Chairman Gibson called the meeting to order at 4:00 P.M. on March 8, 1973 for the purpose of continuing the hearing on SB-290.

Mayor Sweeney, Boulder City: Thank you, Mr. Chairman, ladies and gentlemen. I appreciate being able to be here today and I should like to thank most of those people who appeared before me as they have in a sense, made my presentation a little more simple. It would be simple anyway.

I'm not here to debate the merits of the various bills that have been brought before you, but rather to replay a record which to many of you may have been played before. Indeed, I am putting on a new needle, at least, and I would say that Boulder City from the standpoint of geography, history and economy is a great deal different from most any city in the State of Nevada. Being aware, you might say, of the United States government, they came into being as the result of legislation Boulder Bill 85900, which gave Boulder City certain things, such as 33 square miles of land, streets, curbs and sidewalks, power system, 3650 gallons a minute, 24 hours a day, 365 days out of the year, a water distribution system, a sewage system, and as the result of this we entered into many contracts with the United States government, which we do not believe could be transferred with any great degree of simplicity to another body or master water board, or any thing of that nature.

As another example, Boulder Bill 85900 has stated that any time Boulder City wishes to increase its water supply or storage capacity, it has the privilege of going to the Secretary of the Interior and through the secretary of obtaining money to provide such facilities. As the result of the cooperation of the United States Government, and the fact that the Southern Nevada Water Project is coming into being just about the time that we were asking for additional water in Boulder City, we were advised by the Secretary of the Interior that the best thing for us to do was go through the Southern Nevada Water Project for this additional water, and as the result of this we followed this recommendation and made it available to us by contracting with the Colorado River Commission to obtain water through the Southern Nevada Water Project and going into debt for $1,881,000. Also, through the advantage of the Boulder Bill, we were able to borrow $629,000 from the Bureau of Reclamation at 3% interest. Being the headquarters for many government facilities such as the National Guard Service, Bureau of Mines Region, Bureau of Reclamation, many others, I think that the Housing and Urban Development Agency of the government looked with favor upon our application. Not only did they permit us to borrow in excess of $700,000 at 4-1/2% interest, they also gave us a subsidy of some $900,000. So, Boulder City, at the present time has invested in its water supply system, in excess of $4,000,000.

As another example, the 3650 gallons of water supplied to Boulder City makes it possible for us to have sewage in Boulder City. This system has been retained by the United States Government from Hoover Dam to Boulder City. There are two lines -- one is a 12" line and the other about a 14" line. They have three pump stations and possibly 20 pumps. Other than that we have a water treatment plant. Now, all of this has been retained by the United States Government and the City of Boulder City must pay for the operation and maintenance, replacement and the amortization of all this equipment, which amounts to hundreds of thousands of dollars. We have been paying for that over some 10 or 12 years since we have been incorporated, and we will possibly continue to do so.

Now, as I say, this is under the control of the United States Government. All of the employees that operate this system, of which there are probably 10, are on the government payroll. They are subject to sick, annual leave, holiday pay, and retirement at government rates. They are on the government payroll, but yet Boulder City pays for all of this. Therefore, when we talk about transferring the employees of the supply and federal systems to some agency, I don't see how this could be accomplished, because it is written by contract and becomes a part of our obligation.

As far as the sewage disposal is concerned, I spoke about Las Vegas Valley. The city is separated from Las Vegas by a chain of mountains. Boulder City is situated on the south side of El Dorado Valley. When we put our sewage system in Boulder City I pointed out that we were required by the State of Nevada to spend in excess of $350,000 to make it possible to pump the sewage effluent over the rise and put it into El Dorado Valley. We have also enlarged the sewage collection system of Boulder City. Because we have not, in any sense, contributed one gallon of waste or effluent to Las Vegas Valley or to the Vegas Wash, it is our contention that Boulder City should not be obliged in any sense, to underwrite the building of any facilities for the disposition of sewage in the Las Vegas Valley.

We were excused from participating in the Las Vegas Valley Flood Control District because geographically we are removed from Las Vegas Valley. I want to point those things out because of the fact that, as I say, geographically, we are not in the valley, we are in another area altogether. Therefore, we do not believe that we would have to participate 100% in the erection of a facility. If there is written in any bill a permission for

Boulder City to vote for or to enter into an agreement with any facility and it has this choice, naturally we wouldn't have a great objection. I believe that as far as the waste water that goes into Lake Mead, we have a great interest in Lake Mead because you might say that Boulder City is the home of Hoover Dam which caused Lake Mead to come into being. There have been a number of dams built in the last several years, which are adding to the pollution of Lake Mead. As far as some of the government employees are concerned, they are completely in accord with the idea of exportation of effluent from the Las Vegas Valley. I don't believe that Boulder City is entirely in agreement with this. I believe that reclamation of water should be given great priority to be used in the foreseeable future. At least the State of Nevada should be given the opportunity to reclaim this water when and if it is necessary.

Now, if there are officials that are in favor of exporting the water from Las Vegas Va-ley to be evaporated or lost, you might say, to future use, it may be because it removes a part of their problem. Any pollution of Lake Mead is their problem, so for that reason it may be that they will be more or less in favor. We are not 100% against the exportation of water -- we are also in favor the idea of recycling water, of treating water, of tertiary treatment of water. When they speak about tertiary treatment, we are talking about putting this water in ponds where it is to be evaporated. I know that in Lake Mead something like 200,000 acre feet of water by exportation is evaporated every year. When you consider that in every acre foot of water there is 325,851 gallons of water, you are losing a lot of water. Nevertheless, I think one day the State of Nevada is going to be in a position where they would like to recover 325,851 gallons of water in one acre foot.

Mr. Clay Lynch, City of North Las Vegas: The chairman's introduction to this city's appearing makes it possible for my comments to be very brief also. First of all, we are not really talking about all of Senate Bill 290. Senate Bill 290 in this first section calls for approval of the final written report. The final written report means the proper legislative proposals which are the subject of other meetings. We want to point out that you can carefully examine the material prepared for the pollution abatement project. There is no where in the material the engineering facts and the economic analysis and an environmental assessment which would make it necessary for this project to become the problem of other legislation. The pollution abatement project itself in studies that have been made and complied and the millions of dollars or more that have been spent prove that a kind of project should be built -- but no where is there any analysis or any

information which would indicate that the development of this project, or the future of this project, need interfere with the operation of any of the existing systems operated by any of the entities in Clark County, especially that of the City of North Las Vegas. I address that portion of the statement only to the engineering based upon the abatement project itself.

Our second question, and perhaps this may be answered next week, as you indicated in your intorduction -- the staff of the city of North Las Vegas is unable to go to our governing body and explain why Las Vegas Valley has been singled out as the place to solve the problems of the Colorado River. The Colorado River covers many states, covers many miles, has many problems, has many things that contribute to it and to its problems. But perhaps next week or at some future meeting, the E.P.A. can explain why we are being singled out to be, as far as I know, the only place that's been given 180-day notice to do something about the Colorado River.

A third point -- in yesterday's presentation I think it was made clear that the proposals have been aired and reviewed throughout various meetings in Clark County. I want to bring to your attention, make it a matter of record that insofar as the federal water pollution control act, any E.P.A. money to support this project is concerned, the Clark County Planning Regional Council has been designated as the clearing house. In a latter of intent prepared by the Las Vegas Valley Water District, addressed to the E.P.A., the initial efforts to acquire monies through that source, and to assist that project, was denied officially by the Clark County Regional Planning Council at a regular meeting called for the particular purpose of this Letter of Intent. The vote was 5-1 in opposition in a formal meeting on the date of February the 15th.

Mr. Jack Mitchell, Engineer, City of North Las Vegas: Considering circumstances and events that have led to the Las Vegas Valley Water District's proposed project, we find the following: (1) Some acceptance of a combination plan. (2) A desire by many for treatment of our waste water. (3) Absolutely no acceptance of a strict export plan per se by any group except maybe the Las Vegas Valley Water District who entered into contracts for the design of an export system before all the studies were completed or evaluated.

The proposed project has the capacities to export 128 MGD, give advanced waste water treatment to 1.5 MGD and to desalt .25MGD.

This means that we will give complete treatment to two-tenths of one percent of our waste water.

For all practical purposes, with 98.8 to 100% of our waste water discharges to be exported, the proposed project is nothing but an export system with token treatment facilities included to retain the name combination.

Shwoing as the Las Vegas Valley Water District did yesterday, the hundreds of thousands of pounds per day of dissolved solids that are in our waste water makes an impressive number. Showing the hundreds of thousands of pounds of dissolved solids that are in our water supply would also make an impressive number.

The net difference between these numbers would be quite drab and unimpressive.

After having spent over $1,000,000 in studying the situation surely the Las Vegas Valley Water District must have these numbers somewhere.

It is unfortunate that the Las Vegas Valley Water District ignored TDS removal in our incoming water where a direct benefit would result in the water we use and the waste water we produce.

We recommend funding for project be denied on the basis that the studies prepared to support the project are not objective and were export oriented from their inception.

Duane R. Sudweeks, Engineer, City of North Las Vegas: In studying the reams of data associated with the Las Vegas Valley Water District's proposed project and listening to the information that has been presented at this hearing, it is apparent that this project is based on water quality standards that are not only unreasonable but impossible. The standards must be revised and can be revised if we will commit ourselves to that task.

To commit ourselves to a course of action such as this proposed project, when the whole basis for such action is so poorly founded, is not only unreasonable but completely unwarranted. At this point we must ask ourselves if the citizens of the Las Vegas Valley can afford a pollution abatement project such as this that is premised on unrealistic standards and at best would only provide an interim solution to the total problem.

It must be brought to your attention that the proposed project of the Las Vegas Valley Water District itself would be in violation of existing state standards relative to discharge to the Las Vegas Wash. Further, it must also be noted that this project completely ignores E.P.A.'s recommendation that standards be set for dry lake. This was suggested in a letter to Mr. Rice of the Water District from Frank Covington of E.P.A. dated November 29, 1972.

With over 5,000 cities in the United States still discharging raw sewage or only primary treated wastewater, it can be reasonably assumed that E.P.A. will not have money for projects such as the one we are presently considering. If every dollar our state receives from E.P.A. between now and completion of this project goes into this project it wouldn't be half enough to save us from this tremendous financial burden. It is our opinion that we should not even be talking about funding a project of this magnitude without a firm commitment from E.P.A.

We believe that improvements to our existing wastewater treatment facilities can be and should be made. Further, we believe that our goals should be kept high but they must be kept within the bounds of reason. However, under no circumstances can we recommend to the legislature that they fund a project of this type, one which has been developed and premised on paper water quality standards that are unreasonable, impossible and completely unobtainable.

Mr. Don Paff, Administrator, Colorado River Commission: Mr. Chairman and members of the committees, it certainly pleases me, and I am sure the Colorado River Commission, to observe the continuing current intense focus on the water resources of the Colorado River. Such focus emphasizes the value of this resource and the need to carefully consider any action which involves its care, protection and beneficial use now and in the future.

Senate Bill 290 certainly is directly related to the Colorado River. Therefore, I believe the bill should be considered as to its impact on the availability of water, its quality and commitments of funds initially and in the future and the benefits derived.

The Commission considered these elements and in September 1972 forwarded to the Las Vegas Valley Water District the following guidelines:

(a) The dominant theme of the solution to the Las Vegas Wash and water quality problems in the Las Vegas Valley must be conservation, reclamation and beneficial use of all water resources including effluent waters.

(b) The solution to the Las Vegas Wash and water quality problems must be a comprehensive plan in both scope and time to assure that all water quality and quantity aspects are considered and that all methods that will assist in reducing or eliminating water quality degradation be enlisted.

(c) Within the solution, commitments must be made immediately and costs borne to initiate steps toward programs and facilities to reclaim and reuse effluent waters.

The solution as presently proposed and contained in the bill has a dominant theme of exportation and therefore is not in concert with the theme of beneficial use, conservation and reclamation. It is also my opinion that the proposed action does not clearly identify the extent or timing of further expenditures that will be needed within the repayment period of the initial expenditure. It would appear desirable to have all estimated expenditures clearly identified prior to the commitment of the initial sums.

Adoption of the bill as now drafted could also have an impact on the future stages of the Southern Nevada Water Project as currently identified in the contracts with the water users. This would come about by not having Colorado River water committed to be available for the next stage. This has not been addressed in the studies and could result in a potential loss of the remaining authorized thirty million dollars @3.25 percent interest for the additional project works.

In effect: before you have rabbit stew you need the rabbits - or before you have effluent to reclaim as export you need the water supply.

I believe that Nevada's commitment to the betterment of water quality in the Colorado River should be in harmony with the other Basin States. We should now seek and expect some benefits of improved quality if we are willing to commit substantial funds toward the water quality improvement effort.

It is my opinion that the plan proposed in Senate Bill 290 is not a comprehensive plan in either scope or time. Further I believe the alternatives or combinations of alternatives have

not had an equal degree of evaluation particularly as they must relate to present and future water quality objectives and/or standards. I believe these evaluations are a necessary consideration in any action on the bill.

Mr. Whitney, Director of Public Works, City of Henderson: There has been much said here about E.P.A., the standards, the condition of the Las Vegas Bay, and we will speak on these, but first we would like to voice objection to start with, to the export plan, primarily on reasons that we feel it an answer to a problem that has not been properly defined. We will speak on that when we talk of the conditions of Las Vegas Bay and what work has been done there to determine how much effect the Wash has had on the Bay. We feel that it is the result of an over-reaction to E.P.A.'s abatement notice, that the water law amendment of 1972 to the Water Pollution Control Act is going to require some second-thinking by E.P.A. and certainly some more activity by E.P.A. before we can have some firm guidelines on which to solve the alleged problem of pollution of the bay.

The plan was one that was precipitated, we feel, by raising the standard which was impossible to attain. It was not based on any needs of the Lake. We can only assume that it was more or less arbitrarily established. Mr. Gregory mentioned yesterday that there is a possibility that this one standard which has been put before us can be relaxed. They suggested there possibly could be -- there was no commitment. Also, we feel that the export plan will stifle all local efforts to improve methods of sewage treatment. In other words, all progress in the valley could stop because we have no more problems.

