

FEB 13 1981

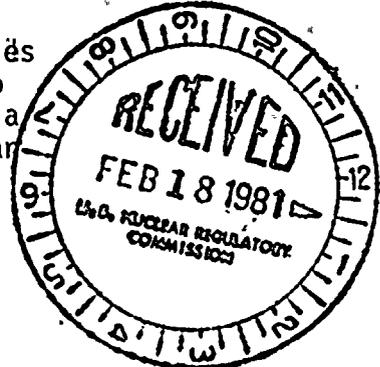
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- JKerrigan
- GGears

Docket Nos.: STN 50-528/529/530

Mr. E. E. Van Brunt, Jr.
 Vice President - Construction Projects
 Arizona Public Service Company
 P. O. Box 21666
 Phoenix, Arizona 85036



Dear Mr. Van Brunt:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE ENVIRONMENTAL REVIEW
 OF PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3

A site visit to the Palo Verde Nuclear Generating Station was made on Tuesday, January 27, 1981, by members of the NRC staff and our consultants from the Argonne National Laboratory (ANL). On Wednesday, January 28, 1981, members of our review team met with your representatives at the Buckeye Union High School board room in Buckeye, Arizona, to discuss draft questions resulting from our earlier review of the Environmental Report and the site visit. As a result of our site visit, our meetings with your representatives and our continued review of your Environmental Report, we require additional information to complete our evaluation of the environmental factors related to the operation of the station. Accordingly, please amend your Environmental Report to include the information requested in Enclosure 1 to this letter.

In order to maintain our proposed schedule, we will need a completely adequate response to the enclosed request and the above ER revision by March 3, 1981. If your reply is not fully responsive to our requests, or not provided in a timely manner, the overall schedule for the environmental review will have to be extended. Should you have questions concerning the scope or intent of the requested information, please contact us for an early resolution.

During our site visit and meetings with your representatives, we discussed our proposed schedule for conducting the environmental review of the Palo Verde Nuclear Generating Station. The principal milestones are listed on Enclosure 2. We believe this schedule is realistic, but demanding on both of our staffs. We must caution that failures in meeting the listed milestones may result in significant delays in the start of the environmental portions of the hearings to be held on this operating license application.

Sincerely

Original signed by
Robert L. Tedesco

Robert L. Tedesco, Assistant Director

A

8102260 558

| | | | | | | |
|---------|------------------|--|--|-----------------------|--|--|
| OFFICE | DI... | | | For Licensing | | |
| SURNAME | | | | Division of Licensing | | |
| DATE | cc w/enclosures: | | | | | |
| | See next page: | | | | | |



23-1017

E. E. Van Brunt, Jr.

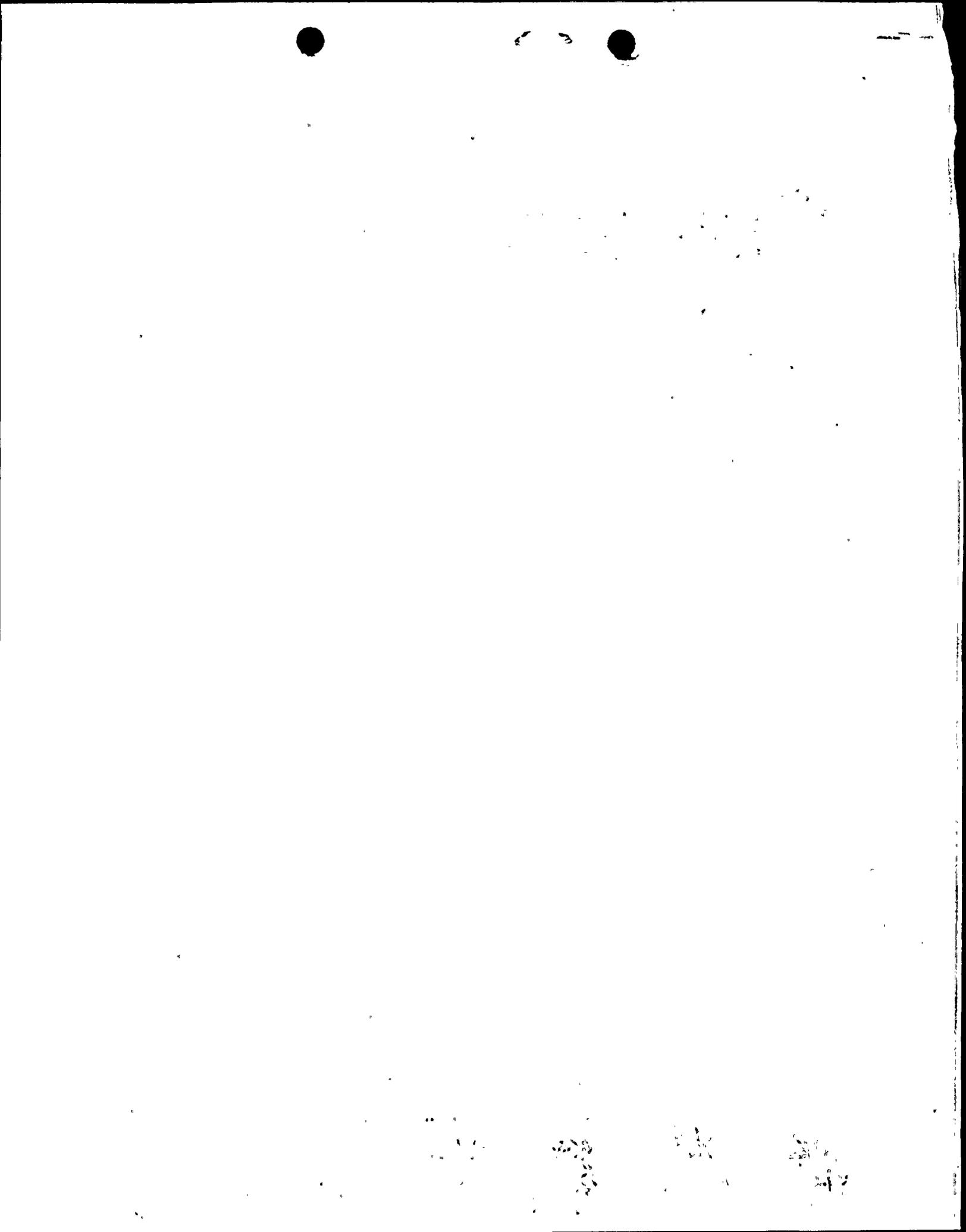
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FEB 13 1981

Enclosures:

1. Environmental Review, Request for Additional Information
2. Operating License Environmental Review Schedule

| | | | | | | | |
|---------|---------------|----------|---------|-----------|--|--|--|
| OFFICE | DL:LB#3 | DL:LB#3 | DE:EEB | DL:AD/L | | | |
| SURNAME | JDKedrican:jb | FMI:Alia | GGe:G | RL:edesco | | | |
| DATE | 2/12/81 | 2/12/81 | 2/12/81 | 2/12/81 | | | |





UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 13 1981

Docket Nos.: STN 50-528/529/530

Mr. E. E. Van Brunt, Jr.
Vice President - Construction Projects
Arizona Public Service Company
P. O. Box 21666
Phoenix, Arizona 85036

Dear Mr. Van Brunt:

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE ENVIRONMENTAL REVIEW
OF PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3

A site visit to the Palo Verde Nuclear Generating Station was made on Tuesday, January 27, 1981, by members of the NRC staff and our consultants from the Argonne National Laboratory (ANL). On Wednesday, January 28, 1981, members of our review team met with your representatives at the Buckeye Union High School board room in Buckeye, Arizona to discuss draft questions resulting from our earlier review of the Environmental Report and the site visit. As a result of our site visit, our meetings with your representatives and our continued review of your Environmental Report, we require additional information to complete our evaluation of the environmental factors related to the operation of the station. Accordingly, please amend your Environmental Report to include the information requested in Enclosure 1 to this letter.

