
ABS		
Carbon chloroform extract*	0.15	<0.04
Cyanide*	0.20	Absent
Herbicides		
2,4-D + 2,4,5-T + 2,4-TP*	0.1	Absent
Oil and gases*	Virtually absent	Absent
Pesticides*		
Adrian	0.017	Absent
Chlordane	0.003	Absent
DDT	0.042	Absent
Dieldrin	0.017	Absent
Endrin	0.001	Absent
Heptachlor	0.018	Absent
Lindane	0.056	Absent
Methoxychlor	0.035	Absent
Toxaphene	0.005	Absent
Phenols*	0.001	Absent

* Substances that are not significantly affected by the following treatment process: coagulation (less than about 50 mg/liter of alum, ferric sulfate, or copperas, with alkali addition as necessary but without coagulant aids or activated carbon), sedimentation (6 hours or less), rapid sand filtration (3 gpm/ft² or less), and disinfection with chlorine (without consideration to concentration or form of chlorine residual).

Source: "Raw Water Quality Criteria for Public Supplies," National Technical Advisory Committee Report (a report to the U.S. Secretary of the Interior, issued by the Federal Water Pollution Control Administration, April 1, 1968).

MUNICIPAL-WASTEWATER CHARACTERISTICS

Constituent	(1) Untreated Sewage (mg/l)	(2) Typical Secondary-Treatment Effluent (mg/l)	(3) Actual Quality Applied to Land (mg/l)
Physical			
Total solids	700	425	760–1200
Total suspended solids	200	25	10–100
Chemical			
Total dissolved solids	500	400	750–1100
pH	7.0 ± 0.5	7.0 ± 0.5	6.8–8.1
BOD	200	25	10–42
COD	500	70	30–80
Total nitrogen	40	20	10–60
Nitrate-N	0	—	0–10
Ammonia-N	25	—	1–40
Total phosphorus	10	10	7.9–25
Chlorides	50	45	40–200
Sulfate	—	—	107–383
Alkalinity ($CaCO_3$)	100	—	200–700
Boron	—	1.0	0–1.0
Sodium	—	50	190–250
Potassium	—	14	10–40
Calcium	—	24	20–120
Magnesium	—	17	10–50
Sodium adsorption ratio	—	2.7	4.5–7.9
Biological			
Coliform organisms (MPN/100ml)	10^6	—	$2.2–10^{6}$

W.D.

W16 (cont.)

(mg/L)

levels found on Wolf Creek downstream from Grass Valley's sewage plant area of W.D. water found

41.0 TKN foam

3.1 foam

6.1 water

12 water

16 foam

47 water

38 foam

W.D.

> 160,000 MPN per 100 mg/L

W.D.

Arsenic: 29 orange water mg/L

Levels A,C,F,W,S,N,6, found 12 foam mg/L

21 scum accumulation mg/kg

orange water Foam Scum

Iron 3,460/102/2,640

W.D.

Phenols .035 mg/L

foam turns into dark water before being analyzed

Ammonia as Ammonia-Nitrogen

Ammonia 1.3 mg/L

The high levels of chromium, calcium, phosphorus and coliform p[illegible] to that this

definitely [illegible]

CH 9

C1

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

December 23, 2000

Marilyn C. Underwood, Ph.D.
Staff Toxicologist
Environmental Health Investigations Branch
Dept. of Health Services
1515 Clay St., #1700
Oakland, CA 94612
(510) 622-4500

Dear Dr. Underwood:

I was recently sent a copy of the Lava Cap Lost Lake Superfund Site's *Public Health Assessment* document.

I perform volunteer water monitoring here on Greenhorn Road, where Lost Lake is located, and I have been sampling in around the Greenhorn Road watershed now for more than five years. What really concerns me is that, regardless of what you refer to as a sampling protocol for testing a waterway, each individual protocol contains specific instructions on how the sample is to be gathered.

For example, multiple samples of the water and soils were taken of Lost Lake. But of all the areas of the water that were tested, the water's surface was never taken as a sample. So in a way it could be said that these samples were taken selectively. This method of selective sampling has overlooked a very important part of the water because it is the water's surface with which a person or an animal or an amphibious creature most often come in contact when drinking or swimming.

On the surface of the water in Lost Lake and downstream from Lost Lake we found arsenic levels ranging from 20 to 700 times higher than the levels found in a sample taken by both the state D.T.S.C. and the federal E.P.A. (i.e., via their selective sampling methods) by using samples taken below the water's surface. I raise this point with the hope that you will see the value in what I'm pointing out—that we're not really seeing the whole health picture by not doing our water sampling on the water's surface as well as at the mid-stream point and in sediments. In our five years of monitoring we have seen clearly the politics of arsenic or some other health-harmful metals being either removed from the water to the water's surface, or chemically coagulated momentarily into a semi-solid gelatinous mass just long enough to discharge it into a state waterway. I'm sure that both of us know many relatives and/or friends who are contracting cancer or some other dreadful disease, yet the cause is never said to be from toxic waste! After all this time spent sampling water myself, I am beginning to question the way that we view water toxicity.

Our bodies are more than two-thirds water, and water is the one element that has more to do with our health than any other single environmental element. Please review our group's material openly and hear us out. As you will see when you review the eight sites that we have documented, we don't have an agenda of targeting the Superfund, the Nevada Irrigation District, or the Grass Valley Sanitation District. This is happening on a much larger scale, which is what really makes the matter such a serious health issue, not only for us but for all biological organisms. It is our sincere hope that you will see past the individual skirmishes in which we are involved with dischargers of wastewater at each of these eight sites, and that you will begin to notice bubbles and foaming substances below other sewage- and water-treatment facilities, as well as other industrial establishments, including mining operations.

Many individuals, including myself, have spent small fortunes out-of-pocket testing the water's foaming surface and making these videos because we all believe that this is a very unhealthy situation and a serious problem.

Sincerely,

Will Doleman
A Call for Water Sanity! Monitoring Group

A Water Quality Project from the Bottom Up.

Too many people had died in a relatively short time of the same thing. Myself and my neighbor made a list of those that had died and next to their names we listed their source of home use water. Almost all of them used the Chicago Park-Rattlesnake Ditch (agricultural ditch) for their home use water and drank it. We started the analytical work in 1995 with mid-ditch – MRS.D's site and then moved upstream to the O.R (old res),and the P.D.P. (pre-ditch puddle). Then the green stream ravine which includes the silver stream, asbestos cement pipe, wier box and electric two titled sampling sites although receiving waste from the water treatment facility and they flow directly into the East fork and head waters of Little Greenhorn Creek, (H.E.F.L.G.H.crk.). The land-fill site part of the old reservoir water shed flows into the old Res and then into the P.D.P (preditch puddle) before entering the agricultural ditch. (see map) Six years later the levels are just getting higher but the E.P.A., Water Quality Board, Fish and Game, Wildlife Service, Geological Survey, Highway Patrol dumping unit, County Environmental Health Unit as well as the Water Purveyor have done very little. The Water Quality Board sent out a gentleman who refused to sample the areas of the water which were contaminated even though I told him what I found there. He would steer clear of those areas like he intentionally did not want to find anything. In the 6 year period we spent hundreds calling these people and thousands on analytical work as well as shipping, gloves, film, video production copies to send to the state and county agencies as well as many other different environmental groups. It has become obvious that very few people care if our water, fish, game, and agricultural products are contaminated or not. Myself, I am saddened by the lack of interest in protecting the substance which makes up over 60% of our bodies volume: water.

What is the foam? What is the gelatinous substance?

A local friend of mine told me he read an article in the local newspaper about a company located locally here which had created a toxin cleanup chemical. This chemical, which is being tested on location locally, they claimed will remove mining and other health harmful constituents from the water. (actually only temporarily moving them to the waters surface and to the waterways bottom) He told me it was a two part chemical that one chemical was alkaline in ph and would cause a foaming substance and the other chemical was an acidic in ph. and is a semi solid. substance that would coagulate into a dark gelatinous substance. The two substances I have found fit the consistency and ph description. As well I found surfactant (soap) or sulfate (water treatment chemical) in the foam as well as the other constituents of the water treatment chemical (aluminum potassium sulfate), both sulfate and potassium can become aerated and can cause floating of the metals they compound with. The gelatinous substance as well contains these constituents and resembles aluminum sulfate or (alum) the spent water treatment waste in many ways.

There has been a handful of brave supporters who have assisted me in this effort for water sanity! Thank you all, you know who you are and I will keep your assistance a secret so that you are not persecuted as well as I have been due to our continual insistence to stop the chemically manipulating of our water and us. Lost Lake is in the next watershed over and is being chemically manipulated as well. Parts of this site are overseen by the Federal E.P.A. as a superfund site. The D.S. ditch (west fork of Little Greenhorn Creek) and Allison Ranch Road are but a couple of the many sewage, water treatment plant waste water sites in Nevada County, California. I know that due to my exposure to these toxins being dumped now for such a long time this may cause eventual health problems for myself but I carefully continue to try and stop these serious oversights and useless killing of all living things, people, animal and plants. Now after 6 years I have seen so much corruption in the government agencies that I no longer hold any hope for their assistance. To get the word out to the people, residents on the ditch, people drinking potable water, farmers, ranchers, legislators is in my view the only hope we have to stop this serious exposures to health harmful substances. I continue to spend every cent and hour I can muster up to stop the poisoning of our people as if our lives depend on it because I am afraid that they do. I may have caught phistaria, a water borne microbe caused by polluted water, a couple of years ago and with herbs I have slowed the progress down to allow more time to hopefully complete this project. If I'm unable to, please continue it yourselves for all of our sakes. Thank you for accepting these materials and reading them. Please refer them on to others or mail them back to me when you can.

"A Call For Water Sanity!" Monitoring Group Volunteers needed!!!
Will Doleman
P. O. Box 3544
Grass Valley, CA 95945
530-272-6421

see updated info which follows
3-1-00

PROSPECTOR

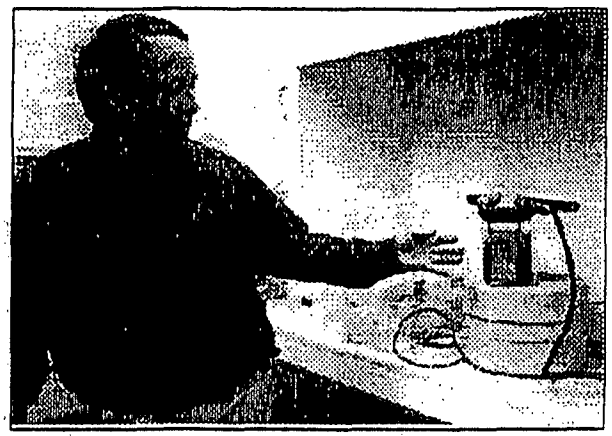
C 4

General

Is it science or illusion?

By Tim Omarzu - Fri, Feb 25, 2000

Two inventors who operate a small laboratory near the Nevada County Airport say they've developed chemicals that exist nowhere else in the world which have enormous potential to cure a variety of environmental ills.



Mike Overton, co-founder of HPT Research, demonstrates how his company uses magnets and electricity as part of the process in removing toxins from water. *Eileen Joyce*

The inventors admit scientists have dismissed their chemical solutions as physically impossible. But the men predict their inventions could create billion-dollar industries with applications that range from replacing herbicides, to cleaning toxic mine waste, to removing nuclear waste from water.

"The potential's unlimited. We're the best-kept secret in Nevada County," said Michael Overton, who with Steve Wurzburger co-founded HPT Research Inc.

The men say they've found a way to produce an acid and antacid unlike any other.

Their "acid replacement solution" has a pH of almost 0, which makes it "21/2 times as strong as the sulfuric acid in your car battery," said Wurzburger.

Yet, "the way we manufacture it, it's no longer corrosive to flesh," he said

To demonstrate, he took a beaker of the solution, inserted a colored test strip to show its low pH, and then tipped it to his lips.

At the other end of the spectrum, the men developed an antacid - which they've nicknamed "special sauce" - that has a pH of 14.

"Pure antioxidant," is how Wurzburger described the concoction, before drinking it. He said, "there's more antioxidant in there than there is in a truckload of betacarotene," a health-promoting chemical found in carrots and other vegetables.

"Chemicals that don't exist anywhere else in the world," is how Wurzburger

described the two solutions.

The chemical formula for the antacid is H4O3, Wurzburger said, and the formula for the acid replacement solution is H9O4.

Those are unbalanced equations, according to standard chemistry, Wurzburger said.

"The chemicals (are) not anything you're going to find in your standard chemistry book," Wurzburger said.

Chris Bishop, a chemistry teacher at Nevada Union High School, said, simply: "I don't believe it. It doesn't add up. I've never heard of such a thing."

"If they've invented a new molecule, you win Nobel Prizes for that sort of thing," Bishop said.

To demonstrate the ability to clean up contaminated mine waste, the company voluntarily set up two truckloads of equipment in November at a portal of the contaminated Mammoth Mine above Lake Shasta.

"The chemistry is so radical. The concept is so radical ... we couldn't get anyone to pay to do it," Wurzburger said.

Currently, powdered lime is used to remove heavy metals from mine water at places such as the Iron Mountain Mine outside Redding.

Lime neutralizes acidic water and causes heavy metals to fall out, explained Jim Pedri, assistant executive officer of the Central Valley Regional Water Quality Control Board in Redding.

Most of the $4 million to $5 million annual cost of cleaning up the Iron Mountain Mine results from hauling off sludge that's created during the process, Pedri said.

HPT claims its process is cheaper because it only produces a fraction of the sludge.

Wurzburger said HPT treated 160,000 gallons of contaminated water at Mammoth Mine, yet only generated four 55-gallon barrels of waste.

"If you use a liming process, it probably would have generated 30 times that," he said.

HPT's process does clean up contaminated water, said Pedri and a scientist familiar with HPT, Bill Glassley, a geochemist at Lawrence Livermore National Laboratory.

But HPT hasn't revealed exactly how it cleans contaminated water, claiming the process is proprietary.

It can't be scientifically proven, until a neutral party reproduces and verifies the

results, Glassley said.

"I think these guys honestly believe they have a revolutionary approach. But I have serious questions that I think should be answered," Glassley said.

"I know there are physicists who raise their eyebrows when they look at (HPT patents) and say, 'Hmmm. That seems to violate basic physics.'"

Wurzburger won't reveal exactly how HPT treats water. He said the company has 10 patents and 12 more are pending.

"(It's) proprietary. But it works," he said. "We don't have to explain how it works. We just have to prove we can do the job."

Peter Menell, a Berkeley law professor who specializes in patents, said "the patent and trademark office doesn't test the inventions that are applied for."

"You can't get a patent that doesn't do what you claim it does," said Menell, who explained the patent office does screen patents and won't approve things such as perpetual-motion machines.

"They're not perfect, but they're certainly careful," he said.

Wurzburger, who learned about chemistry working as a miner for various mines in Nevada and Southern California, said he went to the "school of hard knocks," but also has associate of arts degrees in law enforcement and general education.

Overton has an engineering degree from the University of California at Berkeley.

Wurzburger and Overton have had a lab in Nevada County since 1992, and incorporated their current business in 1996. The company has a dozen full-time employees, Wurzburger said. Sales were about $750,000 in 1999, he said.

The company has more than 170 investors, Wurzburger said. Only qualified investors can purchase shares in the company, said David Melton, the company's attorney. Shares cost $12.50 each, and there's a minimum purchase of 1,000 shares.

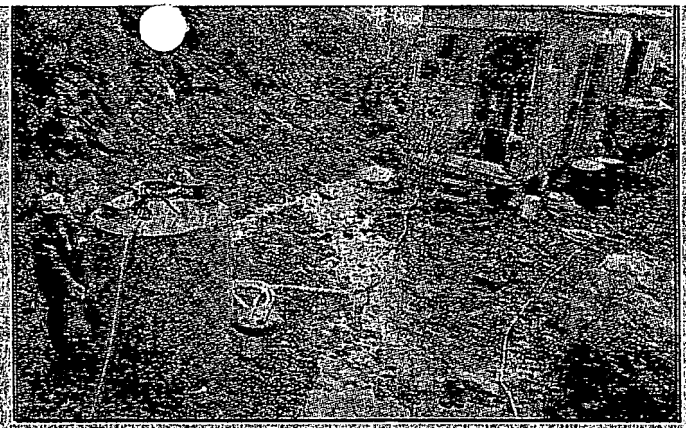
HPT is changing its focus from research and development to manufacturing and marketing, according to a sales brochure.

Because of the similarities in the foaming appearance, the ph, and in the descriptions of the foaming chemical and the semi-solid, we at A Call for Water Sanity! Monitoring Group strongly suspect that these supposed cleanup chemicals are not what they claim they are. Floating toxic substances downstream off one property to another and/or gelatinizing them temporarily to facilitate the taking of a clean sample is not cleaning the toxics up.

Will Doleman

11-18-99

Shaft to carafe



WATER WORKS: Larry Adloff of HPT Research takes a water sample from a holding tank of untreated water from the Friday Louden mine.

Company tests new treatment for mine water

By Kimberly Bolander
Record Searchlight

New recipe for drinking water: Take several thousand gallons of toxic mine water, add some secret ingredients, electrify it, and voila — clean, clear H2O that tastes better than the stuff from your kitchen faucet.

That's what two inventors say, at least.

The new water treatment process is being tested at the Friday Louden mine west of Shasta Dam, and is intended to remove metal residue in water that has collected in Mammoth Mine, said S.R. Wurzburger, principal investigator for HPT Research Inc. of Grass Valley.

"You can taste a big difference. All the metal and all the nasty stuff is gone. It's very pure water," he said.

See *Mine,* back of section

Brad Garrison / *Record Searchlight*

TOXIC SLUDGE: Treated mine water is held up in front of the Friday Louden portal, the lowest tunnel in the Mammoth mine complex. The heavy metals are slowly settling to the bottom, leaving a layer of drinkable water at the top.

MINE: *Site was once source of gold*

Continued from A-1

Mammoth Mine was reportedly discovered in 1882 and worked as a gold mine four miles up the mountain northwest of the dam. The mine and smelter at one time employed 2,300 workers, according to the Dictionary of Early Shasta County History.

Also, untreated water that leaks or overflows from the mines kills off salmon, trout and bass living in Keswick Lake, Lake Shasta and the Sacramento River.

Wurzburger and J.M. Overton, also from HPT Research, invented the process.

The treatment involves pumping water from within the mine into a plastic container, where an electric charge is sent through it. The electricity breaks up the molecules in the metal, causing the metal material to sink to the bottom of a second container and leaving clean water on top.

The metal layer, called "sludge," is pumped out, pressed into a cake, and smoldered back into the solid copper, zinc lead and cadmium forms it started out as.

"So you end up with a little bit of recyclable material instead of tons of hazardous lime material," Wurzburger said.

The current method for reducing the acidic levels of those metals from mine water is by adding powdered lime. The Iron Mountain Mine outside Redding — declared a Superfund cleanup site in 1983 — is one example of mines that use lime. While that practice makes the water habitable for fish, it creates a layer of sludge at the bottom of any lakes and streams the water reaches. The sludge has to be pumped out and put into landfills.

Brad Garrison/*Record Searchlight*

DRINK ME: Tim Hoel, director of research for HPT Research Inc., drinks from a beaker of electrically treated mine water.

"There's no hazardous waste generated by this (new) process. All the lime processes, which everybody else is using, generate mountains of hazardous waste."

S.R. Wurzburger

"There's no hazardous waste generated by this (new) process. All the lime processes, which everybody else is using, generate mountains of hazardous waste," Wurzburger said.

Some chemicals are also added to the mix, which Wurzburger declined to disclose to protect the secret method. But they don't hurt people or animals, he said, and can be found at any drug store.

"Some of it you've soaked your feet in when your feet hurt and some of it you've taken for an upset stomach, and I'll leave it at that," he said.

HPT is conducting its first large-scale test of the process — using equipment costing more than $75,000. A prototype was built three years ago, after the inventors discovered the method by accident.

"We were working on other things when we stumbled on this, and it's taken five years to find out how we got there and how to control it," Wurzburger said.

At the mine site, 100,000 gallons of water have already been run through the process, extracting about 150 gallons of metal hydroxide cake, or packed sludge, that will be recycled instead of contaminating fish life or being buried in the earth.

Only about 14 million gallons are left to That's the estimated amount of bad water still in the mine.

Within the next few days, investigators from the Central Valley Regional Water Quality Control Board in Redding will evaluate the system, said Jim Pedri, assistant executive officer.

"The technology looks like it has the potential to work. But we really want to see it operate and see how it's done first," Pedri said.

If it does work, using electricity instead of lime to treat mine water will be much less expensive, officials said. HPT hopes to have costs figured by next week, Wurzburger said.

"We're only using $1.72 cents of electricity an hour. And that's to treat about 600 gallons an hour," Wurzburger said.

HPT hopes its method can eventually be used to treat water from California's 16,000 mines, and maybe the 60,000 spread across the 11 Western states, Wurzburger said.

Reporter Kimberly Bolander can be reached at 225-8339 or at kbolander@redding.com.

W.D. Notes:

This orange sludge cake that sinks to the bottom of the beaker above resembles in appearance and ph the semi-solid sunk to the bottom of Lost Lake (see Sacramento Bee neighbors' newspaper article). This semi-solid contains incredible levels of arsenic. The federal E.P.A. continues to ignore this orange substance seemingly intentionally. Another chemical substance that this company makes that they call "Secret Sauce" resembles the foaming substance that our monitoring group has documented in the video (*Lost Lake* and *Mid Ditch* as well as on *Wolf Creek*). It also has a similar appearance and ph to "Secret Sauce" discussed in the Nevada *Union* "Prospector" article, "Is It Science Or Illusion?" (2/25/00). Will Doleman

c9

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

December 11, 2000

The *Union*
464 Sutton Way
Grass Valley, CA 95945

re: Clean Water-Bond Being Misused?

We read about monies for testing our water. One might think that finally research might demonstrate how our water gets contaminated so that we can do things differently. Is the way we harvest trees in our forest causing erosion of old-mine tailings into our water? Is acid rain coming from populated areas upwind or are municipalities or other industries impacting our water quality?

It appears instead that research of issues such as these are being discouraged. Instead random sampling that might mean something someday is being done. Monitors are being pressured not to research constituents that might lead to changes in commerce, including forestry, mining, or municipalities. I confronted one monitoring group and was told they won't help us as they are not willing to offend their polluter supporters.

The E.P.A. as well as *some* members of the Yuba watershed overview groups are applying pressure. The intent of many voters, myself included, was for us to do meaningful research that might bring about change in the way we do things.

Our bond funds are being used frivolously in some instances to test for specific substances that are not offensive to commerce, and the tests are being done in a specific fashion to avoid detection of constituents that might offend business entities. Is it not time to stop playing games with our water and expose those who are polluting it? The resultant changes that our businesses make are recoverable. However, if we poison ourselves, we will not recover so easily.

Call your state senators, representatives, and the E.P.A. Tell them you voted and you want your bond money to target *all* water-polluting sources. The problem is not our monitoring groups.

Will Doleman
A Call for Water Sanity! Monitoring Group

C 80

Why Would Someone Poison Our Water?
Is It Not Their Water, Too?
by Will E. Doleman

It is actually very simple and easy to understand: They demand that they have the right to do so because it brings them short-term profit, and they feel it's their right to pollute our water. You see, their needs and wants supersede all other uses of water, and they could care less if any wildlife survives or not. Obviously, if any other life-form or person becomes ill, it's because they are weak rather than admitting that they created the problem by polluting the water.

Let's face it, their ancestors would just take and dump whatever they wanted, so is it not their right to behave like primitives as well? Generally these headstrong close-minded individuals lack the intellect to understand any person or animal other than themselves. The concept of living in harmony and balance with all life is simply met with the unintelligent answer belying their basic attitude: all that matters is myself and my family.

The concept of conserving anything or saving anything is replaced with that of "Use it up; destroy it for our own convenience. It's ours to use as we see fit." They feel that property ownership is for them to do exactly what they want regardless of how much life dies downstream. These organizations, which include industry, municipalities, and other government entities, employ the principle of right to privacy to justify the dumping of toxics into our waters, and their blatant abuse of the right-to-privacy laws threatens not only our health but also our own rights to privacy.

I thought the 2000 U.S. presidential election was very interesting. One candidate spent many times the funds of the other major candidate, yet the other received more votes than the other! The monetarily-poor candidate stood on a platform of public health, and the richer one received large sums of money from industry wanting a reprieve from regulation regarding polluting our air and water. In my view, the poorer candidate would have easily won if it had nor been for his political party's presidential incumbent, who was publicly branded a chauvinistic womanizer and a liar, which turned many women's votes to the other candidate.

So now if the rich man wins, there is a possibility that life itself may get flushed down the toilet. It's very interesting how everything is so interrelated. As president, a person merely has to say "Execute!" and nuclear war occurs that kills everything.

Will E. Doleman
A Call for Water Sanity! Monitoring Group

"While the people retain their virtue and vigilance, no administration, by any extreme of wickedness or folly, can very seriously injure the government in the short space of four years."

-- Abraham Lincoln

A Citizen Monitors
The General-Representative
Waterway Sampling Protocol

Because of modern-day progresses in chemical engineering, and as well a political environment that can at times be anti-environmental, we are witnessing for example the passage of S.B. 649 in California that allows the chemical manipulation of our waterways, and the recent decision of our legislature to decrease funding to the Superfund and other E.P.A. projects, the few personnel that are left in the E.P.A. are being forced to cooperate with polluters, which limits them in their established roles as water-quality regulators. After all, with their staff cut way back as it is now, they really do not have any choice but to cooperate with industry. Now with the emergence of the volunteer monitor who hopefully *does not answer to political heads*, we may be able to help regulate industry.

With this protocol, as well as in general, we see our roles as the volunteer-water monitor as being there to help the E.P.A. and to supply a fresh spectrum of information. With the need for a sampling protocol that will include in its scope aquatic habitat areas of the waterways, this alternative protocol has been written. Instead of one sample of water being taken mid-stream, this protocol includes the average result of three samples that have been taken in three different and distinct fashions, the mid-stream sample information being one of them.

(1) The surface-water sample: An untreated 2"x4" is used across the waterway. It must be long enough to be set at an angle in a portion of the waterway that is wide and where the current is slower. This untreated 2"x4" shall be double-wrapped with a plastic wrap, starting the wrap at the end that will be placed downstream on the stream to the upstream end. There is to be no exposed bolt heads or other protrusions at the 2"x4"'s surface on the skimmer's upstream side. The skimmer shall float, catching the water's surface and bringing it over to the stream side to concentrate the surface from this foam and take your sample. Rubber gloves with cuffs should be used to collect this sample. The gloves and the 2"x4" should be pre-rinsed, the gloves a minimum of four times downstream from the skimmer, and the skimmer shall be in place a minimum of one hour to facilitate rinsing after which time any floating material collected shall be discarded downstream, marking the beginning of the surface-material sample collection.

Depending on circumstances, you might collect foam, scum, leaves, wood, or other floating debris. The debris should be removed with gloved hands. You may gently squeeze the solids and floating debris to leave the foaming substance on the upstream side of the skimmer while discarding the solids downstream. Once the debris has been removed or separated by pushing it into the corner, collect the foam or scum by whichever means seems practical.

It may take a period of time—an hour or more—to accumulate enough material to make collection worthwhile. If neither foam nor scum accumulate after an hour of sample-collection, then skim your sample from the very top layer of water where the 2"x4" comes up to the shore, but far enough from the shore that you don't collect any soil. If foam is collected, then it will need to be de-aerated in order to fit it into the bottle and to obtain a full sample. Thumping on the ground or shaking the bottle are ways of centrifuging the foam in the field. Always place a lid on the container before any shaking or pounding. Always take care to rinse gloves thoroughly before scooping foam again. Position yourself in a way that you do not have to use your hands for support while sampling. Brown, black, grey foam, and concentrated liquid will need to be refrigerated as soon as possible and be handled with appropriate containers. This procedure can take hours in its entirety.

(2) The de-foamacant: Some wastewater establishments are now using a de-foamacant as well as a foaming agent. There will be much less foam, but there will be a clear

substance on the water's surface. You will see the leading up-current edge of it that's getting direct sunlight move away from the skimmer in the shadow on the waterway's bottom below as the clear defoamed foam, now a completely clear scum, piles up. When gathering this substance, you need to skim just the very top 1/16" of the water and move the water container forward as you collect your sample. If you can manage to get just the surface, you may find it more concentrated than the foam in metals, bacteria, or who knows what else.

(3) Seasonal-silt sample: Skim the seasonally deposited surface silt at the waterway's bottom with a stick attached to a non-metallic clean cup, or use gloved and rinsed hands (as I prefer) to scoop up the silty uppermost layer at the bottom. An eddy area where seasonally deposited material collects is an excellent choice. Use gloved hands either to collect the substance or to examine it if, for example, it jiggles like gelatin when you move it suddenly from side to side. In this case, it may be a chemically manipulated substance, sludge, "Yellow Boy" mining sludge, alum, chemical soap, mining waste, or potassium-permanganate waste. Quantitatively inventory the bottom to access the quantity there. It comes in various colors, from lime-green to orange, red, grey, brown, or black.

Obtain a sample that's the most gelatin-like and free of soil. Seasonal silts accumulate in areas where the current may slow and allow for settling. If no gelatinous material is available, try to obtain that light silty material that you knew was not there last year.

I like to use gloves to collect this because then I can gather, jiggle, test, and fill the unpreserved bottle 1/2 to 3/4 full with silt, then fill the remainder with clear unconcentrated surface water. After it settles overnight in the refrigerator, I shake it well and let it settle for exactly five minutes, then pour the watery liquid portion into the properly preserved bottle. Metals will tend to accumulate more on the outside corner of a waterway due to centrifugal force. It's good to use only the upper 50-percent or so of the sample's water in order to prevent soil itself from concentrating into the sample. An approved rinsed glass container is best for collection purposes, unless of course you are running bacteria. Then you will need at least two sterile containers: one for the collection and settling, and the other for the finished sample. This method reflects what portion of these silts is being mobilized into the water both at your site and downstream, as well as indicating how water soluble these silts are.

Sample Data: The results of the three samples should be converted into comparable parameters and then added together and divided by three. Take one-half the detection limit on any single sample that has an analytical result of "none detected" (N.D.) or the "less than" result as your number to add, and then divide.

This protocol is aimed at providing a more complete assessment of a waterway and its aquatic habitat. For example, the water's surface of the waterway is a feeding ground for many aquatic species and for the creatures that feed on them. Frogs and other wildlife live and breathe through their skin on the water's surface. Fish feed on the water's surface and in and around the waterway's silts. Seasonal silts and surface scum and foam become mobilized and rapidly move from one location to another. Insects and other aquatic food are being concentrated by foaming agent, and the insects and the floating undesirables are then being ingested by fish and then by man. Seasonal silts are deposited in agricultural areas during storm events, so some water-soluble forms of toxins could possibly not be diverted for these agricultural uses if a problem could be identified in advance.

-A Call For Water Sanity! Monitoring Group

We the undersigned have read A Call for Water Sanity! Monitoring Group's "General Representative Waterway Sampling Protocol" and feel that it is an acceptable and viable protocol for assessing aquatic habitat in a waterway. We feel that it does a much more thorough job of assessing than previous one-sample protocols, and we feel that it should be an acceptable tool for the volunteer monitor as well as others. We encourage its adoption as a water-monitoring tool by the E.P.A. and other government agencies. Furthermore, we feel it's a much-needed addition to help curb the use of water-monitoring loopholes that polluters are now using by discarding chemically to the surface or into the waterway's silts.

DATE	SIGNATURE	GROUP
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

"Water Sanity!" Volunteer Monitoring Group
Will Doleman
P.O. Box 3544
Grass Valley, CA. 95945

SEEKING RESEARCH ASSISTANCE

"Water Sanity!" (WS) , a volunteer monitoring group, is actively seeking help from the academic community in regards to the very real problem and serious condition of water quality in Nevada County and surrounding areas. For the last five years WS has been testing water in local streams, irrigation ditches and privately owned wells and has documented the presence of heavy metals and bromate many times over existing MCL's (see enclosed test results). We have also shown the potential for potassium bromate to be present as well. This condition has been found to be wide spread. Past and present mining operations have been suspected as a possible cause, though not the sole cause.

This condition of seriously impaired water quality and threats to human health and wildlife have been largely ignored by the regulatory agencies involved because identification and remediation of the problem would cost millions of dollars and would probably be only partly effective. Because this problem is so difficult to fix, government agencies have chosen to pretend the problem doesn't exist. This has left the public in the dark and public welfare unprotected . The foothills of the Sierra Nevada range have in recent years become one of the most popular and fastest growing areas in the state. The water that comes out of the Sierras is the main water source for most of the people living in California. The fact that so many people are being subjected to high levels of known carcinogens is criminal.

It is our hope that someone interested in this field would pursue these concerns as a research project, thesis, ect.

Health Impacts

Though most health concerns rely on anecdotal evidence, the weight of this evidence is very strong. There are numerous cancer clusters that exist within this area and many of these rely on Nevada Irrigation District (NID) water, both treated and untreated. In one particular cluster, there is a 50% death rate from cancer in the last 10 years. All of those involved drank water from NID sources. County wide, there is a high per capita death rate from cancer.

Other anecdotal evidence includes numerous cases of people moving to this area in good health and then experiencing a serious decline. In a couple of cases, these individuals were told to change their water source from NID to bottled and in all cases where this occurred the individuals quickly recovered their earlier good health.

Water Quality

That water quality is impaired is easily identifiable from field observations. Surface water is often discolored, either with red, orange or brown scums, shiny

metallic sheens or multi-colored rainbow effects, similar to patterns seen in parking lots after a rain has dispersed oil leaked from a car.

One of the most pressing concerns is high levels of bromate in surface water, well water and treated water. Of 35 samples of surface water taken between 10/1/99 and 12/17/99, bromate was found in 19 samples to exceed the MCL for safe drinking water with detection levels between 1.4 and 9.4 ppm. The MCL for bromate is 0.01 ppm. During this same period 9 well samples were taken with detections occurring in all samples from unfiltered water and levels as high as 15 ppm. This is 1500 times the MCL. Treated water was also sampled with a detection level of 7.9.

Equally disturbing is the presence of high levels of potassium from these same samples which indicates the potential for potassium bromate formation. We have been unable to test for potassium bromate however because of cost constraints.

Areas of research needed include:

a) identifying cancer clusters, death rates ect. and discovering the cause or identifying possible causes; b) examining analytical data amassed over a 6 year period and creating a sampling plan for future projects; c) to identify sources of the water contamination; d) to research and document the presence of heavy metals in surfactant foam floating on top of water, a gray area of potential contamination that is unregulated; e) to research the effect of past and present mining operations and water quality and the deleterious effect they have on municipal water uses.

The Sierra Nevada foothills are a wonderful place to live, except for the quality of the water. This project has the potential of producing many benefits to anyone who undertakes it. This person or persons would be on the cutting edge of one of the greatest and most damaging forms of pollution in the western US. The scope of the problem is staggering and extends from the top of the Sierras, Rockies and Cascades to the flatlands where the pollutants are being deposited and where most of the western US population resides.

There is also the potential for future employment from this project. There are already numerous Superfund mining sites and many more potential sites. The EPA is and will be seeking technical support from private sources. They are currently assembling a TAG for support in remediating the most recent Superfund site at the Lava Cap Mine, just outside Nevada City.

As the extent of the problem becomes known other agencies will also become involved as well as private organizations. The cost of remediation in the Sierras from just one source, acid mine drainage (AMD), has been estimated to potentially run in the billions of dollars. If the problem is not first methodically investigated and exposed it will continue to get swept under the rug and the harm it produces will continue to mysteriously plaque us for hundreds of years to come.

The Water Sanity! group runs on a shoestring budget but will do whatever it can to help with housing and food and provide gas money. You will also get the rewarding satisfaction of knowing that you have helped further an issue that is in such great need of assistance. You will be helping protect thousands of older retired people now living in the foothills, and to the millions of people downstream who depend on our water to survive and all other living things in between. All interested parties should contact Water Sanity! at 530-272-6421.

Thank You

Edited + Typed By Dan Zimmerman
Ca. Toxics

Lost Lake and All sites

About an Electrical Magnetic charge on water

chemistry

From Richend & Eastman's general chemistry experiment and theory

About Ferro-Cyanide, colors, percitate and cyanides undectable state

Below as in New Pic 25 and others

Iron(III) hydroxide is not amphoteric to anywhere near the same degree, and does not dissolve appreciably in even concentrated base solutions. Analytical separations take advantage of the amphoterism of aluminum and chromium hydroxides.

The tendency to form complex ions is slight for aluminum(III) the hexaquo and hexafluoro ions discussed earlier being the most important. However, iron(II), iron(III), chromium(II), and particularly chromium(III) ions show a much greater tendency toward complex ion formation. With iron, the complexes with cyanide ions as ligands are of particular interest; they are the yellow hexacyanoferrate(II) ion $Fe(CN)_6^{4-}$ (ferrocyanide ion), and the orange hexacyanoferrate(III) ion $Fe(CN)_6^{3-}$ (ferricyanide ion). They are available in the crystalline, soluble, ionic compounds potassium hexacyanoferrate(II) (potassium ferrocyanide) $K_4Fe(CN)_6$ and potassium hexacyanoferrate(III) (potassium ferricyanide) $K_3Fe(CN)_6$. Both ions are useful reagents since each forms a deep blue precipitate (Prussian Blue) when combined with a solution of hexaquoiron ion of the alternate oxidation state:

$$Fe(H_2O)_6^{3+}(aq) + Fe(CN)_6^{4-}(aq)$$
$$Fe(H_2O)_6^{2+}(aq) + Fe(CN)_6^{3-}(aq) \longrightarrow \text{deep blue precipitate}$$

The composition of the precipitate is not known for certain but appears to be KFe(III) [Fe(II)$(CN)_6$] and thus to contain iron in both the +2 and +3 oxidation states. The combinations of $Fe(H_2O)_6^{3+}$ with $Fe(CN)_6^{4-}$ and of $Fe(H_2O)_6^{2+}$ with $Fe(CN)_6^{3-}$ do not yield the blue precipitate, so the reactions producing the precipitate are often used in analysis to demonstrate the presence of the aquocomplexes of iron(II) and (III) in solutions.

The hexacyano complexes of iron(II) and (III) are very stable toward displacement of the cyanide ions by other ligands. No cyanide ion can be detected in solutions of $Fe(CN)_6^{4-}$, and only a barely detectable trace is present at equilibrium in solutions of the iron(III) complex, $Fe(CN)_6^{3-}$. This behavior is in marked contrast to the ease with which water molecules in most ions of the type $M(H_2O)_6^{3+}$ are replaced by hydroxide ions or other ligands, and the "instantaneous" replacement of water molecules by ammonia in such displacements as $Cu(H_2O)_4^{2+}(aq) + 4NH_3(aq) \rightleftharpoons Cu(NH_3)_4^{2+}(aq) + 4H_2O(l)$.

It is customary to distinguish among *stable*, *labile*, and *inert* complex ions of the transition metals. Stable complexes are those

Below as in Picture (New) #5

The tendency of chromium in oxidation state +3 to bond ligands firmly is reflected in the remarkable properties of anhydrous chromium(III) chloride, $(CrCl_3)_x$. This beautiful violet compound, prepared by the action of gaseous chlorine on chromium at elevated temperatures,† is completely insoluble in water, melts only at 1150°C, and sublimes at 1300°C. Its properties are very different from those of the volatile Al_2Cl_6 and Fe_2Cl_6, and reminiscent of the properties of $(AlF_3)_x$ discussed earlier. The remarkable high melting point and low volatility are presumably due to a ligancy of six for chromium that leads to a very stable solid, as is the case with $(AlF_3)_x$. Although iron(III) chloride is similar in properties to Al_2C iron(III) fluoride melts above 1000°C, is only slightly soluble water, and is therefore presumably also a giant polymer of structure $(FeF_3)_x$, in which the ligancy of iron is six.

The only additional oxidation state of chromium that is important is +6 displayed in chromates such as K_2CrO_4, dichromate such as $K_2Cr_2O_7$, and in chromium(VI) oxide, CrO_3; this oxide also called *chromic anhydride* because it reacts with water to give a solution of chromic acid:

$$CrO_3(s) + 3H_2O(l) \longrightarrow 2H_3O^+(aq) + CrO_4^{2-}(aq)$$

Chromates, dichromates, and solutions of the corresponding acid are important oxidizing agents in organic chemistry, being very effective in converting the $\diagdown\!\!\diagup C\!-\!OH$ group to the ketone group $\diagdown\!\!\diagup C{=}O$; they are reduced to chromium(III) in the process. Chromates are prepared by fusing chromite, $FeCr_2O_4$, an important of of chromium, with alkali metal carbonates in the presence of air

$$4FeCr_2O_4(s) + 8K_2CO_3(l) + 7O_2(g) \longrightarrow 2Fe_2O_3(s) + 8K_2CrO_4(s) + 8CO_2(g)$$

The structural relation between chromic and dichromic acid was discussed in Section 14.3 as an example of the use of the hydroxyl scheme. Actually, chromate and dichromate ions come into equilibrium in acidic aqueous solution†:

$$2\underset{\text{yellow}}{CrO_4^{2-}}(aq) + 2H_3O^+(aq) \rightleftharpoons \underset{\text{orange}}{Cr_2O_7^{2-}}(aq) + 3H_2O(l)$$

As predicted by Le Chatelier's principle, the equilibrium can be driven to the left by the addition of base to reduce the hydronium ion concentration, or to the right by adding strong acid.

† The anhydrous forms of Al_2Cl_6, Fe_2Cl_6, and many other transition metal chlorides generally cannot be prepared by heating the corresponding hydrates, because reactions such as $2M(H_2O)_4Cl_3(s) \longrightarrow M_2O_3(s) + 6HCl(g) + 9H_2O(l)$ occur instead.

† $HCrO_4^-$ and $HCr_2O_7^-$ are also present.

Will Doleman
Water Sanity!
Volunteer Water Monitoring Group of Nevada County
P.O. Box 3544
Grass Valley, CA 95945

10-05-99

NWQMC
C/O 6WPC
827 NW 63rd Suite 103
Oklahoma City, OK 73116

Beyond Protocol!

