

GOVERNMENT AFFAIRS COMMITTEE

Minutes of Meeting - February 21, 1977

Present: Chairman Gibson
Senator Foote
Senator Faiss
Senator Gojack
Senator Raggio
Senator Schofield

Also Present: See Attached List

Chairman Gibson opened the fourteenth meeting of the Government Affairs Committee at 2:00 p.m. The first order of business was to go over the new amendments on SB-25.

Frank Daykin stated that this bill now does two things with the previous changes. 1st it removes the requirement of paying taxes from the qualifications of elected officials in city and unincorporated towns. It also removes the requirement of being a registered voter for nonpartisan offices. Both of these changes stem from the supreme court decision.

Chairman Gibson asked Mr. Daykin if research showed that the Boulder City charter could be amended in order to use the above bill and Mr. Daykin stated that it could.

Motion to Amend and Do Pass from Senator Raggio, seconded by Senator Faiss. Motion carried unanimously.

SB-168

Increases number of required reports of candidates' campaign contributions and expenses and lowers threshold of requirement for reporting campaign contributions. (BDR 24-439)

Senator Gojack, one of the main sponsors of the bill, passed out some information that she had obtained on similar bills that have been passed and are being used in other states for the committees consideration. The Senator indicated that this bill has been broken down into three main parts: 1) Lowering threshold from \$500.00 to \$100.00. 2) Requires two more reporting periods. 3) Define in the law when the year begins, as far as campaign expenses are concerned. (See Attachment A)

With regards to the limitations on expenditures on the Governor, Lt. Governor, District Judge, Justice of the Peace it is old language and has been declared unconstitutional. Mr. Daykin noted that he has put in a revisers bill to take out this language.

Secretary of State, William Swackhammer, spoke to the committee on this bill. Mr. Swackhammer feels that the information should be received prior to the election and is in favor of this portion of the bill. The time element causes him some difficulty. Also the addition of two extra reports and lowering the threshold of

reporting campaign contributions will cause their office a great deal of work. Suggested that on line 11 of Section 2, remove the word, "districts". Its to broad a term, would rather have new language listing multi county districts that are to be included in this bill specifically noted. He also suggested moving the place of notification to the district where the candidate is registered. Mr. Swackhammer felt that filing 15 days prior to the election causes severe administrative problems. Going by the post mark date is good for most cases but due to the way the mail system is it can cause some reports to come it about 7 days after the mailing. They can't post that report but it is also working within the law.

Pat Gothberg, Common Cause, had a prepared testimony and read it to the committee. (See Attachment B) Ms. Gothberg is very much in favor of this bill.

Ms. Gothberg felt that their people were interested in getting information on campaign contributions to the people before the election.

Senator Raggio brought up the point of "in kind" contributions that may also carry a burden of obligation without a dollar figure. The type of "in kind" contribution could be far in excess of \$500. or \$100. but how do you take into consideration the types of contributions.

Ms. Gothberg felt that it was a good point, she indicated that she would check with her office and see if this has not come up and been handled in other states.

Robert Guinn, Nevada Motor Transportation Association, felt that lowering the threshold would cause people and companies to drop their campaign contributions to \$100. to remain anonymous. He also felt that "in kind" contributions played a big part in the election of a candidate.

Senator Gojack questioned Mr. Guinn as to any facts that led him to feel that contributors of large groups prefer to remain anonymous and would drop their contributions to \$100. in order to remain that way.

Mr. Guinn stated that he had done no formal research but from his experience he felt that in the business communities many people pull together to give a contribution but as individuals they are kept anonymous.

Senator Hilbrecht gave an example of an individual that helped him in his campaign. Should he put a dollar figure on that help and include it in his expenses even if the service was from a devoted friend?

Bob Broadbent, County Commissioners, felt that if this measure did come to the city clerks and registrars, as was discussed when Mr. Swackhammer testified, it would cause a considerable fiscal impact. They would need to have time to work up the cost involved. Mr. Broadbent indicated that it was their opinion that this should be handled in the Secretary of States office.

Chairman Gibson asked Mr. Broadbent to get the figures necessary so that if the change was made they would be prepared to know the costs involved.

There would be no action on this bill today.

SB-197

Creates office of State Science Adviser. (BDR S-520)

Senator Gojack, co-sponsor, indicated to the committee that as a member of the SCRA study committee she has traveled throughout the state and took testimony from various state agencies, the university and other offices. One of the persons interviewed was Les Burgwardt, Science Advisor to the Governor. He told the committee that his main function was in being able to aid the Governor on scientific educational questions. At this time no funding is provided for the position and it is an appointment from the Governor. Mr. Burgwardt was of the opinion that a person of this position, not the Governor's science advisor, should be advising someone at the State level as to where information can be obtained. He sees the science adviser's position as a bridge between the University and State agencies. He is on the mailing list of a great deal of scientific information but has no way of disseminating this, letting people know what information he has access to, and that his office does exist.

Senator Gojack went on to give further testimony to support this position by noting that there are federal funds available through the National Science Foundation. She further stated that there are 12 to 15 states that now have a science adviser in one form or another. Utah has a Science Counsel with a four year cut-off date. Congress has allotted about \$300 million in matching grants for states to identify ways in which to use scientific and technical information.

Bruce Arkell, Chairman of that Committee and State Planning Coordinator, indicated that the State Science Adviser would be located within his department mainly to give him a home. The two year period would allow the adviser to set up his program in a testing situation. After that period has elapsed they could evaluate the program and make the necessary changes.

Senator Hilbrecht brought up the question of the Science Adviser being chosen from the list of one-year sabbatical applicants.

Senate

There seems to be a conflict as the Governor's budget indicated cutting out sabbaticals.

Bruce Arkell agreed that this did indeed create a conflict. He also noted that he would try and work up the fiscal note with the creation of this position.

Neal Humphrey, Chancellor, University of Nevada, felt that what was proposed was a two year experiment. He felt that the committee misunderstood the Governor's meaning on the sabbaticals. They would be continued but the procedure used would be the same as was used two years ago. The University would absorb the costs. The Board of Regents discussed this bill Friday, 2-18-77, and they are in favor of it.

Senator Raggio asked what effect this bill would have on SB-244.

Senator Gojack anticipated this problem and this is why the bill is before the Legislature as well as the Governor's office.

Chairman Gibson suggested that no action be taken on this bill until the intent on sabbaticals is cleared up.

SB-40

Authorizes division of Colorado River resources to acquire water facilities and complementary electric properties and to issue securities to finance such acquisitions. (BDR S-134)

Don Paff, Director of Colorado River Resources, had prepared his testimony for the committee and passed out copies for their information. (See Attachment C) Also attached but not part of the testimony is a letter from Jack Lehman, Chairman of the Colorado River Advisory Commission.

At the conclusion of his testimony Senator Hilbrecht questioned the deletion of a ceiling on costs. We should try to set some limit to go by.

Don Paff explained that the costs escalate at such an enormous rate that a ceiling is very hard to obtain but that if that was the wish of the committee he would try to work up some figures that would allow for the escalation rates.

Chairman Gibson requested Mr. Paff to go back and bring to the committee some figures of cost so they could set a limit on the bill.

The water district people were not informed as to the contents of Mr. Paff's testimony and therefore had not had time to prepare testimony. Senator Hilbrecht at this point suggested that it be policy to have both the water district people and the Colorado River Resources people mutually informed prior to

the hearing. Chairman Gibson felt that the scheduling of the meeting didn't leave enough time for proper notification and expressed apologies. The next hearing would be scheduled and people notified so that all could be prepared, in approximately two weeks.

AB-52

Repeals bond requirement for director of Nevada Mental health institute. (BDR 39-325)

John Crossley, Deputy Auditor, L.C.B., this is purely a house-keeping bill. In the last session we abolished the bond trust fund and removed the requirement for security bonds for all state officers. We attempted to go through the statutes and bring all of the requirements up to date. We have missed two and cured one already and this bill cures the second one. This now makes all the statutes consistent with one another.

Motion of "Do Pass" by Senator Hilbrecht, seconded by Senator Schofield. Motion carried unanimously.

Senator Hilbrecht felt that this might be put on the noncontest calendar as the decision was made years ago and this is merely a 'clean up' bill.

AB-26

Clarifies provision on expiration of appointments to vacancies in certain county offices. (BDR 20-442)

Bob Barengo, Assemblyman, testified as the sponsor of the bill and indicated to the committee that the language was not clear. The key changes occur in lines 6 and 7. It clarifies that the office is open on the first day of January not the first Monday.

Motion of "Do Pass" by Senator Schofield, seconded by Senator Hilbrecht. Motion carried unanimously.

Chairman Gibson asked for the committee to consider BDR-20-1420 for committee introduction. This came out of SB-30. County Sewage and Waste Water law. Because of technicalities the three low bids could be objected to, also going to the fourth lowest bid could cost the tax payers a great deal of extra money. Frank Daykin worked this up to cure the problems in SB-30.

Motion to introduce from the committee by Senator Foote. There was no objection to this motion.

With no further business the meeting was adjourned at 4:00 p.m.

Approved:

James D. Gibson

Respectfully submitted, *Jan Peck*
Janice M. Peck, Committee Secretary

Senate

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7/1/88

Alabama Alaska Arizona Arkansas California Colorado Connecticut Delaware D.C. Florida

<u>Threshold:</u>	10 ⁰⁰	100 ⁰⁰	25 ⁰⁰	250 ⁰⁰	50 ⁰⁰	100 ⁰⁰ in kind 25 ⁰⁰	15 ⁰⁰	100 ⁰⁰	50 ⁰⁰	any contr. must be itemized
<u>Filing:</u>	30 after —	30 before 10 after	10-15 before —	25 before 30 after	40 before 60 after	11 before 30 after	21 before 45 after	by 12/31 before 4 after	15 before —	40 before 45 after

Georgia Hawaii Idaho Illinois Indiana Iowa Kansas Kentucky Louisiana Maine

<u>Threshold:</u>	101 ⁰⁰	100 ⁰⁰	50 ⁰⁰	150 ⁰⁰	each must be listed	different limits for diff. office	100 ⁰⁰	100 ⁰⁰	state 100 ⁰⁰ district 500 ⁰⁰	50 ⁰⁰
<u>Filing:</u>	15 before by 12/31 after	10 before 20 after	40-30 before 30 after	15 before 90 after	— 45 after	— —	7 before 10 after	32 before 30 after	10 before 30 after	7 before 45 after

Maryland Massach. Michigan Minnesota Mississippi Missouri Montana Nebraska Nevada New Hampshire

<u>Threshold:</u>	not specified	15 ⁰⁰	200 ⁰⁰	50 ⁰⁰	500 ⁰⁰	25 ⁰⁰	25 ⁰⁰	100 ⁰⁰	500 ⁰⁰ currently	each contri.
<u>Filing:</u>	7 before 30 after	8 before 1/10 follow year after	10 before 20 after	8 BE 10 AF	3 BE —	40 BE 30 AF	50 BE 20 AF	15 before 20 after	30 AF gen. 15 AF prim.	5 before 10 after

Continuation for 4/B 168.

	New Jersey	New Mexico	New York	North Carolina	North Dakota	Ohio	Oklahoma	Oregon	Pennsylvania
<u>Threshold:</u>	100 ⁰⁰	All	All	50 ⁰⁰	none	All	200 ⁰⁰	100 ⁰⁰	150 ⁰⁰
<u>Filing:</u>	25 before 15 after	— 10 after	25 before 20 after	10 before 10 after	none none	12 before 45 after	10 before 40 after	30 before 30 after	— 30 after
	Puerto Rico	Rhode Island	South Carolina	South Dakota	Tennessee	Texas	Utah	Vermont	Virginia
<u>Threshold:</u>	All	200 ⁰⁰	All	100 ⁰⁰	100 ⁰⁰	50 ⁰⁰	All	25 ⁰⁰	100 ⁰⁰
<u>Filing:</u>	— 30 after	30 before 30 after	no limit 7 before 10 after	7 before until 12/1	8 before 30 after	30 before 30 after	5 before 12/1 after	40 before 10 after	5 before 30 after
	Washington	West Virginia	Wisconsin	Wyoming	United States				
<u>Threshold:</u>	10 ⁰⁰	250 ⁰⁰	20 ⁰⁰	All	100 ⁰⁰				
<u>Filing:</u>	19 before 20 after	10 be. 30 after	14 before 30 after	— 10 after	10 before 30 after				

ALABAMA

Threshold: Include names of contributors of more than \$10 and the amount given by each, gifts and loans too.
Filing: Finance Reports due within 30 days after election.

ALASKA

Threshold: Over \$100 - name, address, occupation and employer of contributor. Date and amount of contribution.
Filing: 30 days before election
1 week before
10 days after

ARIZONA

Threshold: Over \$25 - Itemized account
Filing: General election - Not more than 15 nor less than 10 days before election.

ARKANSAS

Threshold: Over \$250 - itemized list of contributors.
Filing: Not less than 25 days before each election.
Not less than 7 days.
Final report no later than 30 days after
Supplemental Report if received after.

CALIFORNIA

Threshold: Broken down to under and over \$50. Over \$50: Itemized, name occupation, employer or name of business.
Filing: Due not later than 40 and 12 days before an election and 65 days after.

COLORADO

Threshold: \$100 in-kind contributions) name, address,
\$ 25 contributions) and date
Filing: 11 days before and 30 days after each election.

CONNECTICUT

Threshold: Name and address of each contributor and amount.
Those under \$15 may be grouped together.
Filing: Second Tuesday of January, April, July, September.
30th and 7th day before election.
45 days following an election.

DELAWARE

Threshold: Over \$100 - name and address, date and amount
Filing: 20 days before election
By December 31 of year following.
By December 31 after election.

DISTRICT OF COLUMBIA

Threshold: \$50 or more - name, address, amount
Filing: During Election year March 10, June 10, August 10,
October 10, December 10.
15 days before election.
5 days before election.

FLORIDA

Threshold: Any contribution must be itemized.
Filing: 40th day before election.
45 days after election.

GEORGIA

Threshold: \$101 or more - list name, etc.
Filing: 45 and 15 days before - 10 after primary
15 days before general
After - December 31 of election year.

HAWAII

Threshold: More than \$100.
Filing: 10th day before each election.
20th day after.

IDAHO

Threshold: Listing of contributors giving over \$50.
Filing: 40-30 days before.
14-7 days before
Cumulative report 30 days after.

ILLINOIS

Threshold: More than \$150.
Filing: No later than 15th day before.
No later than 90th day after.

INDIANA

Threshold: Amount of each contribution and name.
Filing: 45 days after each election.

IOWA

Different limit for different offices.
Filing: January 20, May 20, July 20, October 20.

KANSAS

Threshold: Over \$100 - Name, amounts, date
Filing: 7th day before primary.
10th day after primary.
7th day before general.
December 3 of every year.

KENTUCKY

Threshold: More than \$100 - amount, date, name, address,
occupation.
Filing: From campaign treasurers:
32nd day before election
12th day before
30 days after

LOUISIANA

Threshold: Statewide \$100)
District \$500) Name, address and amount
Other \$250)
In-kind contribution, too.
Filing: 10th day prior
30 days after

MAINE

Threshold: Name and address of each donor of \$50 or more.
Filing: 7th day before (completed on 11th)
45 days after election.

MARYLAND

Threshold: Not specified.
Filing: 7th day before
30th day after

MASSACHUSETTS

Threshold: \$15 or more - names and addresses
Filing: State Senate and House
8th day before
January 10th - following year

MICHIGAN

Threshold: Name and address of all contributors.
Over \$200 - include occupation and place of
business.
Filing: 10th day before
20th day after

MINNESOTA

Threshold: Over \$50 - legislative candidates and \$100 for
statewide - Name, address, employer, and occupation.
Filing: 8 days before
No later than 10 days after.

MISSISSIPPI

Threshold: List of contributors of \$500 or more for state
and district candidates.
County - \$100 or more
Filing: 5th day of each month of campaign
Saturday before each election

MISSOURI

Threshold: More than \$25.
Filing: 40 days before
7 days before
30 days after

MONTANA

Threshold: \$25 or more - name, address, occupation
Filing: March 10 and September 10 of each election year
15th and 50th day before each election
20 days after election

NEBRASKA

Threshold: Over \$100
Filing: 15 days before
5 days before
20 days after

NEVADA

Threshold: Over \$500.
Filing: 30 days after general
15 after primary

NEW HAMPSHIRE

Threshold: Name, address, amount of each contributor.
Filing: Wednesday before primary and general
2nd Friday after primary and general

NEW JERSEY

Threshold: Over \$100
Filing: 25 days before election
7 days before
15 days after

NEW MEXICO

Threshold: List of contributions and names
Filing: 10 days after primary and general

NEW YORK

Threshold: Name and amount of those who contributed
Filing: 25th and 10th day before
20th day after

NORTH CAROLINA

Threshold: Over \$50
Filing: 10 days before primary - 10 days after
10 days before general - 10 days after

NORTH DAKOTA

No campaign finance reports

OHIO

Threshold: List all contributors, amounts, date
Filing: 12 days before
45 days after

OKLAHOMA

Threshold: Over \$200
Filing: 10 days before primary and general
40 days after general

OREGON

Threshold: Statewide \$100, other \$50
Filing: Between 30 and 21 days before
12 - 7 days
30 days after

PENNSYLVANIA

Threshold: Over \$150
Filing: 30 days after

PUERTO RICO

Threshold: All contributions
Filing: 30 days after (Contributions over a specified amount - \$500 - received a short period before election must be reported 48 hours after receipt.)