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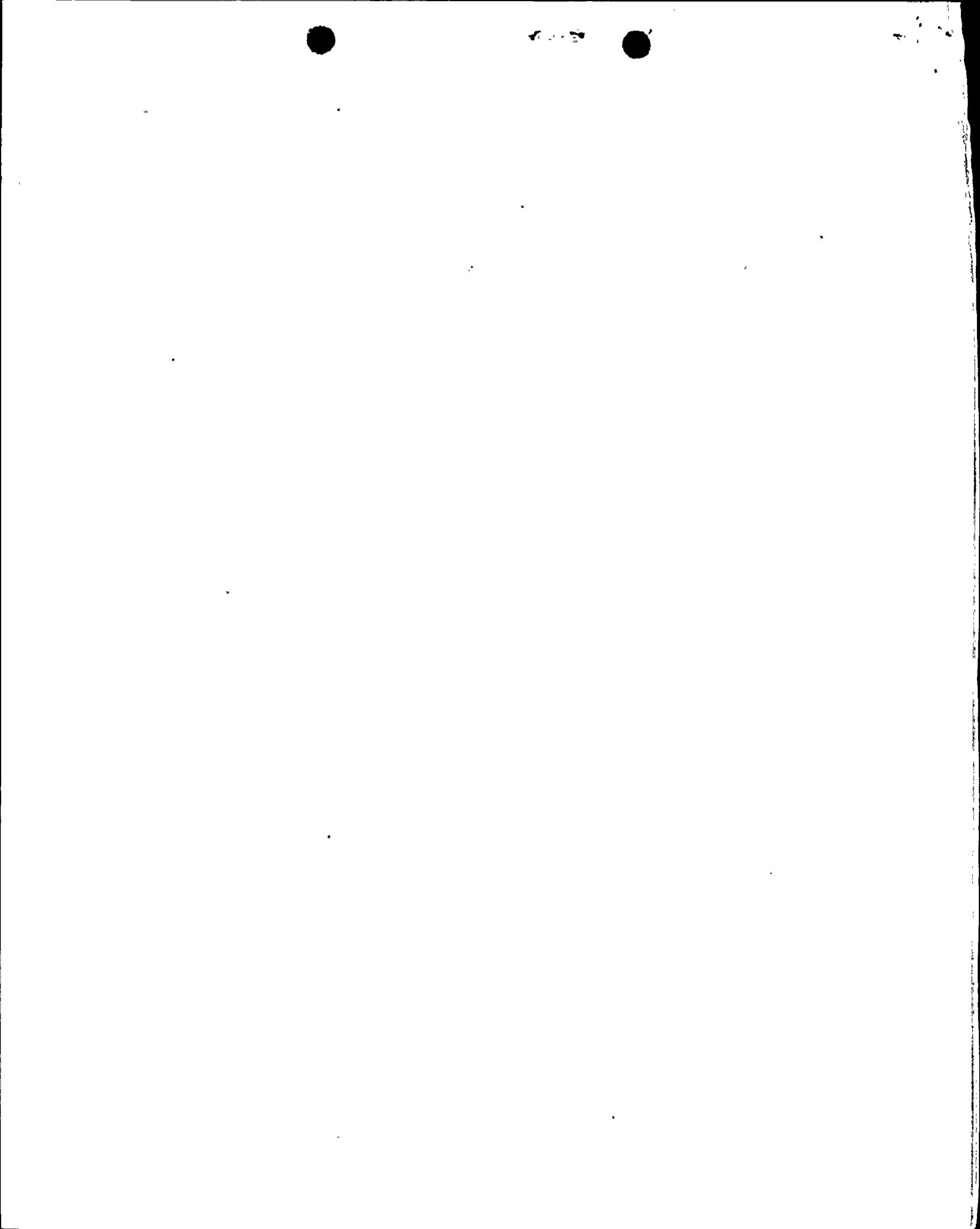
During our site visit and meetings with your representatives, we discussed our proposed schedule for conducting the environmental review of the Palo Verde Nuclear Generating Station. The principal milestones are listed on Enclosure 2. We believe this schedule is realistic, but demanding on both of our staffs. We must caution that failures in meeting the listed milestones may result in significant delays in the start of the environmental portions of the hearings to be held on this operating license application.

Sincerely

A handwritten signature in dark ink, appearing to read "R. L. Tedesco".

Robert L. Tedesco, Assistant Director
for Licensing
Division of Licensing

cc w/enclosures:
See next page.



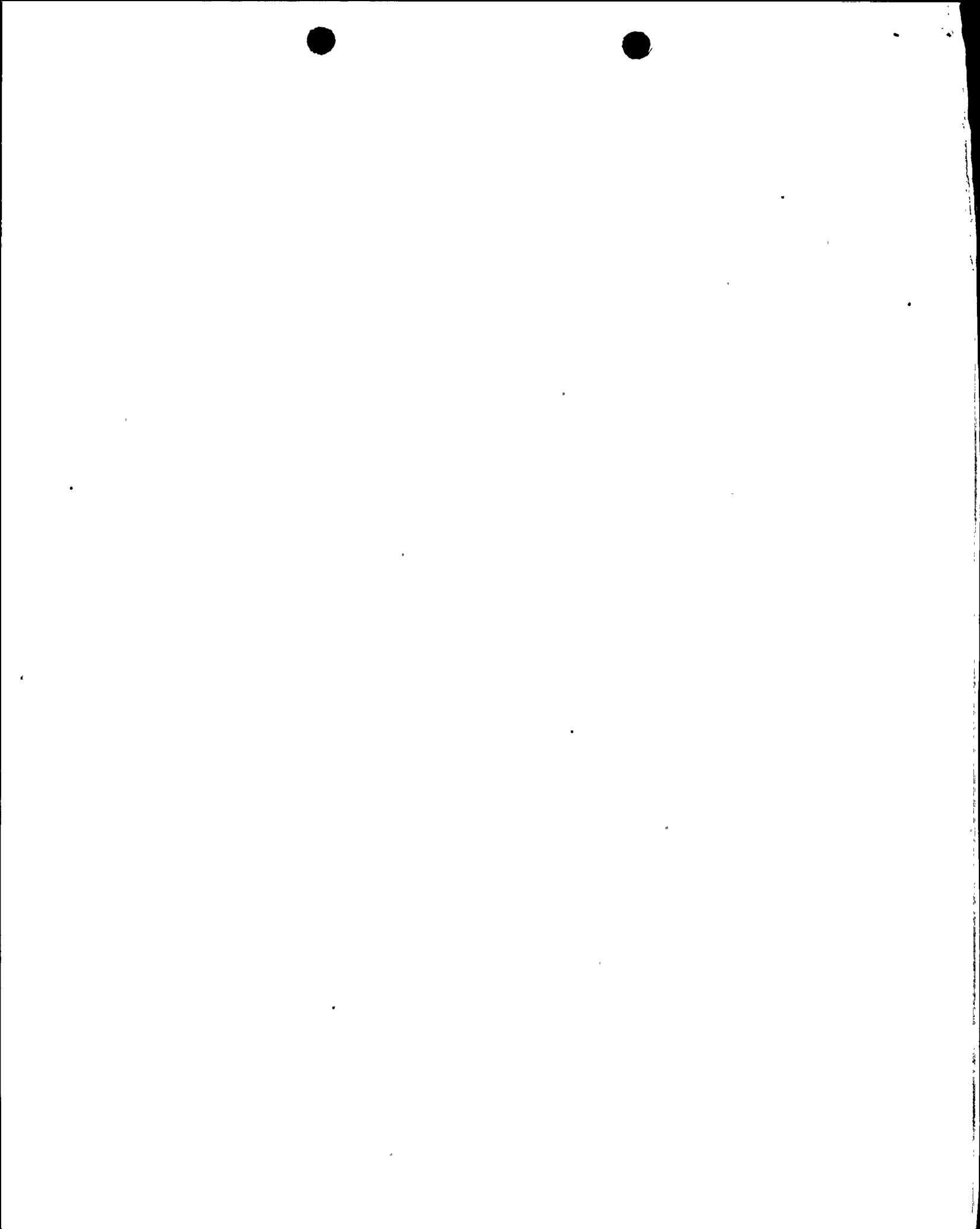
E. E. Van Brunt, Jr.