Anybody would be attracted to colored seepages and metallic scum on the surface of a waterway, as we were back in 1995. In documenting this area as a monitor, attention was drawn and so here came the Neighboring Industries Bio-mediator. Now our study changed as the Industry used chemicals to temporarily remove these undesirable materials from the body of the water to the waterway's bottom and then to the surface. Our study shows that the Industry is not in violation of the law perfecting the body of water that now have toxic substances which are much more concentrated in certain areas than before, raising the hazard to health for all biological life. Our in-depth study revealed that what is considered to be a general representative sample of water by protocol, is now due to chemical manipulation a selective sample (see video and back-up materials for details). We really should try to learn from our mistakes, as our environmental protection and governmental water quality agencies make allowances for water; sewage treatment plants and the mining industry; state that we need make these sacrifices of water quality for the community good. This attitude in Europe lead to severe consequences to the point that they now recycle these substances. In fact, the North American continent remains the last continent in the developed world to still dispose of these wastes in different devious ways (see back-up materials).

Water Sanity!

William Doleman

NOTES FROM WILL E. DOLEMAN

P.S. This is about newly discovered toxic-floating substances. Bromate and potassium bromate, a carcinogen five to 5,000 times more toxic than arsenic, can be caused by the water-treatment process as seen in Section 6 of the Water Sanity report. This chemical is highly corrosive and tends to extract metals from solid material with which it may come into contact, such as dirt silt ??? metal and other materials that are harmless in their solid state but deadly as a liquid. A lot of studies have and are being conducted about its occurrence in the treated-water product, but since in North America we dump the water-treatment waste on or into the ground, the outcome is totally random. Contributing factors in its formation are carbon and organic matter commonly occurring in our environment.

* see chapter 9 for Exact Chemical Discriptions

The public-water supply contains more than 19 times the safe level of coliform for bathing.

EH 10

Bacterial Mania

The Chicago Park Rattlesnake Ditch contains more than 19.1 times the recommended level of fecal-coliform bacteria, as well as an average in five tests of 292 to 456 times that of total coliform for safe-bodily contact.

Nevada Irrigation District (N.I.D.) operates the ditch system that is used in approximately 1,000 homes in Nevada County for dishes or showering purposes. N.I.D., which has a reported $48 million in surplus funds, has been in violation of the federally mandated Safe Drinking Water Act for more than 2 1/2 years now and continues to drag its feet about mandating the required bottled-water program to encourage people not to drink the ditch water.

A Call for Water Sanity! Monitoring Group, in cooperation with neighborhood residences, tested the ditch's surface water and found an average of 3,820 M.P.N.s of fecal coliform and 292,475 to 456,475 M.P.N.s of total coliform for five samples gathered on the ditch over a 30-day period. A sample taken six months ago showed a very high level as well, indicating that the origin of the water-treatment, chemical-laden substance downstream from a large N.I.D. water-treatment facility is most probably *not* being caused by a dead animal in the ditch! Although complaints were filed with Nevada County Environmental Health, the county told us that they refused to take any legal action regarding the wealthy municipality's home-use water ditch.

Will Doleman
A Call for Water Sanity! Monitoring Group

SUMMARY

Problem	Contaminated water from August 1995 to 2001
Location	Surface Water on the Chicago Park Rattlesnake Ditch near Greenhorn Road
Average Constituent Level	Total Coliform Found is 292,475 to 456,475 M.P.N.s per 100 ml
Constituent Level of Fecal Coliform Found	3,820 M.P.N.s
Five-Test Average Maximum Safe Level for Bathing or Swimming	Total Coliform 1,000 M.P.N.s per 100 ml; Fecal 200 M.P.N.s per 100 ml
Maximum Safe Level for Drinking Water	0
Maximum Allowed Fecal Coliform Addition for Wastewater Discharge	7 to 8 M.P.N.s per 100 ml

Coming in contact with this effluent may result in a number of illnesses. Please see Bloodborne Pathogens for a further explanation of the illnesses. These infectious organisms enter the body through the hands, eyes, mouth and ingesting the organisms through respiration as either dust, aerosol or mist. There is increased risk in the worker who has cuts or lacerations. Wiping the face with contaminated hands or gloves is particularly hazardous. Wear clothing that covers the exposed part of the body to prevent contact with effluent.

OSHA Standard 29CFR Part 1910.1030 covers all employees who could be "reasonably anticipated", as the result of performing their job duties, to face contact with blood and other potentially infectious materials.

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945

see end of EH 10 for more info

Cranmer
Analytical
Laboratory

October 27, 2000

1188 E. Main Street / Grass Valley, CA 95945-5710 / (530) 273-7284 / FAX (530) 273-9507 / ELAP Certification No. 1936

HEALTH SIGNIFICANCE OF THE BACTERIOLOGICAL EXAMINATION OF RECREATIONAL WATER

The bacteriological examination of recreational water (water used for swimming and other water contact activities) is designed to evaluate the disease-producing potential of the water by identifying the presence and abundance in a water sample of the group of bacteria called coliform bacteria. Most of these bacteria are not themselves a health hazard, but indicate the degree of contamination of the water by surface run-off, decaying vegetation, animal feces, or sewage.

Total coliform refers to the entire group of bacteria known as coliform bacteria. Many of these bacteria are naturally occurring species that harmlessly feed on dead plant and animal matter Fecal coliform is a sub-group of the total coliform group, and is made up of bacteria found principally in the intestines and feces of warm-blooded animals, including humans. *E. coli* is the principal fecal coliform species. Most strains of *E. coli* are harmless, except for rare strains that periodically make headlines when they contaminate meat products.

The Department of Health Services recommends that public beaches meet the following guidelines:

Single sample results should not exceed 10,000 MPN/100 mL* for total coliform, 400 MPN/100 mL for fecal coliform, or 235 MPN/mL for *E. coli*.

The average (based on the log mean) of at least 5 evenly spaced samples in a 30-day period should not exceed 1,000 MPN/100 mL for total coliform, 200 MPN/100 mL for fecal coliform, or 126 MPN/100 mL for *E. coli*.

* MPN/100 mL = Most Probable Number of bacteria per 100 milliliters of water (about 3½ oz).

Cranmer Analytical Laboratory

w.d. Mid-ditch foam

Bacterial Report

1188 East Main Street, Grass Valley, CA 95945-5710 (530) 273-7284, FAX (530) 273-9507 E.L.A.P. Certification No. 1936

Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1007810
Date Reported: 09/25/00
Date / Time Received: 09/19/00 17:33

Site Description: Wastewater #389.
Collected By: not listed
Source Type: Influent
Treatment: Raw
Chlorine Residual: None detected

Sample Number: 1007810-1
Date Collected: 09/19/00 16:00
Set Up Time: 09/19/00 17:47
Elapsed Time: 1.8 Hours
Analysis: Dil. 5x3 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	>160000	SM(18) 9221	MPN per 100mL
Fecal Coliform	8000	SM(18) 9221	MPN per 100mL

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Hosford, John & Elizabeth
13198 Greenhorn Rd
Grass Valley CA 95945

Job Number: 1013543
Date Reported: 02/09/01
Date / Time Received: 02/05/01 10:01

Site Description: NID ditch at Greenhorn Rd.
Collected By: John
Source Type: Suspected Sewage
Chlorine Residual: None detected

Sample Number: 1013543-1
Date Collected: 02/05/01 15:40
Set Up Time: 02/05/01 11:13
Elapsed Time: -4.4 Hours
Analysis: Dil. 5x5 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	240000	SM(18) 9221	MPN per 100mL
Fecal Coliform	1300	SM(18) 9221	MPN per 100mL

Approved By: Rudolph C. Darling

Cranmer Analytical Laboratory

Bacterial Report

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Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1013777
Date Reported: 02/26/01
Date / Time Received: 02/20/01 14:43

Site Description: #455

Sample Number: 1013777-1
Collected By: William Doleman
Date Collected: 02/17/01 21:00
Source Type: Suspected Sewage
Set Up Time: 02/20/01 15:02
Chlorine Residual: None detected
Elapsed Time: 66.0 Hours
Analysis: Dil. 5x3 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	1415	SM(18) 9221	MPN per 100mL
Fecal Coliform	<200	SM(18) 9221	MPN per 100mL

While the other samples were taken of water that condensed off of a brownish-white foaming substance, this sample was a small amount of old dark-brown foam and mostly water. This shows that the fecal and total coliform is mostly concentrated in a clear scum that foams when snagged. This scum, which tends to cling to leaves, gnats, and flies in the waterway, will also cling to a bather or swimmer, which is an unsafe condition. Being that it's on the surface of the Chicago Park Rattlesnake Ditch, which is considered to be the public-water supply for more than 600 residences downstream from the Glenn Pines Road area, N.I.D., which manages the ditch, is and has been out of compliance with the Federal Safe Drinking Water Act in regards to the Chicago Park Rattlesnake Ditch now for more than two and a half years. More on these issues to follow!

-A Call For Water Sanity! Monitoring Group

Rudolph C. Dashney
Approved By:

Analytical Laboratory

Bacterial Report

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Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1014097
Date Reported: 03/12/01
Date / Time Received: 03/07/01 17:40

Site Description: #429

Collected By: Will Doleman
Source Type: Suspected Sewage
Chlorine Residual: None detected

Sample Number: 1014097-1
Date Collected: 03/07/01 16:25
Set Up Time: 03/07/01 17:51
Elapsed Time: 1.4 Hours
Analysis: Dil. 5x5 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	2376	SM(18) 9221	MPN per 100mL
Fecal Coliform	500	SM(18) 9221	MPN per 100mL

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Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1014020
Date Reported: 03/09/01
Date / Time Received: 03/05/01 14:27

Site Description: #428

Collected By: Will Doleman
Source Type: Suspected Sewage
Chlorine Residual: None detected

Sample Number: 1014020-1
Date Collected: 03/05/01 12:30
Set Up Time: 03/05/01 15:34
Elapsed Time: 3.1 Hours
Analysis: Dil. 5x5 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	900000	SM(18) 9221	MPN per 100mL
Fecal Coliform	8000	SM(18) 9221	MPN per 100mL

Rudolph C. Rodriguez
Approved By:

Analytical Laboratory

Bacterial Report

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Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1013893
Date Reported: 03/02/01
Date / Time Received: 02/26/01 12:03

Site Description: #456

Collected By: Will Doleman
Source Type: Suspected Sewage
Chlorine Residual: None detected

Sample Number: 1013893-1
Date Collected: 02/26/01 10:30
Set Up Time: 02/26/01 12:35
Elapsed Time: 2.1 Hours
Analysis: Dil. 5x4 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	>160000	SM(18) 9221	MPN per 100mL
Fecal Coliform	8000	SM(18) 9221	MPN per 100mL

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Doleman, Will
PO Box 3544
Grass Valley CA 95945

Job Number: 1013919
Date Reported: 03/05/01
Date / Time Received: 02/27/01 12:58

Site Description: #457, wastewater

Collected By: Will Doleman
Source Type: Suspected Sewage
Chlorine Residual: None detected

Sample Number: 1013919-1
Date Collected: 02/27/01 10:30
Set Up Time: 02/27/01 13:19
Elapsed Time: 2.8 Hours
Analysis: Dil. 5x5 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	>160000	SM(18) 9221	MPN per 100mL
Fecal Coliform	1300	SM(18) 9221	MPN per 100mL

Approved By:

Customers Respond to Ditch Water Questionnaire

By the second week in April, 712 year-around raw water customers had returned survey forms distributed by NID in March. All forms were due to be returned by May 1.

NID is surveying year-around raw water customers as part of a state-mandated public health program to determine if some customers are using untreated water in their homes.

Early survey returns showed encouraging signs, said NID Water Supt. Dennis Sanders, who is coordinating the program.

Sanders estimates that about 300 of 1,093 customers surveyed may have no alternative source of drinking water and will be participating in a bottled water distribution program.

Once all the questionnaires are in, NID will compile the results and report to the state Department of Health Services. The bottled water program is expected to begin this summer.

Meanwhile, NID will use the survey results to identify areas where it may be appropriate and cost-effective to extend treated water pipelines. This is seen as a permanent, longer-term solution to improving water quality for affected customers.

Sanders said he has talked to many customers about the new public health requirements and that most are grateful that NID lobbied for affordable alternatives — such as bottled water instead of having to drill wells.

"People don't always like new regulations," Sanders said, "but they realize it's not the district; it's the state and federal regulations that we're dealing with."

Surveys Returned *(as of Apr. 7, 2000)*	712
Drinking Water Source	
Well or Spring	65 %
Home Treatment Units	10.5%
Other	9%
Bottled Water	7.5%
No Other Source	5%
Hauled Water	.5%

October 14, 2000

More than 1,000 year-round ditch-water home-use customers need a new source of water for their homes. First, N.I.D. maintains that some ignorant bureaucrats in an office somewhere are trying to tell us what to do in our homes. They continue to maintain that their ditch water is suitable for all uses except drinking water, which is it not. Now they are saying that less than a third of these ditch-water users need another water source. Obviously the story fits their purposes. The Department of Health, which has mandated the bottled-water program, is merely attempting to safeguard your health.

The whole thing began years ago with a meeting of Nevada County supervisors when they discussed and decided with N.I.D. to allow ditch water in homes. Presently close to 1,200 people use this water in their homes in Nevada County year-round. In this part of the country, the rains are fairly continuous during the winter months so that the irrigation season is just that: seasonal.

A Call for Water Sanity! Monitoring Group, which has been researching water-quality issues in the area, has determined that the Chicago Park Rattlesnake Ditch, which is the ditch that is being used for the larger percentage of home-use water, was tested and contains potassium bromate. The level of this very difficult-to-filter substance was more than 60,000 times the safe drinking-water level. This substance can also be absorbed dermally (i.e., through the skin). Ditch water is not safe for home use because of the seepages occurring from water- and sewage-treatment plants, mining, and from other industry. It appears that the agricultural ditch is not even a high enough quality of water for agricultural uses as well.

-A Call For Water Sanity! Monitoring Group

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

August 25, 2000

Department of Health Services Drinking Water Program
601 N. 7th St.
MS 92
P.O. Box 942732
Sacramento, CA 94234-7320

re: "Customers Respond to Ditch Water Questionnaire"
from N.I.D. *WaterWays*, Vol. 21, No. 1

To Whom It May Concern:

What a farce if there are 1,093 customers receiving water from the ditch year-round! It's not because these people are growing rice in the winter during the rainy season. These people are using this water from the ditch in their homes, which even exceeds the water-quality goals for safe agricultural use in some areas. In other areas, at times it contains more than 33,000 times the safe drinking-water level of potassium bromate, a carcinogen that is smaller than one ten-thousandth of a micron. This very small molecule is *very difficult to filter*, and is *absorbed through the skin*, as stated in the attached E.P.A. document.

So this water-treatment effluent in the ditch with this water-treatment by-product, potassium bromate as well at a level of 24.0 to 30.0 mg/L (the m.c.l. for drinking water is .0005 mg/L according to Proposition 65 mandate), is not fit to *shower* in or to wash dishes in, and possibly the only use it is safe for (as I heard Mr. Bierwagen, one of the N.I.D. directors, state) is to flush a toilet!

N.I.D. wishes to dump its wastewater into the ditch and to sell it for home-use water as well. The problem I see with this is that it's killing many of N.I.D.'s older customers, who only know what N.I.D. tells them in their public-relations bulletin. Whether these uninformed older citizens know what's good for them or not, it is the Department of Public Health Services's job, to protect the health of the people of the state of California and to enforce the Federal Clean Water Act. Our group, which has determined the magnitude of wastewater constituents that N.I.D. continues to dump into its ditches from its water facilities, is writing this letter to you, *petitioning you to do your job*. Also, if you do not do your job, we will *petition other groups that also care, to file suit against you for your negligence.*

Sincerely,

Will Doleman, Chair
A Call for Water Sanity! Monitoring Group

cc:
A.W.W. Assn.
Center for Disease Control
Citizens for a Better Environment
Division of Water Quality W.D.C.
Doctors for a Responsible Environment
Environmental Defense Fund
Federal District Attorney
Federal E.P.A.
N.R.D.C.
Rivers Network
Sierra Nevada Alliance
Vice President Al Gore

Mid-ditch and all Nevada County ditch water

Drinkable Ditch Water?

For years now, water in the local ditches has been used in homes throughout Nevada County. At one time, perhaps, this was acceptable, but now with rapid industrial growth and local urban sprawl, as well as M.T.B.E. automobile gas emissions, we are really grateful for the improvements required by the Federal safe drinking Water Act regarding raising the standard for potable water in our homes.

Nevada Irrigation District, which provides both ditch and treated metered water, has been removing and concentrating undesirable materials from treated water, and these have been allowed to seep into ditches now for years. N.I.D. is the leading user of pesticides in Nevada County; pesticides are used for weed control along the ditches.

The demand for treated water to provide the Brunswick urban sprawl area is such that N.I.D. is treating three-to-four times the water the Loma Rica Water Treatment plant was designed to filter. The problem there is that they are unable to handle the undesirable-to-toxic effluent properly, so it ends up in the watershed downstream. Ditch water is dangerous to use in your home; a carcinogen 60,000 times the safe drinking level, was found in one of the more popular home water use ditches here in Nevada County.

We should encourage N.I.D. to pipe treated water, when able, to more homes, as well as to subsidize those individuals on fixed incomes with financial help, rather than waste rate-payers' funds on frivolous lawsuits such as fighting public use of trails along the ditchbanks of county residents' which have been used for years by neighborhoods for recreation.

As voters, another thing we can do is cast our votes for <u>different</u> directors this election.

Will Doleman
"Water Sanity!"
Volunteer Monitoring Group
P.O.Box 3544
Grass Valley, CA 95945

September 12, 2000

To: Jim Chatney
Nevada Irrigation District

From
A Call for Water Sanity! Monitoring Group
P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

Dear Mr. Chatney:

My name is Will Doleman, Dorothy Doleman's son. Remember, I met you in the bank last month. I had also spoken with you back in 1995 with Mr. Southern, your N.I.D. director.

The reason I'm writing is because there is an ongoing problem that is being caused by the way N.I.D. handles the water-treatment process. The reason I'm approaching you is because Mr. Bierwagon refuses to return my calls or answer my letters, and Nancy Weber is too busy to meet with me.

The intent of the laws pertaining to effluent discharges is to protect the beneficial uses of the water and to protect the health of the human population, fish and game, and recreational and agricultural uses of the water. Years ago you referred me to the state agencies, and now after years of dealing with them I can honestly tell you that, whether intentional or not, they are looking right past a very serious problem.

Having relatives who were Catholic and knowing you are a Catholic, I'm approaching you and asking you to be open enough to give me one day of your time so you can see for yourself that indeed if we are to avoid poisoning ourselves we must make a few minor adjustments. Obviously the reason this concerns you is because you work for N.I.D., which is the company that is mishandling wastewater and causing serious health problems.

Regarding other areas over which N.I.D. has jurisdiction (i.e., the ditch-water system), since your company provides homes with their domestic-use water and you are in the business of selling this water to them, N.I.D. has access to these people through having these peoples' billing or mailing addresses. Also, your company delivers a quarterly publication to these people.

Jim, under the Freedom of Information Act, I am asking you to provide me with the mailing addresses of your customers that purchase N.I.D. ditch water year-round. It is important to allow these people access to different viewpoints about using ditch water in their homes. It is only through hearing from a variety of information sources that your year-round ditch-water customers can become educated and better able to make informed decisions about whether or not to continue to use this water in their homes.

I hereby request the addresses of these people, as is allowed me by the Freedom of Information Act. I respect and do not wish to invade anybody's privacy, so I am not asking for their names. I will simply make other information available to these people that will help them view water sources from the eyes of someone who is not in the business of selling them anything. I am open to other ways of doing this as well, such as utilizing a section of your bulletin. You need to understand that, in this case, nobody would have any editing power over such an alternate-viewpoint column, otherwise it would not be an alternate viewpoint at all.

Jim, my intention in this matter is to help and protect the older members of our community, and I believe you know me and know about me enough to know that the information I am offering these older citizens will help them to decide not to drink this ditch water. Being in business and selling water, you have to relate to these people a (cont.) certain way, and you and the N.I.D. directors do this very well. You have brought N.I.D. from the point of bankruptcy to being the second-largest utility in California, as well as solvent. I hope the people of this community appreciate this fact.

I am a volunteer who is interested in water-quality issues, and I feel I have much to offer your customers as well. There are issues to be addressed other than financial issues, and I'm willing to volunteer my time to help address these other issues.

Because of the very high costs of medical care and medicine, the subject of our older-public's health is an issue of great importance. After all if we die, then we can't enjoy our riches, retirement, or prosperity.

I ask you to meet with me and get to know me for yourself. It's only through the changes that N.I.D. chooses to make that things can improve for the very element of which we ourselves are nearly two-thirds comprised—water.

Sincerely,

Will Doleman

Will Doleman, Chair
A Call for Water Sanity! Monitoring Group

as of 3-20-01 have recieved no reply whatsoever

Cranmer Analytical Laboratory

old Res w.p. Pre Ditch Puddle

Bacterial Report

1188 East Main Street, Grass Valley, CA 95945-5710 (530) 273-7284, FAX (530) 273-9507 E.L.A.P. Certification No. 1936

Gabriel, John
Local
CA

Job Number: 1008220
Date Reported: 10/16/00
Date / Time Received: 10/10/00 17:27

Site Description: Creek.
Collected By: not listed
Source Type: Creek
Treatment: Raw
Chlorine Residual: Could not determine

Sample Number: 1008220-1
Date Collected: 10/10/00 14:10
Set Up Time: 10/10/00 17:27
Elapsed Time: 3.3 Hours
Analysis: Dil. 5x3 TC/ FC
Media: LTB/BGB/EC

	Result	Method	Units
Total Coliform	>1600	SM(18) 9221	MPN per 100mL
Fecal Coliform	240	SM(18) 9221	MPN per 100mL

This sample was taken as the Old Reservoir Pre-Ditch Puddle enters the Chicago Park Rattlesnake Ditch. The sample was taken off the water's surface and delivered under Mr. Gabriel's continuing supervision.

-A Call For Water Sanity! Monitoring Group

Rudolph C. Darling
Approved By:

COMMUNITY DEVELOPMENT AGENCY
CODE COMPLIANCE DIVISION
950 MAIDU AVENUE, NEVADA CITY, CA 95959
(530) 265-1222 FAX (530) 265-1272
www.co.nevada.ca.us/cda

Investigation Service Request

PLANNING DEPARTMENT	ENVIRONMENTAL HEALTH DEPARTMENT	BUILDING DEPARTMENT	CODE COMPLIANCE
PHONE (530) 265-1440 FAX (530) 265-1798	PHONE (530) 265-1452 FAX (530) 265-7056	PHONE (530) 265-1444 FAX (530) 265-1272	PHONE (530) 265-1362 FAX (530) 265-1625

Name of Violator: Nevada Irragation District-

Street Address of Violation: chicago park Rattlesnake ditch end of Glenngin Rd a Ditch

City/Town: Grass Valley Ca Assessor's Parcel Number: N. A.

Complaint Types Check categories that apply **AND** include written remarks at the bottom

- ☐ **Grading, or diversion of water flows** without permit
- ☐ **Building** a structure, not exempt by ordinance without a permit
- ☐ **Unsafe dwelling,** Dangerous building
- ☐ **Certificate of Occupancy,** using an unfinished or non approved building
- ☐ **Other dangerous or unpermitted construction** without permits(specify)_____
- ☐
- ☐ **Contractors equipment storage** in non industrial zoning
- ☐ **Two or more dwelling units** in single family zoning
- ☐ **Home Occupation-** Commercial uses in a residential zoning district
- ☐ Non compliance with **commercial site plan**
- ☐ Living in **Travel Trailer**
- ☐ **Site development, easement and setback** violations
- ☐ Other zoning or planning violation (explain below)
- ☒ Unsafe Levels of Fecal Coliform for swimming purposes on ditch wat
- ☒ **Septic system,** none present or surfacing (circle one) No signs posted or warnings issued to ditch water purchasers warni
- ☒ **Water well** violations, lack of water or maintenance required which endangers water potability of unsa
- ☐ **Solid waste** accumulation, **trash** and items which attract rodents or insects on private property. for swim
- ☐ **Health related - restaurants, food outlets, public pools, and consumer protection issues.* ming pu
- ☐ **Hazardous materials - material spills, toxic storage, underground tanks.* poses
- ☐
- ☐ **Abandoned, Wrecked, Dismantled Autos** and parts on private property
- ☐ **Junkyard, Auto dismantling,** or accumulation of other material for storage and /or sale
- ☐ **Abandoned vehicle** Public Road____Private Road_____Private Property _____Without your permission?
- ☐ If this complaint involves vehicles, please provide any **identifying characteristics**

License #	Make	Model	Body type	Color	How long at this location?	Inoperable?

☐ Does this matter involve a vehicle abandoned on your property **without your permission?** yes___ no___

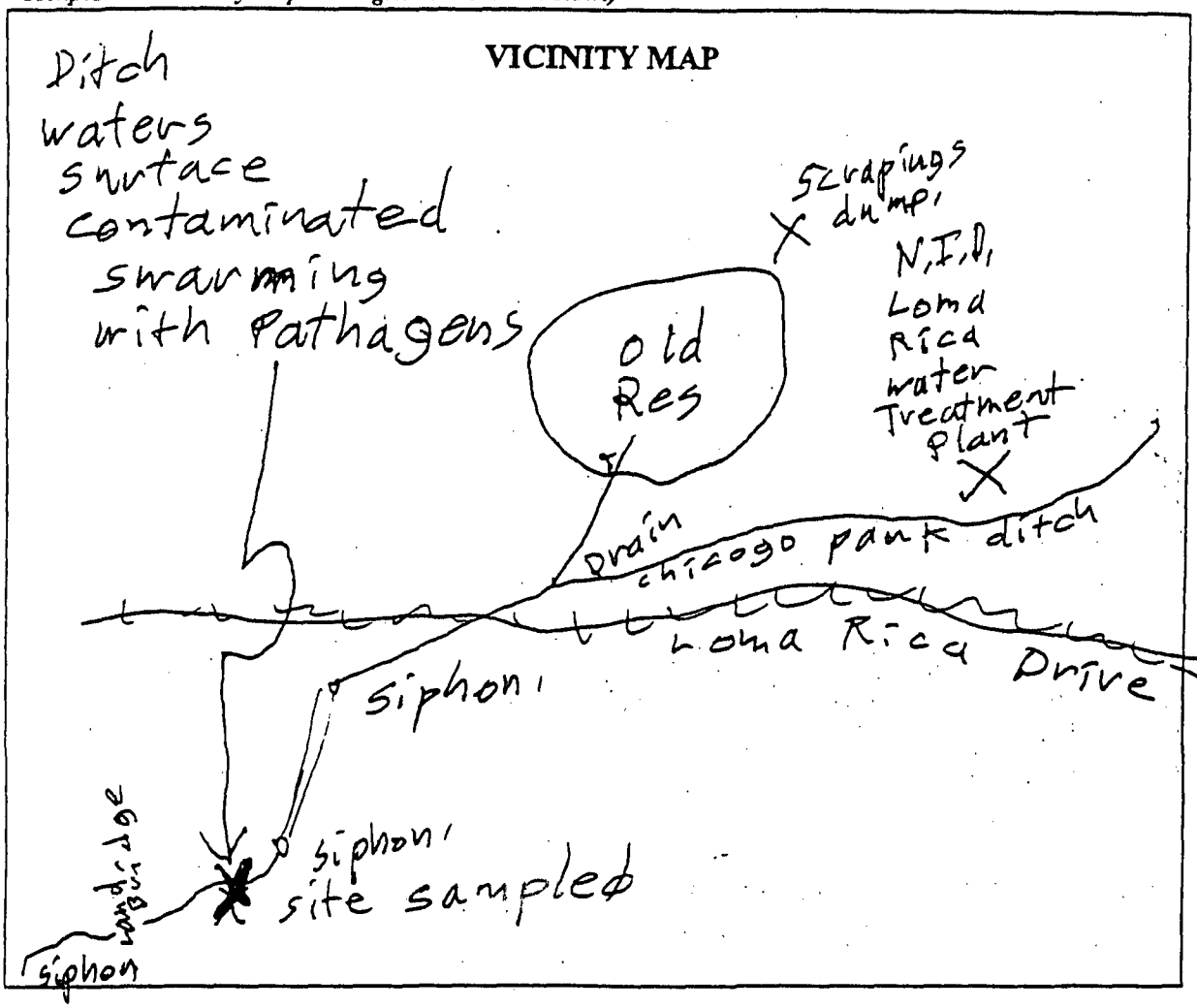
BRIEFLY DESCRIBE THE VIOLATION IN YOUR OWN WORDS: (specific details required)

As stated above average of 4 to 5,000 M.P.N. Fecal coliform bacteria at waters surface over ~~400~~ M.P.N. requires signs be posted and warning of bill to Water Purchasers Unsafe for swimming purposes

**Hazardous material and consumer protection complaints are forwarded directly to the appropriate investigative unit.*

(PLEASE SIGN REVERSE SIDE)

(Complete and accurate information are necessary on both sides of this form for investigation. Please complete the vicinity map and signature block below.)



Records of complaints are considered "acquired in confidence" consistent with Section 1040 of the Evidence Code and Section 6254 of the Government Code.

___ **I request that my identity as complainant be kept confidential. In submitting this complaint, I understand that the County or a court may determine that the disclosure of my name as the person filing this complaint or that the release of this form to the public, is legally required.**

W.D. **I do not request that my identity as the complainant be kept confidential.**

Investigation requested by: Will Doleman Day Phone: 272-6421

Address and/or Assessor's Parcel Number: 13935 Glenn Pines rd.

Signature: W. Will Dole Date: 3-15-01

(This complaint will not be processed unless it is signed. Incomplete or insufficient information may delay or stop this investigation. Should you desire follow-up information on this complaint, contact this Division.)

Rev: 1/00

Working With Pipes Containing Raw Sewage or taking samples of foaming substances.

The term raw sewage may mean raw sewage, sewage sludge or tank waste and these may be encountered when cleaning out stopped-up drains and sewers and also in the repairing and modifying of live sewer lines.

Coming in contact with this effluent may result in a number of illnesses. Please see **Bloodborne Pathogens** for a further explanation of the illnesses. These infectious organisms enter the body through the hands, eyes, mouth and ingesting the organisms through respiration as either dust, aerosol or mist. There is increased risk in the worker who has cuts or lacerations. Wiping the face with contaminated hands or gloves is particularly hazardous. Wear clothing that covers the exposed part of the body to prevent contact with effluent.

To minimize the risk of infection, employers must provide:

1. Suitable personal protective equipment including: watertight gloves (perhaps wearing latex gloves under the leather ones), appropriate footwear, face shields, safety glasses or goggles and respiratory protection.

2. Adequate facilities including clean water, soap, nailbrushes, disposable paper towels, and if heavy contamination is expected, showers.

3. Adequate First-Aid equipment including clean water, sterile wipes and a supply of waterproof dressings.

4. Insure that employees understand the risks and safety precautions through instruction, training and supervision.

5. Areas for storage of clean and contaminated equipment. These should be kept apart and separate from eating facilities.

   a. Equipment should be cleaned with a solution of bleach and water or other disinfectant.

   b. The cable and equipment can be cleaned with a spray bottle containing disinfectant before returning them to the truck ..

6. Laundry service for contaminated clothes.

In this chapter we will look at various activities that Plumbers encounter on the job. Safety is the primary objective of any occupation; therefore, the focus will be on helping recognize the hazards in each activity and how to prevent injury or in some cases, disease. On some jobs, safety and personal protection equipment is necessary. On all jobs, good common sense, attention to detail, proper equipment and a thorough knowledge of the job at hand are necessary to have a safe outcome.

Bloodborne Pathogens

Blood borne pathogens are microorganisms that exist in human blood and other body fluids. The most common are Hepatitis B virus (HBV) and the Human Immunodeficiency Virus (HIV). When body fluids that are infectious enter the blood stream of another person, they can cause disease. Some of the body fluids are: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, amniotic fluid, pleural fluid, saliva in dental procedures and any fluid that is visibly contaminated with blood. The HBV virus is usually found in small quantities in some other fluids such as urine .

These pathogens *cannot* be transmitted from one person to another through casual contact. They are transmitted by sexual contact with an infected person, sharing needles, contact with infected human material (this method of transmission is of particular concern to Plumbers), transfusions, from mother to newborn baby and semen used for artificial insemination.

The likelihood of becoming infected with HIV in the workplace is extremely small. The routes of transmission in the workplace include:

> Needle sticks or skin punctures from sharp items contaminated with blood or other potentially infectious materials.
>
> Extensive contact, splashing or generation of droplets of blood or other potentially infectious materials into mucous membranes or onto broken skin.

OSHA Standard Regarding Bloodborne Pathogens

Even though Plumbers are not in a profession identified as at high risk for bloodborne pathogen transmission, the OSHA Standard 29CFR Part 1910.1030 covers all employees who could be "reasonably anticipated", as the result of performing their job duties, to face contact with blood and other potentially infectious materials.

THE CELL FROM HELL

When JoAnn Burkholder found a deadly organism in Carolina's waterways, her troubles were just beginning • by Meg Grant

Pollutants turn a lowly amoeba into a killer

HOVERING OVER A 10-GALLON aquarium containing millions of the microscopic organisms she had found concentrated in North Carolina's rivers, Dr. JoAnn Burkholder felt her eyes beginning to burn. Without thinking, she rubbed them with a gloved hand still wet with aquarium water. Almost immediately she felt unsteady. Her movements and thinking slowed. An hour or so later her stomach began to cramp and she had trouble breathing. Then, for the next eight days, holed up in her apartment and afraid to report to her job as a botany professor at North Carolina State University, Burkholder felt as if her brain had stopped working. "I remember staring at the words on my computer," she says, "but I couldn't put them into sentences. I couldn't even remember my phone number."

The attack, in January 1993, provided Burkholder, now 43, with the best evidence yet that Carolina waterways were harboring a dangerous microbe. For three years she had been studying Pfiesteria Piscicida, a member of a 450-million-year-old family of one-celled organisms that thrive in the warm, brackish waters of tidal estuaries and cause huge, red-tide-type fish kills. "The toxin that Pfiesteria produces can go right through membranes, ripping and dissolving fish skin," she says. Now she realizes that it could do terrifying damage to people who live and work near microbe-infested waters or eat diseased fish.

Burkholder's finding was not welcomed by North Carolina state officials. According to her they feared that if she could prove that urban runoff and wastes spewed into rivers from pig and poultry farms were creating conditions hospitable to Pfiesteria, it would have a negative impact on tourism and industrial growth. Even as Burkholder battled the effects of her own infection—including eight bouts of pneumonia and a weakened immune system—she found herself at war with government agents responsible for protecting people from such hazards.

Her previous warnings about Pfiesteria in 1991 had been met with "organized indifference," says Burkholder. "State environmental officials acted as if the organism didn't exist." When she persisted, health and environmental agency workers began attacking her professional and personal reputation, she says. "They went so far as to say I was sleeping with my students." Even after her illness, at a March 1994 meeting of advisers appointed by North Carolina Gov. James Hunt, the director of the state's water quality program scrawled "bulls--t" across recommendations Burkholder had cowritten urging that the state restrict land use. A year later, she says, she received two anonymous telephone death threats.

But Burkholder hasn't backed down. "People are getting hurt," she says. Less than a year after her own exposure to Pfiesteria, in fact, her research assistant Howard Glasgow was disabled by the organism. For eight weeks he suffered from oozing skin sores, excruciating headaches and a "mental fogginess" that lingered for months. "I had to learn how to read all over again," he says. And more than 100 fishermen who had apparently breathed in the toxin while working in Pfiesteria-infested waters have reported symptoms—disori-

A The organism Pfiesteria is toxic during at least three stages of its life cycle, including this one, which it reaches when it is preparing to feed on fish.

➤ "I would rather do battle with Pfiesteria any day than with some of the state officials I had to deal with," says Burkholder (in her lab with grad student Brant Touchette).

confusion, memory loss and skin infections—that Burkholder says are the hallmark of Pfiesteria exposure.

In March, with the publication of *And the Water Turned to Blood*, a book on Burkholder's work, information about the Pfiesteria hazard finally began reaching a wider audience. Author Rodney Barker says he first stumbled on the topic in October 1995, when he saw an enormous fish kill in North Carolina's Neuse River during a fishing trip. Research led him to Burkholder, he says, and then to the discovery that North Carolina bureaucrats had indeed turned their backs on a major public-health threat. Though officials continue to deny they have been lax—"We have no solid evidence that Pfiesteria can be harmful," says State Health Director Dr. Ron Levine—Burkholder recently received a state research grant of $250,000 to identify the toxin that Pfiesteria produces and find ways to control the microbe's growth.

The younger daughter of Marcus Burkholder, a retired foundryman, and his wife, Ethelle, a homemaker, Burkholder came by her love of nature while growing up in Rockford, Ill. Taken on wilderness outings by her part-Cherokee father, she learned to track animals in the snow and to identify birds from lost feathers. "By the age of 5," she says, "I knew I wanted to be a scientist." She also learned the importance of not backing down. Her father, who had been raised for a time in an orphanage, would tell her stories about his being bullied by older kids. He always fought back, even when he knew he would lose, "because people would think twice before coming after him again," she says.

After earning an undergraduate degree from Iowa State, Burkholder got a Ph.D. in the water sciences from Michigan State. She was introduced to Pfiesteria in 1989, when a colleague at North Carolina State, where she had been teaching for two years, asked her to help him figure out what was killing the fish he was studying. First she isolated the microbe responsible, then viewed it under a microscope. "I was spellbound," she says. "It had 24 different stages in its life cycle, and I could watch it suddenly enlarge in size and, within minutes, be a totally different shape. If you put a drop of blood on a microscope slide, you could watch it being devoured. I had never known of anything like it."

Scientists had thought the different stages represented discrete organisms; Burkholder was the first to show that Pfiesteria is a single-cell creature that morphs into different shapes depending on its diet. Her success as a researcher, says Dr. Jane Lubchenco, past president of the American Association for the Advancement of Science, is due to her "openness to what the natural world is telling her about how it works." Sometimes, Burkholder realizes, the message is partly: "Be careful." Today her lab is equipped with a complex air-filtration system, and she wears protective clothing and a respirator when working with the organism that once laid her low.

Deeply involved in her work, Burkholder permits herself just two distractions: Peanut, her sheltie, who had been abused by a previous owner, and her boyfriend Mike Mallin, 44, an aquatic ecologist at the University of North Carolina at Wilmington. "JoAnn has a heart for people or animals picked on by larger forces," he says.

Now that one of those forces, the state bureaucracy, has reluctantly come around, Burkholder can focus on this fish-killing microbe. "All I ever asked was that Pfiesteria be treated as a problem that needs to be seriously addressed," she says. "Now we're scrambling to find out how toxic the microbe really is." ■

▲ "I'd like to have 10 more dogs like Peanut," says Burkholder (at her Raleigh home).

Apendix (A.p.)

Berliner LAW OFFICES

Eric L. Berliner
Harold A. Berliner, of Counsel

PO Box 6
Nevada City, CA 95959
Telephone 530-477-9123
Fax 530-273-0303
berliner@jps.net

October 21, 1999

Mr. William Doleman
PO Box 3544
Grass Valley, CA 95945

Dear Will:

Looking at your video, and reading your materials, I can only say that you seem 100% correct, and that the problem is grave and unattended to, except for your efforts.

In the 1960's I succeeded in forcing the NID to put in purification systems, by taking the matter to the California Board of Public Health at Berkeley, however I went as District Attorney, and with the backing of many local medical doctors who had found ditch water made people sick, and it was sold then to homes as domestic supply.

Today I am completely unable to take part in the effort you are advancing, but suggest you speak personally to our Assemblyman and get an opportunity through him to address the Board of Public Health. Other agencies seem to have turned you down, without cause. I have no reason to think that the local District Attorney would help, however we do have a County Health Officer who is a medical doctor, and I am sure you could speak to him and show some of the testing results.

Few attorneys are interested in this kind of case, and I am not sure there are any local ones, although there is a chapter of the Sierra Club here which might be interested.

Therefore I am sending back, under separate cover, the excellent video.

Very truly yours,

Harold A. Berliner

HAB:tm

William E. Doleman
P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

March 5, 2001

Members of the State and Regional Water Quality Board
for the State of California

-re: Administrative Complaint!-

Dear Board members:

Since home-use water in an irrigation ditch is privately owned, it doesn't require a discharge permit to pass wastewater, sludge, or chemical waste into it. Although it may be privately owned and maintained and pass on private property with an easement by the public-water purveyance entity, it still is considered under the Federal Clean Water Act to be a public-water supply.

Being that it is a public-water supply, the law requires that it not receive non-potable inflow, as in backflow and cross-connections. Yet it randomly receives inflow from various sources, and those additions don't even require a discharge permit for this inflow water, which contains chemicals and bacterial sludge as they pass into the public-water supply.

According to any and all health sense, this is wrong. Not only should a permit be required to discharge into a public-water supply, but also whatever's being discharged should be placed under close scrutiny as it is being used in homes for dishes, laundry, and bathing, as well as for agricultural uses. Not even the water purveyor should have the freedom to discharge into the public-water supply without proper permits and administrative scrutiny as they are also under when they treat water for piped and metered potable water-purveying purposes. I realize that time has now passed and that changes are occurring very slowly as far as the Clean Water Act actually being enforced. I feel you will agree it's time to give the old cog a kick and start, in effect, discharge regulations governing home-use waterways if we are going to continue to allow them.

You already know that we feel the water in these open ditches is in no way potable water and should be eliminated as a home-use water supply unless a regulation-inspected treatment facility is installed. However, if you insist in using these ditches for this purpose, then you should at least regulate the passage of dermally absorbed harmful substances, which you cannot do unless you require a discharge permit and set limits and restrictions on what's being discharged into them.

In case you're not convinced, our volunteer group has folder upon folder of material demonstrating conclusively that there are unhealthy discharges accruing.

Will Doleman
Concerned Licensed Plumber;
Chair, A Call for Water Sanity! Volunteer Monitoring Group

P.S. It's killing my customers, and good customers are getting harder and harder to find.

Will Doleman
"WATER SANITY!" Volunteer
Water Monitoring Group of Nevada County
530-272-6421
P.O. Box 3544
Grass Valley, CA 95945

Why would the Nevada Irrigation District discharge all of this alum? It's very simple. They have chosen to try to filter over ten million gallons of water a day (a figure given to me in 1996 during a Sierra Club tour of the Loma Rica Water Treatment Plant by a tour guide who used to operate the plant) in a plant that only filters, by design, *three* million gallons, on average, a day!

Mr. G.B. Tucker of Nevada City (his phone number is listed), several others, and I dug in a spot where I had previously dug, and found a deep injection trench—"King Kong's Drainfield"—going from the bottom of the Loma Rica water treatment plant's backwash pond into a large sand pit on top of a spring! The first time I dug there, I could see the trench coming out from the backwash pond and flowing out to the sand pit below. As soon as Caren Gozzi of Environmental health saw that what I was saying was true, the excavating was shut down, and denial set in immediately.