RHODE ISLAND

Threshold: Over \$200 - name and address
Over \$25 - just list contributions
Filing: 30 days before and 30 days after

SOUTH CAROLINA

Just expenditures before and after election.

SOUTH DAKOTA

Threshold: \$100 or more - name, address, occupation
Filing: 7 days before
Within 30 days of the close of calendar year.

TENNESSEE

Threshold: More than \$100.
Filing: 8 days before
30 days after

TEXAS

Threshold: Over \$50 - list name, address, amount, etc.
Filing: 30 days before
7 days before
30 days after

UTAH

Threshold: Itemize all contributions and those who gave
Filing: 5 days before
December of election year.

VERMONT

Threshold: \$25 or more - list everything
Filing: 40 days and 10 days before
10 days after

VIRGINIA

Threshold: Over \$100 - name and address
Over \$500 - occupation and business
Filing: 5 days before
30 days after

WASHINGTON

Threshold: Over \$10 - list name, address, date and amount
Filing: 5th and 19th day prior to an election
10 days after primary
20 days after general

WEST VIRGINIA

Threshold: More than \$250
Filing: 5 and 10 days before
30 days after

WISCONSIN

Threshold: Over \$20 - name and address
Over \$100 - occupation and place of business
Filing: Between 8 and 14 days before
Between 21 and 30 days after

WYOMING

Threshold: All contributions and name of contributors
Filing: 10 days after each election.

UNITED STATES

Threshold: Over \$100 - name, address, occupation, place of
business.
Filing: Not later than 10 days before
Not later than 30 days after



NEVADA

February 21, 1977
Testimony before the Senate Government Affairs Committee
by: Pat Gothberg , CC / Nevada
Re: SB 168

Why do citizens ask for campaign reform? What are the objectives behind requiring that candidates file expenditure and contribution reports prior to election day? Common Cause members believe firmly that in order to once again capture the public trust and confidence, our local, state, and federal governments must stand up and be counted on behalf of open and accountable government. 45 out of 50 states, including Nevada, have enacted campaign reform measures, in varying degrees of severity since November, 1972. We do not believe that candidates for office should be overburdened unnecessarily. We do feel that the changes proposed in SB 168 are realistic in relation to the citizens right to know. The concept of pre-filing of contributions and expenditures is not a new one. By way of an update over the past 4 years:

- In 1974, Alaska passed a law to require pre and post-election reports.
In 1974, Arizona passed a law requiring pre-election campaign reports.
In 1975, Arkansas passed a law requiring reports of expenditures and contributions.
In 1974, California voters approved Prop. 9 which, among other things, requires full disclosure of campaign expenditures and contributions.
In 1974, Colo. passed a law requiring pre-election reports.
In 1975, Conn. law was amended to require new and more frequent reporting - pre as well as post election.
In 1974, Delaware enacted its first campaign financing law - pre-election filing is part of that law.
In 1974, the District of Columbia enacted a Campaign Finance Reform and Conflict of Interest Act, periodic reports must be made of contributions and expenditures.
In 1973, Florida enacted legislation which included disclosure of campaign contributions and expenditures.
In 1974, Georgia passed a law requiring pre and post-election contribution and expenditure reports.
Hawaii has been upgrading its 1973 campaign finance legislation.
In 1974, Idaho voters approved an initiative to require pre and post-campaign disclosure.
In 1974, Illinois passed its first campaign financing law - pre filing was included.
Iowa has been upgrading its campaign financing law since it was passed in 1973.
In 1976, Indiana enacted a campaign financing law that includes pre-election disclosure.
In 1974, the Kansas legislature revised the state's campaign financing law to provide for pre-election reporting.
In 1974, Kentucky tightened its campaign financing law.
In 1975, Louisiana passed a law to require pre and post election reports.

In 1974, Maine decided to start requiring pre-election reports.

In 1974, Massachusetts voters strengthened their law which requires pre-election expenditure and contribution reports.

In 1976, Michigan passed a law which includes pre-election reporting.

In 1974, Missouri voters approved a campaign financing initiative.

In 1975, Montana enacted a comprehensive campaign financing package, including pre and post-election disclosure.

Current Nebraska law requires 2 pre-election campaign financing reports and 1 post-election report disclosing all contributions over \$100.00.

In 1974, No. Carolina's General Assembly enacted a law requiring pre-election reporting.

In 1974, Ohio started requiring pre-election reports.

In 1974, Oklahoma enacted a law requiring pre-election reports.

In 1974, Rhode Island's first campaign financing law required pre and post-election reports.

In 1975, So. Dakota required pre and post-election disclosure.

In 1975, Tennessee passed a law - pre-election reports and disclosure of contributions are required.

In 1973, Texas enacted a law requiring campaign finance disclosure. That law was upgraded in 1975.

In 1976, Vermont's new law required 2 pre-election reports and disclosure of contributions over \$25.00.

In Virginia, last year, additional legislation required one more pre-election report.

In 1972, Washington voters passed an open government initiative encompassing, among other things, campaign finance disclosure.

Much public sentiment in Nevada is that we, too, should join this list of states who, as represented in their re-evaluation and upgrading of campaign laws, recognize that an informed voter is the best kind of voter.

An editorial in the L. V. Sun, on Sunday, Nov. 7, 1976, said, "Under the present law, contributions and expenditures are reported 15 days after the primary and 30 days after the general election, which means the voters become aware too late that a candidate has incurred some heavy obligations to moneyed interests while traipsing down the campaign trail.

"The laws must be revised to require listing of all contributors who give more than say \$100.00, as opposed to the more than \$500.00 now, and to provide that preliminary reports be filed prior to the balloting."

On January 9, 1977, the Political Front column in the Nevada State Journal dealt in part with amounts spent in Nevada Senate and Assembly races in 1976 as reported by Secretary of State Swackhamer. After giving the average amounts spent by both winners and losers, the article goes on to say "The figures show that money counts ... "In all, Swackhamer's report is an invaluable reference, particularly for those persons who are still not convinced campaign reporting laws are needed. One may not enjoy seeing the role the money plays in an election but it's better to be exposed than hidden."



NEVADA

In the Review Journal, October 30, 1976, an article entitled "Campaign Spending Reform Urged", dealt with the subject of prosecution of violators of the law. Assemblyman Demers, the then chairman of the Assembly Elections Committee said, "When the people are seeking the public trust, the voters should know if they have violated the law before the election".

As I have talked with our Nevada members, it has become clear to me that not only do they want to know what kind of money is involved before election day, but they also feel that the \$500.00 threshold is too high. Recognizing that there are arguments on all sides of this question, it is our stand that the \$100.00 threshold is more responsible. This would be lowered but not to an extreme such as the \$10.00 limit in the state of Washington.

We would also ask that you consider changing the location for filing reports from the Secretary of State office in Carson City to the county seat where the candidate filed for office, thus making the information more readily available to the media and the public.

(As a matter of point, there appear to be parts of section 4 and section 6 which should be removed as a result of the court decision against setting limits on campaign expenditures.)

Common Cause members are watching, with interest, in the anticipation of your responsible action on SB 168. We urge your support of this measure.

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF COLORADO RIVER RESOURCES

Testimony regarding Senate Bill 40 - Senate Committee on Government Affairs
February 21, 1977

Mr. Chairman and members of the Committee, my name is Don Paff. I am the Administrator of the Division of Colorado River Resources. My testimony today relates to Senate Bill No. 40.

SB 40 is an amendment to Chapter 482, Statutes of Nevada 1975. Chapter 482 authorizes the Division to acquire the State and Federal facilities comprising the Second Stage of the Southern Nevada Water System. The 1975 Act further authorizes the Division to borrow money, pursuant to the State Securities Law, and otherwise become obligated up to \$60 million for the State facilities and up to \$60 million for the Federal facilities. Authorization to issue State securities for the Federal facilities is a back-up position only.

Under Public Law 89-292 the U. S. Bureau of Reclamation is authorized to fund, construct and acquire the Federal facilities and contract with the Division to repay the reimbursable costs over a 50 year period. State securities would only be issued for the Federal facilities if Congress failed to allocate or appropriate funds, or if the remaining authorized Federal funding is insufficient to complete the Federal facilities.

SB 40 accomplishes 4 main objectives:

1. Expands the definition of authorized acquirable properties to include electric transmission facilities and related appurtenances.

2. Defines and identifies the State and Federal facilities respectively by reference to the Division's pre-design report for the Second Stage of the Alfred Merritt Smith Water Treatment Facility and the Bureau of Reclamation's Second Stage Definite Plan Report.
3. Distributes the authorized funding for State facilities from a total of \$60 million for the State facilities to \$5 million for electric properties and \$55 million for the other State facilities.
4. Changes the authorized back-up and supplemental funding authorization for the Federal facilities from \$60 million to the amount needed to acquire the Federal facilities defined and identified in the Bureau's Definite Plan Report. The amendment still reduces the Division's Federal facilities funding authorization by the amount funded by the U. S. Government.

Chapter 482, Statutes of Nevada 1975 was drafted in 1974 when Stage 2 planning was in the embryo stage. The facilities and design criteria were not well defined and only crude estimates of cost were available. We now know additional electric transmission lines and reconductoring of existing Nevada Power Company distribution lines will be necessary. This prompted the inclusion of the definition of electric properties and authorized funding therefor.

The scope of the Second Stage of the system and general description of included facilities are now well defined. Although the \$60 million authorized by Chapter 482 for State facilities still appears to be adequate in total, this amendment identifies \$5 million for the added electric properties and \$55 million for the remaining State facilities. We currently estimate the cost of those facilities to be \$1.8 million and \$28.4 million respectively,

(in 1976 dollars) excluding interest during construction. Even with conservative estimates of escalated construction costs and interest during construction, I believe these authorized funding limits are adequate. We do not expect to expend the full authorization as was the case in the now-existing First Stage.

The \$60 million Federal facilities back-up and supplemental authorization estimated in 1974 is now known to be inadequate. Federal facilities cost in 1976 dollars are estimated at \$109.9 million excluding interest during construction. Remaining authorized Federal funding falls about \$21.8 million short of meeting this total. The Division must supplement or cause the Federal funding to be supplemented by this amount and be prepared to fund the balance as a back-up if Federal appropriations are not realized. Since these estimates are all in 1976 dollars, the actual costs and authorized Federal funding availability will undoubtedly be higher due to escalation. Rather than specify an authorized amount in the bill the amendment allows the Division to supplement or back-up Federal appropriations in the amount necessary to complete the Federal facilities to the extent and in the manner delineated in the existing Definite Plan Report prepared by the Bureau. The Division's funding authorization is reduced by the amount funded by the U. S. Government through existing or supplementary authorization or grants.

Mr. Chairman and Committee members, that concludes my testimony relative to SB 40 as introduced. I have prepared an amendment to SB 40 that I would like to introduce and discuss at this time. However, if you wish, I would be pleased to answer any questions regarding my testimony at this point, or I can proceed. The amendments I wish to present do not suggest any changes in SB-40 as introduced, but recommends the addition of directly related subjects.

We have attached our recommended amendments to this testimony. They relate to the contractual relationship between the State, acting through the Division, and each of the water users consisting of the cities of North Las Vegas, Boulder City and Henderson, and the Las Vegas Valley Water District. These contracts and the contract between the State, acting through the Division, and the United States, must be executed before construction of the Second Stage can start.

The contract between the State and the United States is, for all practical purposes, in final draft form. We currently anticipate no problems in its final processing and execution. Contracts with the Water Users for Second Stage facilities have been in the negotiation stage now for some 8 months. The contracts are in final form except for 3 points in which disagreement remains without any apparent current resolution. The proposed amendment to SB 40 is offered now by the Division to clarify legislative intent, and direct the Division and the water-using governmental subdivisions on the contractual terms that must be included for any entity wishing to participate in the Second Stage on 2 of the 3 points of disagreement.

The points of contention covered in the amendment to SB 40 and my testimony in support thereof are:

1. Method of allocation of debt and reserve repayment to the water users. Debt amortization of Stage 1 is borne by each user on the basis of each user's contracted proportional share of First Stage water entitlements. Nellis Air Force Base prepaid its share of the Federal facilities cost so it is excluded from that portion of the debt repayment.

2. Method of allocation of operation and maintenance expenses to the water users.
3. The method of addressing in the contract the 1975 legislative action in SB-501 regarding the future responsibilities of the Las Vegas Valley Water District.

Our proposed amendments address only the debt, reserve and operations and maintenance issues. The method of addressing SB-501 appears, most recently, to be coming to a posture of resolution.

In the Division's first draft contract submitted to the water users for their consideration in June, 1976, we proposed the following criteria relative to the three issues:

1. The repayment of all capital costs be allocated on the basis of combined first and second stage costs and water allocations.
2. The operation and maintenance costs be allocated on the basis of water used for the entire system.
3. The 1975 Legislative Act relating to the responsibilities of the Las Vegas Valley Water District relative to the Southern Nevada Water System be cited in its entirety in the water user contracts.

Our proposal in the first draft contracts was not prepared on numerical evaluations alone pertaining to the capital repayment and operation and maintenance. Included in our evaluations were the following concepts:

1. It is impossible to achieve an absolute equity in unit costs among each of the water users although our proposed method achieves such equity over the long term.
2. The independent management authorities and responsibilities of the water users can create financial anomalies which again are erased in the long term of the system.
3. The disparities of location, required facilities and projected water usage, both instantaneous and annual, can best be addressed by the method we propose.
4. The first and Second Stage works are physically and cost inter-related and are considered as a single regional water supply system.

During contract negotiations two different methods of allocating debt repayment, sometimes referred to as capital cost, were discussed. One method is to combine the capital cost of Second Stage with the remaining capital cost of the First Stage, at the time Second Stage is operational, and allocate this combined cost on the basis of total water contracted by each user in both stages. The other method is to keep both stages separate and allocate the capital cost of each stage on the basis of water contracted for in each stage.

The total capital cost obligation of each user differs substantially, depending upon which method of allocation is applied. The differences occur because the users contract for differing amounts of their total entitlement in each stage, and Second Stage is expected to cost over 3 times as much as the First Stage due primarily to construction cost escalation.

Those users in favor of the allocation on the separate basis argue that each user should pay for its share of annual water delivery capacity constructed in each stage separately.

These users in favor of allocation on the combined projects basis argue the project has always been considered a single project and since they do not need the Second Stage for several years, they suffer economic penalties through the earlier construction to meet the needs of users favoring the other method of allocation.

We proposed and still support the concept of a single project built in 2 stages rather than 2 separate projects. It should be pointed out some of the First Stage construction was to accommodate Second Stage such as oversizing the River Mountain tunnel and intake facilities. Expansion of the treatment plant in the Second Stage will include facilities such as flocculation basins that will be used to treat water delivered through the existing First Stage as well as Second Stage facilities.

We also strongly believe the approach towards equity in unit costs or "postage stamp" concept established and agreed to in the First Stage should be continued in the Second Stage. This concept results in each user paying

the same cost per unit of project water whenever water deliveries are in the same ratio as total contracted annual water entitlements. Each user has other sources of water in addition to project water and internal management decisions as well as total water needs have historically resulted in project water usage ratios differing from contracted water ratios and this is likely to continue for some time in the future.

Proponents of the separate projects allocation basis will probably contend, as they have maintained during contract negotiations, that the "postage stamp rate" concept should be abandoned and each user should repay the capital cost of each stage separately on the basis of annual delivery capacities available to each user from each stage. In other words, they will say that the cost to serve each user should be the sole basis of determining cost allocations. We and several other of the water users do not agree.

The proposed amendments to SB 40 conform to the viewpoints I have presented thus far, that it is the intent of the Legislature to continue the postage stamp rate concept in Second Stage and that anyone wishing to contract with the Division for Second Stage water must agree to the allocation of capital costs and required reserves on the combined projects basis.

Both First and Second Stage Federal and State facilities require that certain reserves be established and maintained by the Division for payment of operation and maintenance expenses during emergencies or periods of inadequate revenues,

and for major repairs or replacements or capital improvements or additions. These reserves are established and maintained through monthly charges to the users. Our recommended amendments result in a procedure in the allocation of reserve funds in a similar manner as that for the capital repayment, that is on a combined basis proportional to each users contractual share of the total water in both the first and second stage facilities.

Operation and Maintenance (O&M) expenses of both the first and second stages would be paid by each water user, if the proposed amendment is adopted, on the basis of the proportionate amount of water delivered to each user annually. This is the basis used presently for first stage in accordance with the first stage user contracts. An alternate method of allocating O&M expenses has been suggested. That method separates O&M into fixed and variable components, and allocates the fixed component on the basis of annual contracted water ratios and the variable component on the basis of annual water delivered ratios. We oppose this alternate method because it violates the postage stamp concept and does not result in a uniform unit O&M cost to all users as does the method proposed in the amendment to S.B. 40. It also changes a basic criteria established in the first stage contract negotiations, after considerable bargaining and compromises.

Mr. Chairman and members of the Committee, the subject of these contract arrangements is somewhat complex and detailed. A large number of discussions have been held and there has been a great quantity of numeric evaluations made as to the implication on each of the water users.

Included in the REFERENCE DATA, which we also distributed with our testimony, is a summary of the factors and numbers relating to the two basic approaches for capital and reserve allocation among the water users.