- 2 -

FEB 13 1981.

Enclosures:

1. Environmental Review, Request
for Additional Information
2. Operating License Environmental Review Schedule



Mr. E. E. Van Brunt, Jr.

cc: Arthur C. Gehr, Esq.
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3100 Valley Center
Phoenix, Arizona 85073

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Santa Fe, New Mexico 87503

Resident Inspector Palo Verde/NPS
U.S. Nuclear Regulatory Commission
c/o TTL/LGX
Luke Air Force Base, Arizona 85309

Ms. Patricia Lee Hourihan
6413 S. 26th Street
Phoenix, Arizona 85040



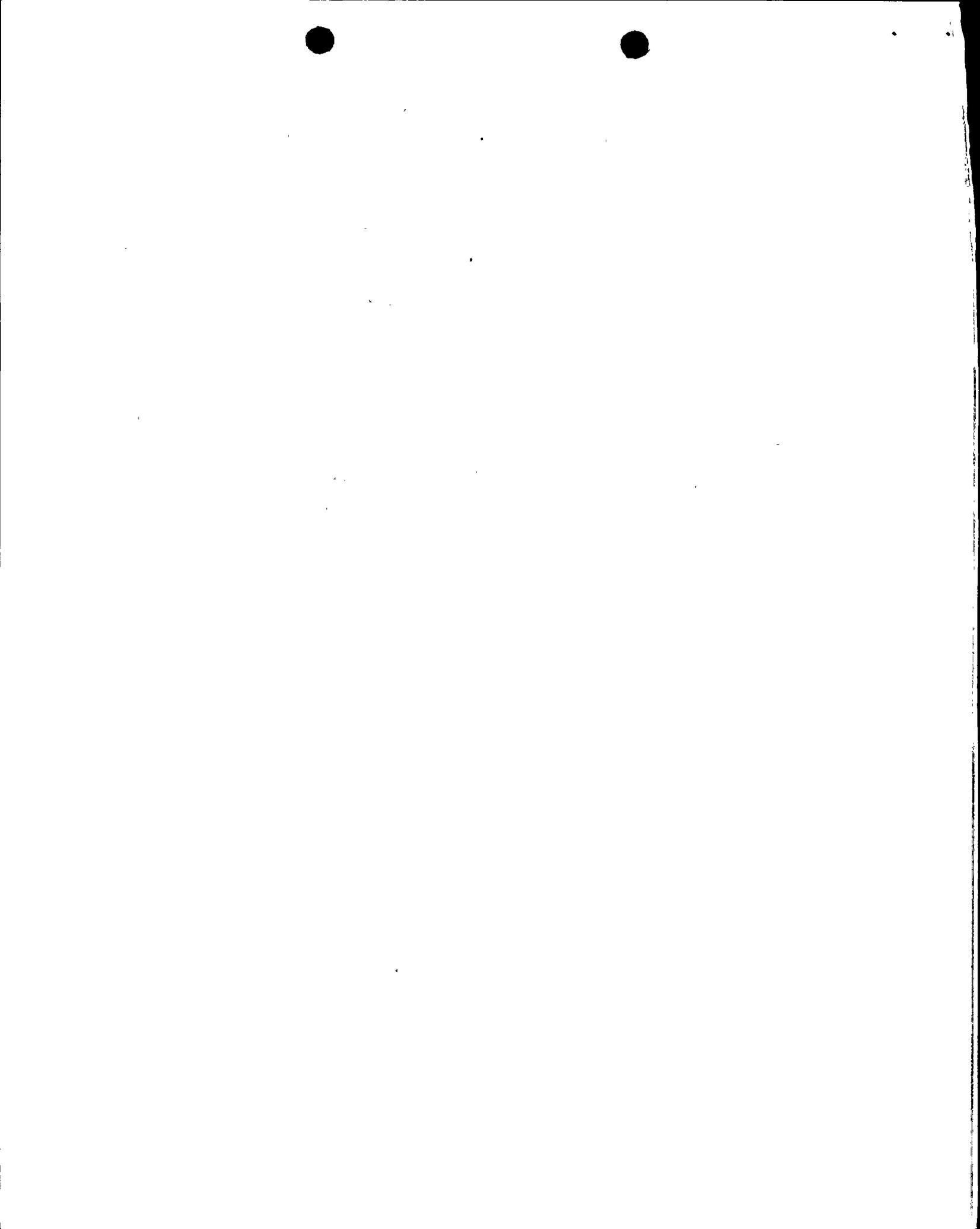
240.0

HYDROLOGICAL AND GEOTECHNICAL AND ENGINEERING BRANCH240.1
(ER)

Sewage effluent from the city of Phoenix is to be utilized as the source of condenser cooling water and the amount of effluent produced at the 91st Avenue Sewage Treatment Facility will determine the amount of cooling water available for plant use. At the present time, the sewage treatment facility is being expanded from a capacity of 95 MGD (million gallons per day) to 120 MGD. It is likely that this facility will not be expanded any further before Palo Verde Unit 3 goes into operation. Assuming that there is no further expansion, will there be sufficient cooling water available for all three units? If yes, provide the basis on which you made your determination. Include as a minimum the following information.

- (1) How much effluent will be produced at the 91st Avenue Facility once the 120 MGD expansion is completed, i.e., will the plant operate at full capacity?
- (2) Of the total effluent produced, how much will be available for use at Palo Verde? Provide and explain the basis used to determine this quantity and show how your right to this effluent relates to other effluent users, i.e., will the amount of effluent available satisfy all user demands? If not, how will the available effluent be apportioned between users and what is the basis for the apportionment.
- (3) Of the effluent determined in (2) above to be available for Palo Verde use at the 91st Avenue Facility, provide an estimate of the net amount that will be available at Palo Verde once all losses have been accounted for. Provide the basis for this determination and include all losses such as pipe leakage, evaporation, seepage, etc. Define the criteria used in determining these losses.

If the 120 MGD expansion will not provide an adequate quantity of effluent for all three Palo Verde units, provide information on how the Palo Verde plant will be operated to compensate for this reduced supply of water.



240.2
(ER)

If the 120 MGD capacity will not provide an adequate amount of cooling water for Palo Verde and you anticipate further expansion of the 91st Avenue Facility, provide information on when this expansion will occur and relate this to your schedule for operation of the Palo Verde station. Also provide data on the status of future expansion plans, i.e., are plans in the planning stage or is a contract ready to be let or is the status somewhere in between?

240.3
(ER)

At the site visit and meeting of January 27-28, 1981, we were informed that the liner for the evaporation and storage ponds will consist of an asphalt bottom with hypalon on the side slopes. Provide plans of this proposal and a description of how the liner is to be installed.

240.4
(ER)
(3.3)

In the key to Figure 3-3 of the FES, the influent from the city of Phoenix 91st Avenue sewage treatment plant is 48,890 gpm for three units at maximum output and annual average ambient conditions. In Figure 3.3-1 of the ER-0L, the influent from the sewage treatment plant is 39,700 gpm for three units at 95% output and annual average ambient conditions and a one month shutdown for each unit. Please explain how the second value is obtained from the first.