The County continues to deny that anything is wrong, and N.I.D. continues to dump toxic materials that filter into the neighborhood wells. I will continue to attempt to get the County Supervisors to order the site excavated, and to get permission to do my volunteer monitoring on property belonging to the County, which appears to have a lot to hide.

Some of the stuff I found in the area: 3,800 mg/L of aluminum at one site; 26,000 mg/L of aluminum at another site; 23 mg/L of potassium, 11 mg/L of chromium, .005 mg/L of mercury, 4 mg/L of lead.

As you can see by "The Real Story" enclosed, they have been spending a lot of energy and money on chemicals to wash the toxic materials away, down into the residential area below, to get it off *their* property. This practice has reached the point where agriculture is being adversely affected. On March 31, 1996—"Chromey" Day, as I call it—it was demonstrated that the local hydrology had been affected down to the water table, and the problems these continual dumpings have created was clearly demonstrated. Found here were: 5,490 mg/L of aluminum in water; 8,100 mg/kg of aluminum; .2 mg/L of chromium; and .3 mg/L of copper (all found in alum). On the surface were: 2.2 mg/L of chromium total liquid, and .3mg/L of copper.

In the metal-by sulfate trap two miles downstream at Greenhorn Road and Greenhorn Creek, I found 1,500 mg/L of aluminum in clear creek water with a few grains of sand, and 7 mg/L of copper. The following is a quote from Dan Phillipson, licensed water treatment specialist, whose phone number is listed in the Grass Valley-Nevada City directory: "This Little Greenhorn Creek at Greenhorn Road is the most acidic creek in Nevada County" (1996).

- *Cascade Shores* receives raw water from NID via the Cascade canal to Deer Creek. Water Treatment is provided at NID's Cascade Shores Treatment Plant utilizing pressure sand filters and chlorination. Current capacity is 0.34 mgd. Water production for 1990/91 provided 24.9 million gallons of water to approximately 350 customers.

- *Elizabeth George* treatment plant has a capacity of 10.0 mgd and supplies approximately 3,300 customers with 872.3 million gallons of water per year. NID owns and operates this Plant.

- *Sherwood Forest* has a capacity of 0.17 mgd and is supplied treated water from NID to serve 50 customers disinfected water. Sherwood Forest is in the process of constructing a tie-in to the Elizabeth George system.

- *Lake of the Pines* receives raw water from NID's Combie Reservoir via the Magnolia #3 ditch. Treatment plant capacity is 3.0 mgd. Currently, the system supplies 1,850 customers with an annual average of 317.8 million gallons. Treatment processes include pre-chlorination, upflow clarifier, pressure sand filtration with backwash equipment, post-chlorination and clearwell storage.

- *Lake Wildwood* is supplied water from NID via Newtown Ditch from Deer Creek above Nevada City's wastewater treatment plant discharge. The current treatment plant capacity is 4 mgd and supplies an annual average of 304.5 million gallons to 2,420 customers. Treatment processes include clarification, filtration, pre- and post-chlorination, pH control, and laboratory facilities.

- *Penn Valley* water system is part is Part of the NID and contains three public service wells and treatment facilities with a capacity of 0.5 mgd. 176 customers are supplied 37.1 million gallons annually. Penn Valley Water Treatment Plant is to be abandoned and treated water will be supplied by the Lake Wildwood System.

- *Snow Mountain* facilities include a 1.2 mgd water treatment plant and a400,000 gallon storage tank. Approximately 300 customers are served 66.7 million gallons annually. Treatment processes include flocculation, sedimentation, chlorination and pH control.

- *Loma Rica* system, receives its supply of raw water from NID via the Cascade Canal. The treatment plant incorporates flocculation, sedimentation, chlorination and pH control as treatment processes. Current plant capacity is 8.0 mgd and serves 3,730 customers 761.8 million gallons annually.

- *Green Reservoir Treatment Plant* received 0.1 mgd raw water from NID and served 58 customers an annual average of 17.0 million gallons of water. This facility no longer exists. Water is supplied by the Loma Rica system.

NID also provides water on a much smaller basis to Deer Creek Park Mutual Water Company to augment their water supplies obtained through wells. In 1991, NID

This portion of the County General Plan was researched and written around 1994-95. This is Proof that the plant designed to filter 3 million gallons per day is filtering much more.

10 million gallons per day were filtered here in 1996. Now it's 1999.

Mid-ditch and all sites except D.S. Ditch and Lost Lake W.D.

From the water-treatment plant's own literature

M3 The association between aluminum-containing products and Alzheimer's disease. *J Clin Epidemiol* 1990; 43: 35–44

7. Flaten TP, Glattre E, Viste A et al: Mortality from dementia among gastroduodenal ulcer patients. *J Epidemiol Community Health* 1991; 45: 203–206
8. Driscoll CT, Letterman RD. Chemistry and fate of Al(III) in treated drinking water. *J Environ Engin* 1988; 114: 21–37
9. Doll R: Review: Alzheimer's disease and environmental aluminium. *Age Ageing* 1993; 22: 138–153
10. Is aluminium a dementing ion? [editorial] *Lancet* 1992; 339: 713–714

Water Treatment Plants	Capacity (million gallons per day)
Loma Rica	8.0
Elizabeth George	7.5
Lake Wildwood	4.0
North Auburn	3.0
Lake of the Pines	2.0
Snow Mountain	1.2
Penn Valley	0.5
Cascade Shores	0.34
Sherwood Forest	0.17
Smartville	0.085

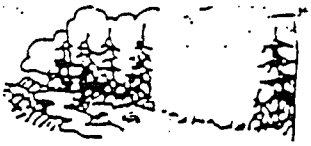
The following information is about this area's water treatment and distribution. (Information provided by the water provider's own information).

The water purveyor manages their own watershed and does not have to buy water from other agencies. The water originates at the upper reaches of the middle and south forks of the Yuba and Bear Rivers, Canyon and Deer Creeks, and several tributaries. The water suppier uses about 500 mi. of canals and 300 mi. of pipeline to transport water to its customers. Some of the flumes and canals were born in the Gold Rush.

More about treated and untreated water in our srea:

The water distributor operates 10 water treatment plants that supply about 2.6 billion gals. or more than 8,100 ft. of treated drinking water per yr. The plants are operated by licensed technicians. The district's water treatment processes include chlorination, coagulation, flocculation, sedimentation and filtration. To treat water in the average yr., they use 380 thousand lbs. of alum sulfate, 170 thousand lbs. of hydrated lime, 33,500 lbs. of chlorine and 5,000 lbs. of soda ash. They do not flouradate their water supplies. They operate a state-certified water lab. at the No. Auburn Water Treatment plant where water samples from throughout the dist. are tested regularly. Average water use among their treated water customers is about 425 gal per home per day.

From "Bonanza", the Sacramento-based Sierra Club newspaper. Summer, 1996.



Polluted Water
Coming Your Way?

A bill that dramatically weakens the enforcement of a tried and true water pollution law will be making a second run at passage in the State Assembly this month. Backed by major oil companies and other business interests, SB 649 amends Section 5650 of the Fish and Game Code, which regulates dumping pollutants into state waters. For over 100 years, the law has made it a crime to place pollutants, such as oil or chemical waste, in areas where they may discharge into State waters. This law has served as an effective deterrent to careless handling of waste and provided citizens some recourse if pollution does occur.

SB 649's amendments to Section 5650 raise the burden of proof that prosecutors must meet to a level that would make it impractical for many district attorneys to enforce the law even when they know about violations. Currently, polluters who introduce substances harmful to fish, plant or bird life into State waters are strictly liable for their actions. SB 649 replaces this clear and proven standard with a nebulous array of hurdles designed to deter enforcement. Prosecutors would be required to demonstrate that the offender "knew or should have known" that the discharge would cause damage and that "significant harm" resulted. These standards would be difficult to prove and would delay any enforcement until after

The bill also adds an exemption for discharges that are permitted or authorized by state or regional water boards or public water treatment facilities. However, discharges that would be immune from Section 5650 under this provision, such as releases from waste water treatment plants, are a significant source of pollution with a major impact on the environment and public health.

The defeat of SB 649 was among our highest priorities last summer. In the face of widespread opposition from law enforcement, fisheries and environmental groups, as well as the media, the bill narrowly failed in the Assembly's Water, Parks and Wildlife Committee last July. However, the bill's author, Senator Jim Costa (D–Fresno), sought reconsideration for the bill, which is scheduled for another hearing on June 4.

Unfortunately, the committee is now dominated by legislators not ordinarily sympathetic to our causes. Intense public pressure gained us some unexpected "NO" votes last year, and we will need to double our effort to derail this terrible bill.

WHAT YOU CAN DO

Contact your Assemblymember and urge him or her to vote "NO" on SB 649. Also consider writing a letter to the editor of your local newspaper, conveying your opposition to SB 649. ■

FPL Food Products Laboratory, Inc.

12003 N.E. Ainsworth Circle, Suite 105 • Portland, OR 97220
Office (503) 253-9136 • FAX (503) 253-9019 • 1-800-FPL-9555

W.D. Chicago Park

ROBRT TOBIS
7008 OLD POND LN.
GRASS VALLEY CA 95949

530-268-0191

W.D. Watered with water five miles or so downstream from the Mid-ditch site purchased at the local health-food store and supermarket.

08/24/00

Re: Results of tests performed on samples received by FPL, Food Products Laboratory, Inc. on 08/14/00.

P.O.# PD $250.00

DESCRIPTION	MINERAL DIGESTION	MANGANESE	COPPER	CHROMIUM	SAMPLE#
#369 FRUIT Chicago Park		0.3 mg/L	<0.05 mg/L	<0.05 mg/L	0814051
#370 JUICE "		2.4 mg/L	<0.05 mg/L	<0.05 mg/L	0814052

W.D. The fruit grown and watered with water downstream from Mid-ditch is six times over the maximum-contaminant level (M.C.L.) for safe-drinking water of manganese.

The apple juice that came from apples that was watered with the water in the ditch downstream from Mid-ditch is 48 times over the M.C.L. for drinking water for manganese.

These levels are listed under the E.P.A. water-quality goals under secondary toxicity levels. In other words, it probably won't kill you immediately; so maybe it's okay. Don't believe it!

THANK YOU.

FPL Food Products Laboratory, Inc.
12003 N.E. Ainsworth Circle, Suite 105 • Portland, OR 97220
Office (503) 253-9136 • FAX (503) 253-9019 • 1-800-FPL-9555

ROBERT TOBIS
1008 OLD POND LN.
GRASS VALLEY CA 95949

08/24/00

530-268-0191

Re: Results of tests performed on samples received by FPL, Food Products Laboratory, Inc. on 08/14/00.

P.O.# PD $250.00

DESCRIPTION	SELENIUM	*COBALT	SAMPLE#
#369 FRUIT	<0.05 mg/L	<0.05 mg/L	0814051
#370 JUICE	<0.05 mg/L	<0.05 mg/L	0814052

NOTES FROM WILL E. DOLEMAN

Since the sample was not done as a total analysis, as was the last one, but just the liquid portion was analyzed, the chromium, copper, and nickel were not in this analysis. However, people drink and eat this portion. As it says on the apple-juice bottle, shake before using!

Will Doleman

A Call for Water Sanity! Monitoring Group

Mid-ditch and H.E.F.L. Greenhorn Creek and the
W.D. Old Yuba River's Pre-Ditch Puddle

November 12, 1999

Nevada County Planning Dept.
County of Nevada
950 Maidu Avenue
Nevada City, CA 95959

Gentlemen:

Lacking a complaint form, please consider this letter a formal complaint regarding the discharge of hazardous silts and foaming agents (M.b.a.s.) from the old Yuba Reservoir located on the Nevada County property at the east end of Airpark runway.

As you know, this part of the Airpark was once an old dump. Again, in 1996, hazardous material was dumped into this reservoir by the Department of Transportation, and many thousands of dollars of taxpayers' money was spent to remove it. The west end of the old res. has been the site of a massive landfill by the Nevada Irrigation District since 1972. They have been dumping the sludge from the undesirable materials being removed from three, to around 10, million gallons of water a day, up to 1996.

Geologically, the Yuba Reservoir is the last low wetland area that drains the vast industrial expanse of the whole north side of Loma Rica Drive, which used to be reservoirs before being filled with fill material. The history of this reservoir dates back to the 1800's, when it was used for mining purposes and was used to power the Pelton wheel at the North Star Mine.

The outlet at the bottom of the reservoir allows heavy metals to escape directly into the Chicago Park ditch, the water from which is used in hundreds of homes downstream, as well as depositing hazardous silts on private property downstream. It is the view of the Water Monitoring Group that all this leaves the County government open to litigation. We wish to try to mitigate a solution to this problem, thereby improving the quality of flowing water in our watershed.

We are not in a position to guarantee the County that there will still not be litigation by private parties, but we believe repairing this ancient drain system in the bottom is in order and is a step in the right direction.

Yours truly,

Will Doleman
"Water Sanity!" Water Monitoring Group

Mid-ditch

COUNTY OF NEVADA
Community Development Agency
Code Enforcement Division
950 Maidu Avenue, Nevada City, CA 95959
(530) 265-1362

Investigation Service Request

(Complete and accurate information are necessary on both sides of this form for investigation. Please complete the vicinity map and signature block on backside)

Name of Violator: Nevada County Airport

Street Address of Violation: _____

City/Town: Grass Valley Assessor's Parcel Number: _____

Complaint Types Check categories that apply AND include written remarks at the bottom

- [X] **Grading, or diversion of water flows** without permit
- [ ] **Building a structure, not exempt by ordinance without a permit**
- [ ] **Unsafe dwelling,** Dangerous building
- [ ] **Certificate of Occupancy,** using an unfinished or non approved building
- [X] **Other dangerous or unpermitted construction** without permits(specify) Broken Valve in proper drain design.
- [ ]
- [ ] **Contractors equipment storage** in non industrial zoning
- [ ] **Two or more dwelling units** in single family zoning
- [ ] **Home Occupation-** Commercial uses in a residential zoning district
- [ ] Non compliance with **commercial site plan**
- [ ] Living in **Travel Trailer**
- [ ] **Site development, easement and setback** violations
- [ ] Other zoning or planning violation (explain below)
- [ ]
- [ ] Septic system, none present or surfacing (circle one)
- [ ] Water well violations, lack of water or maintenance required which endangers water potability
- [ ] Solid waste accumulation, trash and items which attract rodents or insects on private propert
- [ ] **Health related - restaurants, food outlets, public pools, and consumer protection issues.*
- [X] **Hazardous materials - material spills, toxic storage, underground tanks.*
- [ ]
- [ ] **Abandoned, Wrecked, Dismantled Autos** and parts on private property
- [ ] **Junkyard, Auto dismantling,** or accumulation of other material for storage and /or sale
- [ ] Abandoned vehicle Public Road____Private Road_____Private Property _____Without your permission?
- [ ] If this complaint involves vehicles, please provide any identifying characteristics

License #	Make	Model	Body type	Color	How long at this location?	Inoperable?

- [ ] Does this matter involve a vehicle abandoned on your property without your permission? yes___ no X

BRIEFLY DESCRIBE THE VIOLATION IN YOUR OWN WORDS: (specific details required)

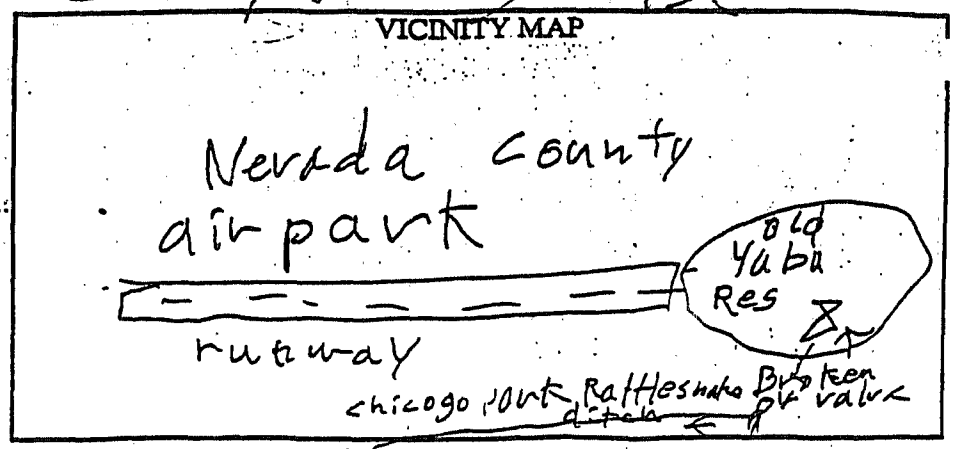
Valve Broken in Bottom of old Reservior, undisirable - materials Leaking out into water shed & downstream

**Hazardous material and consumer protection complaints are forwarded directly to the appropriate investigative unit.*

(PLEASE SIGN REVERSE SIDE)

Every thing else

VICINITY MAP



added
↓ complaint was not responded to as of 1-17-01 w, P,

FOR STAFF USE ONLY

CE Case Number: _____

Code Sections Violated: _____ Zoning: _____

This case is being referred to your Department for investigation, per Resolution 86-38. Please follow established policies within your Department for contacting the violator, inspecting the property, determining and giving proper notice for provable violations of the Land Use and Development Code.

Date referred _____

Environmental Health ___ Building Inspection ___ DOT ___ Other: ___

Date report due to the Code Enforcement Division: _____

Special Instructions for Departmental Investigation:

Date report of Departmental report received: _____

Records of complaints are considered "acquired in confidence" consistent with Section 1040 of the Evidence Code and Section 6254 of the Government Code.

___I request that my identity as complainant be kept confidential. In submitting this complaint, I understand that the County or a court may determine that the disclosure of my name as the person filing this complaint or that the release of this form to the public, is legally required.

_X_ I do not request that my identity as the complainant be kept confidential.

Investigation requested by: Nevada County Env'n Health Day Phone: 272-6421
Address and/or Assessor's Parcel Number: _____

Signature: William Dolan for "water Sanity" / volunteer monitoring group Date: 1-14-00

(This complaint will not be processed unless it is signed. Incomplete or insufficient information may delay or stop this investigation. Should you desire follow-up information on this complaint, contact this Department.)

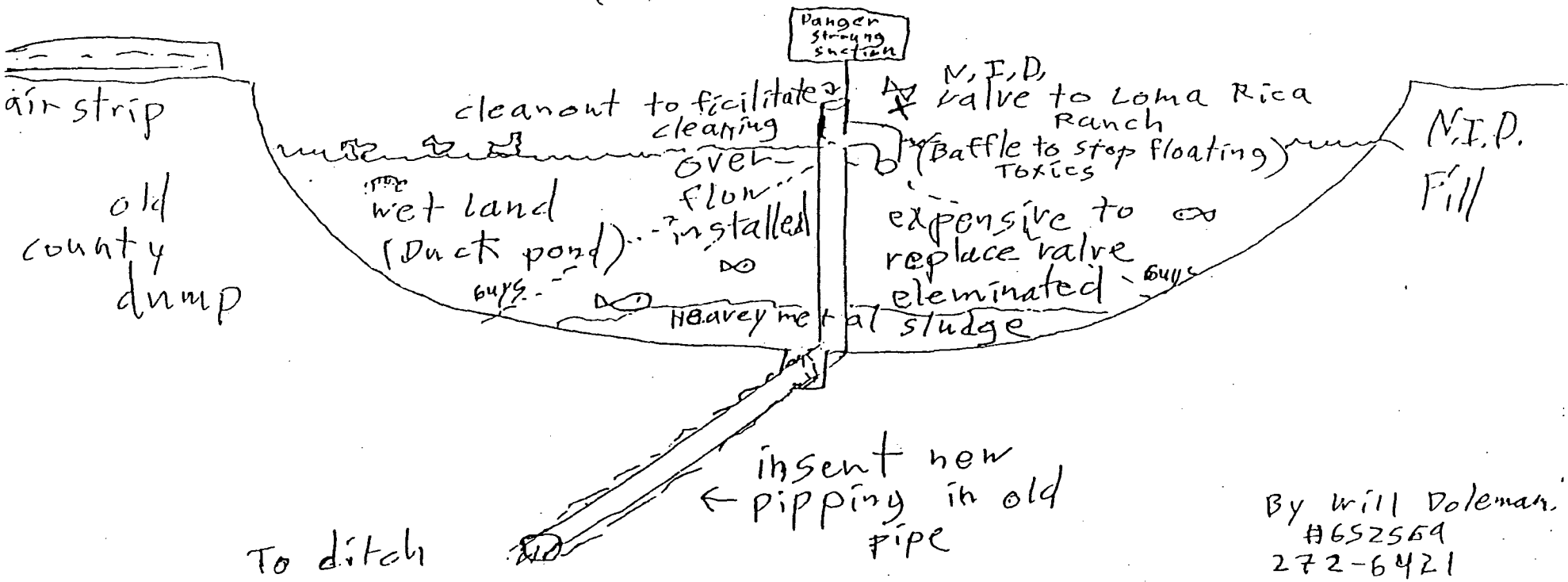
compiref.doc 12/97

Ca. State Plumbers License # 652564

an inexpensive plan to repair broken valve at the bottom of the old Yuba reservoir

11-10-99

For professionally drawn plan consult Harald Wolfe or Tom Lott (Nevada co. engeneering) (530) 265-6911



By Will Doleman
#652569
272-6421

Mining Tailing Filled Reservoirs?
Now County Airpark!

Some Evidence points to high levels of lead and arsenic leaving our county's Airpark property in surface and ground waters.

Zelna Morrow , Airpark Administrator, and Tracy Gidell of Nevada County Environmental Health turned down Will Doleman's :"A Call for Water Sanity!" Monitoring group's offer to do monitoring on Nevada County Airpark property. Zelna also blocked a request for an appeal where the group was going to make a request of the Counties Airpark commission, asking permission to do monitoring.

The monitoring group does random testing of surface, ground water and silts in the Nevada County area and they feel that there is no reason that they should be denied permission to sample water on public property as well. Apparently both the county and N.I.D. have much to hide as they refuse to give Mr. Doleman or his group permission to sample. This group is not the only one N. I.D. doesn't want to sample water on their property. Will says he heard that they had denied the Federal Geological survey team permission to do sampling in around their Loma Rica water treatment plant early last year as well.

Private property laws were created to provide individuals with a right to privacy, not to provide public entities with privacy to discard toxins into our watershed. The County and N.I.D. ,using these rights to privacy this way is a blatant misuse of the statute. A couple of years ago our monitoring group discovered that N.I.D. had a deep injection trench from their settling pond which went onto county property. As soon as the group accompanied by Alan Stahler, G. B. Tucker, Peter Van Zant and Tracy Giddell dug down and found the trench as it came out from under the water plants fence, the Environmental Health unit shut the operation down. Multiple requests have been made and denied to do further excavation. But the county maintains that the large rock drain field is a chain drain even though Will Doleman, of the local monitoring group, who had talked to several civil engineers in regards to the settling pond, was told by all of them that the settling pond berm (a lined pond perimeter dirt retaining wall) was no place for a chain drain as it's supposed to be an evaporation pond! A Loma Rica Dr. neighbor told us that they had dug down five feet and found a porous layer of lava. On Greenhorn Road, water down gradient from this N.I.D. treatment plant and all the way out to the Cedar Ridge Y, a large percentage of the residential wells get their water from this volcanic lava. Will was told by a geologist that the lava rock is a porous geological structure and would filter out very little. Will stipulates that it's not right to take these toxic undesirables, removed from millions of gallons of water treated daily, and place them in an area where they might flow into down gradient wells. We don't feel this toxic waste means of disposal is a legitimate business practice. Besides, and more important, lives are in danger from this continuing means of disposal.

Will Doleman
"A Call For Water Sanity!" Monitoring Group
P. O. Box 3544
Grass Valley, CA 95945

Volunteers welcomed!
Call 530-272-6421

Laucks Testing Laboratories, Inc.
Since 1908
340 South Harney St., Seattle, WA 98108 (206) 767-3060 FAX (206) 767-5063
Chemistry, Microbiology, and Technical Services

06 is Sample #261
W.D. 03 is Sample #258
07 is Sample #262

W, P, The Old Yuba Reservoir Pre-Ditch Puddle

The county hired a bio-mediator to clean up the old reservoir, which dumps into the old reservoir, Chicago Park Rattlesnake Ditch. Upon hosing the old reservoir, a portion stuck in the old reservoir's pre-ditch puddle. This black, gelatinous material was analyzed below.

CLIENT : Will Doleman

Certificate of Analysis

Nevada Irrigation District's water-treatment undesirables fill about 25-percent of the reservoir upstream from the Chicago Park Rattlesnake Ditch.

TESTS PERFORMED AND RESULTS:

Analyte	Units	03	~~06~~	07
Aluminum (Method 6010)	mg/L		6000	
Arsenic (Method 6010)	mg/L		15. U	
Barium (Method 6010)	mg/L		31.	
Chromium (Method 6010)	mg/L		4.6	
Copper (Method 6010)	mg/L		10.	
Lead (Method 6010)	mg/L		17.6 U	
Manganese (Method 6010)	mg/L		84.	
Mercury (Method 245.3)	mg/L		0.055	
Nickel (Method 200.7)	mg/L	0.01 U		
Potassium (Method 200.7)	mg/L	0.61		
Potassium (Method 6010)	mg/L		87.	
Sodium (Method 6010)	mg/L		76. U	
Sulfate (SO4)	mg/L			
Total Solids	%		14.3	
Vanadium (Method 6010)	mg/L		1.2	
Zinc (Method 6010)	mg/L		27.	

W.D. foam on surface

W, D. Black gelation foam on surface

(CR) if VI Over and above the primary M.C.L.s set by the E.P.A. and the Department of Health. And one of the 17 CAM (Calif. E.P.A.) toxic metals.

High to very high levels of secondary metals or compounds.

W.D

Unhealthful if combined with bromate

foam-surface sample

1,U

in excess of California's agricultural water-quality goals

The narrative and chain of custodies are available up request

W.D.

W.D. The Narritive, chain of custody is available upon request.

Mrs. D's 300-Ft.-Deep Well

This well is located down-gradient from the ditch that is used for dumping by the water-treatment plant. According to its own literature, from 1972 until 1996 the plant dumped an average of 150,000 lbs. per year of water-treatment by-products such as aluminum sulfate in the plant area up-gradient. Although now the plant still dumps these chemicals, it now hauls some of them away. The estimated level over the maximum contaminant level for safe drinking-water level for this well water is 840 to 6,800 times over for potassium bromate and 4.6 times over for arsenic. Mine tailings were used up-gradient to fill in a number of large reservoirs, and the county now owns this property—the Nevada County Airpark.

September 19, 2000: To yet be assembled are results showing in the year 2000 the complete and total contamination of the water table down to 300-ft. depth.

Other items yet to be completed:

To add the 1997 and 1998 potassium bromate results to the beginning of the KBR[03] Analytical Data Sheet as well as Alan Stahler's third-party results. New results are finally coming in, along with more background information regarding Wolf Creek, the Mid-ditch site, Lost Lake, the old Yuba reservoir pre-ditch puddle, and a new-mining site. There will be a biological study of the foam. Results already indicate that the white foam carries more than 160,000 units of total coliform and total fecal coliform on these waterways and on the surface of the Chicago Park Rattlesnake Ditch. The research continues.

Identical-looking foam was gathered and seen on mid-ditch at Lost Lake on the D.S. Ditch as well as Little Greenhorn Creek, the Lower Yuba River, the old Yuba reservoir pre-ditch puddle, Greenstream Ravine, the east fork of Little Greenhorn Creek, the upper and lower Bear River, the Auburn aqueduct, the north and middle forks of the American River, Wildwood Creek, Deer Creek, and other various rivers and waterways.

I was told by a water-agency director that the substance (foaming agent) was being used in their sewage-treatment triciary pond, and that because of the unsightly appearance of the foam they were adding a defoamicant (clear death). Pig and chicken manure in the waters of North Carolina caused the mutation of a microorganism to create the cell from hell. This may be occurring here. Perhaps the second five years will reveal this.

The information enclosed represents the first five years, the end of 1995 through 2000, of A Call For Water Sanity's! research work. Keep this folder as we will be sending you "Wolf Creek" and editing other issues as we uncover more information.

More will be coming on airborne toxics. I have yet to find a report on Mid-ditch of 82 mg/L of sulfate, and another report of the same metals in the foam that were caught mid-stream as they emerged from the bursting bubbles on the alum at the ditch bottom and headed for the water's surface. The same metals were found here that were found in the foam showing the alum-to-surface scum to foam chemical reaction.

-A Call For Water Sanity! Monitoring Group

alt. Al+++ ← W.D.?

Mrs. D.'s well is located nearby.

BSK ANALYTICAL LABORATORIES

W.D.— The water in this ditch is used in more than 600 homes downstream and is used for dishwashing, showering, and agricultural uses. Potassium bromate can be a water-treatment by-product. A plant is located upstream.

Certificate of Analysis

Will Doleman
Doleman, Will
P.O. Box 3544
Grass Valley, CA 95945-

Bromate ... found at the same site in ditch. This adds up to 480 mg/L of potassium bromate, which is 960,000 times the safe Proposition 65 drinking-water level.

W.D.

This substance is also absorbed dermally.

Alum or

W.D.— Silt foam pit.

Submission Number	: 9701000009	Sample Date	: 12/29/96
Lab Number	: 10963	Sample Time	: 14:50
Project Number	:	Sample Type	: LIQUID
Project Desc.	:		
Sample Description	: Mrs. D's Ditch 9A	Report Issue Date	: 01/10/97

Method	Analyte	Date Prep.	Date Anal.	Result	Units	DLR	Dil
EPA 200.7	Lead (Pb)	01/07/97	01/07/97	23	mg/L	0.05	40
EPA 200.7	Potassium (K)	01/07/97	01/07/97	240	mg/L	1	40

W.D.— 240 mg/L of potassium was found here as well!

SAMPLE ID: 224

BROMATE EPA 300.0	BROMATE	260	mg/L	0.0010

There is a good possibility of potassium bromate here at a level as high as 460,800 times the safe maximum-contaminant level (M.C.L.) for drinking water.

BROMINE COMPOUNDS (INORGANIC)

CAS Registry Numbers: Bromine: 7726-95-6 Br
Potassium Bromate: 7758-01-2 $KBrO_3$

Molecular Formulas: Br_2
BrO_3K

Bromine is a dark reddish-brown, volatile, diatomic liquid, and can also occur as rhombic crystals. It has a suffocating odor, is corrosive, and vaporizes rapidly at room temperature. Bromine is a strong oxidant especially in the presence of water. It is freely soluble in water, alcohol, ether, chloroform, carbon disulfide, carbon tetrachloride, and concentrated hydrochloric acid (HSDB, 1993; Merck, 1989; Sax, 1989).

The most common inorganic bromides are sodium, potassium, ammonium, and calcium bromides. Potassium bromate is a common inorganic bromide and for the report, was used as an example for the group of bromine compounds. Potassium bromate appears as white or colorless, trigonal crystals or crystalline powder (HSDB, 1993). It decomposes at 370 °C releasing oxygen and is a powerful oxidizer. Potassium bromate is soluble in water and almost insoluble in alcohol (Merck, 1989). Methyl and ethyl bromides are among the most common organic bromides.

Physical Properties of Bromine and Potassium Bromate

Synonyms for bromine: bromine solution
Synonyms for potassium bromate: bromic acid, potassium salt

	Bromine	Potassium Bromate
Molecular Weight:	159.82	167.01
Valences:	1 to 7	
Boiling Point:	59.47 °C	
Melting Point:	-7.25 °C	350 °C
Vapor Density:	5.5 at 15 °C (air = 1)	
Density/Specific Gravity:	3.12 at 20/4 °C (water = 1)	3.27 at 17.5 °C (water = 1)
Vapor Pressure:	175 mm Hg at 21 °C	

(Merck, 1989; Sax, 1989)

SOURCES AND EMISSIONS

A. Sources

Bromine is used as an analytical reagent and chemical intermediate for bromine compounds, in non-drinking water disinfection, bleaching fibers and silk, the manufacture of medicinal bromine compounds and dyestuffs, as a fire retardant for plastics, in photography, for shrink-proofing wool, and for gold extraction (HSDB, 1993; Merck, 1989). The primary stationary sources that have reported emissions of bromine in California are electrical services, national security, and steam and air conditioning supply services (ARB, 1997b).

Potassium bromate is manufactured in California (HSDB, 1993). It is a bread and flour-improving agent used as a dough conditioner, and is also used as a food additive, analytical reagent, and in permanent wave conditioners (Merck, 1989). Bromine and compounds have also been identified but not quantified in motor vehicle exhaust by the Air Resources Board (ARB) (ARB, 1991e).

B. Emissions

The total emissions of bromine from stationary sources in California are estimated to be at least 31,000 pounds per year, based on data reported under the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

Bromine occurs in igneous rock at 1.6×10^{-4} percent by weight and in seawater at 65 parts per million. Because of its high reactivity, bromine does not appear in its pure form in nature. It is found as a normal secondary component of chlorine in minerals and biological systems (HSDB, 1993; Merck, 1989).

AMBIENT CONCENTRATIONS

Bromine and its species are routinely monitored by the statewide ARB air toxics network. The network's mean concentration of bromine and its species from January 1996 through December 1996 is estimated to be 8.4 nanograms per cubic meter (ng/m^3) (ARB, 1997c).

INDOOR SOURCES AND CONCENTRATIONS

In a field study conducted in southern California, investigators collected particles (PM_{10}) inside 178 homes and analyzed the particle samples for selected elements, including bromine. Two consecutive 12-hour samples were collected inside and immediately outside each home. Average indoor bromine concentrations were 13 ng/m^3 in the daytime and 11 ng/m^3 in the

nighttime. Corresponding average outdoor concentrations were similar; 10 ng/m^3 in the daytime and 13 ng/m^3 in the nighttime. Indoor concentrations ranged from approximately 2.8 ng/m^3 to 40 ng/m^3 (Pellizzari et al., 1992).

ATMOSPHERIC PERSISTENCE

Bromine (Br_2) will photolyze rapidly (about 1 minute) to form Br atoms, which then react with ozone to ultimately form aerosol and/or particulate bromine (Fan and Jacob, 1992). No information on the atmospheric half-life and lifetime of bromine was found in the readily-available literature.

Potassium bromide will exist in the particle phase and be subject to wet and dry deposition. The average half-life for particles and particle-associated chemicals in the troposphere is estimated to be about 3.5 to 10 days (Balkanski et al., 1993).

AB 2588 RISK ASSESSMENT INFORMATION

The Office of Environmental Health Hazard Assessment reviews risk assessments submitted under the Air Toxics "Hot Spots" Program. Of the risk assessments reviewed as of December 1996, bromine and bromine compounds were not listed in any of the risk assessments (OEHHA, 1996a,b).

HEALTH EFFECTS

Probable routes of human exposure to bromine and bromine compounds (bromine, potassium bromate, hydrogen bromide, bromine pentafluoride) are inhalation, ingestion, and dermal contact.

Non-Cancer: Exposure to bromine gas by inhalation immediately produces irritation of the respiratory system, tearing, coughing, headache, and dizziness (Sittig, 1991). Subsequent effects may include lung inflammation, abdominal pain, diarrhea, and skin eruptions resembling measles. High level exposure can lead to bronchitis, light sensitivity, and spasms of the eyelid and throat accompanied by swelling. Chronic exposure can lead to headache, irritability, anorexia, joint pain, cardiovascular disorders, gastrointestinal disorders, and thyroid enlargement and dysfunction (HSDB, 1995).

Exposure to bromine pentafluoride or bromine trifluoride may cause severe irritation of the eyes leading to clouding and necrosis of the cornea, skin irritation, difficulty breathing, cough, and pulmonary edema (Sittig, 1991). Acute exposure of experimental animals to bromine pentafluoride has been shown to cause tearing, salivation, and eyelid swelling. Chronic exposure has produced kidney and liver damage (HSDB, 1995).

Hydrogen bromide exposure results in irritation of the eyes, upper respiratory tract, and skin because of its acidity (HSDB, 1995). Higher levels of exposure can cause burns and necrosis of the skin.

Inhaled mists or dusts of potassium bromate can cause irritation of the eyes, nose, throat, bronchial tubes, and skin (Sittig, 1991). Skin irritation may progress to burns. Potassium bromate is absorbed through the skin. Systemic exposure has been shown to result in convulsions, gastrointestinal effects (nausea, vomiting, diarrhea, epigastric pain), and acute renal failure (HSDB, 1995).

Chronic non-cancer Reference Exposure Levels (RELs) are listed for three compounds of bromine in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program, Revised 1992 Risk Assessment Guidelines. These RELs are: 1.7 micrograms per cubic meter ($\mu g/m^3$) based upon respiratory effects for bromine; 24 $\mu g/m^3$ based upon respiratory effects for hydrogen bromide; and 1.7 $\mu g/m^3$ based upon respiratory, gastrointestinal, and kidney effects for bromine pentafluoride (CAPCOA, 1993). Bromoxynil, a pesticide containing bromine, is listed by the State of California under Proposition 65 as a developmental toxicant (CCR, 1996).

Cancer: Experiments in animals have shown that potassium bromate given in drinking water causes kidney tumors and mesotheliomas. The carcinogenic potential of potassium bromate is under review by the United States Environmental Protection Agency (U.S. EPA, 1995a). The International Agency for Research on Cancer has classified potassium bromate in Group 2B: Possible human carcinogen, based on the absence of data in humans and sufficient evidence in experimental animals (IARC, 1987a).

The State of California has determined under Proposition 65 that potassium bromate is a carcinogen (CCR, 1996). The inhalation potency factor that has been used as a basis for regulatory action in California is 1.4×10^{-4} (microgram per cubic meter)$^{-1}$ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 $\mu g/m^3$ of potassium bromate is estimated to be no greater than 140 in 1 million (OEHHA, 1994).

NOTES FROM WILL E. DOLEMAN

MISC.

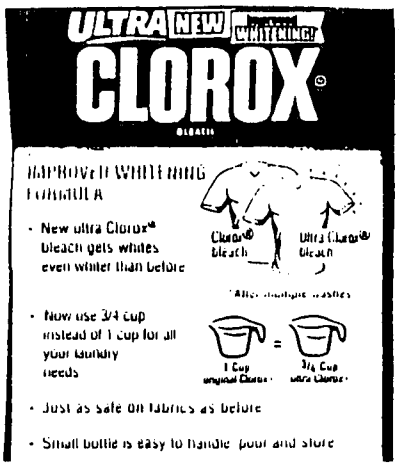
Chlorine is made from sodium chloride and, in the process, bromide is formed. Chlorine easily oxygenates the bromide (BR) into bromate (BRO_3). Sodium hydroxide changes the bromate to sodium.

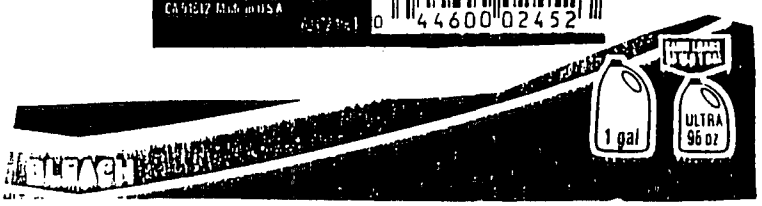
Too much sodium, for example, in drinking water, is a health concern to individuals with high-blood pressure or heart conditions. Many water-treatment plants have their own brine tank for producing chlorine. One plant I know of has no operator on-site, and the plant is run by machines. Bromate is ten times more toxic than arsenic. Some plants also use bromate as a disinfectant in their discard pond. Bromate easily combines with the potassium in the aluminum-potassium sulfate, the water-treatment chemical that is also in the discard pond, to become potassium bromate ($KBr0_3$), which is 100 times more toxic than arsenic.

Liquid chlorine, household Bleach has been used for years to disenfectant Drinking water. Now since New discoveries about chlorine By-products some bleach has also added ingredients?

Will Doleman

A Call for Water Sanity! Monitoring Group





w.D. Some more other laboratory analysis of potassium bromate ($KBrO_3$). Fish and mid-ditch foam. Also see bromine compounds bundle for yet more.

Analytical Data

Will Doleman

Job Number: 980324AO
Page Number: 10 of 10

Lab Sample ID: 980324AO-8
Field ID: Mid Ditch #28 Fish
Date/Time: 03/20/98 1700
Matrix: Multi-phase

EPA Category: Conventional Parameters

Parameter	Method	Detection Limit	Analytical Result	Units
Bromate	EPA 300.0B	5.	19,100.	µg/L

Bromate w.D. *19.1 in mg/L w.D.*

NOTE: Sample number 980324AO-8, "Mid Ditch #28 Fish" was blended in 100 mLs of Deionized water. A 1:100 dilution of this

w.D. *The below figures are approximate and assume that in the fish the carcinogen was potassium bromate. Fish are normally high in potassium, so the test figure for potassium was very high.* w.D.

W.D. Notes: I rarely walk on the ditch anymore, but still I pulled out 2 dead fish and a dead yellow-legged frog. This particular fish was found in the mid ditch area at the bottom. It appears to be quite likely that the fish devoured the foam which I found to be high in this waste bromate, and finally died from it. The M.C.L. set for potassium bromate in waste water is .1 parts per million. This fish if you were to eat it would give you 168,00 (according to the U.S.E.P.A.) to 66,000 (according to Prop. 65) times the maximum contaminant level in drinking water! w. D.

Potassium bromate is a carcinogen, which explains the 50% death rate from cancer. w.D.
(downstream)

38,200 times for Bromate *the M.C.L. for drinking water as listed E.P.A. Primary Drinking Water standard. This fish was a carp, but a bass and yellow-legged (endangered) frog were also found here. People eat bass.*
w.D.

Coffey Laboratories, Inc.
12423 N.E. Whitaker Way • Portland, OR • 97230 (503) 254-1794 • FAX (503) 254-1452

AMENDED

Laboratory
Analysis Report

Over 600 households attempt to filter out the potassium bromate downstream from mid ditch.

To bring the potassium bromate down to the M.C.L. for drinking water would require a filter to remove over 99.998% of the bromate, an impossible task. W.D.

Sierra
Environmental
Monitoring, Inc.

Date : 2/26/98
Client : DOL-001
Taken by: CLIENT
Report : 22225
PO#

WILL DOLEMAN
P.O. BOX 3544
GRASS VALLEY CA 95945

15 mg/L of potassium bromate moving 3-5 miles down into the agricultural area. This is between 30,000 and 225,000 times the M.C.L. for drinking water of the U.S.E.P.A. W.D.