The basis for our recommending your action on the amendments is as follows:

1. The State is the contracting party and is responsible for all repayments pertaining to both the First and proposed Second Stage facilities.
2. Notwithstanding the current contract legal question before the Attorney General, it appears there will not be agreement among the parties to the water user contracts.
3. The consequence of further delay of the very ambitious schedule of activities leading to delays in completion of the Second Stage will have economic and water supply reliability impacts which may vary among the water users but probably would be negative in some way to each.

Mr. Chairman and members of the Committee, that concludes my testimony.

I would be pleased to answer any questions you may have.

PROPOSED AMENDMENTS TO SENATE BILL NO. 40

EXPLANATION - Underlined matter is new; matter in brackets [] is material to be deleted.

S.B. 40 is hereby amended as follows:

Sec. 4. Section 8 of the above - entitled act, being chapter 482, Statutes of Nevada 1975, at page 758, is hereby amended by adding thereto new subsections 4 and 5 to Section 8, which shall immediately follow subsection 3 under said Section 8, and shall read as follows:

4. It is the intent of the legislature to ensure that all water users experience equal annual unit costs for project water delivered through the facilities authorized by chapter 268, Statutes of Nevada 1967 and chapter 482, Statutes of Nevada 1975 at such times as the users' annual water delivery ratios are equal to the maximum annual water delivery entitlement ratios; notwithstanding the realization that said unit costs will vary among users if the aforementioned ratios vary, and that internal management policies of the users may result in varying unit costs to the ultimate consumer of this project water.

5. To implement the intent of subsection 4 of this section, the division is authorized and directed to provide in all agreements executed subsequent to those agreements indicated in Subsection (2) hereunder with users of the water delivered through the facilities authorized in this act and chapter 268, Statutes of Nevada 1967, that:

(a) the cost to the division of amortizing all debt incurred pursuant to chapter 268, Statutes of Nevada 1967 shall be allocated to, and paid by, each water user in accordance with existing contracts with the General Services Administration for Nellis Air Force Base dated January 8, 1969 and with all other users dated August 25, 1967, until payments commence on the debt incurred pursuant to this act;

(b) the cost to the division of amortizing all debt incurred pursuant to chapter 268, Statutes of Nevada 1967 and this act after payments commence on the debt incurred pursuant to this act shall be allocated to, and paid by, each water user, excluding Nellis Air Force Base whose proportionate share of the federal facilities are prepaid, on the basis of the ratio that each users' total maximum annual water entitlement bears to the total of all annual water entitlements deliverable through the facilities authorized by both acts referred to in this paragraph;

(c) the cost to the division of establishing and maintaining all reserve funds required and permitted by the bond resolutions and contracts evidencing the debt incurred pursuant to chapter 268, Statutes of Nevada 1967 and this act shall be allocated to, and paid by, each water user in the same ratio and during the same periods of time as specified in subsections 5(a) and 5(b) of this act, except that Nellis Air Force Base shall not be excluded as stipulated in subsection 5(b);

(d) the annual cost to the division of operating and maintaining the facilities authorized by chapter 268, Statutes of Nevada 1967 and this act shall be allocated to, and paid by, each water user, including Nellis Air Force Base, on the basis of the ratio that each water users' annual water deliveries bears to the total annual water deliveries to all water users.

Sect. [4] 5. The title of the above-entitled act, being chapter 482, Statutes of Nevada 1975, at page 758, is hereby amended to read as follows:

An Act relating to certain water services and facilities and electric properties complementary thereto; supplementing chapter 268, Statutes of Nevada 1967; authorizing the acquisition of certain water service facilities, properties appurtenant thereto and electric

works, properties and appurtenances complementary thereto, and the issuance of bonds and other securities by the State of Nevada, acting by and through the division of Colorado River resources of the state department of conservation and natural resources; relating to the construction, other acquisition, equipment, operation, maintenance, improvement and disposal of properties appertaining to such facilities and properties; otherwise concerning such securities, facilities and properties, and revenues, taxes, pledges and liens pertaining thereto by reference to the State Securities Law; and providing other matters properly relating thereto.

Sec. [5] 6. This act shall become effective upon passage and approval.

SECOND STAGE SOUTHERN NEVADA WATER SYSTEM

REFERENCE DATA

Senate Government Affairs Committee
February 21, 1977

- A. Southern Nevada Water Project, Second Stage (Map)
- B. Alfred Merritt Smith Water Treatment Plant
State II Expansion - Predesign Report (Summary)
- C. Southern Nevada Water Project, Second Stage
Definite Plan Report (Summary Sheets)
- D. Southern Nevada Water System, Summary of Concepts and
Numeric Evaluations Regarding Proposed Water User Contracts
DCRR 2/2/77
- E. Southern Nevada Water System
Presentation to Water User Meeting January 24, 1977
DCRR Revised 1-24-77

SEE SECRETARY'S MINUTE BOOK FOR ABOVE DATA.



MIKE O'CALLAGHAN
GOVERNOR

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES

P.O. Box 19090
LAS VEGAS, NEVADA 89119
TELEPHONE (702) 733-7755

February 18, 1977



DONALD L. PAFF
ADMINISTRATOR

Senator James I. Gibson
Chairman
Government Affairs Committee
Nevada State Legislature
Carson City, Nevada 89710

Subject: Colorado River Advisory Commission
Resolution 77-1

Dear Senator Gibson:

Transmitted herewith is our Resolution 77-1 unanimously adopted by the Colorado River Advisory Commission on February 10, 1976 regarding the Second Stage of the Southern Nevada Water System. Our resolution is in support of Senate Bill 40 which makes necessary modification to Chapter 482; 1975 legislature. SB-40 is now before the 1977 legislature.

The resolution also indicates our wish that the legislature assist in the early resolution of the current disagreements as to the contract terms of the financial participation in the Second Stage facilities by the water user entities.

We request that you distribute copies of this resolution to your committee members and make it a part of any hearing record relating to SB-40.

Best personal regards,

Jack Lehman, Chairman
Colorado River Advisory Commission

Attachment

77-1 Resolution

COLORADO RIVER ADVISORY COMMISSION

WHEREAS, the Division of Colorado River Resources pursuant to NRS 538.041 - 538.251 has the responsibility of the Southern Nevada Water System; and

WHEREAS, it is essential to the welfare of the residents of Clark County that the Second Stage of the Southern Nevada Water System not suffer any delay in planning and construction; and

WHEREAS, SB-40 is identical in concept to Chapter 482 Statutes of Nevada 1975, it provides for additional authorization and funding allocations to conform to the Federal and State studies completed since 1975 relating to Second Stage estimated costs and required facility acquisitions; and

WHEREAS, SB-40 decreases the authorized borrowing for the State facilities by \$5,000,000 and adds authorization to borrow \$5,000,000 to acquire the electric transmission works; and

WHEREAS, SB-40 modifies the borrowing authority and allows for the states participation in the Federal facilities a funding capability in reserve for the Federal facilities upon exhaustion of the Federal funding or secession in Federal appropriations or allocations.

WHEREAS, authorized unresolved contractual issues between the State and various entities in Clark County exist in the area of repayment of capital cost, operation and maintenance, and sections of SB-501 relating to responsibilities of the Las Vegas Valley Water District.

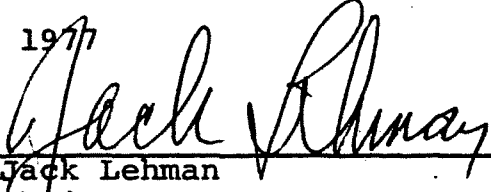
NOW, THEREFORE, BE IT RESOLVED, that the Colorado River Advisory Commission endorses Second Stage activities as now undertaken by the Division of Colorado River Resources; and

BE IT FURTHER RESOLVED, that SB-40 be amended to address the currently unresolved contractual issues between the State and various entities in Clark County; and

BE IT FURTHER RESOLVED, that the Colorado River Advisory Board urges the Senate and Assembly Committees on Government Affairs to take the earliest possible action on SB-40 with required amendments; and

BE IT FURTHER RESOLVED, that copies of this resolution be forwarded to the Governor, Senate and Assembly Government Affairs Committees.

Unanimously adopted February 10, 1977



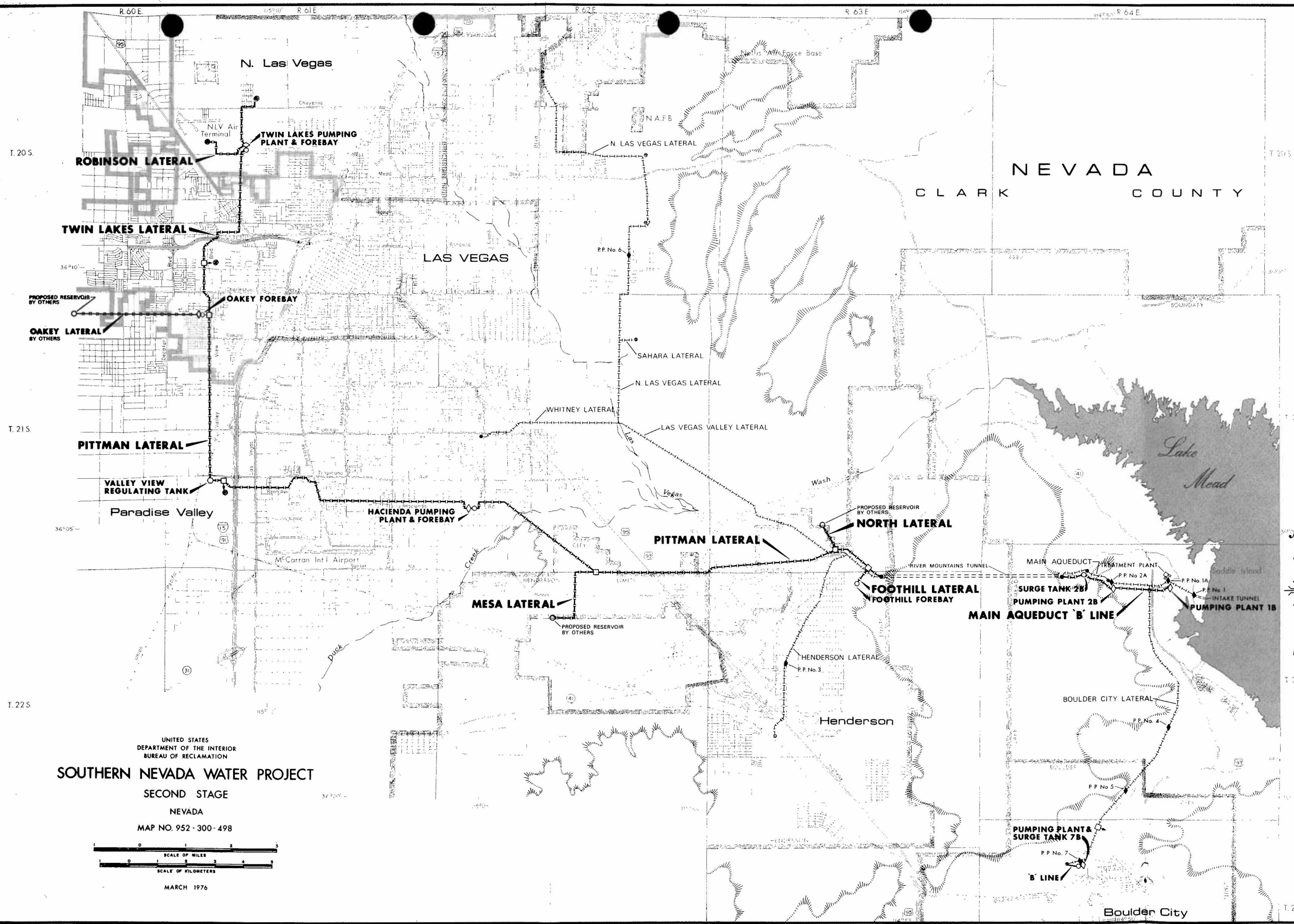
Jack Lehman
Chairman
Colorado River Advisory Commission

Date: 2-18-77

AGENDA FOR COMMITTEE ON GOVERNMENT AFFAIRS

Date 2-21-77 (Monday) Time 2 PM Room 243

Bills or Resolutions to be considered	Subject	Counsel requested*
SB-168	Increases number of required reports of candidates' campaign contributions and expenses and lowers threshold of requirement for reporting campaign contributions. (BDR 24-439)	Yes
SB-197	Creates office of State Science Adviser. (BDR S-520)	
ADDED TO AGENDA		
SB-40	Authorizes Division of Colorado River Resources to acquire water facilities and complementary electric properties and to issue securities to finance such acquisitions. (BDR S-134)	
AB-26	Clarifies provision on expiration of appointments to vacancies in certain county offices. (BDR 20-442)	
REVISED - ADDED TO AGENDA EFF. 2-18-77 (4 PM)		
AB-52	Repeals bond requirement for Director of Nevada Mental Health Institute. (BDR. 39-325)	



EXPLANATION

	EXISTING	PROPOSED SECOND STA.
PIPELINE	—+—+—	—+—+—
PUMPING PLANT	◆	◇
FOREBAY or SURGE TANK	●	○
RESERVOIR	○	○
BIFURCATION or TURNOUT	—+—+—	—+—+—
REGULATING TANK	●	○
NON-USBR WORKS		
PIPELINE	—+—+—	—+—+—
RESERVOIR	○	○

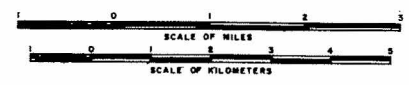
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SOUTHERN NEVADA WATER PROJECT

SECOND STAGE

NEVADA

MAP NO. 952-300-498



MARCH 1976



T. 225

T. 235

ALFRED MERRITT SMITH WATER TREATMENT PLANT STAGE II EXPANSION PRE-DESIGN REPORT (SUMMARY)



ALFRED MERRITT SMITH
WATER TREATMENT PLANT
STAGE II EXPANSION
PRE-DESIGN REPORT
(SUMMARY)



DIVISION
OF
COLORADO RIVER
RESOURCES

Boyle-Carollo
Engineers
July 1976

246

FOREWORD

The Southern Nevada Water System diverts Colorado River water from Lake Mead and delivers a treated potable water to the Las Vegas Valley Water District, North Las Vegas, Henderson, Boulder City, and Nellis Air Force Base for municipal and industrial use. Projections indicate that the first stage Southern Nevada Water System capacity of 132,200 acre-feet per year will be inadequate to meet the needs of the system in the early 1980's. Consequently, the second stage is being planned for an additional capacity of 166,800 acre-feet per year. The first stage allocations and options for second stage water among the contractors are shown in Table 1 in the Appendix to this Report.

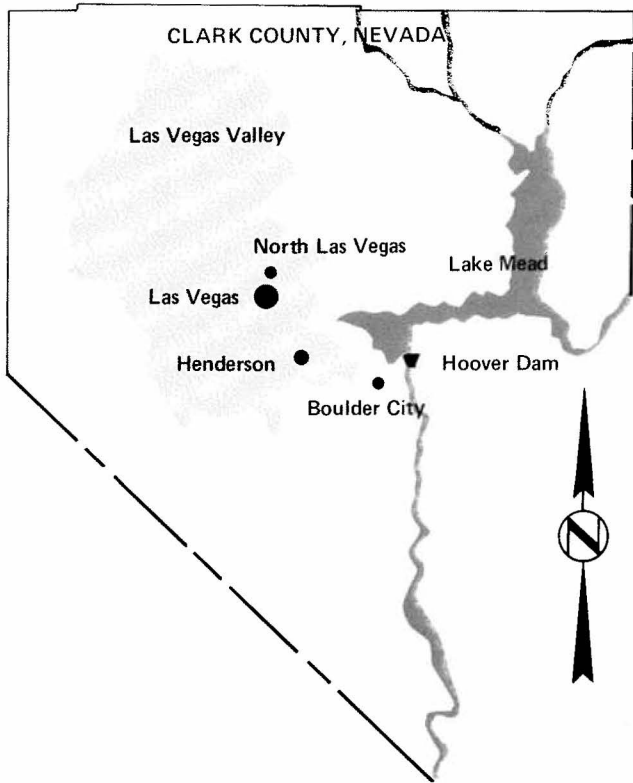
In order to meet the demands for second stage water, Congress in November of 1974, authorized the expenditure of funds for engineering work on the second stage of the Southern Nevada Water System by the United States Bureau of Reclamation (USBR). As part of the proposed second stage, work on an engineering study and Report titled "Alfred Merritt Smith Water Treatment Plant Stage II Expansion Pre-Design Report", was undertaken by Boyle-Carollo* for the Division of Colorado River Resources (DCRR) funded by the sale of State interim debentures. All work was closely coordinated with the staff of DCRR and the Southern Nevada Water System (SNWS) personnel responsible for the operation of the present water treatment plant. The Report provides a basis of design for expanding the Alfred Merritt Smith Water Treatment Plant from its existing capacity of 200 million gallons per day (mgd) to an expanded capacity of 400 mgd.

The proposed design criteria for the Alfred Merritt Smith Water Treatment Plant expansion is contained in Table 3 in the Appendix to this Report. A plan view of the expanded plant is shown on page 9 of this Report. It is estimated that the cost of the expanded treatment facility will be approximately \$43,000,000. With adherence to the recommended schedule, the enlarged plant can be completely operational by early 1981.

*A Joint Venture of Boyle Engineering Corporation and John Carollo Engineers.