290.0

ENVIRONMENTAL ENGINEERING BRANCH

290.1

(ER)
(6.1.3.3)

Describe the validation studies (done either by APS or others) of the FOG, drift and LVPM models since the References 6.1-5 and 6.1-7 were published.

290.2

(ER)

Provide the value of the total dissolved and suspended solids (TDS and TSS) in the circulating cooling water systems used in the drift calculations. Also, provide information on the relative amounts of the various chemicals in the circulating water.

290.3

(ER)
(6.1)

Provide the critical wind speed for aerodynamic downwash for the circular mechanical-draft cooling towers. Describe the basis for this value. Describe how the presence of other structures near the towers and/or wind direction affect the critical windspeed.

290.4

(ER)
(5.1)

State the distance from the towers for which Figures 5.1-7 and 5.1-8 are valid. Are these values for 3-unit operation?

290.5

(ER)
(5.4)

Describe in more detail how the value of $365 \mu\text{g}/\text{m}^3$ of SO_2 was calculated in Table 5.4-2. Was it assumed that 1 or 3 units were in operation for the full 24 hours? Also, the NAAQS standard is that $365 \mu\text{g}/\text{m}^3$ is not to be exceeded more than once per year (indicated as the second highest calculated value).

290.6

(ER)
(5.4)

Please provide information on existing air quality at the site so that the staff can determine if applicable air quality standards will be violated by emissions from the plant. Are the air pollution standards given in Section 5.4 still valid? If not, present the new values.

290.7

(ER)

Describe how the Buckeye Irrigation Company will receive its water from the 91st Avenue Sewage Plant during PVNGS operation. Identify the location where water for the Buckeye Irrigation Company is diverted from water sent to PVNGS. Describe the mitigation measures planned to preserve the riparian habitats and green belts (CP-FES Section 2.7) once the water is diverted from the 91st Avenue Sewage Treatment Plant to PVNGS.

290.8

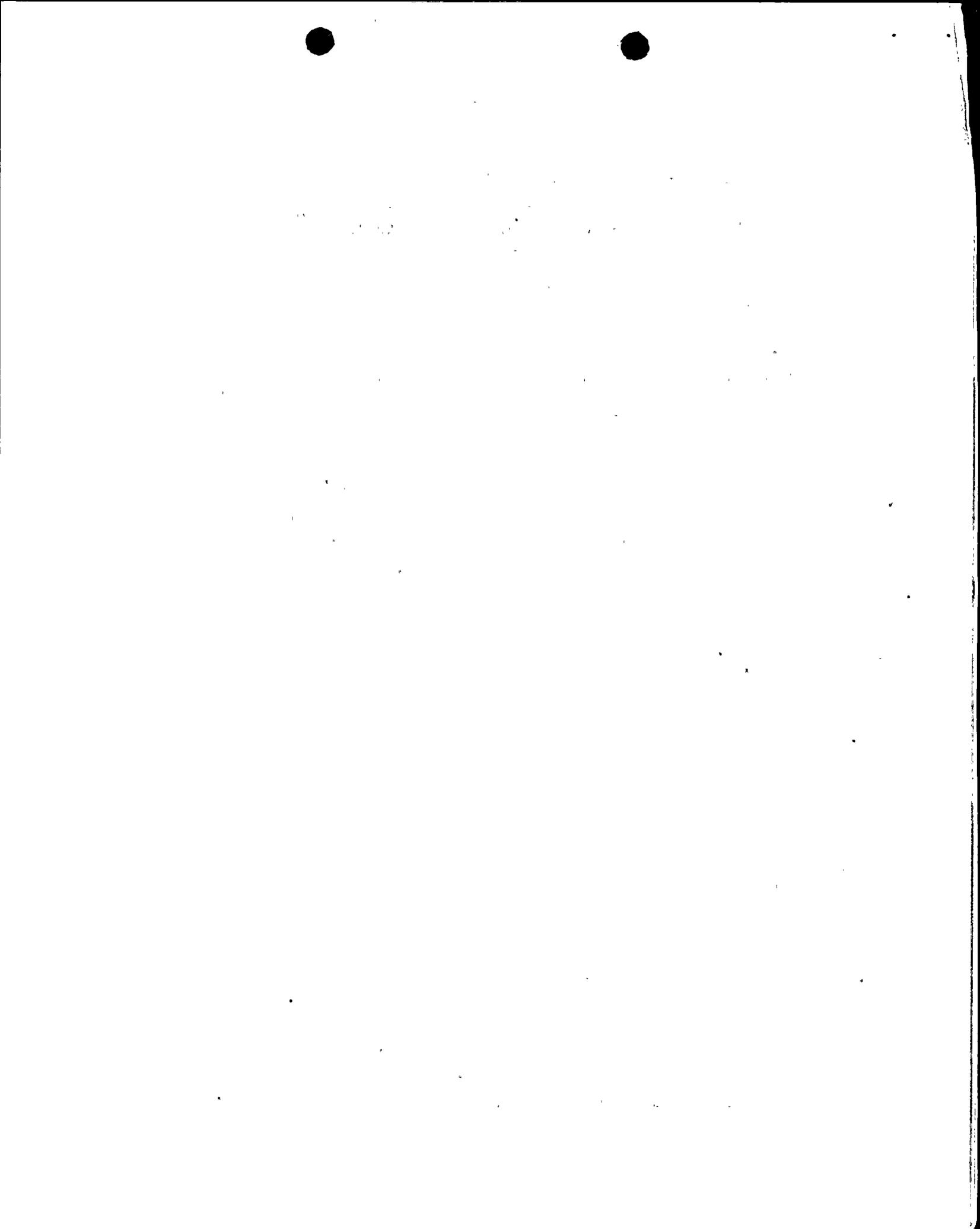
(ER)

Provide an updated description of the transmission lines. The description should include the number of lines, routes, and access corridors. Plans for maintenance and monitoring of the transmission line rights-of-way, as well as for access corridors should also be described. If these plans differ from the BLM procedures for the Devers line, provide an outline of the differences. Describe the normal use for access roads and discuss any problems anticipated from dust.



THE UNIVERSITY OF CHICAGO
DIVISION OF THE PHYSICAL SCIENCES
DEPARTMENT OF CHEMISTRY
5708 SOUTH CAMPUS DRIVE
CHICAGO, ILLINOIS 60637

- 290.9
(ER)
(5.5.1.1) Provide a description of the grounding systems and line clearances which will be used to reduce induced voltages and currents in conducting objects, such as fences and large tractor-trailers, in the vicinity of the right-of-way.
- 290.10
(ER) Describe how the growth of vegetation, along the perimeter of the evaporation pond will be controlled, if any exists.



291.0

ENVIRONMENTAL ENGINEERING BRANCH

291.1
(ER)
(3.6.2)

Based on the updated information provided in Table 3.6-1, provide an estimate of the amounts of the chemical constituents expected in the Water Reclamation Plant effluent.

291.2
(ER)
(3.6.2)

Estimate the capacity of the onsite reservoir and describe methods to be used to control and monitor seepage.

291.3
(ER)
(3.6.2.1
5.3.2)

Provide an updated estimate of the types and amounts of pathogens, heavy metals, and biocides expected in: the influent from the Phoenix 91st Avenue Sewage Treatment Plant; the effluent from the water reclamation plant; and in blow-down and cooling tower drift.

291.4
(ER)
(3.6.2.2)

Identify the dispersant to be added to the circulating water and provide the EPA Registration No. If proprietary, provide toxicity data.

291.5
(ER)
(3.6.2.2)

Provide an updated estimate of the concentrations and annual discharges of heavy metals, toxic and deleterious substances, and biocides in the cooling tower drift using a drift rate of 0.0044%.

291.6
(ER)
(3.6.2.3)

Identify the types and amounts (providing concentration and flow rates) of chemicals to be used in the Reverse Osmosis Units during RO operation or layup.