Potassium bromate is a carcinogen, which explains the 50% death rate from cancer. W. D.

Prop. 65 level. W.D.

Sample	Collected Date	Time	POTASSIUM ICP MG/L	SULFATE MG/L	DIGESTION-TOTAL METALS	BROMATE MG/L	CHROMIUM ICP-MS MG/L	COPPER ICP-MS MG/L
MID DITCH SITE #21	1/05/98	9:30	15	1.7	OK	16	0.31	0.49
MID DITCH SITE #22	1/05/98	9:40			OK			< 0.005

Sample	Collected Date	Time	VANADIUM ICP-MS MG/L
MID DITCH SITE #22	1/05/98	9:40	< 0.005

Approved by:

To bring the potassium bromate down to the M.C.L. for drinking water would require a filter to remove over 99.998% of the bromate, an impossible task for a home water filter. W.D.

William F. Pillsbury
President

1135 Financial Blvd.
Reno, NV 89502
Phone (702) 857-2400
FAX (702) 857-2404
semi@powernet.net

John Kobza, Ph.D.
John C. Seher
Managers

Over 600 households attempt to filter out the potassium bromate downstream from mid ditch. W.D.

Note: *Aluminum 490 very high*
Potassium 17 very high
Sulfate 11 very high

Found at the same place W.D.

High chromium and copper as well.

This is the water treatment chemical used at the water treatment plant upstream.

W.D.

TOXICOLOGIC PATHOLOGY, vol. 26, no. 6, pp. 724–729, 1998

Time- and Dose-Dependent Development of Potassium Bromate-Induced Tumors in Male Fischer 344 Rats*†

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ABSTRACT

Potassium bromate ($KBrO_3$) is a rodent carcinogen and a nephro- and neurotoxicant in humans. $KBrO_3$ is used in cosmetics and food products and is a by-product of water disinfection by ozonization. $KBrO_3$ is carcinogenic in the rat kidney, thyroid, and mesothelium and is a renal carcinogen in the male mouse. The present study was designed to investigate the relationship of time and dose to bromate-induced tumors in male Fischer 344 (F344) rats and to provide some insight into the development of these tumors. $KBrO_3$ was dissolved in drinking water at nominal concentrations of 0, 0.02, 0.1, 0.2, and 0.4 g/L and administered to male F344 rats as the sole water source for 12, 26, 52, 78, or 100 wk. Renal cell tumors were present after 52 wk of treatment only in the high-dose group. Mesotheliomas developed after 52 wk of treatment on the tunica vaginalis. Mesotheliomas were present at sites other than the testicle after 78 wk of treatment, indicating that their origin was the testicular tunic. Thyroid follicular tumors were present as early as 26 wk in 1 rat each from the 0.1- and 0.2-g/L groups. The present study can be used as a basis for the determination of dose-time relationships of tumor development for a better understanding of $KBrO_3$-induced cancer.

Keywords. Disinfection by-products; kidney; mesothelioma; mesothelium; renal cell tumor; thyroid; urothelium; water

INTRODUCTION

Potassium bromate ($KBrO_3$) is a rodent carcinogen and a nephro- and neurotoxicant in humans (10, 17). Male and female Fischer 344 (F344) rats developed renal cell tumors and thyroid follicular tumors, and the male rats also had an increased incidence of abdominal mesotheliomas (6, 14, 16, 21). $KBrO_3$ has been used in cosmetics and food products; it is also a by-product of water disinfection by ozonization (1, 3, 10). We previously showed that $KBrO_3$ is carcinogenic in the rat kidney, thyroid, and mesothelium and that it is a renal carcinogen in the male mouse. $KBrO_3$ was carcinogenic in rats at water concentrations as low as 0.02 g/L (20 parts per million [ppm]) (6).

Male rats treated with 60, 125, 250, or 500 ppm $KBrO_3$ in drinking water for up to 2 yr had renal cell tumors in all dose groups, but there were statistically significant increases only at doses of ≥125 ppm. Of the 20 control rats that survived to 90 wk, none had renal cell tumors, and neither did the 16 that survived to 104 wk (14). Mesotheliomas were seen only in rats treated with ≥30 ppm bromate, with a significantly increased incidence only in the high-dose group (500 ppm). None of the control rats had mesotheliomas (14). Thyroid follicular tumors were present in all dose groups, but there were statistically significant increases only in the high-dose group (500 ppm). None of the 16 control thyroid glands examined at 104 wk had follicular tumors (14).

Male F344 rats treated with 500 ppm $KBrO_3$ for 13, 26, 39, 52, or 104 wk and then necropsied or those treated for that duration and then switched to plain water and necropsied at 104 wk developed renal cell tumors as early as 26 wk, but there were no statistically significant increases in incidence until 52 wk. All rats examined at 104 wk had statistically significant increases in renal cell tumors regardless of duration of $KBrO_3$ treatment. None of the control animals had renal cell tumors at any time (18). Thyroid follicular cell tumors were first identified after 26 wk of treatment, but there were no statistically significant increases until 104 wk. Rats treated for 26 or 52 wk and necropsied at 104 wk had statistically significant increases in numbers of thyroid follicular tumors (18). Mesotheliomas were first seen after 39 wk of treatment, but statistically significant increases were not seen until 104 wk. Rats treated for 13 wk or more and then examined at 104 wk had an increased incidence of mesothelioma, whereas none of the control rats had mesotheliomas (18). The present study was designed to investigate the relationship of time and dose to the development of bromate-induced tumors in male F344 rats by extending previous work to lower doses and a shorter duration of treatment.

MATERIALS AND METHODS

Complete study details were published previously (6). Briefly, $KBrO_3$ (99%; CAS 7758-01-2) dissolved in deionized water at nominal concentrations of 0, 0.02, 0.1,

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† This manuscript has been reviewed and approved for publication by the Environmental Protection Agency and does not necessarily reflect the views of the agency. Mention of trade names or commercial products does not constitute endorsement or a recommendation for use.

0192-6233/98$3.00+$0.00

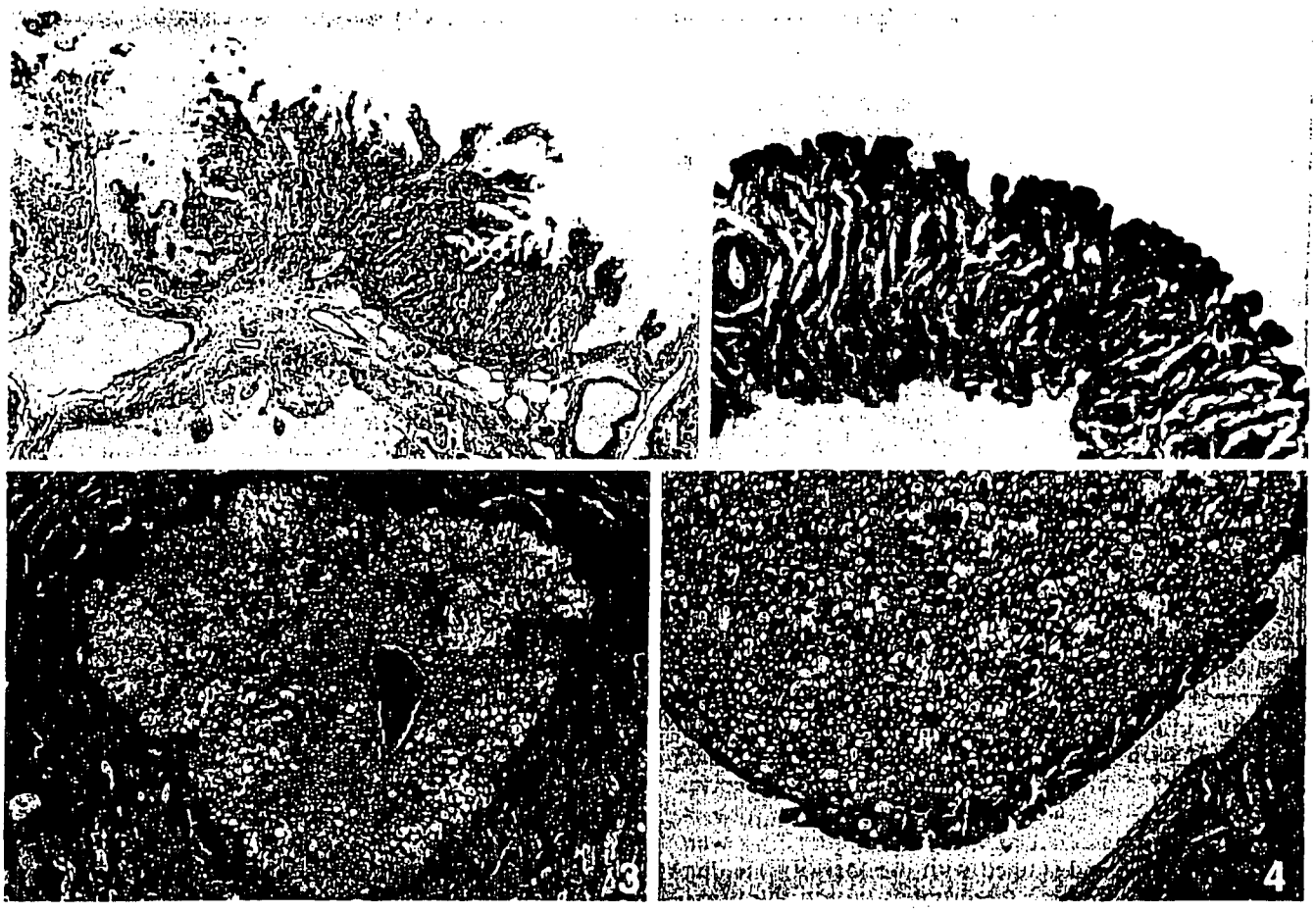

FIG. 1.—Mesothelioma on the tunica vaginalis testis from a male F344 rat treated with 0.4 g/L $KBrO_3$ for 78 wk. The serosal surface of the tunic has a focal proliferation of neoplastic mesothelial cells several layers thick resting on an extensive fibrous stroma. ×25.

FIG. 2.—Mesothelial hyperplasia on the tunica vaginalis testis from a male F344 rat treated with 0.4 g/L $KBrO_3$ for 52 wk. The serosal surface of the tunic has a focally extensive hypertrophy and hyperplasia of mesothelial cells 1 to 3 layers thick resting on the thin connective tissue stroma of the serosa. ×50.

FIG. 3.—Renal adenoma from a male F344 rat treated with 0.4 g/L $KBrO_3$ for 78 wk. This adenoma is characterized by an expansile mass of markedly vacuolated proliferating proximal tubule epithelial cells. The cells have pronounced cell membranes but thin wisps of cytoplasm between large cytoplasmic vacuoles. ×30.

FIG. 4.—Kidney from a male F344 rat treated with 0.4 g/L $KBrO_3$ for 78 wk. The renal papilla contains numerous foci of mineral, and the interstitium is prominent and expanded by a proteinaceous material, likely to be edema. The urothelium lining the renal papilla is markedly thickened by hyperplasia and projects into the pelvic lumen in numerous papillary fronds. ×30.

material (Fig. 4). This lesion was similar to what has been described as intermediate renal papillary necrosis with mineralization (2). In association with the mineralization of the renal papilla, there was moderate-to-marked urothelial hyperplasia that increased in incidence in a dose- and time-dependent manner in rats treated with ≥0.1 g/L (Table IV). The urothelium lining the papilla had increased thickness and projected into the urinary space of the renal pelvis in papillary fronds or sessile mats (Fig. 4). In the more severe cases, the entire pelvis was lined by hyperplastic epithelium, with projections into the lumen. None of the control rats or the rats treated with low-

TABLE II.—Incidence of renal cell tumors in male F344 rats treated with $KBrO_3$ in drinking water.

Group (g/L)	12 Wk	26 Wk	52 Wk	78 Wk	100 Wk
0	0	0	0	0	1/44
0.02	0	0	0	0	1/43
0.1	0	0	0	0	6/47
0.2	0	0	0	0	3/39
0.4	0	0	2/6	4/6**	12/32***

* Trend over dose.
** Trend over time and dose.
* $p < 0.06$ or ** $p < 0.001$ by Fisher exact test.

TABLE III.—Mean ± SD score of eosinophilic droplet accumulation within the renal proximal tubule epithelium in male F344 rats treated for 12 wk with $KBrO_3$ in their drinking water.

	Dose (g/L)				
	0	0.02	0.1	0.2	0.4
[illegible]	1 ± 0	1.5 ± 0.6	2.2 ± 0.5	3.3 ± 0.5	4 ± 0

TABLE IV.—Incidence of urothelial hyperplasia of the renal pelvis in male F344 rats treated with $KBrO_3$ in drinking water.

Group (g/L)	12 Wk	26 Wk	52 Wk	78 Wk	100 Wk
0	0	0	0	0	7/44
0.02	0	0	0	0	6/41
0.1	0	0	0	0	25/47***
0.2	0	0	0	4/6*	32/39***a
0.4	0	0	1/6	6/6***b	30/32***c

[a] Trend over time.
[b] Trend over dose.
[c] Trend over dose and time.
* $p < 0.06$, ** $p < 0.05$, or *** $p < 0.001$ by Fisher Exact test.

dose $KBrO_3$ had renal papillary mineralization, and urothelial hyperplasia was only present in these groups after 100 wk (Table IV).

Thyroid follicular tumors were seen as early as 26 wk in 1 rat each from the 0.1- and 0.2-g/L groups (Table V). A few rats in the 0.2- and 0.4-g/L groups had follicular cell hyperplasia, but this was not a prominent finding (Table V). An apparent treatment-associated follicular cell degeneration was present in the rats treated with the high-dose of $KBrO_3$ for 52 wk but was absent after a longer duration of treatment. The control animals did not develop any thyroid follicular tumors. Total serum concentrations (bound and unbound) of T_3 (but not T_4) were decreased in $KBrO_3$-treated rats (Fig. 5).

TABLE V.—Incidence of thyroid lesions in male F344 rats treated with $KBrO_3$ in drinking water.[a]

Group (g/L)	12 Wk	26 Wk	52 Wk	78 Wk	100 Wk
0	0	0	0	0	0
0.02	0	0	0	0	5/39* *1/39*
0.1	0	1/6	0	1/6 *1/6*	4/43 *2/43*
0.2	0	1/6	0	2/5 *2/6*	6/35*** *2/35*
0.4	0	0	1/6 *1/6*	4/6** *1/6*	16/30**** *2/30*

[a] Top number is thyroid follicular tumor incidence; when present, bottom number in italics is incidence of follicular cell hyperplasia.
[b] Trend over time.
[c] Trend over dose.
[d] Trend over dose and time.
* $p < 0.06$, ** $p < 0.05$, or *** $p < 0.001$ by Fisher Exact test.

DISCUSSION

Chemically induced abdominal mesotheliomas have been seen almost exclusively in male F344 rats (8). Mesothelioma is preceded by mesothelial hyperplasia that is described as focal thickening or single papillary projections of mesothelial cells without stromal proliferation.

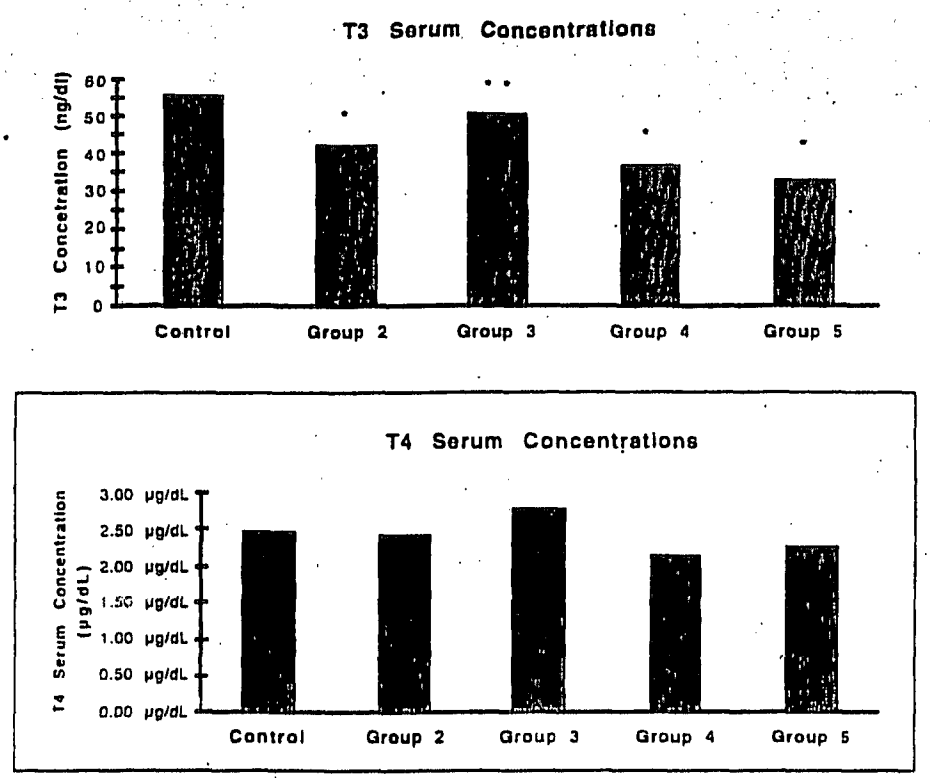

FIG. 5.—Serum concentrations of T_3 and T_4 in control and $KBrO_3$-treated male F344 rats after 12 wk of treatment. Serum T_3 concentrations were decreased in a treatment-dependent but not dose-dependent manner. T_4 concentrations were unaffected by $KBrO_3$ treatment. * $p < 0.05$; ** $p = 0.07$.

0.2, and 0.4 g/L was administered to male F344 rats as the sole water source for 12, 26, 52, 78, or 100 wk.

Three hundred seventy 28- to 30-day-old male F344 rats (Charles River Laboratories, Portage, MI) were acclimated to the environment for 1 wk and then randomly assigned to the treatment groups. The treatment rooms were maintained at 20–22°C and 40–60% humidity on a 12-hr light:dark cycle. Rats were housed 3 per cage on wood chips and provided Purina Rodent Laboratory Chow (St. Louis, MO) and water *ad libitum*. Animals were observed daily, and moribund animals were euthanatized and necropsied. Six animals from each group were euthanatized by CO_2 asphyxiation and necropsied after 12, 26, 52, and 78 wk of treatment; the remaining animals were euthanatized and necropsied after 100 wk of treatment. At necropsy, a blood sample was collected from each animal, and the serum was separated and frozen. The target tissues of kidneys, testes, thyroid gland, and gross lesions were removed, examined, and fixed in 10% neutral-buffered formalin. Fixed tissues were processed by routine methods for paraffin embedding, cut into 5-μm sections, stained with hematoxylin and eosin, and examined by light microscopy. Nephropathy scores were graded semiquantitatively on the basis of the percentage of the renal cortex involved. Grade 0 indicated no nephropathy; grade 1, 1–10% of renal cortex involved; grade 2, ~25% involved; grade 3, ~50% involved; grade 4, ~75% involved; and grade 5, >75% of the renal cortex involved and fibrosis and mineralization were present. The kidneys from rats treated with $KBrO_3$ for 12 wk were sectioned at 5 mm and stained with the Mallory-Heidenhain method to accentuate the droplets within the proximal tubules for qualitative analysis of droplet accumulation. The slides were scored on a 1–4 scale for mild, moderate, marked, and severe accumulations of large red droplets within the proximal tubule epithelium. Total serum, bound and unbound, triiodothyronine (T_3), and thyroxine (T_4) concentrations from animals euthanatized after 12 wk of study were determined by radioimmunoassay using a kit supplied by Diagnostic Products Corporation (Los Angeles, CA), according to the manufacturer's instructions. All aspects of these studies were conducted in facilities certified by the American Association for the Accreditation of Laboratory Animal Care in compliance with the guidelines of that association and those of the National Health and Environmental Effects Research Laboratory Animal Care and Use Committee.

Statistical analysis for histopathology included the Fisher exact test, and polynomial regression was used to determine dose- or time-related trends. Statistical analysis for T_3 and T_4 levels was performed using an ANOVA and a *t*-test. All values were determined to be significant when $p < 0.05$. In some instances, slightly higher values for p are noted when the change is deemed biologically significant but is >0.05.

RESULTS

Mesotheliomas developed on the tunica vaginalis parietalis along the attachment between the testis and the epididymis (Table I and Fig. 1), as previously described (5). In addition to small mesotheliomas, there were also a few animals with hypertrophy and hyperplasia of the mesothelial cells along the parietal vaginal tunic (Table I and Fig. 2). Mesotheliomas of the tunica vaginalis testis were first seen after 52 wk of treatment. Mesotheliomas at sites other than the testicle were not present until after 78 wk of treatment, indicating that the origin of these tumors is likely the testicular serosa. The most common sites of secondary spread of the 52 rats with mesothelioma in this study were on the serosal surfaces of the spleen (56%) and gastrointestinal tract (56%), followed by the mesentery (46%), the pancreas (37%), the urinary bladder (27%), the liver (10%), and, rarely, the kidney (2%). None of the neoplasms invaded adjacent tissue or metastasized to other sites. None of the 52 rats diagnosed with mesothelioma had evidence of spread cranial to the diaphragm.

TABLE I. Incidence of testicular mesotheliomas in male F344 rats treated with $KBrO_3$ in drinking water.

Group (g/L)	12 Wk	26 Wk	52 Wk	78 Wk	100 Wk
0	0	0	0	0	0
0.02	0	0	0	0	4/49
0.1	0	0	0	0	5/50[a]
0.2	0	0	1/6	0[b]	10/47[b,c]
0.4	0	0	0[b]	4/6[c]	27/41[b,c]

[a] A single testicle from 1 animal had focal hypertrophy and hyperplasia of mesothelial cells on the tunica vaginalis testis.
[b] Trend over time and dose.
[c] $p < 0.06$ or [b] $p < 0.001$ by Fisher exact test.

Renal cell tumors were seen after 52 and 78 wk of treatment only in the high-dose group (Table II). Although some of the renal tumors were large after 100 wk of treatment and were classified as carcinomas based on size, none of the renal tumors metastasized. The predominant cell type in these renal tumors was a markedly vacuolated cell of proximal tubule origin (Fig. 3). There was no increase in incidence or number of hyperplastic tubules with bromate treatment when compared with control animals (data not shown). In addition, the incidence and severity of nephropathy were not different between control and treated rats at any time (data not shown).

Proximal tubule epithelium had a treatment-related increase in eosinophilic droplets. In some cases, these droplets had a golden brown appearance consistent with lipofuscin granules, which are indicative of accumulation of undigested membranes. With decreasing dose at the early times, the eosinophilic droplets were similar in size and number to those of the control rats, and in the lower doses, they more closely resembled the α2u-globulin–containing hyaline droplets typical for this sex and strain of rat. Kidneys from rats treated for 12 wk had a dose-dependent increase in numbers of large red droplets within the proximal tubule epithelium (Table III).

The kidney had a treatment-related increase in mineralization of the inner medulla (data not shown). This mineralization was restricted to the renal papilla and became more severe with longer duration of treatment. The mineralized foci were scattered throughout the papillae and were associated with degeneration of the collecting ducts and expansion of the interstitial space with proteinaceous

Mesothelioma is common on the tunica vaginalis and is found adhering to the epididymis or tunica albuginea of the testis of males, from which almost all spontaneous mesotheliomas are thought to originate. The earliest tumors are distinguished from hyperplasia by the presence of papillary growth with stratification and associated stromal proliferation. All mesotheliomas are considered malignant but appear to spread by direct extension or implantation throughout the peritoneum (8). Mesotheliomas were first seen after 39 wk of treatment of 500 ppm $KBrO_3$ and statistically significant increases were not seen until 104 wk (18). Rats treated for at least 13 wk and then examined at 104 wk had an increased incidence of mesotheliomas (18). In the present study all treatment groups had an increased incidence of mesotheliomas at 100 wk, with hyperplasia and small tumors first seen after 52 wk.

In previous work renal cell tumors were found in male rats given 500 ppm $KBrO_3$ that died after 14 wk of treatment (15). However, mean induction time for renal cell tumors ranged from 90 wk in rats given 500 ppm $KBrO_3$ to 111 wk in control male rats (15). Male F344 rats treated with 500 ppm $KBrO_3$ were found to have renal adenomas after 26 wk of treatment and statistically significant increases in numbers were seen after 52 wk (18). Renal tumor development was not reversible when treatment was stopped following continuous treatment for 13 wk or more. Lesions associated with nephropathy such as droplet accumulation were reversed and were not different from control animals after recovery treatment. It was suggested that because tumors arise after discontinued treatment that the mechanism of action is not related to the nephrotoxicity induced by bromate (18). This hypothesis is further supported by the finding from the present study that $KBrO_3$ did not enhance the development of nephropathy at any time.

Male, but not female, F344 rats treated for up to 13 wk with 500 ppm $KBrO_3$ in their drinking water had an increased accumulation of α2u-globulin–containing droplets in the proximal tubule epithelium (28). However, male and female F344 rats both had elevated 8-hydroxydeoxyguanosine levels in the kidney and increased S-phase labeling after up to 13 wk of treatment (28). These data, the present report, and previous work indicating that both male and female rats develop renal tumors suggest that α2u-globulin accumulation is not related to renal tumor development (12, 13, 28). The droplets that accumulate in association with bromate treatment are associated with bromate-induced oxidant damage and not α2u-globulin nephropathy.

$KBrO_3$ induced clear-cell renal tumors in the present and previous studies. This particular tumor type is common in humans with kidney cancer but is unusual in the rat (30). Specific molecular alterations have been associated with particular morphologic patterns of renal cell tumors in human patients (4, 7, 12, 30). Recently, molecular alterations of the *Tsc2* gene have been shown to be associated with chemically induced chromophilic renal cell carcinoma in rats (29). Human patients with nonpapillary clear-cell renal cancer most commonly have mutations in the *Vhl* gene (12). Bromate-induced renal cell tumors in rats are morphologically similar to human renal cell cancer of the clear-cell type. A molecular characterization of bromate-induced rat renal tumors has not been conducted.

Urothelial hyperplasia is commonly seen in the renal pelvis with severe nephropathy, which was not the case in this study. Treatment-related hyperplasia in the urothelium has also been associated with renal papillary necrosis, mineralization, and calculi formation (23). Advanced hyperplasia appears to form a continuum with papillomas of the renal pelvis (23). In the present study, urothelial hyperplasia developed in association with renal papillary mineralization and intermediate necrosis but did not progress to papilloma.

In the present study, thyroid gland follicular cell tumor numbers were increased after 78 wk of $KBrO_3$ treatment. Proliferation of thyroid gland follicular cells is thought to follow a progression from hyperplasia to neoplasia (9). Most chemically induced thyroid neoplasms appear to result from direct interference with the synthesis of thyroid hormones, resulting in a decreased circulating level of T_3 or T_4 with subsequent elevated thyroid stimulating hormone (TSH) secretion. Most agents that produce thyroid gland tumors do so by nongenotoxic mechanisms, rarely do chemicals induce tumors through mechanisms not involving TSH (27). However, a few chemicals do produce thyroid neoplasms without known interference with the pituitary-thyroid axis. These chemicals do not affect thyroid weight, but they induce neoplasms at other sites and they are genotoxic, suggesting that they may directly act on thyroid follicular cells (9). In a time-course study, thyroid follicular cell tumors were first identified after 26 wk of continuous treatment with $KBrO_3$, but statistically significant increases were not found until 104 wk (18). Rats treated for 26 or 52 wk with $KBrO_3$ and then necropsied at 104 wk also had statistically significant increased numbers of follicular tumors (18). The present study had a similar time course for thyroid follicular tumor development and a treatment-associated slight decrease in serum T_3 levels. Additional studies will examine the association between thyroid hormonal changes and $KBrO_3$-induced thyroid tumor development including measurement of serum TSH concentrations.

The specific mechanism by which $KBrO_3$ produces tumors is not known. $KBrO_3$ was mutagenic in the Ames test and caused chromosomal aberrations in Chinese hamster fibroblasts, but did not have initiating activity in the rat kidney and neither initiated nor promoted skin tumors (11, 13, 20, 22). Bromate is thought to produce its toxic response through oxidative damage that results from increased levels of lipid peroxide (19, 24–26). Bromate-induced carcinogenesis may result from lipid peroxidation and generation of oxygen radicals that induce DNA damage (17).

In summary, in the present study we found $KBrO_3$-induced tumors of the kidney, thyroid gland, and abdominal mesothelium. In addition, this study confirmed that $KBrO_3$-induced mesotheliomas originate on the tunica vaginalis at the attachment between the testicle and epididymis. The first tumors to develop from $KBrO_3$ treatment are thyroid gland follicular adenomas. We provided

additional support for the assertion that bromate-induced renal tumors develop unrelated to nephrotoxicity. This study provides a basis for the determination of dose-time relationships of tumor development for a better understanding of $KBrO_3$-induced cancer.

ACKNOWLEDGMENT

Portions of this work were carried out under EPA Contract 68-D03-0024 to Pathology Associates Inc., Frederick, MD.

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COLUMBIA INSPECTION, INC.

7133 N. Lombard Street • Portland, OR 97203 • Telephone: (503) 286-9464 • Fax: (503) 285-7831

May 9, 2000 L000509A.WP

Mr. Will Doleman
Will's Plumbing
P.O. Box 3544
Grass Valley, CA 95945

SUBJECT: A Review of the "Bromate" Problem

Dear Mr. Doleman:

I sincerely apologize for taking so long in getting back to you after the discovery of false positives reported for many of the bromate tests which we performed. Although you have a fairly good picture of the situation, allow me a moment to summarize my viewpoint of what has taken place. Unfortunately, I have been essentially a very limited spectator through most of this since Dave Melander had assumed the role of Project Manager for this work.

During late spring and summer of 1999, our laboratory had developed a method for the analysis of bromate in water using an ion chromatograph. Initial test developments indicated that we could indeed see bromate in an aqueous matrix which also had chlorides, sulfates, and other anions routinely found in groundwaters. The records which I have reviewed show that the bromate tests were valid from May through August of last year. During late summer, we used the ion chromatograph for a number of other projects, including the monitoring of the cleanup of a circuit board manufacturing plant. Hindsight being 100% perfect, it was during this time that I now can see that the separation column on the Ion Chromatograph began to fail and was not separating the components as well as they were supposed to. In September, we reported four bromate hits which now appear to be erroneous. However, in late October and early November, we were able to see that numerous samples were "none detected" (ND) but did report two hits that now appear to be also "ND".

After those "NDs" until the last batch received which we sent to another laboratory, all bromate data appears to be bad. The column separation was poor in the region where bromates would show up. As always, the chemist calibrated the chromatograph but only used bromate standards instead of a matrix-matched mixture which would have included chloride, sulfate, nitrate, etc..As a result, she did not become aware that there was no separation between bromates, fluorides, and chlorides and chloride was mistaken for bromate. Since no separation was taking place, matrix spikes looked reasonable and the data was reported as good. Then in response to HydroSolution's insistance that the last batch of water really should have been clean, we sent the samples to another lab and it soon became obvious that we had a problem.

In the table above, I have credited you for all of the bad bromate test results. By taking this into account and offsetting it by the amount from invoices which you have not received or have paid for, "on paper" you still owe us the $310.00. However, I would never be so presumptuous to demand payment of this amount after what we've put you through. If we were to end our discussions here, I would cancel all remaining invoices and send out final copies of reports for which you only have a faxed copy.

From where I sit, you received a great deal of usable data which was not impacted by the bromate problem. I see no justification for putting that on the table. It is my understanding, however, that some potassium analyses were performed as a result of bromate hits. I am willing to refund those as well.

In conclusion, I would like to say again that I'm quite ignorant of the scope of the project and am willing to let you educate me. Please give me a call at your convenience so we can take the next step.

Sincerely,

Richard D. Reid
Laboratory Director

NOTES FROM WILL E. DOLEMAN

I phoned the Laboratory Director a short while later to point out that he owes me money, not that I owe him. Note also that the credits are to my account, not his. I also pointed out that this list is not at all complete.

Recommended holding times were adhered to as outlined under USEPA 600/sw846 guidelines, unless noted otherwise. All analysis were performed following the laboratory quality assurance guidelines as outlined in Columbia Inspection's Laboratory Quality Assurance manual. Methods for analysis followed are approved under 40 CFR Part 136 and USEPA protocols.

Should you have any questions, please contact me directly at (503) 286-9464.

Martin Little
Quality Manager
Columbia Inspection, Inc.

W. D.

The two preceding pages were the results furnished to us right before the laboratory sent these samples to Coffee Laboratories for retesting. The samples were retested by Coffee, and Coffee reported "N.D." on all of the following pages. Note that Coffee Laboratories had reported results on the 13935 Glenn Pines 300-ft. deep well and the 13733 Loma Rica Drive well 2 1/2 months previously of .11 mg/L of bromate. The Glenn Pines residence was the Dolemans, and the Loma Rica residence was the Evans.

So, did the rains that fell during this 2 1/2 month period finally wash away the bromate, or did the first sample being listed in this last batch—Nevada Union High School—push some political buttons?

As I said before, I haven't been an observer in this study until recently and I still don't know all the "in's and out's" and relationships associated with the scope and purpose of the project. Therefore, I am going to try to summarize the progress from May, 1999 until the present, pointing out the good, the bad, and the apparently unrelated work that has been reported. In the end, I'd like to be able to resolve the details financially.

My record show the following "on paper" activity. This is where I would like to start and then work from that point.

Invoice/Job No.	Invoice Date	Scope of Testing/Outcome	Amt. Invoiced	Amount Paid	Restitution
590970	6/17/99	Wastewaters-Metals and bromates- All good data	422.00	422.00	0
591364	7/22/99	Metals Only-All good data	145.00	145.00	0
591447	8/31/99	Metals, CN, Bromate - Good data	331.00	331.00	0
591782	9/30/99	Wastewaters- Not Applicable	556.00	556.00	0
592087/87A	11/5& 1/31	GWs- 29 bromates+K + CN; 16 Good /2 Bad	382.00	377.00?	+28.00
592088	11/19/99	GW: Metals Only	111.00	111.00	0
592332	12/6/99	GW: Metals Only	150.00	150.00	0
592333/33A	12/7 &1/31	**15 Bad bromates**	380.00	380.00	+210.00
592408	12/20&1/19	8 Bad bromates	387.00	387.00	+112.00
500076	1/31/00	**8 Bad bromates**	375.00	375.00	+160.00
500031	2/29/00	**5 Bad Bromates**	210.00	210.00	+100.00
500326	3/16/00	Metals: As, Pb, K	110.00 (Not Yet Invoiced)	0.00	-110.00
500451	3/21/00	**15 Bad Bromates**	300.00 (Not Yet Invoiced)	0.00	0
500589	4/5/00	Al, K, 6 Good Bromates (All ND, <0.05 ppm)	190.00 (Not Yet Invoiced)	0.00	-190.00
		AMOUNT DUE			**$310.00**

w D.

Columbia Inspection Laboratories
Analytical on Bromate, etc.

BROMATE

9.4	mg/L	10-1-99	#171
12	mg/L	10-1-99	#168
6.1		10-1-99	#172
1.6	"	10-1-99	#177
4.3	"	12-7-99	#199
4.3	"	12-7-99	#200
3.8	"	12-7-99	#201
3.6	"	12-7-99	#202
3.8	"	" " "	#203
3.6	"	" " "	#204
2.9	"	"	#205
4.8	"	"	#207
2.4	mg/Kg	"	#208
3.2	mg/L	"	#209
3.5	"	"	#211
1.2	"	"	#212
3.7	"	"	#213
15	"		#214
1.3	"	"	#216
3.9	"	12-17-99	#219A
2.1	"	"	#219B
3.3	"	"	#221
6.	"	"	#222
7.9	"	"	#223
260	"	"	#224
.85	"	"	#225
160	"	"	#226
N.D.	"	11-3-99	#180
160	"	"	#181
150	"	"	#182
N.D.	"	"	#183
N.D.	"	"	#184
N.D.	"	"	#185
N.D.	"	"	#186
N.D.	"	"	#187
5.9	"	1-28-00	#244
5.3	"	"	#245
5.8	"	"	#246
3.9	"	"	#252
2.9	"	"	#254
4.	"	"	#255
4.9	"	"	#256
6.4	"	2-3-00	#227
5.	"	"	#228
20.	"	"	#229
3.1	"	"	#232
6.	"	"	#233
18	"	3-21-00	#281
5.4	"	"	#282
14	"	"	#283

POTASSIUM

N.D.	mg/L	1-26-00	#201
N.D.	"	1-26-00	#202
N.D.	"	"	#203
N.D.	"	"	#205
N.D.	"	"	#204
1.7	"	"	#207
3.7	"	"	#211
12	mg/L	10-1-99	#165
73	mg/L	10-1-99	#166
12	mg/L	10-1-99	#170
.84	mg/L	1-28-00	#249
3.8	"	1-28-00	#253
3.1	"	2-3-00	#230
55	"	2-3-00	#231
1.13	p.p.m	1-18-00	#219A
1.	p.p.m	1-18-00	#219B
.35	"	" " "	#222
1.5	"	" " "	#225
240	"	"	#226
N.D.	mg/L	1-26-00	#199

BROMIDE

N.D.		12-7-99	#206
"		"	#207
1.3	mg/L	12-17-99	#219B
N.D.	"	1-28-00	#254

BROMATE

N.D.		10-10-99	#178
N.D.		"	#179
N.D.		"	#188
N.D.		10-13-99	#198
N.D.		10-10-99	#189
N.D.		10-10-99	#190
N.D.		10-13-99	#194
N.D.		10-13-99	#195
N.D.		10-17-99	#196
N.D.		"	#197
22	mg/L	3-21-00	#284
23	"	"	#285
24	"	"	#286
24	"	"	#287
22	"	"	#288
17	"	"	#289
26	"	"	#290
8.9	"	"	#291
15	"	"	#292
12	"	"	#293
7.8	"	"	#294
24	"	"	#295

Engineer's bill $1,200.00

CERTIFICATE OF ANALYSIS

W. D. - The analysis that broke the lab's machine.

CLIENT: WILL'S PLUMBING
13935 GLEN PINN
GRASS VALLEY CA 95945

PHONE: (530) 270-1775
FAX: (530) 272-8891

DATE SUBMITTED: 03/27/20

PROJECT NAME: WILL PROJECT NUMBER: 00348

CI SAMPLE	CLIENTS ID#	DATE	TIME	MATRIX	DESCRIPTION
0589-001		03/24/1900	12-4	Water	NEVADA UNION HIGH SCHOOL
0589-002		03/24/1900	12-4	Water	14093 GLENN PINES
0589-003		03/24/1900	12-4	Water	EMPIRE SHOES
0589-004		03/24/1900	12-4	Water	13733 LOMA RICA DR.
0589-005		03/24/1900	12-4	Water	13935 GLENN PINES
0589-006		03/24/1900	12-4	Water	368 GRACIE RD

REPORT DATE: 04/05/2000 REPORT NUMBER: 0589 PAGE: 1 OF 1

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
NEVADA UNION HIGH SCHOOL						
0589-001	BROMATE EPA 300.0	BROMATE	34	mg/L	0.02	Abby K.
14093 GLENN PINES						
0589-002	BROMATE EPA 300.0	BROMATE	9.3	mg/L	0.02	Abby K.
EMPIRE SHOES						
0589-003	BROMATE EPA 300.0	BROMATE	34	mg/L	0.02	Abby K.
13733 LOMA RICA DR.						
0589-004	ALUMINUM - ICP EPA 200.7/6010B	TOTAL ALUMINUM	ND	mg/L	0.04	Greg N.
	BROMATE EPA 300.0	BROMATE	15	mg/L	0.02	Abby K.
13935 GLENN PINES						
0589-005	BROMATE EPA 300.0	BROMATE	3.2	mg/L	0.02	Abby K.
368 GRACIE RD						
0589-006	BROMATE EPA 300.0	BROMATE	10	mg/L	0.02	Abby K.

REVIEWED BY:
Martin Little - Quality Manager

COLUMBIA INSPECTION, INC.
7133 North Lombard Street • Portland, Oregon 97203

April 5, 2000

HydroSolutions of California, Inc.
P.O. Box 922
Nevada City, CA 95959

Subject: Calculation of $KbrO_3$ concentration - Will Project (CI Lab # 0589)

The following is the calculated $KBrO_3$ concentrations for samples submitted for analysis on March 27, 2000. The calculations are based on the measured bromate (BrO_3^-) concentrations only and assume that the only bromate compound species present are in the form of $KbrO_3$.

Laboratory sample ID	Sample Description	BrO_3^- (mg/L)	$KBrO_3$ mg/L
0589-001	Nevada Union High School	34	44
0589-002	14093 Glenn Pines	9.3	12
0589-003	Empire Shoes	34	44
0589-004	13733 Loma Roca Dr	15	20
0589-005	13935 Glenn Pines	3.2	4.2
0589-006	365 Gracia Rd	18	24

The factor for conversion of the bromate (BrO_3^-) concentration to potassium bromate ($KBrO_3$) is 1.306.

If you have any questions, please feel free to contact me at (503) 286-9464.

Martin Little
Quality Manager

COLUMBIA INSPECTION, INC.
7133 North Lombard Street ♦Portland, Oregon 97203

April 5, 2000

HydroSolutions of California, Inc.
P.O. Box 922
Nevada City, CA 95959

Subject: Will Project (CI Lab # 0589)

Columbia Inspection, Inc. following strict Chain-of-Custody protocol received the following samples.

Laboratory sample ID	Sample Description	Matrix	Sample date	Sample time
0589-001	Nevada Union High School	Water	3/23/00	12-4
0589-002	14093 Glenn Pines	Water	3/23/00	12-4
0589-003	Empire Shoes	Water	3/23/00	12-4
0589-004	13733 Loma Roca Dr	Water	3/23/00	12-4
0589-005	13935 Glenn Pines	Water	3/23/00	12-4
0589-006	365 Gracia Rd	Water	3/23/00	12-4

The following is QA/QC data generated for the determination of bromate for samples submitted on March 27, 2000.

QC sample	Actual concentration	Raw concentration	% recovery
IBV	0.0 mg/L	ND	
ICV	20.0 mg/L	19.4 mg/L	97 %
CBV	0.0 mg/L	ND	
CCV	20.0 mg/L	20.4 mg/l	102 %

The following QA/QC data was generated for the determination of aluminum on the "13733 Loma Roca Dr" sample.