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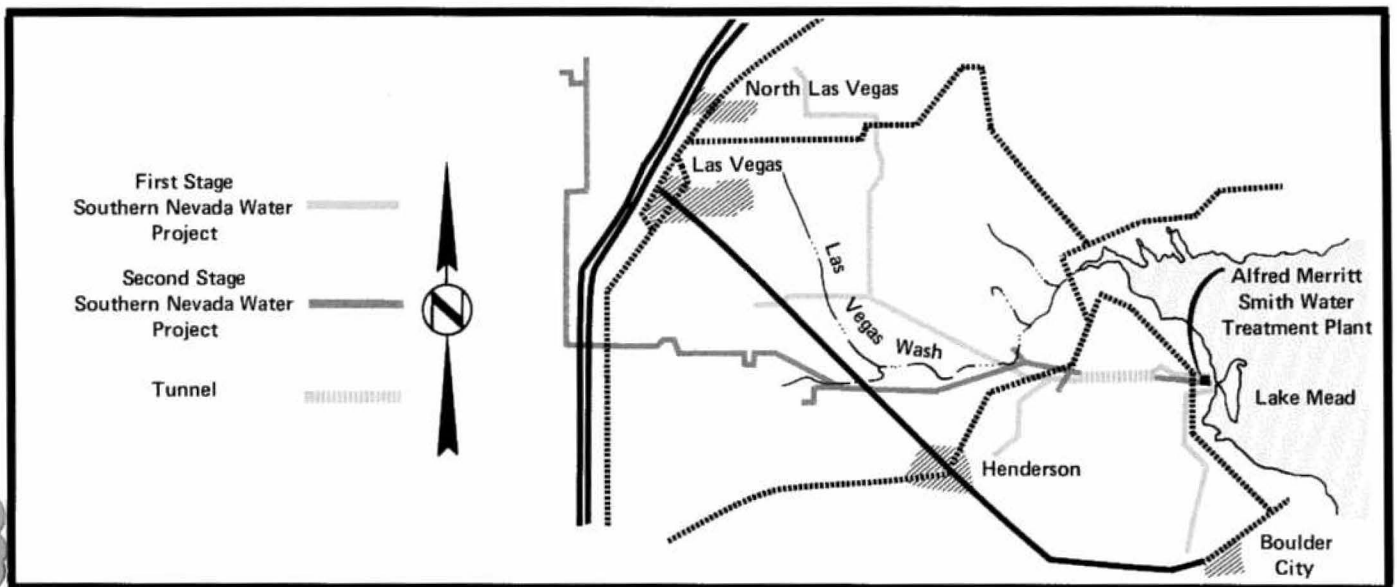


The State of Nevada, Division of Colorado River Resources (formerly the Colorado River Commission of Nevada), in cooperation with the Bureau of Reclamation planned and constructed the first stage of what became known as the Southern Nevada Water System (SNWS). The SNWS, which began water deliveries in June 1971, is designed to deliver 132,000 acre-feet per year of Nevada's entitlement of Colorado River water. The SNWS first stage consisted of the Federally funded and constructed (United States Bureau of Reclamation) Southern Nevada Water Project and the State funded and constructed Alfred Merritt Smith Water Treatment Plant. The Southern Nevada Water Project includes a single level intake facility at Lake Mead, pumping plants, tunnel, and transmission network. The treatment plant provides chemical pretreatment, filtration, and disinfection facilities.

BACKGROUND

Water demands to meet the growing population in Southern Nevada have significantly increased since early settlement in the 19th century. Groundwater was the area's primary water source with less than 40,000 acre-feet per year of Colorado River water being used in 1971 when the Southern Nevada Water System Stage 1 first became operational. From the late 1950's through today, groundwater withdrawals from the Valley basin have exceeded the rate of natural replenishment.

When conceived, it was projected that the first stage of the Southern Nevada Water System would be capable of meeting water demands through the year 1990. The rapid growth of Southern Nevada has necessitated re-evaluation of these earlier projections. Recent independent projections by Federal, State, and local agencies each indicate the capacity of the existing SNWS facilities will be exceeded by the early 1980's. In November of 1974, Congress, at the State's request, authorized the Bureau of Reclamation to initiate pre-construction studies for the second stage of the project's pumping and transmission facilities and the State funded and authorized a study for the enlargement of the treatment plant. The second stage facilities will increase the total treatment and transmission capacity of the Southern Nevada Water System to 400 mgd. Projected deliveries of water through the expanded Southern Nevada Water System will be within the annual consumptive use allotment of Colorado River water granted to the State of Nevada by the March 9, 1964 decree of the Supreme Court of the United States.



SCOPE OF STUDY

The scope of work for the water treatment plant expansion study included, in part, the following tasks:

1. Analyze the existing State and Federal standards, criteria, and goals of various water agencies and present treated water quality of the Southern Nevada Water System; propose new water quality criteria; analyze the Stage 1 treatment plant on the basis of the proposed quality criteria and develop first cost approximations for meeting these criteria. Also, evaluate the feasibility of central demineralization and/or water softening processes.
2. Evaluate the existing treatment plant facilities for the capability of meeting new water standards, goals and criteria.
3. Develop operational and water treatment process alternatives and identify the more viable alternatives through preliminary cost estimates and engineering evaluations.
4. Select the best apparent alternative and for the selected alternative prepare detailed design criteria.
5. Prepare an implementation plan and project schedule.
6. Prepare an environmental assessment of primary impacts to supplement the Bureau's environmental report for the SNWS.

WATER QUALITY

The selection of appropriate water treatment processes depends on the quality of the water supply and the desired quality of the finished product. While the supply is usually affected by a number of natural and human oriented activities, the quality of the delivered water must consistently meet rigid criteria for a safe and palatable drinking water.

The quality of Lake Mead, the source of water for the Alfred Merritt Smith Water Treatment Plant (AMSWTP), is predominately affected by man made and naturally occurring activities within the Lake and flows from the Colorado River. The water quality is also affected to a somewhat lesser extent by flows entering the Lake from the Muddy River, the Virgin River, Las Vegas Wash, and intermittent storm water runoff.

Water obtained from Lake Mead is characterized by moderately high salinity, hardness, and sulfate concentrations (See Table 2 in the Appendix). Except for these parameters, the water is of good quality and readily treatable by conventional treatment processes. The moderately high concentrations of salinity, hardness, and sulfate content are not known to significantly impair the beneficial use of this otherwise good water. An evaluation of the removal or reduction of hardness and/or salinity by central demineralization or softening indicated the feasibility of these processes would not be attractive in light of current benefits to be gained. The added costs for demineralization and/or softening are shown in Figure 1 in this the appendix of this Report.

The natural activity having a significant effect on the taste and odor of the Lake water is "destratification" of the Lake which occurs in the fall and winter when layers of water developed in the summer months destratify and mix due to changes in water temperature. After destratification the quality of the water in the Lake is essentially homogeneous with depth. During the destratification period, lower quality waters and decaying matter are mixed throughout the body of water and enter the SNWS intake structure requiring special treatment processes and techniques. Destratification can be anticipated by monitoring the Lake's water temperature and dissolved oxygen level.

The quality of water produced by the existing treatment plant is considered excellent over a major portion of the year with some taste and odor problems occurring during the fall. These problems are mitigated to a degree since they occur during periods of reduced water demand when the plant's output is reduced allowing for longer chemical contact and reaction time.

The Alfred Merritt Smith Water Treatment Plant (AMSWTP) Stage II Expansion Pre-Design Report proposes a "water system operation policy", "water quality objectives", and "water quality criteria" as follows:

WATER SYSTEM OPERATION POLICY:

It shall be the policy that the water system shall be constructed, operated, and maintained so that each water contracting entity consistently receives a finished water which is safe and palatable, adequate in quantity, and which has minimal negative impact on the water source and on the ecological, social, and economic environments.

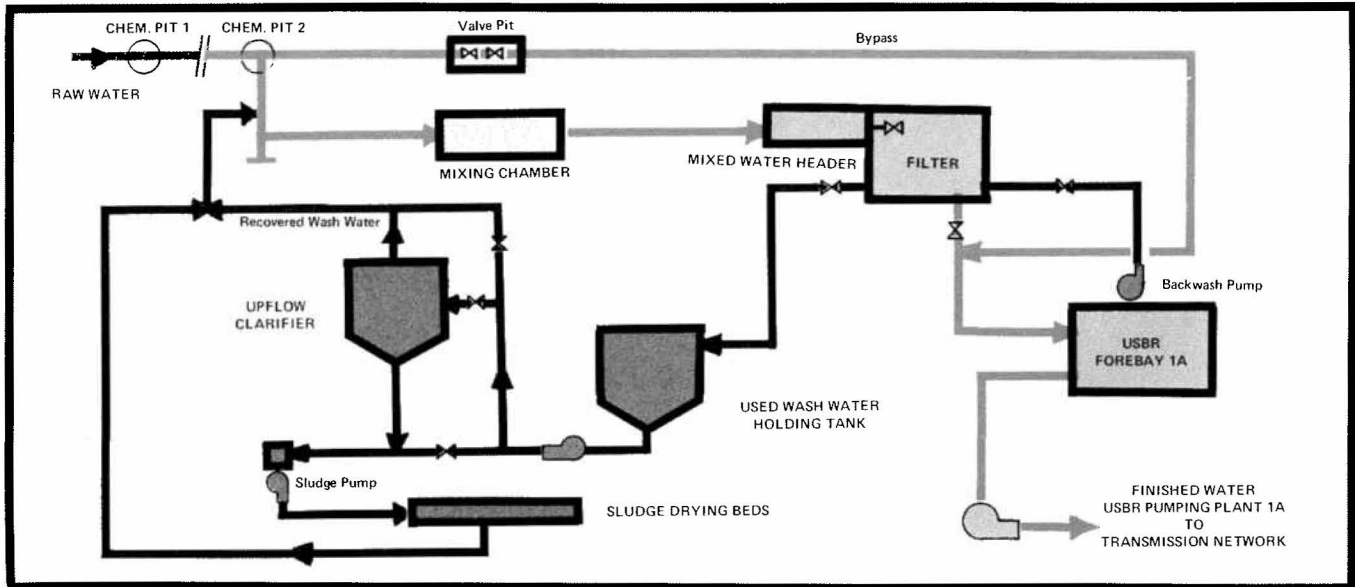
WATER QUALITY OBJECTIVES:

In accordance with the above policy, the following water quality objectives have been established. Water delivered to the contracting entities shall be clear, colorless, and odorless. It shall contain no pathogenic organisms and be free of biological forms which may be harmful to human health or esthetically objectionable. It shall contain no concentrations of chemicals which exceed the maximum contaminant level established by the EPA National Interim Drinking Water Regulations. The water shall be adequately protected by treatment processes which insure consistency and quality.

WATER QUALITY CRITERIA:

The quality of delivered water shall be according to the standards described in Table 2 of the Appendix to this Report. The values given are maximum allowable for recommended limits unless noted otherwise.

The water quality criteria proposed in Table 2 reflect the Southern Nevada Water System operation policy and quality objectives. The water quality criteria also reflect the Environmental Protection Agency's National Interim Primary Drinking Water Regulations, the U. S. Public Health Service Drinking Water Standards, and the American Water Works Association goals.



EXISTING FACILITIES

Treatment at the existing Alfred Merritt Smith Water Treatment Plant (AMSWTP) consists of taste and odor control, filtration, and disinfection. Water pumped from Lake Mead enters Chemical Pit No. 1, located adjacent to the pumping plant on Saddle Island, where it is chlorinated. From Saddle Island, it is carried 4,000 feet in a 120 inch intake pipeline to Chemical Pit No. 2, where chlorine, sulfur dioxide, polymers and pH adjusting chemicals can be added. From Chemical Pit No. 2, it enters the mixing chamber where alum and polymeric coagulants are added to cause the suspended particles in the water to agglomerate or clump together. During intermittent Lake de-stratification, when the taste and odor periods occur, powered activated carbon is added with the coagulants to reduce the taste and odors. The treated water is then filtered through beds of anthracite coal and sand to remove the agglomerated particles and carbon. After filtration, the water is conveyed to a clearwell-forebay for flow equalization for the SNWS pumping facilities which convey the treated water through the transmission network for delivery to the water purchasing entities. In addition to chlorination at the plant, chlorine can be injected at points in the transmission network, when necessary, to assure delivery of bacteria free water to each entity.

The existing treatment plant support facilities consist, in part, of the filter wash water recovery system and sludge drying facilities. The wash water recovery system is designed to remove the solids from the filter wash water. The wash water is dosed with coagulant chemicals to aid the settling of particles and then allowed to settle in a clarifier. The clarified wash water is reclaimed and returned to the plant influent. The settled sludge, which is basically inert in nature, is then pumped to drying beds and, when dry, hauled to a landfill.

Other support facilities include a control building and separate chlorination and maintenance shop build-

ings. The control building houses controls for both the treatment plant and Southern Nevada Water Project together with laboratory, administration, and personnel facilities.

Water quality evaluations for the existing AMSWTP indicate that an excellent quality water is obtained for a major portion of the year and a safe drinking water is obtained at all times. During intermittent periods of Lake de-stratification, when high taste and odors occur, increased chemicals dosages are required and filtration rates are reduced to maintain an aesthetically acceptable water. Pilot testing, undertaken as a part of this study, indicated that, with design modifications, treatment by the existing water treatment plant could be improved to increase production of aesthetically pleasing water during periods of high taste and odor. These same pilot test studies gave direction to chemical cost saving design modifications which can be incorporated in the proposed plant expansion.

The filters were found to be operating successfully and at reasonable loading rates for present flow conditions. Recommended modifications within the control system, filter media size, and support components can optimize operation and lower maintenance costs.

The existing wash water recovery system must be relocated to provide needed space for expansions of the main plant. Maximum utilization will be made of the salvageable portions of wash water recovery and sludge drying facilities. Sludge drying beds must be enlarged for the expanded facility and should be modified to provide more effective drying and ease of operation.

A study of the existing control building indicates a need for expanded personnel and maintenance areas to meet existing needs. The expanded treatment facilities will require further expansion of personnel and maintenance areas in addition to expansion of the control room and chlorination facilities.

ALTERNATIVES FOR EXPANSION AND MODIFICATION

The development and analysis of alternatives for expansion and modifications of the treatment plant included the evaluation of several physical and chemical water treatment processes. Alternative arrangements were evaluated from the standpoint of raw water quality, current water treatment technology, existing plant performance, pilot studies, proposed finished water quality criteria, environmental and aesthetic considerations.

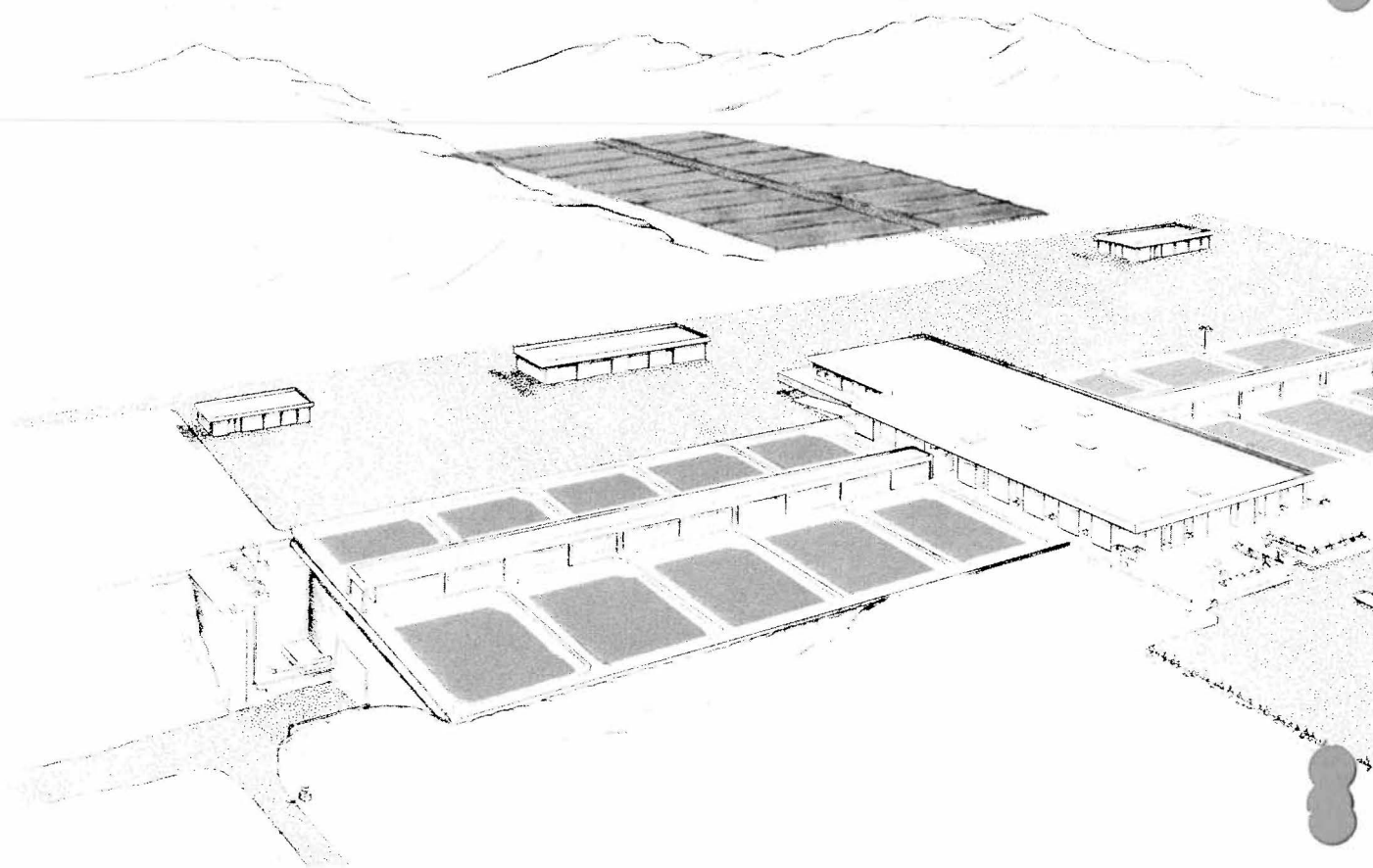
Pilot plant studies were performed to simulate the treatment processes of chemical coagulation with and without flocculation and sedimentation prior to filtration. Testing included an evaluation of optimum coagulant dosage, combinations of coagulants, flocculation time, carbon breakthrough detection in filters, and backwash solids separation. Based on pilot test performance, the chemical coagulation, flocculation and fil-

tration treatment arrangement, without sedimentation, was selected as the most cost effective plan for incorporation in the plant expansion. Pilot studies revealed that sedimentation prior to filtration could not be justified from the standpoint of either water quality or cost effectiveness.