291.9
(ER)
(3.7.1.1)

The CP-FES describes the two packaged sanitary waste treatment units as activated sludge units using aeration, final clarification, continuous sludge recirculation and chlorination. If there have been any changes in the sanitary waste system besides the decrease in the rated capacity of each unit, please provide an update.

291.10
(ER)
(3.7.2.1)

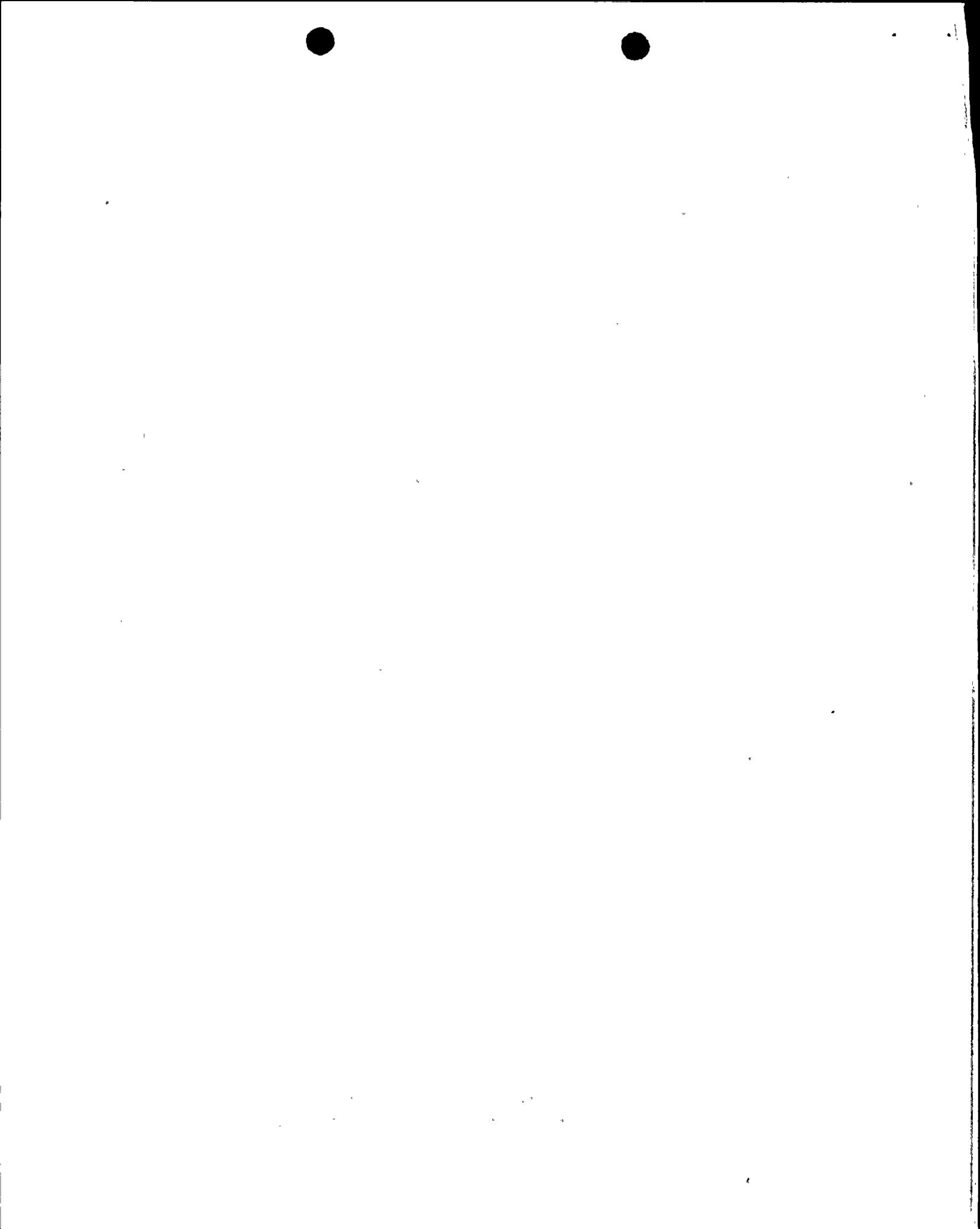
Identify the types and amounts of constituents expected in the solid waste obtained from cleaning of the cooling tower basins and the water storage reservoir. Identify the location of the disposal site.

291.11
(ER)
(3.7.2.2)

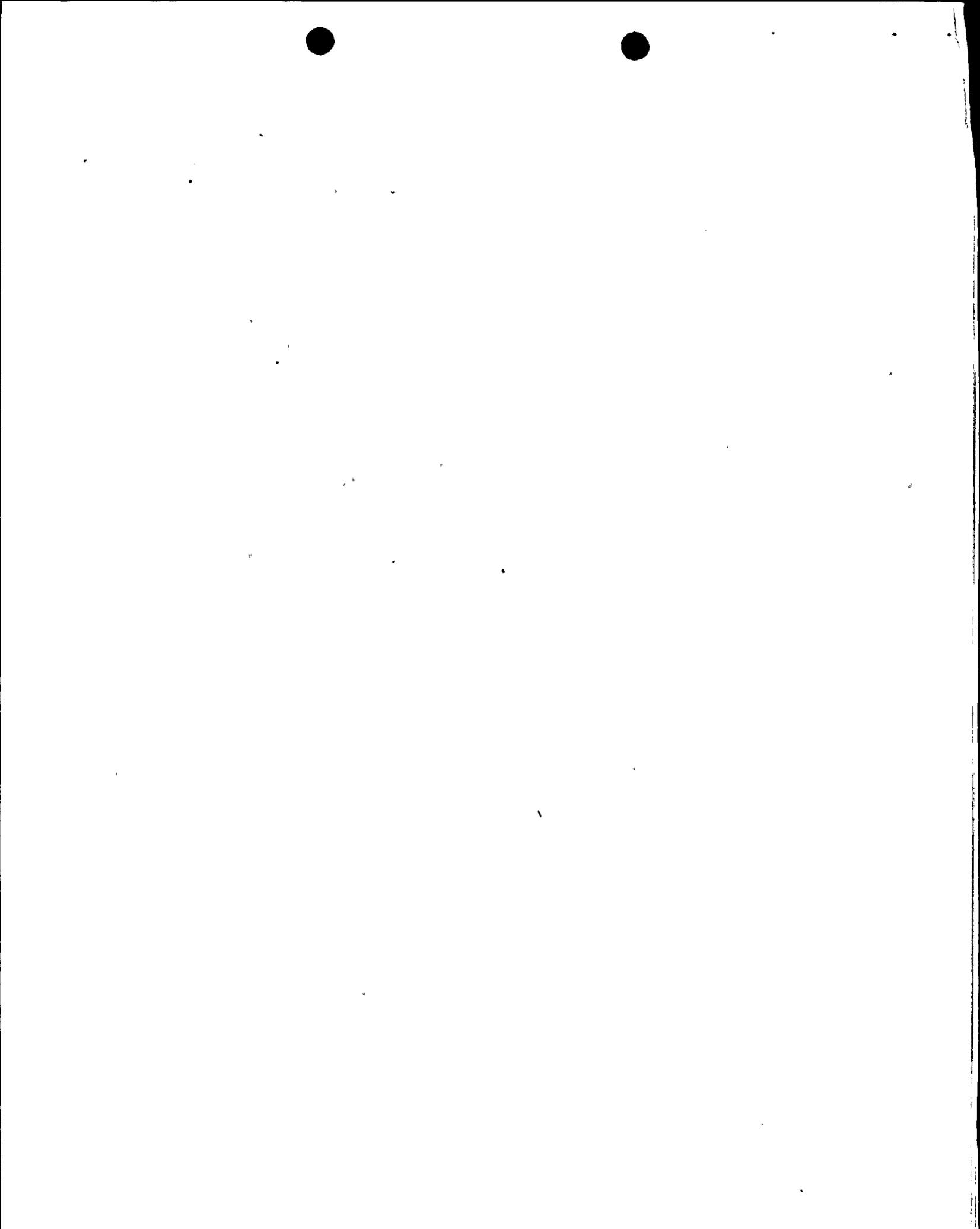
Identify the measures taken to assure no adverse effects from onsite disposal of sanitary waste sludge. Identify the type of lining to be used and estimate the types and amounts of pathogens expected in the sludge. Provide the location of the disposal site.