QC sample	Actual concentration	Raw concentration	% recovery
IBV	0.0	0.04	
ICV	2.0	2.0	100 %
Blank	0.0	0.07	
CBV	0.0	0.04	
CCV	2.0	2.1	105 %

c/o KVMR
401 Spring City 95952

COFFEY LABORATORIES, INC.
CHAIN OF CUSTODY AGREEMENT

CENTRAL OREGON BRANCH
827 SW 7th
Redmond, OR 97756
PHONE/FAX (541) 548-0972

CORPORATE HEADQUARTERS
12423 NE Whitaker Way
Portland, OR 97230
(503) 254-1794 FAX: (503) 254-1452

EASTERN OREGON BRANCH
419 SW 5th
Pendleton, OR 97801
PHONE/FAX (541) 276-0385

Report Attention: Alan Stahler
Company Name:
Mailing Address: P.O. Box 1006
Nevada City, CA 95959
Phone: 530 271-4647 FAX: ( )

Report Instructions (Special - Additional- Job Specific):

PO Number:
Project Number:
Project Name:
EPA Protocol Containers: Y/N Other:

Sample Turnaround
- ☐ Standard
- ☐ Priority (Additonal Fee)
- ☐ Rush (Additional Fee)
- ☐ Emergency (Additional Fee)

Reporting Request
- ☐ State Compliance Format
- ☐ FAX Results - Preliminary
- ☐ FAX Results-Final
- ☐ Verbals Results
- ☐ Extra Report Copy (Fees Associated)

Initials:

FOR LABORATORY USE ONLY Page 1 of 1
Job Number: DGH0012FAT
Custabbr: Stahler Ala X NEW

☐ VISA ☐ M/C Cardholder:
Card #: Exp: / /
Cash / Check / CC:$ #:
Billing Code: 1 2 3 4
QC LEVEL: 1 2 3 4
FEDX BUS COURIERS UPS LAB CLIENT MAIL AIR

Sample ID	Loc.	ID	#	Collection Date / Time	Media	Analysis Requested	Test/ Profile
Dolman 13		13	X	Jun 9	DW	Dromotr.	T460?
Buckman 1	2	2					78
Sanderson 1		3				$23.50 per sample	
Polk 1		4	X				
Evans 1		5	X				
Hunter 1		6	X				
Chamlee 1		7	X				
0							
N							

Sampled By: AUTHORIZED CUSTOMER SIGNATURE DATE:

Sample Comments	Relinquished by: (Please Sign)	Date	Time	Received by: (Sign)	Date	Time
				LAB	11/21	1438

White Copy-Laboratory Yellow Copy - Customer

COMPLETE THIS FORM PER INSTRUCTIONS ON REVERSE SIDE

SUBMISSION OF SAMPLES WITH TESTING REQUIREMENTS TO CLI WILL BE UNDERSTOOD TO BE AN AGREEMENT FOR SERVICES IN ACCORDANCE WITH THE CONDITIONS LISTED ON THE BACK OF THE CLIENT COPY.

Wells where the same laboratory reported 2 1/2 months later that there was no bromate.

Analytical Data

Alan Stahler
a local Biologists samples

Job Number: A00121AI
Page Number: 6 of 8

Coffey Laboratories, Inc.
12423 N.E. Whitaker Way • Portland, OR • 97230 • (503) 254-1794 • FAX (503) 254-1452

Lab Sample ID: A00121AI-5
Field ID: Evans
Date/Time: 01/09/00
Matrix: Drinking Water

EPA Category: Conventional Parameters

Parameter	Method	Detection Limit	Analytical Result	Units	EPA Limit	EPA Code
Bromate	EPA 300.0B	50.	110.	µg/L	----	----

Analytical Data

Alan Stahler

Job Number: A00121AI
Page Number: 2 of 8

Lab Sample ID: A00121AI-1
Field ID: Doleman
Date/Time: 01/09/00
Matrix: Drinking Water

EPA Category: Conventional Parameters

Parameter	Method	Detection Limit	Analytical Result	Units	EPA Limit	EPA Code
Bromate	EPA 300.0B	50.	110.	µg/L	----	----

Analytical Data

Alan Stahler

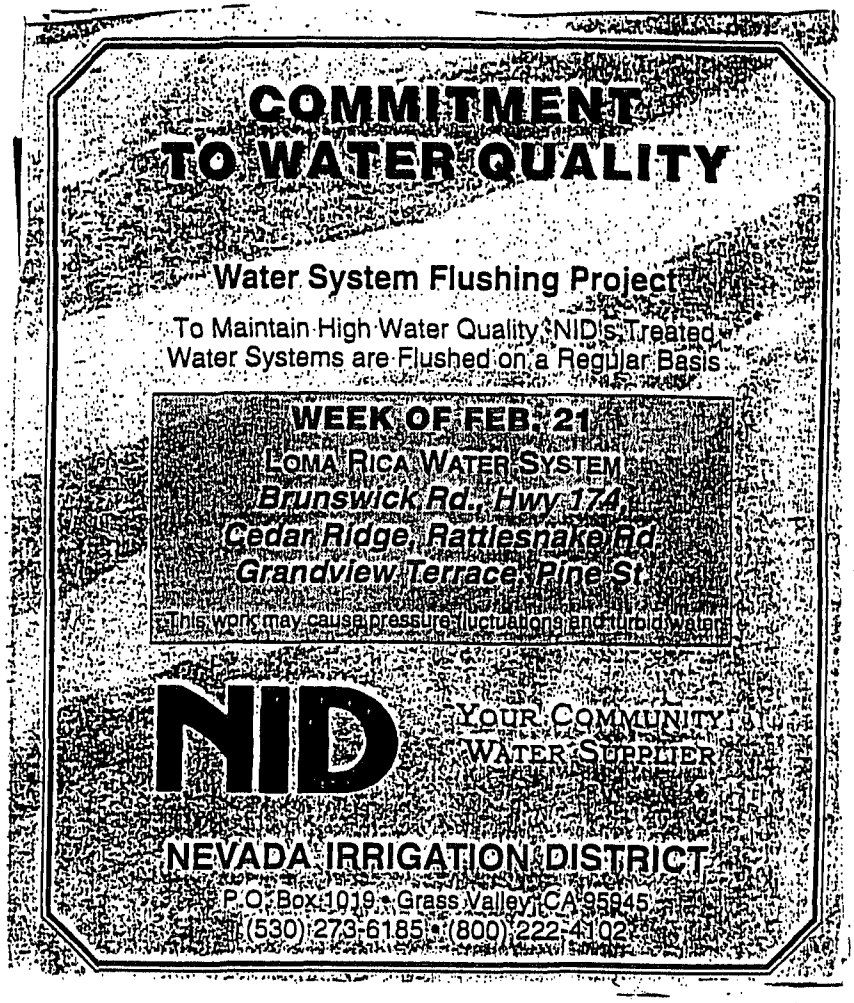
Job Number: A00121AI
Page Number: 7 of 8

Lab Sample ID: A00121AI-6
Field ID: Hunter
Date/Time: 01/09/00
Matrix: Drinking Water

EPA Category: Conventional Parameters

Parameter	Method	Detection Limit	Analytical Result	Units	EPA Limit	EPA Code
Bromate	EPA 300.0B	50.	110.	µg/L	----	----

W. D.
~ 11 times the M.C.L. of bromate was found for drinking water in the Evans well, and 880 times the M.C.L. for drinking water for potassium bromate at the Dolemans well.



On Jan. 9, 2000, Alan Stahler of the Sierra Nevada Sierra Club took samples of seven locations. Stahler insisted on putting the name and address of each location on each sample bottle. All these locations had just been previously tested for bromate and were reported to have high levels of bromate. Now the levels had suddenly diminished to nothing in the metered-water locations but reported lower than the previously reported levels in all the wells. The locations are reflected in the N.I.D. metered water provided in the ad taken from the local newspaper, the *Union*.

Bromate is cleaned up by the use of sodium hydroxide, the newest ingredient now in Clorox-brand chlorine bleach, where the bromate is changed to sodium.

In research being done (see Bromate @Yahoo! www.net) about bromate and chlorine, it was found that bromate was more commonly formed by liquid chlorine rather than gaseous chlorine. Now after my bromate study showing widespread bromate down-gradient from a water-treatment plant making its own liquid chlorine via a brine tank and as well after release of research data regarding chlorine by-products, now Clorox-brand chlorine has a new ingredient, which will sodiumize bromate.

Shortly after this occurrence, the water systems were found to have a very high level of sodium in them. I noticed that a couple of acquaintances suffered heart attacks and died. They were all on restricted sodium diets and drank metered municipal N.I.D. water in the areas mentioned above in the N.I.D. ad.

Will Doleman
A Call for Water Sanity! Monitoring Group

Columbia Inspection Lab results and Location ID- 99 to 4-2000 for BRO_3^- + $KBRO_3$

P9.1

168 08/22/99 2130 WASTE WATER

REPORT DATE: 10/01/99 REPORT NUMBER: PAGE: 6 OF 15

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
AMPLE ID: 168	100% foam mid-ditch foam pit					
(2) 6rn.	BROMATE EPA 300	BROMATE	12	mg/L	0.001	

REPORT DATE: 10/01/99 REPORT NUMBER: PAGE: 9 OF 15

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 171	Downey creek spring water					
9.4 red.	BROMATE EPA 300	BROMATE	9.4	mg/L	0.001	

172 09/06/99 1600 WASTE WATER

REPORT DATE: 10/01/99 REPORT NUMBER: PAGE: 10 OF 15

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 172	orange water out of spring mound water filters					
6.1 red	BROMATE EPA 300	BROMATE	6.1	mg/L	0.001	

177 09/06/99 1730 WASTE WATER

REPORT DATE: 10/01/99 REPORT NUMBER: PAGE: 15 OF 15

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 177	orange jello Base (Leak) of Lost Lake dam					
	BROMATE EPA 300	BROMATE	1.6	mg/L	0.0010	

PROJECT NAME: BROMATE

Date submitted 11/24/99

BRO^3 + KBRO^3 Pg.2

SAMPLE #	CLIENTS ID#	DATE	TIME	DESCRIPTION
	199	11/09/99	1700	WATER SAMPLE
	200	11/09/99	1705	WATER SAMPLE
	201	11/09/99	1345	WATER SAMPLE
	202	11/09/99	1350	WATER SAMPLE
	203	11/09/99	1355	WATER SAMPLE
	204	11/09/99	1400	WATER SAMPLE
	205	11/21/99	1330	WATER SAMPLE
	206	11/21/99	1335	WATER SAMPLE
	207	11/21/99	1340	WATER SAMPLE
	208	11/21/99	1345	SOIL SAMPLE
	209	11/21/99	1350	WATER SAMPLE
	211	11/15/99	1800	WATER SAMPLE
	212	11/15/99	1900	WATER SAMPLE
	213	11/21/99	1400	WATER SAMPLE
	214	11/21/99	1430	WATER SAMPLE
	216	11/21/99	2000	WATER SAMPLE

well and surface water in the Nevada county, Placer county aread call for appointment to take your own sample

REPORT DATE: 12/07/99 REPORT NUMBER: PAGE: 1 OF 4

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE SAMPLE ID: 199		Residential well near cedar Ridge Y area clean water from fiberglass storage tank				
	BROMATE EPA 300.0	BROMATE	4.3	mg/L	0.0010	
WATER SAMPLE SAMPLE ID: 200		as above cept orange water from Bottom of water heater				
	BROMATE EPA 300.0	BROMATE	4.3	mg/L	0.0010	

The Chicogo Party Ditch rattlesnake

Certificate of Analysis

years of seepages and a constant stream of undisinables settle here. Seepages from the Industrial aread use this as there settling Pond

Doleman
leman, Will
O. Box 3544
ass Valley, CA 95945-

Report Issue Date :

Sample Date :
Sample Time :
Sample Type : LIQUID

mission Number :
Number :
ject Number :
ject Desc. :
ple Description :

thod	Analyte	Date Prep.	Date Anal.	Result	Units	DLR	Dil
A 200.7	Lead (Pb)	01/07/97	01/07/97	23	mg/L	0.05	40
A 200.7	Potassium (K)	01/07/97	01/07/97	240	mg/L	2	40

see previous page for site discription

260 mg/L of ~~PPT~~ Bromate found here Bringing the total to 480 mg/L Potasium

9701000009 DOLEMAN_W

Bromate, .0005 mg/L is Prop 65 drinking water limit used in appro 1000 homes

BSK Lab

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PE

Purchase Order #

TURN

BRO3 + KBRO3 con't pg.3

PETROLEUM AND ENVIRONMENTAL LABORATORY
TANK CALIBRATIONS

Duplicate of results showing the origin of the Highest Level of Bromate is Highest Level found

OFFICES
Portland, OR (503) 286-9464
Fife, WA (253) 922-8781
Martinez, CA (925) 229-0360
San Pedro, CA (310)833-1557

WILL'S PLUMBING
WILL DOLEMAN
POB 3544
GRASS VALLEY, CA 95945

Fed. I.D. 93-0746019

No Bromate was found upstream from the Loma Rica

INVOICE DATE: 12/07/99 Invoice number: 592333

Date	Description of services	Amount
12/07/99 campanoph Levels for Bromate highest Level(1)	LABORATORY REPORT NUMBER: 992333 Client's Project Name: BROMATE Date Submitted: 11/24/99	

CI SAMPLE #	CLIENTS ID#	DESCRIPTION
(3) 992333-001-01	199	WATER SAMPLE From private residential well Corner of Brunsarch + 174
(3) 992333-002-01	200	WATER SAMPLE " " " water heater as above
(4) 992333-003-01	201 pipe #1	WATER SAMPLE when Box of N.I.Ps, Loma Rica's Res
(5) 992333-004-01	202 " #2	WATER SAMPLE Res, #1, pipe #2, #3, #4
(4) 992333-005-01	203 " #3	WATER SAMPLE recieves seeps from Back wash ponds
(5) 992333-006-01	204 " #4	WATER SAMPLE drs sand pile runs into the #4 pipe of the
(9) 992333-007-01	205	WATER SAMPLE 6" AC pipe same as #217 and #181
(10) 992333-008-01	206	WATER SAMPLE cascade ditch up stream from the old L.F. Landfill
(2) 992333-009-01	207 old Yuba Res	WATER SAMPLE white foam emerging from the old
(10) 992333-010-01	208	SOIL SAMPLE Land fill Soil dumped in 1996
(5) 992333-011-01	209	WATER SAMPLE old Res, pre-ditch puddle at eddy from BAC,
(7) 992333-013-01	211 Tom B's	WATER SAMPLE 2 Glenn well filter Examples (water)
992333-014-01	212 Tom #3	WATER SAMPLE Pines rd well taken by Tom Glenn Pines
(5) 992333-015-01	213	WATER SAMPLE Little hill drive well water from #2
(1) 992333-016-01	214	WATER SAMPLE residential well Loma Rica drive Top of Little hill drive near
(11) 992333-017-01	216	WATER SAMPLE Glenn Pines well Glenn Pines with

Formula
The Lower Level of of Potassium or Bromate times 2 = P.B. P.B. ÷ max contaminent Level for safe drinking water Prop. 65 which is .0005 p or ng/L. so P.B. ÷ .0005 = Number of times o the safe m.c.L. for safe drinking water

REPORT DATE: 10/01/99 REPORT NUMBER: PAGE: 6 OF 15

SAMPLE	TEST	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 168						
	BROMATE	BROMATE	12	mg/L	0.001	
	EPA 300	BROMATE				

24 mg/L Potasium Bromate is 48,000 times the safe drinking water Level

If the 12 mg/L Bromate is combined with the surface water 12 mg/L found in this water as then the Level Potasium Bromate would be

A good posibility of 24 mg/L Potasium Bromate here which is 24,000 times the prop 65 Level for safe drinki

BRO3 + KBRO3 con't pg. 4

11-03-99

181
SAMPLE ID: 4 — alum material gathered where the gu Asbestos cement pipe comes out from under the Loma rica water plants fence 3/4 of this is water 1/4 alum

160 red — BROMATE EPA 300 — BROMATE 160 mg/L 0.0010 ✓

182
SAMPLE ID: 5 — soil water treatment residues off the surface of the Loma rica water treatment plants back wash pond and dumped into the watershed of the wren Box and the Ex fork of little greenhorn creek

150 red — BROMATE EPA 300 — BROMATE 150 mg/L 0.0010 ✓

REPORT DATE: 12/07/99 REPORT NUMBER:

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE SAMPLE ID: 207 — white foam and water coming off the old Landfill and dumped into the old reservoir						
4.8 red	BROMATE EPA 300.0	BROMATE	4.8	mg/L	0.0010	2.7 Potasium found here ✓
	BROMIDE EPA 300.0	BROMIDE	ND	mg/L	0.01	Potasium Bromate
SOIL SAMPLE SAMPLE ID: 208 — soil in rain since 1996 or previous on the surface of N.I.P.S Landfill in the old resorvior						
see 4.8 red	BROMATE EPA 300.0	BROMATE	2.4	mg/Kg	0.03	✓
WATER SAMPLE SAMPLE ID: 209 — white foam in the eddy at the chicago park rattle snake ditch below the old res. water entry point						
3.2 red	BROMATE EPA 300.0	BROMATE	3.2	mg/L	0.0010	✓
WATER SAMPLE SAMPLE ID: 211 — 260 ft. deep well filter water in the glenn pines rd nieghborhood (3.7 Potasium found						
Tom B's 3.5 red	BROMATE EPA 300.0	BROMATE	3.5	mg/L	0.0010	✓
possibly 7 mg/L of Potasium Bromate if combined						
WATER SAMPLE SAMPLE ID: 212 — diferent well same discription as 211 cept water out of well with no filter						
1.2 red	BROMATE EPA 300.0	BROMATE	1.2	mg/L	0.0010	✓
1.8 mg/L potasium found. Possibly 2.4 mg/L Potasium Bromate if combined						
WATER SAMPLE SAMPLE ID: 213 — 200 + ft. deep well in the Little hill Drive nieghborhood of Greenhorn rd. between Greenhorn rd and Brunswick bottom of water heater						
3.7 red	BROMATE EPA 300.0	BROMATE	3.7	mg/L	0.0010	✓
4. mg/L potassium found. Possibly 7.4 mg/L Potasium Bromate if combined						

181
SAMPLE ID: 4 — alum material gathered where the gu Asbestos cement pipe comes out from under the Loma rica water plants fence 3/4 of this is water 1/4 alum

160 red — BROMATE EPA 300 — BROMATE 160 mg/L 0.0010 ✓

8

BRO_3^- + $tBRO_3^-$ con't pg. 5

182 SAMPLE ID: 5 — soil from the Loma rica water treatment modules off the surface of the Pond and dumped into the water shed of the Wier Box and the E. Fork of Little grass-hourcutt

150 red — BROMATE EPA 300 — BROMATE — 150 — mg/L — 0.0010

REPORT DATE: 12/07/99 REPORT NUMBER: PAGE: 2 OF 4

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE SAMPLE ID: 201		Wier Box of the New Reservior dam at the Loma rica water plant #1 Pipe, downstream water from backwash discard Pile dumped in the Rain at Base of dam				
(A) red	BROMATE EPA 300.0	BROMATE	3.8	mg/L	0.0010	
WATER SAMPLE SAMPLE ID: 202		wier Box as above pipe #2				
	BROMATE EPA 300.0	BROMATE	3.6	mg/L	0.0010	
WATER SAMPLE SAMPLE ID: 203		wier Box as above pipe # 3				
	BROMATE EPA 300.0	BROMATE	3.8	mg/L	0.0010	
	SULFATE-IC EPA 300.0	SULFATE	1.4	mg/L	0.1	
WATER SAMPLE SAMPLE ID: 204		wier box as above pipe #4				
	BROMATE EPA 300.0	BROMATE	3.6	mg/L	0.0010	
WATER SAMPLE SAMPLE ID: 205		clear water from 8" Asbestos cement Pipe Pipe, exstension coming out from under the plant (Loma rica water treatment) Renee, source: chain drain around quagulation Pr treatment pond				
2.9 red	BROMATE EPA 300.0	BROMATE	2.9	mg/L	0.0010	
	SULFATE-IC EPA 300.0	SULFATE	2.2	mg/L	0.1	
WATER SAMPLE SAMPLE ID: 206		water from the cascade ditch entering the new reservior				
	BROMIDE EPA 300.0	BROMIDE (B)	ND	mg/L	0.01	

BRO_3 + $KBRO_3$ cont pg. 6

WATER SAMPLE		SAMPLE ID: 207				
1-26-2000	ALUMINUM - ICP* EPA 200.7/6010B	TOTAL ALUMINUM	0.74	mg/L	0.02	
	LEAD - ICP* EPA 200.7/6010B	TOTAL LEAD	ND	mg/L	0.08	
	POTASSIUM - ICP* EPA 200.7/6010B	TOTAL POTASSIUM	1.7	mg/L	0.62	

4,8 Bromi was found here if combined 1.7 Potasium (K) 1.7 K x 2 = 3,4 mg/L $KBRO_3$ which is 6,800 times the M.C.L for safe D.W.

WATER SAMPLE		SAMPLE ID: 211			
1-26-2000	POTASSIUM - ICP* EPA 200.7/6010B	TOTAL POTASSIUM	3.7	mg/L	0.62

~~37~~ $KBRO_3$ if all BRO_3 + K are combined

7, mg/L $KBRO_3$ is 14,000 times the M.C.L for safe D.W.

REPORT DATE: 01/26/2000 REPORT NUMBER: PAGE: 3 OF 3

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE	POTASSIUM - ICP* EPA 200.7/6010B	SAMPLE ID: 212 TOTAL POTASSIUM	1.8	mg/L	0.62	
WATER SAMPLE	ALUMINUM - ICP* EPA 200.7/6010B	SAMPLE ID: 213 TOTAL ALUMINUM	0.11	mg/L	0.02	
	POTASSIUM - ICP* EPA 200.7/6010B	TOTAL POTASSIUM	4.0	mg/L	0.62	
WATER SAMPLE		SAMPLE ID: 214			0.02	

2,4 mg/L $KBRO_3$ is 4,800 times the M.C.L for safe D.W.

2,4 mg/L $KBRO_3$ if BRO_3 and K are combined

this is a residential well

possibility that this water is 7,4 mg/L of Potassium Bromate which would be 14,800 times the safe level for Drinking water.

Potasium Bromate is a rarity in the water or to test for in a county with per-capita level of cancers (a very high

REPORT DATE: 12/07/99 REPORT NUMBER: PAGE: 4 OF 4

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE SAMPLE ID: 214	BROMATE EPA 300.0	BROMATE	15	mg/L	0.0010	
	SULFATE-IC EPA 300.0	SULFATE	1.7	mg/L	0.1	
WATER SAMPLE SAMPLE ID: 216	BROMATE EPA 300.0	BROMATE	1.3	mg/L	0.0010	

200 ft well in Madrona Havana Loma Vista drive neighborhood near the Loma Vista plant

15 is red

clear water at well head

aluminum is 11 mg/L

300 ft. well water from Bottom of water heater tank in Bloom Fines Rd area

1.3

BRO3 + KBRO3 con't pg

CERTIFICATE OF ANALYSIS

CLIENT: WILL'S PLUMBING
GRASS VALLEY CA 95945

PHONE: (530) 270-1775
FAX:

DATE SUBMITTED: 12/08/99

PROJECT NAME:

SAMPLE	CLIENTS ID#	DATE	TIME	MATRIX	DESCRIPTION
	219A	11/28/1999	1500	GROUND WATER	
	219B	11/28/1999	1530	GROUND WATER	
	220	11/28/1999	1500	GROUND WATER	
	221	11/29/1999	1330	GROUND WATER	
	222	11/29/1999	1335	GROUND WATER	
	223	12/01/1999	0900	GROUND WATER	
	224	12/03/1999	0905	SOIL	
	225	12/05/1999	1800	GROUND WATER	
	226	12/03/1999	2100	SOIL	

Retested for Potassium to determine Potassium Bromate Levels

REPORT DATE: 01/18/2000 REPORT NUMBER: PAGE: 1 OF 3

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 219A						
	BROMATE EPA 300.0	BROMATE	3.9	mg/L	0.001	
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	1.13	PPM	0.62	

2.26 Potasium Bromate here
If all K and B are combined this is 4,520 times m,c,L, for safe

REPORT DATE: 01/18/2000 REPORT NUMBER: PAGE: 2 OF 3

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
ID: 219B						
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	1.0	PPM	0.62	
	SULFATE-IC EPA 300.0	SULFATE	4.6	mg/L	0.1	
SAMPLE ID: 222						
	ALUMINUM - ICP EPA 200.7/6010B	TOTAL ALUMINUM	1.5	PPM	0.02	
	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	ND	PPM	0.12	
	BROMATE EPA 300.0	BROMATE	6.0	mg/L	0.001	
	POTASSIUM - ICP	TOTAL POTASSIUM	0.35	PPM	0.62	

2.1 Bromate (BRO3)
1.0 Potassium (K)
could be 2 mg/L Potasium Bromate if if all Available Potassium and Bromate are combined. This Level of 2, mg/L BRO3 is 4,000. times the M,C,L for safe D,W, L

.7 ~~0~~ mg/L KBRO3 if all available BRO3 and K are combined 7,0 mg/L KBRO3 is 14,000 times the M,C,L for Safe D,W, (drinking water)

BRO_3^- + $tBRO_3^-$ cont p9.8

DATE SUBMITTED: 12/08/99

PROJECT NAME:

SAMPLE #	CLIENTS ID#	DATE	TIME	DESCRIPTION
	219A	11/28/99	1500	The Below water samples
	219B	11/28/99	1630	came from residencial Meter-
	220	11/28/99	1500	ed water, residencial wells
	221	11/29/99	1330	and surface waterways in
	222	11/29/99	1335	the Placer Nevada county Area
	223	12/01/99	0900	at an elevation of 2 to 3,000 ft.
	224	12/03/99	0905	
	225	12/05/99	1800	
	226	12/03/99	2100	

REPORT DATE: 12/17/99 REPORT NUMBER: PAGE: 1 OF 2

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 219A		out of Drain from the D.S. Ditch crossing over Wolf creek near Idaho-Maryland Rd.				
3.9 red	BROMATE EPA 300.0	BROMATE	3.9	mg/L	0.0010	1.13 mg/L potasium V
		2.26 Potasium Bromate if combined (I.C.)				
SAMPLE ID: 219B		D.S. Pond the water shed directly below				
2.1 (E) red	BROMATE EPA 300.0	BROMATE	2.1	mg/L	0.0010	the area where Nevada county Buried the toxics North side airpark 1 mg/L Potasium
	BROMIDE EPA 300.0	BROMIDE	1.3	mg/L	0.01	2 mg/L Potasium Bromate L
		possibly an indication of the water				
	SULFATE-IC EPA 300.0	SULFATE	4.6	mg/L	0.1	Table Below the county and the Loma Rica water treatment plant

REPORT DATE: 12/17/99 REPORT NUMBER: PAGE: 2 OF 2

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 220						
red (C)	O & G NP (SGT-HEM) EPA 1664	NONPOLAR OIL & GREASE*	4.6	mg/L	2	
		D.S. Pond spring below Nev. co. Airpark				
SAMPLE ID: 221		mixer box #3 pipe				
red (A)	BROMATE EPA 300.0	BROMATE	3.3	mg/L	0.0010	V
SAMPLE ID: 222		Downey creek acrossed from Mr. Shaws in the current pipe under the road. Public easment				
6.0 red	BROMATE EPA 300.0	BROMATE 6.0 :35 potasium found :7 Potasium Bromate if combined	6.0	mg/L	0.0010	V

BRO3 + KBRO3 con't pg. 9

New addition city 7.9 red

SAMPLE ID: 223 from the bottom of a 2 month old water heater inside a residence which is on metered water (treated water) ✓

BROMATE EPA 300.0	BROMATE	7.9	mg/L	0.0010	

SAMPLE ID: 224 from the bottom of the chicago park ditch alum and silt which was dried in an open container since 1996 23 mg/L ✓ Lead and 240 mg/L of Potasium may also found here

260 red

BROMATE EPA 300.0	BROMATE	260	mg/L	0.0010	

SAMPLE ID: 225 at the well head at a 300-ft. deep well .23 P.P.m. arsenic

.85 red

BROMATE EPA 300.0	BROMATE	0.85	mg/L	0.0010	

glenn pines rd. area, 1.7 mg/L Potasium Bromat (K,C,) ✓

SAMPLE ID: 226 gathered this sample at surface of old Reservion Mid Landfill in 1996 it remain refridenated till 1999 ✓

BROMATE EPA 300.0	BROMATE	160	mg/L	0.0010	

590 P.P.m. Potasium 70,581 P.P.m. Aluminum

red note it's the same level as other surface water

320 mg/L Potasium Bromate if combined

*Note: Laboratory oil and grease method blank = 3.3 mg/L treatment nodules dumped at the Base of the New reservior in 1999 ✓

SAMPLE ID: 224 good possibility of a Level of Potasium Bromate here at a Level as high as 950,000 times the safe M.C.L. for Drinking water.

12-17-99

BROMATE EPA 300.0	BROMATE	260	mg/L	0.0010	

480 mg/L KBRO3 if combined ✓

SAMPLE ID: 224 3.1 mg/L K was found 6.2 mg/L KBRO3 if combined which is 12,400 times the safe D.W. Level ✓

BROMATE EPA 300.0	BROMATE	260	mg/L	0.001	

SAMPLE ID: 225 well water normally thought of safe for drinking purposes ✓

ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	0.23	PPM	0.12	

REPORT DATE: 01/18/2000 REPORT NUMBER: PAGE: 3 OF

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
SAMPLE ID: 225						
	BROMATE EPA 300.0	BROMATE	0.85	mg/L	0.001	
	MANGANESE - ICP EPA 200.7/6010B	TOTAL MANGANESE	0.022	PPM	0.01	
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	1.5	PPM	0.62	
	VANADIUM - ICP EPA 200.7/6010B	TOTAL VANADIUM	0.016	PPM	0.01	

1.7 mg/L KBRO3 if all K and BRO3 are combined ✓

1.7 mg/L KBRO3 is 3,400 times the M.C.L. for safe D.W.

WATER SAMPLE 3.1 red 0031-006 — SAMPLE ID: 232 Headwaters of the E. Fork of Little grn-horn ckr. ✓

BROMATE EPA 300.0	BROMATE	3.1	mg/L	0.001	Abigail K.

1/4th orange foam

WATER SAMPLE 6. red 0031-007 — SAMPLE ID: 233 Brunswick Basin Metered treated water ✓

BROMATE EPA 300.0	BROMATE	6.0	mg/L	0.001	Abigail K.

BRO3 + KBRO3 cont p9.10

SAMPLE ID: 226

ALUMINUM - ICP EPA 200.7/6010B	TOTAL ALUMINUM	70581.0	PPM	0.02	possiblity this sample may be 320 mg/L of Potassium Bromate which would be 640,000 times the safe Level for Printing water for a human
BROMATE EPA 300.0	BROMATE	160	mg/L	0.001	
POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	590	PPM	152	
VANADIUM - ICP EPA 200.7/6010B	TOTAL VANADIUM	ND	PPM	0.01	

160 x 2 = RB. ÷ 1,000 s
M.C.L = 640,000 times the M.C.L for Safe D.W.

with the Level of Potassium found here it is quite Likely that all the BRO3 is combined in the substance KBRO3. 160 KBRO3 is 640,000 times the M.C.L for D.W. Prop 65 Level.

A New record is set for Aluminum 70,581. mg/L of Aluminum.

Dumped in the old Yuba Reservion By M.I.D.

BR03 + KBR03 con't pg. 11

DATE SUBMITTED: 01/06/20

PROJECT NAME: BRO-METAL PROJECT NUMBER: 227-232

SAMPLE	CLIENTS ID#	DATE	TIME	MATRIX	DESCRIPTION
0031-001	227	12/14/1999	1855	Water	WATER SAMPLE
0031-002	228	12/23/1999	0930	Water	WATER SAMPLE
0031-003	229	12/30/1999	1700	Water	WATER SAMPLE
0031-004	230	01/04/2000	1745	Water	WATER SAMPLE
0031-005	231	01/04/2000	2000	Water	WATER SAMPLE
0031-006	232	12/23/1999	0930	Water	WATER SAMPLE
0031-007	233	01/04/2000	1201	Water	WATER SAMPLE

REPORT DATE: 02/03/2000 REPORT NUMBER: 0031 PAGE: 1 OF 2

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE		SAMPLE ID: 227				
0031-001	BROMATE EPA 300.0	BROMATE	6.4	mg/L	0.001	Abigail K.
WATER SAMPLE		SAMPLE ID: 228				
0031-002	BROMATE EPA 300.0	BROMATE	5.0	mg/L	0.001	Abigail K.
WATER SAMPLE		SAMPLE ID: 229				
0031-003	BROMATE EPA 300.0	BROMATE	20	mg/L	0.001	Abigail K.

6.4 red — L.O.P. water tap!

5, red — Headwaters of the E fork of Little Grn-horn creek 25% alum remainder water

20, Red — Geyserville municipal water potable? From the water in the housing surrounding hen Spring mound home drinking water pre-filter

CLIENT: WILL'S PLUMBING PHONE: (530) 270-1775

FAX:

GRASS VALLEY CA 95945

New samples in; 1-28-00

DATE SUBMITTED: 01/12/20

PROJECT NAME: WSMCB SURVEY

SAMPLE	CLIENTS ID#	DATE	TIME	MATRIX	DESCRIPTION
	244	01/04/2000	2000	Water	WATER SAMPLE Metered water R) R Plant
	245	01/04/2000	1800	Water	WATER SAMPLE " " Grn-horn rd
	246	01/06/2000	1530	Water	WATER SAMPLE " " Alta Sierra
	247	01/09/2000	1700	Water	WATER SAMPLE as water Leares Lost Lake (5,6)
	248	01/09/2000	1717	Water	WATER SAMPLE Skimmed 100 yds downstream from the lake 249 as 248
	249	01/09/2000	1720	Water	
	250	01/08/2000	1315	Semi-Solid	SEMI-SOLID SAMPLE Gelitan at Leak from the
	251	01/08/2000	1320	Semi-Solid	SEMI-SOLID SAMPLE Base of the dam.
	252	01/08/2000	1330	Water	WATER SAMPLE as above " "
	253	01/08/2000	1335	Water	WATER SAMPLE as above
	254	01/09/2000	1800	Water	WATER SAMPLE R + Ready ditch
	255	01/08/2000	1340	Water	WATER SAMPLE water sample simulated rain
	256	01/06/2000	1900	Water	WATER SAMPLE Meter Res / house water

REPORT DATE: 01/28/2000 REPORT NUMBER: PAGE: 1 OF 3

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE		SAMPLE ID: 244				
5.9 red	BROMATE EPA 300.0	BROMATE	5.9	mg/L	0.001	
WATER SAMPLE		SAMPLE ID: 245				
5.3 red	BROMATE EPA 300.0	BROMATE	5.3	mg/L	0.001	
WATER SAMPLE		SAMPLE ID: 246				
5.8 red	BROMATE EPA 300.0	BROMATE	5.8	mg/L	0.001	

Metered home use residintal water in the Bitney springs area

Metered home use Potable? water on Greenhorn rd.

metered municipal water out of a tap in a restaurant in Alta-sierra

BRO3 + KBRO3 con't p9.12

WATER SAMPLE			SAMPLE ID: 247			as water leaves Lost Lake on Gum horn rd. downstream from the Lava cap mine. Taken from the waters surface. (Clear Death)
(D) red	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	0.59	mg/L	0.12	
	LEAD - ICP EPA 200.7/6010B	TOTAL LEAD	ND	mg/L	0.08	

SAMPLE			SAMPLE ID: 249			.84 mg\L Potas inm since it's the smaller Number of the TWO Bromate and Potasium then you double it 1.68 mg\L Potasium Bromate if all of the available Potassium is combined with the Bromate. This Level of 1.68 Pot assium Bromate is 3,360 times the safe drinking water Level Prop. 65 M.C.L criteria.
Lost Lake 1-28-2000.	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	ND	mg/L	0.12	
	LEAD - ICP EPA 200.7/6010B	TOTAL LEAD	ND	mg/L	0.08	
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	0.84	mg/L	0.62	

WATER SAMPLE			SAMPLE ID: 249			Both 248 and 249 were taken about 100 yds downstream from the confluence of Lost Lake Dam overflow and the Dam Leak. taken off the surface (on clipper creek)
(D) Red	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	ND	mg/L	0.12	
	LEAD - ICP EPA 200.7/6010B	TOTAL LEAD	ND	mg/L	0.08	
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	0.84	mg/L	0.62	(1.68) mg\L found if all Bromate and Potasium are combined

SEMI-SOLID SAMPLE			SAMPLE ID: 250			orange Gelitan at the Dam Leak Magnetically made detectable
(D) red	CYANIDE, TOTAL EPA 335.2	TOTAL CYANIDE	0.08	mg/L	0.02	

SEMI-SOLID SAMPLE			SAMPLE ID: 251			as above sampled as found 60% increased in cyanide when made detectable
(D) red	CYANIDE, TOTAL EPA 335.2	TOTAL CYANIDE	0.05	mg/L	0.02	

WATER SAMPLE			SAMPLE ID: 252			Gelitan Leak from the Base Lost Lake dam.
3.9 red (D) red	BROMATE EPA 300.0	BROMATE	3.9	mg/L	0.001	

WATER SAMPLE			SAMPLE ID: 253			as above Arsenic as Decrease 1 mg\L from sample taken around this time Last year
(D) red	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	30	mg/L	1.2	
	LEAD - ICP EPA 200.7/6010B	TOTAL LEAD	0.46	mg/L	0.08	Note Below: 7.6 mg\L P.B. is 15,000 times the (M.C.L.) max contament Lerel for D.W. Drinking water. Prop 65 Levels,
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	3.8	mg/L	0.62	7.6 mg\L Potasium Bromate if all Potasium and equal Bromate are combined

7.6 ÷ .0005 = # of times over M.C.L.

aring Lost Lake

WATER SAMPLE			SAMPLE ID: 254			raw ditch surface scum as it enters pipe intake for water treatment plant. (Roof and Ready Ditch)
(2.9 Red)	BROMATE EPA 300.0	BROMATE	2.9	mg/L	0.001	

WATER SAMPLE			SAMPLE ID: 254			same as 254
	BROMIDE EPA 300.0	BROMIDE	ND	mg/L	0.01	

BR03 + KBR03 con't pg. 13

REPORT DATE: 01/28/2000 REPORT NUMBER: PAGE: 3 OF 3

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
WATER SAMPLE		SAMPLE ID: 255				
	BROMATE EPA 300.0	BROMATE	4.0	mg/L	0.001	Simulated rain.
WATER SAMPLE		SAMPLE ID: 256				
	BROMATE EPA 300.0	BROMATE	4.9	mg/L	0.001	
WATER SAMPLE		SAMPLE ID: 253				
	ARSENIC - ICP EPA 200.7/6010B	TOTAL ARSENIC	30	mg/L	1.2	
	LEAD - ICP EPA 200.7/6010B	TOTAL LEAD	0.46	mg/L	0.08	
	POTASSIUM - ICP EPA 200.7/6010B	TOTAL POTASSIUM	3.8	mg/L	0.62	

4. red (P) red

water sample taken as water drops from Lost Lake Dam leak into the overflow of Lost Lake after (clipper creek)

Metered municipal water taken from tap in residence Nevada city

Last Lake 1-28-2000

3,8 Potasium x2 = 7,6 Potasium Bromate if all Potasium is combined with the 3,9 Bromate.

7,6 Potassium Bromate is 15,200 times the M.C.L. for safe Propitos Drinking water Level

CERTIFICATE OF ANALYSIS
PARTIAL REPORT

CLIENT: WILL'S PLUMBING
13935 GLEN PINN
GRASS VALLEY, CA 95945

PHONE: (530) 270-1775
FAX: (530) 272-8891

DATE SUBMITTED: 03/09/20

PROJECT NAME: F T BRO

CI SAMPLE	CLIENTS ID#	DATE	TIME	MATRIX	DESCRIPTION
0451-001-01	281	03/04/2000	1730	Water	
0451-002-01	282	03/04/2000	1700	Water	
0451-003-01	283	03/04/2000	1800	Water	
0451-004-01	284	03/04/2000	1845	Water	
0451-005-01	285	03/04/2000	1500	Water	
0451-006-01	286	03/05/2000	1815	Water	
0451-007-01	287	03/05/2000	1900	Water	
0451-008-01	288	03/05/2000	1800	Water	
0451-009-01	289	03/05/2000	2300	Water	
0451-010-01	290	03/05/2000	2300	Water	
0451-011-01	291	03/02/2000	0300	Water	
0451-012-01	292	03/05/6000	1430	Water	
0451-013-01	293	03/06/6000	1530	Water	
0451-014-01	294	03/06/6000	1600	Water	
0451-015-01	295	03/06/6000	1630	Water	

281. Metered tap water on timbur Ln.
282. well H2O on Little Hill Dr. off Greenhorn
283. well H2O in the wanona Madrona
284. Metered tap water Bis. Alta Sierra
285. Metered tap water Residence sunset
286. Metered tap water High school Drinking
287. Metered tap water Middle school "
288. Metered Tap water Ridge rd Res.
289. Metered " " Grn.-horn Rd
290. " " " Bear River high
291. Clear Ditch water chic. pan R. ditch
292. metered Tap water Gracie rd M.C.
293. well H2O BR Hyway near ponderosa
294. well res, 260ft Glenn Pines rd.
295. Metered Tap water Bis. Brunswick Basin

REPORT DATE: 03/21/2000 REPORT NUMBER: 0451 PAGE: 1 OF 2

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
		Metered water eff SAMPLE ID: 281				
0451-001-01	BROMATE EPA 300.0	BROMATE	18	mg/L	0.001	Abby K.
		well off anchor Ln. SAMPLE ID: 282				
0451-002-01	BROMATE EPA 300.0	BROMATE	5.4	mg/L	0.001	Abby K.

BR03 + KBR03 con't p9.14

			SAMPLE ID: 283 well near water plant				
0451-003-01	BROMATE EPA 300.0	BROMATE		14	mg/L	0.001	Abby K.
			SAMPLE ID: 284 metered water Alta sierra.				
0451-004-01	BROMATE EPA 300.0	BROMATE		22	mg/L	0.001	Abby K.
			SAMPLE ID: 285 metered water sunset Market area.				
0451-005-01	BROMATE	BROMATE		23	mg/L	0.001	Abby K.