More than 20 site arrangements were studied. Analyses of the most viable of these arrangements indicated an estimated cost difference of less than one percent among the various alternatives. Of the alternatives available, a linear flow pattern was selected for its:

1. Ability to meet the water quality criteria
2. Operational flexibility and functionality
3. Ease of construction
4. Adaptability to the existing plant
5. Aesthetic appeal

A detailed basis of design was prepared and is included as Table 3 in the Appendix to this Report.



SELECTED PROJECT

The selected treatment process is divided into the categories of pre-treatment, filtration, post-treatment, wash water reclamation and solids disposal. Pretreatment refers to conditioning the water, prior to filtration. Pretreatment steps include: disinfection, aeration, taste and odor control, coagulation, and flocculation. Of these processes, disinfection, taste and odor control, and coagulation are already used at the existing plant. Aeration and flocculation are added pretreatment processes to be included in the plant expansion.

The purpose of disinfection, usually by chlorination, is to destroy disease causing organisms. Chlorine also helps destroy taste and odor inducing organisms.

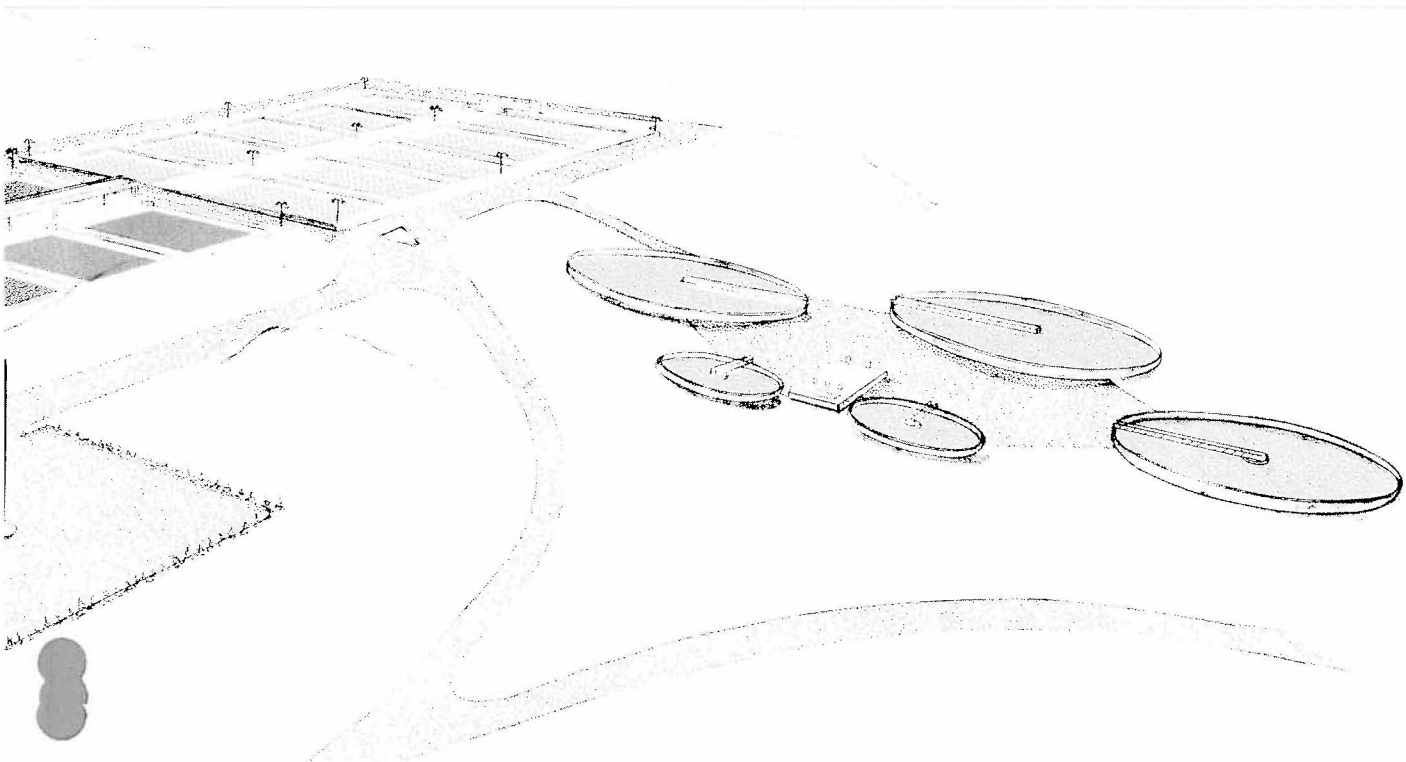
Aeration is used to add oxygen to the water and assist in taste and odor control.

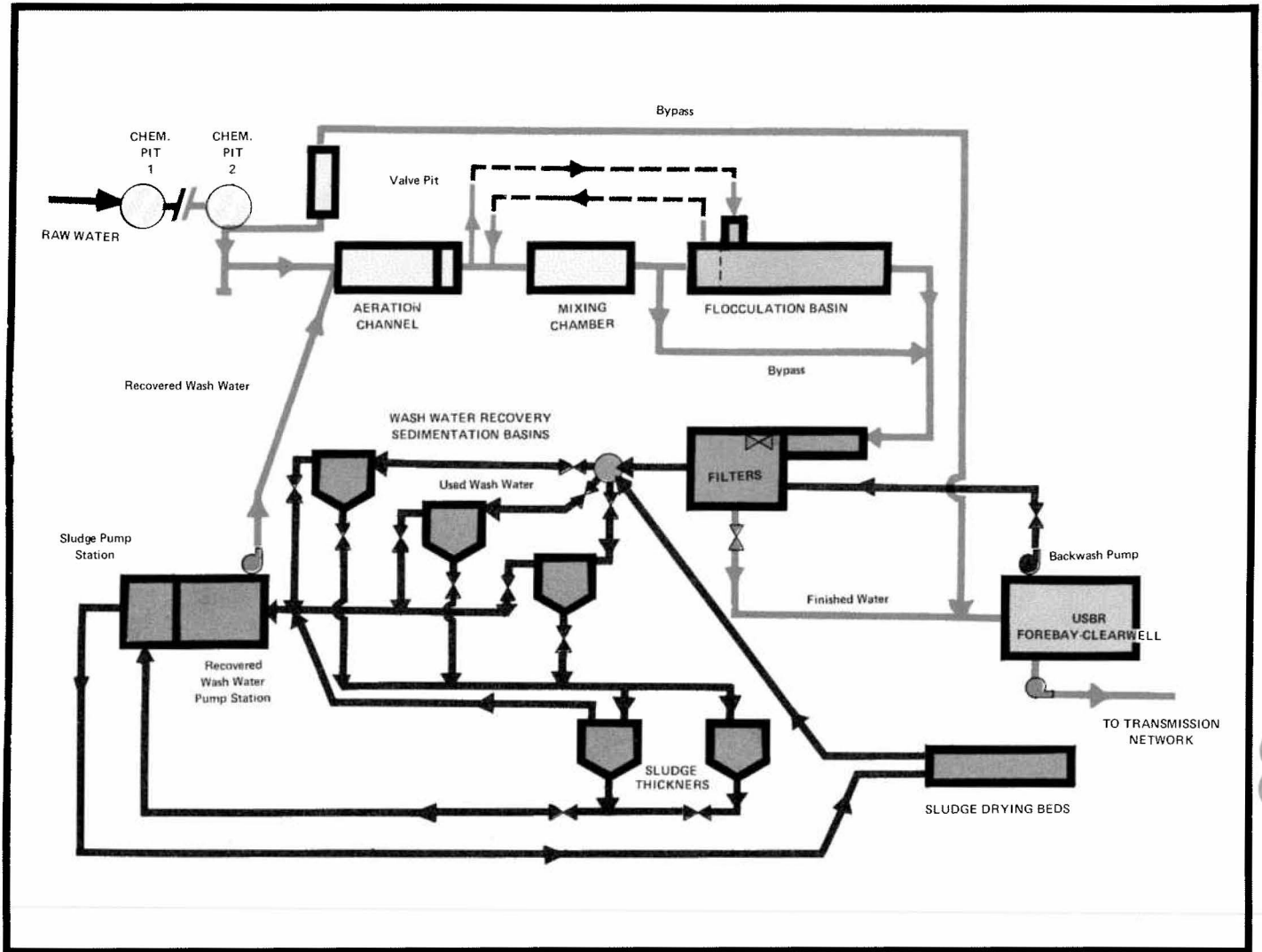
Taste and odor control refers to the overall effect of several physical and chemical processes to minimize

the effects of intermittent naturally occurring taste and odor causing substances in the raw water supply. The most widely used additive for this purpose is activated carbon. Activated carbon adsorbs taste and odor causing substances and is itself removed by the filtration process. The addition of chlorine, sulfur dioxide, and aeration also combine to assist in reducing taste and odor problems including those produced by sulfur compounds.

Coagulation and flocculation are complex processes which (1) uniformly mix the chemicals with the raw water and (2) promote the coalescence or agglomeration of the fine particles in suspension. Alum or other chemical coagulants are rapidly mixed into the raw water followed by gentle mixing of the suspension to induce flocculation.

Filtration at the Alfred Merritt Smith Water Treatment Plant is a process of passing pretreated water





through media comprised of layers of coal and sand. The water is filtered to remove the flocculated suspended particles and carbon particles. Sedimentation prior to filtration was considered however analysis of the pilot study data showed that sedimentation prior to filtration is not needed and would not be cost-effective at the Alfred Merritt Smith Water Treatment Plant. Suspended materials can be effectively removed by the filters without prior sedimentation.

Post-treatment refers to pH adjustment with the addition of caustic soda, sodium silicate, and chlorine. Chlorine is injected at the plant, prior to the clearwell-forebay in the finished water channel, and at points in the transmission network in order to protect public health by destroying disease causing organisms.

The sequencing and arrangement of treatment processes in the expanded facility were selected to assure maximum effectiveness and flexibility. The expanded treatment plant will be operated in two basic modes to accommodate: (1) normal periods when the raw water supply is low in concentrations of taste and odor producing constituents and, (2) periods of high concentrations of taste and odor causing constituents. Under low taste and odor conditions, treatment will consist of disinfection, coagulation, flocculation, filtration, and post chlorination. During intermittent periods of high taste and odor incidence in Lake Mead, chlorination, other chemical additions, aeration and carbon adsorption processes will be activated as required.

Expansion of the existing facilities will be accomplished in the second stage plant enlargement. Chemical Pit No. 1 is satisfactory for the expanded plant. Incorporation of flocculation basins will require the addition of chemical pits and rapid mixing chambers. Aeration facilities will also be included with the expanded treatment facilities. Ten flocculation basins serving the full 400 mgd expanded plant capacity will be added prior to filtration. During periods of high taste and odor in the raw water supply, two of the flocculation basins will be used as activated carbon mixing and reaction tanks. Ten new filters will be added and the existing filters modified for improved performance.

An additional 7.0 million gallon clearwell forebay is planned, allowing greater flexibility in transmission network pumping and filter backwashing.

The existing wash water recovery system will be relocated to make room for the new flocculation basins. Three new gravity clarifiers will replace the existing upflow clarifier and used wash water holding tank. The settled solids will be concentrated in two new thickeners. The existing sludge drying beds will be modified and expanded to provide additional capacity and increase operating efficiency and ease of maintenance. The existing control building will undergo expansion and rearrangement for improved operating efficiency. Personnel areas will be expanded to accommodate the enlarged staff. A new maintenance building will be added with a fully equipped facility for maintaining the entire SNWS. The existing maintenance building will be used for miscellaneous maintenance tasks. A new chlorine building, utilizing the existing equipment, will be constructed and the present building will be converted for storage.

Stringent drinking water regulations adopted by the Environmental Protection Agency and concern for possible organic chemicals in drinking water supplies require installation of more sophisticated laboratory and monitoring facilities. The existing laboratory and control areas will be expanded and updated. Computer controls with manual backups are proposed for control and monitoring of the expanded system. The computer control and monitoring system will increase flexibility and minimize the number of people required to operate the expanded system. Controls for both the transmission network and treatment facilities will be housed in the expanded water treatment plant control room.

SCHEDULING AND COSTS

The plant, as proposed, may be constructed with minimal interference to ongoing daily operation. It is anticipated that plant design will begin in the fall of 1976. Construction of the new facilities is scheduled to begin in mid 1978 and become operational by mid 1980. Rehabilitation of the existing facilities should be complete by early 1981. A planning and Construction Schedule is included as Figure 2 in the Appendix to this Report.

The 58th Session of the State Legislature passed and the Governor approved authorization to finance up to \$60 million for enlargement (the second stage) of the treatment facility. It is estimated the cost of the expanded treatment facility, including financing, financing reserves, escalation, services and construction, will be approximately \$43 million. A summary of estimated capital costs is provided in Table 4 of the Appendix to the Report.

Close cooperation between Federal, State, and local agencies has resulted in a well-conceived and closely-coordinated concept and expected continued efforts will assure that the operational goal of 1981 can be met.

All material herein was extracted from the technical report entitled, "Alfred Merritt Smith Water Treatment Plant Stage II Expansion Pre-Design Report," dated July 1976, by Boyle-Carollo Engineers.

LEGEND



PRETREATMENT



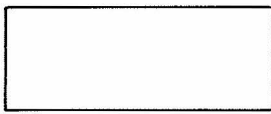
FILTERS



CLEARWELL - FOREBAY (USBR) & PUMP STATIONS



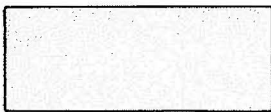
WASH WATER RECOVERY SYSTEM



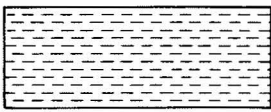
SUPPORT FACILITIES



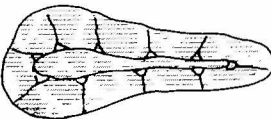
UNDERGROUND STRUCTURES



PAVED AREAS



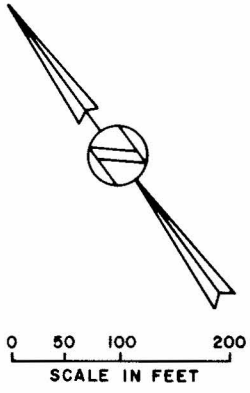
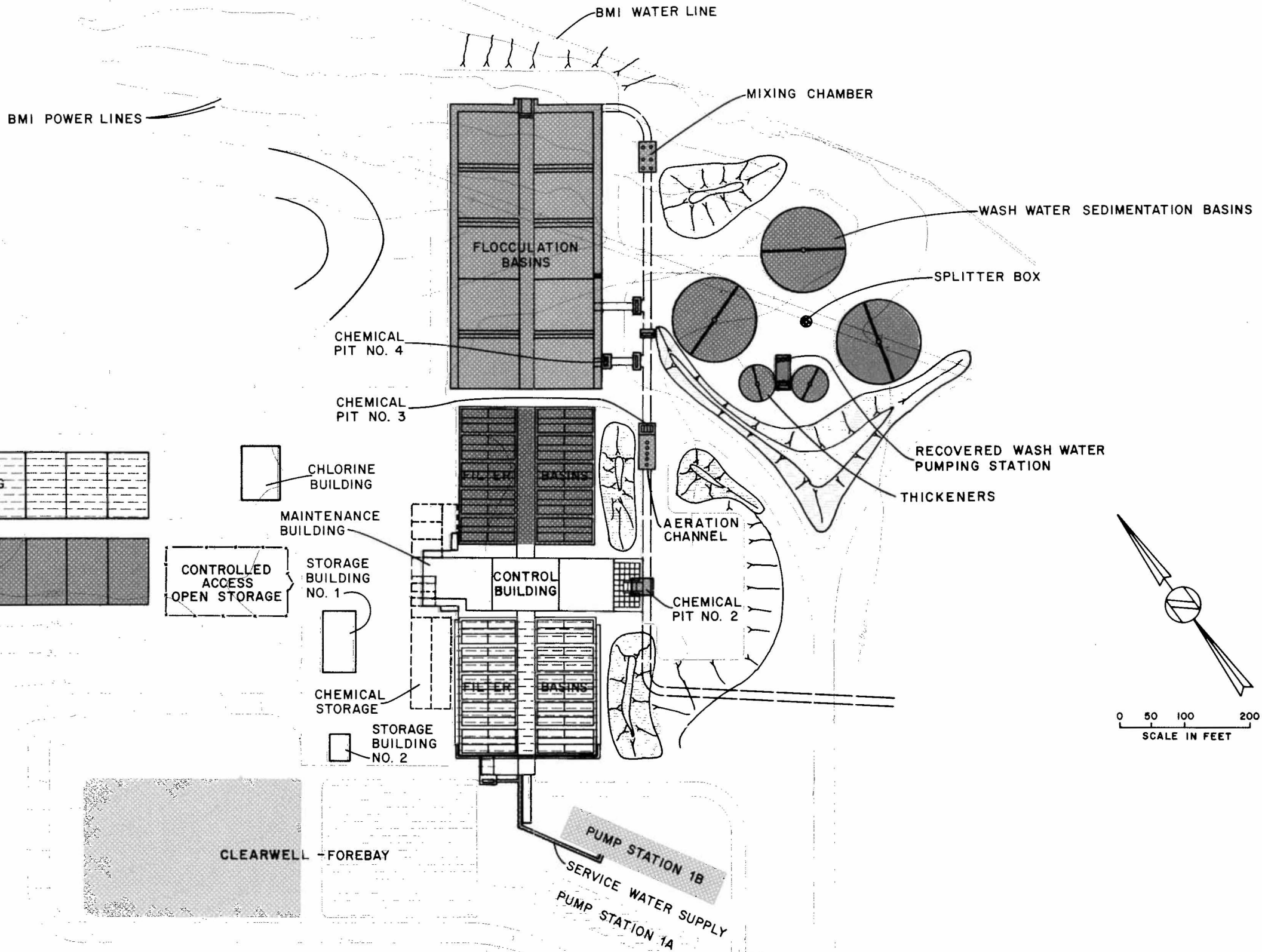
EXISTING FACILITIES