291.12
(ER)
(3.7.3.3)

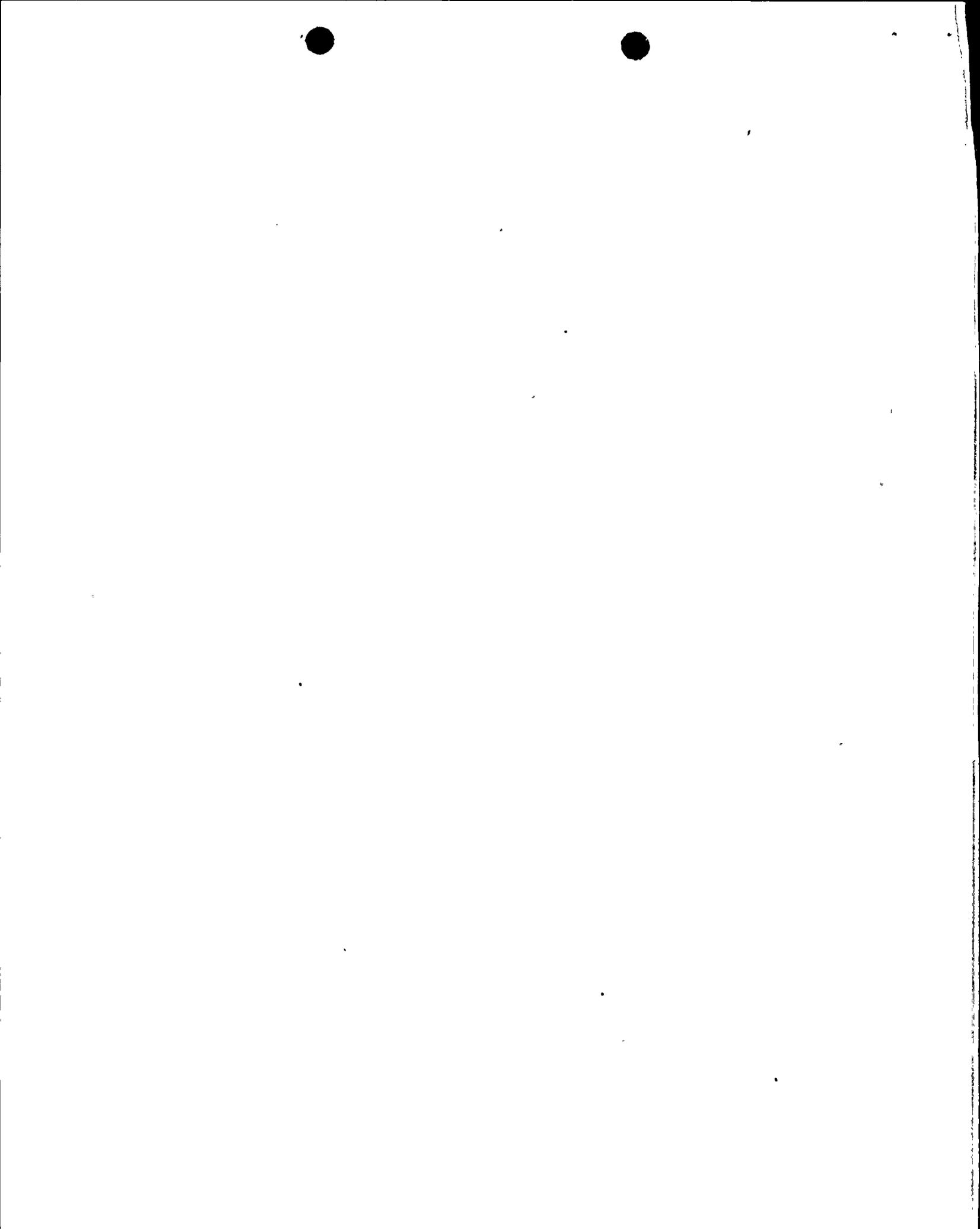
Estimate the amount of metals, in gaseous and solid form, discharged to the atmosphere during lime recalcination. Provide the basis for the estimate, including the quantity of each metal associated with the lime and the maximum temperature required during the calcining process.



- 291.12
(ER)
(5.6.2) Provide the sound-power frequency spectrum and grid coordinates of each sound source used as input to the computer program SOCON. Include the elevation of each assumed source.
- 291.13
(ER)
(5.6.2) Provide documentation on the computer program SOCON.
- 291.15
(ER)
(2.7) Provide a discussion of noise sensitive land uses in the vicinity of the plant site. The discussion should describe the type of land use (e.g., hospital, cemetery, school, residence, wildlife management area), and its location and distance from plant noise sources such as cooling towers, circulating water pumps, plant transformers, switchyard, steam vent locations and outdoor paging system.
- 291.16
(ER)
(2.7) Provide a discussion of all significant barriers (natural or otherwise) to noise propagation and ground cover (such as groves of trees and other vegetation) that could possibly affect sound propagation to offsite areas. Indicate their location, extent, elevation, proximity to noise sources and noise sensitive land uses, and estimate their effect on noise propagation offsite.
- 291.17
(ER) Provide an updated estimate of the types of biocides, and their concentrations, present in the effluent from the 91st Avenue Sewage Treatment Plant. If the effluent has been monitored for physical, chemical, or microbiological characteristics, please provide an update of Table.3.1 of the CP-FES. If monitoring data is not available, provide an estimate and basis therefore of the effluent temperature and pH ranges.
- 291.18
(ER) Indicate the maximum and average time necessary for water to travel the distance from the 91st Avenue Sewage Treatment Plant to PVNGS.. Indicate whether the influent from the 91st Avenue STP will ever be stored onsite prior to treatment by the water reclamation plant or will always be treated immediately.
- 291.19
(ER) Predict the effect of the 36-mile pipeline passage on physical, chemical and microbiological parameters of the effluent from the 91st Avenue Sewage Treatment Plant. Provide references used in reaching your predictions regarding microbiological organisms.
- 291.20
(ER) Provide an updated estimate of the types and amounts of biocides expected in the effluent from the PVNGS water reclamation plant.
- 291.21
(ER) Describe the average and maximum time periods that the effluent from the PVNGS water reclamation plant will remain in the onsite storage reservoir prior to entering the cooling system.
- 291.22
(ER) Describe the effects that a breakdown at the Phoenix 91st Avenue Plant would have on the efficiency of the PVNGS water reclamation plant, on the storage reservoir capacity, and on plant operation.