It was indicated by a study just completed that even if we had not been putting waste waters through the Las Vegas Bay, it would very possibly be in the same condition it is today through natural utrification forces. Because of its location on the Lake as an arm off of the main body, it does not have the flow-through or circulation that takes place in the main body of the Lake. This report is also expected to indicate that the utrification standpoint, the conditions in the Bay are less severe than popular belief would indicate and that an alarming situation in the Bay does not exist. The same report admits that some utrifying forces are being applied from the Wash, but recommends that "alternative methods of minimizing them should be examined more closely before an irrevocable commitment to export is made."

One such alternate that has been suggested in this respect is to take the point of discharge out into the point where the Las Vegas Bay joins the main body of the Lake where it is estimated

from the content of the Wash flow now that there would be an unmeasurable amount of nutrients or so-called pollutants added to the Lake that would be picked up in the mainstream -- the huge ratio of dilution and the flow-through effect of the Lake would make these unnoticeable. You could not, with the modern scientific testing apparatus be able to notice any difference in the water quality at that point.

(Mr. Whitney then read from the Federal Water Quality Pollution Act, stating what the goals and the policies are at this time, as well as the Desert Research Institute Report dated April 19, 1972, which is concerned primarily with the Las Vegas Wash itself.)

Mr. Whitney of the City of Henderson then submitted a report entitled, "City of Henderson Wastewater Management Plan, A Status Report," which is attached herewith as Exhibit "D". Mr. Whitney emphasized that they felt the export plan is premature, if necessary at all. He further stated that at this point in time he didn't believe we were faced with a crises and unless something is done we will have a disaster. The Clark County Regional Planning Council is presently having prepared a master water management plan that will be made acceptable to the E.P.A. and give the time required to come up with a real solution. A small part of the money that is being proposed for expenditure of the export plan, if spent on research and development and further studies of the Lake and the pollution problem might come up with a solution that would indicate that export of a drop of water from the valley would never be required.

A question and discussion period followed with the City of North Las Vegas as to their objections to the proposed abatement plan. Mr. Lynch emphasized that they feel too much of the plan goes to export and too little to treatment. Also, they don't feel that any proposed plan should interfere in any way with existing facilities. Mr. Mitchell pointed out during the discussion that E.P.A. has put out an extensive report on improvements that can be made to already existing facilities.

Mr. Urban Schreiner, Bond Counsel to the Las Vegas Valley Water District: I am bond counsel to the Las Vegas Valley Water District and played a part in the drafting of SB-290. I thought it might be appropriate just to identify for you the basis upon which this bill was drafted and actually what it does. Six years you had before you a bill which became Chapter 268 of the 1967 statutes which provided for the funding of the Southern Nevada Water Project third phase, and SB-290 is drawn very similarly to that bill. Chapter 268 provided that the Colorado River Commission was given the authority to issue bonds to cover the entire cost of the first phase of the Southern Nevada Water Project. As we know, there

was a congressional appropriation -- the bulk of the funds were made available through the Bureau of Reclamation loan. As the result of that, notwithstanding the fact that some $50,000,000 was authorized to be issued by the Colorado River Commission, a single bond issue of 8.9 million dollars was issued and sold and these funds used for the treatment plant at the end of the Southern Nevada Project withdrawal line.

SB-290 parallals that legislation very closely with one exception being that the agency responsible for the project, in this case the Las Vegas Valley Water District, is given the opportunity to fund the entire project by means of state-backed bonds and the and the 65 million dollar figure represents, as you know, the total estimated cost of the project which has been under discussion. The reason for the state's involvement here is the same as it was then -- that this is a state-type project and obviously the state allocation of water from Lake Mead is something over which the state has concern. Also, the fact that we do have a better bond rating on state bonds than is available to us if we were to have a county or a Las Vegas Valley Water District or a combination bond issue from local sources in Clark County serve to hold the interest costs down and thus reduce the overall financing costs from whatever portion of the project would be required to be refunded by the state in this case. Just for an example, the difference on the rating of "A" bonds which is the way state bonds are rated, and the AA bonds which is the rating for the other bonding entities in Clark County, we can look to practically seven million dollar savings with all of the projects financed pursuant to SB-290 somewhere between 3-1/3 and seven million dollars. (end of tape)

Mr. Clayton, Nevada Environmental Systems: I would like to answer some of the criticisms that have been leveled at the export plan. First of all, do we have a problem? I do believe that we do, and as we pointed out, the 1971 legislature, in effect, recognized it and directed the Las Vegas Valley Water District to start a program for the abatement of pollution. The next question is, are the discharge standards unreasonable? Must they be changed? I would point out that when these standards were set some two to three years ago, I, myself, thought they were strict and restrictive. If I recall correctly, in Mr. Gregory's statement yesterday, he indicated that there might be some consideration of changing the standards and possible relaxing on the nitrogen requirement. He indicated further that if there were any changes, certainly the requirements on the discharge of phosphorous would be significantly strengthened or even more restrictive than they are at present.

This is an export scheme only -- we are talking about water reclamation and water reuse only in a voacl manner. May I point out to you that this project has very seriously considered water reclamation in many forms. This project is actually put together so that when and as the needs for the reclaimed water materialize, the facilities will be there to provide the reclaimed water when the market develops.

One of the requirements of this program has been the consideration of the use of this water when properly treated for the recharge of the groundwater basin. This possibility offers promise -- we recognize that it does offer promise and we have proposed a program of investigation and physical testing to demonstrate whether the program of groundwater recharge is physcially feasible, whether the chemistry of the recharge waters and the groundwater occurring naturally are compatible and the degree of treatment necessary to protect the quality of the existing groundwater basin. One of the reasons for the plants involved in advance waste treatment proposed for the initial program would give us an opportunity to work with different qualities of water and demonstrate on a relatively good basis the feasibility of treating this water for groundwater recharge, if and when possible.

We have advocated in our plan, by the year 2000, some 35-40% of the total effluent has been designated as water to be reclaimed for use in the valley. Certainly the system is flexible enough that if this water is actually demanded and needed this can be expanded. One other element of concern which was mentioned considerably yesterday, but not today, was the utilization of this water as cooling water in a proposed power plant -- I would point out simply that use of that water in a proposed plant is not an essential element of the plan and it is flexible enough to accommodate that, if again, that use is demanded for reclaiming this water.

Looking at the total cost involved, we feel we have a program which protects the water resource for the foreseeable future, looking forward to the year 2000, and we feel that we have advanced a plan which meets the objectives layed down by the 1971 legislature -- that of abating pollution of the Las Vegas Wash, while at the same time meeting a secondary objective -- that of providing for the possibility of water reclamation to the extent demanded or required to investigate the physical possibility of groundwater recharge -- to provide as has come out of the environmental impact here, conduct the public hearings to provide the mechanism whereby the Las Vegas Wash can continue as a green belt area.

An extensive discussion and question period followed Mr. Clayton's testimony with regard to cost, size of pipeline, construction costs, salt reduction, changing of standards, et cetera.

Chairman Gibson then stated that the committees would try and digest all the testimony given, and give further consideration to this matter.

There being no further business, the meeting was adjourned.

Respectfully submitted,

Mary Jean Fondi,
Recording Secretary

United States Department of the Interior

BUREAU OF RECLAMATION

LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

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Mr. R. L. O'Connell, Director
Enforcement Division
Environmental Protection Agency
100 California Street
San Francisco, California 94111

Dear Mr. O'Connell:

In accordance with your request to Dr. Deason of this office, this letter briefly summarizes the Bureau of Reclamation's comments made at the initial meeting of the Natural Resources Council's Las Vegas Wash Work Group, held at EPA headquarters, Las Vegas, Nevada, on January 10, 1973.

The Bureau of Reclamation concurs with the pollution abatement scheme developed by the Las Vegas Valley Water District. As you are aware, Reclamation is deeply involved in matters dealing with water quality, particularly salinity control, of the Colorado River.

Las Vegas Wash, under present conditions, adds to Lake Mead approximately 220,000 tons of salt per year from ground-water discharge and waste water effluent. This is a significant salt load to the lower basin, and we encourage the water district to implement the removal of the highly saline waters before they drain into Lake Mead. The removal of this significant salt load will benefit the overall salinity control program for the lower Colorado River.

In response to your soliciting help for writing and/or reviewing the environmental statement, we will be glad to review the statement. Dr. Wayne Deason (702-293-8527) of the Environmental Office and Mr. Ronald Ellerts (702-293-8538) of the Division of Water and Land Operations will serve as primary reviewers.

Thank you for the opportunity of attending the Work Group meeting and for your contribution to such a timely and worthwhile subject. We look forward to future participation with the Work Group assigned to this project.

Sincerely,

E. A. Lundberg

E. A. Lundberg
Regional Director

Exhibit "A"

2-24

ANALYSIS OF LAS VEGAS VALLEY WATER DISTRICT PLAN TO ABATE POLLUTION IN LAS VEGAS WASH AND BAY AND SUGGESTED ALTERNATIVES

Elizabeth M. Phillips, B.S. Chemistry
Michelle Tomlinson, B.S., M.T., A.S.C.P.

CONTRIBUTIONS

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G. William Fiero, Jr., Ph.D., Director, Environmental Studies, University of Nevada, Las Vegas
Claude Warren, Ph.D., Department of Anthropology, UNLV
Henry Curtis, Professional Engineer

PREPARED FOR:

Nevada Open Spaces Council, Inc.
Las Vegas, Nevada

MARCH, 1973

Exhibit "B"

Two years ago the State Legislature gave the Las Vegas Valley Water District a directive to abate pollution in Las Vegas Wash[1]. At least five studies[2,3,4,5,6] have been made of this problem prior to the 1971 Legislative Mandate and the later Environmental Protection Agency 100-day notification of December 25, 1971[7]. It seemed as though the problem of cleanup of the Wash could now be solved, and with it, future water shortages in Southern Nevada[8] avoided.

Since that time what has happened? The official proposal[9] by the Las Vegas Valley Water District (LVVWD) has basically been to gather the wastes within the valley and to ship them 27 miles away to Dry Lake (the export plan) with a small amount of water to be used for greenbelts, maintenance of Las Vegas Wash, small advanced waste treatment and desalting plants[10, 11] and pilot tests on the feasibility of groundwater recharge[12]. In addition, negotiations are taking place between Nevada Power[13, 14], Clark County, City of Las Vegas, and LVVWD for sale of effluent exported to Dry Lake to be used at the proposed Arrow Canyon plant[15, 16, 17]. The City of Las Vegas and Clark County Sanitation District have primary rights and can treat the effluent anywhere[18, 19].

However, there are important questions that must be answered concerning this proposal. First, does the official proposal meet both immediate objectives of: (a) abatement of pollution in Las Vegas Wash, and (b) judicious interim[20, 21] water management? Second, what effect does this interim plan have on long range water needs in Southern Nevada? Third, if there is a deleterious effect on long range management, what changes should be made? And fourth, has the public been fully informed and actively listened to?

Quite frankly, the more we researched this situation the clearer it became that we disagreed completely with the official proposal and that, indeed, none of the above questions had been satisfactorily answered. Let's examine this in detail.

IMMEDIATE OBJECTIVES

(a) Abatement of pollution in Las Vegas Wash
(b) Judicious interim water management

So far as abatement of pollution in Las Vegas Wash local experts have disagreed as to whether the problem will be solved by the export plan. Even the Water District is uncertain[22, 23]. In particular, Dr. George Maxey[24] of the Desert Research Institute has expressed doubts concerning the export plan. He and others have been concerned with possible pollution in Lake Mead from flood water rushing through the Wash several times a year[25, 26, 27, 28, 29].

It is assumed that the natural barrier near Henderson can be used to contain the wastes so that they may be piped away for treatment, but the six feet deep trench to collect wastes will certainly be flooded with silt and gravel several times a year[30].

As to the other immediate objective of judicious interim water management[31, 32], we should admit at the outset that we do live in a desert[33, 34] and evaporating water in the desert[35] does "go against the grain"[36] for many people. It is wasteful.[37]

For the past 40 years water runoff in the Colorado Basin has been quite a bit below normal. In feet it has averaged 21.8 percent below the total allotment for all the Colorado River Basin States and Mexico[38]. Archaeologists tell us that at earlier times this general area has been even drier and that there have been the intrusion of sand dunes onto bogs indicating sudden climatic

changes[39]. If we are entering a long drying period any water plan must be carefully thought out lest we literally find ourselves without water.

In addition, we definitely question whether this plan is reasonable because: (1) it is completely inconsistent with suggestions previously made by many local citizens, local, state, regional or national experts, most of whom indicated some form of advanced treatment and return to the river or groundwater recharge[40, 41, 42, 43, 44, 45]. (2) The Environmental Protection Agency says that the water shipped to Dry Lake may well have to be treated once the "Lake" becomes a viable entity[46]. Shipping water 27 miles (the longest sewage force main known[47]) to be treated does not make sense. That means, in our opinion, that the only party to have any gain from such an export would be Nevada Power Company.

(3) At times the various reports of the Las Vegas Valley Water District have indicated that tertiary treatment with shipment to the Colorado River would be the cheapest plan (and very feasible)[48, 49, 50] if the standards for effluents discharged from the Wash to Lake Mead were relaxed.

So why hasn't the Las Vegas Valley Water District asked the Nevada State Board of Health to relax these standards? They are more stringent than the USPHS drinking water standards[51]. In fact, the EPA itself may very soon relax these standards themselves[52, 52A].

We wonder if the Water District knows about this. They have claimed they are in constant contact with EPA officials[53]. (4) Shipment to Dry Lake might very well not be considered a beneficial use as required by Nevada law[54]. This has indeed been evidence by communication between Roland Westorgard, State Engineer, Las Vegas Valley

Water District, and Don Peff, Colorado River Commission Administrator[55].

(5) The proposed Arrow Canyon power plant is being considered a beneficial use by Las Vegas Valley Water District[56]. However, such a use for the effluent would involve a long term commitment, one not easily taken back, whether the water was needed in Las Vegas (for reuse) or not[57, 58, 59].