** Draft Report **
Data in this report may not be complete. This report has not undergone final quality assurance review

REPORT DATE: 03/21/2000 REPORT NUMBER: 0451 PAGE: 2 OF 2

COLUMBIA INSPECTION, INC. 7133 N. Lombard, Portland, OR 97203 Phone:(503) 286-9484 Fax:(503) 286-5356 E-mail:lab@ColumbiaInspection.com

SAMPLE	ANALYSIS	PARAMETER	RESULT	UNIT	DETECTION LIMIT	ANALYST
	EPA 300.0					
		SAMPLE ID: 286 Metered water Nevada Union high school				
0451-006-01	BROMATE EPA 300.0	BROMATE	24	mg/L	0.001	Abby K.
		SAMPLE ID: 287 metered water Middle school of squirrel Hn.				
0451-007-01	BROMATE EPA 300.0	BROMATE	24	mg/L	0.001	Abby K.
		SAMPLE ID: 288 Metered water ridge rd.				
0451-008-01	BROMATE EPA 300.0	BROMATE	22	mg/L	0.001	Abby K.
		SAMPLE ID: 289 Metered water Greenhorn rd.				
0451-009-01	BROMATE EPA 300.0	BROMATE	17	mg/L	0.001	Abby K.
		SAMPLE ID: 290 Metered water Bear River high school				
0451-010-01	BROMATE EPA 300.0	BROMATE	26	mg/L	0.001	Abby K.
		SAMPLE ID: 291 clean ditch water chicago Park ditch				
0451-011-01	BROMATE EPA 300.0	BROMATE	8.9	mg/L	0.001	Abby K.
		SAMPLE ID: 292 Metered water Gracie rd. N.C.				
0451-012-01	BROMATE EPA 300.0	BROMATE	15	mg/L	0.001	Abby K.
		SAMPLE ID: 293 well water R+R Hy and Ponderosa				
0451-013-01	BROMATE EPA 300.0	BROMATE	12	mg/L	0.001	Abby K.
		SAMPLE ID: 294 Buckman well 2 cases diagnosed for Bone cancer 160 ft, Deep well (volcanic rock strata)				
0451-014-01	BROMATE EPA 300.0	BROMATE	7.8	mg/L	0.001	Abby K.
		SAMPLE ID: 295 Metered water Brunswick bagby Bis.				
0451-015-01	BROMATE EPA 300.0	BROMATE	24	mg/L	0.001	Abby K.

(6)

Bromate formation during pre-coagulation ozonation in drinking water treatment

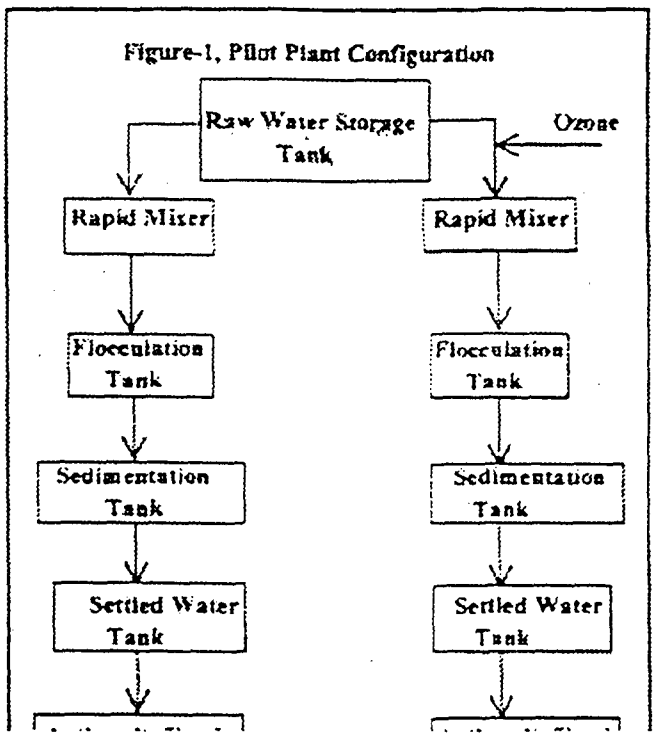
By Saad Y. Jasim, Ph.D., P.Eng.

The presence of bromide ion in raw water can lead to the formation of brominated disinfection by-products (DBPs) such as bromate during water treatment with ozone. The formation of bromate depends on water quality parameters such as influent bromide ion concentration, pH, total organic carbon (TOC) and various treatment conditions (O3 dose, dissolved O3 and contact time). The US Environmental Protection Agency (USEPA) has proposed a maximum contaminant level (MCL) for bromate in drinking water of 10 µg/L.

Many studies on bromate formation during ozonation have been conducted on a bench-scale under batch or semi-batch conditions. A pilot scale application is considered to be closer to a full scale operation.

The NSERC Industrial Research Chair in Drinking Water Treatment at the University of Waterloo and partners from various segments of the water industry, are conducting research to investigate important issues in drinking water treatment. Three state-of-the-art drinking water treatment pilot plants were built to conduct these studies.

The Windsor Utilities Commission, Windsor, Ontario (one of the NSERC Chair partners), and the Civil and Environmental Engineering Department, the University of Windsor, conducted a pilot scale study for the formation of bromate during a pre-coagulation ozonation process. The Windsor Water Treatment Centre serves three municipalities whose total population is approximately 214,000. Raw water is drawn from the Detroit River which connects Lake St. Clair and Lake Erie.

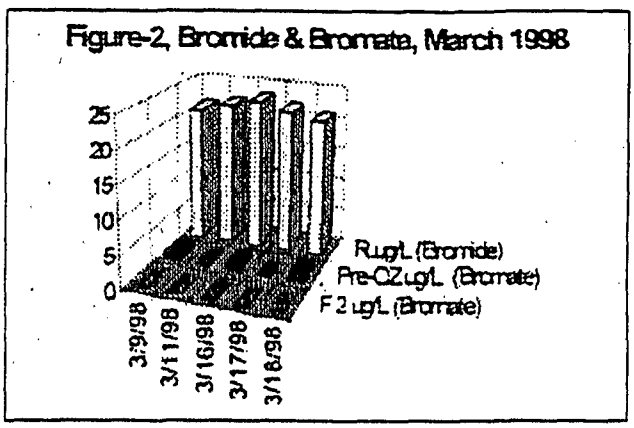


The Windsor Water Treatment Centre was upgraded in 1994 to increase total capacity from 227 ML/D to 454 ML/D with the construction of a second drinking water treatment plant (A.H. Weeks Plant) at the site of the original plant. Provisions were made for the addition of ozone at some point in the future.

The pilot plant used in this study had two identical process trains constructed of organically inert materials (stainless steel, glass, or fluorocarbons). Each side of the pilot plant shared identical physical characteristics which allowed for direct comparison between the two sides of the plant with common raw water quality.

Aluminum sulfate (alum) was used as the coagulant, and a cationic coagulant aid (Percol LT 24), was applied to both sides of the pilot plant. Ozone was applied prior to coagulation on side 2 of the pilot plant (**Figure 1**) at a dose of 1.3-1.5 mg/L. Flow rate through the anthracite/sand filters was maintained at 3.25 L/min. (10.7 m/h).

Samples were taken from the pilot plant influent (raw water) for bromide analysis, while samples for bromate analysis were taken from the pre-ozone contactor and anthracite/sand filter effluent.



Bromide concentration in raw water (Detroit River water), was 21-23 µg/L during the experiment; bromide concentration did not exceed 1.1 µg/L after ozonation (samples were collected from the ozone contactor), while bromate was always lower than the detection limit (1 µg/L) for filtered water. (**Figure 2**)

Future experiments would investigate bromate formation at pre-coagulation ozonation compared to post sedimentation ozonation, and pre-coagulation ozonation compared to multi-stage ozonation.

The findings of this study would be of particular significance to the Windsor Utilities Commission in future consideration for the implementation of ozonation as a process to be considered at the A.H. Weeks Water Treatment Plant and potentially at other locations.

Dr. Saad Y. Jasim is conducting studies on water quality for the Windsor Utilities Commission. He also serves as an Adjunct Assistant Professor in the Civil and Environmental Engineering Department, University of Windsor, Windsor, Ontario.

NOTE FROM WILL E. DOLEMAN

Bromide could become part of our raw water up here because of the dumping of spa and hot-tub water into the environment. This water is generally disinfected with bromide. For one thing, ozination turns bromide to bromate as in some water-treatment plants and in a lot of bottled water.

Nevada Irrigation District (N.I.D.) does not test the backwash effluent before dumping it. Pretending that it's fine is cheaper than having to deal with it in a special way. From what I have seen, the cheapest way is always the choice regardless of the implications to public health.

The California Regional Water Quality Board (C.R.W.Q.B.) pampers and protects N.I.D., which has to my knowledge never been fined under the present C.R.W.Q.B. management. Unless it's a financial loss for N.I.D., it's ignored.

If N.I.D. is a responsible party due to years of dumping water-treatment waste into the Lava Cap mine or other watersheds, then these two major projects of my watershed are definitely related. Also, if present (seeming at this point more likely) mining operations, the state and federal E.P.A., and water- and sewage-treatment plants are using a chemical to foam their pollutants away, then still all these sites and many more across the U.S. are related.

NATIONAL CENTER FOR ENVIRONMENTAL RESEARCH AND QUALITY ASSURANCE

Office of Research and Development
U.S. Environmental Protection Agency

Kinetic-Based Models for Bromate Formation in Natural Waters

EPA Grant Number: R826835
Title: Kinetic-Based Models for Bromate Formation in Natural Waters
Investigators: Paul Westerhoff
Institution: Arizona State University
EPA Project Officer: William Stelz
Project Period: September 1, 1998 August 31, 2000
Project Amount: $99,500
Research Category: Drinking Water - Disinfection Byproducts

Description:

Objectives/Hypothesis: Ozone (O3) is an effective disinfectant, but it can form by-products (e.g., bromate). There is a need to develop tools to understand and predict bromate (BrO3-) formation while still achieving high levels of microbial disinfection. The central hypothesis is that a kinetic-based understanding of natural organic matter (NOM) reactions with hydroxyl (HO) radicals and aqueous bromine (HOBr/OBr-) over a range of temperatures is necessary to develop mechanistic-based models for bromate formation in bulk waters. Objectives include: Develop a comprehensive database of BrO3-, O3, and HO radical concentrations; Determine rates of reaction between HOBr and OBr- and NOM; Calibrate and verify a BrO3- formation mechanistic-based model that includes NOM; Simulate BrO3- control measures necessary to meet proposed and future MCLs; Link the numerical BrO3-formation model with hydraulic and CT disinfection models.

Approach: A mechanistic-based, numerical, kinetic BrO3- formation program will be developed. The program links an oxidant module for predicting O3 and HO radical concentrations with a BrO3- formation module. The model employs a set of bromide oxidation reactions that have been previously developed by the Investigator, and calibrated against bromine and BrO3- formation in NOM-free water; NOM reactions will now be incorporated. The oxidant module will be calibrated against experimental O3 decay data (e.g., simple first-order decay) and HO radical concentrations (calculated from the disappearance of a HO radical probe compound during ozonation). Predicted BrO3- levels will be calibrated and verified against an internal database, that accounts for synergistic effects of key parameters (bromide, pH, ozone dose, temperature, inorganic

carbon, and ammonia) on ozone decay, HO radical concentrations, and BrO3- formation, and an external USEPA database.

Expected Results: We propose a paradigm shift from previous and ongoing studies that employ empirical models for BrO3- formation Unlike other DBPs, the inorganic mechanisms for bromide oxidation are well defined. Basic expressions for oxidant (O3, HO radicals,HOBr/OBr-) reactions with NOM will be determined and incorporated into an existing numerical model. The final program will accurately predict BrO3- formation in the presence of NOM and could be easily adapted for studying innovative control strategies.

Supplemental Keywords: Drinking water, oxidation, pathogens, human health, carcinogen

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Return to the top of the page

Last Updated: December 4, 1998

NOTE FROM WILL E. DOLEMAN

Other items of interest are found on the net under "sodium bromate."

High levels of manganese, sodium, potassium, SO4 sulfate, iron, chromium, aluminum, copper, lead, and mercury have all been found in everything from the gelatin at the waterway's bottom to scum on the waterway's surface to the foam material on the water's surface as well.

The ph of the gelatin is generally 5, which is acidic. Hydrated lime is used in the water-treatment process. Until the hydrated lime is completely dissolved in water, it forms pockets of alkalinity. The literature on the internet under "www.bromate" points our that bromate form initially in alkaline conditions. (*According to N.I.D., it's slow to dissolve.*)

Ammonia, the base of the water-treatment chemical, is another ingredient listed at the top of the page for bromate formation. It is only since the addition of a tall white tank at the Loma Rica plant in the pre-flocculation pond position has bromate been found. The neighbor who used to live nearby said that N.I.D. used to purchase chlorine gas. He could hear them filling their tank. So it could be the tower is a brine tank for the use of making chlorine, which is another process that tends to form bromate.

Disinfection By-Products

Learn more about water treatment with ClO_2...Select from: Select a Topic... Go

Chlorine is the traditional chemical disinfectant of choice in drinking water, used since the early 1900's, to inactivate or chemically kill microorganisms in our drinking water. Chlorine provides a degree of public health reliability in drinking water safety which regulatory officials cannot easily replace. However, certain chlorinated, brominated, or poly-substituted (a combination of the two) organic compounds result from the interaction of chlorine with natural organic matter in raw water supplies. Some of these compounds have been linked with potential long term health effects. Permissible levels of some of these halogenated organic byproducts are currently in the process of being reviewed and will likely be reduced by the United States EPA and Health Canada due to potential long-term health effects observed in animal studies. Should the disinfection of drinking water be changed without caution, or simply abandoned, the microbial related risk of becoming sick from drinking inadequately disinfected water is much greater, quantitatively estimated to be thousands, if not more, times higher than the chemical risks.

As ClO_2 does not form these halogenated byproducts when it reacts with the same precursors (even in the presence of bromide in the water source), it is possible to produce microbiologically safe water that has been chemically disinfected without encountering the high cost of ozone or causing the production of the chlorine-related DBP's. Although bromide ion itself is not cause for alarm, the use of strong chemical oxidants such as chlorine and ozone can result in the formation of bromate (a known cancer-causing compound, or carcinogen) or the polysubstituted organic compounds (some of which are suspected carcinogens, predominantly the bromine-containing species). The use of ozone by itself can result in high levels of bromate ion in the finished water if the raw water has significant levels of bromide ion present. Bromate levels can be controlled by effective pH depression during the ozonation process, but this adds to chemical costs, operational difficulties, and altered ratio's of potential organic DBP species formed during subsequent chlorination (ozone does not persist in treated water as a residual disinfectant).

Two families of DBP's are currently under regulatory development by the US EPA, the THM's (trihalomethanes, 4 compounds) and the HAA's (halo acetic acids, a family of 9 compounds, of which only 5 are being regulated). Current proposed D/DBP regulations will limit the total THM's to 0.08 mg/L (80 ppb) and the 5 HAA's to 0.06 mg/L (60 ppb). The proposed level for bromate ion is 0.01 mg/L (10 ppb) in the USA. These levels may be changed in the next 5 years.

As with all chemical disinfectants used in treating drinking water (all are strong oxidants), there are numerous organic and inorganic chemical products of disinfection for ClO_2. Although ClO_2 is unable to react with unsaturated bonds of natural organic matter (NOM) containing the DBP precursors, it directly oxidizes NOM constituents by electrophilic abstraction rather than via substitution & oxidation as chlorine does. Hence, the use of ClO_2 results in much lower levels of chlorine- or bromine- substituted organic byproducts, but it does form the chlorite ion (another DBP under regulatory development by US EPA) by electron transfer from an organic moiety or compound directly to the ClO_2.

The reaction between ClO_2^- and NOM in raw water can potentially produce two other inorganic byproducts. These are ClO_3^- (chlorate ion) and Cl (chloride ion). Free chlorine, (which is the most common residual disinfectant in drinking water), converts any chlorite directly to chlorate in the distribution system, assuming chlorite is present only in very small concentrations. The mass balance between chlorite, chlorate and free chlorine remains the same. The chloride ion is not considered a disinfection byproduct, as insignificant amounts are contributed in relation to those found in natural waters. Much has been learned about the inorganic byproducts of ClO_2 over the past decade due to improved analytical chemistry. In addition, more is known about health effects of the chlorite ion by efforts of the Chlorine Dioxide Panel of the Chemical Manufacturer's Association in Arlington, VA. Sterling Pulp Chemicals is a founding member of the Panel.

Chlorine dioxide produces 20 to 50 times less TOX (total organic halides) than direct chlorination at comparable doses [4]. Typical levels of its organic byproducts are ng/L (parts per trillion, ppt) whereas some chlorinated DBP's are found as ug/L or higher levels. The organic byproducts associated with using ClO_2 include principally low molecular weight aldehydes and oxy acids (such as maleic acid) [13]. Extremely low levels of halopropanones have also been found, possibly formed from trace amounts of chlorine in the ClO_2 used in the past. The use of chlorine-free ClO_2 eliminates formation of THM's and HAA's either during preoxidation or disinfection stages of water treatment. However, if free chlorine is added as the disinfectant at a later stage in the water plant, halogenated byproducts continue to be formed throughout the distribution system. This suggests that all of the organic THM or HAA precursors are not fully oxidized by ClO_2, but more likely that they are reduced in concentration by simultaneous treatment practices by coagulation, flocculation, clarification (settling) and filtration.

Very different ratios of chlorite and chlorate levels have been produced from similar doses of ClO_2 applied at different sites or in different municipalities, depending on a number of elements specific to each. These may include the particular ClO_2 generating system and its performance or operating status

(with the resultant purity of ClO_2) and whether gaseous or aqueous solutions of ClO_2 are applied. Certain raw water quality characteristics (e.g. DOC or TOC - dissolved or total organic carbon; pH; temperature; turbidity ; and alkalinity or hardness), point of application in the treatment plant, exposure of basins to bright sunlight or other water treatment chemicals (such as powdered activated carbon (PAC), CO_2 , or lime), and choice of secondary disinfectant (i.e. chemical residual used in the distribution system) also may impact on the levels of each of the inorganic DBP's.

Sulfur compounds, reduced iron compounds, granular activated carbon (GAC) or PAC have been used to chemically reduce the chlorite or chlorate levels in water treated by ClO_2. The addition of ferrous chloride in the plant process after ClO_2 disinfection has been shown to quickly and effectively reduce levels of chlorite at those pH's commonly found in water treatment plants, as well as remove residual ClO_2 after disinfection. The sulfur compounds may require excessive pH depression to be feasible for reduction of the chlorite ion levels. GAC, while effectively stripping ClO_2 and chlorite from the water, may present an additional cost as a chlorine dioxide related DBP removal technology, due to the relatively short bed life before break through of the chlorite ion.

In summary, all water treatment strategies will result in the formation of disinfection by-products. Chlorine dioxide is no exception. Chlorine dioxide has the advantage that it will not directly react with organic material to form halogenated by-products and its use results in 20 to 50 times less TOX than direct chlorination [4]. The inorganic by-products formed when chlorine dioxide is used - chlorite, chlorate and chloride ions - can easily and efficiently be removed if proper analytical procedures are followed. Thus, the ability to effectively handle disinfection by-products produced in the process, the dramatic reduction of organic products from the process and the strong disinfection strength of chlorine dioxide makes this chemical good candidate for disinfecting water sources.

Report No DWI0137

THE FORMATION OF BROMATE DURING DRINKING WATER DISINFECTION (DWE7101) Final Report to the Department of the Environment DoE 3397

DWI0137

Apr 1993

SUMMARY

An increase in interest in the use of ozone in drinking water treatment has led to concern over the formation of ozonation by-products. Of particular concern is bromate which can be formed from the ozonation of raw waters containing bromide. In addition it is possible that bromate could be present in chlorinated waters (viathe use of hypochlorite for disinfection).

Bromate has been classified by the International Agency for Researchon Cancer (IARC) as having sufficient evidence of carcinogenicity in laboratory animals. The World Health Organization have set a provisional guideline value of 25 µg/l in their forthcoming revision of the drinking water guidelines. This value was set to take accountof analytical problems associated with measuring bromate - the value obtained from low dose extrapolation models is 3µg/l (at an upper 95% confidence limit risk of 1 in 10% of the population). There are few data available on the formation and occurrence of bromate in UK waters. Consequently, a review of current knowledge concerning bromate formation during drinking water disinfection was undertaken. Possible control options for minimising bromate formation were assessed from recent literature findings. In addition, a limited survey of bromide and bromate concentrations in UK treated waters (both chlorinated and ozonated) was carried out.

The literature review revealed that bromate could readily be formed from the ozonation of waters containing bromide under typical water treatment conditions. There is some evidence that, under certain conditions, chlorine can oxidise bromide to bromate. However, there have been no reports of bromate formation from chlorination under realistic treatment conditions. Commercial sodium hypochlorite has been found to contain bromate as a contaminant (probably produced from the bromide present in the brine used in hypochlorite production) and this could give rise to low µg/l levels of bromate in chlorinated drinking water. There seems to be some scope for minimising bromate formation by modifying treatment processes (e.g. ozone dose, ozone residual, pH). However, limiting bromate formation could result in increased levels of brominated organic by-products.

The survey of treated drinking waters revealed that bromate was produced from ozonation. Concentrations of 10 - 20 µg/l were detected at two of the four sites sampled, with bromide concentrations in the corresponding raw waters of >100 µg/l. At two other sites the raw waters contained very low levels of bromide (<20µg/l) and no bromate was detected after ozonation. Bromate was only detected in one of the chlorinated samples analysed - from a treatment works using hypochlorite for disinfection. Bromate was also detected in samples of hypochlorite produced by on-site electrolytic generation, although no bromate was detected in final waters disinfected using hypochlorite generated in this way. The use of hypochlorite for disinfection would seem to be the most likely source of bromate in chlorinated drinking water - the formation of bromate from the oxidation of bromide by chlorine would appear unlikely under normal drinking water treatment conditions.

Copies of this report may be obtained on application to the Foundation.

Copies of the Report are available from FWR, price £15.00 less 20% to FWR Members

THE FORMATION OF BROMATE DURING ELECTROLYTIC GENERATION OF CHLORINE (DWE 9005) Final Report to the Department of the Environment DoE 3533/1 Report No DWI0136

Nov 1993

SUMMARY

The use of ozone in drinking water treatment has led to concern about the possible formation of harmful by-products. Of particular concern is bromate, which can be formed from the ozonation of raw waters containing bromide. Bromate is a suspected carcinogen and is included in the revised WHO Guidelines for drinking water. The WHO have set a provisional guideline value of 25 µg/l, taking account of perceived analytical problems associated with the determination of bromate in drinking water. However, in the absence of such problems the low dose extrapolation models commonly used when deriving guideline values give a value of 3 µg/l.

Another potential source of bromate is the use of sodium hypochlorite (either generated on-site or commercially available). There is a growing interest in the use of on-site electrolytically-generated chlorine for water treatment but brine used in on-site generators will contain bromide, and it is possible that it will be oxidised, leading to bromate in the treated water. There are few data on the levels of bromate either in hypochlorite solutions generated on-site or in the associated final waters.

The objectives of this study were threefold:

- review the theoretical basis for the formation of bromate during the electrolysis of sodium chloride;
- to assess the potential yield of bromate in the hypochlorite solution produced by on-site electrolytic systems and relate this to possible concentrations in treated waters;
- to determine the concentration of bromate in hypochlorite solutions and the associated treated waters, taken from sites using on-site electrolytic systems.

The work showed that bromate is formed during on-site generation of hypochlorite. The concentrations found in hypochlorite samples ranged from 2.8 to 21.8 mg/l. However, bromate was only found in two out of twelve final waters analysed. These corresponded to the two hypochlorite solutions containing the highest concentrations of bromate. It appears unlikely that the provisional WHO Guideline for bromate of 25µg/l would be exceeded through the use of on-site generated hypochlorite alone. If a lower value (i.e. less than 10 µg/l) were adopted then it is feasible that exceedances could occur at some sites. A major factor determining the level of bromate present in hypochlorite will be the bromide concentration in the brine. This will depend on the bromide content of the salt and the strength of the brine. The brine strength is likely to vary significantly in different systems. In some cases it is increased to maintain a pre-determined hypochlorite concentration in the outlet stream (normally 0.7-0.9% chlorine).

Other operating conditions could affect the amount of bromide converted to bromate. These include cell voltage, current density, operating temperature and residence time in the generator cell. To a certain extent all these parameters are inter-related, and whilst it is difficult to predict the effect of

changes in any one of them on bromate production, it is possible that any increase in one or other parameter is likely to favour bromate production.

Storage of on-site generated hypochlorite does not seem to result in significant increases in bromate concentrations.

The type of on-site generating system does not appear to be important in determining the level of bromate formed.

The significance of the findings clearly depends on the numerical value of any standard set for drinking water. However, some further investigations would seem prudent.

Wider monitoring of bromate concentrations in hypochlorite solutions generated by on-site systems, and of bromide concentrations in brines should be carried out.

Since it is not possible to explain the reason for the two detected levels of bromate in treated water, due to insufficient data on the brine feedstocks and detailed operating conditions, a detailed study of the factors that control bromate formation should be carried out. In practice, this would require a test rig to allow bromate monitoring under the full range of operating conditions.

Copies of the Report are available from FWR, price £15.00 less 20% to FWR Members

NOTE FROM WILL E. DOLEMAN

Bromide (BR), bromine (BR^{O2}) and bromium in the raw water going into q water-treatment plant in the form of the raw water to be treated is documented as causing the formation of bromate(BR^{O3}). Bromate is an anion that likes to combine with other elements such as potassium as in potassium bromate(KBR^{O3}), which is 40 to 80 times more toxic of a carcinogen than bromate, which itself is already five times more carcinogenic than arsenic. Although I have not yet located a laboratory that will test for bromium, I have discovered that bromium and iodide are two of the major constituents of greenhouse gases, as in global warming. So it's a possibility that the increase of these particular gases influences rainfall. We have not yet found the connection.

Food Chemical News July 26, 1999

Food Chemical News

July 26, 1999

SECTION: No. 23, Vol. 41; Pg. NA ; 0015-6337

IAC-ACC-NO: 55303346

LENGTH: 939 words

HEADLINE: CSPI seeks immediate ban on use of **potassium bromate** in bread, baked goods >BY Elizabeth Lohr.

AUTHOR-ABSTRACT:

BODY:

Potassium bromate is linked to cancer and should be banned immediately as a food ingredient in bread and other baked goods, the Center for Science in the Public Interest told FDA in a July 19 petition.

The Washington, D.C.-based health advocacy group said consumers should avoid eating bread, rolls, cakes and other bakery products that list "**potassium bromate**" or "bromated flour" among their ingredients. The substance is added to certain baked goods as a dough strengthener and to improve texture - making it easier to spread peanut butter, for example.

CSPI said FDA has known since the early 1980s that ingestion of **potassium bromate** was found to cause cancer and tumors of the kidney and thyroid in laboratory rats and mice. But instead of issuing an outright ban to protect public health, FDA has merely urged bakers to voluntarily stop using the substance, the group said.

"Instead of meeting privately with industry, the FDA should ban bromate immediately," CSPI Executive Director Michael Jacobson said in a statement.

Darren Mitchell, a CSPI attorney, said FDA tests of several dozen baked goods in 1992-93 and 1998-99 found **potassium bromate** at levels considered unsafe by the agency. One sample had nearly 1,000 times the detection limit, he said.

FDA approved **potassium bromate** for use in flour at 50 ppm in 1941, and for use in bread and rolls in 1952. Following consultation with FDA in 1991, the baking industry volunteered to reduce the amount of added **potassium bromate** from 75 ppm to 50 ppm. In March 1998, bakers further reduced levels to 30 ppm for bread and 15 ppm for rolls.

Issuing an outright ban on **potassium bromate** would be a complicated task for FDA since the substance has prior sanction status, is not a "food additive," and is not subject to the Delaney Clause (See Food Chemical News, May 4, 1998, Page 14).

Art Lipman, acting deputy director for the Office of Premarket Approval's division of petition control, said the agency is still reviewing the issue. "We've been looking into bromates and various regulatory options for some time," he told Food Chemical News. At this point, he said, any concerns would be limited to rolls and buns, which tend to contain higher levels of **potassium bromate** than bread.

Lipman said the studies showing a clear dose-response relationship between **potassium bromate** and cancer involved rats - whose physiology is vastly different from humans - and high doses of the chemical. He said he is unaware of any human studies that support the claim that typical ingestion of **potassium bromate** causes cancer.

The American Council on Science and Health on July 21 criticized CSPI's call for an FDA ban on **potassium bromate** on the basis of claims that the chemical causes cancer in laboratory rats.

"This is typical of CSPI's habit of calling attention to hypothetical health risks," Gilbert Ross, ACSH's medical director, said in a July 21 statement. "Such a ban would not improve health; it would only disrupt the food production system. If we acted to purge our food supply of all known animal carcinogens, including those in nature, we would literally have nothing to eat."

Anne Giesecke, vice president of environmental activities for the American Bakers Association, said **potassium bromate** has been safely used for 80 years and poses no public health threat.

Currently, the substance is used in "minuscule" amounts, and in very few products "only where it's been absolutely necessary," she told Food Chemical News. On July 19, ABA released the following position statement:

"When properly used, **potassium bromate** disappears during baking, converting to a harmless inert bromide in the finished product. Industry studies show that baked goods can be made with no detectable bromate residues, even when measured to levels as low as 3 ppb."

FDA's current safe level for **potassium bromate** residues is 20 ppb.

Giesecke said ABA in recent weeks had submitted a guidance document, Industry Guide for the Use of **Potassium Bromate,** to FDA's Center for Food Safety and Applied Nutrition. The guidance provides background information on the substance and details the importance of monitoring baking ingredients, proper mixing, and sufficient bake temperature and bake time.

"Basically, it says **potassium bromate** is very controllable by the baker," Giesecke said.

ABA supports product labeling to indicate whenever **potassium bromate** has been used in the baking process. The association also notes the Joint FAO/WHO Expert Committee on Food Additives "has indicated a willingness to reconsider" its 1993 decision to take **potassium bromate** off the list of approved flour treatment agents in the Codex Alimentarius - "if it can be shown that residues of **potassium bromate** are less than 5 ppb."

Bromates were banned in the UK in 1990 and in Canada in 1994. In 1991, California declared bromate a carcinogen under Proposition 65, which would require baked goods sold in the state to carry a cancer warning if they exceed a certain bromate level.

CSPI reports the following bakers have switched to bromate-free processes: Best Foods Inc. (maker of Arnold, Entenmann's and Orowheat breads and rolls), Pepperidge Farm and Pillsbury. In addition, bromate is not used in Giant, Jewel, Ralph's and Von's supermarket chains.

Potassium bromate is still used in products made by Interstate Brands Corp. (Wonder, Home Pride), Schmidt Baking Co. (Schmidt, Sunbeam), Tasty Baking Co. (TastyKate), and Martin's. Fast-food chains still using bromate: buns - Burger King, Arby's and Wendy's; french sandwich bread - Boston Market.

LANGUAGE: ENGLISH

IAC-CREATE-DATE: August 3, 1999

LOAD-DATE: August 04, 1999

*49 C.C.P.A. 1215, *; 304 F.2d 676, **;*
*1962 CCPA LEXIS 233, ***; 134 U.S.P.Q. (BNA) 248*

IN RE SAMUEL GRANT

No. 6788

United States Court of Customs and Patent Appeals

49 C.C.P.A. 1215; 304 F.2d 676; 1962 CCPA LEXIS 233; 134 U.S.P.Q. (BNA) 248

Oral argument March 6, 1962

July 18, 1962

PRIOR HISTORY: [***1]

APPEAL from Patent Office, Serial No. 456,314

DISPOSITION: Affirmed.

CORE TERMS: copper, ion, iron, compound, sequestered, catalytic, disclosure, neutralizing, bromate, ferric, specification, sequestering, ferrous, invention, catalyst, hair, soluble, concentration, keratin, heavy metal, composition, consisting, ethylene, desired, diamine, tetra, neutralizer, discovery, sodium, alkali

COUNSEL: *Lewis D. Konigsford (Max Wall,* of counsel) for appellant.

Clarence W. Moore (Jack E. Armore, of counsel) for the Commissioner of Patents.

OPINIONBY: SMITH

OPINION: [**677]

[*1215] Before WORLEY, Chief Judge, and RICH, MARTIN, and SMITH, Associate Judges

SMITH, Judge, delivered the opinion of the court:

Appellant has appealed from the decision of the Board of Appeals of the Patent Office affirming the Primary Examiner's rejection of claims 15, 18, 20 and 22, of appellant's application Serial No. 456,314, filed September 15, 1954, for a "Cold Wave Neutralizing Composition and Process," on the sole ground of "undue breadth of recited terms and the lack of proper support in the original disclosure for said terms." No prior art references were relied upon. Five claims, 16, 17, 21, 23 and 24, have been allowed.

An understanding of the invention claimed in the rejected claims and of the basis for the rejection requires some background knowledge of the so-called cold permanent hair waving process. As set forth in appellant's brief:

Hair is composed of a protein substance called keratin which contains [***2] a disulfide linkage in the molecule. The cold waving process employs certain substances which reduce

the keratin by breaking this disulfide linkage and thus render the hair plastic, after which an oxidizing agent, called a neutralizer, is employed to restore the disulfide linkage and restore the resiliency of the hair. The usual keratin reducing solution employed in beauty parlors is thioglycolic acid in the form of the ammonium salt. In operation, the hair is wound upon a curler rod and is treated in this condition with the keratin reducing solution. Then, after a suitable time of treatment, the hair is treated with a neutralizer to complete the waving operation.

Originally, hydrogen peroxide solution was used as the neutralizer, but sometime prior to the invention in this application, the art proposed the use of alkali metal bromates as neutralizers. A number of advantages for bromate neutralizer over hydrogen peroxide are asserted in the art, but need not be discussed here.

[*1216] The application describes the discovery that ferrous, ferric and copper ions act as catalysts to increase the reaction rate of the bromate neutralizing agents. The invention disclosed [***3] therein relates to a [**678] neutralizing composition comprising soluble iron or copper salts in solution with the bromate oxidizing agent to provide the desired catalytic ferrous, ferric or copper ions.

The application states that although copper ions show some catalytic effect at higher concentrations, it has been discovered that iron ions are most effective, even at low concentrations and even when the iron ions are complexed with a powerful sequestering agent such as ethylene diamine tetra acetic acid or its salts or derivatives, the catalytic action of the iron ions was not deleteriously affected. The minimum disclosed concentration of iron ions is "approximately 0.001% by weight" which corresponds to a concentration of 0.1% of mono sodium ferric ethylene diamine tetra acetate by weight, while the minimum concentration of copper ion is about 0.1% by weight. The specification indicates that almost any soluble ionizable iron salt compound may be employed, such as ferric chloride, ferrous ammonium sulfate or mono sodium ferric ethylene diamine tetra acetate and to supply the copper ion, cupric chloride or other soluble copper salts may be employed.

The specification states [***4] the essence of the invention to be as follows:

The essence of the present invention resides in the discovery that ferrous, ferric, and copper ions act as catalysts to increase the reaction rate of sodium and **potassium bromate** neutralizing agents. That is, the neutralizing composition of the present invention comprises soluble iron or copper salts in solution with the oxidizing agent to provide the desired catalytic ferrous, ferric, or copper ions. * * * Furthermore, even when the ferrous and ferric ions are complexed with a powerful sequestering agent such as ethylene diamine tetra acetic acid, or its salts or derivatives, the catalytic action of the iron ions was not deleteriously affected.

Claim 15, for a process for neutralizing a keratin reducing cold wave solution on the hair, and claim 18, for the neutralizing composition, are as follows:

15. A process for neutralizing a keratin reducing cold wave solution on the hair, said process comprising applying to the hair a neutralizing solution including bromate salts selected from the group consisting of alkali and alkali earth metals [sic n1] and a sequestered compound of a heavy metal selected from the group consisting [***5] of iron and copper, said neutralizing solution containing at least 0.001 per cent by weight of the heavy metal.

n1 At the oral argument, counsel for appellant acknowledged the omission of "bromates" in this portion of the claim. For the claim to be complete the word "metals" should be changed to read "metal bromates".

18. A composition for neutralizing a keratin reducing cold wave solution on the hair, said composition comprising an aqueous neutralizing solution of a water soluble bromate salt selected from the group consisting of alkali and [*1217] alkali earth metal bromates and a sequestered compound of a heavy metal selected from the group consisting of iron and copper, said neutralizing solution containing at least 0.001 per cent by weight of the selected heavy metal.

Claim 20 is dependent on claim 18 and requires that the heavy metal be iron. Claim 22 is dependent on claim 20 and further requires that the compound contain about 2 1/2 to 18 percent of the soluble bromate salt.

The examiner's rejection of the appealed claims is based upon his finding that the broad recitations in the claims to "a sequestered compound" of iron or copper is not supported by [***6] disclosures in the application. Considering first the disclosure with respect to "a sequestered compound" of iron, the appellant's specification states that "the essence of the present invention" resides in the discovery that ferrous, ferric and copper ions [**679] act as catalysts; that the iron ions are most effective even at low concentrations; that even when the ferrous and ferric ions are "complexed with a powerful sequestering agent, such as ethylene diamine tetra acetic acid or its salts or derivatives, the catalytic action of the iron ions was not deleteriously affected." Further, the specification states that the catalytic iron ions are provided in the neutralizing solution "by dissolving therein almost any soluble ionizable iron salt compound, such as ferric chloride, ferrous ammonium sulfate or 'sequestrene NaFe' which is the common designation for mono sodium ferric ethylene diamine tetra acetate", but that "other iron compounds which dissolve to form ferric and ferrous ions may also be employed instead of the specific compounds enumerated above." Thus, one specific example is disclosed of "a powerful sequestering agent" which can complex iron and still retain the [***7] required catalytic activity.

Appellant has included in his brief an excerpt from an article in the Journal of the Society of Cosmetic Chemists, Vol. 9, No. 2, June 1954, by Goodyear and Hathorn where (p. 98) the following definition is found:

2. A sequestering agent is one which inactivates a metallic ion by forming a water-soluble complex in which the metal is held in non-ionizable form.

Thus, by definition, the normal function of a sequestering agent appears to be to inactivate a metallic ion by forming a water-soluble complex in which the metal is held in non-ionizable form. Appellant states in his brief:

The specification nowhere uses the term "sequestering agent" in anything other than a generic sense for describing a conventionally recognized class of compounds. * * *

Appellant's position appears to be that where the specification describes the invention in broad terms, the fact that only one specific [*1218] example is enumerated does not defeat the right to broad claims citing, In re Walker, 21 CCPA 1121, 70 F.2d 1008, 22 USPQ 53; In re Grimme, 47 CCPA 785, 274 F.2d 949, 124 USPQ 499, as well as a number of prior decisions by the Board of Appeals.The cited [***8] decisions relied upon by appellant are concerned with applications having broad disclosures and limited examples. In the present case there is but one example and, as stated by the board, there is no broad statement or even suggestion in the disclosure that all types of sequestering agents complexed with iron are suitable as a catalyst.

[1] As pointed out by the examiner, other well known sequestering agents of diverse nature, such as sodium hexametaphosphate, glycine compounds and the tetracyclines which have not been shown to be operative for appellant's purpose, would be covered by

the broad term recited in the claims. Since sequestering agents are diverse in their molecular composition as well as in their ability to inactivate the metallic ion, and since catalytic behavior is generally recognized as being unpredictable, we do not agree with appellant's contention as to the generic nature of the disclosure regarding sequestered iron compounds. Such agents appear to be so diverse that it would seem to be beyond the ordinary skill in this art to predict from the action of the one disclosed specific agent that all sequestering agents would function the same, i.e., to inactivate [***9] the iron ion and yet permit the desired catalytic action of the iron ions. The disclosure is, we think, under the facts shown here, necessarily limited to the single example disclosed. Therefore, we agreed with the board that the disclosure does not support the broad terminology of the appealed claims.

It is noted further that claims 15 and 18 refer to "a sequestered compound of a heavy metal selected from the group consisting of iron and copper." The pertinent disclosure with respect to "a sequestered compound" of copper is that "copper ions act as catalysts"; that soluble "copper salts" may be employed "in solution with the oxidizing agent to provide the desired * * * catalytic copper [**680] ions"; and that "copper ions showed some catalytic affect [sic] at higher concentrations * * *". Further, it is stated that "if it is desired to employ copper ions as the catalytic agent instead of ferric or ferrous ions, cupric chloride or other soluble copper salts may be employed." Appellant conceded below that the specification does not disclose a specific sequestered complex of copper. In addition, the board held that there is no suggestion in the disclosure that a sequestered [***10] compound of copper will act as a catalyst. The reference in the disclosure to the sequestered iron compound cannot be construed to imply that the admittedly catalytically weaker copper will also be effective catalytically when similarly sequestered. We find no disclosure in the specification that a [*1219] sequestered compound of copper will provide the required copper ion catalytic effect. We agree, therefore, with the board's conclusion that the disclosure contains no basis for including claims broad enough to cover "a sequestered compound" of copper as the catalyst.

Under these circumstances the undue breadth of the expression used in appealed claims 15 and 18 with respect to "a sequestered compound" of copper is manifest since "the essence" of appellant's invention is disclosed to be the discovery that the copper ions exert catalytic activity and increase the rate of reaction of the neutralizing agents.

Appellant relies upon the disclosed equivalency of copper and iron in urging the sufficiency of his disclosure. However, we do not find any teaching in the disclosure that all possible sequestered iron or copper compounds are equivalent or even that simple copper [***11] salts and sequestered copper compounds are equivalent as catalysts for the intended purpose. There is no disclosure whatsoever that sequestered copper compounds would act as catalysts, thus there is no support in the specification for claims based on the asserted equivalency of such compounds with other disclosed compounds.

The discovery upon which patentability is here predicated resides in a catalytic phenomenon, which is usually unpredictable. The language in the specification does not show that copper and iron are equivalents to produce the desired catalytic effect. Further, it does not disclose or suggest the use of sequestered compounds of copper as catalysts. Appellant's specification, reasonably and properly construed, cannot be interpreted to teach that all sequestered compounds "selected from the group consisting of iron and copper" will have a catalytic effect on the bromate solutions for the purpose intended. The appealed claims therefore fail to point out and distinctly claim the invention as it has been disclosed by the applicant. The decision of the board is affirmed.