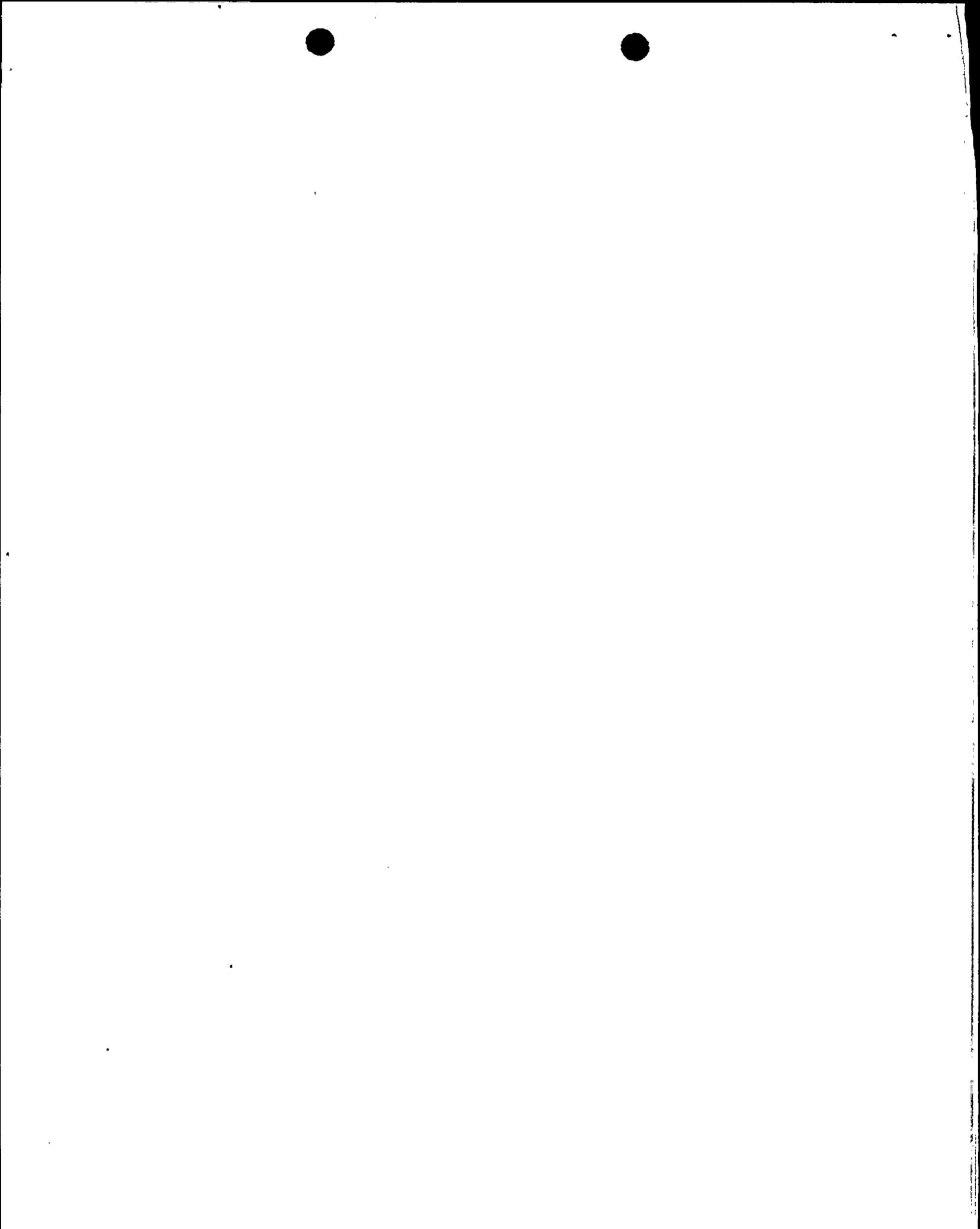
- 291.23
(ER) Describe the temperature and pH fluctuations that will occur in the cooling water as it travels through the cooling system. Estimate the time duration for the water to be at each temperature and pH level.
- 291.24
(ER)
(3.6.3.1) Identify the type and specifications (e.g., permeability, thickness, composition, temperature and pH tolerance, susceptibility to chemical degradation) of the liner to be used in the evaporation ponds. Describe the inspection and maintenance procedures to be used to assure the integrity of the liner. Provide the results of the determination under the Resource Conservation and Recovery Act as to whether all contaminants contained in the plant waste streams discharging to the evaporation ponds may be as discharged.
- 291.25
(ER)
(3.6.3.1) Estimate the final total area to be occupied by the evaporation ponds over the life of the plant, assuming that no additional water recovery/reclamation plans are implemented at the site.



310.0 SITING ANALYSIS BRANCH

- 310.1 (ER) (2.1.2) Provide the updated number and distribution over time of operation workers including reclamation and contracted workers as the three units come on line and during the first five years of operation of all three units.
- 310.2 (ER) (2.1.2) How many operation and reclamation workers would be hired from outside the area, and where would they be likely to live?
- 310.3 (ER) (2.1.2) Based upon available 1980 preliminary census counts, locate on a map all population centers within a 50-mile radius of PVNGS, including all towns, cities, and unincorporated communities. Updates of Tables 2.2-1 and 2.2-2 in the CP-ER would be appropriate.
- 310.4 (ER) (2.1.3) Provide updated zoning and current and future land use plans for the 0-50 mile radius from the site, including Maricopa County and the Phoenix area.
- 310.5 (ER) (2.1.2) Explain the method by which the updated 5-50 mile radius population figures in Section 2.1.2.1 were calculated.
- 310.6 (ER) (2.1.3) In addition to the traffic counts provided in the OL-ER Table 2.1-4, please provide traffic counts on the following roads:
 355th Avenue,
 Elliot (Ward) Road,
 339th Avenue,
 Van Buren Street,
 Wintersburg Road heading south from the site, and
 U. S. Highway approaches (I-10).

 Identify any places where traffic congestion or problems of interference with patterns of local and pedestrian traffic might be anticipated.
- 310.7 (ER) Provide an update of 'operation vehicles' as provided in CP-ER Table 4.1-2.
- 310.8 (ER) Provide annual estimates of the operation work force as the three units come on line and during the first five years of operation of all three units. This data should be presented in the format of Tables 9.1-3 through 8.1-6. Provide yearly dollar estimates of local purchases for goods and services (including contract workers) based on 1981 dollars.



310.9
(ER)

Estimate the average annual tax revenues from sale of electricity as the three units come on line and during the first five years of operation of all three units.



311.0 SITING ANALYSIS BRANCH

311.1 (ER) (2.1) A number of discrepancies between information supplied in the PSAR vs. the ESAR have been noted regarding information concerning the site vicinity. Examples of such discrepancies are as follows:

- (a) The CP lists the PVNGS site as being 15 miles west of Buckeye and 36 miles west of Phoenix, whereas the ESAR lists these distances as 16 and 34 miles, respectively.
- (b) The PSAR lists the elevation of the northern site boundary as 975 feet MSL, whereas the FSAR indicates 1030 feet MSL.
- (c) There are some differences between the PSAR and FSAR in the distances and even some directions of the towns and communities listed.
- (d) There is a considerable difference in the population distribution shown on the charts in the CP and OL submittals. The distribution in certain sectors is confusing. Following is an example of some of the obvious population shifts noted in 6 of the sectors.

| | 40 - 50 | | 30 - 40 | | 20 - 30 | | 0 - 5 | |
|---------|---------|-------|---------|------|---------|------|-------|-----|
| | N | NNE | ESE | SE | SE | SSE | NW | NNW |
| CP-1970 | 0 | 2698 | | | | | 125 | 0 |
| OL-1978 | 3397 | 358 | | | | | 0 | 174 |
| CP-1980 | 0 | 4261 | 955 | 0 | 534 | 0 | 197 | 0 |
| OL-1980 | 3623 | 381 | 0 | 916 | 0 | 502 | 0 | 186 |
| CP-1990 | 0 | 6291 | 1439 | 0 | 788 | 0 | 291 | 0 |
| OL-1990 | 4621 | 187 | 0 | 1168 | 0 | 640 | 0 | 237 |
| CP-2000 | 0 | 8682 | 1986 | 0 | 1088 | 0 | 402 | 0 |
| OL-2000 | 5935 | 625 | 0 | 1500 | 0 | 822 | 0 | 304 |
| CP-2010 | 0 | 11983 | 2741 | 0 | 1501 | 0 | 555 | 0 |
| OL-2010 | 7622 | 803 | 0 | 1927 | 0 | 1055 | 0 | 390 |

The above data is representative but does not include all of the questionable population numbers noted throughout the document.