It is interesting to note that shipment of wastes to Dry Lake was never really considered a top-rate solution[60] to the problem until Nevada Power suggested it might be able to use effluent for a proposed Arrow Canyon plant[61]. Some time after that, the export plan became a front runner[62]. In fact, at present we may pay $5 million for the spur to the Arrow Canyon Plant[63, 64, 65, 66, 67, 68]. Yet, who will have the most to gain?

Not the people certainly. Nevada Power? Probably.

(6) This export plan is a very expensive "interim" plan. According to even the Las Vegas Valley Water District...(quote) "interim solutions are not generally practical since the sizing of facilities (and therefore expense) to meet the near future need is very nearly of the same magnitude as the ultimate development" ... (unquote)[69].

A recent Sylvia Porter column in the Las Vegas Sun indicates that prices may double in 20 years due to inflation[70, 71, 72]. So are we really gaining anything by waiting? NO!

(7) The much vaunted 1.5 mgd. advanced waste treatment plant and 0.25 mgd desalinization plant added, along with other features, to the Las Vegas Valley Water District "export plan" to make it a "combination plan" will be built according to present technology.

In other words, there is nothing new or experimental about them. Even the Water District admits this[73]. Likewise, the plants are so small that many details will not be the same as a full-sized plant[74]. Finally, can these plants be expanded if necessary? If not, this means when we need advanced treatment for large quantities of water, new facilities will have to be started from scratch. And the cost for these small plants? $1,243,300.[75]

At this point a footnote concerning environmental considerations should be added since we're discussing the official "export plan". So far as we know, no study of wind patterns has been made at Dry Lake or between Dry Lake and Las Vegas[76, 77, 78, 79]. If the effluent smells, and there are indications it will[80], the stench could drift back to Las Vegas. On a large scale, a putrid odor would have obvious unpleasant implications for tourists and residents alike.

Even worse, the effluent may dry and become powdery with a seasonal wind storm picking it up and bringing it back to Las Vegas permanently. Airborne Milorganite. That certainly does not make a pretty picture!

In addition, no archaeological reconnaisance of the areas involved has been made[81], yet 17,500 acres[82] are involved in this plan. Prehistoric sites quite probably exist in the Dry Lake area, and certainly in many of the proposed greenbelt areas[85]. Yet no contract that would indicate the intent of reconnaisance of salvage has been signed that we know of. Such prehistory is an irreplaceable resource and once destroyed is gone forever[84]. Nevada is largely unexplored in this aspect and much more needs to be done according to local professional archaeologists[85].

WHAT EFFECT WOULD THIS INTERIM REPORT HAVE ON LONG RANGE NEEDS IN SOUTHERN NEVADA

From what we have been able to ascertain the effect of this "interim" export plan would be devastating. Why? Let us examine the overall water situation in Southern Nevada.

(1) From where do we get our water supply and how much is available to us for all uses? Locally, at present, there are two sources: deep wells and the Colorado River. Because of extensive overdrafting, however, with attendant ground subsidence[86, 87, 88, 89, 90], the total amount of water pumped out has been reduced by the State Engineer from 88,000 A-F/Yr. to 50,000 A-F/Yr.[91, 92, 93]. This is still substantially higher than the estimated annual natural recharge of 25,000 to 35,000 A-F/Yr.[94, 95, 95]. But at least for the foreseeable future the limit will be removal of 50,000 A-F/Yr. unless groundwater recharge is utilized[97].

The second source is the Colorado River, principally through the Southern Nevada Water Project[98, 99]. Use of the Colorado's water is complex. But to simplify and and relate it as much as possible to our local situation in Southern Nevada, several important points must be made.

(a) The Colorado is much overused and probably will be the first river system to go bankrupt in the country[100, 102]. (b) The most water Southern Nevada will ever obtain from the Colorado is 281,000 A-F/Yrs.[103, 104]. Indeed, it may be significantly less. (c) The Bureau of Reclamation claims 404,102 A-F/Yr. have committed for use in Nevada by 1990[105], but if the water isn't there the figures are meaningless. (d) Now that the Upper Basin States, Lower Basin States, and Mexico are exercising their full rights to water[106, 107], coupled with reduced flow in recent years[108], we may well not

receive our full allotment of water here in Nevada, much less any additional water[109, 110, 111, 112, 113, 114]. (e) Indeed, if runoff continues to be less than normal and conditions become more arid, even less water will be available locally and there will be even greater evaporation of standing water (such as Lake Mead) than now. (f) Various state and federal experts have indicated definite concern over the availability of water from the Colorado in the future[115, 116, 117].

What does all this mean? Availability of water in Southern Nevada in the near future is uncertain. At some critical point in the near future, perhaps as early as 1983[118], we may not be able to take more water from the Colorado[119, 120]. And there may very well be a rash of water suits[121]. All of the experts agree there is a problem. Their main area of disagreement is <u>when</u> the crisis will come.[122, 123, 124, 125, 126]

(2) This leads to the next point of how much water do we use in Southern Nevada now? The answer is very simply, much too much. In a survey conducted recently of western cities' water usage, Las Vegas' usage was disastrously excessive by comparison (See Table A). It was usually two times the average of the other western cities, and three times the national average.

Most importantly, the use is gradually increasing[127, 128]. Yet nowhere have we seen any information on this acute problem of excessive use in Las Vegas Valley Water District reports. But the problem certainly exists. And the public must be made aware of this.

(3) As to future need and usage this is where the real crunch comes. Using figures from various reports we have come up with these results (Table B.)[129]

TABLE A
WATER USAGE

National Average	149 gpd(130)
Pacific Southwest Avg.	150 gpd(131)
Los Angeles	187 gpd(132)
El Paso	200 gpd(133)
Tucson	200 gpd(134)
Albuquerque	225 gpd(135)
Denver	229 gpd(136)
San Antonio	588 gpd(137)
(Las Vegas - 1)	450 gpd(138)
(Las Vegas - 2)	475 gpd(139)

gpd equals gallons per person per day

TABLE B - WHEN WILL THE WELL RUN DRY?[140]*

	1 million (2000)	800,000 (2000)
475 gdp[139]	1983	1988
LVVWD[138]**	1984	1989

* Excludes reclaimed wastewater

** Environmental Assessments (August, November, 1972.) See Footnote 138.

These figures assume no increase in water usage though officials agree this is the trend[141]. The figures also exclude the use of wastewater. Despite these above figures in Table B, the Water District officially projects an "excess" of water until a time period of 1999-2019[142], 1990[143], or even 1986[144], depending on what report you read.

This is inaccurate. We do not have this water[145]; and if that fact is not confronted immediately precious water could very well be shipped away either to where we couldn't get it when we needed it (Dry Lake)[146] or be allotted for an irretrievable use[147].

As an example, let us take the Arrow Canyon Project. At present it is estimated that 40 mgd will be needed for cooling water at that facility[148, 149]. The plant as proposed is almost as large as the much maligned Four Corners Plant[150]. And, of course, it will be coal fired[151].

Forty mgd would be lost to that plant for at least 30 to 40 years or more[152] which would make it unavaiable for reuse in the Las Vegas area for a very long time, the rest of the lifetime for most of us in this room. Where will the electricity go? 70 percent to California for the first six years, 50 percent for the next six years and cutoff in 1994 so they say[153].

In addition, another plant, "X", in the general area of Arrow Canyon or Dry Lake, also 2000 megawatts capacity, is planned by Nevada Power for 1985[154]. All of the electricity from "X" will be exported to California for the following ten years[155]. And probably a third 2000 megawatt plant (or one of comparable size[156]) is planned for Southern Nevada where Las Vegas Valley Water District effluent if "available" around 2000 A.D.[157, 156].

Of course, that assumes no reuse of effluent will be needed by the Las Vegas area until at least 2000 A.D. or perhaps much later. Altogether, 120 mgd of effluent (See Table C) for cooling water will be used for Nevada Power's projects[159]. Nevada forecasts a "need" for 6950 mw of electrical capacity by 2000 A.D.[160]. But just how much electricity will the Las Vegas area need during this time? It probably will be between 1200 and 2400 mw[161].

TABLE C.
RELATIONSHIP BETWEEN NEVADA POWER CO.
ELECTRICITY PRODUCED AND EFFLUENT USED.

Year	Plant Size	Water Needed	Amount Requested	Acre-Feet/ Year
1979-81	2000mw	40 mgd	48 mgd (peaking)	44,900(40mgd)
1984	2000 mw	40 mgd	81-82 mgd	90,800 or 91,900
2000	2000 mw(?)	40 mgd	122 mgd	136,900
Other sources	950 mw(?)	-	-	-
Total mw projected	6950 mw	(?)	(?)	(?)

No matter what figures you use, Southern Nevada does not need 6950 mw electricity. In fact, in his letter of January 16, 1973 to us, Harry Allen, President of Nevada Power, said, (quote), "We do not predicate our projections on the population of Las Vegas... population is not a determining factor." (Unquote)[162] So what is he basing his projections on? Export of power? It certainly sounds

like that. It is interesting to note at this point that the design criteria for the export pipeline includes the design peak flow of 120 mgd[163], almost the exact amount needed to generate 6000 mw.

If these plants are built (i.e.: using Las Vegas' effluent to build large power plants locally - or as Thomas Wilson of the Office of the Governor stated, "Is it the answer to convert water pollution to air pollution?" (Unquote)[164], What will be the end result? A critical shortage of water, very extensive air pollution[165], considerable electricity going to California for a long time. Considering the fact that the economy of Southern Nevada is almost totally dependent on tourism at this time and from all appearances will continue so, does this make any sense? No, it doesn't! Yet it most certainly will take place unless stopped right now.

But let's be realistic. We know Las Vegas will need additional power in the future. Where will it come from? There are a number of other possible sources that can and should be developed. First there is the huge reservoir of geothermal power under Nevada: good, clean power[166, 166A]. This can be developed in the near future (by 1985 at least[167, 168, 169]) if money is made available now. In addition, solar energy is a natural for Nevada, too. It will be commercially significant by 1990[170] or earlier if we fund the research and development. In case we need more energy before these sources are developed there are two possibilities: (a) the contract with the Mohave Power Plant can be renegotiated to provide more electricity locally;[170-A] (b) a small "interim" power plant could be built in Las Vegas Valley. It would be near the effluent (negating a need for export) and a dry tower type of installation used for cooling. Significant amounts of

cooling water could be saved by such design[171, 172].

As stated above, we have many real options regarding our electricity needs. We simply have to exercise these options and stand up for the proper use of our water.

IF THERE IS A DELETERIOUS EFFECT ON LONG RANGE WATER MANAGEMENT, WHAT CHANGES SHOULD BE MADE?

First, we feel that the Legislature must hire an unbiased engineering firm outside Nevada, not one of the participating firms. This firm can evaluate the existing situation independently and make a recommendation. Second, in our opinion, the following steps should be taken: (a) the public must be alerted that there is a problem. Water must be conserved (initiate courses in desert gardening, not allowing water to run down the streets, et cetera)[173, 174]. (b) Double water rates[175]. (c) Get the Nevada State Board of Health and the EPA to reevaluate the standards involved[176, 177]. (d) We also strongly recommend two specific approaches to abate pollution and preserve our water supply: (1) since phosphates are often considered to be the limiting factor in algae blooms, treat phosphates first along with BOD removal and suspended organic solids. Add other phases as needed until tertiary treatment is accomplished[178]. Initiate groundwater recharge studies in the meantime. Go to full scale groundwater recharge or recycle to potability as soon as possible. (2) The other alternative is tertiary treatment now with release either through the Wash or to Lake Mead[179]. Groundwater recharge studies would be initiated immediately. Go to complete treatment or potability as soon as possible. The brine[180] and sludge[181] from either alternative can be evaporated down and land filled. There is no need for effluent lines.

One other idea that has surfaced recently is the possibility of pretreating our water from the Colorado before use in the Valley. This has been suggested by several people[182, 183, 184]. And if desalinization were coupled with power generation[185, 186] we would be using a very creative process and utilizing our resources to the fullest.

Of course, in either case, Las Vegas Wash should be maintained, if possible.

There have been, however, several objections voiced to these ideas. Let's examine them.

Objection: Such procedures are too expensive at this time. We should wait until technology brings down the price and procedures are improved. Answer: It is not too expensive[187]. And we cannot afford to wait. We cannot risk running out of water. As to technology improving it undoubtedly will, but there are already 113 advanced waste treatment plants in the country today with 390 planned[188]. Many processes are past the pilot stage and ready for full scale application. So why jeopardize our situation by waiting?

Objection: We need an interim plan. Answer: At this point an interim plan would be disastrous both in terms of time and money unless it is consistent with the area's long range needs[189, 190, 191, 192, 193, 194].

Our above suggestions are consistent. Export is not[195, 196, 197, 198, 199, 200].

Objection: Ground water recharge is unproven. Answer: The concept behind recharge has been used in the petroleum industry for years[201, 202]. The technology is there[203]. The only question is whether it is feasible locally. Preliminary studies indicate it

is[204, 205]. Actual testing might take about four years[206]. It would be a marvelous way to conserve water (underground storage would avoid evaporation), stop subsidence, and prepare for future scarcity of water.

At this time the latest advancements in wastewater treatment are very exciting and cities all over the country are considering various forms of advanced waste treatment right now. Chicago (2.5 to 3 billion gallons per day forecast by 1990)[207]; Detroit (300 mgd)[208]; Tampa (50 mgd)[209]; Washington, D.C. (300 mgd)[210].

Indeed, many cities are either designing, constructing, or already operating advanced waste treatment facilities. In 1968 there were only ten tertiary treatment plants in the United States[211]. Now the EPA says there are 113 plants either in operation or under construction. And 390 plants are pending[212]. Does this sound new and unproven? Certainly not. The technology is exploding[213].

Two areas in the West are already planning reuse: Denver (in use by 1975-1976)[214]. Orange County Water District in California, (1974)[215]. Orange County Water District plans in particular are very exciting because of Las Vegas area's needs. Orange County Water District is advanced waste treating sewage and mixing it with desalinized sea water to recharge the groundwater[216]. Their plant is 15 mgd, large enough to give good full scale results. And (quote) "...the Office of Saline Water believes the (desalinizing) process has the potential for considerable savings in operating costs." (Unquote)

Studies indicate that their (quote) "... effluent may be treated to produce a water acceptable for injection and subsequent extraction and reuse." (Unquote)[217].