LANDSCAPED AREAS



**BOYLE • CAROLLO
ENGINEERS**



ALFRED MERRITT SMITH WATER TREATMENT PLANT

PROPOSED STAGE II
PLANT LAYOUT

APPENDIX

Table 1

FIRST STAGE ALLOCATIONS AND SECOND STAGE OPTIONS
 AMONG THE CONTRACTORS
 SOUTHERN NEVADA WATER SYSTEM

<u>Agency</u>	First Stage SNWS Water Delivery Contracts* <u>Acre-Feet per Year</u>	Second Stage Options for SNWS Water Delivery Contracts <u>Acre-Feet per Year</u>
Nellis AFB	4,000	-
North Las Vegas	20,000	20,000
Las Vegas Valley Water District	99,200	100,800
Henderson	7,000	33,000
Boulder City	<u>2,000</u>	<u>13,000</u>
Maximum annual deliveries	132,200	166,800

* Contract No. 14-06-300-1974 between the U.S. and CRC dated August 25, 1967.

Table 2
 SOUTHERN NEVADA WATER SYSTEM
 SECOND STAGE WATER QUALITY CRITERIA
 1/13/76

Characteristics	Recom- mended Goals*	Maximum Contami- nant Levels*	Not De- vel- oped*	SNWS Record*	SNWS Criteria*
INORGANIC CHEMICALS					
Aluminum	0.05	-	-	0.194	0.05
Arsenic	0.01	0.05	-	0.01	0.01
Alkalinity	-	-	-	129	P
Ammonia (N)	-	-	a	< 0.05	0.01
Barium	-	1.0	-	0.106	1.0
Boron	1.0	-	-	-	1.0
Cadmium	-	0.01	-	0.001	0.01
Calcium	-	-	a	87.6	P
Chloride	250	-	-	90.4	P
Chlorine (Residual)	≥ 1.0	-	-	1.14	≥ 0.5
Chromium VI	-	0.05	-	0.000	0.05
Copper	0.2	-	-	0.0125	0.2
Cyanide	-	-	b	-	P
Fluoride	1.6	1.6	-	0.55	P
Iron	0.05	-	-	0.019	0.05
Lead	-	0.05	-	0.000	0.05
Magnesium	125	-	-	29.1	P
Manganese	0.01	-	-	0.002	0.01
Mercury	-	0.002	-	0.0019	0.002
Molybdenum	-	-	a	0.008	P
Nitrate (N)	-	10	-	0.02	10
Nitrite	-	-	a	0.00	P
Oxygen Dissolved	≥ 3.0	-	a	1.0-8.0	> 3.0
Phosphate	-	-	a	0.014	P

Table II-3, SOUTHERN NEVADA WATER SYSTEM
 SECOND STAGE WATER QUALITY CRITERIA, continued

Characteristics	Recom- mended Goals*	Maximum Contami- nant Levels*	Not De- vel- oped*	SNWS Record*	SNWS Criteria*
Potassium	-	-	a	4.34	P
Selenium	-	0.01	-	0.005	0.01
Silica	-	-	a	9.5	P
Silver	-	0.05	-	0.000	0.05
Sodium	-	-	b	109.4	P
Sulfate	250	-	-	317	P
Zinc	1.0	-	-	0.017	1.0
Total Dissolved Solids (Residue)	500	-	-	749	P
Hardness (CaCO ₃)	80-100	-	-	325	P
ORGANIC CHEMICALS					
Carbon-Alcohol Extract	0.10	-	-	-	P
Carbon-Chloroform Extract	-	-	b	0.034	P
Carbon Dioxide	-	-	a	3.8	P
Foaming Agents	0.20	-	-	-	0.20
Organic Carbon (TOC)	-	-	-	1-10	P
Phenols	0.001	-	-	-	0.001
Pesticides					
Aldrin	0.017	-	b	Nd	0.010
Chlordane	-	-	b	Nd	0.003
Endrin	-	0.0002	-	Nd	0.0002
Heptachlor	-	-	b	Nd	0.0001
Heptachlor Epoxide	-	-	b	Nd	0.0001

Table II-3, SOUTHERN NEVADA WATER SYSTEM
 SECOND STAGE WATER QUALITY CRITERIA, continued

Characteristics	Recom- mended Goals*	Maximum Contami- nant Levels*	Not De- vel- oped*	SNWS Record*	SNWS Criteria*
Lindane	-	0.004	-	Nd	0.004
Methoxychlor	-	0.1	-	Nd	0.1
Toxaphene	-	0.005	-	Nd	0.005
Chlorophenoxy Herbicides					
2,4-D	-	0.1	-	Nd	0.1
2,4 5-TP (Silvex)	-	0.01	-	Nd	0.01
Persistent Organics					
Polychlorinated Biphenyls (PCBs)	-	-	b	-	P
Phthalate Esters	-	-	b	-	P
RADIOLOGICAL FACTORS					
Gross Alpha including Ra226 (PCi/L)	-	-	b	Uk	15
Cesium 134 (PCi/L)	-	-	b	Uk	P
Iodine 131 (PCi/L)	-	-	b	Uk	P
Strontium 89 (PCi/L)	-	-	b	Uk	P
Strontium 90 (PCi/L)	-	-	b	Uk	2
Tritium (PCi/L)	-	-	b	Uk	20,000
BACTERIOLOGICAL					
Coliform Organisms/ 100 ml	0	1	-	0	1.0
Microorganisms (Plankton)					
Areal Standard Unit	200	-	-	-	200
Number/ml	600	-	-	671	600

Table II-3, SOUTHERN NEVADA WATER SYSTEM
 SECOND STAGE WATER QUALITY CRITERIA, continued

Characteristics	Recom- mended Goals*	Maximum Contami- nant Levels*	Not De- vel- oped*	SNWS Record*	SNWS Criteria*
PHYSICAL PARAMETERS					
Color-Unit	3	-	-	1.4	3.0
Odor-Threshold	1.4	-	-	1.4	1.4
pH	6.5-9.0	-	-	7.8	7.5-9.0
Residue (Nonfilterable)	c	-	-	749	P
Taste	Unobjec- tionable	-	-	-	Unobjec- tionable
Turbidity (TU)	0.1	1.0	-	0.1	0.1
Specific Conduct- ance (μ mho)	-	-	a	1,107	P
CORROSION & SCALING FACTORS					
Incrustation of stainless steel (mg/cm^2)	≤ 0.05	d	-	-	P
Corrosion of gal- vanized iron (mg/cm^2)	≤ 5.0	d	-	-	P
Corrosion of galvanized iron (mils per year)	1.0	-	-	2.13	P
Langlier Index	≥ 0.5	-	-	-	0.2

*Indicated in mg/l except where otherwise stated.

a - No known attempts are being made to set allowable limits.

b - EPA is studying effects and will set limits based on results of the study.

Nd - Not detectable.

c - Virtually suspension free, function of turbidity.

d - Coupon tests (90-day test).

Uk - Unknown.

P - Prevailing: an accepted characteristic undergoing little or no change during treatment.

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES

TABLE 3

PROPOSED BASIS OF DESIGN
FOR SECOND STAGE
OF
ALFRED MERRITT SMITH
WATER TREATMENT PLANT

BOYLE•CAROLLO ENGINEERS

PROPOSED
BASIS OF DESIGN
ALFRED MERRITT SMITH
WATER TREATMENT PLANT

PRINCIPAL PLANT FEATURES

Surface water supply from Lake Mead

Aeration

Two stage rapid mix

Tapered energy flocculation

High-rate, dual-media filtration

Wash water and plant water pumps

Wash water solids separation by gravity settling

Wash water recovery pumps for backwash water recycle

Waste sludge thickening and drying

Chemical feeders and storage

Low-profile plant design

Administration and Control Building

PLANT CAPACITY

	<u>Unit</u>	<u>Present</u>	<u>Proposed</u>
Design capacity (design flow on maximum day)	mgd	200	400
Filter hydraulic capacity (1.5 x design cap)	mgd	300	600
Minimum flow	mgd	20	20

PLANT COMPONENTS

	<u>Unit</u>	<u>Present</u>	<u>Proposed</u>
Aeration basin - for maintenance of dissolved oxygen levels and taste and odor removal			
Number of basins	each	-	1
Number of aerators	each	-	5
1 Row of five surface turbines			
Size of basin			
Nominal width	feet	-	16
Nominal length	feet	-	70
Average water depth	feet	-	17
Total net volume	cf	-	17,850
Detention time @ design capacity	sec	-	30
Rapid mix, first stage - for homogeneous dispersion of coagulant			
Number of units	each	1	2
2 Parallel units, 1 mixer each			
Design capacity each unit	mgd	200	400
Hydraulic capacity each unit	mgd	300	440
Velocity gradient at design capacity and 59°F water temperature	ft/sec/ft		1000-1200
Rapid mix, second stage - for other chemical mix			
Number of units	each	1	4
2 Parallel units, 2 mixers each			
Design capacity each unit	mgd	200	400
Hydraulic capacity each unit	mgd	300	440
Velocity gradient at design capacity and 59°F water temperature	ft/sec/ft		100-500
Tapered energy flocculation basins - for floc agglomeration			
Number of basins	each		10
Design capacity each basin	mgd		40
Size of each basin			
Nominal width	feet		80
Nominal length	feet		87
Average water depth	feet		16
Net volume each basin	cf		111,360
Total net volume	cf		1,113,600
Detention time at design capacity	min		30

	<u>Unit</u>	<u>Present</u>	<u>Proposed</u>
Flocculators in each basin			
1 - row of five plate turbine flocculators imparting a velocity gradient* range of	ft/sec/ft		125-25
1 - row of five plate turbine flocculators imparting a velocity gradient* range of	ft/sec/ft		100-20
1 - row of five plate turbine flocculators imparting a velocity gradient* range of	ft/sec/ft		75-15
1 - row of five plate turbine flocculators imparting a velocity gradient* range of	ft/sec/ft		50-10
1 - row of five plate turbine flocculators imparting a velocity gradient* range of	ft/sec/ft		25-5

Range of Gt = 135,000 - 27,000

*Velocity gradients (G) based upon a water temperature of 59°F.

High-rate, dual-media filters			
Number of basins	each	10	20
Filtration rate @ design capacity	mgd/filter	20	20
	gpm/filter	13,900	13,900
	gpm/sf	5.0	5.0
Filtration rate @ hydraulic capacity	mgd/filter	30	30
	gpm/filter	20,850	20,850
	gpm/sf	7.5	7.5
Size of each filter basin			
Width	feet	39	39
Length	feet	87.5	87.5
Water depth to filter floor	feet	12	12
Surface area of media per basin	sf	2,800	2,800
Number of filters per basin	each	2	2
Dimensions of "filter halves"			
Width	feet	16	16
Length	feet	87.5	87.5
Surface area of media	sf	1,400	1,400
Net volume of water per basin	cf	16,800	16,800
Total volume of water all basins	cf	168,000	336,000
Detention time @ design capacity	min	9	9

	<u>Unit</u>	<u>Present</u>	<u>Proposed</u>
Filter media			
Depth of anthracite	in	20	20
Effective size anthracite	mm	0.70	0.9-1.0
Uniformity coefficient anthracite		1.75	<1.75
Depth of sand	in	10	10
Effective size sand	mm	.45	.45-.55
Uniformity coefficient of sand		1.50	<1.50
Support gravel			
Depth of gravel	in	12	12
Number of layers	each	4	4
Type of underdrain		Leopold tile	Wheeler or Leopold
Backwash rate - design	in/min		24
	gal/min/sf		15
	mgd		30
Backwash rate - maximum	in/min	36	36
	gal/min/sf	22.5	22.5
	mgd	45	45
Filter agitators			
Type		Rotary sweeps with nozzles	Rotary sweeps with nozzles and possible air agitation
Source of water		Clearwell-forebay	Pumping Plant 1B discharge
Filter effluent controllers			
Number	each	10	20
Type		Propeller meters	Venturi
Control		Master & manual	Computer master remote & local manual
Plant service water			
Existing			
Service water pumps			
Number of pumps	each	4	-
Capacity each pump	gpm	750	-
Source of supply		5 mg forebay	-
Proposed			
Plant service water piping from discharge of pumping Plant 1B			
	unit	-	1
Plant service water back-up pumps			
Number of pumps	each	-	4
Capacity of each pump	gpm	-	750
Source of supply		-	12 mg forebay

	<u>Unit</u>	<u>Present</u>	<u>Proposed</u>
Wash water pumps			
Number of pumps	each	2(+1 spare)	2(+1 spare)
Capacity each pump	mgd	22.5	22.5
Source of supply		5 mg forebay	12 mg forebay
Wash water recovery system			
Holding basins			
Number		1	-
Capacity	gal	800,000	-
Clarifiers			
Type		Upflow	Gravity
Number		1	3
Diameter	feet	110	125
Operation		Continuous	Batch
Capacity, each	mgd	12	16*
Total capacity	mgd	12	48*
Surface loading rate	gpd/sf	1,440	3,900**
Thickeners			
Type		-	Gravity
Number		-	2
Diameter	feet	-	65
Operation		-	Batch
Capacity, each	mgd	-	0.3***
Total capacity	mgd	-	0.6***
Surface loading rate	gpd/sf	-	90***
Recovered wash water pumps - for backwash water recycle			
Source of water		-	Gravity clarifiers
Number of pumps		-	3
Capacity each pump	mgd	-	20
Sludge drying beds			
Type		Sand filter	Solid bottom
Number		5	20
Size, each	sf	6,000	6,000
Total area	sf	30,000	120,000

*Based on the capacity of batch operation being a hydraulic loading of one million gallons each 90 minutes to each basin.

**Based on clarifying one mg in 30 minutes.

***Based on the capacity of batch operation being a hydraulic loading of 300,000 gallons every 24 hours.

Chemical handling, storage and
points of chemical applicationChemical

Chlorine

Sulfur dioxide

Potassium Permanganate

Activated silica

Caustic soda

Aluminum sulfate

Activated carbon

Polyelectrolyte (flocculant aid)

Polyelectrolyte (filter aid)

Sodium silicate

Points of ApplicationChemical Pit No. 1, Chemical
Pit No. 2 flocculation basins,
filter feed channel, filter
effluent channel, recovered
wash water splitter boxChemical Pit No. 3, mixing
chamber, flocculation basins,
filter feed channel

Mixing chamber

Mixing chamber

Chemical Pit No. 2, mixing
chamber, filter effluent
channel

Mixing chamber

Chemical Pit No. 2, Chemical
Pit No. 4, mixing chamber,
flocculation basins, filter
feed channelChemical Pit No. 2, mixing chamber,
flocculation basins, recovered
wash water splitter box, sludge
thickeners, thickened sludge pump
station

Filter influent channel

Chemical Pit No. 2, mixing
chamber, filter effluent
channelProjected chemical feed rates
in mg/l

<u>Chemical</u>	<u>Avg.</u>	<u>Max.</u>
Chlorine	3	8
Chlorine dioxide	0.2	1
Sulfur dioxide	2	5
Potassium permanganate	1.0	4
Activated silica (liquid~0.6% SiO ₂)	0.7	1.7
Caustic soda*	0.4	50
Aluminum sulfate (liquid)	10	40
Activated carbon	3	20
Polyelectrolyte (flocculant aid)	1.0	2.5
Polyelectrolyte (filter aid)	0.1	2

*Variable for pH adjustment.