Please resolve these discrepancies and amend the FSAR, as appropriate.

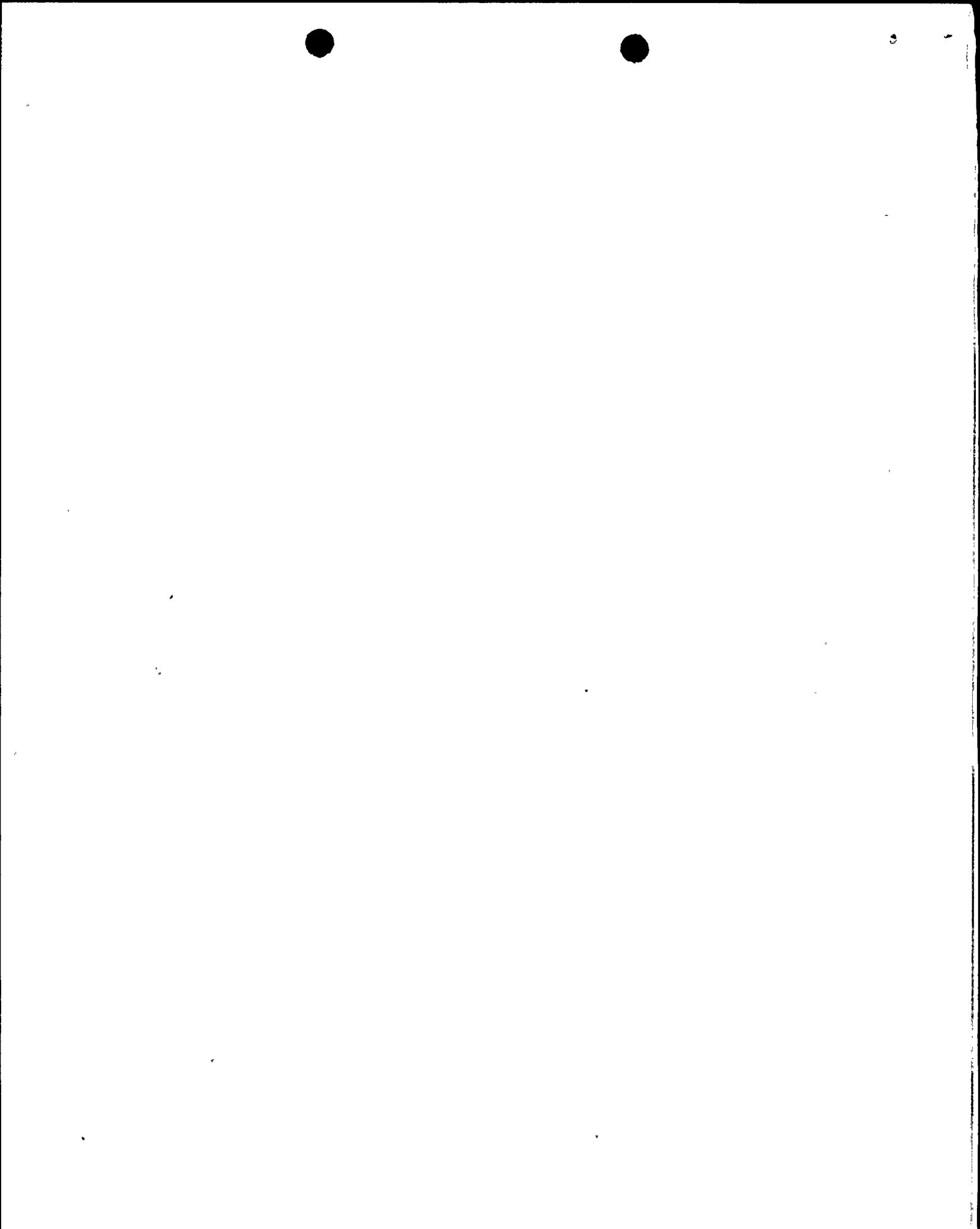


- 311.2
(ER)
(2.1.3.5) The population for the year 2030, for the cities of Avondale and Goodyear has a higher residential population than the sector (E) in which these cities are located. Please resolve this discrepancy. Also explain how the population projections for the entire 30 mile radius around the site can be lower than either of the above (Section 2.1.3.6).
- 311.3
(ER)
(2.1.3.5) Sun City has been designated as the nearest population center as defined by 10 CFR Part 100.. However, since the projected population for the cities of Avondale and Goodyear, which are closer to the site than Sun City, is expected to reach 25,000 prior to the end of plant life, please amend your application accordingly by designating Avondale/Goodyear as the nearest population center.
- 311.4
(ER)
(2.2.2.2) Southern Pacific Pipelines is "currently studying the feasibility of installing a pipeline parallel to the existing pipeline" which is 4.5 miles from Unit 2. There is no indication as to whether the new pipeline will be closer to the site, or exactly where it will be located. Please discuss the proposed location more fully and provide all pertinent additional information regarding this pipeline.
- 311.5
(ER)
(2.2.2.4) Provide more information on the current status of the proposed energy research park and petroleum refinery mentioned in the FSAR.



320.0 UTILITY FINANCE BRANCH

- 320.1 (ER) Provide production costs with operation of PVNGS as scheduled, with each of the three PVNGS units delayed one year, delayed two years, delayed three years, and delayed indefinitely.
- 320.2 (ER) Provide annual fuel use with operation of PVNGS as scheduled, with each of the three PVNGS units delayed one year, delayed two years, delayed three years, and delayed indefinitely.
- 320.3 (ER) Provide reserve margins (and LOLP indices if available) with operation of PVNGS as scheduled, with each of the three PVNGS units delayed one year, delayed two years, delayed three years, and delayed indefinitely.
- 320.4 (ER) The above information should cover the period through 1990 for each participant's system and, where applicable, for the combined system. Also present the basis and assumptions (e.g., average heat rate, fuel costs, O & M costs, and discount rate) that are used in obtaining the above data.
- 320.5 (ER) Explain how the reserve requirements were calculated. Were both firm purchases and sales included in the calculations?
(1.1.1) Note inconsistency in Table 1.101 and the statements on page 1.1-9.
- 320.6 (ER) Explain the inconsistency in Table 1.1-8 (page 1.1-189/190) in the total installed resources and the summation of power supply from individual plants (e.g., installed resources for 1988 should be 19322 MW, not 18728).
(1.1.2)



450.0

ACCIDENT EVALUATION BRANCH

450.1
(ER)

Provide a magnetic tape of hourly meteorological data for the five-year period described in the ER-OL. The data should be in the format described in Appendix A of the Draft of Revision 1 to Regulatory Guide 1.23. The tape should be compatible with IBM computer equipment.



VI
-174

ENCLOSURE 2

Environmental Review Schedule
for Palo Verde EIS

| <u>Milestone</u> | <u>Date</u> |
|--|------------------|
| Site visit questions complete with input to LPM | 12/15/80 |
| Letter to Applicant on ER with list of informal questions | 12/21/80 |
| Site visit agenda to Applicant | 01/12/81 |
| Site visit | Week of 01/26/81 |
| Formal staff questions (Q1) to Applicant | 02/10/81 |
| Applicant's complete response | 03/03/81 |
| DES input complete | 04/21/81 |
| PDES | 06/01/81 |
| Management review by OELD and DOL complete | 07/17/81 |
| DES issued, NRC FR notice | 07/30/81 |
| Public comment period ends | 09/15/81 |
| LPM receives Applicant and staff responses to comments | 10/15/81 |
| PFES | 11/05/81 |
| Management review by OELD and DOL complete | 11/25/81 |
| Issue FES | 12/18/81 |

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