Not only that but Denver's timetable includes a 100 mgd plant for providing potable water from effluent by 1979-80.[218] And residents in the Denver area have shown a generally positive attitude toward the reuse concept.[219]

All in all, dramatic breakthroughs are just around the corner in this field. Cities all over the country are looking ahead and taking courageous steps forward into the future.

The question is what Southern Nevada will do at this pivotal point in time. Will Nevada stick with "old-fashioned, proven" sewage pipes and pump the problem from sight over the hill while hiding its head like an ostrich and saying, "Everything's all right"?

The public feels that the officials tell them that they (the officials) know best, that the public possesses no expertise about the public interest. Yet, in this instance, the public has demonstrated more common sense and courage than the officials who have looked for an easy out. Though the public feels it has not been listened to, it has hung in there, continued to express its opinion, and has asked hard questions of the Las Vegas Valley Water District.

As to whether the public has been fully informed, they've tried to be. The Clark County Library, as an example, indicates an active use of Water District material[220] even though area libraries do not have all reports issued[221]. Hearings have been fairly well attended[222].

But when it came to the actual materials presented by the Water District, people generally found them to be contradictory [223], [224], inconsistent[225], [226], [227], and incomplete[228], [229]. Readers had to look in different volumes to correlate information. Even to the Scientific Evaluation Committee, some reports were "not easily

readable, difficult to interpret."[231] "It was difficult to relate the material in the text in the tables in the appendix."[232] It was the unanimous ..."that the report was not easily digestible by non-engineers."[233]

Many individuals found it difficult to digest large volumes of material often presented to the public only a few days before hearings.[234, 235, 236]. At times, it seemed to be as though different people had written the reports and had not consulted each other at all!

It is with the foregoing in mind that the people of Southern Nevada now come to you. As elected representatives of the people you are responsible for legislation affecting our well-being. Our very lives are intimately connected with the wise use of water resources in Southern Nevada's desert environment.

Our research documented in this statement clearly indicates that the Water District Proposal for Export is not in the best interests of the people -- neither short range nor long long range interests.

We urge you not to allow money to be borrowed nor to allow obligations to be made in the name of and on behalf of the State of Nevada in accordance with the provisions of the State Securities Act to defray the cost of exporting Southern Nevada's water.

We urge you, the Legislators, to carefully study the report, along with the other information available on this most vital issue. Furthermore, we urge you to take action only when you are completely informed and knowledgeable concerning the alternative solutions to this problem.

You must live with the consequences of your actions and, in this case, so must over 300,000 fellow Nevadans.

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9. P. iii, "Report to the Governor and the Legislative Commission, Pollution Abatement Project." Las Vegas Wash and Bay," Las Vegas Valley Water District. December, 1972.

10. P. IV-10, IV-11. "Project Report. Pollution Abatement Project. Las Vegas Wash and Bay, Annex A." Prepared by Nevada Environmental Consultants for Las Vegas Valley Water District. November 15, 1972.

11. Letter from Duane Sudweeks, City Engineer, City of North Las Vegas, to Las Vegas Valley Water District, October 30, 1972. "For all practical purposes, with 98.8 to 100 percent of our discharges to be exported, the project is nothing but an export system with a little lip service given to items that could make it a combination system...the token items in the project that are used to retain the name 'combination' are so trivial and scheduled so vaguely somewhere in the distant future they may as well not exist...the wisdom of building such small advanced treatment and desalt plants, if and when they are built, is doubtful from the standpoint that they are so small that their basic operation in many details will not be the same as a full size plant (i.e. no lime kiln, once through chemical feed creating more pollution, etc.)"

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13. P. 15-16. "Report to the Governor and the Legislative Commission, Pollution Abatement Project, Las Vegas Wash and Bay," Las Vegas Valley Water District, December, 1972. "Negotiations between NPC, Clark County (CC), the City of Las Vegas (CLV), and LVVWD for the sale and ownership of effluent water are currently under way. The City and the County own the primary rights to the effluent and NPC wants to obtain secondary rights to the effluent...if Arrow Canyon is constructed."

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16. P. 3. Ibid. December 16, 1972, another article mentioned a delay until January, 1973.

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18. P. 6. Minutes of Professional and Technical Advisory Board Meeting to the Las Vegas Valley Water District. July, 1972.

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20. P. 14. "Environmental Assessment. Pollution Abatement Project. Las Vegas Wash and Bay." By VTN Nevada and Jones and Stokes Associates, Inc. for the Las Vegas Valley Water District. Las Vegas, Nevada. August 9, 1972. "In order to qualify for... assistance, the LVVWD must have an interim basin plan. EPA has interpreted the National Environmental Policy Act of 1969 as requiring that an environmental assessment of this interim plan also be prepared. The Phase III Report is intended to be the amended interim plan, and this report is intended to constitute the Environmental Assessment of that plan..."

21. P. vii, "Evaluation of Alternates for Water Pollution Control and Resource Management. Phase III. Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes, and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November, 1972)..."These export systems all require the transmission of large volumes of water to the respective export areas immediately after commencement of operations. Because of this immediate problem, interim solutions are not generally practical since the sizing of facilities to meet the near future need is very nearly of the same magnitude as the ultimate development."

22. P. 5. "Report to the Governor and the Legislative Commission. Pollution Abatement Project. Las Vegas Wash and Bay." Las Vegas Valley Water District. December, 1972. "The recommended plan, therefore, achieves the primary objective of eliminating the flow of pollutants in Lake Mead from the Wash..."

23. P. 13. Ibid. "...with the combination alternative, the pollution to Lake Mead is reduced considerably, but not stopped completely. Storm waters and a minor amount of groundwater are expected to flow through the Wash into the Lake." (This is the same report and only eight pages apart.)

24. P. 2. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District, September 8, 1972. "Maxey indicated that it will take many years to completely clean up the Wash. One quick solution, already suggested by the District, is an impoundment or constriction of the Wash with adequate allowance for flash flooding. Maxey was not sure that this could be accomplished. Maxey said inclusion of this groundwater into the regional system is the obvious solution...Maxey emphasized that in his view export is not the solution to the general problem, because export will only reduce the salt load entering the Colorado by approximately 25%."

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36. P. 3. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District. August 18, 1972. Comments by Don Paff, Administrator, Colorado River Commission, State of Nevada.

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46. Letter from Frank M. Covington, Director, Air and Water Programs Division to Mr. Tom Rice, Chairman, Clark County Regional Planning Council, Water Quality Management Steering Committee. Appendix, this paper. "...To the maximum extent possible, the planning program should anticipate standards for the waters of Dry Lake and the groundwaters of the Las Vegas Valley." (EPA, Region IX.)

P. 2. "Summarized Review of Scientific Evaluation Committee's Comments Re the Draft Boyle-CH_2M Phase III Report, Memorandum to PTAB from Project Assistant, Las Vegas Valley Water District. "One reviewer characterized the recommended export system to Dry Lake as the longest sewage force main in existence..."

48. P. 31. "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III. Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes, and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November, 1972). "As described in Phase II study report, the alternate of Colorado River return has been formulated to collect all waste water prior to its entering the Las Vegas Wash, treating it, and discharging it to the river below Hoover Dam. By discharging all treated waste water below the dam, maximum pollution abatement in Lake Mead can be achieved."

49. P. 33. Ibid. "From the standpoint of construction and operation, this alternative is very feasible. Local geography is suitable for a gravity type disposal system bypassing Lake Mead entirely. The gravity is much simpler, more trouble-free, and more economical to maintain than any system relying on pumping. The tertiary treatment operations of phosphorus and nitrogen removal have been by various prototype plants, as mentioned in section 22.40. This alternative also has the advantage that it returns valuable water to the river for subsequent use. Acceptable quality reclaimed water returned to the Colorado River can be credited to the State of Nevada's annual allotment of water. The most serious limitation to this alternative

is that the water would not meet standards set by the Nevada State Board of Health for effluents discharge to the Las Vegas Wash."

50. P.A12. Appendix this report. Calculations on Colorado River Return Costs as opposed to Dry Lake Export.

51. P.A3. Appendix this report. For comparison.

52. Letter from Frank M. Covington, Director, Air and Water Programs Division to Mr. Tom Rice, Chairman, Clark County Regional Planning Council, Water Quality Management Steering Committee, November 29, 1972. See Appendix this report, P. 1. (EPA, Region IX.)

52A. 'Review-Journal," Las Vegas, Nevada, February 16, 1973. "The Environmental Protection Agency has issued guidelines to assist EPA Regional Offices in developing or revising state water quality standards..."

53. P. 14-15. "Report to the Governor and the Legislative Commission, Pollution Abatement Project, Las Vegas Wash and Bay." Las Vegas Valley Water District, December, 1972. "The LVVWD staff and consultants have developed an excellent working relationship with the EPA. EPA guidance has been requested frequently throughout the planning phase. Their assistance in many ways manifests their concern for the need to develop a solution to the pollution of Lake Mead. Environmental Protection Agency, Region IX, staff members have made numerous visits to the LVVWD since that agency issued an enforcement notice to abate the pollution of Lake Mead approximately one year ago. Members of the LVVWD Board of Directors and staff have also met with EPA officials in San Francisco, and Washington, D.C. These visits, telephone conversations, and exchanges of correspondence have resulted in a meaningful exchange of information and the development of an excellent rapport."

54. Chapter 533.025. Nevada Water Laws. Prepared by the Division of Water Resources, State of Nevada, Carson City, Nevada, 1966. "The water of all sources of water supply within the boundaries of the state, whether above or beneath the surface of the ground, belongs to the public"...Chapter 533.030, "Subject to existing rights, all such water may be appropriated for beneficial use as provided in this chapter and not otherwise..."

55. Letter to Las Vegas Valley Water District and Mr. Donald L. Paff from Roland Westergard, State Engineer, May 22, 1972. "We would like to reemphasize our belief that beneficial use should be made of the effluent water and return-flow to the Las Vegas Wash. In an arid state such as Nevada, the export of the subject waters to areas where it is proposed that the waters be evaporated solely for water quality purposes with no beneficial use being made of the resource should be avoided if at all possible..."

56. P. 150. "Environmental Assessment, Pollution Abatement Project. Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. "When water is used in the generation of power, it is, by definition, a beneficial use. If that water could be put to a more beneficial use, and a commitment to power generation prevents that, then an adverse impact results."

57. P. 135. "Environmental Assessment. Pollution Abatement Project, Las Vegas Wash and Bay," by VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada. August 9, 1972. "Sale of wastewater for power plant cooling and irrigation could prove to be an irretrievable commitment, also. It might be impossible to cut off water to a major power plant to reclaim additional domestic water, if that would mean loss of power to the area. Once a use of water has been established, it it most difficult to discontinue."

58. P. 149. "Environmental Assessment. Pollution Abatement Project. Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc. for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. "...the Arrow Canyon Power Plant...is dependent upon a water supply of 36 to 38 mgd...the only source of cooling water for the plant is effluent from Las Vegas Valley..."

59. P. 150. Ibid. "The Arrow Canyon Plant will require a long term commitment of water for cooling..."

61. A chronology of events would run something like this. The Las Vegas Sun (2/25/71) carried an article mentioning piping effluent to Arrow Canyon with Mr. Sauers, Director of Las Vegas Public Works, saying the city would pay for the pipeline (later to be repaid by the Nevada Power) and to (quote) "...give it (the water) to the power company at no charge to get rid of it..." (unquote)... This was in lieu of a CRC proposal to advance waste treat the water and return the water below Hoover Dam. On July 31, the Professional and Technical Board met with Nevada Power Co. officials to discuss this further and Nevada Power indicated it would not build the line independently but would cooperate with the city and county in construction. In the September 1, 1972 (p.6,7,) report to the Governor concerning its project the Water District indicated that Nevada Power, City of Las Vegas, and Clark County had been negotiating for the sale of effluent without the Water District's knowledge and after the Water District had been informed that had been stopped several months before. The Water District then expressed interest in a four-party agreement, but it has bogged down.

62. P. 154. "Environmental Assessment, Pollution Abatement Project, Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc. for the Las Vegas Valley Water District, Las Vegas, Nevada. November 15, 1972.

60. P. 108. "A Comprehensive Water Quality Control Program for the Las Vegas Drainage Basin, Phase II", a Report to the Clark County Board of Commissioners. Boyle Engineering and Cornell, Howland, Hayes, and Merryfield Consulting Engineers, Las Vegas,Nevada, 1969.

63. As of now the Las Vegas Valley Water District would build the whole export system itself. There is a section on p. 54 (Phase III, Annex C) that discusses the pipeline being built from the export line to Arrow Canyon. It will cost $5.4 million. The costs are detailed in Table A23.11, page A-48.

64. P. 3. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District. January 20, 1972. "Sudweeks asked relative to Butler's presentation and the estimated cost of $25 million (export plan)..."

65. P. 4. Ibid. "McLean asked Butler relative to the cost estimates for the exportation system, if the $25 million capital costs would primarily be the pipeline construction?...the pond at Dry Lake... would cost approximately $15 million. This would give a total estimated cost to the project of $40 million."

66. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District. Appendix A. July 27, 1972. Figures from 4/19/72. Initial cost (export) $26,465,000.

67. P. 2 Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District. August 18, 1972. "Sudweeks asked for the cost of the export system alone. Blackmer replied $25 million."

68. (Table A23.17) "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III, Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes, and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (Issued November 1972). Capital costs (1975) for Dry Lake Export including pipelines, reservoirs and pump stations: $19,947,000. (1975) Arrow Canyon spur is $5,418,000. Total is $25,365,000.

69. See Footnote 21 for complete quote.

70. "Your Money's Worth: Impact of Inflation." Sylvia Porter,"Las Vegas Sun," November 29, 1972. "At a 3½% a year rise in prices, you will have to be earning more than $16,200 in ten years and more than $22,800 in 20 years just to have the same buying power that an $11,500 family income has today."

71. Costs for treatment, and capital costs, in other words, could almost double in 20 years making it expensive to wait to take care of our water needs even with only moderate inflation and if technology cuts costs.

72. P.A16. Appendix this report. "Water in Las Vegas" Dr. G. William Fiero, Jr., "Since it requires approximately twenty years to look ahead for engineering plans for the importation of water, we should, therefore, be examining the possibility of a water supply for the future today."