Source: All Sources : Combined Federal & State Case Law - U.S. : **Federal and State Caselaw**
Terms: **"potassium bromate"** (Edit Search)
View: Full
Date/Time: Monday, March 27, 2000 - 3:19 PM EST

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CRAIG COMBS ENG.
Client:
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Nevada City, CA 95959

Client I.D.: SAMPLE #300
Site:
Description:

Matrix: water

Page: 1 of 1
Lab No.: L67555-005

Date Reported: 04/14/00

Collected By:
Date: 03/10/00
Time: 1600
Submitted By: UPS
Date: 03/30/00
Time: 0905

Constituent	Result		Method	RL	Date / Analyst
Bromate	38.	ug/L	EPA 300.0	5.	000405/RK

NOTES FROM WILL E. DOLEMAN

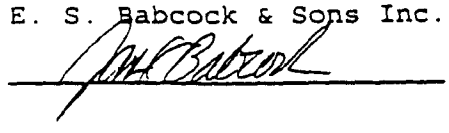
Interesting. One quart of distilled water with 180 drops of Planet brand Biodegradable Dishwashing Liquid added to it. The distilled water was tested separately and contained no bromate. This figure represents .038 mg./L.

ND = None detected at RL (Reporting Limit). RL units same as result.

Custody tape intact.

cc:

E. S. Babcock & Sons Inc.



GOVERNOR PETE WILSON

SEP 29 1996

To the Members of the California Senate:

I have signed the date Senate Bill No. 649.

This bill changes the enforcement of section 5650 of the Fish and Game Code, a statute that has served this state for over a century. Like all venerable statutes, however, it must be updated to fit with development since its original enactment.

SB 649 takes a step toward harmonizing Section 5650 with the State's (and Nation's) comprehensive water quality planning, regulatory and enforcement programs, which did not exist when section 5650 was adopted in 1876. These laws includes the State's Porter-Cologne Water Quality Control Act and the federal Clean Water Act.

This bill removes the possibility of civil or criminal liability under Section 5650 for discharges into state waters that are expressly authorized under state and federal water quality permits. The Government should not tell a regulated party that it may make certain discharges under a permit, and then turn around and prosecute the party for the very conduct allowed by the permit. The bill also creates an affirmative defense where no harmful material actually reaches state waters and the discharger has complied with reporting requirements and acted to mitigate the impact of a discharge. Finally, the bill provides a tailored and balanced approach to injunctions against individuals and businesses who may be responsible for potentially harmful discharges.

The bill maintains the ability of local officials to vigorously enforce section 5650 where State water pollution law is not complied with or where mitigation by the discharger is ineffective.

In signing this measure, I am directing the Department of Fish and Game and the State Water Resources Control Board to develop and issue a single set of regulations to provide modern definitions and standards under Section 5650. The regulations shall include a process for scientific determination of harm to fish and wildlife. The Department and the Board shall actively involve business, agricultural, and environmental groups in promulgating these regulations.

Finally, I am signing this measure with the commitment of the author and the sponsors to introduce urgency legislation in the next session to ensure that willful violators or repeat spillers do not use the provisions of this bill to attempt to escape liability when they threaten state waters.

Cordially,

Pete Wilson

PETE WILSON

(4)

Will Doleman
P.O. Box 3544
Grass Valley, CA
95945

July 21, 1998

To Whom It May Concern:

I talked with Chris Anaya, another concerned individual in a neighboring county, who was also under the yoke of the corrupt region 5 water quality board. I spoke to him on the phone 2 or 3 years ago and told him of the foam I discovered and sent him pictures of how I gathered it and analytical information on what I found. I also sent him pictures with writing on the back, the same information found in our water sanity report. He also tested the water which had been chemically airrated into foam and these articles reflect the result of his work. He has been working on this project for four years, as I have.

Jim Eckman, of the region 5 water quality board, has never to my knowledge taken a sample from the waterway where I found high levels of toxins. He has always done selective sampling, taking water only from places other than where I found toxins. In my view this means he knows exactly where the chemicals are moving the toxins to and is intentionally sampling elsewhere. In cases where I reported finding toxins in a particular portion of the water where he also decided to sample, he has omitted testing constituents that I found there. According to the ruling of a federal judge this is selective sampling or falsification of sample reports. Mr. Eckman of our region 5 water quality board also refuses to test Alum. A semi solid which consists of a spent water treatment chemical, as well as other water treatment undesirables such as chromium and other bi or tri-valent toxic metals.

Alum readily dissolves into water. The mat of leaves that Mr. Eckman discusses in his letter, and refused to sample, was very high in Aluminum potassium sulfate, the water treatment chemical and foaming agent. This sample has been certified by an EPA approved lab and the substance proven to be just that and not another type of soap or detergent. This particular substance, found to be at 48 times the maximum contaminant level for drinking water, is being used to clean up toxic sites and float contaminants downstream.

Sincerely,

William D Doleman

Will E. Doleman

Deer Creek Dud

State deceptive reporting investigation gets slammed.

State officials are being accused of going easy on sewage treatment plant workers who lie to them, while punishing those who tell the truth.

The state office that issues licenses to sewage treatment plant operators has dropped its investigation of Daryl Prouty—the man at the center of the deceptive reporting allegations concerning the El Dorado Irrigation District (EID)—in return for his promise to leave the profession.

"This investigation smells no better than the effluent that Prouty was discharging into Deer Creek," said dissatisfied activist Chris Anaya. "I'm just pissed off at this whole thing. It's a mockery of the whole process."

The matter has profound implications for Californians' water quality and public health, because the state's oversight system depends completely on honest reporting by those who release into waterways.

Prouty, as chief operator of the EID's Deer Creek plant in western El Dorado County, was the man who signed reports that state investigators later did not report or underreported numerous violations of the federal Clean Water Act. Moreover, two of his underlings alleged that they were instructed to underreport

(continued on next page)

Moreover, state regulators who at first ignored the allegations, and who internal memos suggest attempted to obstruct and suppress Trgovich's investigation, all remain in their jobs.

The fallout is reminiscent of the 1994 West Sacramento case, which also involved hundreds of water quality violations and allegations of fraudulent reporting. Treatment plant whistle-blowers were punished and harassed while those who appeared culpable emerged unscathed.

In his recent memo, Trgovich suggested the state change the question on its operator certification test that implies an operator's license could be revoked for false or deceptive reporting.

"It should be rewritten to reflect the reality that it may be more likely for an operator to profit from any illegal, unethical or deceptive behavior at the workplace than to be punished," Trgovich wrote. "We should also make it clear that if an operator becomes aware of any illegal or dishonest conduct at the treatment plant he [she] should keep his mouth shut because doing the right thing may not be worth it."

—NICK BUDNICK

(continued from previous page)

and to sample the plant's discharges only when the troubled system was running well.

"We deny those allegations—but you can only fight so much," said Prouty's attorney, John Grattan, referring to his client's agreement to leave the profession. Grattan described his client's situation as "low man on that totem pole. He was akin to the captain on a leaky, ill-prepared and ill-staffed vessel."

Court records in a California Sportsfishing Protection Alliance lawsuit against EID suggest that as early as August 1994, the district's top management were aware of allegations that Prouty pressured his staffers to underreport the plant's violations.

But EID did nothing to even investigate the allegations until after state investigator Boris Trgovcich came on the scene, in late 1994. In April 1995, the district suspended Prouty for three days. The chief operator went on medical leave, from which he has not returned.

Trgovcich last month wrote a scathing memo to his superior concerning the OOC's decision to not take formal disciplinary action against Prouty or his superiors. The investigator said the state has sent a clear message, noting that, "As of now, the only people in the Deer Creek case who have been punished are the two operators who cooperated with the state and federal investigators."

Those two operators received a letter of reprimand. Prouty's record, however, remains clean. His superiors have faced no repercussions.

SIDELINES

El Tu, Pete?

Bill Crooks, the state's top water-quality enforcer for Sacramento and surrounding counties, is accustomed to enviros slamming him for lax enforcement of water quality laws.

But Gov. **Pete Wilson**?

According to last Friday's Bee, Wilson's Secretary of the Environment **James Strock** asked the governing board of the Central Valley Regional Water Quality Control Board to fire Crooks, its executive officer, for mishandling water pollution complaints and covering up alleged deceptive reporting by a wastewater treatment plant at Deer Creek in El Dorado County. No decision had been announced at press time.

Crooks refused to comment to the SN&R, but several board employees said that they believe Deer Creek is a red herring, and what Strock really wants is control over the semi-independent regional boards.

As of Monday, Crooks had not been shown the Deer Creek report on which Strock based his request. "He couldn't even respond to the charges against him," said one employee.

"The secretary views the responsibility of everyone in our agency [as being to] promote environmental protection and protect public health," said California Environmental Protection Agency spokesman **Dan Pellissier**. "The Deer Creek case indicates that those things were not always the priority of the staff at that regional board."

The true test of Strock's intent, employees said, will be the quality of Crooks' replacement.

PHOTO BY NOEL NEUBURGER

Young & Green

You have to be 35 years old to run for the United States presidency, but if you want to head a $50 million national organization, 23 will do.

That's the age of **Adam Werbach**, who was elected president of the Sierra Club last May. He's the youngest president elected to the Sierra Club in its 104-year history.

"I was 8 years old when I found a petition on my parent's table to oust James Watt," recalls Werbach. "I didn't know who he was, I thought he had something to do with electricity. I did know I could sign my own name, though." Werbach didn't just stop there. He got all of his second-grade friends to also sign the petition and embarked on a lifelong campaign to educate, inform and empower people to take action on environmental issues.

Werbach plans to add a touch of his Gen-X sensibilities to environmental issues. Upcoming ventures include television projects and record albums (which he'll produce), and he also plans to use art, dance and the Internet to get the message across and implement ideas.

"I want to see Clinton re-elected," he said. "And then I want to see anyone who's ever voted against the environment kicked out on their ass."

Smoking Footnote

For two years, huge amounts of state money and staff time have gone into crafting a comprehensive plan to protect California's waterways. Now it seems that someone at the State Water Resources Control Board has inserted a tiny footnote in the latest draft that will protect polluters—but may kill the whole shebang.

The "Inland Surface Waters Plan" would not be adopted until October-November 1998—more than two years from now. But according to the footnote, that's not enough time to analyze economic impacts. So the plan would set limits only on the pollutants that *do not* "pose attainment problems for dischargers," Loophole city, in other words.

The state's Jesse Diaz, chief of water quality, said economic studies are needed to make the plan lawsuit-proof—but have been delayed by budget cuts. However, a U.S. Environmental Protection Agency employee described the footnote as a "joke"—and predicted the feds would reject an incomplete plan.

Water-quality cop to be fired?

State impatient with pace of enforcement

By Chris Bowman
Bee Staff Writer

Gov. Pete Wilson's appointed clean-water enforcers for the Central Valley are scheduled today to consider firing their chief pollution cop for failing to police and punish a chronic sewage treatment violator in the foothills of El Dorado County, an administration source said.

In a closed meeting this morning, the Central Valley Regional Water Quality Control Board plans to review the performance of its executive officer, William H. Crooks, in the case of the Deer Creek wastewater plant and other enforcement-related issues, said the source, who requested anonymity.

"We have an hour in closed session to discuss a personnel matter with me," Crooks said Thursday. The board meets in open session for its regular monthly meeting at 9 a.m.

Another knowledgeable state source said the request for Crook's termination comes from the state Secretary of Environmental Protection, James M. Strock, who could not be reached for comment Thursday.

Though Strock oversees the state's nine regional water quality control boards, only the quasi-independent boards of directors appointed by the governor can hire or fire their executive officer at will.

Strock made the request to the chairman of the nine-member Central Valley board, Karl Longley, an engineering professor in Fresno. Longley could not be reached for comment Thursday, and other board members said they had not yet been told Crooks' job would be on the line.

Strock's request follows an internal investigation the secretary launched early this year in response to numerous complaints from Latrobe residents along Deer Creek downstream of the treatment plant, the state source said.

The source said the investigators, members of the enforcement unit of the Santa Ana Regional Water Quality Control Board in Orange County, confirmed

Please see FIRE, page B4

Fire: Deer Creek pollution led to lawsuit

Continued from page B1

through public records what has already been aired in public meetings and reported in The Bee last fall:

El Dorado Irrigation District, operator of the tiny Deer Creek plant, has for three or more years disclosed numerous violations of pollution limits in the required monthly self-monitoring reports of effluent discharge into the creek.

In addition, creekside residents have repeatedly complained to Crooks and his staff about fish kills, foul odors and murky water. Some say they have been forced to abandoned their drinking water wells due to fecal contamination that they blame on the plant's lax operation.

But until December, Crooks had not taken any enforcement action beyond warning notices to the district. The district is under a timetable to come into compliance. It has been fined several times this year for continuing to violate environmental standards even as the 25-year-old plant upgrades its treatment equipment.

"The board has failed in its duty to properly police and punish violations occurring at the plant," Strock wrote Longley in April.

Despite recent enforcement actions, he wrote, "I am still deeply disturbed that the voices of these concerned citizens could have gone unheeded for so many years."

Crooks would not comment on the investigative report, which neither he nor his board has seen.

"We want to see what people are accusing us of, and we want to defend ourselves."

"To the extent that they knew about selective sampling or any other problems at the plant, they did not pass any of that information along to us," Russo said.

"If people are falsifying public documents or engaging in a willful attempt to deceive the public on hazards, that would be something we would have pursued criminally."

In the course of the investigation, officials also learned the board staff had approved permits allowing publicly operated sewage treatment plants to discharge treated wastewater with pollutants in concentrations far above those permitted by the board's own master plan, the administration source said.

Crooks, a registered engineer, has served as the board's chief executive since 1982.

The administration source said investigators also found that Crooks and members of his staff knew that Deer Creek plant operators were intentionally doctoring the self-monitoring reports to make it appear that the effluent was cleaner than it actually was.

"They knew that selective sampling was going on but did not share that information with the district attorney," the source said.

The El Dorado County district attorney, Steven Russo, filed a lawsuit against the district last fall based on several violations of the state fish and game code. The state Department of Fish and Game launched an investigation because the primary enforcer of wastewater discharges – the regional board – failed to take action, department officials said at the time.

start mid top right

mental group's suit thrown out of court, a federal judge issued a sharp rebuke.

"With respect to the recent board [fine]," wrote Judge Gregory Hollows, "the chronology of facts and swiftness of settlement suggest nothing less than a 'sweetheart deal.'"

Observers have been disturbed by the flaccid response exhibited by Crooks' agency when sewage treatment plants are suspected of turning in fraudulent reports to deceive the state.

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Then came Tulare Lake. In 199 after four years of heel-dragging. Crooks and his regional board defended a drainage district's plan to operate 6,000 acres of agricultur al discharge ponds—though very high levels of selenium were causing birth defects in nine bird species. After appeals from opponents including the U.S. Fish And Wildlife Service, the state board overturned the decision.

This was an exact replay of Crooks' involvement with Kesterson Reservoir almost a decade earlier: same problem, same players, same outcome.

"The one thing that concerns me is the extent to which [Crooks] didn't learn from that," said Joseph Skorupa, a Fish & Wildlife Service biologist who worked on Tulare. "Ten years later, he did it again."

This year, when his staff proposed restrictions for the Port of Sacramento, a chronic polluter, Crooks publicly worried that settin standards for the port would allow citizens to sue for "small, almost inconsequential" violations. He blocked the move, though one engineer said it was the worst water quality problem he'd seen in a decade.

At Deer Creek, after the El Dorado County district attorney had already filed a lawsuit against the wastewater treatment plant, Crooks and his board jumped into the fray to slap the plant operator, the El Dorado Irrigation District (EID), with a $100,000 fine. The penalty allowed a county judge to throw the DA's suit out of court. But when EID cited the fine to get an enviro

(3)

Nevada Co — Elderado Co
Identical foam downstream from the plant...

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At Deer Creek, as reported by the SN&R a year ago, a plant operator bravely broke ranks to tell a regional board manager of routine deceptive reporting there—only to be ignored. In July 1992, the city of Auburn conscientiously fired a contractor suspected of falsifying the city sewage plant's test results. The city sent the evidence along, but the regional board took no action.

Improper sampling remains a problem at the Deer Creek sewage plant. To halt a spate of coliform violations, regional board staff recently suggested EID take samples further upstream where results would be better. This violated the board's own manual, which requires samples be taken after dechlorination. But Crooks argued in September that samples can be taken anywhere in the plant.

"If Crooks really said that, I find that just incredible, nothing short of mind-boggling," said one U.S. EPA employee, who spoke on condition of anonymity. "It makes the whole sampling process a complete charade. ... It's what the quality of effluent is when it hits the water that's relevant."

Steve Buggs, until recently a Department of Fish & Game biologist, said that Crooks' agency has not consistently enforced sampling guidelines. "There's a big problem in that area," he said, and added, "We [DFG employees] always got to feeling that he was more pro-discharger than pro-environment. It didn't seem right to us."

Despite all the criticisms, U.S. EPA staff conducted an enforcement comparison that revealed that Crooks could very well be better than some of his counterparts at other regional boards. "I think it's no secret that all of the regional boards are lax in enforcement," said the U.S. EPA source.

Skorupa noted that Crooks has recently been more willing to regulate toxic agricultural drainage and defended him as just a cog in a system where environmental agencies are headed by political appointees.

"The mere fact that [board members] are political appointees means they have to think about politics first and science second," said the federal biologist, "and that's what destroys the whole system."

—NICK BUDNICK

Nevada County: Lake Wildwood Sewage Treatment Plant was recently sued and lost.

cont.

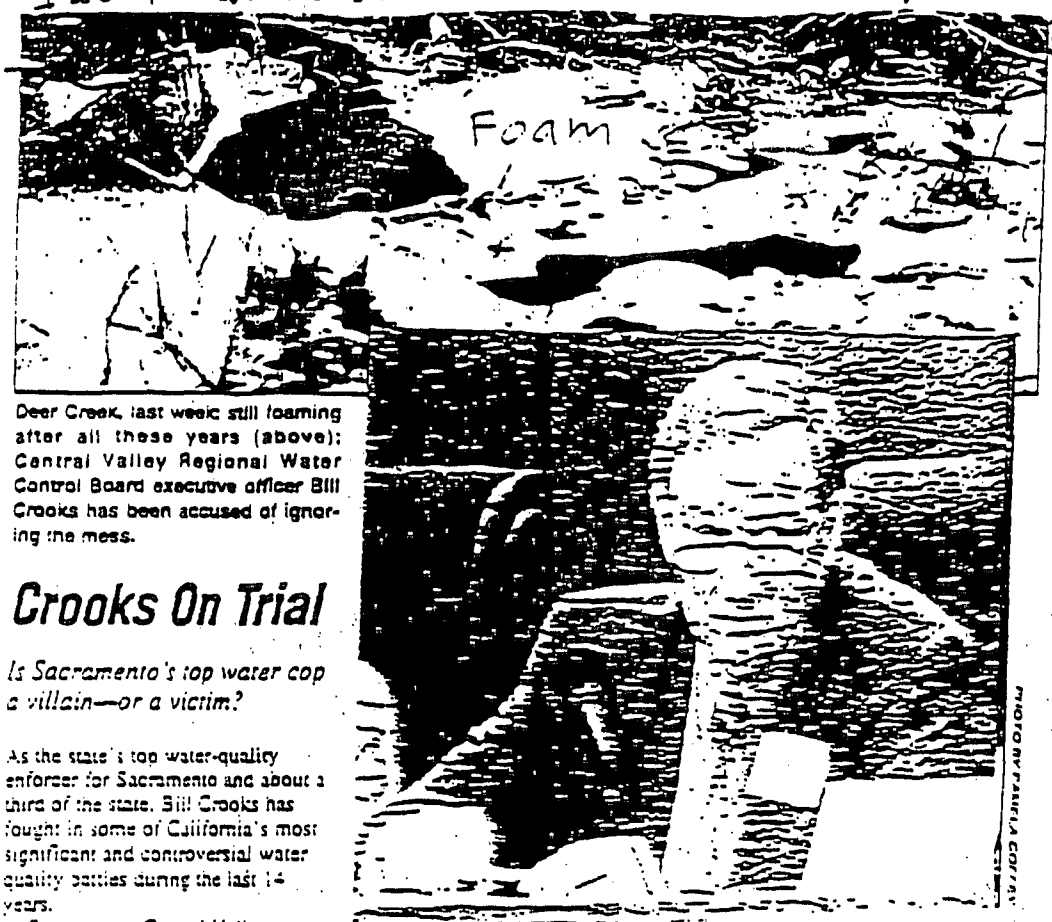

PHOTO BY PAMELA CORTEZ

Deer Creek, last week still foaming after all these years (above); Central Valley Regional Water Control Board executive officer Bill Crooks has been accused of ignoring the mess.

Crooks On Trial

Is Sacramento's top water cop a villain—or a victim?

As the state's top water-quality enforcer for Sacramento and about a third of the state, Bill Crooks has fought in some of California's most significant and controversial water quality battles during the last 14 years.

But now the Central Valley Regional Water Quality Control Board executive officer may have met his Waterloo—at an incongruously tiny trout stream in rural El Dorado County. Crooks seems likely to be fired next week. This might seem a routine change of personnel, but it raises issues that strike to the heart of California's system of water quality protection.

California Environmental Protection Agency Secretary James Strock wants Crooks gone because an internal investigation expanded upon earlier media reports—finding that, among other things, he and staff members knowingly accepted doctored self-monitoring reports that disguised pollution flowing from a sewage treatment plant at Deer Creek. The Sacramento Bee reported the findings in late October.

The deceptive reporting concealed a serious problem marked by spills of raw sewage and chlorine-induced fish kills. Creekside residents, their kids and pets were exposed to water later found to be unfit for human—and wildlife—contact. Residents blame the plant's problems for the fecal contamination that's ruined their wells. Crooks, meanwhile, blamed the Deer Creek debacle on a Wilson administration directive to focus on a backlog of unissued permits, along with unintended slip-ups and budget cuts.

Rather than leave under a cloud of disgrace, the 25-year board employee has requested a public hearing next Monday, Nov. 18, to attempt to clear his reputation. Then his board, appointed by the governor, will vote behind closed doors on whether to fire Crooks.

Many of his employees have rallied behind the charismatic leader, saying that unlike other regional board chiefs, at least Crooks allows some enforcement. "He's a great guy," Supervisor Gordon Boggs told a reporter. "Keep him on."

Last Friday a grim-faced Crooks sounding wounded by the negative publicity, granted the *SN&R* an impromptu interview.

"All I know is the dismissal is based on what appeared in the Sacramento Bee," he said, explaining that he had not yet even seen the charges against him.

"You come to that hearing Nov. 18 and you will see an enforcement record that is second to none," he said. "I've issued 145 [fines] in the last 12 years, for over $3 million. There's no regional board in the state of California that could come close to that."

Asked about other controversies that have marked his career, Crooks declined to discuss specifics—but said that he's followed his board's directive: "Be aggressive—but reasonable."

Maybe so. But citizens and state and federal employees have become increasingly wary of Crooks and his board during the last few years.

In 1991, controversy arose over Penn Mine in Calaveras County, where a series of ill-conceived dams operated by the East Bay Municipal Utility District had fish literally jumping out of the Mokelumne River to escape heavy flows of lethal acidic mine drainage. Documents showed Crooks worked behind the scenes to shield EBMUD from attempts to enforce water quality standards.

"Your assignment is to talk our attorneys into doing nothing," Crooks at one point instructed his staff in a memo, "or at the most giving EBMUD a permit to do exactly what they are doing now."

The regional board favored EBMUD but was overturned by the state Water Resources Control Board in the face of overwhelming scientific evidence.

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Con't from Pg. 3

The lack of evidence against Crooks caused speakers to liken the hearing to a "Star Chamber" proceeding and the Spanish Inquisition.

But Dan Pellisier, spokesman for Cal/EPA Secretary Jim Strock, has said the reports concerning Crooks cannot be made public because they have been subpoenaed by a federal grand jury now conducting a criminal investigation of the debacle at Deer Creek.

In Defense Of Crooks

Water cop's controversial firing may spark Senate investigation.

After a dramatic, bizarre public hearing Monday evening, appointees of Gov. Pete Wilson voted to fire Bill Crooks, the region's top state water quality enforcer. But what the Wilson administration billed as a change to improve the state's environmental protection has, ironically, put Wilson's green credentials on trial, with the promise of a state Senate investigation.

How bizarre was Crooks' termination? The 14-year Central Valley Regional Water Quality Control Board executive officer was fired without ever seeing the text of the allegations against him. The political appointees who fired him reportedly had not seen the allegations, either.

Of those appointees, three were sworn in earlier that same day and had no experience with Crooks—but voted to fire him anyway. The brand-new appointees filled one vacancy on the board and replaced two Crooks supporters who were removed just 48 hours before in a move dubbed "The Saturday Night Massacre."

"I asked you at a closed session on the 25th of October what I had done wrong," Crooks told his board members during his defense. "You've provided me with no answer."

grand jury now conducting a criminal investigation of the debacle at Deer Creek.

However, the general charges against Crooks, mostly centering on the trout stream in El Dorado County, were conveyed to him in newspaper reports, including the SN&R. Confidential California Environmental Protection Agency investigations of the non-enforcement of water quality standards at Deer Creek reportedly found evidence that Crooks ignored fraudulent reports from the wastewater treatment plant there.

Residents complained of ruined wells, raw sewage spills, chlorine-induced fish kills and arrogance and misrepresentations on the part of the regional board.

"You know, all we want is honesty," testified El Dorado's Chris Anaya, one of Crooks' most vocal critics. "But we can't even get that."

But others suggested that Crooks was removed for reasons other than the Deer Creek incident.

"Something smells rotten in all this," said Hank Abraham, one of the regional board appointees who was removed Saturday, "and it's not coming from Deer Creek."

Nor was Alan Gordon buying it. "I don't think they give a damn about Deer Creek, frankly," said the senior consultant with the Senate Office of Research, after attending Monday's hearing.

Environmentalists' distrust of the Wilson administration exhibited itself in speeches supporting Crooks—for instance, one made by consultant Tom Sparks, a part-time public interest crusader. Sparks claimed that Crooks' real mistake was in proposing a $3 million fine on Kern Oil, a well-connected firm in the Bakersfield area with a long history of violations.

Jack Pandol, until recently Strock's second-in-command, derived some income from Kern Oil, and the company hired the law firm of another former Cal/EPA undersecretary, Ken Wiseman, to defend itself.

"We're convinced that this case stems to a large extent on the anger of a former high Cal/EPA official, Jack Pandol," said Sparks.

Pellisier defended the removal of Crooks as well-intentioned and said talk of ulterior motives was "just ludicrous."

Contacted by the SN&R, Pandol confirmed that his family manages a vineyard for Kern Oil, and that two representatives of the firm had asked him to intercede on their behalf. But, "I just stayed away from the issue," he said. "To say that I had some vendetta against Crooks is crazy."

Gordon said Senate Majority leader Bill Lockyer is upset about Crooks' termination, and predicted a state Senate investigation would look into the matter, along with other controversies involving Strock's agency—notably, recent revelations concerning an internal Office of Environmental Health Hazard Assessment directive that called for the destruction of scientific documents that do not agree with Wilson administration policies.

"The real issue is with Wilson and Strock and their unwillingness to enforce the laws of California," said Gordon, "and that's what we're going to look at."

A state Water Resources Control Board employee, James R. Bennett, was appointed Tuesday to serve as a temporary stand-in for Crooks. Gordon said the true test of Wilson's intentions will come with the hiring of a permanent replacement.

"If this is really about Deer Creek, they they'll appoint an environmentalist—and the chances of that are slim and none," he said. "I think [Strock's ostensible motives] are going to be exposed as a sham."

Gordon asserted that if all Wilson environmental appointees were held to standards similar to that applied to Crooks, almost all would lose their jobs. "Wilson would have to fire himself, for that matter."

Asked whether actions against other anti-environmental appointees were in Strock's plans, spokesman Pellisier said such actions would be taken as "circumstances come to light." He noted that citizens' complaints about Crooks had been streaming in for two years, but the furor about OEHHA shredding scientific documents "has only been an issue for what—six weeks?"

Sparks also claimed Crooks was targeted because, unlike his counterparts at other regional boards, he allowed his employees to publish papers detailing scientific findings hostile to powerful interests such as agribusiness.

"I don't know what the heck they're talking about," responded Pellisier. "No one has been denied the opportunity to publish papers."

The Monday hearing took a bizarre turn in Crooks' closing statements. He begged the board members to postpone the vote on his firing and intercede on his behalf with the Wilson administration. He revealed that a federal Environmental Protection Agency official had offered to pay his salary if he were to transfer to the Water Resources Control Board and focus on water quality problems caused by agricultural drainage and abandoned mines.

After deliberating in a closed session, the board voted publicly 6 to 3 to fire him.

Even El Dorado's Anaya was disturbed by the revelations at the hearing. "It left a bad taste in my mouth last night," he said on Tuesday, but added that he has recovered his optimism. "I truly believe that this is the best thing Wilson's ever done. ... I have to think that things are going to get better."

—NICK BUDNICK

I received a call as Water Sanity! volunteer water-monitoring group of Nevada County. The description was that there was sewage and toilet paper heading down (4' deep) Deer Creek in Nevada County from the Lake Wildwood Sewage Treatment Plant. It had been flowing this way for a couple of days down into the lower Yuba River. The lawsuit was very similar to the one in Eldorado County.

cont. from page 3

Will Doleman
A Call for Water Sanity! Monitoring Group

1 ~ MCLs

State of California
Environmental Protection Agency
California Regional Water Quality
Control Board
Central Valley Region

18 June 1996

WATER QUALITY GOALS FOR METALS AND HYDROCARBONS

It was a pleasure to speak with you today about the Will Doleman complaint and other issues. One of the benefits of this job is that it affords me the opportunity to meet intelligent, interesting, committed people. I'm convinced that you could comfortably wear each of those three hats.

I've enclosed pertinent sections of our Water Quality Goals which address metals and similar information for hydrocarbons.

If you have any questions about this information or about the issues we discussed, please call me

Area Engineer

Enclosures

W.D. The following maximum contaminant levels are in parts per billion (p.p.b.). To change them to parts per million (p.p.m.) or milligrams per liter (mg/L)—which in this case is the same as p.p.m.—move the decimal point three places to the left. For example, if lead is 15.0 p.p.b., it becomes .015 p.p.m. or .015 mg/L.

To convert to millions, move the decimal point three places to the left, as in .1 p.p.b. equals .0001 p.p.m.

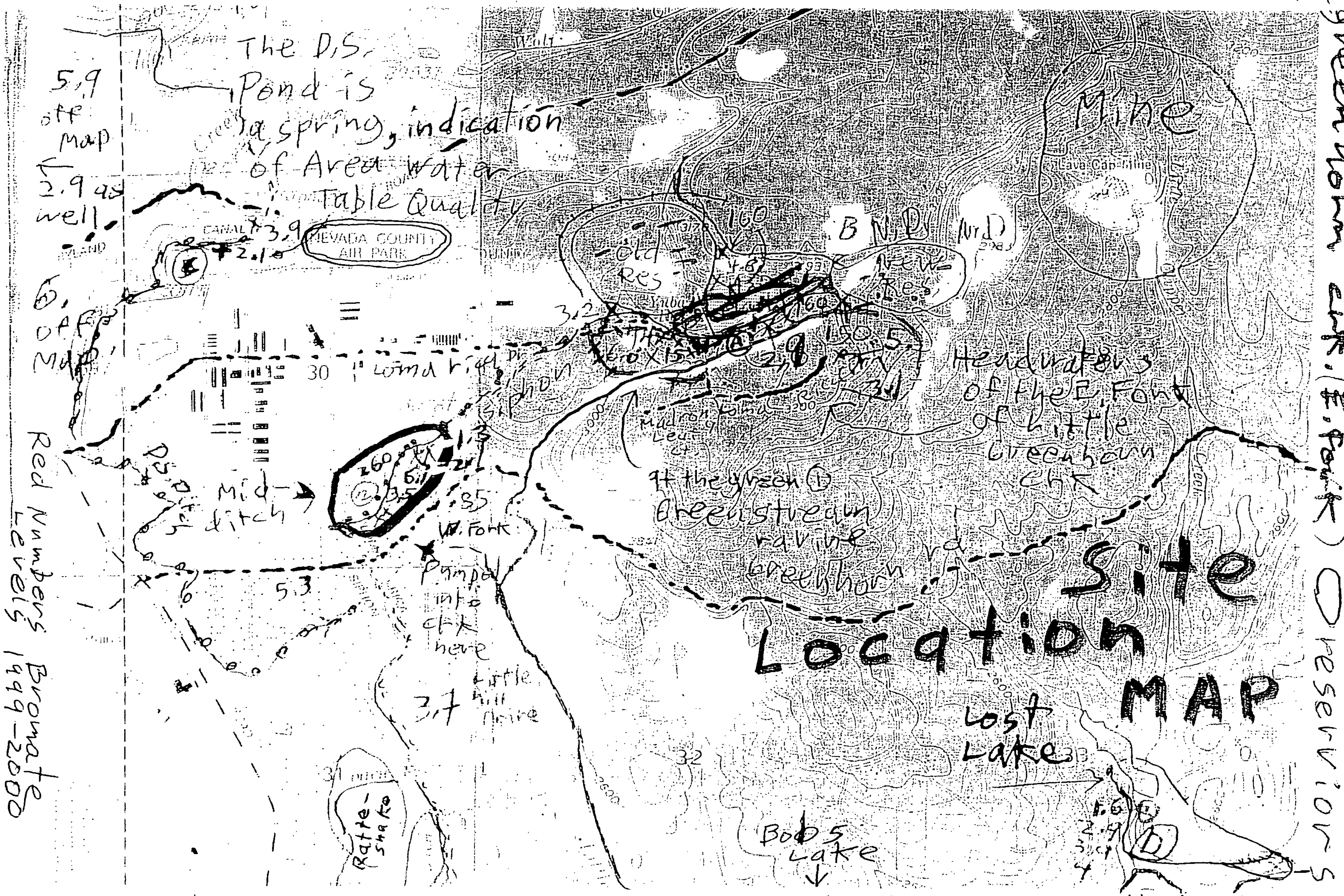
WATER QUALITY GOALS — INORGANIC CONSTITUENTS

INORGANIC CONSTITUENT	Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL)	California State Action Levels		Other Taste & Odor Thresholds
	California Dept. of Health Services		U.S. Environmental Protection Agency						
	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal	Department of Health Services	Toxicity	Taste & Odor	
Alkalinity									
Aluminum	1000	200		50 to 200		1000 (100)			
Ammonia									37 (55)
Ammonium sulfamate									
Antimony	6		6		6				
Arsenic	50		50						
Asbestos	7 MFL (101)		7 MFL (101)		7 MFL (101)				
Barium	1000		2000		2000				
Beryllium	4		4		4				
Beryllium oxide									
Beryllium sulfate									
Boron							1000		
Bromate			10 (100)		0 (100)				
Bromide									
Cadmium	5		5		5				
Carbon disulfide									
Chloramine			4000 (66)		4000 (66)				
Chlorate									
Chloride		250,000 (73)		250,000					
Chlorine			4000 (66)		4000 (66)				
Chlorine dioxide			800 (67)		300 (67)				
Chlorite			1000 (100)		80 (100)				
Chromium (III)									
Chromium (VI)									
Chromium (total)	50		100		100				
Cobalt									
Color		15 units		15 units					
Copper		1000	1300 (111)	1000	1300				
Cyanide	200		200		200				
Fluoride	1400 to 2400 (109)		4000	2000	4000				
Foaming agents (MBAS)		500		500					
Hydrazine									
Hydrazine sulfate									
Hydrogen sulfide									
Iodide									
Iron		300		300					
Lead			15 (111)		zero				
Manganese		50		50					
Mercury (inorganic)	2		2		2	2 (100)			
Molybdenum									
Nickel	100								
Nickel subsulfide									
Nitrate	45,000 (72)		10,000 (103)		10,000 (89)				
Nitrite	1000 (103)		1000 (103)		1000 (89)				
Odor		3 threshold units		3 threshold units					
Oxygen, dissolved									
pH				6.5 to 8.5 units					
Phosphorus									
Potassium bromate									
Radioactivity, Gross Alpha	15 pCi/l (110)		15 pCi/l (110)		zero (100)				
Radioactivity, Gross Beta	50 pCi/l		4 mrem/yr		zero (100)				
Radium 226 + 228	5 pCi/l		5 pCi/l / 20 pCi/l (100)		zero (100)				
Radon			300 pCi/l (100)		zero (100)				
Selenium	50		50		50				

Values are in µg/l (ppb) unless otherwise noted. *Numbers in parentheses indicate footnotes on next to last page.*

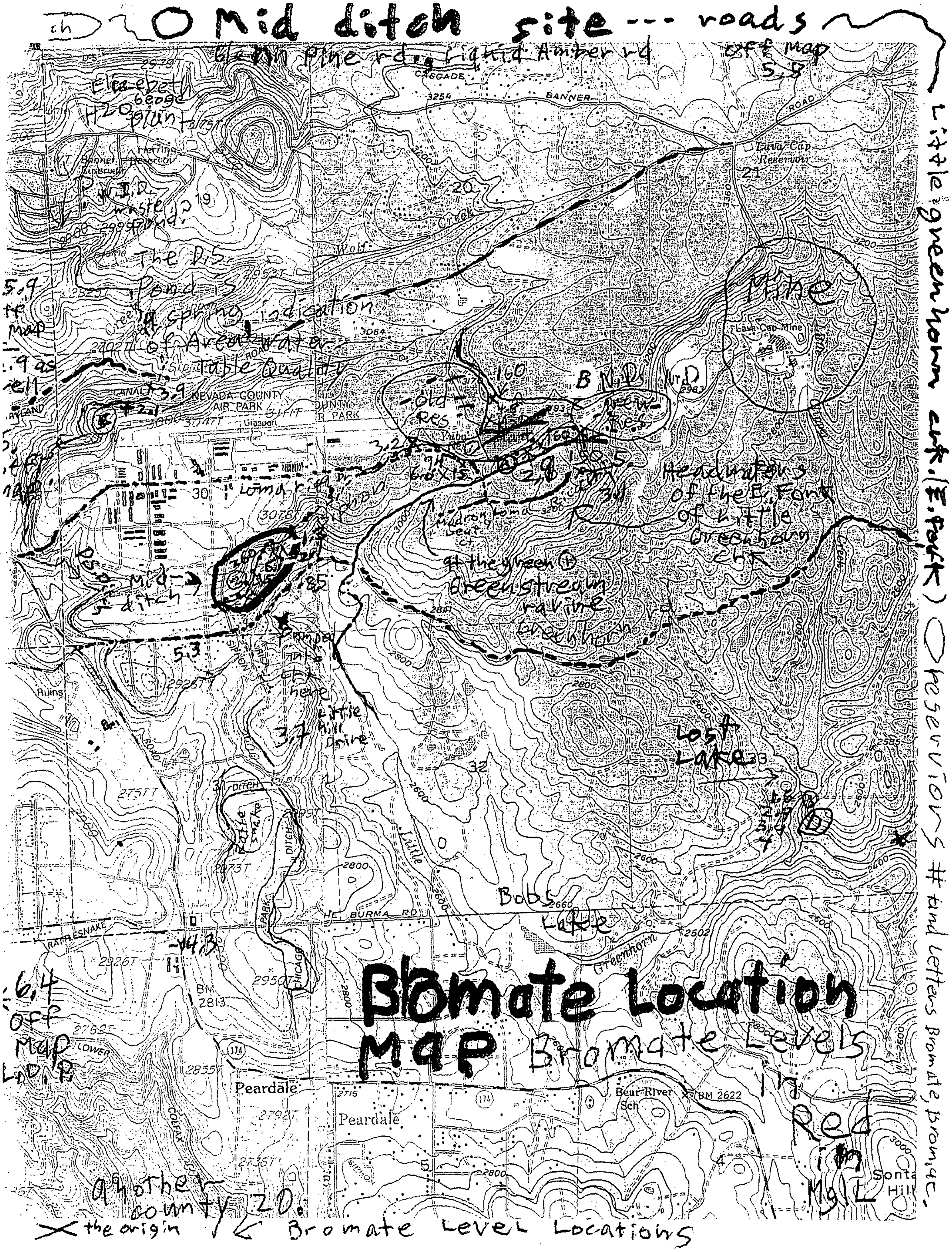
chicogo Park Rattlesnake ag ditch

Greenstream stream site — Lost Lake site — Loma Rica Water Treatment Plant

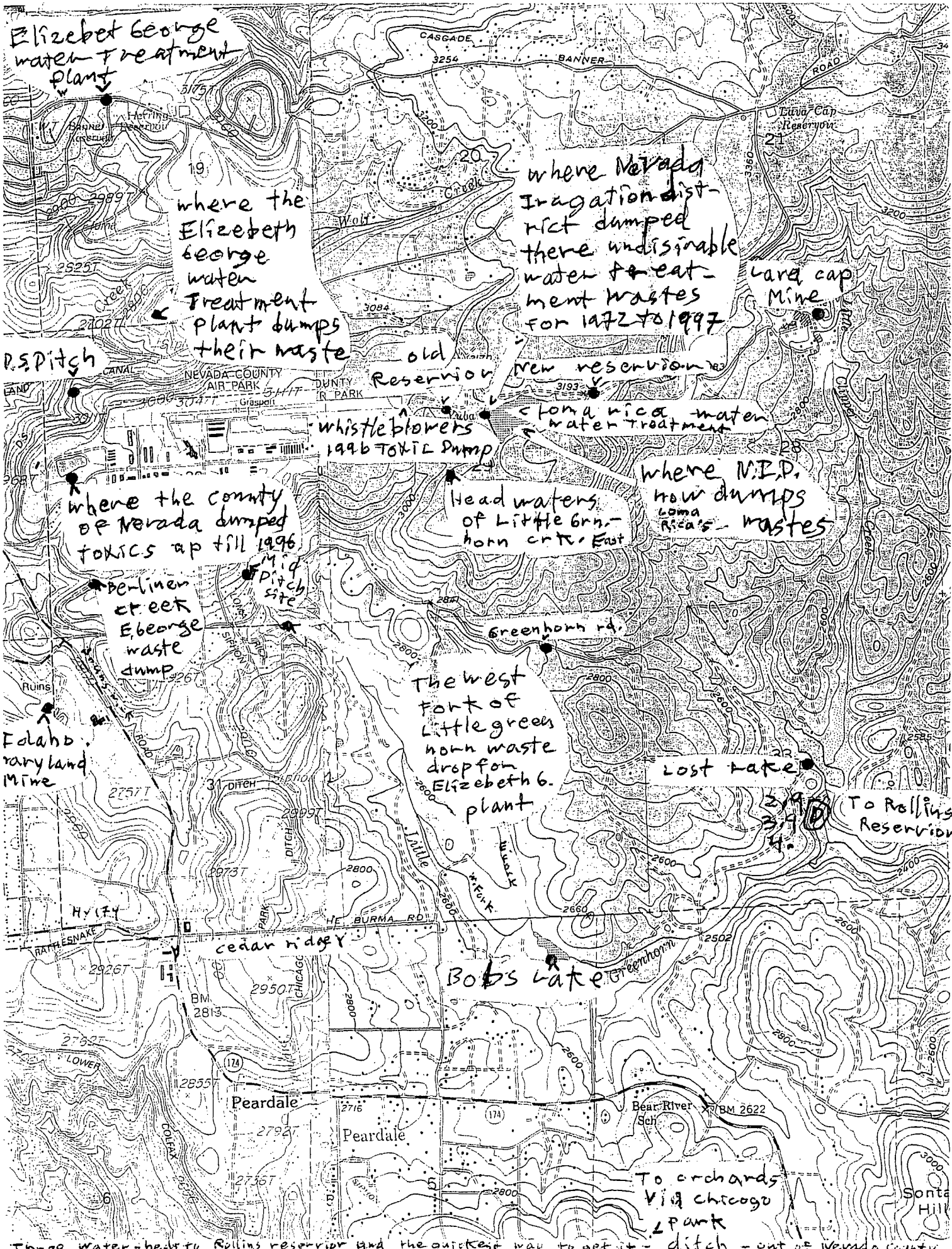


Mid-ditch site — Old Yuba Reservoir Pre-ditch puddle site — E. Fork of Little Grn-horn crk site — W. Fork

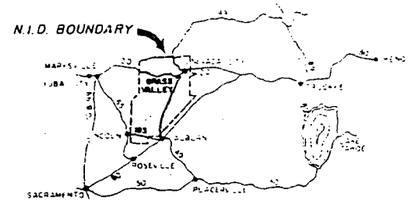
roads — Nevada co. Airport — o-o-o-o



ch
Mid ditch site --- roads
Glenn pine rd., Liquid Amber rd
off map 5.8
Little greenhorn crk. (E. Fork)
reservoirs # and letters Bromate, bromate,
Elizebeth George H2O plant
N.I.D. waste? pond?
The D.S. Ponds
a spring indication of Area water table Quality
5.9 off map
BNID
old Res
new Res
Mine
Lava Cap Mine
Lava Cap Reservoir
Headwaters of the E. Fork of Little Greenhorn crk
NEVADA COUNTY AIR PARK
Loma rita
Mid-ditch
Green stream ravine
Lost Lake
little hill Drive
Bobs Lake
Bromate Location Map
Bromate Levels in Red in Mg/L
6.4 off map
Peardale
Bear River Sch
another county 20.
X the origin
Bromate Level Locations



Three watersheds to Rollins reservior and the quickest way to get it - ditch - out of Nevada county



VICINITY MAP

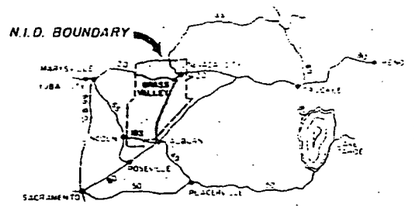
NID

NEVADA IRRIGATION DISTRICT

MAJOR CANAL SYSTEM

LEGEND

- NEVADA IRRIGATION DISTRICT BOUNDARY
- NEVADA IRRIGATION DISTRICT CANALS
- POWER HOUSES



VICINITY MAP

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- NEVADA IRRIGATION DISTRICT BOUNDARY
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- POWER HOUSES

A Call for Water Sanity! Monitoring Group

P.O. Box 3544
Grass Valley, CA 95945
(530) 272-6421

R39

March 5, 2001

To whomever is also concerned about our water:

We all make our choices. Many of us have worked for years to buy our homes, and some of us—such as myself—took this money that I could have used in other ways and did a study on a local watershed. As if I was instructed by a divine source, I forsaked all personal needs and pursued this task. I have enclosed the five-year report for this project, and I feel that this fifty-thousand dollars was well spent and that the finding of chemicals that simply move toxic substances from one part of the water to another part of the water was a good way for these funds to be used.