Projected chemical feed requirements

<u>Chemical</u>	<u>Unit</u>	<u>Avg.</u>	<u>Max.</u>
Chlorine	ppd	10,000	26,700
Chlorine dioxide** (as commercial NaClO ₂)	ppd	560	2,800
Sulfur dioxide**	ppd	3,340	8,340
Potassium permanganate	ppd	3,336	13,350
Activated silica (0.6% solu. SiO ₂)	gph	10	30
Caustic soda*	gph	4	515
Aluminum sulfate (50% solu. liq.)	gph	121	500
Activated carbon**	gph	210	1,400
Polyelectrolyte (floc @ 0.3 lbs/gal)	gph	465	1,400
Polyelectrolyte (filt @ 0.3 lbs/gal)	gph	50	1,000

*Variable for pH adjustment.

**Seasonal use. Values given are calculated on the basis of 200 mgd flow during taste and odor period.

Chemical feeders to meet requirements:
(in most cases includes 1 standby)

	<u>Unit</u>	<u>Proposed</u>
Chemical feeders		
Chlorine (at treatment plant)		
Number of chlorinators		5
Capacity of chlorinators	ppd	5 @ 8,000
Number of evaporators	each	5
Capacity of evaporators	ppd	5 @ 8,000
***Chlorine dioxide in the form of NaClO ₂ crystal		
Number of feeders		4
Type		Dry feeder
Capacity of each feeder	ppd	4 @ 1,000
Sulfur dioxide		
Number of feeders		3
Capacity of feeders	ppd	8,000
Number of evaporators		3
Capacity of evaporators	ppd	8,000
Potassium permanganate		
Number of feeder pumps		2
Type		Diaphragm
Capacity of each feed pump (@ 1 lb KM _n O ₄ /gallon water)	gph	800
Activated silica		
Number		2
Type		Diaphragm
Capacity of each feed pump (assuming @ 0.6% SiO ₂ solution)	gph	40

***Area provided for future installation.

	<u>Unit</u>	<u>Proposed</u>
Caustic soda		
Number		4
Type		Diaphragm
Capacity of each feed pump	gph	1 @ 400 1 @ 100 2 @ 20
Aluminum sulfate in liquid		
Form -8.3% Al ₂ O ₃ (5.4 lbs/gal)		
Number of feed pumps		4
Type		Diaphragm
Capacity	gph	4 @ 220
Activated carbon slurry @ one lb carbon/gallon water		
Number of feeder pumps	each	3*
Type		Rotodip
Capacity of each feeder pump	gph	3 @ 1,800
Polyelectrolyte (floc aid)		
Number of pumps		4
Type		Diaphragm
Capacity, each	gph	2 @ 880 2 @ 220
Polyelectrolyte (filter aid)		
Number of pumps		4
Type		Diaphragm
Capacity, each	gph	2 @ 440 2 @ 220
Chemical storage and handling		
Chemical	<u>Unit</u>	<u>Proposed</u>
Chlorine		
Number		3**
Type of containers	each	bulk tanks
Capacity, each	gal	5,000 (water equivalent)
Storage @ design flow and average dosage (3 mg/l)	days	16
Storage @ design flow and maximum dosage (8 mg/l)	days	6
Handling		Transfer from tank truck with compressed air

*Variable feed points require duplication of equipment.

**Area for a possible fourth tank recommended.

	<u>Unit</u>	<u>Proposed</u>
Sulfur dioxide		
Type of storage*		TO BE DETERMINED
Number		60
Capacity of each	lbs	2,000
Total storage capacity	lbs	120,000
Storage @ design flow and average dosage (2 mg/l)	days	18
Storage @ design flow and maximum dosage (5 mg/l)	days	7
Storage @ turnover flow and maximum dosage (5 mg/l)	days	14
Potassium permanganate		
Type of storage		lined concrete
Number of tanks	each	1
Capacity of tank	gal	100,000
Days of solution storage @ design flow and average dosage (1 mg/l)	days	30
Days of solution storage @ design flow and maximum dosage (4 mg/l)	days	7.5
Sodium silicate bulk storage		
Type of storage		lined concrete
Number of tanks	each	1
Capacity of tank (~21% SiO ₂ solution)	gal	5,600**
Days of solution storage @ design flow and average dosage (0.7 mg/l of 0.6% SiO ₂)	days	816
Days of solution storage @ design flow and maximum dosage (1.7 mg/l of 0.6% SiO ₂)	days	275
Activated silica day tank storage		
Type of storage		stainless steel tank
Number of tanks	each	2
Capacity of each tank	gal	1,200
Total storage capacity	gal	2,400
Solution		0.6% as SiO ₂
Days of solution storage @ design flow and maximum dosage (1.7 mg/l of 0.6% SiO ₂)	days	3.33

*At time of design, recommend investigation of using bulk storage (two 5,000 gallon tanks).

**Capacity to handle one 4,000 gallon truck load of 30% SiO₂ again diluted 40%.

	<u>Unit</u>	<u>Proposed</u>
Caustic soda		
Type of storage tanks		lined concrete
Number of tanks	each	1
Capacity of tank	gal	30,000
Solution		50% NaOH
Days of solution storage @ design flow and average dosage (0.4 mg/l)	days	312
Days of solution storage @ design flow and maximum dosage (50 mg/l)	days	2.4
Alum		
Type of bulk storage		lined concrete
Number of bulk storage tanks	each	2
Capacity of each bulk storage tank	gal	105,560
Total storage	gal	211,120
Storage @ design flow and average dosage (10 mg/l)	days	72
Storage @ design flow and maximum dosage (25 mg/l)	days	29
Activated carbon		
Type of storage bins		lined concrete
Number of slurry bins	each	2
Capacity each slurry bin	gal	363,500
Total slurry storage capacity	gal	727,000
Days of slurry storage @ design flow and average dosage (3 mg/l)	days	145
Days of slurry storage @ design flow* and maximum dosage (15 mg/l)	days	30
Handling		Bulk delivery, slurry mixers and pumps
*Design flow @ lake turnover period assumed to be 200 mgd.		
Polyelectrolyte - flocculant aid		
Concentration of solution		0.3 lbs/gal
Type of storage tanks		Fiberglass, 316 stainless steel or steel epoxy lined

	<u>Unit</u>	<u>Proposed</u>
Number of day tanks	each	4
Capacity each solution tank	gal	6,000
Total solution storage capacity	gal	24,000
Days of solution storage @ design flow and average dosage (1.0 mg/l)	days	2.15
Days of solution storage @ design flow and maximum dosage (2.5 mg/l)	days	0.71
Bulk storage	gal	30,000
Type of storage tanks		lined concrete
Concentration	%	100
Days of storage @ design flow and maximum dosage	days	30
Polyelectrolyte - filter aid		
Concentration of solution		0.3 lbs/gal
Type of storage tanks		Fiberglass, 316 stainless steel or steel epoxy lined
Number of day tanks	each	2
Capacity each solution tank	gal	1,800
Total solution storage capacity	gal	3,600
Days of solution storage @ design flow and average dosage	days	3
Days of solution storage @ design flow and maximum dosage	days	0.15
Bulk storage	gal	30,000
Type of storage tanks		lined concrete
Concentration	%	100
Days of storage @ design flow and maximum dosage	days	39

Table 4
ESTIMATED CAPITAL COST
ALFRED MERRITT SMITH WATER TREATMENT PLANT
STAGE II EXPANSION

Item	Construction Cost Based Upon Pre-purchase of Major Equipment		
	1976 Costs*	Escala- tion**	Total
	\$	\$	\$
Construction	25,176,000	5,630,000	30,806,000
Services	3,258,000	624,000	3,882,000
Land	-	-	0
Interest during project less interest earned	-	-	4,513,000 ^{***} †
Bond reserve fund	-	-	3,369,000†
O&M reserve fund	-	-	300,000†
Total	28,434,000	6,254,000	
Anticipated funding requirement			42,870,000

End of project period for bond
interest, May 1, 1981

* Indicates amounts expressed in February 1976 dollars.

** Escalation at 9% for construction, 7% for services,
and 12% for chemicals per year.

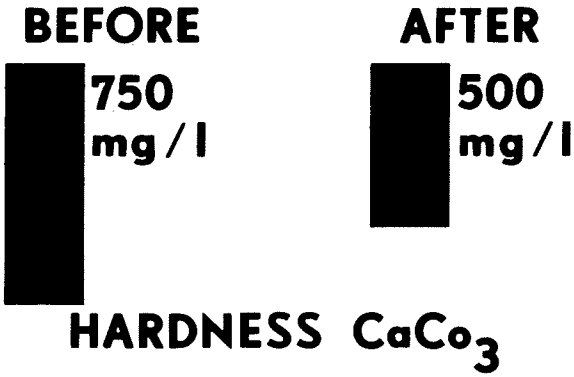
*** Estimate based on unexpended funds invested at same
rate as bond interest.

† Preliminary, refer to Financial Advisor.

SOUTHERN NEVADA WATER SYSTEM ALFRED MERRITT SMITH TREATMENT FACILITY

DEMINERALIZATION

T.D.S.



COST

REVERSE OSMOSIS

CAPITAL COST
120 M TO 150 M
ANNUAL O & M
13 M TO 34 M

ION EXCHANGE

CAPITAL COST
55 M TO 70 M
ANNUAL O & M
22 M TO 69 M

SOFTENING

HARDNESS REDUCTION CaCo₃



COST

LIME-SODA METHOD

CAPITAL COST
18 M TO 32 M
ANNUAL O & M
4 M

Figure 1

SUMMARY SHEETS

Southern Nevada Water Project, Nevada
Second Stage

LOCATION: Clark County, Nevada

AUTHORITY FOR REPORT: Federal Reclamation Law (Act of June 17, 1902, 32 Stat. 388 and Acts amendatory thereof or supplementary thereto). Authorized by Public Law 89-292, dated October 22, 1965 and Public Law 89-510, dated July 19, 1966.

PLAN:

Construction of the Second Stage of the Southern Nevada Water Project will enlarge the present system in a manner designed to increase the capacity of Colorado River water available to the project area from about 200 million gallons a day to nearly 400 million gallons a day. The expansion is necessitated by population growth and the present and future need for additional water generated by that growth. The project will necessitate 5 new pumping plants, modification of 4 existing pumping plants, a 4-mile aqueduct running parallel with the First Stage aqueduct, 32 miles of additional pipeline, and appropriate surge tanks, regulating tanks, and appurtenant works.

PROJECT COSTS: (April 1976 prices)

Construction Costs Financed by Federal Government (Public Law 89-292)	\$	88,083,000
Construction Costs Financed by State of Nevada (Other than Public Law 89-292)		21,781,000
Total Construction Cost (Exclusive of interest during construction)		109,864,000
Item Cost		
Supply Conduits		69,760,000
Pumping Plants		34,800,000
Operating Facilities		5,304,000

CONSTRUCTION PERIOD: Approximately 4 years

ANNUAL EQUIVALENT OPERATION, MAINTENANCE, AND
REPLACEMENT COSTS: 7,751,000

ANNUAL EQUIVALENT BENEFITS: \$ 14,084,000

NET BENEFITS: 3,153,000

ALLOCATION OF COSTS:

100-year period of analysis

Construction Cost (Allocated to M&I and completely reimbursable)	88,083,000
Interest During Construction	5,776,000
Total Federal Investment Cost	93,859,000
Annual Equivalent Investment Cost	3,180,000

REPAYMENT OF COSTS:

Project costs in the amount of \$93,859,000 will be repaid in 50 years at an annual interest rate of 3-1/4 percent interest.

PROJECT FEATURES:

<u>Conduits</u>	<u>Unit</u>	<u>Quantity</u>
Main Aqueduct "B" Line		
Maximum Capacity	ft ³ /s	306
Covered Conduit	feet	12,350
Boulder City Lateral "B" Line		
Maximum Capacity	ft ³ /s	15
Covered Conduit	feet	1,845
Pittman Lateral (Reach 1)		
Maximum Capacity	ft ³ /s	319
Covered Conduit	feet	34,760
Pittman Lateral (Reach 2)		
Maximum Capacity	ft ³ /s	250
Covered Conduit	feet	16,660
Pittman Lateral (Reach 3)		
Maximum Capacity	ft ³ /s	250
Covered Conduit	feet	52,800

PROJECT FEATURES (Continued):

<u>Conduits</u>	<u>Unit</u>	<u>Quantity</u>
Twin Lakes Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	82 29,600
Robinson Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	10 6,400
Foothill Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	12 960
North Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	11 2,960
Mesa Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	46 11,075
Charleston Lateral		
Maximum Capacity Covered Conduit	ft ³ /s feet	40 250

<u>Pumping Plants</u>	<u>Number of Pumps and Standby</u>	<u>Capacity of Each Unit (ft³/s)</u>	<u>Total Dynamic Head Feet @ Design</u>
Pumping Plant No. 1 Additions	10+0	31.2	223
Pumping Plant No. 1A Additions	2+0	7.55	445
Pumping Plant No. 4 Additions	2+0	7.55	445
Pumping Plant No. 5 Additions	2+0	7.55	445
Pumping Plant No. 7B	3+1	5.13	78
Pumping Plant No. 1B	6+1	51.0	355
Pumping Plant No. 2B	6+1	51.0	355
Hacienda Pumping Plant	6+1	43.75	364
Twin Lakes-Robinson Reservoir	3+1	3.5	97.7
Twin Lakes-Carlton Reservoir	3+1	11.2	113

Southern Nevada Water System

Summary of Concepts & Numeric Evaluations
Regarding Proposed Water User Contracts

INTENT - BY WATER USERS AS TO SECOND STAGE CONTRACT OPTIONS
FOR WATER

- Nellis AFB - No second stage option, would like increased
delivery rate (peak capacity)
Letter August 29, 1975, Lt. Col. Pearson
- No. L.V. - 20,000 AF/yr option. Requests 20,000 AF/yr
Letter September 3, 1975, Mayor C. R. Cleland
- LVVWD - 100,800 AF/yr option. Requests 100,800 AF/yr
Letter September 9, 1975, President Jack Petitti
- Henderson - 33,000 AF/yr option. Requests 33,000 AF/yr
Letter September 10, 1975, City Manager Donald Dawson
- Boulder City-13,000 AF/yr option. Requests 13,000 AF/yr
Letter September 9, 1975, City Manager M. L. Degernes

Summary: All contract options fully exercised to a
total of 166,800 AF/yr for second stage water.

CAPITAL COST ALTERNATIVES AFTER SECOND STAGE FACILITIES BECOME
OPERATIONAL (1982)*

Alternate A - Combined Repayment

This alternate provides for the repayment of the capital
costs for both the first and second stage facilities on
the basis of each entities' proportionate, combined first
and second stage contracted amounts.

Alternate B - Separate Repayment

This alternate provides for the separate repayment of the
capital costs for the first and second stage facilities on
the basis of each entities' proportionate contracted amount
for the first and second stages, respectively.

*Reserve costs are anticipated to be treated in a similar manner
as the capital costs.

Alternate C - Combined Repayment with First Stage Adjustment

This alternate provides for the repayment of the capital costs for both the first and second stage facilities as described in Alternate A, providing, however, adjustments would be made to the repayment obligations which accrued prior to the second stage coming on line and the resulting differences would be debited or credited to the entities in some manner yet to be determined.

Alternate D - Separate Repayment with Second Stage Principal Repayment Adjustment

This alternate provides for the separate repayment of the capital cost for the first and second stage facilities as described in Alternate B, providing, however, amortization of the second stage principal by any given entity would begin when one of two events occurred; namely, (1) the actual annual water delivery exceeds the first stage delivery allocation, or (2) the annual water delivery projection submitted by the entity exceeds the first stage delivery allocation. Annual interest on the outstanding balance would be paid by each entity on the basis of the proportional outstanding principal balance of each entity for that year.

EXPRESSIONS BY WATER USER REPRESENTATIVES REGARDING
COMBINED OR SEPARATE CAPITAL & RESERVE
REPAYMENT ALTERNATIVES

Nellis AFB - Not affected by second stage Federal facilities, generally agreeable to participate financially in modifications to first stage treatment facilities.

No. L.V. - Suggests modification of combined alternative to address redistribution of costs of first stage facilities to closer relate to combined allocation.
Letter December 28, 1976, Jack Mitchell, Director of Public Works

LVVWD - Repayment of capital and reserve funds should be separate for first and second stages.
Letter December 21, 1976, T. R. Rice, General Manager

Henderson - Repayment of capital and reserve funds should be combined for first and second stages.
Letter December 21, 1976, Geoffrey Billingsley, Director of Public Works

Boulder City - Repayment of capital and reserve funds should be combined for first and second stages.
Letter December 22, 1976, M. L. Degernes, Jr., City Manager

Summary: Two water users favor Alternative A - Combined Repayment

One suggests Alternative C - Combined Repayment with first stage adjustment

One suggests Alternative B - Separate Repayment

One is not impacted directly by any alternative.

EVALUATIONS & CONSIDERATIONS

Separate Capital Repayment v Combined Capital Repayment

Ref: Las Vegas Valley Water District September 28, 1976

	Separate Obligation Total	Combined Obligation Total	Difference Total
North Las Vegas	76,400,000	81,600,000	+ 5,200,000
Las Vegas Valley Water District	383,400,000	407,900,000	+24,500,000
Henderson	102,300,000	81,600,000	-20,700,000
Boulder City	39,600,000	30,600,000	- 9,000,000
GRAND TOTAL	\$601,700,000†	\$601,700,000*	0

*TOTAL \$602,200,000 (Nellis Air Force Base obligation \$500,000).