73. P. 4. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District, September 8, 1972. "...McCurry was concerned about EPA's interest in a treatment plant, because it is not a new concept, Blackmer said even though this was not a new concept, EPA has expressed interest in the demonstration plant, but whether they will fund it is uncertain."

74. See Footnote 11 in this report.

75. P. VI-1. "Project Report. Pollution Abatement Project, Las Vegas Wash and Bay, Annex A." Prepared by Nevada Environmental Consultants for Las Vegas Valley Water District. November 15, 1972.

76. P. 35. "Environmental Assessment, Pollution Abatement Project, Las Vegas Wash and Bay." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, August 9, 1972. "Those days in which there are winds from the northeast, this valley fills with a white haze which from the coal-burning Reid Gardner Power Generating Station just northeast of this valley. This haze hangs in the valley until a strong wind arises to blow it out."

77. P. 63. "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III, Pollution Abatement Project, Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes, and Merryfield, Consulting Engineers, prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November 1972). "There are...many critical design problems (which include)odor control."

78. P. 66. Ibid. "Both plans (Dry Lake and Eldorado Valley) offer the hazards of mosquito breeding and odor generation...Dry Lake appears to be superior site in this regard because of its remote location from residential areas."

79. Las Vegas Valley Water District's answer top. 4, ₱ 8. Letter from E. I. Rowland, State Director, Nevada, Bureau of Land Management, Department of Interior, to Las Vegas Valley Water District, August 29, 1972. Appendix F. Comments on the Draft Assessment. "Environmental Assessment. Pollution Abatement Project, Las Vegas Wash and Bay, Annex B." BY VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. "...there are no existing windrose data at the proposed Arrow Canyon Plant site or at the areas where evaporation ponds were proposed. It could be assumed that wind patters at these individual sites will be the same as those in the Las Vegas Valley...This information would not materially affect any of the conclusions of the Assessment."

80. See Footnotes 77 and 79, this report.

81. Personal communication with Dr. Claude N. Warren, Professor of Anthropology, University of Nevada, Las Vegas. A number of other people commented on this also: the League of Women Voters, National Park Service, Nevada State Park System, Bureau of Reclamation, and various individuals.

82. P. 6. "Environmental Assessment. Pollution Abatement Project. Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. It is estimated under Alternative #7 that 17,500 acres will be permanently affected by 2000.

83. P. 4. Appendix this report. Archaeological statement endorsed by Dr. Claude Warren, Professor of Anthropology, UNLV.

84. See Footnote 81.

85. Personal communication, Dr. Claude Warren, Professor of Anthropology, University of Nevada, Las Vegas.

86. P. 1. "Summary of Data Relating to Land Subsidence in Las Vegas." By Anthony Mendling, AEC Contract AP(29-2)1253, March, 1971. Desert Research Institute, Las Vegas, Nevada. "Land subsidence resulting from withdrawal of groundwater has proceeded to such an extent as to have a significant effect on man's activities in Las Vegas Valley."

87. P. 24. "Pacific Southwest Water and Land Resources: An Analytical Summary Report of Framework Studies of Four Regions." Prepared by the Pacific Southwest Inter-Agency Committee, Department of Interior, November, 1971. "...the greatest (water) 'mining'... has occurred in...Nevada...serious overdraft has occurred...in Southern Nevada."

88. P. 41. Ibid.

89. P. 25. "Environmental Assessment. Pollution Abatement Project. Las Vegas Wash and Bay." BY VTN Nevada and Jones and Stokes Associate Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada. August 9, 1972.

90. P. 25. "Environmental Assessment. Pollution Abatement Project, Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972.

91. P. 3. "Water for Nevada: Water Supply for the Future in Southern Nevada." By Montgomery Engineers of Nevada, Division of Water Resources, State Engineer's Office, January, 1971.

92. P. 4. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District, January 26, 1972.

93. P. 15, ℙ 21.31. "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III. Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes, and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November, 1972.)

94. P. 24. "Environmental Assessment, Pollution Abatement Project, Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972.

95. P. 2. "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III. Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November, 1972).

96. P. 80. "Projected Sweage Effluent in Las Vegas Valley, 1972-2000." G. F. Cochran, A. E. Peckham. Prepared for Nevada Power Co., Desert Research Institute, Las Vegas, Nevada, December, 1971. "It is assumed that with completion of SNWP the groundwater extractions would be reduced to 50,000 acre/feet per year. This figure, however, could potentially be reduced to near 35,000 acre/feet per year if the State Engineer enforces conformance to perennial yield by revocation of temporary permits. The figure 50,000 is used here because it appears in several authoritative reports on water supply in the valley, one of which was financed and accepted by the State Engineer's Office. Other reports have indicated that this withdrawal rate may be far from an economically or aesthetically optimal one."

97. If groundwater recharge were initiated with simultaneous pumping undoubtedly more water could be taken out than the 50,000 A/F/Yr. limit, even approaching the amount recharged.

98. P. iv. "A Comprehensive Water Quality Control Program for the Las Vegas Drainage Basin, Phase II," a report to the Clark County Board of Commissioners, Boyle Engineering and Cornell, Howland, Hayes and Merryfield, Consulting Engineers. Las Vegas, Nevada, 1969.

99. P. 4-5. "Outline of Activities." Colorado River Commission of Nevada, December, 1972.

0. P. i. "Summary of Findings, Questions and Answers." Lower Colorado Region, Comprehensive Framework Study of Water and Land Resources. Prepared by the Lower Colorado River Region State-Federal Inter-Agency Group for the Pacific Southwest Inter-Agency Committee, February, 1971.

102. P. VI-81. Appendix V. "Water Resources," Lower Colorado Regional Comprehensive Framework Studies. Bureau of Reclamation, Department of Interior, November, 1971. "...The analysis of Table 21 does not limit Nevada to its entitlement from the Colorado River of only 300,000 acre-feet per year. Such a restriction would show Nevada grossly short of water to meet demands...The Nevada problem would need to be solved through development of sources other than the Colorado River, be it augmentation or by further use of Nevada groundwater resources."

103. P. 16. "Evaluation of Alternates for Water Pollution Control and Resource Management, Phase III. Pollution Abatement Project. Las Vegas Wash and Bay, Annex C." Boyle Engineering and Cornell, Howland, Hayes and Merryfield, Consulting Engineers. Prepared for Las Vegas Valley Water District, Las Vegas, Nevada, March, 1972 (issued November, 1972).

104. P. 3. "Water for Nevada: Water Supply for the Future in Southern Nevada." By Montgomery Engineers of Nevada, Division of Water Resources, State Engineer's Office, January, 1971.

105. P.A5. Appendix this report. "Contracts in the State of Nevada for Colorado River." Bureau of Reclamation, Department of Interior, December 1, 1972.

106. P. 3-4. Letter to Brig.Gen. Frank Camm, Chairman PSIAC, from Samuel Weinstein, Acting Regional Administrator, Region IX, HUD, San Francisco, November 24, 1971, Exhibit D. "State and Federal Comments." Lower Colorado Region Comprehensive Framework Studies. Burea of Reclamation, Department of Interior, June, 1971. "The Colorado River has been dammed and developed until its waters are used and reused so often that, quite literally, there has been no outflow to the Gulf of California in almost a dozen years. Even then, there is not enough water to satisfy present needs...in 2020, the Type I Framework studies estimate the overdraft will be four million A-F/Yr. unless the river is augmented, and even with the augmentation by desalting that is proposed, a much smaller but still substantial overdraft will remain..."

107. Memo to Interim Regional Coordinator, Pacific Southwest Region, Environmental Protection Agency, from Acting Regional Solicitor, Los Angeles Region, January 6, 1971. "...in connection with the project, Beaumont is negotiating a contract with the Bureau of Reclamation, Region 3, Boulder City, Nevada, for the delivery of not more than 11,000 acre-feet of Boulder Canyon Project water per year. This office has reviewed the proposed contract which is still in the drafting stage. It is pointed out that there is some doubt that the contract will be culminated for the reason that water delivery contracts previously entered into, plus options to other contractors for Nevada entitlement of 300,000 acre-feet of Colorado River water, will exceed Nevada's entitlement by over 100,000 acre-feet by 1990."

108. See Footnote 38 this report.

109. P. 60. "Lower Colorado Regional Comprehensive Framework Studies," Appendix III, Legal and Institutional Environment, November, 1970. The treaty with Mexico of February 3, 1944, allotted to Mexico a guaranteed annual quantity of 1.5 million acre-feet of Colorado River water to be---reduced in years of extraordinary drought in proportion to the reduction of consumptive uses in the United States.

110. The Supreme Court Decree in Arizona v. California, March 9, 1964, apportions the water of the main stream of the Lower Colorado River between Arizona (2.8 million A-F/Yr.); California (4.4 million A-F/Yr.) and Nevada (0.3 million A-F/Yr.): a total of 7.5 million A-F/Yr, if available. If insufficient mainstream water is available the Court did direct that apportionment of consumptive uses would be made after first providing for present perfected rights in order of present perfected rights in order of priority without regard to state lines. The rest was left up to the Secretary of Interior unless and until the Congress legislates on the subject...p. 99, 102, 103. Lower Colorado Regional Comprehensive Framework Studies, Appendix III, Legal and Institutional Environment, November, 1970.

111. P. 29. "A Comprehensive Water Quality Control Program for the Las Vegas Drainage Basin, Phase II," A report to the Clark County Board of Commissioners, Boyle Engineering and Cornell, Howland, Hayes and Merryfield, Consulting Engineers, Las Vegas, Nevada. 1969. "In the absence of any reclamation program the entire allotment of Colorado

River water (265,000 A-F) will be required by 1986...a successful groundwater recharge program in the Las Vegas Valley could significantly delay these dates."

112. P. 29. "Environmental Assessment. Pollution Abatement Project, Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. "It is not inconceivable that at some future date, the total allotment of 300,000 acre-feet/year from the Colorado River could be reduced or partly unavailable. This would require reclamation at an earlier date just to meet the demand for water, and might require reclamation at an earlier date just to meet the demand for water, and might require more extensive methods of water conservation in the future."

113. P. 24. "Pacific Southwest Analytical Summary Report on Water and Land Resource Based on Framework Studies of Four Regions." Prepared by the Pacific Southwest Interagency Committee for the U.S. Water Resources Council, November, 1971. "...the most serious problems of future water supply development concern: the insufficiency of stream flow in the Colorado River to meet project demands, the effects of continued overdraft of groundwater, and degradation of water quality with more intensive use...'

114. P. 25. Ibid. "...the basic allotments (of the river)...are not sufficient to meet requirements..."

115. P. 14. "Western U. S. Water Plan, 1971 Progress Report to the President, National Water Commission, Water Resources Council, the Congress." Bureau of Reclamation, Department of the Interior, June 30, 1971. "No special diagnostic skills are required to detect an unhealthy water situation in the Pacific Southwest. The nation's most arid region continues to absorb the greatest increase in population. Seven states - including Arizona, California, and Nevada, three of the fastest growing - are too dependent on the runoff of the Colorado, which since 1930 has averaged about 13 million acre-feet of virgin flow per year at Lee Ferry, well under the 18-million acre-feet a year average which prevailed at the time the 1922 Colorado River Compact was signed. About 80 percent of Southern California's water supply originates with the beleaguered Colorado."

116. P. 1. "Las Vegas Review-Journal." Las Vegas, Nevada, November 25, 1972. "Increasing population and agriculture is putting an increasing strain on the river, officials have said. Lundberg (Bureau of Reclamation, Director, Lower Colorado Region) said that by the mid-1980's the supply of water from the Lower Basin will probably be critically short."

117. P. 29. "Environmental Assessment. Pollution Abatement Project. Las Vegas Wash and Bay, Annex B." By VTN Nevada and Jones and Stokes Associates, Inc., for the Las Vegas Valley Water District, Las Vegas, Nevada, November 15, 1972. "It is not inconceivable that at some future date, the total allotment of 300,000 acre-feet per year from the Colorado River could be reduced or partly unavailable. This would require more extensive methods of water conservation in the future.

118. See Figure I. Calculations of water usage based on 475 gpd as estimated by the State Engineer's Office using 331,000 acre-feet as the upper limit of water available.

119. P. 1. "Las Vegas Review-Journal." Las Vegas, Nevada, November 18, 1972. "River Commission official Paff didn't feel a recommendation should be made. He noted Nevada has a 300,000 acre-feet per year allocation of water from the Colorado River. Present contracts for water from the river, plus any amounts exported could total above the 300,000 figure...Paff argued that the federal government might not fund the planned second phase of the Southern Nevada Water Project (due in the 1980's) if Nevada is overallocated. He pleaded a definite schedule for constructing the reclamation aspects of the project, noting the state gets credit for any water, no matter what quality, it returns to the river."

120. P. 7. Minutes of the Professional and Technical Advisory Board to the Las Vegas Valley Water District, January 26, 1972. "...he (westergard)...feels that (it) isn't just a short-range consideration, but could affect Nevada's prerogative as far as participating in future water development on a large scale. If 50,000 acre-feet a year is running out to Dry Lake, and being evaporated it is going to be difficult to request an increased water supply being made available within the state."

121. Letter to Brig.Gen. Frank Camm, Chairman PSIAC, from Samuel Weinstein, Acting Regional Administrator, Region IX, HUD, San Francisco, November 24, 1971. Exhibit D. "State and Federal Comments. "Lower Colorado Regional Comprehensive Framework Studies. Bureau of Reclamation, Department of Interior, June, 1971. "These conflicts (over the Colorado) which are of 50 years standing and which a number of times have involved litigation before the Supreme Court of the United States, involve quantities of the Colorado River."

122. P. 29. "A Comprehensive Water Quality Control Program for the Las Vegas Drainage Basin, Phase II," a report to the Clark County Board of Commissioners, Boyle Engineering and Cornell, Howland, Hayes and Merryfield, Consulting Engineers, Las Vegas, Nevada. 1969. "...in the absence of any regulation program the entire allotment of Colorado River water...will be required by 1986..."