The realization that our chemical technology has exceeded the scope of our laws, which are in place to protect our health, is startling. Education and knowledge of these chemicals, which are now being used on all our waterways, is becoming a necessity for any person who does water monitoring. Knowledge of how these substances work and how they can concentrate and harm both aquatic and human life are essential to know.

On the back of the table of contents is an introduction that will help you to understand the contents of the report and the best time to watch the video. I have enclosed a report made from each chapter of the five-year report, as I believe that breaking each chapter of the report into separate issues—such as sewage-treatment downstream, water-treatment issues, mining issues—will help to create an issue-focus so that a person who lives or uses the water downstream or is monitoring downstream can learn about the issues that might be pertinent to their situation. I would also like to point out that if a plant operator states that they are not using any chemicals upon discharge, either that person may not really know or they may be telling an untruth.

To know what to look for downstream and research from bio-assays, etc., will usually tell the real story. Chapters Nine and Ten are keys to pulling the report together and supplies a realization about what you are seeing in the video or reading about at each of the sites in the report. Chapters Nine and Ten came last and gave a name to the two chemicals we see in the video and read about in the report. "Special Sauce" is the alkaline foaming substance and then the orange-black or yellow-acidic semi-solid gelatinous substance is what they refer to as "acid mine-waste chemical."

Will Doleman
A Call for Water Sanity! Monitoring Group

Introduction

This story is about the discovery of a serious environmental problem that causes disease and death. It has been created both for the professional aquatic scientist as well as for the lay person, as is the person who wrote it—Will Doleman. Although you may find the narratives to be slightly technical, there are M.C.L.s (Maximum Contaminant Levels) for drinking water and irrigation use, which will help you understand the toxicity levels in the back of each of the site narratives. If you glance at these first, then as you read you may have a clearer understanding of the level of toxicity present. Except areas of concentration, the body of water appears to be fine in most of the locations according to acceptable standards. Even as a lay person you need to understand the difference between p.p.m. (parts per million—the same as mg/L, as well as p.p.b. or parts per billion) if you are going to discuss these levels with a water regulator, since most of the regulator's M.C.L.'s are in p.p.b.

The summary of each of the eight sites discusses each site, the levels I've found, and the implications to public health. This is the part that a lay person can easily understand. To an expert it may justifiably be accepted as one group of peoples' opinions drawn from the narrative data. Such a person may want to read the narrative for each site, then the Appendix, then the ninth chapter (re: chemicals that appear to float, evaporate to the air, or temporarily coagulate—i.e., gelatinize—bacterial and heavy-metal substances out of the water body), and then read the summary of each site to see if the conclusion you have drawn concurs with the opinion of A Call for Water Sanity! Monitoring Group's opinion.

A lay person may find it easier to read the summaries, then proceed to the Appendix, reading the "W.D." notes and the letters (with Will Doleman's signature at the bottom), and quickly skim the rest, returning last to read chapter nine (re: the chemicals that appear to be the ones being used).

This whole document is generally about the surface and semi-solid sediment portion of waterways and lakes and not about the body of the water mid-stream, which has been documented by the regulators and appears to be in much better condition, the notes of which are not enclosed. The exception to the foregoing is the $KBr0_3$ potassium bromate, which is about the body of the water. If you received a video, it is suggested that you read this first and save the video for dessert.

This project was done in just one small part of the watershed (except $KBr0_3$) and does not necessarily reflect the condition of all watersheds. But other water areas have been analyzed as in the Wolf Creek site that appear to reflect the same general conditions regarding the foaming substance.

A Call for Water Sanity! Monitoring Group
Five Year Report 1995-2000

Other materials available: two-hour video; analysis book; site-log book; calls and letters to regulators book; chain-of-custody and laboratory narrative upon request; computer analytical database forthcoming; graphs; Wolf Creek video; chemical-manipulation video; condensed informative video.

Issue Index

A Call for Water Sanity! Monitoring Group's Analytical-Site Narrative Five-Year Report 1995-2000/Subject Description

CHAPTER ONE and A1

Mid-Ditch; 3000' elevation $10.00

This site, which is a slow spot in a waterway or a natural settling pond, also lies downstream from leaking landfills and two water-treatment plants.

It is documented over a five to six year period and reveals that concentrations of health-harmful substances are killing people, fish, and frogs that use the waterway. The site-narrative summary and video show a hands-on approach to documenting random concentrations of these substances. It also shows how chemicals that float, congeal, and evaporate toxic metals are poisoning the water and air that people are breathing and the food that people are eating.

The Mid-ditch site receives much of its water from the Loma Rica Water Treatment Plant's backwash pond and seeps from its 24-year-old discard pile; seeps from a mine-tailing arsenic-dump landfill by way of the Old Reservoir Pre-Ditch Puddle site and the Greenstream Ravine site, the bromate-source site, and the Cascade Water Treatment Plant located upstream.

CHAPTER TWO and A2 $5.00

The Old Yuba Reservoir and Its Pre-Ditch Puddle site; 3,200' elevation

This reservoir receives its waste, bromate, and heavy metals from: (1) Nevada County property that is on loan in part to the local water-treatment municipality; (2) the municipalities' 24-years of discarded-pond scrapings that were dumped into the old reservoir; (3) a massive landfill of arsenated mine tailings. This site demonstrates how solid-waste dumped out in the rain or in a wetland area seeps into the water, causing a water-pollution problem. The Old Yuba Reservoir Pre-Ditch Puddle is upstream from the Mid-Ditch site and the Chicago Park agricultural area. Additionally, it discharges into the public-water supply that is used in approximately 600 residencies downstream for showers, dishwashing, hand-washing, and bathing.

CHAPTER THREE

Greenstream Ravine $5.00

This site demonstrates: (1) how to locate deep-injection wells and trenches; (2) how a wetland can become totally overloaded with discarded toxins; (3) how to sample silver-gelatinous substances; and (4) how to show the origin of toxins by demonstrating high levels of constituents that are used in the nearby municipalities or industry. It also shows how sometimes local government chooses not to do anything that might create any financial liability, and how they often fence off or hose an area in order to cover up inadequacies. They may not have any consideration whatsoever for the public's health. Greenstream Ravine flows down to the Mid-Ditch site.

CHAPTER FOUR

Headwaters of the East Fork of Little Greenhorn Creek $5.00

This creek flows down to Rollins Reservoir and is joined by Clipper Creek from Lost Lake. This site demonstrates how municipal water- and sewage-treatment plants use deep-

injection trenches to discard their by-products, and how they intentionally avoid the testing of discharge water for water-treatment by-products. It also shows how the groundwater table is completely contaminated and how it kills a very old madrone forest and shows what effect the standard methods of alum disposal has on groundwater quality.

CHAPTER FIVE

The D.S. Ditch $5.00

This ditch demonstrates how inadequacies in the law have allowed private and public waterways to be used for wastewater-dump channels and how chemical-mining technology is being used to move toxins from one part of the water to another part of the water body so that the area normally tested under accepted water-testing protocols is temporarily cleaner than other untested parts of the waterway. The D.S. Ditch clearly demonstrates how engineering with chemicals and waterway design are separating undesirables to be discarded to the creek while the better water is to be used by the water purveyor to sell. It also shows how it's really important for the people of California to see that S.B. 649 is repealed. The D.S. Ditch enters the East fork of Little Greenhorn Creek and flows down to Rollins Reservoir and then into the Auburn Aqueduct, which is used for agricultural use. Also, it overflows to Bear River, which has fish advisories about not eating the fish from it.

CHAPTER SIX and A6

$KBrO_3$—Potassium Bromate $10.00

This chapter is about an issue more than about an individual site, and all the well- and municipal-metered water samples were taken according to acceptable water-testing protocols. It shows why cancer is accruing fourfold in watersheds located below water- and sewage-treatment facilities. Fourfold cancer levels of cancer were shown to be the case in a statistical study done in Toronto Canada by Dr. Mac Lach Lan, professor of statistical studies at the University of Toronto. It also shows how the waste products of water-treatment processes are not the subject of chlorine residual (i.e., by-product) research, and how they should be.

The amazing thing it reveals is how government-regulatory agencies got involved and how suddenly all the results were now incorrect. A quote from a state employee who wishes to remain anonymous: "Sometimes it's easier to fix the lab results than it is to fix the problem." This carcinogen that was found to be emitting from the water-treatment plant and its discharged solid waste has wide-area implications. Samples taken from other California counties show that the problem is accruing in probably many if not all locations where chlorine is being used or especially where it's made on-site in brine tanks.

This chapter touches on how this substance is being used in bakery goods, listing bakery names to avoid, and how $KBrO_3$ in permanent-hair curler solution and dyes have disfigured many people.

CHAPTER SEVEN and A7

Lost Lake $5.00

How a government superfund agency used or ignored the use of chemicals to move the toxics downstream just out of the site boundary so that they could say all is well and not take any action. Clearly this shows what chemical manipulation does and how it is being ignored. It centers around the contaminant arsenic and other mining wastes.

We still hope to convince and get the help of the federal E.P.A. or one of the state agencies to look at what we have found here. It's been four years now of ongoing effort. So far the only reply has been tongue wagging.

CHAPTER EIGHT and A8

Wolf Creek Site

This shows how chemical manipulation floats undesirable substances onto the water's surface, and how the municipality saves money by falsely representing its discharge to the creek. This chapter also addresses protective measures that any volunteer-water monitor should take to protect his or her health while gathering foam or coliform samples that could and often contain high levels of raw-sewage concentrations. This site addresses sewage-treatment discharge issues.

CHAPTER NINE

Chemical Mania

This chapter is about chemicals being used in our watersheds. Read and see and hear for yourself the claims of one manufacturer so you can understand that there is lots of money to be made in the chemical loopholes that allow the poisoning of our waterways. Understand the protocol issue and what we can do to remedy it. It touches on chemicals that are very likely being used on our waterways in all the preceding chapters.

CHAPTER TEN

Bacterial Mania

The concentrating surface scum not only contains high levels of heavy metals and occasionally bromate but, as discovered in this chapter, could be accurately considered be to a heavy-metal bacterial swarm. The swarming action of 900,000 M.P.N./100 mg/L total coliform in one sample could easily be understood as why there is foam there. Although the foam at Mid-Ditch is what's highlighted here, documentation of the Wolf Creek site shows that it is also accruing there.

Even though I took every precaution, I still got contaminated with the bacteria in the foam with a sinus infection. I took many months to figure out what was biting me, followed by weeks of treatment, as I was still hoping to be rid of the bacteria. I still hope that none of the pathogens that crowded my eyes, ears, nose, throat, and lungs were carrying any disease as they often do. Now with high doses of antibiotics, I hope finally to rid my body of these invaders. I thought they were water fleas that were crawling on me and biting me." Now I follow the strictest raw-sewage sampler's protocol.

Videos

The two-hour video: Presently the video encompasses mining and water-treatment discharge issues. Three of the videos are about water-treatment plant discharge issues to waterways and groundwater. Included is a pep-talk preview touching on local mine-tailing issues and the effects of acid rain. Lost Lake, which is a half-hour video out of the four videos, centers on mine-waste issues and chemical manipulation of these substances.

At this time, all four videos are on one tape, but eventually three different tapes will be available: (1) water-treatment, wastewater, and sludge issues; (2) chemical and bacterial manipulation of our waterways; and (3) sewage-treatment discharge and sludge issues. (The next video will cover Wolf Creek and Gas Canyon Creek downstream from sewage-treatment facilities, and sewage-treatment wastewater issues. Another video in progress will be about the chemicals being used to manipulate our waterways. This video will include bacteriological issues.)

Interrelation of Sites and Issues

The Mid-ditch site (Ch.1) is a receptor site and received effluent from the O.R.-P.D.P. (Ch.2) and the G.S.R. (Ch.3) sites. The original body of *Bacterial Mania* (Ch.10) was done on the Mid-ditch site (Ch.1). The chemical company that makes the chemicals mentioned in *Chemical Mania* (Ch.9) is located upstream, and it is thought that the water-plant ditch managers, who are very pro-chemical use, are probably using or holding stock in this chemical company. So Ch.1 and Ch.10 definitely go together and should be purchased together. Chapters 2, 3, 6, and 9, as one could guess, are also definitely interrelated with Chapter 1.

The Lost Lake site (Ch.7) is located in the next watershed to the east from the above-mentioned sites. The upstream portion is a federal-superfund site and is owned by a developer (I have no access to the Lava Cap Mine site). The H.E.F.L.G. Crk. (Ch.4) downstream portion joins Clipper Creek just downstream from Lost Lake as the D.S. Ditch (Ch.5) is in the H.E.F.L.G. Crk. watershed as well. It is believed that B.M. (Ch.10) is also occurring at the D.S. Ditch, which caused the bacteria swarm of 35 mg/L of arsenic just below the confluence of Little Greenhorn Creek and Clipper Creek of 35 mg/L of arsenic reported in Lost Lake (Ch.7). Bromate was found at Ch.1, Ch.2, Ch.3, Ch.4, Ch.6, and Ch.7 sites as well as area-residential wells and the metered-potable water supply. So when purchasing Lost Lake one should also purchase *Chemical Mania* (Ch.9). You might also want to consider the interrelationship of Ch.4, Ch.5, Ch.6, and Ch.10. More work on bacterial substances is now being done, but preliminary results show the D.S. Ditch (Ch.5) and H.E.F.L.G. Crk. (Ch.4) probably added the bacterial substances causing the bacterial swarm of 35 mg/L of arsenic downstream from Lost Lake, which was likely manipulated by Ch.9.

Wolf Creek (Ch.8), the sewage-treatment issue, should be purchased with *Bacterial Mania* (Ch.10).

The Ch.1 and Ch.6 reports are more due to the volume of the material. The individual reports are the same as the large report, which contains all of these ten chapters, except the individual chapters will have at least two 8½" x 11" color photos taken of the site. The larger report contains maps of the study area and two color photos as well. For those who wish to take a good look at these issues, it is recommended that they order the A.C.F.W.S. Monitoring Group's *Five Year Data Report*, which comes in an attractive photo-cover binder for $30.00, and also order the two-hour video, *Greenhorn Watershed*, for an additional $20.00.

For another $20.00 per year, the price of the group's support membership, a person will receive yearly updates to the data-report, chapters 1 through 10. Presently, purchases are not tax deductible, but this status is soon likely to change.

For a group with limited funds, if you purchase one of the $10.00 report chapters, we will let you exchange one for one until you have read all ten chapters, but you will have to provide a 9"x12" S.A.S.E. each time and pay all postage. The returned reports will have to be in like-new condition.

5-15-01 A.e.f.w.s. Monitoring group

To whom it may concern,

This water quality research project was done on the uppermost reaches of clipper creek, Little greenhorn creek, and wolf creek in Nevada county Ca.

This report shows how a specific health harmful Bacteria is occurring which is moving Toxic concentrations of heavey metals fecal coliform to the waters surface and to a media (gelatanous) at the bottom of the waterways, to serve as a bacterial egg hatchery for this bacteria. Due to this phenomena of gathering up these health harmful substances to the waters surface in a scum which foams when shagged and therefore concentrated and to the waterways bottom in a gelatanous (Angua Bloom) orange, green, brown on black substance, the samples taken by normal water testing protocalls are not finding them.

This report and video show how these substances are none the less concentrating into the water at different points and causing both anaquatic and human mortality.

It's not our job as volunteer monitors to point the finger as to origin of constituents that we find so we find ourselves apoligising now for doing that at diferent points in our report summery's. Much of the data was gathered early on in the development of our monitoring group and we have evolved past that now but now the less you will read this flaven in our report, our hope is you will see past this and look at the information which we have gathered.

Land use issues have for one thing definitly impacted our water quality here due to that consideration of our environmental classification as a water recharge zone is being ignored by the C.V.R.W.Q. Board. It's ground water which is being contaminated in many cases that's causing serious water quality problems here.

A number of E.P.A. approved Labratories were used 2.
for this study yet even so we had problems with
some Labs Like Columbia Inspection Labratory in
regards Bromate analysis see (A6) apendix, It is
not possible to touch on all aspects of the
5 year project in this two page document but
if you deem wolf creek and clipper and Little Green-
horn creek impaired it will allow the Epa.
to devote more of it's attention to these
serious problems occurring near in the upper
tributaries of california's watershed,

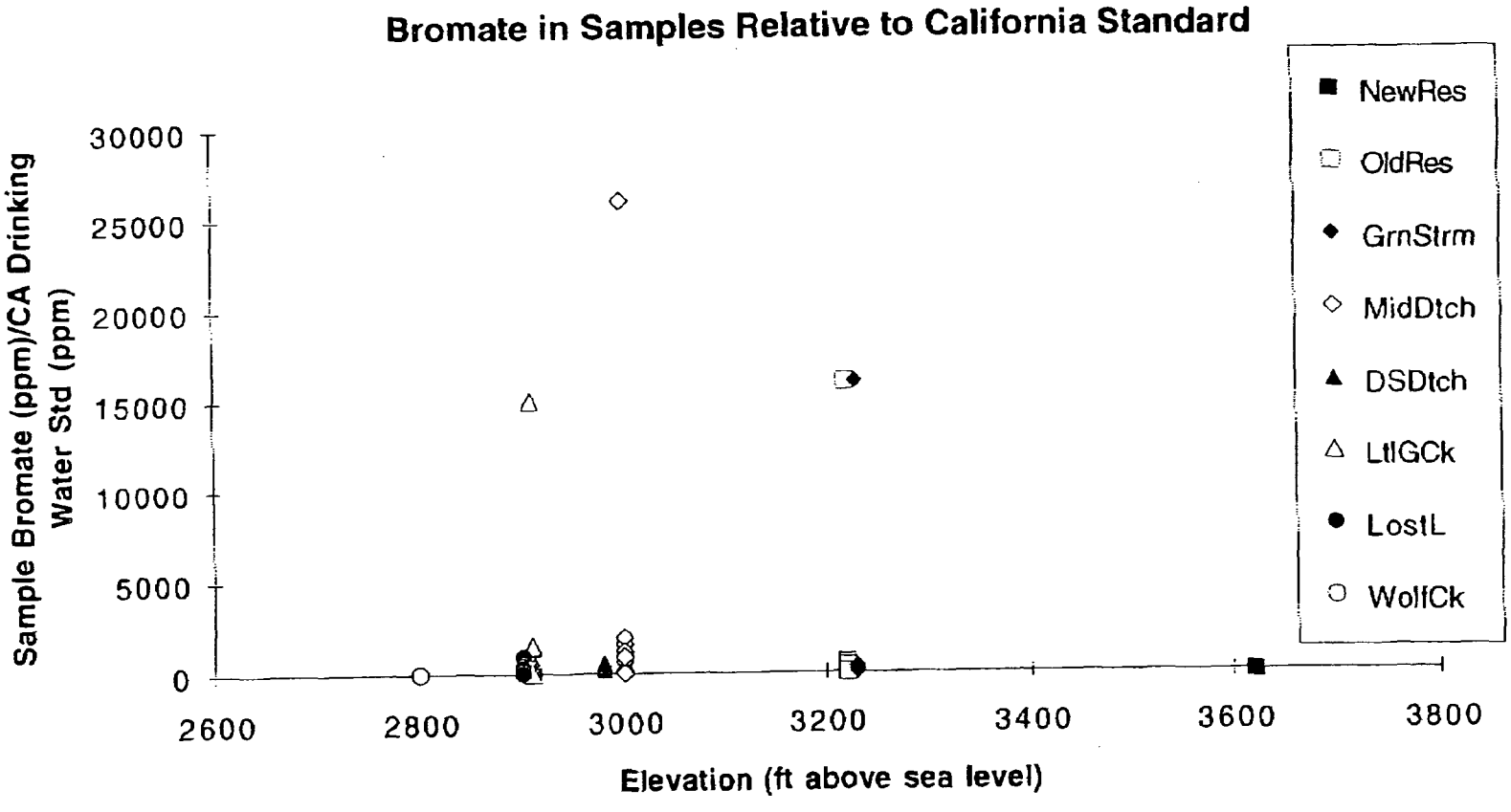
If you skim through the document starting
with reading the introduction guidlines and
possibly take the video home to watch with
your kids, if the comentary offends you turn
off the sound and watch the visual photographic
just the photo's and video alone show the impairment
of these waterways,

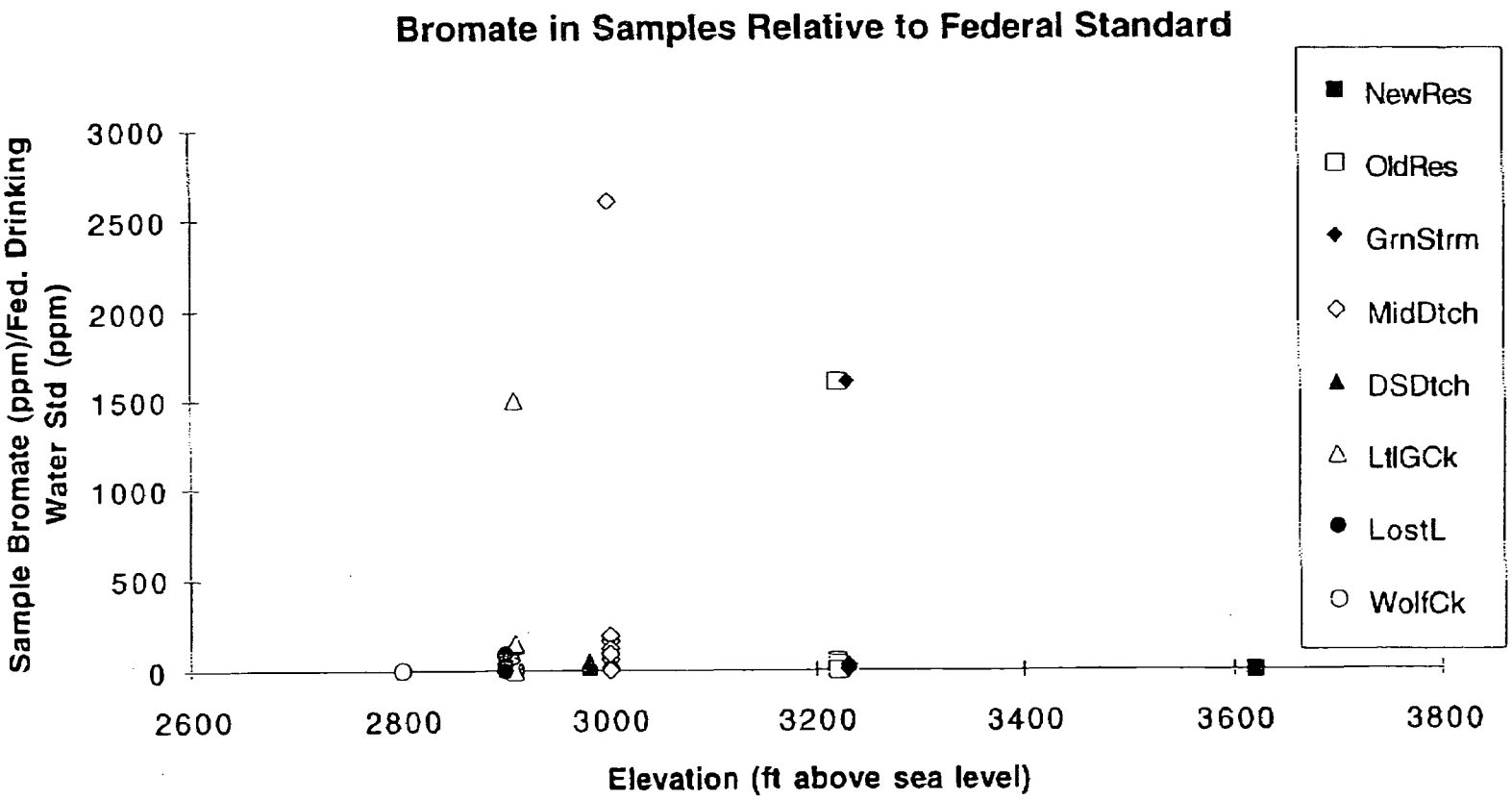
There is a serious problem here in indiv-
idual people as well as county gov't which has
been displayed in the past to agencies outside of
Nevada County in dealings with the county over the
County dump for instance. It's this Local mindset
of denial and Ignorance which continues to com-
pound the problems of dealing with water quality issues,
~~Where~~ where the main focus is on chem-
cal engineering like dumping 35 mgl of permang
ernate into a waterway which is heavily
stocked with heavey metals as it flows down
through a residential neighborhood or just
hosing stuff down off their property
with no thought of health effects down-
stream, It is really the mindset of whats the
cheapest Imeadiate method of covering up
with all emphisis being placed on financial
issues rather that Public health.
Thank You

Potassium Bromate ($KBrO_3$) Results

Number of Times over the prop 65 D.W. - M.C.L

Sample Type	Sample Location	Sample Number	$KBrO_3$ Level (ppm)	MCL (ppm)	$KBrO_3$/MCL
Surface Water					
	Old Yuba Reservoir, NC Airpark, GV	207	6.27	.0005	12,538
	DS Ditch	219A	4.84	.0005	9,677
	DS Pond	219B	2.74	.0005	5,485
	Loma Rica Dr., GV	222	1.50	.0005	2,997
	Old Reservoir, NC Airpark, GV	226	208.96	.0005	417,920
	Loma Rica Dr., GV	228	6.53	.0005	13,060
	Rough & Ready Ditch	254	3.79	.0005	7,575
	Clipper Creek, GV	255	5.22	.0005	10,448
Treated Water					
	Lake of the Pines	227	3.85	.0005	7,708
	Empire Shoes, Sutton Way, GV	233	5.14	.0005	10,277
	Sunset Subdivision, R & R Hwy., GV	244	2.48	.0005	4,967
	Alta Sierra Inn	246	4.28	.0005	8,564
	Pine St., NC	256	2.78	.0005	5,567
Well Water					
	Buckman, Glenn Pines Dr., GV	211	4.57	.0005	9,142
	Glenn Pines Dr., GV	212	1.57	.0005	3,134
	Little Hill Dr., GV	213	4.83	.0005	9,664
	Glenn Pines Dr. , GV	216	1.70	.0005	3,396
	Doleman, Glenn Pines Dr., GV	225	1.11	.0005	2,220





Bromate Study Samples (p 1)

	Blanks and Background Spls				1. Mid Ditch Sites					
Sample No.	179	180	206		19716.5	19716.6	22226.1	22467.1	22467.2	22467.3
Coll. Date	10/10/99	10/10/99	11/21/99		5/5/97	5/5/97	1/5/98	1/20/98	1/20/98	1/20/98
Anal. Date		11/3/99	12/7/99		6/13/97	6/13/97	1/20/98	2/9/98	2/9/98	2/9/98
Aluminium										
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	<0.001	<0.001			<0.5	<1	16	<1	<1	<1
Bromide			nd							
Cadium										
Calcium										
Chromium							.31			
Cobalt										
Copper							.49			
Cyanide										
Lead						20			.4	
Manganese								4.5		
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium										
Nickel										
Selenium										
Silver										
Sodium										
Sulfate							1.7		1.2	
Surfactants										
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 2)

1. Mid Ditch Sites, continued

Sample No.	80305.4	0324.81	708.1	168	171	172	183	184	216	224
Coll. Date	2/27/98	3/21/98	7/4/98	8/23/99	9/5/99	9/5/99	10/10/99	10/10/99	11/21/99	12/3/99
Anal. Date	2/26/98			10/1/99	10/1/99	10/1/99	11/3/99	11/3/99	12/17/99	12/17/99
Aluminium	290									
Antimony	nd									
Arsenic	nd									
Barium	0.033									
Beryllium									1.3	260
Bromate	nd	19.1	nd	12	9.4	6.1	nd	nd		
Bromide										
Cadium										
Calcium										
Chromium	nd									
Cobalt	nd									
Copper	nd									
Cyanide										
Lead	nd									
Manganese	0.048									
Mercury	nd									
Molybdenum	nd									
Petroleum										
Phosphorous									1.7	
Potassium	24									
Nickel	nd									
Selenium	nd									
Silver										
Sodium										
Sulfate	0.5		0.6							
Surfactants										
Thallium										
Vanadium	0.6									
Zinc	0.05									

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 3)

1. Mid Ditch Sites, continued

Sample No.	291	Stahler-2	Stahler-3	282*	213*
Coll. Date	3/2/00	1/9/00	1/9/00	3/4/00	11/21/99
Anal. Date		1/9/00	1/9/00		12/7/99
Aluminium					0.11
Antimony					
Arsenic					
Barium					
Beryllium					
Bromate		110	110	5.4	3.7
Bromide	8.9				
Cadium					
Calcium					
Chromium					
Cobalt					
Copper					
Cyanide					
Lead					
Manganese					
Mercury					
Molybdenum					
Petroleum					
Phospborous					
Potassium					4.0
Nickel					
Selenium					
Silver					
Sodium					
Sulfate					
Surfactants					
Thallium					
Vanadium					
Zinc					

(all analyses reported in mg/l or mg/kg)
* Mid Ditch samples that are close to DS Ditch sites

Chapter 6: Bromate Study Samples (p. 4)

2. Old Reservoir Prediteh Puddle Sites

Sample No.	137	141	142	145	187	207	208	209	226	301
Coll. Date	3/14/99	3/27/99	3/27/99	3/27/99	10/10/99	11/21/99	11/21/99	11/21/99		3/10/00
Anal. Date	4/12/99	4/12/99	4/12/99	4/12/99	11/3/99	12/7/99	12/7/99	12/7/99	12/17/99	
Aluminium						0.74			70581	
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	<0.5	<0.5	<0.5	<0.5	nd	4.8	2.4	3.2	160	0.04
Bromide						nd				
Cadium										
Calcium										
Chromium										
Cobalt										
Copper										
Cyanide										
Lead						nd				
Manganese										
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium						1.7			590	
Nickel										
Selenium										
Silver										
Sodium										
Sulfate	8.7									
Surfactants										
Thallium										
Vanadium									nd	
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 5)

3. Green Stream Sites

Sample No.	138	140	143	144	147	181	185	186	205	212
Coll. Date	3/14/99	3/14/99	3/27/99	3/27/99	3/27/99	10/10/99	10/10/99	10/10/99	11/21/99	11/18/99
Anal. Date	3/24/99	4/1/99	4/12/99	4/12/99		11/3/99	11/3/99	11/3/99	12/7/99	12/7/99
Aluminium									0.18	
Antimony										
Arsenic										
Barium	2.3									
Beryllium										
Bromate	<0.5	<0.5	<0.5	<0.5	<0.5	160	nd	nd	2.9	1.2
Bromide										
Cadium										
Calcium										
Chromium	0.08									
Cobalt										
Copper	0.27									
Cyanide										
Lead										
Manganese	28									
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium	7.2								nd	1.8
Nickel										
Selenium										
Silver										
Sodium	3.9									
Sulfate	0.5		4.8	1.3					2.2	
Surfactants										
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 6)

4. Little Greenhorn Creek Sites

Sample No.	24989.2	24989.3	120	135	136	182	183	201	202	203
Coll. Date	8/18/98	8/18/98	1/26/99	3/14/99	3/14/99	10/10/99	10/11/99	11/9/99	11/9/99	11/9/99
Anal. Date	9/3/98	9/3/98	2/8/99	4/12/99	4/12/99	11/3/99		12/7/99	12/7/99	12/7/99
Aluminium		39								
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	<0.5	<0.5	<0.5	<0.5	<0.5	150	n.d.	3.8	3.6	3.8
Bromide										
Cadium										
Calcium										
Chromium		0.08								
Cobalt										
Copper										
Cyanide										
Lead		0.04								
Manganese		2.4								
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium								nd		nd
Nickel										
Selenium										
Silver										
Sodium										
Sulfate			1.7		1.6					1.4
Surfactants			<0.4							
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 7)

4. Little Greenhorn Creek Sites, continued

Sample No.	204	214	221	222	228	232	283	589.4	Stahler-1	121.1
Coll. Date	11/9/99	11/21/99	11/21/99	11/29/99	12/23/99	12/23/99	3/4/00	3/24/00	1/9/00	
Anal. Date	12/7/99	12/17/99	12/17/99	12/17/99	2/3/00	2/3/00	3/5/00	3/24/00		
Aluminium		11						nd		
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	3.6	15	3.3	6.0	6.0	3.1	14	15	110	0.11
Bromide								20		
Cadium										
Calcium										
Chromium										
Cobalt										
Copper										
Cyanide										
Lead		nd								
Manganese										
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium	nd	nd								
Nickel										
Selenium										
Silver										
Sodium										
Sulfate		1.7								
Surfactants										
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 8)

4. Little Greenhorn Creek Sites, cont'd				5. DS Ditch Sites	
Sample No.	121.5	121.6		219A	219B
Coll. Date				11/28/99	11/28/99
Anal. Date				12/17/99	12/17/99
Aluminium					
Antimony					
Arsenic					
Barium					
Beryllium					
Bromate	0.11	0.11		3.9	2.1
Bromide					1.3
Cadium					
Calcium					
Chromium					
Cobalt					
Copper					
Cyanide					
Lead					
Manganese					
Mercury					
Molybdenum					
Petroleum					
Phosphorous					
Potassium				1.13	1.0
Nickel					
Selenium					
Silver					
Sodium					
Sulfate					4.6
Surfactants					
Thallium					
Vanadium					
Zinc					

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 8)

	7. Lost Lake Sites, continued							8. Wolf Creek Sites		
Sample No.	177	248	252	255	305.12	324-32	331.3	22177.1	352	363
Coll. Date	9/6/99	1/9/00	1/8/00	1/8/00				12/29/97	7/8/00	7/10/00
Anal. Date	10/1/99	1/28/00	1/28/00	1/28/00	3/26/97	3/18/98	3/30/98	2/27/98	8/27/00	8/1/00
Aluminium										
Antimony										
Arsenic							.001		29	
Barium										
Beryllium										
Bromate	1.6	2.9	8.9	4.0	nd	nd	nd	<0.5	nd	nd
Bromide										
Cadium										
Calcium									47	
Chromium								0.22	0.12	
Cobalt										
Copper										
Cyanide										
Lead									0.062	
Manganese									20	
Mercury										
Molybdenum										
Petroleum										
Phosphorous									nd	
Potassium									3.1	
Nickel										
Selenium										
Silver										
Sodium										
Sulfate									6.1	
Surfactants								0.46		
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 9)

Miscellaneous Sites (Residential wells, Urban/Suburban metered water, Other treated waters)

Sample No.	24989.4	24989.5	281	589.1	589.2	589.3	589.5	589.6	350	364
Coll. Date	8/18/98	8/18/98	3/4/00	3/24/00	3/24/00	3/24/00	3/24/00	3/24/00	6/23/00	7/5/00
Anal. Date	9/3/98	9/3/98		3/27/00	3/27/00	3/27/00	3/27/00	3/27/00	7/19/00	8/1/00
Aluminium										
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	<0.5	<0.5	18	34	9.3	34	3.2	18	nd	
Bromide				44	12	44	4.2	24		
Cadium										
Calcium									9.6	
Chromium										
Cobalt										
Copper										
Cyanide										
Lead										
Manganese										
Mercury										
Molybdenum										
Petroleum										
Phosphorous									0.06	
Potassium										4.8
Nickel										
Selenium										
Silver										
Sodium									2.3	13
Sulfate										
Surfactants										
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 10)

Miscellaneous Sites (Residential wells, Urban/Suburban metered water, Other treated waters) cont'd.

Sample No.	365	199	200	211	223	225	227	229	230	233
Coll. Date	7/5/00	11/9/99	11/9/99	11/19/99	12/1/99	12/5/99	12/14/99	12/25/99		12/23/99
Anal. Date	8/1/00	12/7/99	12/7/99	12/7/99	12/17/99	12/17/99		2/3/00	2/3/00	2/3/00
Aluminium										
Antimony										
Arsenic	nd									
Barium										
Beryllium										
Bromate		4.3	4.3	3.5	7.9	0.85	6.4	20	nd	6.0
Bromide										
Cadium										
Calcium										
Chromium										
Cobalt										
Copper										
Cyanide										
Lead									nd	
Manganese						0.022				
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium	4.2	nd		3.7		1.5			3.1	
Nickel									nd	
Selenium										
Silver										
Sodium	4.9									
Sulfate										
Surfactants										
Thallium										
Vanadium						0.16			0.039	
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 11)

Miscellaneous Sites (Residential wells, Urban/Suburban metered water, Other treated waters) cont'd.

Sample No.	244	245	246	254	256	284	285	286	287	288
Coll. Date	1/4/00	1/5/00	1/6/00	1/9/00	1/6/00	3/4/00	3/4/00	3/5/00	3/5/00	3/5/00
Anal. Date										
Aluminium										
Antimony										
Arsenic										
Barium										
Beryllium										
Bromate	5.9	5.3	5.8	2.9	4.9	22	23	24	24	22
Bromide				nd						
Cadium										
Calcium										
Chromium										
Cobalt										
Copper										
Cyanide										
Lead										
Manganese										
Mercury										
Molybdenum										
Petroleum										
Phosphorous										
Potassium										
Nickel										
Selenium										
Silver										
Sodium										
Sulfate										
Surfactants										
Thallium										
Vanadium										
Zinc										

(all analyses reported in mg/l or mg/kg)

Chapter 6: Bromate Study Samples (p. 12)

Miscellaneous Sites (Residential wells, Urban/Suburban metered water, Other treated waters) cont'd.

Sample No.		289	290	292	293	294	295
Coll. Date		3/5/00	3/5/00	3/6/00	3/6/00	3/6/00	3/6/00
Anal. Date							
Aluminium							
Antimony							
Arsenic							
Barium							
Beryllium							
Bromate		17	26	15	12	7.8	24
Bromide							
Cadium							
Calcium							
Chromium							
Cobalt							
Copper							
Cyanide							
Lead							
Manganese							
Mercury							
Molybdenum							
Petroleum							
Phosphorous							
Potassium							
Nickel							
Selenium							
Silver							
Sodium							
Sulfate							
Surfactants							
Thallium							
Vanadium							
Zinc							

(all analyses reported in mg/l or mg/kg)

Chapter 2: DS Ditch

Sample No.	21739.1	21739.2	348	349	220	708.3
Coll. Date	11/21/01	11/21/01	5/30/04	6/7/04		
Aluminium						
Antimony						
Arsenic				0.06		nd
Barium						
Beryllium						
Bromate						
Bromide						
Cadium						
Calcium						
Chromium				0.021		
Cobalt						
Copper						0.3
Cyanide						
Lead	.38					nd
Manganese						2.4
Mercury			nd			
Molybdenum						
Petroleum					4.5	
Phosphorous			0.10			
Potassium			1.2			
Nickel						
Selenium						
Silver						
Sodium						
Sulfate						
Surfactants		.38				
Thallium						
Vanadium				0.077		0.04
Zinc			0.084			

(all analyses reported in mg/l)