Separate Capital Repayment v Combined Capital Repayment Based on
Annual Allotment of Water & Construction Cost

Ref: Brown & Caldwell memo, undated

Construction Cost First Stage assumed \$61,800,000
Construction Cost Second Stage assumed \$209,000,000

	Separate \$/AF	Combined \$/AF	Difference \$/AF
Nellis Air Force Base*	467	467	0
North Las Vegas	860	911	+ 51
Las Vegas Valley Water District	863	911	+ 48
Henderson	1,115	911	-204
Boulder City	1,148	911	-237
AVG	906	906	

*Prepayment of federal construction costs.

Separate Capital Repayment v Combined Capital Repayment Based on Actual and Projected Water Use & Construction Costs (1971 through 2031)

Ref: Division of Colorado River Resources January 31, 1977

Construction Cost First Stage assumed \$61,800,000
Construction Cost Second Stage assumed \$209,000,000

	<u>Total Water</u> <u>1,000 AF</u>	<u>Separate</u> <u>\$/AF</u>	<u>Combined</u> <u>\$/AF</u>	<u>Difference</u> <u>\$/AF</u>
Nellis Air Force Base	181	1.49	1.49	-
North Las Vegas	1,564	22.16	23.45	+1.29
Las Vegas Valley Water District	9,405	18.49	19.50	+1.01
Henderson	1,021	43.79	35.93	-7.86
Boulder City	532	32.42	25.86	-6.56
TOTAL	12,703			

Separate Capital Repayment v Combined Capital Repayment Based on Cost of Facilities to Serve Water User

Ref: Brown & Caldwell memo, undated

Construction Cost First Stage assumed \$61,800,000
Construction Cost Second Stage assumed \$209,000,000

	<u>Separate</u>		<u>Combined</u>	
	<u>%</u> <u>Cost of</u> <u>Facilities</u>	<u>%</u> <u>Repayment</u>	<u>%</u> <u>Cost of</u> <u>Facilities</u>	<u>%</u> <u>Repayment</u>
Nellis Air Force Base*	0.606	0.083	0.606	0.083
North Las Vegas	17.417	12.687	17.417	13.550
Las Vegas Valley Water District	65.241	63.667	65.241	67.735
Henderson	12.362	16.988	12.362	13.550
Boulder City	4.360	6.576	4.360	5.081
TOTAL	100.000	100.000	100.000	100.000

*Prepayment of federal construction costs.

Projected Total Unit Costs Including Capital Repayment and O & M and Reserves (Period 1982 through 2031)

Ref: Division of Colorado River Resources, October 1976

	Separate Capital & Reserves Variable & Fixed O&M			Combined Capital & Reserves Variable O&M		
	\$/AF	\$/AF	\$/AF	\$/AF	\$/AF	\$/AF
	High	Low	AVG	High	Low	AVG
Nellis Air Force Base*	192	51	119	192	52	119
North Las Vegas	210	105	169	212	108	171
Las Vegas Valley Water District	210	99	156	212	102	160
Henderson	959	185	243	752	174	215
Boulder City	288	164	202	230	156	183

*Prepayment of federal construction costs.

Separate Capital & Reserve Repayment v Combined Capital & Reserve Repayment Comparing % Cost to % Water Usage (1982 through 2031)

Ref: Division of Colorado River Resources, December 9, 1976

	Separate		Combined	
	Cost %	Water Use %	Cost %	Water Use %
Nellis Air Force Base*	0.10	1.36	0.09	1.36
North Las Vegas	12.71	12.42	13.55	12.42
Las Vegas Valley Water District	63.79	73.49	67.73	73.49
Henderson	16.87	8.44	13.55	8.44
Boulder City	6.53	4.29	5.08	4.29
TOTAL	100.00	100.00	100.00	100.00

*Prepayment of federal construction costs.

Impact on Average Monthly Residential Customer's Bill if Separate Capital and Reserve Approach is Used as Compared to Combined (Difference) Based on Total Obligation (Principal & Interest Plus Reserves)

Ref: Division of Colorado River Resources, December 9, 1976

	<u>1982</u> \$	<u>1990</u> \$	<u>2030</u> \$	<u>AVG</u> \$
North Las Vegas	- 0.19	- 0.44	-0.15	-0.14
Las Vegas Valley Water District	- 0.23	- 0.48	-0.16	-0.28
Henderson	+10.23	+13.13	+0.64	+1.98
Boulder City	+ 1.84	+ 4.16	+0.75	+1.36

Payment of Second Stage Obligation & Reserve Costs Without Use of Second Stage Water Allocation, Based on Second Stage Cost & Separate Payment of Capital & Reserves

Ref: Division of Colorado River Resources, December 9, 1976

North Las Vegas	\$ 4,777,000
LVVWD	Uses second stage allocation upon completion of Second Stage
Henderson	\$29,931,000
Boulder City	Uses Second Stage allocation upon completion of Second Stage

Adjustments to First Stage Repayment Obligation based on combined capital payment to be effective after Second Stage becomes operational (adjustment period 1972 to 1982)

Ref: Division of Colorado River Resources, January 13, 1977

Alternative C - Combined Repayment with First Stage Adjustment
Increased or Decreased First Stage Obligation*

North Las Vegas	-\$ 368,000
LVVWD	-\$1,722,000
Henderson	+\$1,527,000
Boulder City	+\$ 664,000

* Equal distribution of increase or decrease of obligation not calculated.

Repayment Based on Separate Capital and Reserve Repayment, with distribution of individual annual payments based on interest payments only until water user starts use of Second Stage water at which time principal payments begin and continue.

Ref: Las Vegas Valley Water District, January 28, 1977

Alternative D - Separate Repayment with Second Stage Principal Repayment Adjustment

Total Obligation

	Separate w/modified Annual Distribution* **	Separate w/water Allocation Dist. **	Combined w/water Allocation Dist. **
	\$	\$	\$
No. Las Vegas	81,800,000	76,400,000	81,600,000
LVVWD	362,100,000	383,400,000	407,900,000
Henderson	117,600,000	102,300,000	81,600,000
Boulder City	40,200,000	39,600,000	30,600,000

* Produces "balloon" payments for Boulder City, North Las Vegas, Henderson

** Annual payments calculated but not shown herein

Other Factors

Impact of second stage costs which are beneficial to the first stage facilities, i.e. new overall control systems, modification to first stage treatment facility, etc. Estimated cost \$6,900,000. If separate approach used the Las Vegas Valley Water District and North Las Vegas would assume a larger proportionate share of these costs than that which they would have under a combined approach.

Ref: Division of Colorado River Resources December 9, 1976

Second stage project facilities provide for delivery capacity flexibility to the Las Vegas Valley Water District which is not included in other water user facilities. Costs not estimated.

Since replacement and major repairs are not based on water usage in any capital and reserve repayment alternative, the early usage of second stage facilities and also heavy first stage facilities places an unequitable reserve cost burden on those water users with less water usage costs not estimated.

Southern Nevada Water System

DATA

COSTS

<u>First Stage</u>	<u>Total Capital</u>	<u>Total Repayment Obligation</u>
Treatment Facility (State GO Bonds @ 4.95%, 40 yrs.)	\$ 8,900,000	\$ 15,000,000
Federal Facility (Federal Appropriations 3-1/4%, 50 yrs.)	\$ 52,900,000	\$102,400,000
TOTAL	\$ 61,800,000	\$117,400,000

<u>Second Stage (Estimated)</u>	<u>Total Capital (1981 \$'s)</u>	<u>Total Repayment Obligation</u>
State GO Bonds @ 6-3/4%, 30 yrs.	\$ 83,000,000	\$203,000,000
Federal Appropriations 3-1/4%, 50 yrs.	\$ 126,000,000	\$281,800,000
TOTAL	\$ 209,000,000	\$484,800,000

Southern Nevada Water System

DATA (Continued)

WATER CONTRACT AMOUNTS

	<u>First Stage</u>		<u>Second Stage Option</u>		<u>Combined Total</u>	
	<u>AF/YR</u>	<u>%</u>	<u>AF/YR</u>	<u>%</u>	<u>AF/YR</u>	<u>%</u>
Nellis Air Force Base	4,000	3.026	-	0	4,000	1.338
North Las Vegas	20,000	15.128	20,000	11.990	40,000	13.378
Las Vegas Valley Water District	99,200	75.038	100,800	60.432	200,000	66.890
Henderson	7,000	5.295	33,000	19.784	40,000	13.379
Boulder City	<u>2,000</u>	<u>1.529</u>	<u>13,000</u>	<u>7.794</u>	<u>15,000</u>	<u>5.017</u>
TOTAL	132,200	100.000	166,800	100.000	299,000	100.000

PROJECTED WATER USE** (1976 Projections)

	<u>1976*</u> <u>AF/YR</u>	<u>1982</u> <u>AF/YR</u>	<u>Date First Stage Water Used</u>		<u>Date Second Stage Water Used</u>	
			<u>Year</u>	<u>AF/YR</u>	<u>Year</u>	<u>AF/YR</u>
Nellis Air Force Base	2,100	2,100	2020	4,000	-	-
North Las Vegas	6,500	18,000	1987	20,000	2030	20,000
Las Vegas Valley Water District	59,400	99,200	1982	99,200	2015	100,800
Henderson	1,900	2,000	1995	7,000	2022	33,000
Boulder City	2,000	3,500	1976	<u>2,000</u>	2015	<u>13,000</u>
TOTAL				132,200		166,800

* Actual

** NO consideration of alternative water supplies.

SOUTHERN NEVADA WATER SYSTEM

Water User Meeting January 24, 1977

To put the current contract issues into perspective, perhaps a brief history of past events would be helpful.

In late 1973 and early 1974, it became apparent that water usage and capacity requirements from the First Stage of the system were exceeding projections. This fact was supported by other studies and projections of future water requirements from the water users. Mindful of the lead time required to study, finance and construct a project which would essentially duplicate the size of the First Stage of the system we, in cooperation with the water users, requested initiation of studies for the Second Stage by the Bureau of Reclamation in March of 1974. With favorable action by the Federal Appropriations Committee pursuant to PL 89-292, planning funds were made available for the Second Stage.

The approach taken in the advanced planning of the Second Stage followed closely that which was taken for the First Stage in almost every respect with the exception the timetable of all activities was set up on an expedited basis.

You are already aware of the First Stage water allocations and the attendant cost obligations. It might be of interest to briefly reflect as to the actual unit costs of water to each of the entities in the period from 1972 to date.

The range of unit prices of water, including debt amortization, reserves and operation and maintenance costs, for each of the water users is as follows:

<u>COST PER 1000 GALLONS</u>					
<u>1/</u>	<u>Boulder City</u>	<u>Henderson</u>	<u>LVVWD</u>	<u>NAFB**</u>	<u>NLV</u>
1972	0.116	40.52	0.113	0.107	0.387
1973	0.095	0.174	0.119	0.101	0.304
1974	0.123	0.206	0.150	0.111	0.285
1975	0.138	0.270	0.165	0.126	0.218
1976*	0.141	0.242	0.169	0.126	0.227

1/ Shows in \$

* 11 months

** Federal debt obligation prepaid

	<u>HIGH</u>	<u>LOW</u>	<u>AVERAGE</u>
1972	\$40.52	\$0.107	\$0.126
1973	\$0.304	\$0.095	\$0.126
1974	\$0.285	\$0.111	\$0.156
1975	\$0.270	\$0.126	\$0.172
1976*	\$0.242	\$0.126	\$0.175

These costs are the real costs that impact upon the various water users notwithstanding their independent ability to introduce and manage other water systems available to them, for example ground water and other Colorado River supply systems.

Another factor of interest, which we believe was essential in the First Stage was the planning and construction of facilities necessary to accommodate the full development potential of the system. It is noteworthy

also that parts of the system were constructed to accommodate developments beyond the current boundaries of the existing water users. A case in point is the excess capability in the Boulder City lateral to allow the Las Vegas Valley Water District to make deliveries into the Eldorado Valley.

The fundamental concept of the First Stage was a regional water supply system planned and developed to serve the metropolitan areas of the Las Vegas Valley and Boulder City. The agreed-upon financial arrangements were focused and planned to provide a uniform unit cost to all users, notwithstanding the variation in physical location or extent of the facilities required to make deliveries to each of the water users. Variations in the physical facilities and the potentiality of disparities in unit costs during the project build-up period were acknowledged.

With that very limited history on the First Stage facilities, it might be well to briefly explain some of the activities subsequent to 1974 and the initiation of studies for the Second Stage. Early in the planning processes we requested and received from each of the governing bodies of the water users letters expressing their intent to proceed with their optioned allocation of water for the Second Stage as provided in the First Stage contracts. Planning of the physical requirements were developed on the basis of these letters of intent along with the specific details being prepared by the representatives of each of the water users. In this development there was substantial compromise among the users to seek optimization of the Second Stage facilities to meet their requirements and yet remain an economically feasible system. Here again, there are disparities as to the location and physical works required to make deliveries to each of the entities.

Both stages are in reality a single water supply system built in two stages to serve the Las Vegas Valley and Boulder City areas. Again, as in the First Stage, some anomalies and variations in costs can be experienced and are acknowledged. The intensity of these variations to a great degree reside in the various water agencies' management capabilities of water served from the Southern Nevada Water System and other systems providing water to their service areas.

Through full disclosure, we have attempted to indicate the spectrum of physical works and financial implications to each of the water users, through their representatives on a committee which has met frequently to jointly formulate and consider all aspects of the system. This is in keeping with the procedure followed during the First Stage development. It is extremely difficult, if not impossible, to forecast all the alternative financial implications to each of the water users because of the almost infinite number of numeric variables involved. Those numeric variations perhaps give guidelines and trends but cannot, in our opinion, be used as a single criteria.

With the Bureau of Reclamation and the water users, we have prepared a definitive plan of the Second Stage pumping facilities and pipelines, along with a pre-design plan for the expansion of the water treatment facilities and some renovation to the existing treatment facility. We are now ready to proceed with the design and construction activities along with the required financing. I would strongly emphasize that we have chosen a highly expedited schedule of over-all activities necessary to accomplish the operation of the Second Stage in early 1981. This is consistent with the general, but not specific, water needs of the Las Vegas Valley and Boulder City.

In the process of carrying out all the activities necessary to accomplish this vital water supply system to the region, a significant element has been under discussion for some six months. This element consists of the contracts required to be executed prior to the initiation of the actual construction. There are six contracts involved; one contract is between the United States and the State of Nevada for water delivery and repayment of the Federal appropriations and five contracts call for water deliveries to each of the water users and their repayment of both the Federal appropriations (costs) and the General Obligation bonds financing the enlargement and partial renovation of the water treatment facility.

The contract between the State of Nevada and the United States is essentially in final form, and will be ready for execution pending the completion of the environmental statement. The five contracts between the State and water users are in final form except for the three issues which have been brought to your attention.

In our preparation of the draft contract which is essentially common to each water user except for numeric values, we proposed the following criteria relative to the three currently unresolved issues:

1. The repayment of all capital costs be allocated on the basis of combined first and second stage costs and water allocations.
2. The operation and maintenance costs be allocated on the basis of water used for the entire system.
3. The 1975 legislative act relating to the responsibilities of the Las Vegas Valley Water District relative to the Southern Nevada Water System be cited in its entirety in the water user contracts.

Our proposal in the first draft contracts was not prepared on numerical evaluations alone pertaining to the capital repayment and operation and maintenance. Included in our evaluations were the following concepts:

1. It is impossible to achieve an absolute equity in unit costs among each of the water users although our proposed method achieves such equity over the long term.
2. The independent management authorities and responsibilities of the water users can create financial anomalies which again are erased in the long term of the system.
3. The disparities of location, required facilities and projected water usage, both instantaneous and annual, can best be addressed by the method we propose.
4. The First and Second Stage works are physically and cost inter-related and are considered as a single regional water supply system.

I understand that many of you have received numeric values indicating a disparity in cost obligations from one water user to another. On the basis of the assumptions and the projections, we believe the numeric values you have received are quite accurate. However, these plus and minus cost obligations must be construed as they were in the First Stage as indicators toward judgmental considerations but must not be considered in our opinion, as absolutes. We believe that the positive and negative cost implications that can be developed and have been developed numerically essentially balance each other for each of the water users if the combined capital and variable operation cost procedure is followed. Indeed there are many factors which somewhat defy numeric

evaluations which also are needed to make decisions. No doubt some of these factors have been discussed with you.

Since we have chosen by necessity a very critical time schedule for the Second Stage facilities required to meet the annual water needs of the region, and further, since the contracts are an essential part of the mechanism to achieve operation of the Second Stage in early 1981, we continue to urge agreement of the contracts among the water users and ourselves. In our opinion, delays caused by prolonged inaction will have serious financial and water supply implications. With the cooperation of the entire community, the State and the United States, we have now created substantial momentum to fully accomplish the Second Stage of the Southern Nevada Water System. Here again, displays of the numeric impacts only provide substance for judgments.

In order to prepare for the necessary financing of the system, we have proposed an amendment to Chapter 482 which amends the 1975 financing authorization to the current facts displayed as to costs and physical features. This amendment has been introduced into the 1977 Legislature as SB-40. We believe the bill which is affirmative to the financing is necessary to the construction of the project. We believe it is supportable and we seek your support. However, at the hearings of this bill we must fully disclose the complete status of the project including the contractual arrangements. Prior to action by the legislature on that bill, we believe that all contracts should be in final form. Thus, if the issues are unresolved at the time of those legislative hearings, it would be my intent to propose amendments which would allow the legislature to define and provide the procedure relative

to the three outstanding issues. I know of no other course of action unless these issues are promptly resolved to the satisfaction of all water users and can be recommended by the Division.