123. P. 3-34. "Southwest Energy Study," Prepared by the Study Management team for the Federal Task Force, Department of Interior, (Draft), April, 1972. "The State (Nevada) is allotted 300,000 acre-feet of water annually from the Colorado River. This amount probably is inadequate for even the near future requirements of Southern Nevada."

124. P. III-2, III-3. "Project report, Pollution Abatement Project, Las Vegas Wash and Bay, Annex A." Prepared by Nevada Environmental Consultants for the Las Vegas Valley Water District, November 15, 1972. "Recent studies by the Nevada State Engineer's Office indicated that the waters currently used for potable supply...will be fully utilized sometime during the decade of 1990 and 2000..."

125. P. 3. Letter to Brig.Gen. Frank Camm, Chairman PSIAC, from Samuel Weinstein, Acting Regional Administrator, Region IX, HUD, San Francisco, November 24, 1971. Exhibit D. "State and Federal Comments." Lower Colorado Regional Comprehensive Framework Studies,

STATEMENT OF LEAGUE OF WOMEN VOTERS OF NEVADA
by Daisy Talvitie, Chairman of Environmental Quality

The League of Women Voters of Nevada, with emphasis on the views of the League of Women Voters of Las Vegas Valley, appreciates the opportunity to speak in support of SB 290 approving and funding the abatement plan developed by the Las Vegas Valley Water District. Concrete action on the continuing pollution of Lake Mead is long overdue and the Legislature is to commended for positive steps in that direction.

Because of our longstanding interest in water problems both nationally and locally, the League has approached the abatement plan with some specific goals in mind: 1) It should end present polution of the Wash and Lake Mead in order to fulfill the 1971 Legislative mandate, meet the EPA enforcement deadlines, and also the State water quality standards.

2) It should include consideration of the approaching water shortage in the Las Vegas Valley. All population projections and water budget figures indicate that the Valley will have to reclaim waste-waters within 20 years. Population growth coupled with a dwindling supply from gound water and a limited source from the Colorado River make it very clear that water resources must be scrupulously tended.

3) It should provide a means of improving the quality of the Southern Nevada Water Project water. Lake Mead water is becoming increasingly saline at the same time that Las Vegas Valley water supply is growing more heavily dependent upon the Southern Nevada Water Project, and we see no indications that upper Basin States are interested in reducing their contributions to the growing salinity problems for our benefit.

4) It should maintain the Las Vegas Wash as a community resource. The Wash provides a unique educational and recreational opportunity in a desert area.

5) With all of these in mind, the ultimate goal must be reclamation and recharge of groundwater.

We believe the abatement project before you does meet these goals; accomplishing both an end of pollution for Lake Mead and a beginning for reclamation, but there are some recommendations the League wishes to make as additional Legislative directives which we will include elsewhere in our statement.

The export line and Dry Lake evaporation site are critical to both abatement and reclamation. Right now the export line and barrier system will remove the poll uting waters from the Wash (both the effluent from the treatment plants and the highly saline groundwater return flows from the BMI ponds area in Henderson) for evaporation at Dry Lake. This satisfies the Legislative mandate, effectively meets EPA deadlines, and will meet State water quality standards. The export line will later carry the large volumes of brine generated by full scale desalinization operations when secondary effluent is reclaimed.

Exhibit "C"

The evaporation site originally provided for effluent will also accomodate the brine. All investigations show Dry Lake as the only geologically and economically feasible location for evaporation of the large quantities of both effluent and brine which will be generated. Sites closer to Las Vegas would be inadequate in size and undoubtedly would require expensive lining to guard against any leakage back into the groundwater system. In addition, considering the growth in the Valley, committment of large acreage to such purposes would not be realistic.

The advanced wastewater treatment and desalinization features of the plan are indispensable to coping with the coming water shortage and the need to upgrade water quality through reclamation and recharge. These smaller pilot projects are a wiser way to go than an immediate rush to complete treatment. While technology and feasibility of advanced treatment such as Lake Tahoe's sophisticated plant are known, a plant 8 times the size of Lake Tahoe's plant would be required in Southern Nevada. Existing desalinization plants operate on a much smaller scale than would be necessary in the Valley and costs run $800 to $1,000 per million gallons. A deciding factor in this matter must be the existence of a market for expensive recycled water and this seems to be lacking. For the immediate future there is an adequate, reasonably priced water supply for domestic use (especially with some earnest conservation efforts), and high costs would rule out irrigation uses for completely treated water. Studies also indicate public acceptance of recycled water would be a stumbling block, unless the reclaimed water can first go through the groundwater recharge process.

The pilot projects do make a concrete and realistic beginning toward the reclamation that is mandatory in so relatively short a time (20 years). They will provide basic operations and cost data. Even more important, they will permit exploration and verification of uses of various qualities of water and will get the groundwater recharge program in motion after so many years of discussion.

Recharge is a desirable method of "banking" our water resource to meet future water shortages. Natural filtration in the aquifer can continue the treatment process reducing bacteria, viruses, and remaining organic materials. An added benefit, considering the effects of previous overdrafting of groundwater, would be a slowing of the subsidence rate caused by continued pumping. And, of course, such storage water would replenish the groundwater resource. Given the elological nature of the Valley, recharge through injection wells would probably be the preferred method of recharge. For this, information is needed on the quality of water required for recharge.....will it be chemically compatible with existing groundwater so as not to clog the aquifier, what effects will temperature variations have on the groundwater and the aquifiers, at what rate can the aquifier accept the recharge water, etc..?

Another important use for the pilot project water will be devising a means of upgrading the quality of the Southern Nevada Water Project water used in the Valley. As the ratio of Southern Nevada Water Project water to well water is rising, the Lake Mead water is also increasing in total dissolved solids. This lower quality of water will affect not only our pipes, washing machines, dishwashers, etc., but also our taste buds and health (a rising problem of sulphates could have peculiar side effects on our tourist industry . . .

a Las Vegas version of Montezuma's disease.) While our water quality today is still within acceptable limits, it is within the 'ball park' of maximum limits and could easily reach the troublesome area within the foreseeable future. Certainly it will increase the probability of salt build-up in the soils as more growth, more houses, more lawns, more watering occurs. A blending of completely treated water with the incoming Lake Mead water could improve the quality, and such a solution could be easily evaluated through the pilot projects.

A similar use of the treated water could be applied to irrigation uses of effluent. There is already strong evidence of salt build-up from present irrigation uses of effluent. This doesn't present an overly optimistic outlook for the in-valley irrigation planned in the future, unless the quality of effluent is upgraded. This could be accomplished through dilution with tertiary or completely treated water. Just what mixtures would provide the best results can be worked out through the pilot projects.

The abatement plan does maintain a portion of the Las Vegas Wash which is a desirable feature. Though not a 'natural' area, its unique presentation of desert ecology side by side with a marsh environment makes it well worth retaining and developing. Many Clark County and UNLV Students have experienced at first hand the educational values of this marshland as a living ecological laboratory. The potential of the Wash further extends to such recreational uses as picnicking, hiking, etc. One thing that does concern the League of Women Voters is the necessity to establish ownership and management as the Wash Area, now that we have developed a plan for retention. Hopefully, it could become a State or Regional Park and we recommend that Question for Legislative consideration.

The League of Women Voters is not enthusiastic about the proximity of the proposed power plant to the Dry Lake site or the implications thereof--in terms of both air and water. The prospect of substantial amounts of wastewater being tied up over a period of 40 years when reclamation dates are within 20 years is not really acceptable. Nor is the possibility of degradation of air quality in the region. This, however, is not a valid reason for negating the abatement plan. Certainly any power plant erected today would have to comply with all Federal, State, and Local regulations, including ambient air quality standards. Considering the Southwest Energy Study conclusions, the concern of all for our National parks, and the possibility of cumulative effects from several plants in the Area, it is doubtful that a plant can be built at that location. Both the Federal Air Pollution Law and the National Environmental Policy Act would require any proposed plant to undergo the intense scrutiny of a separate environmental impact statement, and the capability of it air pollution technology would have to be proved before construction. In light of all this, we believe the power plant and the siting of any power facility must be considered separately from the abatement project, and each should be weighed on its own merits independent of the other. We do, however, appeal to the Legislature to authorize a study of Nevada's power needs--with the goal being to adequately meet our own needs and limit use of Nevada's water allocation to power to the actual Nevada need.

The League of Women Voters objects to any lowered standards approach because it does not deal effectively with several problems. The 'whys' and 'wheres' must be defined to begin with. Are you lowering standards for the

purpose of return to the river of for the purpose of return to the Lake? Delineation of the point of return is a critical factor. Return to the river below the Dam would involve thermal pollution since there would probably be considerable difference in the temperature of the treated water and the river. Facts presented in the 1969 Boyle II Report indicate the returning water would have to be cooled as much as 15 degrees to be compatible with river temperatures. (75 down to 58) Indeed, this would have required a refrigeration plant at the point of return. Obviously any increase in the river temperature below the Dam would be a threat to fish population and the fish hatchery. This is a critical factor in light of the fact that the river temperature is already in delicate balance.

If the return is to be to the Lake, one would need information as to exactly how far the standards could be reduced without harm to the Lake. A comparison against drinking water standards is not appropriate for this purpose. For instance, at Lake Tahoe nothing is returned to the Lake because the balance between nutrient level and algae growth is so delicate. Of course, for either return there would have to be an entirely separate and new environmental impact statement on the effects of the necessary facilities upon Park lands.

Our other concern is that although a return to the Lake or river might help in increasing the amount of water available, it does not shoot at all toward improvement of the quality of the water supply. We would also ask if it is really desirable to lower standards designed to protect and upgrade water quality. In the face of population and urban growth in this area, a non-degradation principle would seem especially important.

The League believes that the ultimate goal must be reclamation and recharge. To assure this goal is met, we would urge that the Legislature require periodic incremental progress reports be made to the Governor and the Legislature concerning 1) the construction and operation of the advanced wastewater treatment and desalinization pilot plants which are scheduled to be on line by the first of 1975 and 2) progress in planning for implementation of full scale complete treatment facilities in adequate time to meet the water needs of the Valley--in terms of both water quantity and water quality.

In summary, the League of Women Voters supports SB 290 because it believes the abatement plan meets the need for both pollution abatement and reclamation. Its pilot projects will place the Valley in a better position to deal with the complicated and sophisticated problems of total re-use in the not too distant future; it will provide evaluation of solutions to effluent salinity and improving the quality of Las Vegas water; it will begin work on groundwater recharge; and it will preserve the Las Vegas Wash as a community resource. The reclamation features of the plan are of paramount importance because they are the first steps toward the ultimate goal of total reclamation. We request the abatement plan be approved with these Legislative directives, either as part of the plan where appropriate; or as separate actions where indicated;

1. Emphasis on policies and practices to promote conservation of water.
2. Study of power needs of Nevada, limiting Nevada water use for power production to that which is necessary to meet needs of Nevada.
3. Determination of ownership and management of the Vegas Wash area with consideration of its becoming a State Park.
4. Legislative directives establishing reclamation of waste water as the ultimate goal with regular reports to the Governor and Legislature of increments of progress in that direction required.

DT/ff

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CITY OF HENDERSON

WASTEWATER MANAGEMENT PLAN

A STATUS REPORT

Prepared by:

CITY OF HENDERSON
DEPARTMENT OF PUBLIC WORKS

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January, 1973

243 Water Street
Henderson, Nevada 89015

Exhibit "D"

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PREFACE

This report is one of a series, requested by the Environmental Protection Agency to be submitted to them quarterly, detailing the activities of the City of Henderson directed toward "implementation of a regional system" to bring wastewater discharges into compliance with State-Federal water quality standards established for Lake Mead and the Colorado River.

Rather than present this report as a progress report, it has been determined to prepare the report as one that will stand alone as a status report relieving any interested readers of the burden of searching for and reading previously issued reports. The expansion of this report was felt necessary because the first reports were originally made available only to the E.P.A; copies of them were later made available and distributed to others who has expressed an interest in the evolving plan of the City of Henderson.

This report will attempt to establish the position of the City of Henderson in regard to the problem of possible pollution of Las Vegas Wash, Lake Mead and the Colorado River.

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PART I - SUMMARY

180-Day Notice

On December 27, 1971, the City of Henderson, along with other municipalities and industrial concerns in the Las Vegas Valley received notice from the Regional Administrator of the Environmental Protection Agency that continued discharge of wastes from the City of Henderson Wastewater Treatment facility into the watershed of Las Vegas Wash constituted a violation of established State and Federal water quality standards.

The standards which the City of Henderson is alleged to have violated were cited as the "Federally approved standards of Nevada for the waters of the Colorado River."

These standards were recited in the notice as follows:

> "Free from materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to produce taste or odor in the water, or detectable off-flavor in the flesh of fish, or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such degree as to create a public nuisance, or in amounts sufficient to interfere with any beneficial use of the water."

The notice further advised that -"If this matter is not satisfactorily resolved within 180 days from the date of this

letter, an abatement action may be brought against your City by the United States pursuant to Section 10 (g) of the Federal Water Pollution Control Act."

January, 1972, Informal Hearing

An informal hearing on the matter was held in Las Vegas on January 25, 1972. At this hearing, the City of Henderson, neither admitting nor denying the truth of the allegations made by the EPA, described its tentative plan to achieve compliance with any local and federal water quality standards.

Although circumstances and changing conditions have required some alterations to the plan as originally presented, it will be included here for reference. The brief plan was presented as six items. The parenthetical statements following each item are in explanation of the item and of any changes or delays that may have subsequently occurred.

The Tentative Plan

(1) Isolate the City of Henderson influent lines from the BMI lines and by-pass the BMI treatment plant.

(At the time of the informal hearing Basic Management, Incorporated, was operating a wastewater treatment plant, and, under contract with the City, was treating about one-half of the City's wastewater. Because the City could not be certain of what action Basic Management, Incorporated, would be taking and it was recognized that the BMI plant was, at that point in

time, (January, 1971) operating very ineffectively and in an overloaded state, it was determined to consolidate the City domestic wastes at its own plant. Tentative plans and cost estimates had been prepared and an application for federal funding assistance was being prepared. Since that time BMI has sold the plant to the City and agreed to remove all industrial waste connections from the system. This has not changed the basic plan, but has altered the priorities. The same by-pass lines (outfalls) are planned but the use will be; first, to carry the treated effluent of the BMI plant, now and hereafter called City Plant No. 2, to the original City plant, now and hereafter called City Plant No. 1; second, to provide an emergency by-pass outfall for raw sewage from the influent of Plant No. 2 to Plant No. 1; and third, serve as a major outfall to Plant No. 1 at such time as it is convenient or necessary to abandon Plant No. 2.

(2) Modify the present plant to a complete secondary treatment plant.

(This refers to City Plant No. 1

Again, little change in the plan has resulted from the changed conditions. The plant is operating at about 50% of its design capacity and since the diversion to Plant No. 1 of the domestic waste flowing into Plant No. 2 has been deferred by acquisition and operation of Plant No. 2, design of a system

for Plant No. 1 is being deferred until results of experimentation and testing at Plant No. 2 are completed. This will be treated further, later in this report. The City has acquired an additional 80-acres of land at Plant No. 1, giving a total of 100-acres for plant construction and operation.)

(3) Construct an impermeable evaporation and holding reservoir.

(This reservoir has been conceived of as a product reservoir system, from which discharges will be made to points of beneficial use of treated effluent, to points of waste irrigation, and to Las Vegas Bay when it has been determined that such discharge will not violate the "Federally approved standards of Nevada for the Waters of the Colorado River". (See Page 2)).

(4) Apply for a research and demonstration grant to demonstrate if present qualifications testing indicates further research, the capability of a proposed biocatalytic sewage treatment process to be a safe, effective and economical stimulation of sewage treatment and water reclamation/purification.

(The original plan of testing has been revised since acquisition of Plant No. 2, but the basic concept has not changed. This is covered in more detail later in the report).

(5) Develop a plan for waste irrigation of excess treated effluent and a plan for use of treated effluent for the irrigation of public park areas and rights-of-ways.

(This item of the plan has not changed).

(6) If necessary or expedient, join in the Regional Plan of Exportation of Treated Effluent.

(This item has changed and some explanation is necessary. It was included to "leave the door open" for the City of Henderson, if unable to stand off an abatement suit, to compromise its principles of conservation and reclamation of our water resources and join in an export scheme to be able to serve its interests of civic growth and progress. This subject will receive further treatment in Part II of this Report.)

May, 1972, Report

Nearly four months later, on May 22, 1972, with the 180-day deadline approaching, the City of Henderson received a demand from the EPA for a "firm commitment" as to the pollution abatement improvements to be made.

In response, the City of Henderson attempted to state its position; but because the City has been included in the Clark County Areawide Planning Jurisdiction represented by the Clark County Regional Planning Council as the areawide planning organization, the City of Henderson could not make a firm commitment without reservations.

The City did state in a report to the EPA in May of 1972 as follows:

"Specific pollution abatement actions taken by the City of Henderson will depend in a large measure on the actions indicated in the Clark County Master Water Quality Management Plan.

In general, the City of Henderson will cooperate in the formation of the plan and will then incorporate the acceptable recommendation of the consultant into its plan." (Underlining added).

The City's response included a re-statement of many of the steps in the tentative plan presented at the January 25th hearing.

Accompanying and a part of the City's response to EPA's demand of May 22, 1972, was a resolution of the City Council "committing the City of Henderson to participation in the Master Water Quality Management Plan to be developed in so far as such participation is in the best interest of the City of Henderson". (See full text of Resolution in Appendix).

September, 1972, Report

In an interim report, dated September 1, 1972, the City reported on its activities aimed at improving its wastewater treatment facilities.

Most of the information contained in the September report has been included in Part III of this report in an updated status.

PART II - CURRENT STUDIES AND EVALUATION OF REGIONAL PLAN

Following the submission of the September Report, the City's Public Works Staff began a serious study of the alleged pollution of Las Vegas Bay. It had become quite evident to the City Planners that the report of the Regional Planning Consultant, when presented, would include at least two recommendations that

that would not be in agreement with the City's plan which was being formulated on the basic concept of conservation and reclamation. These are:

1) The export of effluent to dry lake, and

2) the formation of a Master Water Control Agency for the Las Vegas Valley.

The draft report of the consultant to the Regional Planning Agency is past due and the consultant has been granted a 75-day extension on the time to complete the draft report. The City of Henderson cannot, therefore, know what the report will recommend but activities of other agencies hint strongly at a recommendation of the above two items.

Although export for the major flow from the valley will probably be recommended, there is a possibility that the report will recommend that Henderson pond and evaporate its effluent.[1] At this point, the City of Henderson study team, already working to evolve a water quality management plan for the City of Henderson, turned its efforts to a serious independent research in an attempt to follow the reasoning of those researchers who agreed to recommend the Export Plan to the Regional Council.

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1. Wollum, Miles C., Nevada Environmental Consultants, Letter to Clark County Regional Planning Council, Water Quality Management Steering Committee. July 31, 1972, page 5.

The study team began reviewing the myriad of previous reports dealing with the subject of pollution of Las Vegas Bay and related items. With a few notable exceptions, most of the reports were felt to be too unscientific to be of real value. Most of the reports which had expressed conclusions from physical measurements were found to be based on such fragmentary data as to be useless.

The various standards were studied and found to be confusing and contradictory, and in some cases, arbitrary and unreasonable. It did not seem apparent to the City study team that any of the numerical standards were based upon the needs of the receiving waters; but rather were arbitrarily established using ideal values or possibly values based on inconclusive data and assumptions not definitely proven.

In a letter to the Chairman of the Water Quality Management Steering Committee, dated November 29, 1972, Frank M. Covington, Director of EPA Air and Water Programs Division stated:

"Under the provisions of the Federal Water Pollution Control Act Amendments of 1972, standards for both interstate and intrastate waters must be reviewed by EPA and revised, if necessary, to meet National guidelines; <u>therefore, the criteria contained in Exhibits C through H</u> (includes the standards for discharge to Las Vegas Wash at the Clark County and City of Las Vegas Wastewater Treatment Plants) <u>may be revised in the near future</u>".

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It was felt by the City of Henderson study team that the acceptance of the State "standards" by EPA was an interim action necessitated by the fact that there were no Federal guidelines or standards to offer. It is the opinion of the City study team that the standards were possibly established to correct a suspected condition for which there is, as yet, no supporting data.

Personal contact with other investigators concerning valid in-depth studies, currently in progress or nearing completion, further supports the City's attitude with regard to the acceptability of the "standards".

University of Nevada researchers are completing a two year study of the trophic condition of the Las Vegas Bay. The report, to be published in February, 1973, is expected to indicate that conditions in the Bay are less severe than popular belief would indicate. While some eutrophying influences certainly, are applied from Las Vegas Wash, the alternate methods of minimizing them should be examined more closely before irrevocable commitment to export is made.

Several questions of prime importance arise when one considers the export plan. These are:

1. <u>How can the proponents of the export plan justify exporting substantial quantities of relatively high quality water from the Colorado River system</u>?

It is recognized that the effluent from the various

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secondary wastewater treatment plants, if operating effectively, is superior to much of the water entering the Colorado River downstream from Hoover Dam.

Failure to return the treated effluent to the system would have a quality-lowering affect through increased concentration of the remaining waters and a loss of dilution effect of the treated effluent on influent waters of much higher salinity from other sources. Frank M. Covington, of EPA in his letter of November 29, 1972, (see above) questioned the export plan in the following statement:

"Concerning the salinity criteria, the EPA notes that the Colorado River Enforcement Conference does recommend 'the maintenance of salinity concentrations at or below levels presently found in the lower main stem'. While this does not provide specific criteria, it does provide upper limits for TDS concentrations for the entire Colorado River system. In addition, you should recognize the over-riding significance of the Executive Agreement modifying the 1944 treaty with Mexico. It is not obvious that the Las Vegas Valley planning efforts have taken into account the implications of these limits on several of your project options, particularly those that involve exporting substantial quantities of relatively high quality water from the Colorado River system without providing flexibility to compensate for the effect on downstream interests."

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The export plan assumes the continued availability of water to meet increasing demands to about the year 1990, but fails to consider the possibility that increasing demands by other Colorado River users may result in a reduction of all allocations.

2. What consideration, if any, has been given to the possibility of an electrical power shortage in the area which might require that a decision be made either to supply water to the area or to export effluent?

The propenents of the export plan, while exhibiting marked pessimism regarding the advance of technology to meet the water conservation needs have at the same time shown unwarranted optimism regarding the ability of the power utilities to always have the necessary power available for all uses. The City study team assumes that it is recognized that the abatement of one form of pollution will often give rise to other forms of pollution in the process, particularly where the abatement scheme is dependent upon a high energy consumption. In this case, the export scheme may not be one of pollution abatement since pollution has not been proven; yet to operate the proposed system, large quantities of electrical energy will be required with possibly noticeable additional air and thermal pollution.

3. How could proponents of the export plan accept as justification for commitment to expend in excess of 100 million dollars a "paper standard" promulgated to correct or alleviate a problem not proven to exist?

The planners have been stampeded into proposing an ultra-expensive system to meet a standard that could conceivably be proven to be overrestrictive and premature by as much as several decades; while failing to consider the inevitable advances in technology that could preclude ever having to export an ounce of water or brine from the Las Vegas Valley. The expenditures of a small portion of the proposed 100 million dollar commitment for studies and research of the receiving waters and its capacity to receive treated effluent would make it possible to arrive at a set of standards that would be valid and possibly make feasible a less costly plan for adequate protection of the receiving waters. The expenditure of another small portion of the proposed 100 million dollar commitment for a research project could result in the development of new and improved wastewater treatment technology directed toward the unique requirements of the region's receiving waters.

4. What cost-benefit or valid alternative cost analysis can the proponents of the export plan exhibit to justify this very large financial commitment?

The only alternative costs that have been developed were

based on alternative methods of complying with the same questionable "standard", and the only obvious consequence of not complying with the standard would be a violation of the standard. It is doubtful that any action to force abatement of the alleged pollution could be sustained without first proving that continued discharge was polluting "in fact" rather than polluting "by decree". It is felt that any such action would result in the adoption of a reasonable standard based on actual needs of the receiving waters. It is possible that the export plan could be of no benefit to the region, giving rise to an infinite cost-benefit ratio.

The established standard should be based on the needs of the Bay and the Lake. The standard should consider the dilution and flow through properties of the receiving waters and consider the ambient level of critical constituents of the receiving water. The time table for compliance should be one that would keep a reasonably attainable goal ahead and would spur the engineers on to reach resonaable levels of performance.

The City of Henderson's approach to the solution of the problem confronting the Las Vegas Valley would have been entirely different from the approach taken by the Las Vegas Valley Water District. The City would, and does, question the "standard". It is the standard, and the time limit imposed for compliance

with the standard, that has created an artificial crisis that has led to what the City of Henderson feels is an unacceptable solution to the problem.

A crisis that results from raising a standard prematurely as in the present case is not a crisis that, unless something drastic is done immediately, will lead to disaster. To treat it as if it were, as other investigators have done, could be a serious mistake.

If a standard is too high, arbitrary, or premature, those confronted by the standard may be stampeded into adopting measures that are wasteful and even injurious. If the standards are too restrictive, they cannot spur those upon whom the standards are being imposed on to reach the prescribed level of performance sooner than they would otherwise, because that level is by definition impossible of attainment.

The City of Henderson is opposed to the "export" plan and feels that it is a "head in the sand" approach taken to avoid rather than to solve the problem. The City also feels that the real problem has not been adequately defined at this point and the problem that the Las Vegas Valley Water District attempted to solve was strictly one created by the imposition of a standard.

The City of Henderson acknowledges the need for adequate, specific standards for wastewater effluent, but feels that they

should be standards based on the needs of the receiving waters which can be determined by research and studies which relate to the conditions of Lake Mead and Las Vegas Bay; and believes that the standards should be such that continued improvement over a reasonable time is possible.

There are studies presently going on and others proposed that will provide the necessary data to determine what restrictions must be placed on the discharge to the Bay and at what point in time they should be imposed.

The Water District proposes that all water and sewer utilities in Southern Nevada be put under the control of one agency. Time and space do not permit detailed arguments against all of the points that the Water District raises as justification for the creation of such a district.

The City of Henderson is opposed to the plan as conceived by the Water District. The major accomplishment of the plan as it is understood by the City would be to consolidate all the water and sewer utilities in the Las Vegas area, or in the County, under one agency. In other words, leaving the City of Henderson out of the District, the District would accomplish for Las Vegas and vicinity what Henderson presently has, that is a unified water and sewer utility within its own corporate limits and under the control of one governing body. It would be a disservice to the residents of the City of Henderson to include Henderson in the District.

Through sound planning and efficient management, the City of Henderson has been able to provide for its residents an acceptable level of service while maintaining the per capita bonded indebtedness for water and sewer utilities at about 23 dollars. If the City of Henderson were absorbed into a Regional District it would have a per capita bonded debt for utilities of about 178 dollars, nearly eight times the present level, and the City would have little or no control over the increase in this debt.

The City of Henderson recognized that many utility improvements are required and that the utility debt will probably have to be increased to provide the needed improvements. The City is more capable of providing the required funding under its present utility structure than would be possible through a Regional District, where the City would have to compete with every other entity for every dollar of capital invested in the region.

Under the present structure, the City of Henderson has full control of the growth and development of the City. The City feels that it is imperative that this control remain in the local governing body and not in the governing body of some other level of government in which the City would be inadequately represented.

It is the understanding of the City that the present

version of the legislative bill proposed to the 1973 Legislature, mandates that the "District", if formed, take over the Henderson Wastewater Treatment facilities and provides the option to take over the water distribution system. The bill would then, in effect, be creating for Henderson the problem it is trying to solve for the remainder of the valley, that is, separation of control over water and sewer utilities.

It is the feeling of the City of Henderson study team that the Water District is complicating a problem that could be easily solved without the creation of another level of government. Among the areas of concern are:

1. Control of Water Supply Source.

The Colorado River Commission, which has control over the Colorado River water within the State, presently exists. The legislature could give to the CRC control of groundwaters within the watershed of the Colorado River basin within the State, thereby putting the source of supply of all water under one agency.

2. Control of Pollution

Each entity operating wastewater treatment plants, or flood control systems can be held responsible for controlling pollution of the receiving waters, when valid and reasonable standards have been established. The standards should be established by competent investigators after suitable and definitive

studies and research have been completed; and hearings have been held on the creation of such standards. With a campus of the University of Nevada located in Southern Nevada, research and studies by the University and the Desert Research Institute would be possible at reasonable cost to the area and with benefit to the University. Since the CRC has the responsibility for the receiving waters, the establishment of quality standards should be the responsibility of CRC, subject to Federal EPA concurrence and public acceptance.

3. Overlapping of Service areas and Duplication of Facilities.

All entities in the Valley are members of the Clark County Regional Planning Council. The Regional Planning Council should be the clearing house for all plans and should be charged with the responsibility for approval of plans to prevent such overlapping and duplication of facilities.

The City of Henderson would not object to a Regional District if the boundaries of the district did not include any land within the corporate limits of the City of Henderson, or the logical extensions thereof; did not change the control of water supply sources; did not assume control of the Las Vegas Wash and wastewater effluent; and did not provide for the funding of the Las Vegas Valley Water District Export Plan.

PART III - CURRENT ACTIVITIES AND PLANS

The City of Henderson is continuing its efforts toward solution of the problem of effluent waters from its Wastewater Treatment Plants entering Las Vegas Wash and thereby possibly degrading the quality of the waters of Lake Mead.

To this date, the City of Henderson has completed the following items in its schedule of activities to resolve its wastewater treatment and disposal problems:

1. On June 14, 1972, the City of Henderson purchased the BMI Wastewater Treatment Plant and began operation of the plant on June 15, 1972.

2. The City of Henderson has purchased 80-acres of land adjacent to Wastewater Treatment Plant No. 1, at a cost of $60,000 for expansion of Plant No. 1.

3. The City of Henderson has submitted preliminary requests to HUD for two projects that involve improvements to the treatment plants and for one project that will resolve a problem in a collector sewer and at the same time, relieve some load from Plant No. 2 by diverting a major flow to Plant No. 1. Descriptions and project amounts are as follows:

Project	Total Estimated Cost
Construction of Hillcrest Pumping Station and Water Street Interceptor	$ 255,918
Outfall from Plant No. 2 to Plant No. 1	$ 579,988

Improvements to Plant No. 1, consisting of Inlet Works, Activated Sludge Secondary Unit, etc.	$ 1,046,183
Total of Plant Improvement Projects	$ 1,882,089

4. In November, the City began treating Plant No. 2 with a new advanced wastewater treatment process, without prior repairs or improvements in its otherwise very deteriorated condition (Boyle Engineering report of Sewage Treatment Facilities, City of Henderson, September, 1971). In the first four weeks of treatment significant improvement occurred in the quality of the plant effluent.

Prior to treatment, the plant effluent BOD's ranged up to 150% of influent BOD values, whereas, following treatment, effluent BOD's were reduced by 60% to 90% of influent values. Variations in the data values were the result of internal changes occurring in flow conditions within the plant due to intermittent mechanical equipment failures, improper modifications made by previous operators and total loss of some plant functional operations. Analytical data further pinpointed specific locations within the plant where upgrading of the system was necessary for further quality improvement. The treatment process was subsequently stopped and upgrading operations begun. With the exception of work necessary to put the No. 2 trickling filter back in operation, the remaining repair and modification work will be complete about February 1, 1973.

As soon as it has been established that the plant is capable of maintaining a continuous reasonably effective processing operation, the new treatment process will be re-started.

Application of the new treatment process to Plant No. 1 will be started as soon as data obtained from the No. 2 Plant is sufficient to provide the necessary guidelines. The first objective of treating Plant No. 1 will be to bring the quality of the plant effluent to current acceptable levels for effective secondary treated domestic wastewater. Other objectives are stated further on.

In support of its views, concerning the necessity of conducting research and pilot studies related specifically to the control of water quality in the Las Vegas Wash and Bay area, the City of Henderson feels that its operation of two domestic wastewater treatment plants presents ideal conditions for certain studies relative to new waste water treatment concepts. In operating design, the two plants represent those most widely found in use in the United States at the present time. Plant No. 1 is a double oxidation lagoon system employing Imhoff settling tanks, and Plant No. 2 is a two-stage trickling filter secondary treatment system. The load capacity of both is approximately the same (about 1.5 mgd) and their ages are similar, (20 to 30-years).

In view of the success already obtained through treatment of its No. 2 Plant with the new treatment process, the City plans to continue studies of the application of this process to both plant systems with the ultimate objective of developing a plant design based upon the new process. In this regard, the process has been very effective in establishing and maintaining active aerobic digestive systems. To further test it for use in total oxidation lagoon systems (eliminating the requirement for a separate sludge digestion facility), the City plans to build a parallel system of ponds and controls for its No. 1 plant for pilot study purposes. It has, in addition, plans for the construction of by-pass lines (outfalls) to permit consolidation of the City's total domestic waste waters at Plant No. 1, if desired, allowing still more flexibility in designing study projects. It has already advised the EPA Regional Headquarters of its intentions in this matter and will also request their cooperation through a development and demonstrative grant to support the study.

Other activities being undertaken include:

1. Begin investigation of possible infiltration of highly saline ground water into the outfall to Plant No. 1. This outfall passes through an area that could be greatly affected by the ground water mound created by the BMI ponds. If preliminary investigation indicates infiltration, it will be followed

by television survey of the line to determine the cause and location. Further action will be determined after completion of the investigation.

2. Begin survey to locate and disconnect all illegal or previously approved and constructed storm drain connections to the sanitary sewer system.

3. Begin revision of necessary ordinances to effect tighter controls of discharges into the sanitary sewer system and begin a survey to determine and correct violations of existing requirements for sand traps, grease traps, etc.

4. Begin study and experimental construction of low-cost impermeable ponds, which will retain their impermeability in an environment of fully or partially treated wastewater.

5. Continue preparation of conceptual plans for a pilot treatment plant to reclaim wastewater of various qualities for differing beneficial use applications. Our concepts must be acceptable to the governing body of the City and to the Regional planners. Our basic philosophy will be that of treating wastewater for reuse not merely for disposal which has been the goal for so long a time.

6. Begin procedures for improving our position as owner of the rights to all effluent from the two wastewater plants.

7. Continue to cooperate with the Regional planners in developing a Regional Plan for Water Quality Management.

RESOLUTION NO. 337

WHEREAS, on December 23, 1971, the City of Henderson was notified by Mr. Paul De Falco, Regional Administrator of the Environmental Protection Agency, pursuant to Section 10 (c) (5) of the Federal Water Pollution Control Act, that the City of Henderson was discharging inadequately treated wastes into Las Vegas Wash, a tributary of Lake Mead, in violation of the Federally approved water quality standards for the State of Nevada; and

WHEREAS, it is the desire of the City Council of the City of Henderson to be in full compliance with the requirements of the Federal Water Pollution Control Act and of the State of Nevada; and

WHEREAS, the Clark County Regional Planning Council has contracted with an Engineering and Planning Consultant to develop a Master Water Quality Management Plan, acceptable to the Federal Environmental Protection Agency, for the entire Clark County area; and

WHEREAS, the City of Henderson has a voting representative sitting in the Clark County Regional Planning Council and is represented on the Steering Committee formed to assist said Council in the development of a workable Master Water Quality Management Plan:

NOW, THEREFORE, BE IT RESOLVED, that the City Council of the City of Henderson herewith commits the City of Henderson to participation in the Master Water Quality Management Plan to be developed insofar as such participation is in the best interest of the City of Henderson, and is toward the goal of full compliance with the requirements of the Federal Water Pollution Control Act and the standards developed for the State of Nevada, and insofar as such participation is not detrimental to the status of the City of Henderson as an independent governmental agency or detrimental to the orderly growth and development of the City of Henderson.

ADOPTED AND PASSED this 5th day of June, 1972, by the following roll call vote:

Those Voting AYE: Estes M. McDoniel, Lorin L. Williams, John E. Jeffrey, Cruz Olague, and Jerry Franklin

Those Voting NAY: None

Those Absent: None

Estes M. McDoniel
ESTES M. McDONIEL, MAYOR

ATTEST:

Genevieve H. Harper
GENEVIEVE H. HARPER, CITY CLERK

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Addendum 1

Total discharge to Lake Mead from the Las Vegas Wash is based on estimated average inflows from the sources listed in Table 1 (see attached), (Desert Research Institute (DRI), Project Report No. 19, April, 1972).

Henderson's contribution to the Wash discharge is .10% of the total and approximately .001% of the total discharge to Lake Mead from all sources. Henderson receives its entire municipal water supply from the lake. Analysis of the raw lake water (Southern Nevada Water System Report, 12/4/72) showed a TDS of 776 mg/l. Analysis of effluent from Henderson Domestic Wastewater Treatment Plant No. 2 (BMI) showed a TDS of 840 mg/l (Nevada Testing Laboratories, Ltd. Report 11/21/72). The treatment plant sample data was measured prior to the start of plant restoration work when treatment processing was known to be below expected efficiency. Nevertheless, TDS increase resulting from municipal uses showed only approximately 8.5% rise. This would result in a net annual increased contribution of 159 tons of salt to the Wash discharge with an equivalent increase of .01 ppm TDS at Hoover Dam. If Henderson is allowed to carry out its planned improvements for both plants, these projected figures are expected to decrease. Henderson's contribution to the total salinity of the Wash discharge is obviously insignificant.

The DRI report identifies several principal sources of high salinity as shown in Table 2, which can be effectively corrected without excessive economic stress or technological difficulty.

From Table 2, it is evident that the BMI Industrial Complex is the major contributor to the salt load of the Wash (estimated 11.5 cfs discharge). Retention and evaporation of this effluent in impermeable ponds on-sight could be done without excessive economic stress or technological difficulty.

It is apparent from the Table that the Las Vegas and Clark County Sewage Treatment Plants are next in the order of high saline contributors. The values reported, however, are not representative of the true condition since they show the gross saline content which includes the TDS of the municipal source waters. If it were assumed that the TDS value of the lake waters received for municipal purposes in the City and County areas was the same as that entering Henderson's water system, the true saline contribution of both areas would lower the reported values for the treatment plants nearly 75% and 54% respectively. The salinity increase of Sewage Plant Effluent over Influent is no doubt due in a large measure to increased use of ion exchange type domestic and commercial water desalinization units. Effective ordinances regulating the salinity of discharged waste waters emanating particularly from Commercial Bottled Water Suppliers and Soft

Drink Bottlers could lead to significant improvement in water quality. If requirements regulating the quality of discharged waste waters were set at realistic levels commensurate with the quality of the water received they need only provide for a return quality equal to that of the source. This approach could also be applied to sewage treatment plant effluent to maintain the quality of the discharge at the level of the receiving water thereby preventing saline degradation, if indeed such a condition is proven to exist with respect to these sources.

Of much higher saline content than any municipal source is the apparent ground-water inflow West of Pabco Road (nearly 20% of the total annual load to the Wash). This is a natural source and justifications involving large long-term expenditures for its reduction or elimination are entirely unwarranted when the true condition of the so called "Lake and River Basin degradation" effects by the Las Vegas Wash discharge have not been proven, and while other natural sources of higher saline discharge to Lake Mead are allowed to continue unabated. Similarly, the same considerations apply to the apparent ground-water inflow reported occurring between Pabco Road and the North Shore Road.

The remaining two contributing sources listed in the Table are industrial and public service type operations, other than the

BMI Complex, referred to above, whose combined effluent represents less than 9% of the total. A combination of desalinization and pond-evaporation to an effluent quality equal to that of the receiving water should be considered.

A major cause of high saline concentration in the Wash discharge not shown in tne tables results from the loss of approximately 13.5 cfs of high quality (ion free) water through evapo transpiration (E.T.) from about 2.84 square miles of phraetophyte growth in the lower Wash area. So effective is this biological system that the DRI study says "During the growing season, much of the ground water which would otherwise be transported out of the shallow-flow system via the Wash is lost to the atmospherc by E. T. from plants". The principal plants involved are salt cedar and tules. Gradual elimination of this growth would increase streamflow volume with about 3,184 million gallons of salt-free water annually, equivalent to 20% of the total annual volume discharged to Las Vegas Bay. This saving would have the real effect of reducing the saline concentration of the Wash discharge nearly 17%; a condition which otherwise could be achieved only by the removal of 25,500 tons of salt annually. Continued failure to recognize this situation further results in repeated misleading evaluation of the quality of the discharged waters and interpretations of the causes thereto.

Summary

Approximately 23% of the Wash salt load is from natural sources.

Approximately 21% of the Wash salt load is return flow of salt as the natural content of the source waters.

44% Total from natural sources

Approximately 35% of the Wash salt load is from the BMI Industrial Complex.

Approximately 9% of the Wash salt load is from miscellaneous Industrial sources.

44% Total from Industrial sources.

Approximately 12% of the Wash salt load is contributed by municipal uses.

12% Total from municipal uses.

TABLE 1

Station	Inflow (cfs)	Inflow TDS (mg/l)	Outflow (cfs)
Sunrise Power Generation Station	0.35	2565	
Gravel Pit near Sunrise Station	1.90	5290	
Las Vegas Sewage Treatment Plant	27.27	959	
Clark County Sewage Treatment Plant	12.43	1456	
Clark Power Generation Station	0.41	3480	
Apparent ground-water inflow West of Pabco Road	8.51	2500-4000	
Sub-Total	50.87		
Las Vegas Wash at Pabco Road			50.87
Apparent ground-water inflow between Pabco Road and North Shore Road (includes 2.35 cfs inflow from two Henderson Sewage Treatment Plants)	8.02	Not available[1]	
Plant No. 1 (0.8)		2427[2]	
Plant No. 2 (1.58)		840	
Sub-Total	58.89		
Las Vegas Wash at North Shore Road			58.89

1. Discharged flows in this area represent a non-equilibrium condition of underflow, shallow ground-flow, Henderson municipal and BMI Industrial effluents making quantative identification impossible.

2. Includes ground seepage into interceptor where ground-water TDS showed 8916 ppm (Station LW020 DRI Report) and municipal outfall measured 840 TDS.

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